January, 1898.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

VOL. IX. NO. 1.

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Central Station, Des Moines, Iowa.

J. R. SAGE,
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GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER.
1898.

THE IOWA WEATHER AND CROP SERVICE

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME IX. JANUARY, 1898. No. 1.

NOTE AND COMMENT.

In 1897 the farms of Colorado produced $46,965,000 The total output of gold, silver, copper, lead, iron and coal the same year amounted to $45,384,600. So even in the leading gold producing state, agriculture is the leading industry.

***

The first tornado of the new year occurred on the night of January 11th, at Ft. Smith, Ark., causing a fearful loss of life in that city and vicinity, and destroying property valued at over a half million dollars. The track of the funnel was narrow, being less than a thousand feet in width. It originated southwest of the city and struck that place about 11 P. M. The death list is above fifty, and it will probably be increased from some of the large number of the seriously injured people who were rescued from the wrecked buildings. The cyclone was first noted on the weather map on the morning of the 11th, the center being at El Paso. It moved swiftly and developed in intensity during that day, the central line passing northwest of Ft. Smith On the morning of the 12th it had reached the vicinity of Chicago.

***

The Sioux City *Journal* of February 21 contained the following note in relation to January weather at that station:

"In his meteorological summary for the month Observer Purssell gives the mean temperature for the month as 24° above zero. The mean temperature for January for the last nine years has been 18°. The prevailing direction of the wind was from the northwest, from which direction came 26 per cent of the breeze. The total movement of the wind during the month was 7,529 miles. The wind reached its maximum velocity for the month, 43 miles, on January 28th The total precipitation for the month was .27 of an inch, there being 5 days of more than .01 of an inch precipitation. During the month there were 15 clear days, 4 partly cloudy days and 12 cloudy days"

***

Why do the direct rays of the sun appear white? The rays that come from the sun directly to us have lost a greater share of blue than of red rays, and the sun should therefore appear of a reddened, or at least of an orange, tint This reasoning is correct, and the best answer to it is the one suggested by Langley. If we could see the sun from outside of our atmosphere, it would probably be a blue sun: it appears white only after an excess of blue in the original sunbeam has been turned away on its passage to us through the dusty air. In this respect the sun is not a unique body; blue stars are known in various parts of the sky, and these are evidently even more blue than our sun; otherwise their light also would be white when it came down to us.

The greater purity and fainter illumination of the blue of the sky when seen from lofty mountain tops is due to the absence in the upper air of those larger dust motes so common at lower levels. The larger motes turn to us waves of all kinds, diluting the blue sky by the addition of white light to the observer at sea level When we rise above the level at which the coarser motes are common, their action weakens; the sky is less illuminated, but of a deeper and purer blue color, and at heights of fifteen or twenty thousand feet observers describe it as of a deep indigo color, extremely dark compared to the well illuminated sky to which we are accustomed.—*From Davis' Elementary Meteorology.*

***

The New Orleans *Times-Democrat* says: "The United States has by far the best weather service in the world, and it is worth millions of dollars to it each year in shipping cargoes and crops saved. We, in Louisiana, have been able to appreciate the advantages from it, for our chief crop, sugar cane, is one that depends largely upon the weather, and the possibility of the weather bureau telling the planters of a freeze three or four days in advance has robbed sugar planting of one of its greatest dangers. It is a standing joke to laugh at the mistakes, the erroneous predictions of the weather bureau, but, as a matter of fact, the mistakes are few, and, as the statistics show, getting fewer every day. With the improvements hoped for from the weather stations we may hope to move closer to perfection The science of meteorology has proved a very progressive one in America."

***

The final estimates of acreage, production and value of crops in the United States for 1897, made by the department of agriculture, are as follows:

Wheat -39,465,066 acres, 530,149,168 bushels; value, $428,547,121.

Corn—80,095,101 acres, 1,902,967,933 bushels; value, $501,072,952.

Oats—25,730,375 acres, 698,767,809 bushels; value, $47,974,719.

Rye—1,703,561 acres, 27,363,324 bushels; value, $12,239,647.

Barley—2,719,116 acres, 66 685 127 bushels; value, $25,142,139.

Buckwheat—717,836 acres, 14,997,451 bushels; value, $6,319,188.

Potatoes—2 534,577 acres, 165,015,964 bushels; value, $89,643,059.

Hay—42,426,770 acres, 60,664 876 tons; value, $401,390,728.

The area devoted to hay in 1896 was 43,259,756 acres, from which there was gathered 59,282,158 tons, valued at $388,145,614; in 1895, 44,206,453 acres, 57,078,541 tons; value, $393,185,615, 1894, 48,321,272 acres, 54,874,408 tons; value, $468,578,321; 1893; 49,613,469 acres, 65,766,158 tons; value, $570,882,872.

NATIONAL WEATHER BULLETIN, JANUARY, 1898.

WASHINGTON, D. C., February 2, 1898.

The month averaged milder than usual in all districts east of the Rocky mountains, as well as over the northern Rocky mountain region and on the north Pacific coast. Over much the greater part of the country the average daily temperature excess amounted to 3° or more, and in the central valleys, upper Lake region, upper Missouri and Red River of the North valleys, it ranged from 6° to 17° per day, the excess being most marked in the upper Missouri and Red River of the North valleys.

Over the central and southern plateau regions, extreme northern New England, and on the east coast of southern Florida, the month averaged colder than usual, the deficiency in temperature ranging from 2° to 4° per day in California and from 3° to 7° per day over the middle plateau region.

COLD WAVES.

On January 1st a cold wave overspread the interior portions of the Atlantic coast states from northern New England to the Carolinas, and thence westward over the northern portion of the Gulf states, including the southern portions of Missouri and Illinois. During the night of the 2d and on the 3d the temperature rose over this entire section, but on the 4th there was a fall in temperature over eastern New York and New England. The temperature over the middle and south Atlantic and Gulf states remained below normal until the afternoon of the 4th.

From the 4th to the 27th no decided cold wave occurred.

On the afternoon of the 28th a cold wave appeared over North Dakota, and during the night, extended over South Dakota, northern Iowa, Minnesota, and the Lake Superior region, and while a decided fall in temperature occurred in the Ohio valley, lower Lake region, and middle Atlantic states, the cold wave did not extend eastward of the upper Mississippi valley and the upper Lake region.

The morning reports of the 31st indicated a cold wave of considerable severity over the Dakotas, and by the morning of February 1st it had extended eastward over the Mississippi and Ohio valleys and Lake region, accompanied by freezing temperature as far south as central Alabama and southern Georgia

PRECIPITATION.

The precipitation of January, 1898, exceeded the average over the greater part of the Lake region, in the Ohio, central and lower Mississippi valleys, lower Missouri valley, including the middle-eastern Rocky mountain slope, and portions of northern and eastern Texas. There was also more than the average precipitation over the greater part of New England and the northern portion of the middle Atlantic states The precipitation was unusually heavy in the Ohio, lower Missouri, central and lower Mississippi valleys, where it generally ranged from 4 to 10 inches, the region of greatest precipitation embracing eastern Arkansas, northern Mississippi, and the western portions of Tennessee and Kentucky, where it was about double the January average.

The month was marked by unusally light precipitation in the south Atlantic and east Gulf states, southern and western Texas, in upper Michigan, northern Wisconsin, Minnesota, the upper Missouri valley, the middle and northern plateau districts, and throughout the Pacific coast region. The deficiency in south Atlantic and east Gulf states ranged from 1 to 3 inches; in southern Texas from 1 to 2 inches, and on the Pacific coast from 1 to 5 inches. The very light rainfall in California is the most important feature in connection with the precipitation of the month. In the central and northern portions of the state it has amounted to not more than from one-eighth to three-eighths the average amount for January, and as that for December in this region was also very light, averaging about 25 to 40 per cent of the normal amount, the precipitation of the remainder of the season becomes a matter of more than the usual importance, and fears are entertained that agricultural interests will suffer as a result of insufficient moisture.

DEPTH OF SNOW AT CLOSE OF MONTH.

Over the northern districts from the upper Mississippi valley eastward, considerable snow fell during the week ending January 31st, the southern limit east of the Mississippi river generally ranging from fifty to two hundred and fifty miles farther south than on January 24th. The greater part of the upper Lake region is now covered to depths ranging from 9 inches to 2 feet, and along the southern shore of Lake Superior, in the upper Michigan peninsula, the depths generally range from 30 inches to 3 feet. From western New York to the northern New England coast snow ranges from 9 inches to over 2 feet, the depth being greatest in the mountains of northern New England and on the southern coast of Maine. Much snow has disappeared over the middle-eastern Rocky mountain slope, and also on the north Pacific coast. Continued absence of snow in Minnesota, the Dakotas, and Montana mark the present winter, to date, as exceptional in that region.

At the corresponding date of 1897, Minnesota, the Dakotas, and eastern Montana were covered to depths generally ranging from 4 to 18 inches, while the Lake region, portions of the upper Mississipi valley, northern New England, and the northern plateau region had decidedly less snow than at this date.

WILLIS L. MOORE,
Chief of Bureau.

FRUIT AND HEALTH.

BY CALEB BROWN, M. D.*

*Extract from a paper read before the Northwestern Horticultural society, at Sac City, December 9, 1897.

Viewing this subject from the standpoint of the physician we first must express our great appreciation of the benefits of ripe, juicy apples, luscious grapes, the mellow pear, rich peach and strawberries that make our mouths water, but in our enthusiasm for those nice, wholesome fruits we must not forget the aches and pains of the small boy who has eaten the green apples or sour gooseberries, or the delicate little babe, but a few months old, that through mistaken kindness of its mother, has been allowed to eat a raw apple, or that adult patient whose weak, irritable stomach has been outraged by some improper fruit; or the sick person, whether child or adult, whose digestive organs are in such a condition that fruit, under any circumstances, is injurious. The idea is too prevalent that fruit does not injure sick persons, especially if they crave it, but this is wrong and cannot be condemned too severely. How often do we, as physicians, find our patients switched off, as it were, from the highway to recovery, by being given a piece of raw apple or some other equally injurious substance! Do not understand me as condemning unreservedly fruit for the sick, for when properly ripened or cooked and given with good judgment it is of undoubted benefit, and should not be discarded by any means from the diet of children.

That we may understand why fruit is so many times injurious let us look at it from the standpoint of the physiological chemist Most green fruits contain tannic acid in one of its forms (C_{14} H_{10} O_9), which gives it the peculiar pungent, astringent taste; cellulose (C_6 H_{10} O_5), which composes the cell walls; and one or more vegetable acids—mallic, citric or tartaric, corresponding to the kind of fruit. In addition to these there is a peculiar substance called pectose, the exact composition not known. While the fruit remains green it bears much the same

relation to the tree that the leaves do, that is, it absorbs carbonic acid and throws off oxygen. The most injurious property of unripe fruit, perhaps, is the tannic acid. This, along with the vegetable acids, makes it irritating and injurious under all circumstances.

Let us now notice the changes that take place when fruit begins to ripen. When this process begins carbonic acid is thrown off and oxygen is absorbed. The changes taking place in the principal constituents are as follows: Each molecule of tannic acid (C_{14} S_{10} O_9) takes up one molecule of water (H_2 O) and twelve atoms of oxygen (O_{12}) producing one molecule of fruit sugar (C_6 H_{12} O_6) and eight molecules of carbonic acid 8 (C O_2), the carbonic acid being thrown off. To each molecule of cellulose (C_6 H_{10} O_5) is added one molecule of water (H_2 O) producing one molecule of sugar (C_6 H_{12} O_6). Taking tartaric acid as a type of the fruit acids we find that to three molecules of tartaric acid are added three atoms of oxygen (O_3), which gives us one molecule of sugar (O_6 H_{12} O_6), three molecules of water 3 (H_2 O), and six molecules of carbonic acid 6 (C O_2). The cellulose, under the influence of the vegetable acids, is converted into sugar by the addition of one molecule of water to each molecule of cellulose. Pectose, during the ripening process, is converted first into pectin, then into pectic acid and pectosic acid. It is from the presence of these acids that fruit juice, on boiling, is converted into jellies. Hence we see in the ripening process we have had thrown off the surplus carbon and oxygen in the form of carbonic acid, while the tannic acid has been changed into sugar, the fruit acids into sugar, which sweetens the fruit and water which makes it juicy. We now have a luscious, refreshing, healthful fruit from what was a pungent, sour, injurious product.

Cooking has much the same effect on fruit that the ripening process has; for this reason cooked fruits are much better for delicate stomachs than the raw products.

BROAD-TIRED WAGONS.

[CINCINNATI PRICE CURRENT.]

An interesting and instructive series of experiments have been made by the Missouri Experiment station during the past two years with the draft of broad and narrow-tired wagons. These tests have been made with the ordinary narrow-tired wheels and with six-inch tires, on macadam streets, gravel and dirt roads in all conditions, on meadows, pastures, stubble and plowed fields, both wet and dry.

The broad tires pulled materially lighter on the macadam streets and the gravel roads. Also on dirt roads in all conditions except when soft or sloppy on the surface, underlaid by hard roadbed, and when the mud was very deep and sticky. In both these conditions the narrow tires pulled considerably lighter. It should be borne in mind, however, that the roads are in these conditions for a comparatively short period of time, and this at seasons when their use has naturally been reduced to the minimum. The tests on meadows, pastures, stubble land, corn land and plowed ground in every condition, from dry, hard and firm to very wet and soft, show, without a single exception, a large saving in draft by the use of the broad tires.

The bulk of the hauling done by the farmer is on the farm, in hauling feed from the fields and hauling manure from the barns, etc. The actual tonnage hauled to market is insignificant in comparison with that hauled about on the farm, inasmuch as a large proportion of the products of the average farm is sent to market in the form of live stock or its products.

It is clearly shown by these experiments that in many instances where the narrow tire is very injurious to the road or field, the broad tire proves positively beneficial when the same load is hauled. When it is considered, therefore, that the average draft of the broad tire is materially less than the narrow tire, and that the injury done to the roads and farms by the narrow tire can be almost wholly corrected by the use of the wide tires, there remains no longer any good reason for the use of the narrow-tired wagons.

These experiments further indicate that six inches is the best width for the farm and road wagon, and that both axles should be the same length, so that the front and rear wheels shall run in the same track. A profusely illustrated bulletin giving full report of these tests is now ready for free distribution upon application to the director of the Missouri Experiment station at Columbia.

AMERICAN CORN ABROAD.

"One of the most favorable commercial features for this country in 1897," says the St. Louis *Globe-Democrat*, "was the largely increased foreign demand for Indian corn. The total exports last year amounted to 186,000,000 bushels, or over 69,000,000 more than ever before. In the six years preceding 1897 the average annual exports of corn were 66,000,000 bushels. It is clear that the record for 1897 justifies the belief that the uses of maize are becoming more familiar in Europe. The missionary work performed by the special American commissioner, Charles J. Murphy, was successful to a remarkable degree, and a general effort should be maintained to extend an appreciation of corn among the masses of the old world.

"An extensive corn exhibit is to be made at the Paris exposition of 1900. It is an excellent idea, and should be adopted for every international exhibition. Corn lends itself readily to picturesque structures and displays of various kinds, and when intelligently employed in an exhibit always draws a crowd. There should be at the Paris exposition, in addition to the proposed colossal corn picture, 40x60 feet in size, a large corn kitchen, in which articles of food prepared from maize can be tested by the multitude. A plate of corn cakes, baked to a golden brown, would be a revelation to nearly all Europeans. Corn bread of different kinds should be freely supplied to all who desire to taste it. That it is savory and wholesome is well known in America. The table of Washington was never without corn bread, made of white meal, and it was his chief article of food at home or in the field. In the states where corn is most abundant the physical types of manhood and womanhood are unusually fine.

"What is needed to insure a general demand for corn in foreign countries is a knowledge of preparing it for the table. All cereals need a special treatment to make them palatable. Nature completes the grain, but the cook must then step in to produce the viand. In this respect corn has long rested under a disability outside of America. The cornmeal sent to Ireland many years ago during a famine was largely wasted, for the starving people could add nothing to it except water, and insisted that it was food for horses. Maize is an unsurpassed basis for many breads and delicacies, but it requires combination, just as oatmeal demands milk or cream, and milk is a complete food in itself. The work of educating Europe and Asia on the merits of maize should go forward steadily, and it is pleasant to know that success is attending the efforts already made in this direction."

DIMENSIONS OF THE EARTH.

[FROM DAVIS' "ELEMENTARY METEOROLOGY."]

Area of earth's surface, 197,000,000 square miles.

Volume of earth, 256,000,000,000 cubic miles.

Area of ocean, 150,000,000 square miles, or three-fourths of earth's surface.

Volume of ocean, 300,000,000 cubic miles, or 1-843d of earth.

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WASHINGTON, D. C., February 2, 1898.

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Over the central and southern plateau regions, extreme northern New England, and on the east coast of southern Florida, the month averaged colder than usual, the deficiency in temperature ranging from 2° to 4° per day in California and from 3° to 7° per day over the middle plateau region.

COLD WAVES.

On January 1st a cold wave overspread the interior portions of the Atlantic coast states from northern New England to the Carolinas, and thence westward over the northern portion of the Gulf states, including the southern portions of Missouri and Illinois. During the night of the 2d and on the 3d the temperature rose over this entire section, but on the 4th there was a fall in temperature over eastern New York and New England. The temperature over the middle and south Atlantic and Gulf states remained below normal until the afternoon of the 4th.

From the 4th to the 27th no decided cold wave occurred.

On the afternoon of the 28th a cold wave appeared over North Dakota, and during the night, extended over South Dakota, northern Iowa, Minnesota, and the Lake Superior region, and while a decided fall in temperature occurred in the Ohio valley, lower Lake region, and middle Atlantic states, the cold wave did not extend eastward of the upper Mississippi valley and the upper Lake region.

The morning reports of the 31st indicated a cold wave of considerable severity over the Dakotas, and by the morning of February 1st it had extended eastward over the Mississippi and Ohio valleys and Lake region, accompanied by freezing temperature as far south as central Alabama and southern Georgia

PRECIPITATION.

The precipitation of January, 1898, exceeded the average over the greater part of the Lake region, in the Ohio, central and lower Mississippi valleys, lower Missouri valley, including the middle-eastern Rocky mountain slope, and portions of northern and eastern Texas. There was also more than the average precipitation over the greater part of New England and the northern portion of the middle Atlantic states The precipitation was unusually heavy in the Ohio, lower Missouri, central and lower Mississippi valleys, where it generally ranged from 4 to 10 inches, the region of greatest precipitation embracing eastern Arkansas, northern Mississippi, and the western portions of Tennessee and Kentucky, where it was about double the January average.

The month was marked by unusally light precipitation in the south Atlantic and east Gulf states, southern and western Texas, in upper Michigan, northern Wisconsin, Minnesota, the upper Missouri valley, the middle and northern plateau districts, and throughout the Pacific coast region. The deficiency in south Atlantic and east Gulf states ranged from 1 to 3 inches; in southern Texas from 1 to 2 inches, and on the Pacific coast from 1 to 5 inches. The very light rainfall in California is the most important feature in connection with the precipitation of the month. In the central and northern portions of the state it has amounted to not more than from one-eighth to three-eighths the average amount for January, and as that for December in this region was also very light, averaging about 25 to 40 per cent of the normal amount, the precipitation of the remainder of the season becomes a matter of more than the usual importance, and fears are entertained that agricultural interests will suffer as a result of insufficient moisture.

DEPTH OF SNOW AT CLOSE OF MONTH.

Over the northern districts from the upper Mississippi valley eastward, considerable snow fell during the week ending January 31st, the southern limit east of the Mississippi river generally ranging from fifty to two hundred and fifty miles farther south than on January 24th. The greater part of the upper Lake region is now covered to depths ranging from 9 inches to 2 feet, and along the southern shore of Lake Superior, in the upper Michigan peninsula, the depths generally range from 20 inches to 3 feet. From western New York to the northern New England coast snow ranges from 9 inches to over 2 feet, the depth being greatest in the mountains of northern New England and on the southern coast of Maine. Much snow has disappeared over the middle-eastern Rocky mountain slope, and also on the north Pacific coast. Continued absence of snow in Minnesota, the Dakotas, and Montana mark the present winter, to date, as exceptional in that region.

At the corresponding date of 1897, Minnesota, the Dakotas, and eastern Montana were covered to depths generally ranging from 4 to 18 inches, while the Lake region, portions of the upper Mississipi valley, northern New England, and the northern plateau region had decidedly less snow than at this date.

WILLIS L. MOORE,
Chief of Bureau.

FRUIT AND HEALTH.

BY CALEB BROWN, M. D.*

*Extract from a paper read before the Northwestern Horticultural society, at Sac City, December 9, 1897.

Viewing this subject from the standpoint of the physician we first must express our great appreciation of the benefits of ripe, juicy apples, luscious grapes, the mellow pear, rich peach and strawberries that make our mouths water, but in our enthusiasm for those nice, wholesome fruits we must not forget the aches and pains of the small boy who has eaten the green apples or sour gooseberries, or the delicate little babe, but a few months old, that through mistaken kindness of its mother, has been allowed to eat a raw apple, or that adult patient whose weak, irritable stomach has been outraged by some improper fruit; or the sick person, whether child or adult, whose digestive organs are in such a condition that fruit, under any circumstances, is injurious. The idea is too prevalent that fruit does not injure sick persons, especially if they crave it, but this is wrong and cannot be condemned too severely. How often do we, as physicians, find our patients switched off, as it were, from the highway to recovery, by being given a piece of raw apple or some other equally injurious substance! Do not understand me as condemning unreservedly fruit for the sick, for when properly ripened or cooked and given with good judgment it is of undoubted benefit, and should not be discarded by any means from the diet of children.

That we may understand why fruit is so many times injurious let us look at it from the standpoint of the physiological chemist Most green fruits contain tannic acid in one of its forms (C_{14} H_{10} O_9), which gives it the peculiar pungent, astringent taste; cellulose (C_6 H_{10} O_5), which composes the cell walls; and one or more vegetable acids—mallic, citric or tartaric, corresponding to the kind of fruit. In addition to these there is a peculiar substance called pectose, the exact composition not known. While the fruit remains green it bears much the same

relation to the tree that the leaves do, that is, it absorbs carbonic acid and throws off oxygen. The most injurious property of unripe fruit, perhaps, is the tannic acid. This, along with the vegetable acids, makes it irritating and injurious under all circumstances.

Let us now notice the changes that take place when fruit begins to ripen. When this process begins carbonic acid is thrown off and oxygen is absorbed The changes taking place in the principal constituents are as follows: Each molecule of tannic acid (C_{14} 8_{10} O_9) takes up one molecule of water (H_2 O) and twelve atoms of oxygen (O_{12}) producing one molecule of fruit sugar (C_6 H_{12} O_6) and eight molecules of carbonic acid 8 (C O_2), the carbonic acid being thrown off. To each molecule of cellulose (C_6 H_{10} O_5) is added one molecule of water (H_2 O) producing one molecule of sugar (C_6 H_{12} O_6). Taking tartaric acid as a type of the fruit acids we find that to three molecules of tartaric acid are added three atoms of oxygen (O_3), which gives us one molecule of sugar (O_6 H_{12} O_6), three molecules of water 3 (H_2 O), and six molecules of carbonic acid 6 (C O_2). The cellulose, under the influence of the vegetable acids, is converted into sugar by the addition of one molecule of water to each molecule of cellulose. Pectose, during the ripening process, is converted first into pectin, then into pectic acid and pectosic acid. It is from the presence of these acids that fruit juice, on boiling, is converted into jellies. Hence we see in the ripening process we have had thrown off the surplus carbon and oxygen in the form of carbonic acid, while the tannic acid has been changed into sugar, the fruit acids into sugar, which sweetens the fruit and water which makes it juicy. We now have a luscious, refreshing, healthful fruit from what was a pungent, sour, injurious product.

Cooking has much the same effect on fruit that the ripening process has; for this reason cooked fruits are much better for delicate stomachs than the raw products.

BROAD-TIRED WAGONS.

[CINCINNATI PRICE CURRENT.]

An interesting and instructive series of experiments have been made by the Missouri Experiment station during the past two years with the draft of broad and narrow-tired wagons. These tests have been made with the ordinary narrow-tired wheels and with six-inch tires, on macadam streets, gravel and dirt roads in all conditions, on meadows, pastures, stubble and plowed fields, both wet and dry.

The broad tires pulled materially lighter on the macadam streets and the gravel roads. Also on dirt roads in all conditions except when soft or sloppy on the surface, underlaid by hard roadbed, and when the mud was very deep and sticky. In both these conditions the narrow tires pulled considerably lighter. It should be borne in mind, however, that the roads are in these conditions for a comparatively short period of time, and this at seasons when their use has naturally been reduced to the minimum. The tests on meadows, pastures, stubble land, corn land and plowed ground in every condition, from dry, hard and firm to very wet and soft, show, without a single exception, a large saving in draft by the use of the broad tires.

The bulk of the hauling done by the farmer is on the farm, in hauling feed from the fields and hauling manure from the barns, etc. The actual tonnage hauled to market is insignificant in comparison with that hauled about on the farm, inasmuch as a large proportion of the products of the average farm is sent to market in the form of live stock or its products.

It is clearly shown by these experiments that in many instances where the narrow tire is very injurious to the road or field, the broad tire proves positively beneficial when the same load is hauled. When it is considered, therefore, that the average draft of the broad tire is materially less than the narrow tire, and that the injury done to the roads and farms by the narrow tire can be almost wholly corrected by the use of the wide tires, there remains no longer any good reason for the use of the narrow-tired wagons.

These experiments further indicate that six inches is the best width for the farm and road wagon, and that both axles should be the same leugth, so that the front and rear wheels shall run in the same track. A profusely illustrated bulletin giving full report of these tests is now ready for free distribution upon application to the director of the Missouri Experiment station at Columbia.

AMERICAN CORN ABROAD.

"One of the most favorable commercial features for this country in 1897," says the St. Louis *Globe-Democrat*, "was the largely increased foreign demand for Indian corn. The total exports last year amounted to 186,000,000 bushels, or over 69,000,000 more than ever before. In the six years preceding 1897 the average annual exports of corn were 66,000,000 bushels. It is clear that the record for 1897 justifies the belief that the uses of maize are becoming more familiar in Europe. The missionary work performed by the special American commissioner, Charles J. Murphy, was successful to a remarkable degree, and a general effort should be maintained to extend an appreciation of corn among the masses of the old world.

"An extensive corn exhibit is to be made at the Paris exposition of 1900. It is an excellent idea, and should be adopted for every international exhibition. Corn lends itself readily to picturesque structures and displays of various kinds, and when intelligently employed in an exhibit always draws a crowd. There should be at the Paris exposition, in addition to the proposed colossal corn picture, 40x60 feet in size, a large corn kitchen, in which articles of food prepared from maize can be tested by the multitude. A plate of corn cakes, baked to a golden brown, would be a revelation to nearly all Europeans. Corn bread of different kinds should be freely supplied to all who desire to taste it. That it is savory and wholesome is well known in America. The table of Washington was never without corn bread, made of white meal, and it was his chief article of food at home or in the field. In the states where corn is most abundant the physical types of manhood and womanhood are unusually fine.

"What is needed to insure a general demand for corn in foreign countries is a knowledge of preparing it for the table. All cereals need a special treatment to make them palatable. Nature completes the grain, but the cook must then step in to produce the viand. In this respect corn has long rested under a disability outside of America The cornmeal sent to Ireland many years ago during a famine was largely wasted, for the starving people could add nothing to it except water, and insisted that it was food for horses Maize is an unsurpassed basis for many breads and delicacies, but it requires combination, just as oatmeal demands milk or cream, and milk is a complete food in itself. The work of educating Europe and Asia on the merits of maize should go forward steadily, and it is pleasant to know that success is attending the efforts already made in this direction."

DIMENSIONS OF THE EARTH.

[FROM DAVIS' "ELEMENTARY METEOROLOGY."]

Area of earth's surface, 197,000,000 square miles.

Volume of earth, 256,000,000,000 cubic miles.

Area of ocean, 150,000,000 square miles, or three-fourths of earth's surface.

Volume of ocean, 300,000,000 cubic miles, or 1-843d of earth.

THE WELLMAN POLAR EXPEDITION.

It was recently announced in the New York *Herald* that Mr. Walter Wellman was to be the leader of an expedition into the polar region. Three years ago Mr. Wellman was the head of an expedition which penetrated far into the ice at the north of Spitzbergen. The new expedition will start north some time next June, taking the Franz Josef Land route. Mr. Wellman has just returned from Europe, and held a long conference with Nansen concerning his plan, which Nansen approved with warm terms. Mr Wellman says:

"My plan is very simple. We shall establish a supply station at Cape Flora, which has just been abandoned by Jackson, the English explorer, who returned without going as far north as Nansen did. Next autumn we expect to throw out a second supply station, two, or perhaps three, degrees further north, or within seven or eight degrees of the pole. There we shall winter. The following spring, as soon as there is light enough to travel by, we shall set out with six men, sixty or seventy dogs, and sledges, determined to make the best possible use of the favorable season. The favorable season for work in that region is while the cold is still great, say at temperatures from 60° to 15° below zero. Then the surface is hard and sledging at its best. In June the power of the summer sun produces slush and renders travel difficult, if not quite impossible.

"Therefore, we shall have from 100 to 110 days in which to make our effort. Actually, all attempts to reach the north pole nowadays are dashes. Dr. Nansen made his dash from the Fram. Lieutenant Peary proposes to make a dash from the north of Greenland.

"Dr. Nansen believes, if he had had a base of supplies to fall back upon and a large number of dogs, he could have reached the pole. He says it can be done in the way I propose, and I am naturally eager to have a try at it, and if possible to plant the American flag at the spot where there is no other direction than south.

"I am well aware that many persons think nothing practical is to be gained by reaching the pole. It chances that I am an enthusiast in this field, and I ask neither public subscriptions nor universal consent. My party will be a mixed one as to nationalities, with a few American scientific men and the others Norwegians."—*Scientific American.*

LOCAL CLIMATIC CHANGES.

[MONTHLY REVIEW U. S WEATHER BUREAU.]

A correspondent in Northfield, Mass., desires our opinion on the question: "Were the winters of fifty years ago much colder, or were the snowfalls deeper than at present? The opinion is widely held that the winters were colder and the snowfalls deeper, but I can find nothing to warrant the belief except that in the first part of the century a much larger percentage of the population lived in the hill towns or in the interior, which are both colder than the valley or the coast towns."

On the general question as to the appreciable changes in climate the editor's opinion is that there has been no such change in any respect whatever so far as meteorology proper is concerned. If we divide our records of the weather recorded in North America since the days of Columbus into two periods, viz., before and after the year 1800, we shall find that every peculiarity, such as remarkable storms, winds, rains, floods, frosts, etc., recorded in the current century can be matched by a corresponding remarkable event before the year 1800. The popular impressions alluded to by our correspondent result almost entirely from the imperfections of our records and especially of our memories. There is a large class of persons whose habits of thought are so crude that when they experience any very remarkable weather they jump to the conclusion that the climate has changed, forgetting that they themselves have had such a limited personal experience that they are not fair judges of the weather over the whole country or of the climate of a century.

Our correspondent seems to suggest that a certain change in the habits of the people, such as the removal from the interior to the coast, or from forests to prairies, or from country to city, or vice versa, will partly account for widespread errors in respect to climate. The suggestion is excellent, but the editor would be inclined to interpret the phenomenon somewhat differently. The general movement of the population in the past century has been from the Atlantic states westward, and from the country to the city, or quite opposite to the movement suggested by our correspondent. In fact, we find no real agreement in the so-called popular traditions with regard to the weather. We have met with quite as many persons who think the winters are more severe as with those who think the winters are less severe than formerly. Everything seems to depend upon how and where the "oldest inhabitant" lived when he was a boy as compared with his present condition. If he moved from a farm on a windy hilltop in the country down to a cosy house in the village, the climate seemed to him to have improved If he moved from the milder climates on the coast in his youth to the severer climates in the interior he was, as a boy, struck with the great change, and the impression still remains with him that those winters were severer than now. If he has lived continuously in a large city like New York, where the growth of tall houses, the increased smoke, and diminished sunshine have completely changed the climate, and where these combined with the changes in the mode of living, especially the abolition of the open wood fire, have rendered the human system vastly more sensitive, he finds that the inequalities of climate are greater than formerly.

From a hygienic point of view "the climate" includes everything that affects the health and comfort of the body. The meteorological climate that agrees perfectly with one person may be entirely too severe for another. Our remembrance of our physical sensations is not a safe criterion when judging of climate. Our remembrance of an occasional storm or winter is not a safe guide in comparing the past with the present. Our records of deep snows are too fragmentary to give anything more than a general conviction that there has been no material change in the snowfall. Our records of extreme low temperatures are liable to be in error several degrees by the ancient use of very imperfect thermometers, and are almost certain to be exaggerated if the thermometers were placed in valleys or lowlands where cold air settles on still, clear nights, so that we must use great caution in interpreting these records; differences of 5°, 10°, and even 20° have occurred between the minimum temperatures recorded by weather bureau and voluntary observers located within a few miles of each, owing to the combination of these two sources of error.

Remarkable rains and snows are usually quite local phenomena; there have been several remarkable cases of this nature in certain portions of New England and the middle Atlantic states within the past ten years. Similar remarkable cases occurred in other portions of these states fifty years ago, and equally remarkable cases occurred in still other portions just before 1800. If there has been any change in the climate of Northfield, Mass., it is because it lay within some one of these regions of extraordinary rain or snow on one occasion and not on another. Such a change of climate at one spot is no criterion by which to judge of changes at other places 100 miles away. The average climate of New England, so far as the weather is concerned, has not appreciably changed since the days when her oldest forest trees were young saplings, and that carries us back nearly five hundred years.

IOWA CROPS AND LIVE STOCK.

SOME WONDERFUL FIGURES RELATING TO HAWKEYE STATE PRODUCTS.

[FROM THE HAY TRADE JOURNAL]

A week or two ago we published an article bearing on the size and value of the various products of Kansas, and that a Kansas boomer who was handy with figures had estimated that it would take a train 6,000 miles long to transport it out of the state Speaking of the Kansas claim, Mr J. R. Sage, of the Iowa Weather and Crop Service, whose attention was called to the above, says:

"That seems like a whopper, but figures never lie, unless the figurer is something of a prevaricator. We will allow, however, that the calculations are correct. And now, Iowa products in 1897 (though it was an off year) would load up something of a railroad train, if the people should conclude to export the entire output of the soil for the year.

"For our three heaviest crops, corn, oats and hay, we should rsquire 1,174,757 freight cars, which would make a train 7,341 miles long, allowing thirty-three feet as the average length of a car

"Add to that all other crops grown in the state, exclusive of pasture and corn fodder, and to move our total soil products would require 1,339,231 cars, making a train of 8,367 miles long.

"After shipping away all our feed stuff we should be obliged to export our live stock of all kinds, and this would call for 339,150 cars; that would make a train 2,168 miles long.

"So, our total soil products grown in 1897, and the live stock we had on hand before the 1897 crop was used to feed the stock, would load the grand total of 1,678,381 freight cars; that would make a train 10,535 miles in length

"If we should bridge the Atlantic and construct an air line railroad east by south, that train laden with Iowa crops and stock would reach all the way from Des Moines to a point about 200 miles east of Calcutta, India"

JANUARY WEATHER RECORD.

The month of January was warmer than usual, the mean temperature for the state, as shown by records of 106 stations, being 23.4°. The lowest temperature recorded was 11° below zero, at Cedar Rapids, on the 27th.

The average precipitation for the state was 1.60 inches, which is nearly the normal amount for January. It was an unusually mild January for this latitude, with less than the average number of severe storms.

The following table gives the mean temperature and precipitation for the month of January, at the stations named, for the years from 1872 to 1898, inclusive:

YEARS.	MEAN TEMPERATURE—DEGREES.						PRECIPITATION—INCHES					
	Des Moines.	Davenport.	Dubuque.	Keokuk.	Omaha.	Sioux City.	Des Moines.	Davenport.	Dubuque.	Keokuk.	Omaha	Sioux City
1872	...	23	...	25	19	..	.....	.13	.....	.07	08	.....
1873	....	17	...	16	17	....	....	3.56	.....	3.40	.64	.....
1874	...	24	....	27	22	....	.....	4.34	2.45	3.92	.32	.....
1875	....	9	7	16	11	...	.....	.38	1.00	.61	.26	.....
1876	....	30	27	34	27	....	.....	3.47	3.20	3.68	.22	.....
1877	....	17	15	22	20	..	.....	1.41	.96	.84	.53	.....
1878	.	30	28	33	29	...		.36	.49	.17	1.13	.....
1879	18	18	17	21	22	...	.69	.79	.44	.50	.07	....
1880	36	38	34	41	34	....	.70	3.13	1.95	3.91	.90	.....
1881	13	14	12	18	12	....	1.55	1.34	1.87	.50	.61	.....
1882	26	29	23	28	28	...	.63	.90	.84	1.07	.74	.....
1883	9	16	10	16	12	....	1.72	1.16	1.59	1.24	1.01	.....
1884	15	19	14	19	17	....	.85	.75	.99	.85	.73	.....
1885	11	17	11	16	12	....	1.00	2.10	1.80	2.44	.41	.....
1886	11	13	12	15	7	....	3.47	2.22	3.17	2.08	1.15	.....
1887	11	13	11	19	12	....	.83	1.43	3.33	1.48	.49	.....
1888	7	10	7	15	8	....	1.15	1.54	1.20	1.57	.58	.....
1889	23	25	24	28	24	....	1.22	.95	1.55	1.89	1.62	.....
1890	21	27	22	29	18	14	2.62	2.49	2.31	1.81	1.44	1.14
1891	28	28	27	32	30	28	1.82	2.38	1.27	2 59	2.11	1.66
1892	18	17	15	20	18	15	1.60	1.60	2.34	1.96	.42	.41
1893	10	9	11	14	16	13	.56	1.14	1.60	.92	.28	.34
1894	21	24	22	28	21	15	1.09	1.33	1.11	2.24	.51	.60
1895	17	15	14	20	19	14	1.30	1.27	1.44	1.44	.35	.16
1896	25	27	25	29	27	23	.60	.87	.75	.85	.33	.21
1897	20	21	18	23	21	14	2.02	3.58	2.55	4 90	.87	1.41
1898	26	26	24	30	28	24	1.59	3.68	2.19	3.13	.62	.27
Means	18	20	17	23	20	18	1.35	1.79	1.68	1.80	.68	.69

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30 09 inches; highest observed, 30.70, at Clarinda and Sioux City on the 1st; lowest observed, 29.34, at Keokuk on the 25th; range for the state, 1.36 inches.

Temperature.—Monthly mean, as deduced from 106 reports, was 23.4°; highest monthly mean, 30.2°, at Ft. Madison; lowest monthly mean, 19°, at Dows; the highest temperature reported was 52°, at Keokuk on the 7th; the lowest temperature reported was –11°, at Cedar Rapids on the 27th; the average daily maximum was 32.4°; the average daily minimum was 14.5°; the average monthly maximum was 42.7°; the average monthly minimum was –2.3°; the greatest monthly range was 54°, at Cedar Rapids and Denison; average monthly range, 45°.

Precipitation —Average for the state, as determined from the reports of 112 observers, 1.60 inches; the largest amount reported was 5.32 inches, at Ovid; the least amount was trace, at Mason City; the greatest daily amount reported was 2.50 inches, at Ovid on the 24th and 25th; average number of days on which .01 inch or more of precipitation was reported, 5.

Wind.—Prevailing direction, northwest; highest velocity reported, 43 miles per hour, from the northwest, on the 28th, at Sioux City.

Weather.—There were 15 clear days, 6 partly cloudy days, and 10 cloudy days.

Auroras.—Britt and Cresco, 16th.

Lunar corona.– Osceola, 5th.

Lunar halos.—Alta, 27th; Guthrie Center, 1st and 7th; Thurman, 1st; Waverly, 7th.

Sun dogs —Carroll, 17th; Ft. Madison, 31st: Lamoni, 24th; Lenox, 24th and 25th; Mt. Ayr, 24th.

Fog.—Carroll, 19th; De Soto, 11th; Dows, 11th, 19th, 20th and 21st; Greene, 11th and 18th; Greenfield, 10th and 11th; Guthrie Center, 10th and 11th; Humboldt, 19th; Iowa Falls, 11th; Lansing, 11th, 12th, 14th and 18th; Larrabee, 19th and 20th; Lenox, 10th, 11th, 18th, 19th and 23d; Osceola, 10th, 11th, 18th and 19th; Sidney, 10th, 11th, 18th and 20th; Thurman, 11th; Vinton, 11th; Whitten, 11th and 19th.

PRECIPITATION.

STATIONS.	PRECIPITATION IN INCHES.		No. of clear days.	No. of partly cloudy days.	No. of cloudy days.	No. of rainy days (.01 in. or more).	Total snowfall during month.
	Monthly.	Greatest daily.					
Adair	.90	.40	17	8	6	3	9
Larchwood	.55	.25	11	11	9	3	5.5
Millman	1.85	.45	.	.....	.....	.....	17.5
Washta	.10	.10	20	2	9	1	1

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.05	30.55	1	29.43	12
Des Moines	30.11	30.69	1	29.60	12
Clarinda	30.11	30.70	1	29.58	12
Cresco	.....	30.66	31	29.68	12
Dubuque	30.06	30.54	1	29.50	12
Omaha, Neb	30.10	30.66	1	29.66	12
Keokuk	30.07	30.63	1	29.34	25
Sioux City	30.10	30.70	1	29.70	7
Means	30.09	30.70	1	29.34	25

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,623	29	NE	25
Des Moines	5,238	26	NW	28
Dubuque	5,159	40	NW	31
Keokuk	5,909	30	SW	1
La Crosse, Wis	4,708	30	W	28
Omaha, Neb	4,844	24	N	25
Sioux City	7,529	43	NW	28

OBSERVERS' NOTES.

CLINTON—*Dr. Luke Roberts.* The meteorological conditions of January, 1898, were markedly different from its last nineteen predecessors. In temperature it was 3 8° above a normal mean. My maximum and minimum temperatures only go back seventeen years; and during that time the minimum temperature for January was below zero from 9° to 36° except in 1891, when it was zero, and in 1898, when it was 1° above. The normal minimum is 24 6° below zero, which makes the minimum for 1898, 24.6° above normal. The maximum temperature was 56°, or 3° below normal

The warmest day was the 11th, with a mean temperature of 36.7°. The coldest day was the 31st—mean temperature 10°. The normal temperature for the warmest and coldest January days is 37.8° for the former, and 8.4° below zero for the latter. The coldest January day for the last twenty years, was the 5th, in 1884, the mean temperature being 30.5° below zero. The warmest day for the same time was the 1st, 1897, the mean being 54°; 21 inches of snow fell during the month. Total precipitation, rain and snow, netted 3.60 inches.

This was in excess of January means by 1.6 inches. There were six storm days, being two less than normal.

The movement of the wind was decidedly sluggish except on two days, the average for the month being only four miles per day. The total movement being only 2,960 miles, while a January normal is 5,070 miles.

The weather for the month may be epitomized as follows:

Eighth, heavy frost, morning; 11th, rain, 3 A. M. to 7:30 A. M., .06 inches; a fog commenced A. M. and increased through the day, becoming very dense by 6 P. M., commenced to lift at 9 P M. At 11 20 P. M., an intense flash of lightning followed by a very heavy report, awoke many people, intensely frightening some, who in their sudden awakening, thought a great conflagration was raging around them. Two or three lighter reports of thunder followed. Ten minutes after the first electrical discharge rain commenced, lasting until 7 A. M. the next morning, with a precipitation of .53 inches The rain, in form of mist, continued to 4 P. M., when it changed to snow, which continued about one hour, leaving about one inch of snow on the ground, or when melted, .27 inches of water.

Some snow fell between noon and 4 P. M. on the 13th. On the 14th a crystalized fog gave beauty to the landscape in the morning. From the earliest hour of the 15th to 10 A. M. about three-fourths of an inch of snow fell; 17th, foggy A. M.; 19th, a storm of rain, sleet and snow occupied the time from 9:15 P. M. to 7 A. M of the 20th, leaving a deposit of nearly two inches of slush, or .65 of an inch of water.

On the 22d snow from 7 A. M. to midnight covered the ground to the depth of eight inches, with a water equivalent of .8 of an inch. On the 25th a similar storm, but of greater intensity raged from 6 A. M. to 5 P. M, leaving an additional coating of snow ten inches in depth, being material for 1.20 inches of water. These last two storms were accompanied with wind from east to northeast, which attained a velocity of twenty-eight miles an hour, which, had the temperature been low, genuine blizzards would have been the appropriate name. Good sleighing from the 19th to the close of the month.

BELKNAP—*A. W. Rankin.* January, 1898, goes out with fully two feet of snow on the level and five to seven feet in places. Very nearly all of the precipitation of January (five inches) lies on the surface in the shape of snow and ice, and is hard water for stock, and little improvement over December.

BONAPARTE—*Hon. B. R Vale.* A pleasant month for feeding and for work. Fully eighteen inches of snow in sight at close. Only two notable storms, viz., 22d and 25th

FOREST CITY—*J A Peters.* Only three days of zero weather. Good sleighing all the month.

GRAND MEADOW—*F. L. Williams.* The month was unusually pleasant; only once did the mercury reach zero; neither was it warm enough to have any mud. Fine sleighing all of the time and no drifts

LAMONI—*T J. Fitzpatrick.* Thunder and lightning on the 11th was rather pronounced and remarkable for the season. A heavy snowstorm raged all day the 25th. Trains blockaded until the next day. The worst storm in many years.

LARRABEE—*H B. Strever.* Such a January has been seldom seen; so mild and free from storms and wind; so enjoyable throughout.

LOGAN—*Mrs M. B. Stern.* We have had no bad storms, but considerable cloudy weather. Very little wind Altogether a rather mild winter.

OVID—*H. C. Miller.* A remarkably warm month. Thawed twenty-three days of the thirty-one. No frost in the ground except in the bare spots.

SIDNEY—*G. V. Swearingen.* On the 22d a high wind came with the snow, which fell to the depth of 5.2 inches. Sledding has been from good to fair since December 4, 1897.

TOLEDO—*Charles Mason.* The month has been very mild. We have had excellent sleighing since December 3d; something uncommon. The night of the 12th we had a thunderstorm, with vivid lightning and heavy thunder.

WEST BEND—*Philip Dorweiler.* A fine month for the middle of winter. Ground covered with snow where not too much exposed and sleighing fair.

WEST BRANCH—*A. A. Madson.* A very heavy snowstorm on the 23d, but not cold. On the 25th strong northwest wind, with snow. The most snow for four years fell on these two days and is staying on the ground.

ERRORS IN NOVEMBER (1897) REVIEW.

PLOVER: Maximum temperature should be 68° on the 3d.

SEYMOUR: Mean temperature should be 38.4°; mean maximum, 49.4°.

SPIRIT LAKE: Precipitation should be .20 of an inch. Omit Galva precipitation data.

DECEMBER.

CEDAR FALLS: Minimum should be 14° on the 18th.

GUTHRIE CENTER: Maximum temperature should be 51° on the 8th.

ROCKWELL CITY: Total precipitation should be 2 20 inches.

METEOROLOGICAL DATA FOR JANUARY, 1898.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION IN INCHES.				Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	No. of thunder storms.
	Monthly mean.	EXTREMES.						Monthly range.	Monthly.	Greatest daily.	Total snowfall.	Depth of unmelted snow at end of mo.						
		Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.											
Afton	26.1	35 0	17.2	42	7	1	29	41	1.75	.75	12.0	.....	.....	.....	...	. . .	5	....
Albia	21.1	.....	.....	37	7	3	29	40	.25	.10	2.5	4.0	NW	14	8	9	3	....
Alta	23.0	32.0	14.1	41	7	-1	1,27,29	42	2.99	1.17	17.2	11.5	NW	14	6	9	3	....
Amana	22.8	30.8	14 8	42	7	0	29	42	46	.20	4 7	.....	.....	15	1	15	6	....
Ames *b*	23.2	32.7	13.6	43	9	-8	26	51	1.48	.63	14.5	....	SW	2	13	16	2	....
Atlantic	22.8	31.8	13.7	43	4, 7	-5	29	48	1 10	.70	11.0	6.0	NW	16	5	10	10	....
Audubon	26 4	34 9	17 8	42	18	1	1, 2	41	5.00	1.20	38.0	24 0	NW	13	6	12	6	....
Belknap	20.5	30.7	10.3	42	7	-7	1	49	3.32	1.40	26.5	18.0	SE	11	10	10	4	....
Belle Plaine	19.2	28.9	9 4	39	6	-8	1	47	.25	.17	1.8	3.4	W, SW	15	5	11	5	....
Britt	28.3	35.6	21.0	43	5	4	1	39	1.86	1.15	...	.....	.....	...	.....		6	....
Burlington	26.2	35.4	17.1	47	7	-2	16	49	3.33	.95	22 0	18 0	.....	18	5	8	4	....
Bonaparte	22.4	32.3	12 5	42	3, 7	-4	29	46	1.20	.85	12.0	5.0	.....	15	6	10	4	....
Carroll	22.3	32.4	12.2	40	4, 7	-5	1	45	1.90	1.10	.....	.....	NW	17	4	10	7	....
Cedar Falls	22.4	32.9	11.8	43	7	-11	27	54	1 02	.72	19.9	5.0	NW	13	10	8	10	....
Cedar Rapids	27.2	34.2	20.2	45	7	3	1	42	3.49	1 28	22.4	12.0	NW, SE	17	3	11	2	....
Charlton	21.5	32.1	10.9	40	6, 7, 20	-9	1	49	1.20	1.00	4.0	3.0	SE	15	4	12	7	....
Charles City	28.2	35.9	20 6	46	7	7	26, 31	39	1.42	.48	12 2	4 0	SW	11	6	14	6	...
Clarinda	25.0	34 3	15.6	45	21	1	27	44	3.60	1.20	21.8	12.0	W	15	6	10	6	...
Clinton	27 0	35 5	18.6	43	3, 7, 17	1	26	42	1.01	.30	9.5	.....	NW	14	2	15	5	....
College Springs	27 4	36.9	17.8	48	3, 6	3	26, 29	45	1.50	.80	14 0	6.0	sW	13	3	15	4	...
Corning	27.0	35.1	18.8	45	9	1	26	44	.18	.07	....	....	S	14	7	10	2	....
Council Bluffs	19 8	28 8	10.7	38	7, 9	-10	1	48	.55	.40	1.5	5.0	NW	10	6	15	8	0
Cresco	26.3	33.5	19.1	45	5	4	31	41	3.68	1.08	21.8	14.4	NW	...	.....	.....	2	....
Davenport	20.0	29.9	10.2	41	5, 7	-7	1	48	.82	.70	.....	.....	.....	...	.....	.....	2	....
Decorah	25.2	40.3	10 2	50	6, 7	-4	31	54	.60	.40	6.0	.....	NW	15	1	15	3	...
Denison	19.7	.....	.....	43	5	-1	29	44	1.42	.77	9.0	10.0	NW	14	8	9	7	....
Delaware†	25.6	33.5	17.7	43	7	2	1	41	1.59	.46	17.6	4.5	NW	14	4	13	9	1
Des Moines	25.2	33.5	16 8	43	7	1	16, 29	42	1.81	.50	15.0	.....	SW	14	0	17	8	....
De Soto	19.0	29.1	9.0	36	5, 6	-10	1	46	.85	.65	5 0	12.0	NW	18	0	13	4	....
Dows	24.1	31 7	16.5	44	7	4	2	40	2.19	.92	15.1	6.6	NW	13	6	12	9	....
Dubuque	23.0	32.3	13.8	40	4, 7	-11	1	51	2.30	1.00	23.0	.....	NW	2	18	11	4	...
Eldora ‡	22.6	34.7	10.6	47	4, 9	-4	1	51	.88	.58	6.8	6.0	N	17	7	7	3	....
Elkader	21.7	32 2	11 2	43	9	-6	27	49	15	.10	1.5	1.5	SW	13	11	7	2	...
Estherville	26.4	35.2	17.7	46	7	-2	16	48	3 52	1.20	23.5	...	.....	13	7	11	6	....
Fairfield‡	20.7	31.2	10.2	43	9, 18	-6	1	49	1.63	.57	4.6	4.5	NW	13	9	9	5	1
Fayette‡	20 0	29.2	10.8	39	4, 10	-4	1, 2	43	.30	.20	3 0	3 0	NW	17	3	11	2	....
Forest City	30.2	.....	.....	44	7, 18	7	1	37	3.78	1.10	20.5	6.5	NW	8	8	15	6	1
Ft. Madison*	22.0	30.7	13.4	39	7	-3	29	42	.18	.10	....	.....	N	16	7	8	2	....
Galva	26.4	35.8	17.1	47	3	-1	22	48	1.40	.40	14.0	.....	NW	13	4	14	5	...
Glenwood	21.4	.....	.....	38	5, 7	-4	1	42	.90	.50	6.0	6.0	NW	11	10	10	3	...
Grand Meadow*	21.0	31.4	21.0	40	4, 5	-9	1	49	.47	.25	10.0	6.0	W	15	7	9	3	....
Greene	26.3	35.7	17.0	50	8	0	29	50	1.53	.52	15.0	8.0	N. S	15	4	12	10	1
Greenfield	24.5	33 2	15 8	44	19	-5	1	49	3.19	1.95	25.1	....	N	8	14	9	7	....
Grinnell	20.7	30.8	10.6	40	7	-6	1	46	1 80	.80	18.0	19 0	NW	17	4	10	5	1
Grundy Center	24.2	33 2	15.2	43	7	0	29	43	1.06	.50	6 8	3 0	NW	15	5	11	5	...
Guthrie Center	20.3	28.3	12.3	39	7	-6	1	45	1.03	50	5.5	6.0	NW	13	12	6	5	....
Hampton	24 6	.....	.....	43	20	-6	27	49	3 30	1.50	.....	.....	.....	16	7	8	3	....
Hedrick*	25 4	33.4	17 5	43	7	1	29	42	2 32	.65	.....	.....	NW	8	11	12	7	....
Hopeville	21.2	30.9	11.5	40	7	-5	29	45	.23	.19	2.0	8 0	NW	16	7	8	3	....
Humboldt	19.8	29.7	9.9	38	7, 18	-7	1	45	1.76	.80	12.4	7.5	NW	15	9	7	7	....
Independence	...	...	17 1	.....	.....	-1	1	.....	3.38	1.20	20 7	.....	NW	.....	.....	.....	7	1
Indianola	24.7	34.0	15.4	44	7	-3	27	47	4.62	2.00	26.0	18.0	NW	11	13	6	5	....
Iowa City (Veblen) *a*	...	29 1	...	39	7	...	...	...	1 05	.60	9.5	.....	NW	14	8	9	3	....
Iowa Falls	...	...	...	...	7	4	1	48	3.13	1.19	14.3	3.5	SW	13	4	14	11	2
Keokuk	30.0	38.1	22.8	52	7	-2	16	50	3.37	1.55	20.0	15.0	.....	...	.....	.....	7	....
Keosauqua	27.9	36 5	19.3	48	7	-2	16	50	3.37	1.55	20.0	15.0	.....	...	.....	.....	7	....
Knoxville	26.5	35.3	18 7	47	21	0	1	47	3 55	1 50	21.0	.....	SW	16	5	10	4	....
Lamoni ‡	26.3	35.1	18.5	46	7	1	29	45	2.88	1.71	25.5	14.0	NW	.....	.....	.....	7	1
Lansing	23.4	33.2	13.6	44	4, 5, 9	1	1, 2	43	.85	.67	2.4	4.5	.....	16	8	7	3	...
Larrabee ‡	20.6	30.3	11.0	38	3, 7	-5	29	43	.17	.10	1 7	6 5	NW	12	11	8	3	...
Le Mars	...	...	13.8	36	4,17,30	-3	29	39	.25	.15	3.0	3.0	S	19	4	8	2	....
Lenox*	26.6	35 5	...	43	6, 7	4	26	39	1.07	.32	7.9	3.3	NW	13	6	12	6	1
Linn Grove (Mt. Vernon)	23.2	31.2	15.3	41	7	-1	1, 29	42	2.57	1.09	23.0	17 0	W	13	4	14	6	1
Logan *a*	25.4	35.3	15.6	49	9	4	1,27,28	45	1.30	.30	13.0	6 0	S	...	.....	.....	2	...
Maquoketa	23 0	33.2	12 8	42	5, 7	-2	16	44	2.01	.82	17 8	12.0	NW	21	4	6	7	...
Marshalltown	23.1	32.7	13 5	42	7	1	16, 29	43	1.02	.48	.....	.....	S, SW	14	7	10	8	...
Mason City	19.2	30.2	8.1	38	5, 7	-10	1	48	T	T	.....	.....	.....	.....	.....	.....	0	....
Mooar	27.1	35 7	18.5	50	7	-1	17	51	3.12	1.00	.....	.....	NE	15	3	13	5	1
Monticello	23.6	32.4	14.9	41	7	-2	16	43	2 59	1.00	18.0	11.0	NW	13	6	12	6	1
Mt. Ayr	26.0	34.8	17.2	48	4	0	26	48	2.80	1.01	22.0	10 0	NW	9	12	10	6	1
Mt Pleasant*	28.2	.....	...	45	19	4	1	41	2.73	.91	.....	.....	NW	19	5	7	6	...
Mt. Vernon*	24.0	.....	.....	42	7	-4	1	46	.....	.....	.....	.....	.....	.....	.....	.....	...	1
New Hampton	25.3	36 3	14.3	50	4, 9	-2	2	52	.53	.38	...	...	NW	17	5	9	2	...
Newton	23.4	31.8	15.1	42	7	-4	1	46	2.22	.78	13.5	7.0	NW	15	6	10	6	1
Northwood	20.0	29.4	10.5	40	4	-6	1	43	.20	.20	3.0	.....	S	27	0	4	1	....
Odebolt	22.6	31.0	14.3	39	5	-2	29	41	.44	.15	4.6	10.0	.....	16	5	10	5	....
Ogden	22.6	32.4	12.8	40	7	-6	29	46	.92	.64	9.5	6.0	NW	18	0	13	5	....
Omaha (Neb.)	28.3	34.9	21.7	45	9	8	26	37	.62	.21	6.1	T	NW	14	3	13	7	...
Osage†	19.3	...	...	...	...	...	...	...	.37	.25	1.2	6.0	NW	11	9	11	2	....
Osceola	25.6	32.9	18.2	45	7	1	1	44	3.30	1.08	25.3	12.0	SW	...	.....	.....	9	1
Oskaloosa‡	24 6	34 2	15.1	45	7, 18	-3	1	48	2.01	.60	17.5	4 0	NW	14	1	16	8	....
Ottumwa	26.0	35.5	16.4	49	7	-1	1	50	4.14	1.30	27 0	6.0	NW	4	15	12	6	....
Ovid	25.1	33.9	16.3	45	7	-1	1,29,31	46	5.32	2.50	30.5	18 0	NW	15	1	15	9	1
Plover *j*	20.4	29.9	10 8	40	7	0	1,27,30	40	...	.....	...	2 0	...	...	.....	... ..	...	...
Primghar	21.4	29 9	12 9	36	5,7,9,17	-3	29	39	.19	.10	1.9	3.0	NW	17	10	4	4	...
Red Oak	26 5	35.5	17.5	43	7	0	26	43	1.49	.55	22.0	10 0	... ...	.....		.....	6	...
Rock Rapids ‡	22.4	33.7	11 0	45	16	-7	27	52	.45	.30	4 5	.....	S	16	13	2	3	....
Rockwell City	19 1	28.7	9.5	40	7	-4	23, 25	44	.46	.30	8.5	8.0	... ...	23	4	4	2	....
Ruthven	22.1	31 2	13.0	42	6	-3	29	45	.10	.05	1.0	.....	NW	14	2	15	2	....
Sac City	22.2	28 8	15.5	36	5, 7	-4	29	40	.41	.20	4.1	8 0	NW	20	3	8	4	....
Sibley	20.8	30 1	11.4	42	9	-4	1	46	.20	.10	2.0	...	NW	18	10	3	3	....
Sidney	27.0	33.5	20.6	43	7	4	26	39	1.92	.71	22.6	8 0	NW,SW	16	2	13	9	...
Sigourney	25.0	34.3	15 8	40	7,10,18	-2	1	42	2.86	.93	24.0	10.0	NW	9	12	10	5	1
Spencer	20.2	29 9	10.6	38	5	-2	29	40	.04	.02	.5	.5	SW	9	12	10	2	....
Spirit Lake	21.6	31.7	11.6	47	5	-5	27, 29	52	.30	.30	3.0	3.0	S	21	3	7	1	...
Sioux City	23.8	32.5	15.0	40	5	1	29	39	.27	.12	4.3	.....	NW	15	4	12	5	...
Stuart *a*	23.2	31.0	16.3	43	4	-6	26, 27	49	.90	.30	9.0	.....	W	...	.....	.....	4	....
Tara	20 4	29.9	10.8	40	5, 7	-5	1, 28	45	.17	.05	1.7	3.2	NW	12	11	8	4	....
Toledo	21.8	30.7	12.9	41	7	-5	1	46	1.57	1.02	8.0	.....	NW	18	0	13	5	1
Thurman	25.4	34.6	16.2	43	3, 7	-2	26	45	1.36	.51	19 7	2.0	NW	11	4	16	5	1
Villisca	25.8	34.3	17.2	43	3, 7	-1	26	44	1.21	33	....	.....	SW	15	5	11	6	...
Vinton*	22.6	...	.....	40	7, 18	-4	1	44	2.27	.80	14.0	.....	NW	22	3	6	5	....
Washington	24.2	33 4	15 1	45	7	-2	29	47	3.17	1.35	25.5	.....	NW	...	...	.....	7	...
Waterloo	21.2	31.2	11.3	43	21	-1	29	44	1.45	1.01	7.0	6 0	NW	12	9	10	4	...
Waverly	21.6	31.1	12.1	40	7, 18	-6	1	46	1.00	.69	6 0	5.0	W	12	10	9	4	....
Webster City	21.6	30.5	12.8	42	7	-4	31	46	1.12	1.00	10.8	4.0	NW	15	8	8	3	....
West Bend*	20 2	.....	.....	38	5	-5	29	43	.25	.10	2.5	.....	N	10	12	9	3	...
Whitten*	20.2	...	.....	39	7	-7	1	46	.82	.45	8.2	10.0	NW	20	5	6	4	....
Wilton Junction	24.0	33.2	14.8	45	6	0	26, 29	45	3.07	1.00	20.0	10 0	NW	15	3	13	5	....
Winterset	25.4	33.9	17.0	42	7	0	29	42	2.24	.60	22.0	.....	.....	...	.....	.....	6	....
WestBranch	23.6	33.0	14.1	48	4	-3	24	51	2.29	1.05	18.2	13.0	W	12	9	10	4	....
Means	23.4	32.4	14.5	42.7	.....	-2.3	.....	45.0	1.60	.....	12.6	.....	NW	15	6	10	5	...

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

DAILY AND MONTHLY PRECIPITATION FOR JANUARY, 1898.

STATIONS.	DATE																														Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Adair	T										T	.30										.40		T	.20						.90
Afton	T										T	.75			.30				T			.40		.10	.20					T	1.75
Algona	T											.10						T		.10		T			T				.05		.25
Alta (Hadden)										T		T					T	.01				.02		.05	.02				.15		.25
Albia	T										T	1.05	T	.04	.40				.03	.22	T	.54		.05	.60						2.93
Amana											.03	1 17			.06					.14		.41	.08		1.10						2.99
Ames												19						T		.07		.20		T							.46
Ames (near)												.20								.10		.40		T	05				.05		.80
Atlantic (Love)												.63		.10					.05			.40		.15					.15		1.48
Audubon												.70										.40									1.10
Belknap										.10	1.00				.80				.10	.40		.40	.40		1.20	.30					5.00
Belle Plaine											.02	.80								.35		.70		1.40					.30		3.32
Bonaparte										.11	.95				.40			.15				.80			.92				05		3.33
Britt	T											.17						.02	.03	.03											.25
Burlington											.17				.05					.04		1 15			.45						1.86
Carroll												.85							T			.10		.05					.20		1.20
Cedar Falls												1.10	T						.10	.10		.60			T						1.90
Cedar Rapids										03		.72	.10	.02						.04		.06			.05				T		1.02
Chariton	T										.10	1 28		.03	.16				.11	.11		.50	.06	.02	1 12					T	3.49
Charles City	T		T								T	1.00	T	T					T	.20	T	T	T					T	T		1.20
Clarinda												.15			.41		T		09			.48		.13	.12				.04		1.43
Clinton										.06		.80			.09					.65		.80			1 20						3.60
College Springs											.06			.25					.10			30		.20		.10					1.01
Corning											T	.10		T	.40				.10			.80			.10				T		1.50
Council Bluffs												.07										.05		.04	.02						.18
Cresco												.40							.15			T							T		.55
Davenport	T								T		.22	.89	.07		.24					.58		.52	.08		1.08	T			T		3 68
Decorah												.70								.12											.82
Delaware											.15	77	.05	.03						.11		.07			.24						1.42
Denison											.40	.10										T			.10						.60
Des Moines	T										T	.46	T		.12			T	.06	.10	T	.32	.07	.02	.33				T	.10	1.59
De Soto	T										.01	.25	T	.40					05	.10		.50	T	T	.40				.10		1.81
Dows	T											.65						.05	T	T		.10		T						.05	.85
Dubuque											.06	.92	.06		.10					.24		.26	.22		.32					.01	2.19
Eldora	T										T	1.00	.20								.50				T				.60		2.30
Elkader												.58								.08		.22									.88
Estherville	T																	T			T			.10	.05						.15
Fairfield											.27	.90			.50				T	.05		.60			1.20				T		3.52
Forest City	T											.20						T	.10												.30
Fredricksburg												.56								.08		.14									.78
Ft. Madison									T		1.10			T	.40				.50			1.05		.63					.10		3.78
Galva																								.10					.08		.18
Glenwood												.40		T	.20		T						.40		.20	.20			T			1.40
Grand Meadow												.50							.10			.30								T		.90
Greene												.25								.17		.05									.47
Greenfield	T										.05	.11		.29	.10		T	T	09			.52	.03	.09	.04				21		1.53
Grinnell												.68	.25		06				.06			12			1 95					.07	3 19
Grundy Center												.80	T	T				T	.25	.10		.55			.10						1.80
Guthrie Center	T											.50						T	.10			.21			.15				.10		1.06
Hampton											.50	.22							.15			.09								.07	1.03
Hawkeye													1.00						.10												1.10
Hedrick											.80											1.00			1.50						3.30
Hopeville	T										.53	.65			.10		T		.10			40		.08	.46				T		2.32
Humboldt												.19										.02		T					.02			.23
Independence											.30	.50	.09	.06					.20			.36			.25						1.76
Indianola	T										.01	1 02	T		.30			T	.15	T		.60	T		1.20				T	10	3 38
Iowa City												1.06		.22						.14		1.20			2.00					T	4 62
Iowa Falls											T	.60	T		T					.20		.25							T		1 05
Keokuk									.09		.39	80	T	.02	.20				.02	.25		.90	.29		.70					.04	4.90
Keosauqua											.30	1.25	T		.38			T		.75		.33		T	.30					.06	3.37
Knoxville											T	1.45										.50			1 50					.10	3.55
Lamoni												.61			.11		T		.01	.01		.10		.11	1.71				T		2.88
Lansing											T	.67								.10	T	T	.08						T		.85
Larchwood																		20					T	.25							.55
Larrabee											T						T	.03						.01					.10		.17
Le Mars																								.10					.15		.25
Lenox											.07	.27		.03	.27		T		.03			.32		.04	.03				.01		1.07
Linn Grove (Mt V.)											.03	.60			.07					.23		.55			1.09						2.57
Logan												.20					.10				.30		.20	.10			.20	20			1.30
Malvern										.02		.35		.25			.05		T	T			.30		.10	04			01			1 12
Maquoketa												.82	.06		.07					.11		05	10		.80						2.01
Marshalltown	T	T									T	.48	T		.06			T	.04	.02		.27	.02	T	.11				.02		1.02
Mason City											T	T								T											T
Millman											.16	.28			.45					.15		.36			.45				T		1.85
Mooar									T		.34	.98			.30					.50		1.00									3.12
Monticello											.20	.94			.05					.10		.30			1 00						2.59
Mt. Ayr											.05	1.01			.20		T		.07			.67			80						2 80
Mt. Pleasant											.21	.91			.36					.47			.28		.50			T			2.73
New Hampton												.38								.15		T									.53
Newton											.78	.33								17		.37			.51				.06		2 22
Northwood												.20																			.20
Odebolt												.14					T					.02		13			15				.44
Ogden												.64							.08			14	.03	.03							.92
Omaha (Neb.)	T									T	.01	.10		T	T		.08	T				19	T	.15	.08				.01	T	.62
Osage												.25								.12											.37
Osceola	T									T	.04	1 08			.25				T	.10		.80	.15	.10	.75				T	.10	3.30
Oskaloosa										03	.25	12		.22					T	.12		.55			60					.12	2.01
Ottumwa											.27	1.17			.45				T	.15			80		1 30						4 14
Ovid	T										.04	.89			.60				.08	.23		.90			2.50				.08		5.32
Primghar																		03						.05	.01					.10	.19
Reinbeck																															
Red Oak										T	.55				.24							.45		.10		.10			.05		1.49
Rockwell City												.30												.16					T		.46
Ruthven												.20						T		T				.05					.05		.10
Sac City																						.01		.10					.10		.41
Sibley																		T	T					.05	.10				.05		.20
Sidney											03	.07		.71						.02	.20	.52		.10	.22				T		1.92
Sigourney											T	.93	T		.33				T	.25		.50			.85					T	2.86
Sioux City											T						.06	01					T	.12	04				.04	T	.27
Spencer	T																	T						T	.02					.02	.04
Spirit Lake															T			T													.30
Stuart												.20										.30	.20		.20						.90
Tama	T	T	T									.05												.05					.02		.17
Toledo											.10	1.02			.08																1.57
Thurman											T	.51		T	.25		T		T	T		.17			.20						1.38
Villisca											T	.32			.29		T		.05			.40	T	.05	.15				T		1.21
Vinton											.10	.65							.12			.33			.20				.02		2.27
Washington										.08	.54	.25			.15					.25		.60			.80						3.17
Washta																			T				.55	T	1.35						.10
Waterloo		T										1 01	T						10	.08		.26			T					.10	1.45
Waverly	T										T	.69							.06	.08		.17									1.00
Webster City											T	1.00	T					T		.07		.05		T	T						1.12
West Bend												.10						T	T	T		.05		T					10		.25
West Branch									T		.50		T		.15					.26	T		1.05		48					T	2.29
Whitten											T	.25		T					.02			.45	10		T						.82
Wilton Junction												.92	T		.20																2.07
Winterset												.04		.20	.60					.20			.60		85			.60			2.24

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JANUARY, 1898.

STATIONS.		DATE																															Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max.	20	35	40	38	36	38	42	37	40	39	40	37	85	39	32	33	37	38	33	35	39	30	31	38	32	26	29	35	35	35	32	35.0
	Min.	3	5	14	18	16	24	23	22	24	22	32	26	17	17	16	11	16	26	28	27	25	18	11	17	24	7	6	17	1	15	6	17.2
Alta	Max.	11	30	32	32	38	30	38	33	33	27	34	29	39	36	26	32	34	33	30	25	29	32	28	29	25	21	25	31	17	34	16	29.0
	Min.	4	4	14	24	18	18	24	11	18	15	26	23	11	18	9	14	20	18	25	21	22	22	5	15	16	4	4	16	0	7	-1	14.2
Amana	Max.	10	31	32	37	37	33	41	36	35	37	38	35	32	32	29	26	32	39	37	38	37	33	27	34	30	25	22	34	22	32	29	32 0
	Min.	-1	-1	8	15	10	22	15	20	23	19	32	32	20	12	17	1	7	12	27	32	27	23	12	4	25	1	-1	7	-1	14	5	14.1
Ames	Max	..	..	32	41	35	35	42	37	36	34	35	34	30	31	24	32	32	36	30	31	35	23	31	31	28	19	25	33	16	28	16	30.8
	Min.	..	..	2	23	9	21	30	14	22	13	27	25	15	11	12	4	11	18	25	27	26	18	11	14	23	5	1	9	0	8	4	14.8
Atlantic	Max.	22	35	42	49	39	39	29	17	22	20	32	24	9	4	5	-2	8	28	27	27	22	20	-4	17	15	-8	-2	20	-4	10	4	13.6
	Min.	8	9	11	21	10	24	29	17	22	20	32	24	9	4	5	-2	8	28	27	27	22	20	-4	17	15	-8	-2	20	-4	10	4	13.6
Albia	Max.	23	41	42	46	44	47	46	50	39	41	40	37	41	..	..	41	42	44	40	36	40	34	43	36	35	33	34	40	36	37	37	39.5
	Min.	-3	5	15	22	17	24	23	21	26	23	31	27	24	20	23	11	18	28	28	32	28	22	15	16	27	5	8	22	4	16	7	18.9
Audubon	Max.	25	33	38	43	37	37	43	37	40	34	35	31	26	37	28	32	34	36	31	30	37	23	31	28	27	23	24	28	23	37	17	31.8
	Min.	7	5	10	25	15	17	25	17	19	17	30	21	13	6	10	10	9	24	25	25	17	15	3	16	17	3	3	15	-5	10	2	13.7
Belknap	Max.	16	36	39	39	40	40	47	39	38	41	36	34	34	35	26	30	40	42	41	36	37	38	33	35	31	25	30	37	35	34	17	34.9
	Min.	1	1	17	20	19	19	25	25	29	27	24	25	23	23	24	6	13	20	25	32	29	29	16	14	28	5	5	11	5	5	8	17.8
Belle Pl'ne	Max.	12	30	28	31	33	34	42	32	35	35	37	33	34	37	33	25	34	37	39	40	40	26	25	32	12	20	35	24	32	30	15	30.7
	Min.	-7	12	4	10	12	10	8	12	18	15	30	28	18	10	12	0	6	12	18	30	22	15	8	5	0	-4	5	-5	5	10	0	10 3
Bonaparte	Max.	15	38	39	39	42	40	47	41	38	40	43	37	43	18	9	14	20	18	25	21	22	22	5	15	16	4	4	16	0	7	-1	14.2
	Min.	2	3	13	24	15	23	22	24	28	25	34	33	26	22	32	26	26	30	33	31	34	30	21	24	27	27	23	24	28	19	33	22	28.9
Britt	Max.	15	30	32	36	37	39	37	33	33	33	33	26	22	32	26	26	30	33	31	34	30	21	24	27	27	23	24	28	19	33	22	28.9
	Min.	-8	-4	6	18	9	18	17	11	13	15	23	20	4	8	9	0	8	6	26	23	18	8	6	11	18	-1	-5	8	-5	10	1	9.4
Burlington	Max.	17	39	37	32	43	41	28	24	26	29	27	36	33	29	23	22	11	14	28	32	32	30	27	16	11	29	16	10	21	11	17	8	21.0
	Min.	4	5	17	15	19	28	24	26	29	27	36	33	29	23	22	11	14	28	32	32	30	27	16	11	29	16	10	21	11	17	8	21.0
Carroll	Max.	20	32	42	38	40	38	42	40	41	28	32	35	30	31	28	36	32	39	28	30	32	22	32	28	28	28	28	32	30	33	16	32.3
	Min.	2	4	10	20	20	25	22	5	15	12	28	20	18	15	8	8	11	19	25	25	20	11	2	12	2	2	2	12	-4	8	0	12.5
CedarFalls	Max.	32	32	35	40	39	35	40	35	35	37	36	35	30	23	5	4	6	5	22	22	24	22	15	5	22	0	0	7	-1	12	4	12.2
	Min.	-5	2	10	10	8	21	15	20	15	25	25	30	23	5	5	4	6	5	22	22	24	22	15	5	22	0	0	7	-1	12	4	12.2
Cedar Rap	Max.	11	32	34	36	41	33	43	37	35	38	38	36	34	31	31	26	32	42	38	36	35	35	28	33	34	25	25	38	20	31	28	32 9
	Min.	-3	2	9	15	11	20	15	18	19	15	31	30	18	13	11	1	6	12	22	30	26	21	3	3	21	-5	-11	-4	-1	12	5	11.8
Chariton	Max.	19	34	38	38	37	38	45	38	39	36	39	35	32	35	35	32	17	30	32	30	29	21	15	17	24	7	8	19	4	15	9	20.2
	Min.	3	10	18	28	21	29	26	25	29	28	33	27	24	21	19	11	17	30	32	30	29	21	15	17	24	7	8	19	4	15	9	20.2
Charles Cy	Max.	10	31	27	37	37	40	40	32	38	37	39	37	28	29	8	6	4	6	8	18	29	23	8	12	8	22	0	-1	9	-3	7	4	10.9
	Min.	-9	1	2	8	8	20	14	15	13	15	25	28	34	36	38	32	37	42	36	34	34	41	30	34	34	34	28	33	40	24	39	19	35.9
Clarinda	Max.	25	20	43	40	41	43	46	40	42	30	27	34	24	20	24	14	10	24	28	30	30	28	22	9	23	16	7	8	20	8	20	7	20 6
	Min.	12	11	20	25	20	29	32	26	30	37	40	40	38	35	34	33	28	35	40	39	39	45	33	27	35	32	28	24	37	20	33	27	34.3
Clinton	Max.	18	35	35	39	44	36	44	5	35	40	40	38	35	34	33	28	35	40	39	39	45	33	27	35	32	28	24	37	20	33	27	34.3
	Min.	6	2	11	16	14	22	15	22	20	17	31	33	24	15	23	4	8	17	28	33	31	25	8	5	27	3	1	3	3	12	6	15 6
College Sps.	Max.	34	38	43	38	38	40	43	40	41	37	36	35	37	32	34	32	43	37	38	35	41	33	30	33	32	24	23	34	32	36	31	35 5
	Min.	9	10	19	25	28	25	25	24	28	25	31	27	15	22	14	8	21	24	27	26	23	20	10	17	21	1	3	19	5	15	9	18 6
Corning	Max.	25	42	48	46	42	48	42	41	42	36	36	34	35	36	35	35	38	46	34	32	38	33	33	33	34	28	34	45	33	37	32	36.9
	Min.	7	10	16	27	14	25	29	25	26	24	32	27	15	22	15	9	16	22	27	15	33	36	27	26	31	30	32	36	37	20	40	30	35.1
C'cil Bluffs	Max.	25	38	42	44	41	44	43	42	45	34	33	31	38	35	32	38	38	35	33	33	36	25	4	22	20	3	4	21	3	15	8	17.8
	Min.	11	13	21	23	22	24	32	22	22	24	31	19	9	22	15	15	26	29	24	24	26	19	6	25	14	1	7	20	10	17	11	18 8
Cresco	Max.	12	27	28	36	37	30	38	30	38	33	36	31	38	32	24	25	32	35	32	35	30	20	24	28	27	23	23	32	17	25	14	28.8
	Min.	-10	5	6	10	11	16	13	16	16	16	26	26	13	12	10	5	8	12	24	28	13	8	9	8	18	1	1	11	-5	4	0	10.7
Davenport	Max.	17	36	37	40	45	36	44	38	36	38	41	33	39	34	34	31	35	42	39	38	31	33	28	32	32	25	24	35	19	30	21	33 5
	Min.	7	6	18	21	22	26	23	24	28	25	32	33	24	21	14	6	10	20	31	35	27	26	16	13	25	9	9	14	6	14	4	19.1
Des Moines	Max.	11	22	30	38	41	32	41	36	38	38	37	38	33	30	33	28	33	34	37	34	17	8	22	28	30	25	24	33	22	23	18	29.9
	Min.	7	4	8	10	18	12	18	8	9	24	26	10	10	8	3	3	4	10	7	20	3	4	11	0	3	2	10.2					
De Soto	Max.	13	43	45	43	47	50	50	42	45	40	40	45	46	40	43	49	42	40	42	41	34	36	37	31	35	31	3	4	12	3	38	40	40.3
	Min.	5	6	6	9	10	14	14	16	14	12	19	22	15	25	12	12	10	12	11	12	14	15	10	12	18	2	3	4	12	3	4	10.2	
Dows	Max.	18	39	41	39	46	43	38	41	34	36	38	36	33	33	31	29	35	41	36	39	36	33	27	37	32	28	28	35	..	31	30	34.0	
	Min.	10	-3	3	12	11	18	13	10	12	17	24	24	4	4	9	-1	5	11	22	24	22	11	3	9	21	1	-4	7	-8	7	2	9 0	
Dubuque	Max.	16	30	31	40	43	34	44	35	38	36	38	37	32	28	29	25	5	17	31	30	29	24	12	8	27	10	8	9	5	10	5	16.5	
	Min.	5	4	14	14	20	24	18	25	21	20	29	32	21	10	19	5	5	17	31	30	29	24	12	8	27	10	8	9	5	10	5	16.5	
Elkader	Max	18	32	36	47	46	38	43	37	47	38	37	33	35	34	32	33	36	43	38	44	31	26	33	34	34	29	32	36	28	26	21	34.7	
	Min.	-4	-2	5	7	6	14	9	18	10	10	27	30	19	9	10	3	5	6	29	30	25	20	3	0	22	0	1	9	-1	5	4	10.6	
Estherville	Max.	20	34	31	41	39	38	41	34	43	35	34	31	34	35	29	40	36	33	31	29	31	25	32	28	26	28	28	31	22	36	22	32 2	
	Min.	2	4	7	19	14	20	28	11	12	13	19	18	5	12	18	8	12	11	22	21	20	7	5	12	13	6	-6	14	-5	7	-1	11.2	
Fairfield	Max.	14	37	39	40	41	39	46	43	35	40	40	38	33	32	30	30	37	41	38	38	35	32	37	37	32	29	28	36	29	34	32	35.2	
	Min.	1	3	13	24	16	24	20	25	27	22	34	31	27	21	14	-2	9	23	27	32	26	23	15	11	21	2	4	15	0	15	7	17.7	
Forest City	Max.	12	30	32	39	35	35	37	36	38	39	31	31	24	30	25	26	32	31	30	34	27	22	8	9	20	3	0	9	-3	2	1	29.2	
	Min.	-4	-4	7	15	19	21	15	18	14	15	24	23	9	10	10	0	9	11	25	26	13	8	9	9	20	3	0	9	17	35	25	10.8	
Galva	Max.	13	30	33	35	34	34	39	35	34	29	35	31	32	38	30	35	36	35	31	29	30	30	6	17	16	6	5	5	-3	10	1	30 7	
	Min.	3	8	12	22	16	20	21	11	21	11	21	24	14	8	8	13	19	21	25	22	20	11	6	17	16	6	5	5	-3	10	1	13 4	
Glenwood	Max.	31	37	47	41	43	41	42	41	40	38	31	32	33	32	34	41	22	27	29	23	30	20	-1	21	15	4	7	23	3	15	10	12	17.1
	Min.	10	13	18	30	21	26	32	32	23	15	10	13	33	34	27	29	32	35	32	37	31	26	33	27	28	24	26	33	23	31	25	31.4	
Greene	Max.	15	31	31	40	40	35	39	35	14	13	14	22	28	16	8	10	8	7	7	20	28	22	10	7	8	20	1	-1	8	-5	9	3	10.5
	Min.	9	1	5	10	8	20	15	14	43	48	37	32	34	39	30	36	36	40	35	35	40	37	31	37	31	23	30	36	25	34	29	35.7	
Greenfield	Max.	21	35	42	38	39	39	45	50	43	48	37	32	32	34	39	30	36	36	40	35	35	25	25	19	6	20	15	3	4	20	0	14	3	17.0
	Min	4	9	15	23	23	23	28	18	25	22	32	25	15	20	12	22	27	29	32	27	15	20	3	18	24	27	25	26	30	38	26	26	33	28	33.2
Grinnell	Max.	14	30	32	36	38	38	40	43	34	40	41	34	35	31	30	26	31	37	44	38	40	25	20	11	..	22	5	6	14	-1	10	4	15.8
	Min.	-5	5	14	18	18	22	23	18	20	20	30	29	23	15	13	9	12	18	25	30	25	20	11	..	22	5	6	14	18	30	20	30.8	
Grundy C'r.	Max.	12	30	32	38	37	33	40	33	33	34	35	35	29	33	28	37	30	37	34	35	36	29	27	29	30	23	23	34	28	34	45	33	37	32	36.9
	Min.	-6	1	7	14	14	17	15	14	17	16	28	24	9	8	6	2	8	8	16	25	24	18	10	4	17	1	25	27	37	27	36	32	33.2
Guthrie C'r.	Max.	22	34	29	37	39	37	43	38	39	35	36	33	33	37	31	35	33	34	33	32	38	32	30	2	16	16	4	5	7	0	8	4	15.2
	Min.	4	4	11	21	19	24	24	17	21	19	32	20	17	15	13	12	15	25	27	26	32	23	26	27	28	21	22	32	18	31	16	28.3	
Hampton	Max.	13	30	31	35	38	31	39	31	31	34	34	29	25	32	21	25	29	30	24	25	33	36	32	30	33	24	5	0	11	-3	9	2	12.3
	Min.	-6	1	9	16	15	20	16	17	15	19	23	24	11	10	10	6	12	8	24	25	33	36	32	30	33	32	24	28	35	23	32	30	33.4
Hopeville	Max.	18	35	40	38	36	38	43	36	39	28	25	32	24	16	18	14	10	18	29	27	25	24	20	8	16	17	3	6	21	1	13	6	17.5
	Min.	2	8	15	26	20	25	25	21	24	32	34	32	27	34	30	32	30	36	32	33	35	29	27	30	27	23	25	34	17	34	29	30.9	
Humboldt	Max.	28	30	32	34	38	34	40	36	20	10	16	24	24	3	8	8	0	8	12	27	25	23	11	5	12	21	4	-3	14	-5	6	1	11.5
	Min.	14	0	6	14	10	22	16	20	10	16	24	24	3	8	8	0	8	12	27	25	23	11	5	12	21	4	-3	14	-5	6	1	11.5	
Independ'c.	Max.	10	28	31	37	36	33	38	37	36	34	34	35	31	29	28	24	29	38	35	36	33	32	26	28	30	19	22	33	18	26	15	29.7	
	Min.	-7	-4	5	13	5	19	11	13	14	16	22	27	18	3	18	-4	0	12	21	28	22	18	12	1	22	-2	-1	2	-5	5	3	9.9	
Indianola	Max	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	
	Min.	-1	6	16	16	17	26	25	21	26	21	32	26	28	15	16	10	15	26	25	26	..	20	10	..	24	6	6	20	1	13	5	17.1	
Iowa City	Max.	12	32	37	38	41	35	44	41	34	38	38	36	33	33	31	29	35	41	36	39	36	33	27	37	32	28	28	35	..	31	30	34.0	
	Min.	0	2	10	12	9	25	17	22	24	18	32	32	24	13	17	2	2	17	31	32	22	24	9	3	28	3	-3	12	..	14	8	15.4	
Iowa Falls	Max.	20	29	32	38	37	31	39	32	35	33	36	33	28	34	25	25	22	30	32	33	35	27	25	28	29	20	22	32	17	31	16	29.1	
	Min.	...	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	
Keokuk	Max.	16	41	41	42	43	42	52	49	39	38	44	46	35	33	31	32	40	45	37	40	36	31	32	38	36	31	35	38	31	35	20	38.1	
	Min.	4	8	21	28	21	30	29	29	32	30	35	33	30	26	23	8	20	31	32	32	30	27	17	15	31	10	14	25	8	19	10	22.8	

MONTHLY REVIEW OF THE

ILY MAXIMUM AND MINIMUM TEMPERATURE FOR JANUARY, 1898—CONTINUED.

STATIONS.		DATE.																														Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Keosauqua.	Max.	18	38	40	43	41	43	48	41	38	38	41	43	34	38	31	30	37	41	41	38	37	42	34	35	34	28	31	37	24	35	32	36.5
	Min.	3	6	15	26	15	26	23	26	31	26	35	32	24	32	16	-2	11	26	31	31	29	24	15	6	28	7	7	14	7	18	9	19.3
Knoxville..	Max.	16	35	37	39	38	39	41	38	37	39	42	34	34	44	36	33	34	..	33	36	47	36	31	34	32	37	40	36	23	39	16	35.3
	Min.	0	8	17	25	18	27	24	24	25	24	33	28	24	16	18	10	16	27	27	30	27	27	13	15	25	6	5	17	4	15	6	18.7
Lamoni	Max.	..	..	..	38	38	38	46	41	40	36	38	36	32	36	31	34	37	40	53	35	39	33	31	33	34	25	29	35	28	33	33	35.1
	Min.	..	..	..	27	15	22	20	21	30	25	33	28	20	22	15	5	17	27	28	28	23	21	10	18	4	2	6	20	1	17	7	18.5
Lansing.....	Max.	19	33	32	44	44	38	42	37	44	38	36	33	31	33	30	30	32	37	38	41	35	29	31	29	32	30	25	26	26	26	26	33.2
	Min.	1	1	8	10	12	20	13	23	12	14	28	31	17	11	15	5	6	9	26	31	27	13	14	7	25	6	9	14	4	4	6	13.6
Larrabee...	Max.	14	32	38	35	36	33	38	36	37	30	34	32	30	35	29	34	37	34	32	29	28	24	29	28	26	24	27	28	18	34	17	30.3
	Min.	1	4	12	19	12	19	19	9	10	14	25	17	6	13	3	10	17	18	21	21	14	14	8	15	9	2	0	12	-5	5	-2	11.0
Le Mars....	Max.	15	33	35	36	36	34	34	35	34	30	30	32	32	34	29	34	36	35	35	28	30	25	25	29	27	24	26	32	22	36	23	30.5
	Min.	0	8	8	23	14	20	26	22	13	14	23	14	10	20	9	12	18	22	23	21	21	7	11	16	20	5	1	18	-3	14	-1	13.8
Logan.....	Max.	24	36	39	40	40	42	44	39	49	35	35	32	35	40	41	40	40	41	32	37	35	26	30	27	30	39	28	24	31	28	..	35.3
	Min.	4	13	18	22	16	20	22	12	10	15	30	17	13	14	15	13	20	22	24	22	20	19	5	20	24	11	4	4	10	8	..	15.6
Linn Grove	Max.	11	31	33	35	39	33	41	33	34	37	39	35	32	35	28	27	33	39	37	38	35	27	27	30	31	21	25	35	21	29	17	31 2
	Min.	-1	2	13	17	16	22	19	19	20	21	31	31	19	15	15	4	10	18	31	31	27	18	12	10	24	3	4	9	-1	11	5	15 3
Maquoketa.	Max.	19	30	28	38	42	40	42	40	41	30	39	38	37	30	35	25	31	40	30	34	35	33	30	31	33	25	23	34	32	31	30	33.2
	Min.	6	10	13	4	14	25	20	22	19	17	31	31	24	8	15	-2	3	10	15	12	20	25	15	3	5	7	2	0	5	10	9	12.8
Marshallt'n	Max.	15	32	33	40	39	36	42	36	34	36	36	35	32	33	30	33	33	38	33	34	39	33	31	32	30	27	24	36	23	32	27	32.7
	Min.	5	5	7	16	9	23	16	17	18	18	27	28	19	11	12	-1	7	15	19	30	25	21	10	8	23	2	1	15	-1	12	4	13.5
Mason City.	Max	12	28	31	36	38	34	38	36	34	34	35	34	29	34	20	26	30	33	32	34	32	23	28	24	27	22	28	32	32	31	26	30.2
	Min	-10	0	4	12	10	19	14	13	10	12	27	24	8	6	7	0	4	12	10	15	14	4	-2	4	6	5	4	28	-4	-8	2	8.1
Monticello.	Max	20	32	33	38	40	34	41	35	35	37	38	37	35	31	32	27	34	38	38	38	35	29	29	32	32	22	24	38	1[illegible]	[illegible]	[illegible]	32 4
	Min.	2	2	8	14	10	24	25	20	19	18	25	33	28	12	23	-2	4	28	25	29	30	23	13	2	25	1	-1	3	1	11	8	[illegible]
Mooar	Max	17	43	42	42	40	42	50	42	45	39	45	37	33	33	29	21	37	43	37	40	36	31	27	39	34	30	34	41	24	33	21	35.7
	Min.	3	2	12	27	12	28	17	25	25	25	35	37	28	18	25	0	-1	29	31	31	28	29	20	6	29	5	10	12	8	10	8	18.5
Mt. Ayr. .	Max.	20	35	41	48	42	38	45	40	41	37	39	26	32	34	30	38	38	39	32	34	37	33	32	32	32	25	29	36	28	34	32	34.8
	Min.	4	3	15	25	18	22	26	20	27	26	32	34	12	19	15	5	18	21	28	26	22	21	8	17	22	0	2	19	4	15	7	17.2
N.Hampton	Max.	25	36	35	50	44	45	40	35	50	42	36	37	33	32	41	33	40	45	35	47	36	27	37	30	30	28	34	33	33	30	27	36 3
	Min.	0	-2	10	17	12	22	16	17	18	20	26	30	19	12	20	7	12	16	23	30	23	14	13	12	23	4	2	12	1	10	6	14 3
Newton.....	Max.	13	32	34	38	37	34	42	36	36	37	37	36	29	34	24	28	31	39	35	34	38	26	28	32	30	24	30	35	19	33	25	31.8
	Min	-4	4	12	17	12	22	18	18	20	22	32	26	19	14	13	2	14	21	25	28	25	20	11	15	20	5	6	12	1	13	5	15.1
Northwood.	Max.	14	31	30	40	37	35	39	31	32	34	34	30	27	31	28	30	31	36	32	35	31	21	30	29	26	26	22	32	19	29	15	29 4
	Min.	-6	-2	7	20	10	15	14	16	13	11	22	20	18	7	13	2	6	9	27	27	15	6	10	10	26	5	1	4	-3	7	2	10.5
Odebolt	Max	11	31	37	35	39	34	38	35	36	31	31	30	30	38	31	36	35	37	31	29	30	33	28	30	26	25	28	31	24	35	26	31.0
	Min.	5	4	13	22	16	19	21	15	12	17	24	24	14	15	10	13	17	19	26	23	24	13	12	4	14	4	16	8	-2	9	2	14 3
Ogden	Max	19	34	33	39	38	36	40	36	36	35	35	33	30	32	32	33	34	38	35	31	36	30	28	30	28	25	25	35	25	35	30	32.4
	Min.	-5	0	8	14	32	19	20	10	19	18	30	24	10	14	10	5	15	19	25	25	24	21	4	16	22	-1	2	12	-6	9	1	12.8
Omaha, Neb	Max	23	38	41	41	42	42	43	41	45	34	34	31	26	36	32	39	38	37	32	37	37	27	37	32	31	29	32	36	27	40	26	34 9
	Min.	11	18	26	31	26	31	33	27	26	23	30	24	18	25	20	19	26	30	29	23	27	22	11	22	13	8	11	22	11	19	12	21 7
Osceola.....	Max.	17	35	42	41	39	40	45	38	39	36	37	32	31	36	27	32	36	44	32	32	35	30	31	32	31	24	28	34	18	32	17	32.9
	Min.	1	7	11	26	22	25	27	22	28	26	32	24	10	18	17	9	16	26	28	28	25	20	10	16	24	5	8	22	2	12	[illegible]	[illegible]
Ottumwa...	Max	14	37	41	41	40	40	49	39	38	39	40	40	40	34	32	31	35	44	38	36	36	33	35	36	35	28	29	37	27	37	20	35 5
	Min	-1	4	15	21	17	25	29	25	30	25	29	31	27	23	14	2	9	20	16	31	29	22	14	11	19	5	6	17	4	4	4	16 4
Ovid.....	Max	19	36	42	38	39	40	45	38	39	36	38	33	34	34	30	[illegible]	38	42	35	34	36	30	32	33	32	27	28	35	21	33	19	33.9
	Min.	-1	6	12	24	15	25	23	21	29	28	33	25	19	22	10	[illegible]	13	25	26	25	24	20	8	14	18	0	3	20	-1	15	-1	16 3
Plover.....	Max	20	32	32	34	36	28	40	36	34	30	35	28	20	24	30	..	..	..	..	..	..	..	..	..	..	30	24	46	22	30	20	29 9
	Min.	0	16	5	15	12	24	14	12	10	15	28	26	5	5	15	..	..	..	..	..	..	..	..	..	..	10	0	10	0	0	4	10.8
Primghar ..	Max.	12	31	34	33	36	35	[illegible]	[illegible]	36	35	33	31	28	33	30	31	36	34	33	28	28	23	23	27	27	23	23	29	23	34	24	29 9
	Min.	0	4	16	17	[illegible]	[illegible]	22	10	21	14	[illegible]	22	7	17	5	10	18	18	25	20	22	12	11	15	18	3	4	9	-3	7	-1	12 9
Red Oak....	Max	23	38	[illegible]	[illegible]	40	39	43	40	41	38	36	[illegible]	34	38	41	30	[illegible]	34	36	32	38	34	30	34	32	22	29	36	33	39	34	35.5
	Min.	[illegible]	10	16	[illegible]	15	[illegible]	28	19	21	22	31	27	10	[illegible]	[illegible]	4	15	[illegible]	29	26	[illegible]	[illegible]	6	[illegible]	[illegible]	0	3	18	2	[illegible]	9	17.5
Rockwell C.	Max	18	20	31	[illegible]	32	30	40	30	35	32	32	20	[illegible]	[illegible]	[illegible]	28	38	37	[illegible]	[illegible]	[illegible]	28	30	28	24	[illegible]	[illegible]	[illegible]	63	[illegible]	[illegible]	28.7
	Min.	11	8	12	6	15	13	10	10	12	21	22	7	4	1	4	11	16	14	22	14	10	7	-4	10	-4	-3	20	12	6	6	2	9.5
Ruthven ...	Max.	18	29	27	34	38	42	37	40	36	37	34	34	29	34	34	33	38	34	35	31	27	32	26	29	28	15	22	30	29	33	34	31 2
	Min	2	3	12	20	20	18	21	20	15	15	22	19	11	17	5	10	15	11	25	22	21	12	12	13	20	4	1	13	-3	9	0	13.0
Sac City....	Max	11	30	34	33	36	33	36	34	33	34	33	25	25	33	25	22	31	33	32	30	31	35	28	25	25	20	25	33	16	32	20	28.8
	Min	4	4	11	21	18	21	20	20	10	15	26	21	14	12	7	7	12	15	22	25	20	15	2	11	15	5	2	14	-4	14	2	15.5
Sibley	Max	16	32	32	34	37	34	39	34	42	32	30	30	32	32	30	37	39	33	31	26	30	27	22	26	25	25	27	28	20	32	24	30 1
	Min.	-4	3	11	18	11	19	20	9	14	13	21	20	4	13	8	6	16	20	25	20	22	9	11	14	16	1	-3	14	-3	5	0	11.4
Sidney	Max	21	39	42	29	38	40	43	39	42	36	35	37	34	35	30	35	40	36	32	31	38	27	28	32	30	26	33	37	20	40	20	33.5
	Min.	10	11	21	18	22	30	31	26	28	26	32	30	13	24	18	17	25	25	30	25	29	22	10	19	25	4	9	24	10	16	9	20.6
Sigourney..	Max	11	34	37	38	39	36	40	39	37	40	40	36	34	36	36	29	36	40	38	37	37	33	30	39	31	27	37	36	25	34	31	34.3
	Min.	-2	3	8	20	16	22	25	21	21	22	33	32	22	12	15	1	2	22	29	31	17	21	12	11	25	0	5	12	0	14	5	15.8
Sioux City..	Max.	21	37	40	40	40	39	40	38	37	30	33	31	37	34	29	38	36	34	33	32	29	25	27	30	26	28	34	33	20	37	18	32.5
	Min	6	7	18	23	22	21	26	18	17	15	14	25	17	18	13	12	19	25	25	22	22	11	9	9	22	8	6	5	2	1	[illegible]	15.0
Spencer.....	Max.	28	32	32	34	38	32	37	33	37	30	32	30	30	33	28	34	34	34	31	28	30	24	27	29	24	25	26	30	15	35	16	29.9
	Min.	1	3	7	17	14	19	15	10	13	15	22	10	6	14	6	9	14	11	19	21	22	12	9	11	14	3	-1	9	-2	6	0	10.6
Spirit Lake.	Max.	24	32	35	41	47	36	46	34	42	31	31	27	33	31	29	37	40	32	31	25	32	24	26	24	25	27	30	31	24	35	17	31.7
	Min.	-4	14	14	20	17	19	22	10	16	14	23	19	4	15	7	10	17	16	25	22	14	11	4	16	5	3	-5	9	-5	8	0	11 6
Stuart	Max.	19	39	38	43	40	..	..	35	40	37	35	27	30	35	26	32	31	37	32	31	37	30	25	30	32	21	24	30	19	27	19	31.0
	Min.	4	5	16	25	22	23	..	10	24	20	30	23	18	18	13	11	18	25	27	26	26	20	8	15	20	-6	-6	11	4	12	4	16.3
Tara.....	Max	19	20	34	35	40	34	40	34	35	35	32	31	28	34	27	34	35	36	32	29	32	24	26	28	28	32	28	30	20	20	15	29.9
	Min.	-5	13	4	10	5	14	22	9	10	13	23	23	4	9	9	8	10	15	23	23	21	11	13	18	20	-3	-3	-5	-3	10	5	10.8
Toledo.....	Max.	12	31	31	36	36	33	41	31	32	35	36	34	35	34	34	25	29	40	34	39	37	26	25	28	29	25	25	33	23	30	16	30.7
	Min	-5	2	7	13	10	23	14	17	17	17	26	30	23	10	22	-3	4	14	22	29	25	24	10	6	25	0	1	8	-2	9	3	12.9
Thurman...	Max	24	39	43	41	40	40	43	38	41	36	32	32	31	35	32	32	38	36	35	32	39	28	26	33	32	24	29	36	32	40	33	34.6
	Min	9	9	15	25	14	25	27	22	21	23	32	25	4	12	15	3	16	20	29	24	28	20	-3	24	17	-2	0	18	2	17	12	16.2
Villisca.....	Max.	23	38	43	39	40	40	43	40	41	37	36	30	33	38	28	33	41	39	34	32	39	27	32	34	30	26	32	38	23	38	16	34.3
	Min.	8	10	13	27	13	25	28	20	25	24	32	27	15	16	12	3	13	25	29	25	27	20	2	27	25	-1	0	20	1	17	7	17.2
Washingt'n	Max	15	35	36	40	41	37	45	36	34	38	39	36	33	32	29	30	34	43	38	40	35	30	31	34	31	28	29	37	21	32	18	33.4
	Min.	0	0	12	18	15	20	20	22	25	22	32	30	20	19	9	0	9	19	28	31	28	22	12	8	22	1	0	12	-2	12	1	15.1
Waterloo...	Max.	13	31	33	39	38	35	40	32	33	36	35	34	30	32	28	28	29	37	34	37	43	28	28	30	32	25	22	36	22	30	19	31.2
	Min.	6	3	6	13	8	15	8	17	16	14	31	24	8	5	16	1	6	8	25	16	25	20	10	4	20	3	1	7	-1	13	1	11.3
Waverly....	Max	11	31	33	39	37	34	40	34	36	35	37	33	31	34	28	26	33	40	33	37	34	27	25	31	31	23	24	35	18	30	23	31.1
	Min.	-6	3	5	10	6	20	15	17	14	14	24	30	18	10	15	4	7	11	23	30	25	17	12	7	17	1	0	10	1	12	5	12 1
Webster Cy	Max.	17	26	31	35	39	32	42	35	38	34	35	34	26	32	28	27	31	36	32	34	35	31	26	30	30	25	21	33	20	30	20	30.5
	Min.	-3	1	9	17	12	22	17	15	26	15	27	25	8	7	11	1	9	17	25	27	25	18	9	15	22	5	2	10	-3	10	-4	12.8
W. Branch..	Max.	12	32	34	48	36	36	41	42	32	38	36	38	42	32	29	22	32	39	36	38	34	36	25	31	31	31	20	34	28	30	29	33 0
	Min.	1	2	12	16	12	24	16	21	22	18	32	32	24	10	19	-1	3	16	22	32	26	24	14	-3	26	2	-1	-2	-1	13	6	14.1
Wilton Jc..	Max.	14	33	35	38	43	45	44	41	36	37	41	38	33	36	31	19	35	41	38	38	36	32	22	37	31	23	22	25	24	34	28	33.2
	Min.	3	1	11	16	15	24	19	20	23	17	29	32	19	13	16	2	3	15	32	32	28	26	13	4	25	0	1	0	0	13	7	14.8
Winterset..	Max.	20	35	41	40	38	38	42	38	39	36	35	31	34	37	39	27	37	42	32	34	39	26	36	36	32	27	33	36	22	38	17	33.9
	Min.	1	5	13	24	19	25	22	20	25	20	31	29	17	16	16	8	15	25	27	27	25	24	7	16	24	6	5	18	0	12	5	17 0

February, 1898.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

VOL. IX. NO. 2.

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LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER.
1898.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW
OF THE
Iowa Weather and Crop Service.

VOLUME IX. FEBRUARY, 1898. No. 2.

NOTE AND COMMENT.

Alfalfa is not a pasture plant, but as a soiling crop for sheep it is excellent. It is said that an acre will keep ten sheep.

***

Wild geese were observed on March 4th headed toward the Klondike region. And many other bipeds will make a "wild goose chase" into that region this season. Of the two the wild fowl will make the most out of the trip into the Arctic region.

***

The report of the bureau of statistics for the year 1897, shows that over 67 per cent of the exports of the United States were the products of agriculture, amounting in value to $730,323,314, as against $664,955,372 in 1896. These are encouraging figures.

***

The movement to promote the larger use of Indian corn, as an article of human food, in this country and abroad, will possibly cause a notable decrease in the per capita consumption of wheat. In so far as this line of promotion is successful it must certainly affect the demand for the grain that has heretofore held the foremost place among the breadstuffs of civilized countries.

***

If spring wheat is to be grown this year it should be sown in March if conditions of soil and weather will permit. The earlier the better after March 1st, is the rule in this region, and it seldom happens that there is not a time during the month when the seeding may be done. The successful farmer is always ready to do the work when the conditions are favorable.

***

The report of the New England Climate and Crop Service for January states that the weather for that month was determined by the movement of eight high pressure areas and eleven barometric depressions, or "lows." The general character of the month was therefore stormy, with a large amount of rain and snow, considerable severely cold weather, great ranges of temperature and barometric pressure, and several violent gales. A remarkable feature of the cyclonic areas was that not less than six developed in the southwestern portion of the United States and moved northeasterly across the lower Mississippi and Ohio valleys, passing down the St. Lawrence valley or off the New England coast. This number was largely in excess of the average, as by far the greater number of January storms in that section originate in the northwest. This fact may also be cited as having some relation to the mild weather that prevailed in Iowa and other portions of the upper Mississippi valley in January. The trend of cyclonic storms appears to be a prime factor in determining the general character of the season in this valley, as well as in the extreme eastern portion of the United States. The track of areas of low pressure in January affords an interesting study.

Of the 10,522 cars of cattle received here in January, Iowa sent in 4,053, Illinois 2,685 and Missouri 2,095. Of the 10,950 cars of hogs received, Iowa is credited with 4,243, Illinois 3,600, Wisconsin 1,203, Minnesota 600, Missouri 568 and Indiana 502. Compared with a year ago, Illinois shows a gain of 386 cars of cattle, Iowa a gain of 862 cars, Missouri a gain of 329 cars, Texas a decrease of 138 cars. As to hogs, Illinois shows a gain of 35 cars, Iowa a gain of 223 cars, Missouri a loss of 527 cars, Minnesota a loss of 325 cars, Wisconsin a loss of 117 cars.—*Chicago Drover's Journal.*

***

The first number of the Iowa Weather Crop Bulletin, for the season of 1898, will be issued Tuesday, April 12th. Supplies of report cards and blanks for the season will be mailed to the voluntary observers of this service about the middle of March. The weekly bulletins are justly regarded as the most valuable crop reports issued during the season, giving in a concise form a review of all the meteorological conditions affecting the staple crops from seed time to the harvest. We have an excellent corps of observers, many of whom have had many years of experience in this service, and we confidently expect the reports for the coming season will be fully up to the standard of former years.

***

In a volume of essays published by Count Rumford a century ago, we find the following relative to our great American staple:

"Indian corn possesses very extraordinary nutritive powers and it is well known that there is no species of grain that can be had so cheap, or in so great abundance; it is, therefore, well worthy the attention of those who are engaged in providing cheap and wholesome food for the poor, or in taking measures for warding off the evils which commonly attend a general scarcity of provisions, to consider in time, how this useful article of food may be procured in large quantities, and how the introduction of it into common use can most easily be effected."

THE SOLAR RAYS.

Editor Monthly Review:

I noticed in the January Review an extract from Davis' Elementary Meteorology relating to the color of the sun's rays. For many years, even before we knew of electric lights, I have discredited the theory of direct light and heat from the sun. I could give numerous reasons for this disbelief, but it would be asking too much of your space to state them here. I will only say it does not seem reasonable that the sun's light and heat could pass through many millions of miles of dark, cold space without any effect whatever until the earth is reached. My opinion is that light and heat are generated on the earth's

potatoes (10 pounds) one and three-quarter pounds of nutrients and about 3,200 calories of fuel value; in 10 cents worth of eggs, at 25 cents a dozen (3–5 of a pound) about one-fifth pound of nutrients and about 400 calories of fuel value; in 10 cents worth of milk, at 6 cents a quart, two-fifths of a pound of nutrients and 1,000 calories of fuel value; in 10 cents worth of round steak at 12 cents a pound, less than one-quarter of a pound of nutrients and about 775 calories of fuel value, and about the same for rib of beef and leg of mutton. This pecuniary economy of corn meal is therefore well established. Moreover the nutrients which it contains are in such form as to be admirably suited to the needs of the laboring classes, while the palatability and digestibility of many of the forms in which it may be prepared for the table recommend it highly for general use. In brief, properly prepared, Indian corn furnishes a very wholesome, nutritious, digestible, and economical food for man. Owing to its deficiency in gluten, Indian meal is not adapted for making bread unless mixed with wheat or rye flour. Mixed with rye flour it makes a most nutritious "brown bread"—famous in New England. Alone it may be made into cakes and roasted, yielding a very palatable and useful product which is eaten both hot and cold under the various names of "johnny-cake," "hoe-cake," "Indian bread," and, in Spanish America, tortilla. It may also be served as porridge, as "mush," or "hasty-pudding," as baked Indian pudding, as Indian bag pudding, etc."

SUGAR-BEET CULTURE IN AMERICA.

HOW THE MATTER STRIKES INTELLIGENT GERMANS.

Frank H. Mason, consul-general at Frankfort, writing to the state department under date of February 10th, says: "I inclose herewith an article with translation from the *Leipsic Tageblatt* of the 9th instant, describing the efforts of the department of agriculture and farmers and capitalists in the United States, to establish the cultivation and manufacture of beet sugar on a large scale, the probable effect of such enterprise upon sugar imports from Germany, and the unwisdom of the efforts which have been made by German agriculturists to discredit American agricultural products and preclude their importation into Germany. It is thought that this article, from a prominent and influential organ of the German sugar-growing section, may have, at this time, a general interest in the United States:"

American journals announce that the beet-sugar craze prevails throughout the counties of northern and middle Indiana to a degree that recalls to mind the co-operative creamery and milk station fever which raged there several years ago. Numerous and largely attended meetings of farmers and capitalists have been held to discuss and agree upon plans for mutual operation. The former are to raise beets; the latter are to manufacture them into sugar. So great is the excitement, that many already cherish the dream of seeing Indiana become the center of the American beet-sugar industry.

spired the unheard of measures
country of American agricul-
audacity to condemn American
greatly embittering the feel-
st Germany
doubled fervor into sugar-beet
t entirely the use of German
agriculturists may be actuated
and protect its members, but
it would help, and is, in this
erica imports from us constantly
hemp and manufactures of such
otato starch, etc., which are in
it is simply insanity to want to
e.

S IN IOWA.

S. WEATHER BUREAU.]

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is to be used as a general name
winds then, of course, there may
use of the word "chinook," but
f many years of meteorological
y chinooks in Montana, and wet
ington, the editor would prefer
vetian word "fœhn."
rt from Iowa for the month of
resting notes by observers At
s:

the wind was in the northwest,
as mild as May and reminded me
inook. Query: Was it the tail
was very compact from previous
depth.

s:

midnight that settled the snow

ther maps to ascertain whether
descending winds on these dates,
general, such winds may occur
he fact that they are peculiarly
tain regions, such as Switzerland,
na, New Zealand, and northern
from recognizing the fact that
ly in almost every other region.
other air must descend. There
famous hot winds that occur occa-
ward to Canada are descending

enced a moderate chinook. All the intermediate regions had their descending dry and relatively warm winds.

On December 29th the conditions were very similar. The high pressure was over the Salt lake region; the lowest pressure was over Lake Superior; the whole eastern Rocky mountain slope was covered with a layer of descending air, clear and dry, and, in general, warmer to such an extent that Iowa, Minnesota, and Wisconsin were from 20° to 50° warmer than on the 28th The chinook — if it may be so called — prevailed from the Rocky mountains eastward to the Mississippi. Iowa did not get the tail end of it but was in the midst of it.

If "chinook" and "fœhn" are terms that are to be restricted to intense local manifestations of descending winds, and if by the "hot winds" of the western plains we designate only those that occur at the time of the ripening of the wheat and corn, when they do such injury to crops, then we ought perhaps to devise some term specifically appropriate to these widespread areas of descending winds that bring dry, clear, warm weather to one-half of the Mississippi watershed.

Not only does the eastern slope of the Rocky mountain region have its descending chinook winds, but so also has the eastern slope of the Appalachian range, a fact that was pointed out by the editor as long ago as 1872. The westerly winds that bring fog and possibly rain or snow to Buffalo, Pittsburg, Knoxville, and Chattanooga frequently descend upon New York, Washington, Lynchburg, Columbia, S. C., and Atlanta as clear, dry winds, and on the average a very little warmer than on the windward side of the mountain range. One of the first indications of this action of descending winds was observed soon after the station at Lynchburg was opened in 1871, when it was found that so-called clearing up weather and the first clear sky began at that station some hours before it reached Washington, and even a whole day earlier in the case of very slowly moving changes.

An area of high pressure apparently represents a region in which air is descending so slowly to the earth's surface that it cools by radiation faster than it warms up by compression. When such an area is central, as occurred so frequently during December, over the middle plateau region, the atmosphere is pushed not merely eastward down the eastern slope, but also northwestward into California, Oregon, and Washington. It is the relatively rapid descent down these slopes that causes the air, which is compressed by its own weight, to become

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*See the article "Summer Hot Winds on the Plains," by Dr. I. M. Cline, Weather Bureau Observer, in the Bull. Phil. Soc. Washington, XII, 1894.

METEOROLOGICAL DATA FOR FEBRUARY, 1898.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION IN INCHES.				Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	No. of thunder storms.
	Monthly mean.	EXTREMES. Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.	Monthly range.	Monthly.	Greatest daily.	Total snowfall.	Depth of unmelted snow at end of mo.						
Afton	26.6	36.4	16.8	47	27	-6	2	53	1.51	.94	3.0	.....	SW	9	9	10	3	....
Albia	.....	.....	18.9	.....	.....	-7	1, 2	.....	.83	.50	5.0	.....	NW	7	12	9	6	....
Algona*	20.4	.....	.....	40	14	-16	2	56	1.65	1.00	11.0	2.0	NW	8	14	6	4	....
Alta	21.0	29.6	12.5	42	14	-12	2	54	.93	.43	7.2	3.0	NW	15	6	7	7	....
Amana	23.4	32.5	14.4	48	10	-15	1	63	1.11	.50	8.1	4.5	NW	10	10	8	6	....
Ames	22.6	31.2	14.1	44	14	-10	1	54	.... ..	.....	.....	.....	.....	10	15	3	...	....
Atlantic	25.2	34.4	16.1	48	8, 26	-8	1	56	1.10	.90	2.0	.....	NW	12	6	10	3	....
Audubon	23.9	33.7	14.1	47	14	-9	2	56	1.10	1.10	...	.....	NW	3	13	12	1	....
Beiknap	26.2	35.8	17.5	50	8, 10	-7	3	57	1.77	.50	17.0	.....	NW	7	17	4	9	...
Belle Plaine	21.8	32.5	11.1	47	8	-15	1	62	1.30	.90	13 0	7 0	W	7	11	10	6	....
Britt‡	19.8	28.5	11.0	41	8	-18	2	59	1.57	1.00	5.7	1.5	W	7	15	6	6	....
Burlington	29.6	38 2	20.9	58	10	-7	1	65	1 25	.80	.....	.....	.....	13	4	11	3	....
Bonaparte	26.5	35.2	17.8	56	8	-11	1	67	1.00	.70	5.0	.....	.....	.....	.....	.....	3	....
Carroll	21.2	31.5	10.8	45	14	-10	2	55	1.10	.65	10.5	T	.....	16	0	12	4	....
Cedar Falls	22.6	30.7	14.6	45	14	-11	1	56	.70	.40	3 0	.....	NW	7	10	11	2	...
Cedar Rapids	22 8	32.6	12.9	50	10	-12	1	62	3.65	2.50	10.4	2.0	NW	12	7	9	5	....
Charlton	27.3	35.4	19.2	49	10	-5	1, 3	54	.84	.28	3.0	.....	N	11	13	4	7	....
Charles City	20.6	29.6	11.5	42	8	-14	1	56	2.79	1.00	17.5	4.0	S	9	11	8	10	...
Clarinda	29.9	38.8	21.0	52	27	-5	1	57	2.13	1.75	4.2	T	NW	15	8	5	4	....
Clinton	25.4	34.0	16.8	55	10	-8	3	63	2.37	1.35	17.0	6.0	W	6	7	15	10	....
College Springs	28.1	37.8	18.4	51	16	-4	1, 2	55	1 11	.80	2.0	.....	NW	18	5	5	3	....
Corning	28.4	38.1	18.7	51	27	-7	1	58	1.25	1.25	T	T	NW	15	3	10	1	....
Council Bluffs	29.8	38.9	19.8	51	8, 27	-1	2	52	.42	.35	.....	.....	NW	8	11	9	3	....
Cresco	19.8	28.2	11.3	45	8	-15	1	60	1.02	.40	8.2	2 0	NW	8	8	12	9	....
Davenport	26.6	33.2	19.9	57	10	-6	1	63	1.86	.92	12.0	5.5	NW	6	5	17	13	....
Decorah	20.7	29.5	11.9	44	8	-12	1	56	1.29	.65	16.5	6.0	.....	.....	.....	.....	5	....
Denison	.....	.....	8.7	.....	.....	-7	1	.....	.10	.10	1.0	.....	S	.....	....	.....	1	....
Delaware†	20.4	.....	.....	45	10	-10	1	55	1.04	.25	11 0	11.0	NW	5	12	11	8	....
Des Moines	26.2	35.0	17.5	48	14	-7	2	55	.82	.51	3.1	T	N	15	6	7	7	....
De Soto	25.5	35.2	15.8	52	8	-10	1	66	1.44	.75	4 2	.....	NW	13	7	8	6	...
Dows	20.4	30.3	10.6	42	8	-17	1	59	1.60	.75	9.0	5 0	NW	9	4	15	6	...
Dubuque	24.1	31.6	16.6	50	10	-4	1	54	2.01	.91	18.4	.....	NW	9	10	9	11	...
Eldora	22.4	32 3	12.4	45	5	-16	1	61	2.10	.60	....	....	NW	1	24	3	7	....
Elkader	22 8	32.9	12 6	46	10	-13	1	59	1.09	.56	13.8	5.0	N	11	8	9	5	....
Estherville	20.2	32.2	8.1	46	8, 28	-15	2	61	.65	.20	6.5	.....	NW	15	10	3	5	....
Fairfield‡	26.5	35.8	17.2	53	8	-13	1	66	.85	.40	6.0	.....	.....	8	14	6	4	....
Eagle Grove†	19.4	...	.....	.....	.....	-10	2	.....	.90	.60	9.0	.....	.....	18	3	5	2	....
Fayette	21.4	31.2	11.7	46	8	-16	1	62	2.63	1.00	16.0	5.0	NW, SE	10	8	10	13	....
Forest City	19.4	29.5	9.3	45	8	-14	2	59	1 65	.65	9.0	2.0	W	11	2	15	6	....
Ft. Madison*	31.6	.....	.....	55	10	-3	1	58	2.05	1 10	7.0	3.0	SW	3	9	15	5	....
Galva	22.6	32.0	13.1	43	14	-9	2	52	.44	.32	...	.....	NW	6	20	2	2	....
Glenwood	30.2	40.2	20.1	51	14	-3	2	54	1.35	.75	2.0	.....	NW	6	18	4	3	....
Grand Meadow*	21.1	.....	.....	40	8, 10	-7	2	47	1.95	.90	16.8	11.0	NW	5	12	11	8	....
Greene‡	21 0	31.0	11.0	46	28	-13	1	59	1.19	.40	18.0	6.0	W	10	7	11	9	....
Greenfield	26 3	36.8	15.8	48	8	-8	2	56	1.72	1.39	2.3	T	N	14	3	11	6	....
Grinnell	24.3	33.1	15.5	44	10	-9	2	53	.75	.30	4.3	.....	NW	2	14	12	5	....
Grundy Center	21.2	29.7	12.6	44	14	-14	1	58	.77	.50	7 0	4.0	NW	11	7	10	6	....
Guthrie Center	25.3	34.9	15.7	45	8,14,27	-7	2	52	.97	.85	1 4	T	NW	11	10	7	3	....
Hampton	20.3	28.4	12.2	41	8, 14	-12	2	53	1 56	.51	12.1	8 0	NW	11	11	6	10	...
Hedrick*	27.9	.....	.....	53	8	-12	1	65	.60	.60	.....	.....	.....	17	2	5	1	....
Hopeville	26.1	35 3	16.9	48	27	-6	1, 2	54	1.16	.57	.....	.....	NW	7	13	8	4	...
Humboldt	21 4	30.9	11 8	40	8	-13	1	53	.69	.42	6.0	6.0	NW	17	3	8	3	....
Independence	20.8	29.5	12.2	42	10	-11	1, 2	53	1.34	.69	13 5	3.0	NW	10	14	4	7	....
Indianola	25.6	34 2	16.9	46	14	-7	2	53	.54	.40	4.2	.....	NW	10	7	11	3	..
Iowa City	25.0	34.3	15.8	51	10	-12	1	63	1 15	.75	7.0	5.0	NW	6	13	9	3	....
Iowa Falls	20.5	30.1	10.9	43	7	-18	1	61	2.17	1.00	17.8	.....	NW	9	11	8	7	...
Keokuk	31.0	38.9	23.1	61	10	-4	1	65	1 16	.49	.....	.....	NW	12	4	12	8	....
Keosauqua c	27.8	36.9	18.6	62	8	-5	1, 3	67	1.46	.68	9.7	.....	.....	.....	.....	.....	5	...
Lamoni	27.3	37.0	17.6	50	27	-7	1	57	.92	.60	2.0	T	NW	14	2	12	3	1
Lansing	23 3	33.0	13.6	45	11	-9	1	54	1.70	.55	16.5	10.0	.....	5	12	11	4	...
Larrabee	21.6	32.1	11.2	47	7	-12	2	59	.94	.55	4.8	2.5	NW	13	9	6	5	....
Le Mars	22.8	33 0	12.7	43	14	-8	1, 2	51	.45	.38	5.0	.....	N	21	4	3	2	...
Lenox. f*	28 2	37.0	19 3	48	27	-2	2	50	1 54	1.03	3.1	T	NW	14	7	7	4	....
Linn Grove (Mt. Vernon)	23.2	31.0	15 5	47	10	-12	1	59	1.46	.80	15.1	9.0	NW	6	8	14	7	....
Logan	26.4	37.0	15.8	50	14	-6	1	56	.80	.40	4.0	.....	N	16	5	7	3	....
Maquoketa	23.6	33.4	13.9	49	10	-10	1	59	.90	.38	11.2	4.0	NW	14	6	8	5	....
Marshalltown	24.8	34.4	15.2	46	14	-10	1, 2	56	.62	.22	3.5	.....	SE, SW	7	14	7	10	....
Mason City a	20.4	29.8	11.1	41	8	-15	2	56	.95	.50	.....	.....	.....	...	.....	.....	3	....
Mooar	28.7	36.8	20.6	60	10	-8	1	68	1.12	.43	.....	.....	NW	11	7	10	3	....
Monticello a	23 4	33.1	13.6	45	9, 17	-13	1	58	.97	.66	12.5	2.0	NW	9	9	10	3	...
Mt. Ayr	27.3	37 0	17.6	50	27	-7	3	57	1.41	.78	2.0	.....	NW	7	12	9	4	1
Mt Pleasant*	28.4	.....	.....	54	8, 10	-5	2	59	.77	.32	.....	.....	NW	22	1	5	3	...
Mt. Vernon*	24.1	.....	.....	48	10	-12	1	60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Hampton	24.4	34.5	14.3	54	8	-9	1	63	1.60	1.00	16.0	.....	NW	9	10	9	4	...
Newton	24 5	33.1	15.9	46	14	-10	2	56	.85	.41	5.0	.....	NW	9	12	7	5	....
Northwood	19.8	29.1	10.6	42	8	-13	2	55	1.95	.75	12.0	.....	NW	18	0	10	5	...
Odebolt	23.1	33.4	12.8	42	28	-9	2	51	.95	.50	4.2	.....	.....	14	6	8	3	....
Ogden	22.8	32.5	13.1	44	8	-13	1	57	1.01	.75	5.2	.....	NW	12	0	16	6	....
Omaha (Neb.)	29.9	38 5	21.3	52	14	-2	2	54	.67	.34	2.5	.0	NW	13	8	7	8	...
Osage†	19.0	.....	....	.....	.....	-10	1, 2	.....	1.75	.80	14 5	4.0	NW	3	10	15	8	...
Osceola	25 8	34.5	17.1	47	10, 27	-7	2	54	1.18	.38	4.5	.....	S	10	10	8	4	...
Oskaloosa	25.4	35.3	15 5	51	10	-14	1	65	.67	.40	4.7	1.5	NW	10	3	15	4	....
Ottumwa	25 2	35.1	15 2	55	10	-7	1	62	.65	.40	6 5	.....	NW	0	18	10	4	...
Ovid	26.0	35.8	16.3	51	10	-9	1	60	1.25	46	6.0	.....	NW	11	5	12	5	....
Plover	20 8	29.1	12.4	44	14	-13	2	57	.60	.30	6.0	2.0	S	11	8	9	3	...
Portsmouth a	.....	...	13.4	.....	.....	-11	1	.....	.91	.45	4.6	.....	NW	5	18	4	3	....
Primghar	21.8	31 6	12.0	41	8	-11	2	52	.32	.15	3.2	.....	NW	12	13	3	4	....
Red Oak	28.4	38.8	18.1	49	27	-7	1	56	1.49	1.10	3.0	.....	.....	.....	.....	.....	3	...
Rockwell City	20.6	30 8	10.3	44	8, 14	-11	1, 2	55	.54	.37	5.0	3.0	.....	20	1	7	3	....
Ruthven a	20.8	30 9	10.7	41	9	-13	2	54	.85	.30	8 5	.....	NW	17	1	9	5	....
Sac City	21.9	29.7	14.1	42	14	-10	2	52	1.12	.50	6 2	2.0	NW	9	13	8	5	....
Sibley b	21.2	32.7	9 8	46	8	-12	2	58	.57	.53	1.5	.....	NW	13	10	4	2	....
Sidney	28.6	36.1	21.2	50	16	-4	2	54	2.38	.85	4 1	.....	NW	19	3	6	7	2
Sigourney	25.9	36.0	15.8	52	10	-10	1	62	1.06	.70	6.0	4.0	NW	7	14	7	3	....
Spencer a‡	20.2	31.2	9.1	42	14	-13	2	55	.67	.35	2.1	.4	W	7	12	9	4	....
Spirit Lake‡	20.3	31.0	9.6	48	8	-14	2	62	.60	.20	6 0	T	N	16	5	7	4	...
Sioux City	23.6	34.0	13.1	47	14	-7	2	54	.37	.25	5.2	.....	NW	10	11	7	3	....
Stuart	24 8	34.5	15 1	46	13	-11	2	57	.40	.30	4.0	.....	NW	15	0	13	2	....
Tara	23.4	36 2	10 6	48	8	-10	2	58	1.30	.50	11.0	2.0	NW	11	4	13	4	....
Toledo	22 8	30.7	15.0	44	10	-12	1	56	.82	.42	7.5	.....	NW	9	0	19	5	...
Thurman	28.0	37.5	18 5	54	16	-6	1	60	1.35	.70	9 0	.....	NW	11	9	8	7	1
Villisca‡	27.2	36.8	17.6	50	27	-10	1	60	1.92	1.59	3.0	.0	SW	13	9	8	5	....
Vinton*	22.9	.....	.....	42	10	-11	1	53	1.65	.80	14 5	.....	NW	16	5	7	6	....
Washington	24.6	34.1	15.1	51	10	-12	1	63	1.10	.70	8.2	.....	NW	.....	.....	.....	5	...
Waterloo	21.7	30.9	12.5	42	10, 14	-10	1, 2	52	1.19	.53	10 0	6.0	NW	11	5	12	7	....
Waverly	22.3	31 1	13 5	43	8	-11	1	54	1.30	.41	10.8	4 0	NW	5	14	9	11	...
Webster City	22.3	31.8	12 8	46	6	-12	1	58	1.04	.60	8.5	T	NW	10	11	7	4	....
West Bend*	19.7	.....	.....	40	8, 14	-12	2	52	1.40	.80	9.0	.....	NW	7	12	9	3	...
West Branch a	23.1	32.6	13.6	48	10	-10	1	58	1.47	.52	9.0	8.0	NW	.....	.....	.....	3	....
Whi ten*	21.0	.....	.....	40	7,10,14	-12	1, 2	52	.40	.20	.....	1.0	NW	12	2	14	2	....
Wilton Junction	25 6	34 5	16.8	50	10	-12	1	62	1.31	.83	8.0	5.0	NW	11	7	10	2	...
Winterset a	25.5	35.0	16.0	47	26	-9	1	56	1.17	.93	.4	.....	.....	.....	.....	.....	3	....
Means	24.2	33.6	14.8	47.5	... ..	-9.7	.....	57.2	1.20	.....	7.8	.....	NW	10	9	9	5	....

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

DAILY AND MONTHLY PRECIPITATION FOR FEBRUARY, 1898

STATIONS.	DATE																											Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Adair	...	...	...	T	..	....	....	....		.50	..	....	....	....	..	....	....	....	.15	....	....	..	....	....	....	..	..	..	65
Afton	....	T		..	...	...	....		.27	.94		....	....	..		....	....	....	.30	T	....	..	..	....	..	..	..	..	1.51
Albia	....	T	.03	..	...		..	...	.15	T	.02	...	...	T	T		T	....	.50	.08	T	..	...	..	....	....	T	.05	.83
Algona	T	....	....	.10	....	....	..	....	...		1.00	..	.	.10	...	T	....	....	.20	.45	...	...	...	..	....	....	T	T	1.65
Alta (Hadden)	.05	..	..	.02	..	...	..	....	..	.43	20		...	T	T	.03	...	..	.50	.18	..	..	..	....	....	..	..	.04	.93
Amana		.04	....	.09	....	..	.	....	....	.26	T	...	....	T	T	T	..	..	.32	..	....	...	....	..	..	....	T	...	1.11
Ames (near)	T	....	.	.05	..	...	..	....	...	1 05	T	...	..	..	..	T	..		.15	..	..	..	....	..	....	..	....	..	1.42
Atlantic	...	..				..	.	....	....	.90	.05	..		....	..	....	....	..	..	..		..	.	..		..	..	..	1.10
Audubon	...	..	....	...	..	...		1.10		....		..		....	..	....	....	..	.40	.40	.10			..	..	....	....	.05	1.10
Belknap	...	.10	....	..	.10		...	...	.10	.50	.02	....	..		...	.		..	.10	.90	.10	.	.05	T	..	..	.	..	1.77
Belle Plaine	..	...	..	....	.10	..	....	....	....	..		....	....	05	T	....	..		.10	.90	.10	.	.05	T	..	..	.	..	1.30
Bonaparte	....	..	...	...	.	...	....	.25	....	....	..	....	....	....	....	...	05	..	.70	.	...		..		...	..	.	..	1.00
Burlington		....	...	...		...	....	...	.35	...	..	..				....	..	..	....	.80	..	...	...	..	....	...	..	.10	1.25
Carroll	T	....	....	T	..	...		..	..	.15	.25	...	...		T	T	...	....	.65	.05	...	....	....	..	....		..	..	1 10
Cedar Falls		...	....	.30	...	...	..	....	.40	...	T	..		T				..	...						....	..		...	.70
Cedar Rapids	T	....	..	10	....	...			2.50		T	....		.05	T	T	..	...	..	1.00	T	...	T	....	....	..	T	.	3 65
Chariton	...	....	..	.03	..	....	..	.03	.18	.28	02	..	....	....	T	.40	T	..	.23	.07	T	...	T	....	....	..	....	....	.84
Charles City	T	.05		.10	.10			...	T	1 00	.09		T	.30	T	.40	T	..	.40	.30	T		T	..	..	..	....	.05	2 79
Clarinda	..	.02	..	T		...	..	....	..	1 75	T		T	T	...			..	36	T		...	..	..	..	..	..	T	2.13
Clinton	..	.09		.11	....	....	....			47	.01	...	..	.11	.06		.15	..	.20	1.35	..	..	....	....	....	..	.02	..	2.37
College Springs	....	..	...	...	.	....			.11	.80			..	..	..	..	T	..		..	..	..	....	....	....		.	....	1.11
Corning		..	..	T		....			T	1.25	...	..	..	....	..	..		..		..	..	..	....	....	....		.	....	1 25
Council Bluffs	...	..	..		....	..	..	..	.02	.35		..	....	0	.		..	..			...	....			....		.03	..	.42
Cresco	.06	...	..	.11		..	..	...	..	.20	.03			.06	....	.09	...		.40	.04		...	..		....	....		..	1.02
Davenport	....	.04	...	.04	.06	.	...	...	.04	.29	T	T	T	T	08	.01	08	.06	92	.21	.01			T	....	....	T	.02	1.86
Decorah	....	..	....	...	..	22	...	..	.		.03	.	...	...			.12		.65	.27	..	..		....	....			....	1 29
Delaware	.07	..	..	18	..	...	....	..	.16		.02	..	...	.12	..	....	....		25	.14		...	..	....	....	....	10	..	1 04
Denison	..					...	...			T	T	...	..						10		....	....						...	.10
Des Moines	..	.01	....	.01	T			T	.05	.46	T	.	T	T	T	T	T	..	.24	01	..	..	T	....	....	..	T	01	.82
De Soto	T		....	.01	..	...	...	T	.02	.75	.20	...	....	....	T	T	.01	T	.45	T	..	T			....		T	..	1 44
Dows	.05	...	....	.05		..	..	..	...	.75	05	....		.05	T	T		..	.70	...	..		T	T		..	T		1 60
Dubuque	....	.13	...	T	.12	...	....	....	...	.20	T	.03	T	37	.01	.03	...	....	91	.18	01	..	T	T	....	..	T	.02	2.01
Eagle Grove	..	....		T		....	..			....	.30	....	..	....	..	..	....	..	60			....			....	..	....	....	.90
Eldora	....	....	20	...	.30	...	...	T	T	.50	.20	...	..	...	..	..	..	..	60	.20	..	...	10		....	..	....		2.10
Elkader	....	.07	..	.13	..			...	.20		T	....	...	.13		T	....	...	56		..	..	T	..	..	..	T		1.09
Estherville	T	..	..	T	..	....	....	T		.20	.10	...		.05	T	T	.	..	.20	.10	...	..	..	....	....	....	T	..	.65
Fayette		.09	...	..	.03	...	..	....		.28	..	03	..	.20		.50	..			1.40	..		..		....	....	.05	....	2.63
Forest City	T			T		....	....	....	....	.65	T	.10	..	.10	T	.10		..	.60	.	....	..	..	T	..	..	.10		1 65
Fredricksburg		..	.10	.05	.15	..	..	....	..	.25	.03			.16	..	.06	.01	..		.54	..		..		....	....	.04	....	1.42
Ft. Madison	.10	....	....	T	....	....	....	..	.45	....	..		..	....	.	..	T		1 10	20	..	..	....		....	....	.20	T	2 05
Galva	....	..	....	...	..	..	..	....		32	..	....	..			....				.12	..		....		....	....	....	..	.44
Glenwood	....		..	T	..		.	....	.75	T	.	....		T	.40			T	20	T							....	..	1.35
Grand Meadow	..	.15	..	.20	..	..	....			28	.05	..	..	.25		.10			..	.90	..		T	..	....	..	.02	T	1.95
Greenfield	.02	.		.01	...	...	...	...	.39	1.05	T	..	..	..	..	..	....	.22	.03	..	....		....		....	...	..	..	1.72
Grinnell		...	....	T	.05	...	...		.02	.30	T	T	..	..	..	..	....		.30	..	..		T	T		...	.08	...	.75
Grundy Center	T	..	..	T	.05	...	....	..	.02	.05	T	..	....	T	T	....	T	T	.05	.50	..	..	T	T	....	....	.10	..	77
Guthrie Center	T	....	....	T	..	..	.		T	.85	.		....	....	T	....	T	.01	.11	T					....	....	..	..	.97
Hampton	03	..	....	.01	....	..	..	..	..	.51	.03	...	02	.14	.02			.35	43	...	.	..			..	....	.02	....	1 56
Hawkeye	...	...	...	.30	..		....	..	..	....	.10	..	..	....	....	..	..	..	..	1.00		..	..		..	..	.10	.20	1.70
Hedrick	..	..	..	..	..			....	..	....	..	..	..	....	....	..	....	..	60	..					..	..	T	..	.60
Hopeville	....	..	..	.01		..	..	....	.35	.57	T	..		T	..	..	..	..	23	T	....				....	..	....	....	1 16
Humboldt	....	T	..		T	...	..	....	T	.42	.07	..	..	....	..	..	....	....	20	..					....	..	....	T	69
Independence	..	T	..	22	..	..	....	....	.02	....	04	..	...	.20	..	.07	.	.10	.69	..	..	....	T			....	T	....	1.34
Indianola		..	..	T	.02	....	..	..	.12	...	T	..	..	T	..	..	..	..	.40	T	..	....			....	....	....	T	.54
Iowa City	....	...	..	.14	..			....	.03		T	...	.	..	T		...			.98	...	..	T				....	....	1.15
Iowa Falls	.15		..	15		...	...	...	..	.40	.15	...	...	.30	.02	T		.12	1 00	..	...	..	T		...	....	....	....	2.17
Keokuk	....	.04		T	..	..	..	...	.36	.03	02	T		T			T	T	.49	.06	T	....	....		....	....	..	.04	1.16
Keosauqua	.	.06	..	....	....		..	..	55	.13	T	..	.	..	T		T	..	.50	.22	T					....	..	T	1.46
Lamoni		..	...	..	....	.	..	..	.60	.27			T			T		..	.05	T						....	..	....	.92
Lansing	T	....	..		26		..		..	..	....	T	...	.34	T	T	...	....	.55	.55	T		T	T	....	....	..	..	1.70
Larchwood	..	..	..			..	..	..		40	.					T			T	..	....	..	..	....		....	..	....	.40
Larrabee	...	.10		.02		...	..	..	..	.55	..			T	T	05	....		.22	...	....		..		....	....	..	..	.94
Le Mars		....	..	.	..	.	..	..	..	.38	..		...				....	..	.07	..	..		..		....	..	..	..	.45
Lenox		....	..	.01	..	....	....	.	.20	1.03	T	..	..	T	..	..			30	..	....		..		....	..	....	..	1.54
Linn Grove (Mt. Vernon)	.04	..	...	20	....	....	..	....		22	.02	....	..	.08	..	..			..	.80	..	T	T			..	.10	....	1.46
Logan	...	.		....	....	.	..	..	....	....	.40		..				..	..	.20	.20	..	..	..	..			..	....	.80
Malvern	...		..	....	....		..	..	.30	.72	.01				T	....	..	..	28		....	....	....	..	..	....	....	....	1 31
Maquoketa	..		...		.08	...				.38	....	..	...	16		..	..	..	.20	.08	..	..	....		..	....	....	....	.90
Marshalltown	..	.03	...	.02	.01	..	...	..	..	.17	03		...	06		....	..	..	.22	05	..	..	.01	T	T	....	.02	....	.62
Mason City		10	..	..			...	....	....	.35	..	T		....	..	T				.50	T		..	....	..	....	..	....	.95
Mooar	..	..	..	..		..	...	..	.43	..		..	..	..	....		T	..	34	.35	..	..	....	....	..	....	..	....	1.12
Monticello	....	T	..	..	.15	....	...	..	..	.16	..	T	..	..	....	T	....	....		.66	..	..	....	....	..	....	..	T	.97
Mt. Ayr	..	T	..	T	T	..			.40	.78	....	..	..		.03		..	..		20	T	..	....	....	..	....	..	..	1.41
Mt. Pleasant	....	..	..	.	..	..	....			.32		..					.15		.30	....	....	..	....	..	....	....	....	..	.77
New Hampton	....	....	..	..	.20	...							..	.20	....	.20	....	..	1.00	....	..	....	....	..	....	....	....	....	1.60
Newton	....	.	.	.03	...	..	..	....	.41	.	T	..	....	....	..	....	....	....	.28	.08	...	....	T	....	....	....	.05	...	.85
Northwood	....	....	....	...	....	....	....	....	75	.10	....	....	....	.20	....	.30	....	..	.60	....	....	....	....	..	....	....	....	....	1.95
Odebolt	....	....	....	T	....	....	....	....	....	.50	.15	....	....	....	....	....	....	....	.30	..	....	....	....	....	....	....	....	....	.95
Ogden	....	.03	....	..	.01	....	....	....	....	.75	.04	....	..	....	....	.02	....	....	.16	....	....	....	....	....	....	....	....	....	1.01
Omaha (Neb.)	...	02	....	T	....	..	....	....	07	.28	01	...	....	07	T	..	T	.02	18	.02	....	....	....	T	....	....	....	.05	.67
Osage	.10	....	....	.08	....		....	....	....	.32	T	....	....	.20	T	.15	....	....	.80	.05	....	....	....		....	....	....	....	1.75
Osceola	...	....	....	T	....	....	....	....	.35	.38	T	...	....	....	....	....	....	....	35	.10	....	....	....	....	....	....	....	.02	1.18
Oskaloosa	....	....	....	T	....	....	....	....	.20	....	T	....	....	....	....	....	....	.40	05	....	....	....	....	....	....	....	....	.05	.67
Ottumwa	....	.10	....	....	....	....	....	....	T	..	..	....	....	....	....	....	....	T	.40	.10	....	....	....	....	....	....	....	....	.65
Ovid	....	T	....	.02	....	....	....	....	.37	20	....	....	....	....	....	....	....	T	.46	.20	....	....	....	....	....	....	....	....	1.25
Plover	....	....	....	T	....	....	....	....	..	.10	20	....	....	T	..	T	....	..	.30	T	....	....	....	....	....	....	T	....	.60
Portsmouth	....	....	....	T	....	....	....	....	T	.45	.06	....	....	T	T	..	....	T	.40	....	....	....	....	....	....	....	....	....	.91
Primghar	....	.02	....	T	....	....	....	....	..	.15	.05	....	....	T	..	T	..	....	10	....	....	....	....	....	....	....	....	....	.32
Red Oak	....	....	....	....	....	....	....	....	.24	1.10	....	..	....	T	T	....	T	....	.15	T	....	....	....	....	....	....	....	....	1.49
Rockwell City	....	....	....	....	....	....	....	....	....	.37	.07	....	....	....	....	....	....	....	.10	....	....	....	....	....	....	....	....	....	.54
Ruthven	....	T	....	....	T	....	....	....	....	.10	.30	....	.05	....	T	T	....	....	.30	.10	....	....	....	....	....	....	....	....	.85
Sac City	.02	....	....	....	....	....	....	....	....	.50	.20	....	....	....	....	.10	....	....	.30	....	....	....	....	....	....	....	....	....	1.12
Sibley	....	....	....	T	....	....	....	....	....	.52	....	....	....	....	T	T	T	....	.05	....	....	....	....	....	....	....	....	....	.57
Sidney	.01	....	....	T	....	....	....	....	.34	.85	.40	....	....	.38	....	..	....	....	.35	.05	....	....	....	....	....	....	....	T	2 38
Sigourney	....	T	....	.03	....	....	....	....	T	.33	T	....	....	T	T	T	....	....	....	70	....	....	....	....	....	....	....	....	1.06
Sioux City	....	.02	....	T	....	....	....	....	....	.25	T	....	....	T	T	T	....	....	.10	T	....	....	....	....	....	....	....	T	.37
Spencer	T	.01	....	T	....	....	....	....	....	35	.27	....	....	T	T	....	....	04	....	....	....	....	....	....	....	....	....	....	.67
Stuart	....	....	....	....	....	.10	....	....	T	T	....	....	....	....	....	....	....	....	.30	....	....	....	....	....	....	....	....	....	.40
Tara	....	....	....	.50	....	....	....	....	....	.20	.20	....	....	....	....	....	....	....	.40	....	....	....	....	....	....	....	....	....	1.30
Toledo	....	....	....	.10	....	....	....	....	....	.15	....	....	....	.10	....	....	....	....	....	.42	....	....	....	....	....	....	....	.05	82
Thurman	....	.04	....	T	....	....	....	....	.30	.70	.03	....	....	.08	T	....	.17	.03	T	T	....	....	....	....	....	....	....	....	1 35
Villisca	....	T	....	T	....	....	....	....	1.59	.01	.01	....	....	.03	....	....	....	....	.28	....	....	....	....	....	....	....	....	....	1.92
Vinton	.10	T	....	30	....	....	....	....	....	.20	....	....	....	.20	....	....	....	....	....	.80	....	....	.05	....	....	....	T	....	1.65
Washington	.02	....	....	....	.08	....	....	....	....	.26	....	....	....	T	T	T	....	....	.70	....	....	....	....	....	....	....	....	04	1.10
Washta	....	....	....	....	....	....	....	....	....	.70	....	....	....	.11	....	....	....	....	15	....	....	....	....	....	....	....	....	....	.85
Waterloo	....	T	....	.13	.13	....	....	..	....	.27	.02	....	....	.15	....	.05	....	....	.35	.18	T	....	T	....	....	....	T	T	1 19
Waverly	....	.05	....	.13	.02	....	....	....	....	.24	.07	....	....	....	....	....	....	....	.04	.10	T	....	....	....	....	....	.05	.03	1 30
Webster City	....	....	....	T	T	....	....	....	....	60	.08	....	....	T	....	....	....	....	.28	.08	....	....	T	....	....	....	T	....	1 04
West Bend	.10	....	....	T	....	....	....	....	....	.50	....	....	....	T	....	....	....	....	....	.80	....	....	T	....	....	....	T	....	1.40
West Branch	....	T	....	T	....	....	....	....	T	.52	....	....	....	T	T	..	T	....	.46	.49	T	....	....	T	....	....	....	T	1.47
Whitten	....	....	....	T	....	....	....	....	T	....	T	....	....	T	....	T	....	....	.20	....	.20	....	....	....	....	....	T	....	.40
Wilton Junction	....	....	....	....	....	....	....	....	.48	....	T	....	....	....	....	....	....	....	....	.83	....	....	T	T	....	....	....	....	1.31
Winterset	....	....	....	T	T	....	....	....	....	.93	.20	....	..	..	..	T	....	....	.04	....	....	....	....	....	....	....	....	....	1.17

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR FEBRUARY, 1898.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Means.
Afton	Max.	31	20	32	38	31	40	45	42	37	41	32	41	36	45	41	45	40	21	30	25	28	40	37	32	35	43	47	43	36.4
	Min	-3	-6	-4	21	10	15	27	25	28	29	19	17	29	22	23	22	18	5	21	15	8	12	24	17	10	23	18	24	16.8
Albia	Max	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
	Min	-7	-7	-5	24	14	16	34	33	34	34	24	18	32	24	23	21	26	18	25	18	9	10	24	16	10	18	18	25	18.9
Alta	Max.	22	0	30	34	25	38	37	39	36	30	28	38	30	42	25	36	20	17	26	22	29	34	28	24	28	34	38	39	29.6
	Min	-2	-11	-4	22	3	18	24	25	26	17	17	12	24	22	18	10	12	-2	13	14	4	10	14	8	4	13	18	18	12.5
Amana	Max	12	13	24	37	32	36	41	42	39	48	38	34	38	41	37	34	42	27	30	26	26	31	29	24	25	32	35	35	32.5
	Min	-15	-6	-8	11	12	5	23	20	27	35	25	22	25	23	20	15	21	7	25	20	14	2	17	12	5	13	13	20	14.4
Ames	Max	14	2	32	37	27	37	40	43	33	41	30	41	35	44	28	37	35	22	27	21	24	36	30	23	25	32	39	40	31.2
	Min	-10	-9	-4	9	9	15	23	23	28	28	21	13	27	25	21	15	15	1	21	14	7	7	15	12	6	18	20	24	14.1
Atlantic	Max	18	5	33	37	30	40	45	48	36	32	28	40	34	46	29	45	30	21	36	26	30	39	36	30	32	48	46	43	34.4
	Min	-8	-5	1	25	11	20	27	22	24	21	20	9	27	23	24	24	18	6	19	17	9	8	22	17	9	22	18	22	16.1
Audubon	Max	28	9	33	38	28	33	42	43	34	32	34	37	35	47	33	40	35	19	28	23	27	37	33	38	32	42	43	40	33.7
	Min	10	-9	-4	15	15	19	25	21	21	19	21	9	23	22	20	20	10	1	15	15	7	7	18	13	5	19	17	21	14.1
Belknap	Max	19	0	25	40	20	40	44	50	43	50	32	44	40	43	43	43	48	32	34	30	24	34	37	30	33	35	38	42	35.8
	Min	-6	-4	-7	15	14	12	20	32	38	36	25	19	19	25	24	24	32	11	14	19	13	11	22	18	11	14	18	22	17.5
Belle Pl'ne.	Max	19	0	20	40	34	37	42	47	42	44	32	31	33	40	28	32	45	25	30	30	31	31	30	24	28	32	40	42	32.5
	Min	-15	-10	12	9	10	5	21	20	26	34	20	15	15	20	16	10	20	1	16	10	12	1	13	10	-1	10	15	20	11.1
Bonaparte	Max	13	18	28	37	31	39	43	56	43	51	33	43	46	44	32	43	51	31	33	25	24	34	35	29	26	31	37	31	35.2
	Min	-11	-8	-7	8	14	10	30	36	36	36	26	19	28	25	24	23	25	13	25	19	15	6	21	17	9	14	18	26	17.8
Burlington	Max	14	11	29	39	37	39	44	55	47	53	54	55	50	40	40	41	53	33	34	32	27	35	35	34	26	32	39	36	38.2
	Min	-7	-3	-5	19	20	14	31	40	35	39	34	25	30	26	23	23	29	16	28	22	18	10	24	17	16	16	19	27	20.9
Carroll	Max	20	12	32	36	28	38	44	41	35	30	28	41	32	45	28	41	25	20	22	20	18	40	31	25	28	38	41	42	31.5
	Min	-9	-10	-4	20	4	17	22	19	21	20	18	9	24	22	20	15	15	-2	15	12	5	2	0	-5	15	4	15	18	10.8
CedarFalls	Max	11	14	29	34	28	25	41	44	35	40	32	49	35	45	29	27	35	24	25	25	32	33	29	21	25	35	32	35	30.7
	Min	-11	-9	12	20	10	10	19	30	35	32	22	11	26	27	17	10	15	0	20	16	8	7	15	8	3	15	15	25	14.6
Cedar Rap.	Max	13	18	25	38	32	37	43	43	41	50	37	35	39	42	34	32	44	28	30	29	26	30	30	21	21	30	33	32	32.6
	Min	-12	-6	-7	6	5	5	24	20	27	32	24	22	23	25	19	12	18	6	23	16	13	1	14	10	3	7	11	20	12.9
Charlton	Max	19	19	27	38	31	38	43	45	38	49	34	39	41	45	38	45	45	26	33	25	25	34	37	32	31	35	44	36	35.4
	Min	-5	-4	-5	22	14	16	32	30	30	32	25	19	29	26	25	25	23	9	25	19	10	12	25	18	13	23	21	26	19.2
Charles Cy.	Max	12	14	26	34	24	36	37	42	36	40	40	35	34	38	28	24	31	20	25	24	32	30	32	20	23	28	31	34	29.6
	Min	-14	-10	-6	11	9	11	23	22	30	31	21	11	22	21	13	6	14	-4	12	14	7	-1	12	7	1	14	19	25	11.5
Clarinda	Max	26	20	36	43	33	44	48	46	36	34	38	46	39	48	36	50	43	26	31	28	32	41	42	37	37	47	52	45	38.8
	Min	-5	-3	3	25	26	22	33	30	31	25	25	22	27	27	28	30	15	10	24	19	12	14	28	23	17	28	25	26	21.0
Clinton	Max	11	12	23	39	32	38	43	47	42	55	38	35	45	40	35	30	43	33	33	34	29	36	28	21	24	31	35	37	34.0
	Min	-7	-7	-8	5	14	10	22	35	35	37	29	27	25	24	19	12	30	20	28	21	19	11	12	9	0	8	15	26	16.8
College Sps.	Max	23	26	36	39	31	40	44	43	37	36	33	41	37	47	38	51	46	27	32	25	31	40	44	37	38	45	50	44	37.8
	Min	-4	-4	-2	26	10	17	30	27	29	23	27	20	30	24	26	21	20	10	20	17	9	12	25	20	14	25	22	22	18.4
Corning	Max	17	22	35	40	33	41	42	46	46	36	34	46	39	46	43	47	44	25	31	27	34	44	41	36	34	45	51	41	38.1
	Min	-7	-4	1	24	12	20	31	26	28	30	21	16	31	24	24	26	19	17	21	16	11	10	25	18	13	25	21	25	18.7
C'cil Bluffs.	Max	27	20	43	40	34	45	50	51	30	27	35	35	38	50	33	46	26	..	..	..	..	..	..	40	37	50	51	48	38.9
	Min	7	-1	6	22	14	24	32	27	29	19	22	24	27	27	26	27	12	16	16	19	10	16	26	20	14	25	25	22	19.8
Cresco	Max	12	-2	25	32	26	36	39	45	37	38	32	37	33	31	24	22	31	19	23	22	28	30	20	15	21	33	34	36	28.2
	Min	-15	-11	-4	10	9	24	30	27	31	32	22	12	22	22	4	1	8	-3	17	15	11	4	10	4	-1	9	18	9	11.3
Davenport.	Max	10	13	25	39	28	36	44	50	45	57	37	38	45	40	30	32	50	32	34	25	26	29	28	20	21	29	37	31	33.2
	Min	-6	-3	-4	20	16	14	32	40	37	37	27	27	30	27	23	17	30	19	28	22	20	12	20	13	6	14	16	24	19.9
Decorah	Max	15	-2	25	32	20	35	42	44	38	43	38	39	31	28	24	27	34	25	24	23	28	31	25	15	34	33	36	37	29.5
	Min	-12	-10	-3	9	10	15	20	22	32	32	24	20	22	22	15	5	12	-1	12	13	12	0	10	5	7	8	16	17	11.9
Denison	Max	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
	Min	-7	-6	7	10	7	4	6	7	8	9	6	5	11	16	15	7	12	8	12	1	1	8	18	16	17	11	16	19	8.7
Des Moines.	Max	16	18	31	38	27	38	43	46	38	45	32	43	39	48	32	42	41	29	31	24	28	40	36	26	30	36	43	40	35.0
	Min	-7	-7	-3	23	13	17	28	25	32	25	23	19	29	26	24	19	13	8	22	18	11	10	23	17	11	22	23	26	17.5
De Soto	Max	18	4	31	40	30	40	46	52	36	41	40	41	39	48	34	43	34	24	31	24	25	40	37	30	31	39	43	45	35.2
	Min	-10	-7	-3	24	12	19	24	22	30	29	23	14	22	25	22	21	17	4	21	12	7	6	22	17	9	22	23	16	15.8
Dows	Max	12	18	27	36	26	35	38	42	33	36	34	36	35	41	35	31	36	20	25	23	25	31	29	23	22	31	32	34	30.3
	Min	-17	-13	-7	12	5	13	21	18	26	25	18	4	25	19	15	9	12	-2	17	13	6	1	12	7	1	14	21	21	10.6
Dubuque	Max	10	14	22	36	35	34	42	44	43	50	37	37	41	33	28	28	45	30	29	27	30	30	27	16	25	27	33	31	31.6
	Min	-4	-4	-4	10	13	12	26	33	33	36	26	28	25	24	16	10	23	12	26	21	19	9	15	10	6	9	17	19	16.6
Eldora	Max	28	26	30	32	45	38	34	35	36	40	38	44	35	28	30	29	32	25	27	24	32	34	25	34	24	28	32	40	32.3
	Min	-16	-13	17	24	20	21	20	22	24	21	15	4	14	18	10	15	17	-2	15	13	12	5	14	18	5	2	13	20	12.4
Elkader	Max	17	4	27	36	37	37	45	45	41	46	30	43	38	33	32	27	42	30	29	26	34	37	26	19	32	35	37	35	32.9
	Min	-13	-6	-4	2	13	7	15	18	31	34	24	23	24	24	10	5	20	4	23	19	17	0	14	8	0	8	11	21	12.6
Estherville	Max	21	18	34	35	34	40	41	46	38	27	29	42	33	43	28	32	31	14	26	21	30	43	34	21	27	32	35	40	32.2
	Min	-10	-15	-1	10	4	17	20	18	19	12	16	5	21	20	10	2	7	-8	11	11	2	..	9	3	0	9	15	13	8.1
Fayette	Max	10	10	25	35	28	35	41	46	42	43	35	38	35	37	29	28	42	26	27	27	30	31	27	17	24	35	36	34	31.2
	Min	-16	-9	-5	10	10	12	20	22	22	32	22	18	22	23	12	7	15	1	20	16	16	-1	15	7	0	9	10	18	11.7
Forest City.	Max	22	14	27	32	23	35	38	45	36	37	37	37	33	39	28	25	23	27	23	22	24	32	28	19	23	34	29	33	29.5
	Min	-2	-14	-5	6	5	9	22	21	22	21	21	5	23	21	10	-3	10	-6	9	10	5	7	9	3	1	10	17	22	9.3
Galva	Max	23	3	34	37	28	39	41	40	34	28	28	41	35	43	33	38	36	16	26	24	30	38	31	26	31	35	36	42	32.0
	Min	3	-9	-2	24	5	21	26	18	22	19	18	12	25	25	18	13	13	0	13	16	3	5	15	10	5	14	18	13	13.1
Glenwood	Max	35	25	38	40	33	43	45	48	42	32	35	48	41	51	42	50	48	34	30	28	31	44	43	38	37	50	49	47	40.2
	Min	-2	-3	3	30	14	24	31	28	30	21	30	22	31	27	28	28	17	9	20	18	9	15	26	21	14	26	24	24	20.1
Greenfield	Max	24	15	36	40	30	45	45	48	37	38	33	42	35	45	35	45	40	25	30	25	28	41	37	30	35	44	47	44	38.8
	Min	-4	-8	-2	24	8	19	29	27	26	24	20	13	25	23	23	20	13	3	20	15	8	9	22	15	7	21	18	25	15.8
Grinnell	Max	12	16	24	34	33	36	39	42	41	44	41	39	39	42	43	35	40	23	30	23	24	31	30	31	28	38	33	34	33.1
	Min	-6	-9	6	17	10	12	26	26	30	32	25	15	29	24	20	14	18	5	20	15	9	9	18	13	6	18	20	25	15.5
Grundy C'r.	Max	14	0	28	34	25	36	43	42	35	41	30	38	35	44	28	31	21	23	26	23	28	32	29	19	25	33	34	35	29.7
	Min	-14	-11	6	11	8	12	21	21	30	28	20	9	24	22	11	10	10	0	20	14	7	7	14	9	3	15	21	24	12.6
Guthrie C'r.	Max	19	21	32	39	32	41	43	45	34	33	34	40	37	45	40	43	37	21	30	25	26	38	34	29	32	40	45	41	34.9
	Min	-5	-7	-3	23	9	19	25	23	23	30	30	14	28	25	22	21	18	3	21	15	1	5	20	14	7	20	16	24	15.7
Hampton	Max	13	0	26	34	25	36	39	41	35	35	28	37	34	41	24	29	29	22	27	22	27	30	25	15	23	32	32	34	28.4
	Min	-8	-12	-4	13	8	15	21	21	28	28	18	11	22	22	13	9	8	-2	18	15	9	7	13	7	3	13	22	25	12.2
Hopeville	Max	16	20	30	37	31	39	42	41	37	44	32	39	37	44	35	46	41	25	29	23	27	38	37	33	33	40	48	45	35.3
	Min	-6	-6	-5	20	10	14	29	27	29	26	21	16	26	23	23	23	17	6	21	17	8	12	24	18	11	24	20	24	16.9
Humboldt	Max	17	16	29	37	27	38	38	40	35	35	36	38	..	..	..	36	33	19	28	23	28	34	33	24	24	33	37	35	30.9
	Min	-13	-12	-5	16	3	32	22	18	23	20	18	0	26	22	16	10	14	-3	18	15	14	0	13	8	2	11	18	23	11.8
Independ'c.	Max	8	0	22	34	34	34	37	39	38	42	30	31	36	39	38	24	39	25	26	25	27	31	29	18	24	31	32	31	29.5
	Min	-11	-11	-9	6	9	4	17	23	27	31	22	15	23	25	17	9	20	2	21	17	12	7	13	8	2	10	15	18	12.2
Indianola	Max	14	19	32	36	20	38	42	42	35	45	32	43	38	46	30	43	43	25	30	25	25	37	35	32	30	35	45	40	34.2
	Min	-6*	-7	-5	23	12	16	32	27	30	22	22	18	31	24	22	20	19	5	23	17	9	9	22	16	9	22	19	23	16.9
*Iowa City.	Max	12	13	27	39	33	40	43	43	40	51	46	37	40	45	38	35	47	37	31	27	25	30	29	24	22	33	37	36	34.3
	Min	-12	-5	-9	7	13	7	24	29	30	35	25	23	29	25	21	26	25	9	26	20	11	3	19	14	4	10	12	22	15.8
Iowa Falls.	Max	14	3	26	35	26	36	43	40	36	40	32	36	34	40	29	32	33	22	28	24	28	30	28	19	25	34	36	35	30.1
	Min	-18	-11	-6	8	6	12	22	20	29	29	19	4	23	21	13	10	8	-1	18	13	7	0	13	7	2	15	20	23	10.9
Keokuk	Max	16	14	32	46	29	43	46	59	48	61	55	45	50	43	40	44	57	32	36	25	24	34	38	32	29	36	43	32	38.9
	Min	-4	-3	-3	25	20	19	35	41	40	44	28	23	33	36	26	26	29	17	29	22	18	16	25	20	12	20	24	28	23.9
Keosauqua.	Max	17	19	30	32	31	39	42	62	42	46	40	46	44	44	44	48	31	..	35	26	24	38	..	..	32	31	43	33	36.1
	Min	-5	3	-5	11	18	12	31	32	35	35	26	20	29	26	24	25	13	..	24	21	18	11	..	..	10	18	20	23	18.9
Lamoni	Max	15	25	31	38	32	38	45	45	40	46	34	42	38	46	42	47	43	26	30	25	28	39	40	34	35	42	50	41	37.6
	Min	-7	-5	-5	17	10	14	31	28	33	28	23	17	27	21	25	23	20	8	23	8	10	13	27	20	12	26	21	26	17.0
Lansing	Max	17	13	25	35	37	38	44	44	40	43	45	40	43	33	31	25	35	28	28	27	36	35	25	20	29	35	38	35	33.6
	Min	-9	-3	-3	7	17	10	18	22	34	33	25	24	27	23	19	5	10	6	18	19	18	5	13	8	4	3	12	15	13.0
Larrabee	Max	27	14	26	28	27	42	47	41	34	25	38	38	34	42	30	37	34	17	28	23	32	36	29	24	34	36	37	38	32.6
	Min	11	-12	0	10	2	14	23	19	24	15	17	10	23	23	17	9	8	-3	14	14	3	6	14	6	2	13	15	16	11.1
Le Mars	Max	27	26	33	35	27	40	38	40	35	27	28	41	37	43	35	40	30	19	29	28	29	37	30	27	29	37	37	41	33.2
	Min	-8	-8	0	23	5	25	20	18	25	17	16	7	25	25	20	12	10	1	16	15	4	10	10	10	5	16	17	19	12.0

*Veblen.

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DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR FEBRUARY, 1898—CONTINUED.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Means.
Logan	Max	25	36	39	40	35	44	46	49	32	30	36	41	46	50	39	45	25	22	21	27	24	43	37	33	27	47	46	45	37.0
	Min	-6	-5	5	12	9	23	25	23	26	21	20	18	22	24	26	26	17	8	4	10	5	10	20	24	15	20	20	20	15.8
†Linn Grove	Max	14	0	24	38	23	37	43	44	41	47	30	34	35	42	31	29	43	30	29	25	27	32	27	18	22	32	35	37	31.0
	Min	-12	-5	-6	10	14	9	25	30	30	34	24	21	26	24	17	12	20	9	25	20	17	7	17	10	9	9	15	20	15 5
Lenox	Max	..	..	..	..	..	..	..	..	..	38	33	41	36	44	40	46	40	25	28	24	29	38	39	34	34	43	48	43	37.0
	Min	..	..	..	..	..	..	..	..	..	25	21	17	32	22	24	25	19	6	20	15	7	10	25	17	11	26	21	24	19 3
Maquoketa	Max	5	0	22	37	34	36	42	45	41	49	45	35	44	38	40	35	45	37	33	30	28	37	23	22	23	35	34	39	33.4
	Min	-10	-3	-5	0	18	4	9	30	32	35	20	18	21	22	19	11	25	5	24	19	18	9	12	15	3	5	11	21	13.9
Marshallt'n	Max	13	14	31	36	29	39	40	45	36	44	37	41	37	46	37	35	38	24	28	24	28	35	29	24	27	34	35	37	34.4
	Min	-10	-10	4	16	10	15	23	22	30	33	22	12	25	25	20	14	18	3	22	17	9	6	17	12	5	19	23	28	15 2
Mason City	Max	15	15	26	35	29	36	37	41	39	37	29	36	..	39	24	25	28	29	27	24	26	30	29	20	21	35	36	38	29.8
	Min	13	-15	-3	12	4	14	19	20	26	26	22	8	..	22	11	5	12	6	8	1	12	4	10	4	0	12	24	22	11.1
Mooar	Max	14	0	31	44	31	41	48	59	44	60	34	46	40	43	34	46	53	30	35	25	24	36	38	32	28	37	44	32	36.8
	Min	-6	-4	5	20	20	20	20	40	35	42	28	20	29	23	25	21	33	16	28	16	18	14	19	20	12	18	20	26	20.6
Monticello	Max	13	5	24	39	30	38	43	44	45	46	35	34	40	40	32	24	45	42	30	29	30	34	27	20	33	36	36	..	33.1
	Min	-13	-4	-5	9	10	5	19	22	20	35	23	25	26	25	18	12	25	23	20	20	12	2	2	2	9	12	18	..	13 6
Mt. Ayr	Max	17	21	32	37	32	39	45	42	38	44	33	43	37	47	42	49	44	26	27	25	29	40	40	34	36	44	50	44	37 0
	Min	-2	-5	-7	21	10	15	30	26	32	26	21	17	30	20	24	24	20	7	21	15	8	13	25	18	12	26	21	24	17.6
Newton	Max	14	17	29	36	28	38	42	41	38	45	31	39	37	46	35	38	40	25	30	25	27	34	32	26	28	33	38	36	33 1
	Min	-9	-10	-6	19	11	13	22	27	31	30	23	15	26	26	21	17	17	4	22	17	9	10	19	14	8	21	21	26	15.9
N. Hampton	Max	11	12	30	32	35	35	42	54	40	43	41	42	39	35	36	32	35	28	26	31	44	45	29	22	35	37	35	40	34.5
	Min	-9	-8	-8	12	11	13	23	26	32	33	22	22	24	23	15	9	16	0	21	18	9	20	13	7	3	13	20	21	14.3
Northwood	Max	14	14	27	35	25	37	39	42	37	39	35	37	33	34	24	26	29	21	24	20	26	31	28	16	21	34	32	36	29.1
	Min	-10	-13	-3	11	6	15	20	22	25	26	21	8	24	22	7	2	4	-6	15	12	8	7	10	4	1	16	20	23	10.6
Odebolt	Max	20	22	35	36	38	39	40	41	34	30	28	41	36	39	34	39	36	17	26	23	28	39	33	31	31	38	38	42	33.4
	Min	-8	-9	0	23	0	20	25	20	23	20	17	8	26	25	20	15	16	1	15	15	4	5	12	10	4	14	16	20	12.8
Ogden	Max	16	15	31	36	28	37	40	44	40	36	34	39	35	42	31	18	15	16	0	20	15	16	5	15	10	1	17	19	32.5
	Min	-13	-11	-7	18	4	15	24	23	26	25	20	8	28	21	18	15	16	0	20	15	16	5	15	10	1	17	19	24	13.1
Omaha, Neb	Max	27	24	43	41	31	43	44	50	38	28	34	46	41	52	35	48	47	21	29	27	32	44	42	35	34	49	49	45	38.5
	Min	8	-2	11	23	15	26	33	30	28	19	23	26	30	30	27	28	16	9	20	18	12	20	27	21	18	28	28	25	21 3
Osceola	Max	15	3	30	36	27	39	43	39	36	47	34	42	39	45	33	46	42	26	31	25	24	37	37	32	34	37	47	41	31.5
	Min	-5	-7	-6	24	10	16	31	27	29	28	22	17	29	24	23	22	19	6	22	17	7	10	25	17	10	20	19	24	17.1
Oskaloosa	Max	18	13	29	39	28	43	48	47	39	51	31	42	40	47	36	45	46	25	31	23	24	35	35	27	31	37	42	37	35.3
	Min	-14	-8	-7	19	11	12	29	25	28	31	23	15	26	24	21	20	20	6	21	17	11	3	21	15	7	18	15	25	15.5
Ottumwa	Max	17	6	30	40	27	39	44	50	43	55	33	44	39	47	34	44	42	33	32	24	23	34	36	33	27	33	40	34	35.1
	Min	-7	-2	-3	18	3	8	15	21	28	27	24	19	25	25	22	21	24	9	15	15	10	12	15	10	17	19	21	15.2
Ovid	Max	14	4	31	37	31	38	42	50	38	51	32	44	40	45	32	46	43	32	33	23	15	28	39	37	33	35	37	47	40	35.8
	Min	-9	-7	-8	20	10	13	32	29	31	29	22	13	23	22	23	22	17	7	21	17	6	8	22	17	9	22	19	24	16.3
Plover	Max	24	5	29	36	22	37	38	40	35	34	33	34	32	44	22	34	22	20	24	20	21	28	24	18	28	34	36	38	29.1
	Min	-10	-13	-3	15	5	25	24	20	23	22	20	5	22	19	12	8	22	-4	20	14	5	5	13	7	3	13	19	29	12.4
Portsmouth	Max	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
	Min	-11	-6	-3	20	1	20	21	22	26	15	15	7	23	21	20	20	13	4	16	..	15	7	19	12	6	19	16	14	13.4
Primghar	Max	21	21	30	32	26	36	38	41	38	26	27	38	37	40	32	35	35	16	27	23	32	35	35	26	29	36	35	38	31.6
	Min	-4	-11	-3	22	3	19	21	21	25	16	17	14	28	23	16	13	8	-3	13	13	4	12	9	4	5	15	20	17	12 0
Red Oak	Max	35	25	35	41	34	41	44	47	40	36	38	42	38	46	43	48	45	25	32	28	31	40	41	38	36	46	49	43	38 8
	Min	-7	-3	0	26	11	20	30	26	28	25	20	17	30	23	26	27	19	9	21	18	9	12	26	19	11	23	20	21	18 1
Rockwell C.	Max	19	4	29	39	25	39	40	44	34	32	31	36	42	44	30	31	32	18	28	21	22	34	27	28	25	35	38	36	30.8
	Min	-11	-11	-5	18	1	18	22	19	22	20	17	8	24	20	11	11	10	-3	11	7	3	6	13	7	1	12	16	21	.. 2
Ruthven	Max	20	21	27	32	28	35	36	39	41	39	29	35	39	37	39	27	33	19	24	26	24	32	36	28	23	29	36	39	30.9
	Min	-1	-13	-1	15	2	18	22	20	25	16	12	7	21	23	14	5	11	10	11	13	3	7	12	5	4	13	..	15	10.7
Sac City	Max	20	2	30	28	25	38	41	40	38	28	33	36	33	42	32	37	32	20	26	21	26	30	28	20	28	32	38	38	29.7
	Min	-6	-10	-4	2	5	25	32	30	29	28	12	15	25	22	28	24	18	-1	11	15	3	21	15	12	9	14	11	19	14.1
Sibley	Max	20	21	34	31	28	39	45	46	36	26	28	42	35	39	30	35	34	14	26	..	36	37	38	23	29	35	..	43	32.7
	Min	-6	-12	-2	20	3	20	24	24	20	23	14	16	5	22	22	13	4	7	-5	12	..	0	8	11	4	2	15	..	14	9.8
Sidney	Max	23	8	38	41	32	41	43	46	36	32	35	45	35	49	32	50	23	24	29	25	29	41	45	36	35	45	49	45	36 1
	Min	0	-4	2	28	15	32	22	30	32	29	22	30	34	27	30	28	21	11	21	19	11	16	19	24	18	26	26	25	21.2
Sigourney	Max	24	14	27	40	24	41	46	48	41	52	48	40	40	46	40	41	45	31	34	27	26	33	33	28	27	37	35	40	36.0
	Min	-10	-8	-7	9	11	10	27	29	33	34	28	15	28	25	21	19	23	7	25	19	12	5	12	14	5	13	15	27	15 8
Sioux City	Max	30	18	38	38	31	43	40	43	34	25	28	44	37	47	29	43	19	21	28	28	31	39	34	29	30	40	40	45	34 0
	Min	1	-5	-7	12	10	9	28	22	22	18	16	12	16	27	26	19	18	2	26	30	31	36	33	22	25	27	33	..	32	31.2
Spencer	Max	20	19	31	33	27	38	38	41	35	30	29	39	32	42	30	30	32	26	30	31	36	33	22	25	27	33	..	32	31.2
	Min	-7	-13	-1	16	3	17	21	19	17	15	20	3	14	20	14	6	9	-4	12	6	-1	12	6	12	3	12	..	16	9.1
Stuart	Max	15	20	30	33	30	38	42	43	42	33	32	41	46	44	41	38	39	22	29	20	25	38	38	32	31	38	45	41	34.5
	Min	4	-11	-4	19	10	18	27	27	27	26	21	17	24	22	22	9	18	3	18	10	7	10	18	12	9	19	18	23	15.1
Tara	Max	20	24	38	41	34	40	43	48	40	36	34	39	40	43	43	41	42	19	28	30	34	40	38	32	35	37	29	47	36.2
	Min	-5	-10	-7	15	3	15	21	19	18	20	18	5	23	21	18	12	10	-2	18	5	5	1	12	0	0	12	18	32	10 6
Toledo	Max	14	1	16	38	24	39	42	41	37	44	30	36	37	42	30	31	40	24	30	26	30	31	31	23	28	31	28	36	30.7
	Min	-12	-8	-4	14	10	13	22	25	30	33	24	14	29	23	20	14	20	3	23	16	8	5	16	12	4	18	22	25	15.0
Thurman	Max	22	16	35	40	30	40	42	46	36	30	34	45	38	50	38	54	51	23	26	28	30	43	44	35	34	45	50	45	37.5
	Min	-6	-1	3	26	13	24	30	26	27	18	21	17	28	23	28	28	15	12	22	18	11	12	27	23	14	14	23	22	18.5
Villisca	Max	22	7	36	40	32	42	46	48	36	35	34	44	36	47	34	49	32	25	30	27	31	41	41	35	38	47	50	44	36.8
	Min	-10	-4	-1	23	12	19	27	23	27	26	22	18	30	24	25	28	18	8	30	16	7	9	25	18	12	24	22	24	17.6
Washingt'n	Max	15	3	29	40	27	40	43	50	41	51	32	40	44	44	31	39	48	33	30	26	26	34	33	26	25	31	37	37	34.1
	Min	-12	-9	-11	16	11	8	28	33	32	32	22	20	25	24	20	17	18	8	23	15	15	6	18	12	3	12	15	21	15 1
Waterloo	Max	12	3	27	35	25	35	39	41	36	42	31	32	22	13	24	24	15	10	10	-1	22	18	8	5	15	9	2	6	16	21	30.9
	Min	-10	-10	-3	8	9	13	19	23	31	32	22	13	24	24	15	10	10	-1	22	18	8	5	15	9	2	6	16	21	12.5
Waverly	Max	12	14	27	34	30	35	42	43	37	32	33	23	36	35	42	29	27	37	23	26	25	28	31	28	17	25	33	35	37	31.1
	Min	-11	-9	-4	17	10	10	23	23	32	33	23	10	26	24	17	9	16	-1	21	18	8	3	15	9	2	14	16	24	13.5
Webster Cy	Max	18	10	28	38	26	46	43	40	38	38	36	38	35	42	34	35	33	22	28	24	23	32	31	24	23	34	38	37	31.8
	Min	-12	-10	-4	14	7	16	24	23	25	24	21	7	25	23	19	14	13	0	20	15	7	4	15	10	5	7	21	25	12.8
W. Branch	Max	11	12	24	37	36	36	40	42	40	48	42	44	40	41	40	..	40	31	20	28	26	30	28	26	22	30	32	34	32.6
	Min	-10	-5	-9	4	14	0	22	30	28	26	28	26	24	24	28	..	15	11	10	21	12	4	12	11	4	6	12	18	13.6
Wilton Jc	Max	12	12	23	40	33	38	44	47	43	50	47	33	41	40	37	34	47	41	32	27	29	32	28	27	22	35	36	35	34.5
	Min	-12	-4	-8	12	17	7	27	34	32	35	26	26	26	25	23	16	29	13	26	23	18	5	16	11	1	12	13	22	16.8
Winterset	Max	20	10	33	33	30	41	44	49	35	42	32	44	38	44	34	44	25	31	26	27	40	30	29	32	40	47	41	..	35.0
	Min	-9	-8	-4	23	9	15	29	25	28	28	20	15	31	22	25	20	4	20	15	7	8	22	15	8	21	17	23	..	16.0
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† Mt. Vernon.

March, 1898.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

VOL. IX. NO. 3.

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Central Station, Des Moines, Iowa.

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DIRECTOR.

GEO M. CHAPPEL, M. D,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER.
1898.

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Creston.....M. V. Ashby.
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Guthrie Center.....W. W. Bailey.
Hesper.....G. E. Dillingham.
Hodge.....James Piper.
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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW
OF THE
Iowa Weather and Crop Service.

VOLUME IX. MARCH, 1898. No. 3.

NOTE AND COMMENT.

Peaches have been injured materially by the freezing weather of the last decade in March. Freezing temperature extended far southward into the peach belt of this valley.

***

While dry weather prevailed in the larger part of Iowa large portions of the Ohio valley were deluged by rains. The wet weather interfered with plowing and seeding eastward of the Mississippi.

***

It is vastly better to promote a larger use and increase the consumption of corn, than to attempt to restrict the acreage and lessen its production. All efforts should be directed toward an extension of the range of utilities of this most important product.

***

In respect to temperature, March came in wrong end foremost. At the central station the daily mean temperature of the first decade was 3° higher than the last ten days of the month. The second decade was about 4° warmer than the first, and more than 7° per day warmer than the third decade. It was a peculiar month, but for that matter all months are more or less peculiar.

***

A most impressive phenomenon seems to have escaped general notice. It is the earth's shadow in the sky, which, according to Prof. W. R. Brooks of Geneva, N. Y., first becomes visible about half an hour after sunset, as a dark purplish haze on the eastern sky, and gradually rises until lost in the gloom of early night. The shadow, which is doubtless usually mistaken for cloud or haze, is seen equally well on the western sky before sunrise.—*Exchange.*

***

Frequent sea disturbances that are sometimes called earthquake waves are recorded in New South Wales. H C. Russell, the government astronomer, states that these have a period of about twenty-six minutes from crest to crest, which corresponds to the period of waves from earthquakes, but it has been shown that only about 1 per cent have really originated in earth movements. About 60 per cent have their origin in confined waters far to the south under a low pressure. The low barometer is accompanied by a rise in sea level, resulting in currents that meet in Bass' straits, producing waves that are transmitted through Tasman sea and are recorded by the Sydney and Newcastle tide gauges. Heavy gales orignate at least 10 per cent more in the Tasman sea. The remainder of these periodic waves, which somewhat resemble those that have been noticed in Lake George are believed to be due also to meteorological causes, although the connection has not yet been traced.—*Exchange.*

Altitudes are calculated from barometric records according to a formula worked out by Laplace. It is important to know how accurate this formula really is, and to test it Cailletet has devised a photographic camera, to be carried on balloons, for recording at the same instant the height of the barometer and the actual height of the balloon as shown by the distance apart on the photographic plate of prominent objects on the earth's surface. The apparatus consists of a prismatic box, with lenses on the upper and lower faces, between which a band of sensitized celluloid is moved by clock-work and exposed at regular intervals. One lens gives a picture of the scenery below, the other of the needle of the barometer; and in a recent ascent to a mile and a half twenty six photographs were obtained.—*Exchange.*

***

Census reports show that the duration of life is greater in the temperate zone than in semi-tropical countries. The average number of persons over 60 years old in the United Kingdom, in the German Empire, and in Holland is 77 in 1,000 inhabitants; in Denmark, 84; in Sweden 88, and in Norway, 90. In Russia longevity is greatest in northern provinces. In Austria and Portugal persons over 60 fall to 71 in 1,000; in Spain, 58; in Greece, 56; in East India, 40, and in South America about 50. In the United States comparatively few persons live to grow old. Duration of life is usually longest in old countries. During 1896 the death of 188 persons over 90 years of age, 14 being over 100, was recorded in Great Britain and Ireland. Average longevity is greater in Scotland than in England and greater in Ireland than in Scotland, the birth rate being largest in England and least in Ireland. In England the average number over 60 years of age is about 7 per cent, in Scotland 7.7, and in Ireland 10.5. In France it is 12 7, or 127 to each 1,000 population.—*Exchange.*

***

In a letter to the editor, Mr. William H. Thompson of Geneva, Iowa, gives some interesting notes of his observations of climatic conditions in Iowa. We quote as follows: "We have had a very pleasant winter, the forty-third winter I have passed in Iowa, and the forty-first upon the farm I now occupy. The spring of 1858 was something like the present; March was warm, open and dry until the last week, then it began to rain, and continued about seven days in every week until September. We had the highest water the 19th of July that we have ever had, by eighteen inches. The spring of 1857 was by far the most cold and backward of any we have had; there were snowbanks on the open prairie, sloping south, till the 13th of May. The wet season of 1858 was remarkable in many ways, and we have had nothing like it since that year. The winter and spring of 1878 were remarkably mild and open. Plowing was begun in the first week in February and wheat sowing was mostly completed the first week in March. Light snows fell

but no serious setbacks occurred, and crops were good. The past winter has been remarkable in respect to absence of high winds; there has been scarcely wind enough to turn the wind mills The ground was seldom drier at this time of the year, and the streams are low. I am inclined to think we will have a drouth this season, exceeding anything we have ever had; but it 'may turn out to be the other extreme, like that of 1858. Farmers here will sow twice as much wheat as last year."

***

In two crops, alfalfa hay and Kaffir corn, the intelligent farmer of the west has found drought resisting qualities that practically defy nature's withering blasts, writes Franklin Matthews in *Harper's Weekly*. Alfalfa, of itself, is a most valuable crop for feeding and developing live stock, and, besides, withstands great heat. It is almost an ideal food. Kaffir corn has practically the same nutritive qualities that Indian corn possesses, and also withstands great heat. Taken together, alfalfa and Kaffir corn make the ideal dairy ration, as has been found after exhaustive tests—a ration that is bringing prosperity to thousands of those engaged in that industry.

Alfalfa is not new to the United States. For many years it has been one of the chief crops on the Pacific coast It has also been cultivated to some extent in the east, but not by the ordinary farmer. The farmer of the middle west knew little of it. Professor Flint, who has made a study of grasses, says that it was introduced into Europe by Darius, from Media, in Asia, about 500 B. C. It was cultivated by the Greeks, Romans and Egyptians. When the western hemisphere was discovered Spanish priests brought it across the Atlantic and planted it near their missions. In that way it was introduced into South America. In that way it also crept up along the Pacific coast and into Central America, and into what is now the southern part of the United States. Wherever it has gone it has proved a blessing. It has lasting qualities as a forage plant. It is said that near the City of Mexico there are alfalfa fields more than 300 years old. One authority says that the plant will live in a field 1,000 years, producing bountifully every year. With half a chance it defies heat. It even laughs at hail. It enriches the soil, and it does probably what no other plant in this country can do—it produces three crops a year even above the frost line. After it becomes established in a home it requires only the care of the reaper. Its production is cheap, therefore, and it is doubtful if nature ever made a more beneficent gift of the kind to humanity.

LOSSES BY LIGHTNING.

STATISTICS TO BE GATHERED BY CO-OPERATION OF INSURANCE ADJUSTERS AND VOLUNTARY OBSERVERS.

An attempt will be made this season to procure reliable statistics of losses of buildings, live stock and other property from the effects of lightning; and to this end the officials of the Weather Bureau will solicit the co-operation of the agents and adjusters of all insurance companies which carry that class of risks. And voluntary observers will also be asked to make special reports of losses by lightning that occur within the range of their personal observation

At the annual meeting of the Farmers' Mutual Insurance associations of this state, held in this city last fall, this matter was presented by the director of the Iowa service, and the convention voted unanimously to report all losses that are adjusted by their agents. The matter was presented to Prof. Willis L. Moore, chief of the U. S Weather Bureau, and under his direction Professor Garriott, of Chicago, outlined the plan and submitted it to the National Association of Mutual Insurance companies, at the annual session, held in Chicago in February. That body heartily endorsed it, and Chief Moore then ordered the issuance of blanks for distribution in all the states where losses by lightning are of frequent occurrence. Following is the form of blank issued, to be known as "Form No. 4039—Mis.":

Date of storm ...., 189..; hour of day, ...M.
Where loss occurred .....Township.....
County.....State.....
On whose premises..... .....
Kind of building struck.....
Of what constructed (wood, brick or stone) .....
Kind of roof (shingle, slate or metal) .....
If building burned, how much loss..... $ .....
Value of contents burned ....
If struck and not burned, how much damage ....
Was it provided with lightning rods. ....
If so, what metal was used ....
What were the dimensions of the building? Height..... ...
Length ....Width .....
How many points on the roof ....

LIVE STOCK KILLED IN THE FIELD.

Kind of stock ....Number.....
Amount of loss ..... $.....
Was the stock near a wire fence .....
If near fence, were ground wires used ....

Please add details as to character of soil where lightning stroke occurred, whether moist or dry, whether upland or lowland, and whether timber or trees were near. Note special features of the storm, its direction of movement, etc.

Name .....
Postoffice address ....

To be filled up and returned to Director Climate and Crop Service, Weather Bureau, ...

LIGHT, HEAT, ELECTRICITY.

Editor Monthly Review:

Referring to the letter of Mr. Kegler in your January REVIEW, this may be said:

It is not held that light and heat, as such, come to us from the sun; but that the vibrations of the ether, which, when arrested, produce the light and heat, come from the sun. In their passage through space, in which they are not arrested, they are no more light and heat than the swinging hammer of the smith is a blow. The vibrations, unarrested, are potential light and heat in the same manner that the unarrested swinging hammer of the smith is a potential, possibl blow. The swing of the hammer must be arrested or there will be no blow.

Radiant energy, vibrations, pass through an ice lens, without raising the temperature of the lens, and set fire the combustible in the focus. The ice permits free passage to the waves.

Vibrations will pass in, across and out of a dark room, filled with dust-free air, without lighting the room. The room will remain dark till the potential light waves are arrested.

Mr. Kegler thinks it unreasonable to hold that light and heat come from the sun. But is it less easy to understand how potential light waves come from the sun, than how "the magnetic force of the sun, affecting the electric reservoir within the earth" (as he puts it), reaches the earth? Or how "in turn the earth exerts some force upon the sun in the form of light and heat" (as he says)? Or how, as he supposes, "the sun concentrates electricity upon the earth's surface?"

O. L. F. BROWNE.

NATIONAL BULLETIN FOR MARCH.

Following are extracts from the Climate and Crop Bulletin of the U. S. Weather Bureau for March:

The month averaged colder than usual in the Rocky mountain and Pacific coast regions, the average daily temperature deficiency generally ranging from 1° to 3° along the immediate coast, from 3° to 6° over the middle plateau region, and from 6° to 11° in Montana and western North Dakota. Eastward of the Rocky mountains the month was generally milder than usual. Throughout the Mississippi valley and eastward to the Atlantic coast the average daily temperature excess ranged above 3°, and in the lake region, New England, the upper Ohio valley, and over the greater part of the middle and south Atlantic states, the average daily excess ranged from 6° to 9°, while over portions of New England, the middle Atlantic states and lake region it ranged from 9° to 12°.

In the lake region, Ohio, upper Mississippi and lower Missouri valleys the monthly precipitation was largely in excess of the average, the actual fall ranging from six to ten inches in the Ohio and central Mississippi valleys, including southern Missouri and northern Arkansas. There was, also, more than the usual precipitation in Montana, Wyoming and along the immediate Texas coast.

Upon the whole, the weather conditions during March were favorable to agricultural interests Farm work is exceptionally well advanced for the season in the Atlantic coast and gulf states, though retarded by excessive rains in the Ohio and central Mississippi valleys and lake region.

Winter wheat has made rapid growth and is generally reported as in excellent condition. Spring wheat seeding is well advanced in Nebraska and Iowa, and some has been sown in the southern portions of Wisconsin, Minnesota and South Dakota. In California the outlook for wheat is very unpromising except in irrigated districts

No corn has been planted northward of Tennessee. A large part of the crop has been planted in the gulf states, and the early planted is up with good stands. In Texas corn has sustained some injury as a result of low temperatures during the latter part of the month

The following statements are based upon reports from climate and crop correspondents collected at state section centers of the Climate and Crop Service of the Weather Bureau:

Iowa—Des Moines, March 29th.—Month exceptionally warm and favorable for farm work; soil generally dry and in fine condition; unusual progress made in plowing and seeding; largely increased acreage of spring wheat sown, which suffered no damage from sleet and freezing on the 27th and 28th; good start made in sowing oats and barley; fall wheat and rye doing well; fruit buds generally uninjured.

Illinois—Chicago, March 30th.—Floods generally over south half; little work done since 10th; rapid progress made previous to rains; probably one-third oat crop sown in southern district, with seeding begun central and northern, also plowing and preparation for later seeding, early gardening, etc.; wheat much improved, has fine color and good root growth, but small in size and acreage; rye in good condition, also grasses; fruits blooming in southern district, little damage by late freeze; considerable spring wheat to be sown in northern district.

Missouri—Columbia, March 29th.—First decade favorable for farm work and considerable oats sown, but since work generally at a standstill, owing to heavy rains; warm, rainy weather up to 22d favorable for wheat, which improved rapidly; cold wave 22d-24th killed considerable young clover and froze oats to the ground in places; peaches, pears and plums reported killed to a considerable extent in many southern and western counties; damage by cold wave of 27th-28th not yet known.

Nebraska—Lincoln, March 29th.—Warm, pleasant weather first three weeks allowed farm work to be pushed rapidly, except in the northwestern portion, where little was done; low temperature, with some snow, retarded farm work during the last ten days; winter wheat made good progress and is in excellent condition; seeding spring wheat well advanced; oat seeding is quite general.

Kansas—Topeka, March 29th.—Month mild till 21st, when temperatures 14° to 24° below freezing occurred; too wet for farm work in eastern portion and slow progress in western portion, but well advanced in central section; oats nearly all sown, much up; wheat growing finely, in excellent condition generally, though blackened by freeze in central counties, but not injured; oats badly injured, necessitating some reseeding; much plowing for corn, where not too wet; early fruit, pears, peaches and apricots injured; extent not determined.

EVAPORATION FROM THE OCEAN.

The mean annual fall of rain on the entire surface of the earth is estimated at about five feet. To evaporate water enough annually from the ocean to cover the earth, on the average, five feet deep with rain; to transport it from one zone to another, and to precipitate it in the right places, at suitable times and in the proportions due, is one of the offices of the grand atmospherical machine. This water is evaporated principally from the torrid zone. Supposing it all to come thence, we shall have, encircling the earth, a belt of ocean 3,000 miles in breadth, from which this atmosphere evaporates a layer of water annually sixteen feet in depth. And to hoist up as high as the clouds and lower down again all the water in a lake sixteen feet deep, and 3,000 miles broad and 24,000 long, is the yearly business of this invisible machinery. What a powerful engine is the atmosphere! And how nicely adjusted must be all the cogs, and wheels, and springs, and *compensations* of this exquisite piece of machinery, that it never wears out, nor breaks down, nor fails to do its work at the right time and in the right way! The abstract logs at the observatory in Washington show that the water of the Indian ocean is warmer than that of any other sea; therefore it may be inferred that the evaporation from it is also greater. The north Indian ocean contains about 4,500,000 square miles, while its Asiatic watershed contains an area of 2,500,000. Supposing all the rivers of this watershed to discharge annually into the sea four times as much water as the Mississippi discharges into the gulf (107 cubic miles, or about one-sixth of all the rain that falls on its watershed), we shall have an average annual evaporation from the Indian ocean of 6 inches, or .0165 per day.

The rivers of India are fed by the monsoons, which have to do their work of distributing their moisture in about three months. Thus we obtain .065 inch as the average daily rate of *effective* evaporation from this ocean. If it were all rained down upon India, it would give a drainage which would require rivers having sixteen times the capacity of the Mississippi to discharge. Nevertheless, the evaporation from the north Indian ocean required for such a flood is only one-sixteenth of an inch daily throughout the year. I estimate the total amount of evaporation that annually takes place in the trade-wind region generally at sea as not exceeding four feet. —*Maury's Physical Geography of the Sea.*

THE GULF STREAM.

People think the Mississippi river a grand river, said John E. Pillsbury in the *Century*, and so it is in truth, so far as land rivers go, but great as it is it would require 2,000 such rivers to make one gulf stream. The great ocean river is an irresistible flood of water, running all the time, winter and summer, and year after year. It is as difficult for the mind to grasp its

immensity as to realize the distance of the nearest stars. At its narrowest part in the straits of Florida, it is thirty-nine miles wide, has an average depth of 2,000 feet and has a velocity at the axis — the point of fastest flow — of from three to more than five miles per hour. To say that the volume in one hour's flow past Cape Florida is 90,000,000,000 tons in weight does not convey much to the mind If we could evaporate this one hour's flow of water and distribute the remaining salt to the inhabitants of the United States, every man, woman and child would receive nearly sixty pounds.

It is curious to note in the history of the gulf stream how great its influence has been on the fortunes of the new world. Before the discovery of America strange woods and fruits were frequently found on the shores of Europe and off-lying islands. Some of these were seen and examined by Columbus and, to his thoughtful mind, they were confirming evidence of the fact that strange lands were not far to the westward. These woods were carried by the gulf stream and by the prevailing winds from the American continent, so that in part the gulf stream is responsible for the discovery of the new world. Ponce de Leon, while on his famous search for the fountain of youth, made the discovery of this most beneficial phenomenon. The whalers of New England were the first to gain a fairly accurate knowledge of the limits of the current between America and Europe by following the haunts of the whales, which were found north of one line and south of another, but never between the two This, they reasoned, was the gulf stream current. Benjamin Franklin received this information from the whalers, and published it on a chart for the benefit of the mail packets plying between England and the colonies. The chart was first issued about 1770, but was not accepted by the English captains. Before it came to be generally known and used the trouble between England and the colonies had begun, and Franklin, knowing the advantage the knowledge would be to the British officers, suppressed it all he could until hostilities had ceased.

CAUSES OF RAINFALL.

It may be not uninteresting to note the three ways that exist in the atmosphere of condensing moisture suspended in the form of aqueous vapor into rain. The first is the adiabatic cooling, which cousists in the cooling of the air by expansion when it rises from the lower to the higher strata, by which the cumulo-nimbus and the nimbus clouds of summer are chiefly produced, from whose bases the rain falls The second is the intimate mixture of two masses of air having different quantities of vapor in them, but it has been shown that only small amounts of rain can in this way be produced, although very extensive fogs may be formed. The third is by far the most important, and, although in some respects a complex process, it may be called direct cooling by contact. One of the most important physical properties of air at different temperatures is a reluctance to mingle. Such masses will rather flow alongside each other in distinct strata, like oil and water, with contact on the surface. The effect of this is seen in many of the cloud forms that spread over the sky, showing exactly where the currents of different temperature touch each other. In the cyclonic circulation of the atmosphere, which is to be referred primarily to the counter-flow of currents from two adjacent high areas, there is a powerful force that produces a breaking up of the currents into shreds of air, warm and cold in quick alternation, in the interflow, especially in the southeastern quadrants of the lows Here the direct contact in the air of masses having moisture in suspension with the cold masses that are partially dry tends to form rapid condensation and hence rainfall. The operation of such a principle extending to the minute portions of the air will cause the fall of the moisture as rain, and thus dry the air thoroughly Since the low is sustained between two highs and drifts eastward with them, this process of direct cooling between minute masses of air is going on continuously in the eastern quadrants of a storm where the rain falls and the passage of the low is followed by clearing and cool weather in the current from the northwest that has not yet been able to reach any moisture-laden air. No doubt all these three processes are at work more or less simultaneously, but it is clear that direct cooling is the most efficient of all producing ordinary rainfall in middle latitudes.— *Weather Bureau Bulletin No. 114.*

VITALITY OF THE SOIL

Not many years ago the soil was regarded by the agriculturists as dead, inert matter, devoid of all vitality. The theories of fertilization of the soil were based upon this idea, and the methods of culture were conducted according to the same theory. The only vital thing which the farmer considered was the growing crop itself, and there was no suspicion of the relations existing between the vitality of the crop and the living organisms of the field. The reader of the agricultural literature of to-day does not need to be told how all this has been changed in the last twenty years. The soil is no longer regarded as dead and inert matter, but is known to be so permeated with living beings as to entitle it to be considered a living mass. The parts of the soil which are not endowed with life now receive the highest significance as the environment of the living organisms which they contain and which they may help to nourish. The plant which forms the growing crop receives its nourishment through the media of the air and soil, but this nourishment must undergo a process of digestion, before it becomes available as plant food, similar to that suffered by the food which nourishes animals. Indeed, the purely mineral, inorganic foods of plants are probably always absorbed as such, and must undergo a decomposition before they are assimilated. A striking instance of this is shown in the case of silica, an important plant food and a type of inert mineral matter Silica is highly insoluble and apparently the least suited of the mineral constituents of the earth to enter the vital organism of the plant. Yet not only do we find it in the tissues of the mature plant, but also, strange to say, in the greatest abundance in those parts of the plant organism viz., the leaves, most remote from the sources of supply. It is evident from this that the highly insoluble silica of the soil must undergo a complete solution in order to be carried by the juices of the plant through the network of cellular tissues to be finally redeposited in the leaf.

The same statement may be made with regard to the other purely mineral foods of plants. It is quite certain that they do not become a part of the plant organism in the form in which they are found in the soil or in applied fertilizers. In phosphorus, for instance, is found one of the most important mineral foods of plants. This substance exists in the soil almost exclusively as mineral phosphates, or is applied as such in fertilizers. Nevertheless, the phosphorus which is found in plants, and especially in the seeds of cereals, exists in organic combination, showing that the original mineral phosphates have been entirely decomposed by the process of digestion to which they have been subjected. Even the mineral phosphates which are found in the plants are not those which perexist in the soil. Soil phosphates are chiefly those of lime, ron and alumina, while plant phosphates are chiefly those of potash.— *Ye urbook of the United States Department of Agriculture, 1895.*

INVISIBLE PLANT GROWTH.

[THE INDEPENDENT.]

The invisible plant world seems as wonderful as that which we see. We are wading through the atmosphere in a sea of vegetation possibly as numerous as the fishes in the ocean. Mostly existing as spores, they are ever on hand to germinate and become living plants whenever the conditions are favorable. It is only when these spores germinate and become perfect plants that they are beneficial or harmful, as the case may be, to organic beings. Mr. Smith Ely Jelliffe took occasion to gather some of these and cultivate them during the three early months of the past year, at Columbia university, and succeeded in raising no less than twenty-eight well known species from these atmospheric spores. We have known for a long time past that these spores must be there, floating around in great abundance. No fruit rots on the trees or in our cupboards but the peculiar cryptogram that delights to feed on it starts into growth. No piece of bread can be placed anywhere but the little spore that produces the blue mold finds it out, and starts to give the little cluster of filaments which, under the microscope, we so much admire. It is probable that the spores of those minute plants which produce our epidemic diseases are always with us, and extending wherever the atmospheric current may go in which they were originally produced. The germs of yellow fever, even, may be taken into our lungs with every breath, in localities where yellow fever has never been known, but do not find the necessary conditions to germinate into full-grown plants and then become virulent. We may never stamp out the spores by quarantining. The atmosphere cannot be quarantined. Quarantining can only be effective against the growing plants; and even then they soon die out if the proper food in which they delight is not ready to hand for them. It is in this line that cleanliness becomes a virtue. It does not drive the spores from the atmosphere, but it helps to starve out the plants if the spores venture to germinate.

RUSKIN ON TREES.

In God's daily preparation of the earth for man we find a carpet to make it soft, then a colored fantasy of embroidery thereon, then tall spreading foliage to shade him from sunheat, and shade also the fallen rain, that it may not dry quickly back into the clouds, but stay to nourish the springs among the moss. Stout wood to bear this leafage; easily to be cut, yet tough and light, to make houses for him, or instruments; useless it had been, if harder; useless, if less fibrous; useless, if less elastic. Winter comes, and the shade of leafage falls away, to let the sun warm the earth; the strong boughs remain, breaking the strength of winter winds. The seeds which are to prolong the race, innumerable according to the need, are made beautiful and palatable, varied into infinitude of appeal to the fancy of man, or provision for his service; cold juice, or glowing spice, or balm, or incense, softening oil, preserving resin; and all these presented in forms of endless change. Fragility or force, softness and strength, in all degrees and aspects; unerring uprightness, as of temple pillars, or undivided wandering of feeble tendrils on the ground; mighty resistances of rigid arm and limb to the storms of ages, or wavings to and fro with faintest pulse of summer streamlet. Roots clearing the strength of rock, or binding the transcience of the sand; crests basking in sunshine of the desert, or hiding by dripping spring and lightless cave; foliage far tossing in entangled fields beneath every wave of ocean—clothing with variegated, everlasting films the peaks of the trackless mountains, or ministering at cottage doors to every gentlest passion and simplest joy of humanity.

Being thus prepared for us in all ways, and made beautiful and good for food, and for building, and for instruments of our own hands, this race of plants deserving boundless affection and admiration from us, become, in proportion to their obtaining it, a nearly perfect test of our being in right temper of mind and way of life; so that no one can be far wrong in either who loves the trees enough, and every one is assuredly wrong in both, who does not love them, if his life has brought them in his way. It is clearly possible to do without them for the great companionship of the sea and sky are all that sailors need; and many a noble heart has been taught the best it had to learn between dark stone walls. Still if human life be cast among trees at all, the love borne to them is a sure test of its purity.

MARCH WEATHER RECORD.

The month of March was warmer than usual, the mean temperature for the state, as deduced from 107 station records, being 37.5°. Fort Madison reports the highest mean, 44.6°, and Osage the lowest, 32 4°. The maximum temperature registered was 72° at College Springs on the 26th, and the minimum was 2° at Eldora, Neola and Rock Rapids on the 1st, 22d and 23d. There was an average monthly range of 54°.

The average precipitation was 1.94 inches, which is slightly above the March average for the state. The eastern counties received much the heavier rainfall. Fort Madison reports 6 21 inches, and Marshalltown only .33 of an inch. The highest wind velocity was 60 miles an hour, at Sioux City on the 14th.

The following table gives the mean temperature and total precipitation for the month of March, at the stations named, for the years from 1872 to 1898 inclusive.

YEARS.	MEAN TEMPERATURE—DEGREES.						PRECIPITATION—INCHES					
	Des Moines.	Davenport.	Dubuque.	Keokuk.	Omaha.	Sioux City.	Des Moines.	Davenport.	Dubuque.	Keokuk.	Omaha.	Sioux City.
1872	....	32	....	35	31	....	.....	1 82	.....	2 88	1.61	.....
1873	....	36	....	35	38	....	.....	1.43		.51	1.44	.....
1874		34		38	34	....	.....	1 34	1.28	1 14	1.49	.....
1875	....	30	28	34	31	....	.....	.88	1.45	1.67	1 24	.....
1876	....	32	31	35	29	....	.....	4.35	4 00	3.45	3.18	.....
1877	....	29	27	32	34	....	.....	3 91	4 53	3 76	1.26	.....
1878		48	47	50	48	..		2 21	2 44	3 78	3.09	.....
1879	39	40	37	42	41	....	1.68	1 80	1.20	1.71	2 17	.....
1880	38	37	35	40	36	....	.70	2 68	2.55	1.83	.50	.....
1881	29	29	31	34	28	....	1 78	3.33	3 78	2.42	.72	.....
1882	38	40	38	43	40		2 28	2.90	1.49	3.30	.79	.....
1883	33	35	31	36	35	....	.57	.73	32	1.07	52	.....
1884	34	36	32	37	35	....	2 24	3.27	3.85	3.37	4.91	.....
1885	31	34	31	35	36	....	.04	.17	41	.17	.33	.....
1886	36	33	32	37	32	....	1 41	3 08	4.32	2 25	1 31	.....
1887	36	34	33	40	33	....	1.79	.77	1 80	.76	.48	.....
1888	30	30	26	35	29	....	3.09	2 70	3.44	3.45	3 28	.....
1889	42	39	41	43	40	....	.11	1 74	.30	1 04	53	.....
1890	30	30	28	33	33	28	.91	2.31	1.68	2 43	1 35	2 12
1891	29	29	28	31	24	25	2 25	1 68	2 69	2.27	2.26	2.01
1892	34	34	31	36	34	32	2.47	3 06	1 91	2 91	2.74	1.16
1893	33	34	32	37	34	29	1.15	2 25	2.52	2 66	1 29	1.43
1894	43	43	41	46	43	40	1.78	1.88	3.06	2.52	.91	.64
1895	36	35	36	38	37	34	.50	1 57	.99	1.05	.99	50
1896	32	31	32	36	32	27	1.24	.84	.76	.88	1.31	.50
1897	35	35	32	39	35	29	2 13	2 82	2 97	4 16	1 47	1.71
1898	40	41	38	43	39	36	1.35	4.85	2.78	5.98	1.15	.90
Means	35	35	33	38	35	31	1 48	2 24	2 26	2 21	1 52	1.22

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30.08 inches; highest observed, 30.58, at Clarinda and Des Moines, on the 29th and 30th; lowest observed, 29.43, at Omaha, Neb., on the 14th; range for the state, 1.15 inches.

Temperature.—Monthly mean, as deduced from 107 reports, was 37.5°; highest monthly mean, 44.6°, at Ft. Madison; lowest monthly mean, 32.4°, at Osage; the highest temperature reported was 72°, at College Springs, on the 26th; the lowest

temperature reported was 2°, at Eldon, Neola and Rock Rapids, on the 1st, 22d, 23d; the average daily maximum was 48.6°; the average daily minimum was 26.8°; the average monthly maximum was 64.9°; the average monthly minimum was 10 6°; the greatest monthly range was 65°, at Greenfield, Humboldt and Neola; average monthly range, 54 2°.

Precipitation —Average for the state, as determined from the reports of 112 observers, 1.94 inches; the largest amount reported was 6.21 inches, at Ft. Madison; the least amount was .33 inches, at Marshalltown; the greatest daily amount reported was 2.21 inches, at Mt. Pleasant, on the 19th and 20th; average number of days on which .01 inch or more of precipitation was reported, 6.

Winds.—Prevailing direction, northwest; highest velocity reported, 60 miles per hour, from the south, on the 14th, at Sioux City.

Weather—There were 12 clear days, 9 partly cloudy days, and 10 cloudy days.

PRECIPITATION.

STATIONS.	PRECIPITATION IN INCHES.		No. of clear days.	No. of partly cloudy days.	No. of cloudy days.	No. of rainy days (.01 in. or more).	Total snowfall during month.
	Monthly.	Greatest daily.					
Adair	.61	.22	13	13	5	3	4.4
Alta (near)	1.25	.60	...	...	...	5	....
Larchwood	1.30	80	3	18	10	5	2.0
Millman	1.30	.56	...	...	...	...	....
Washta	.53	.19	16	8	7	5	1.5

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.06	30.51	29	29.62	27
Des Moines	30.10	30.58	30	29.61	14
Clarinda	30.09	30.58	29	29.57	14
Cresco	.....	30.56	29	29.76	27
Dubuque	30.07	30.52	30	29.60	27
Omaha, Neb	30.06	30.55	30	29.43	14
Keokuk	30.09	30.56	29	29.65	22
Sioux City	30.08	30.56	30	29.60	14
Means	30.08	30.58	29, 30	29.43	14

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,611	32	W	27
Des Moines	6,882	38	SW	15
Dubuque	5,802	28	SE	15
Keokuk	6,114	31	W	28
La Crosse, Wis	6,256	30	NW	16
Omaha, Neb	6,848	36	SE	14
Sioux City	11,334	60	S	14

OBSERVERS' NOTES.

CLINTON—*Dr. Luke Roberts.* March, 1898, took a departure from normal on all points. Its maximum temperature, minimum temperature, mean temperature mean temperature of the warmest day, mean temperature of the coldest day were each above normal. The rainfall, range of temperature, number of storm days, number of cloudy, number of clear days and the per cent of cloudiness were each in excess of normal. The movement of the wind was much below normal.

The following are the temperatures for the month, followed by March normals: Maximum, 66°; normal, 65.1°; minimum, 18°; normal, 2.9°; mean, 38.6; normal, 33°; warmest day, 65.5°; normal, 50.3°; coldest day, 22°; normal, 12.5°: rainfall, 4.73 inches; normal, 2.49 inches. The rain was in excess of any corresponding month during the last twenty years. The nearest approach to it was in 1886, when the March precipitation was 4.44 inches. The least precipitation for March during my record was .19 of an inch, occurring in 1885. While there was much rain there were no damaging storms and the earth absorbed a large share of it, supplying a needed want.

The first storm of the month was snow, which was deposited on the 1st, between 6 A. M. and 5 P. M , the depth being five inches. Four more inches of snow fell on the 12th, from 3:30 P. M. to well into the night, loading trees, telegraph wires, etc., so that the landscape on the morning of the 13th was a beauty to behold. The heat of the day was too much for the white crystals and by night there was scarcely a trace to be seen.

On the 10th rain fell to the depth of 1.02 inches. Thunderstorms occurred on the 14th, 18th, 19th, 22d, 26th and 27th. There were 14 storm days, 11 cloudy and 12 clear.

The movement of the wind was 3,890 miles, normal being 5,150 miles. The maximum velocity was 23 miles an hour, occurring on the 27th. The prevailing direction of the wind was south and west.

Solar halos were observed on the 5th and 8th, the former furnishing an interesting sundog about 5 o'clock P. M. Lunar halos were observed on the 4th, 5th, 6th and 29th. During the evening of the 15th a fine aurora was observed.

The excess of rain will no doubt prove beneficial to pasturage and meadows as well as fitting the ground for tillage.

ALGONA—*C. D. Pettibone.* 5th, ducks and geese going north; 8th, bluebirds.

ALTA—*Prof. David E. Hadden.* Deep crimson sunset on the 6th. Snow on ground all gone on 8th, after which date roads were dry and dusty until 18th.

AMANA—*C. Schadt.* The snow which commenced to fall in the beginning of December before the ground was frozen to any considerable depth, afforded ample protection to fall wheat, rye and other plants and shrubs during the whole winter. At the close of February and beginning of March it melted away without causing much flow of water and percolated apparently nearly all into the ground which was a great boon to farming. March was unusually mild and warm, so that sowing and planting (onions) began early. Toward the close of the month, however, cold weather set in and caused some damage, the extent of which cannot be estimated.

ATLANTIC—*J. W. Love.* Quite a blizzard with some snow on the 22d.

BONAPARTE—*Hon. B. R. Vale.* The 10th and 27th, inclusive, gave 5.08 inches rain—an unprecedented rainfall for March. Mercury dropped to 17° on 23d, and to 22° on the 28th and 29th. No farm or field work done yet.

BRITT—*Geo. P. Hardwick.* High wind 1st, 8th, 14th, 15th, 22d, 25th. Blizzard 27th. Month generally pleasant.

CARROLL—*Moses Simon.* First robins noticed the 17th.

OGDEN—*E. Sayre.* First robins on the 5th.

OLIN—*Nathan Potter.* First robins seen on the 7th. Geese and ducks on the 8th. First plowing in the field on the 14th. Brilliant aurora night of the 14th.

OVID—*H. C. Miller.* Very brilliant aurora from 7 P. M to 11 P. M. on the 15th.

PLOVER—*J. S. Smith* Considerable thunder on the morning of the 27th; snowing hard at the time, with the temperature 20° above.

SIDNEY—*G. V. Swearingen.* There was a drop of 54° on the 21st, and 47° on the 20th, both changes being very severe on stock and some people.

WASHTA—*H. L. Felter.* Some seeding done on the 9th, and the ground in good condition for sowing wheat on the 15th.

ELKADER—*Charles Reinecke.* Ice in the Turkey broke up and went out at Elkader on March 7th, at 4 P. M. The channel was thawed out before. For the first time since September the precipitation exeeded the average.

FOREST CITY—*J A. Peters.* Severest snowstorm of the season on the 27th. Spring work commenced about the 15th, but was delayed on account of the storm of the 27th

GALVA—*Jay M. Crowley.* The storm of the 27th left from four to five inches of snow on the level.

GRAND MEADOW—*F. L. Williams.* A wonderfully fine display of auroras on the 14th and 15th. On the 15th work in the fields began. The month has been marked by extremes of temperature. The early part of the month was warm and pleasant, followed by every kind of weather, delaying farm work. Wheat all sown during the month; more sown than for years.

HUMBOLDT—*Henry S. Wells.* High wind on the 14th. March came in like a lamb and went out like a lion. Wheat nearly all sown, and thought to be in good condition. Clover sod being plowed for corn.

IOWA CITY—*Mrs. C. M. Hobby.* Robins plenty on the 7th, and bluebirds heard again. Slight hailstorm on the 20th. Very good March weather for this climate--neither too hot nor too cold.

KEOSAUQUA—*J. H. Landes.* The northern light display from 8 to 9 o'clock Monday night, March 14th, was admired by many of our residents.

LAMONI—*T. J. Fitzpatrick.* The 6th and 7th were hazy, like Indian summer. On the 9th frogs were heard for the first time. Thunder and lightning for each rainstorm.

MAQUOKETA—*A B. Bowen.* First robin on the 15th. First plowing on the 16th

MASON CITY—*B. F. Gibbs.* On the 14th wind, nearly a hurricane.

Auroras —Alta, Amana, 14th, 15th; Clinton, 15th; Cresco, 14th, 15th, 16th; Decorah, 14th 15th; Delaware, 14th, 15th; Ft. Madison, 14th, 15th; Grand Meadow, 14th, 15th; Grundy Center, 15th; Guthrie Center, 24th; Humboldt, 16th, 17th; Indianola, 15th; Keosauqua, 14th; Lansing, 15th, 16th; Olin, 14th; Osage, 15th; Oskaloosa, 14th, 15th; Ovid, 15th; Ridgeway, 14th, 15th; Sidney, 15th; Sigourney, 15th; Waterloo, 15th; Webster City, 15th.

Fog —Lansing, 18th; Lenox, 18th; Ovid, 18th; Sidney, 18th, 19th.

Solar Halo.—Alta, 11th; Grundy Center, 29th; Guthrie Center, 3d.

Lunar Halo.—Afton, 29th; Alta, 3d, 7th, 30th; Amana, 4th; Cresco, 4th; Grundy Center, 3d, 4th, 5th; Guthrie Centere, 3d, 4th, 30th; Lamoni, 30th; Lenox, 30th; Osceola, 29th, 30th; Ovid, 29th, 30th.

Lunar Coronæ.—Amana, 4th.

Parhelia.—Ames, 4th, 14th; Grundy Center, 4th; Guthrie Center, 4th; Lamoni, 4th, 5th; Lenox, 4th, 15th; Newton, 4th.

ERRORS IN FEBRUARY REVIEW.

DOWS: Total precipitation should be 1.65.
HUMBOLDT: Total precipitation should be 1.29.
MAQUOKETA: Total precipitation should be 1.52
MONTICELLO: Maximum temperature should be 46° on 10th.
THURMAN: Total precipitation should be 1.72.

LATE FEBRUARY REPORTS.

KNOXVILLE: Mean temperature, 26.6°; highest temperature, 49° on the 10th; lowest, 6° below on the 2d; total precipitation, 1 04 inch.

MILLMAN: Total precipitation, .97 inch.

METEOROLOGICAL DATA FOR MARCH, 1898

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION IN INCHES.				Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	Number of hail storms.	No. of thunder storms.
	Monthly mean.	EXTREMES. Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.	Monthly range.	Monthly.	Greatest daily.	Total snowfall.	Depth of unmelted snow at end of mo.							
Afton	39.6	52.3	26.9	70	26	10	23	60	2.07	.61	T	.....	SW	9	10	12	5		
Algona *	34.2	....		61	14	6	23	55	1.45	1.00	11.0	....	NW	11	15	5	4	1	1
Albia		.....	25.2	.....	.....	13	23	....	2.06	.70		....	NW	11	6	14	9	....	....
Alta	34.1	44.5	23.7	66	14	5	23, 28	61	1.41	.75	5.1	T	S	12	12	7	9	1	2
Amana	38.2	47.6	28.7	61	21	15	23	46	2.26	.74	.7	0	S	15	7	9	10	....	2
Ames	38.3	50.7	25.9	67	26	12	23	55	.78	.35	T	.....	.....	10	13	8	4	....	....
Atlantic	36.4	47.3	25.5	66	14	9	27	57	2.02	.83	5.0	.... ..	NW	13	6	12	4	....	1
Audubon	36.7	48.4	25.0	68	26	10	22 23,28	58	1.53	.56	8.0	.....	S	2	17	12	4	....	....
Belknap	41.0	50.4	31.5	65	26	15	23, 24	50	2.65	.80	1.0	.....	NW	18	3	10	8	....	....
Belle Plaine	34.2	45.0	23.3	60	21	8	23	52	2.05	.50	2.5	.....	SW	11	11	9	8	....	....
Britt	33.8	44.7	22.9	65	26	7	23	58	.93	.43	1.5	.1	NW	7	17	7	6	1	....
Bonaparte	40.2	50.4	30.1	64	25	17	23	47	5.08	1.10	1.0	.. ..	.. ....	....	....	....	8	....	....
Burlington	42.2	52.0	32.3	65	8, 16	19	23	46	6.13	1.65		.... ..	..... .	13	5	13	9	....	....
Carroll ‡	35.7	46.8	24.6	67	14	8	23	59	2.01	.65	12.0	.....	..... .	12	5	14	5	....	....
Cedar Falls	37.5	46.8	28.2	61	25	11	28	50	1.34	44	4.0	.....	NW	8	12	11	5	....	....
Cedar Rapids	38.8	48.8	28.7	63	21	11	4	49	1.71	.52	3.5	.....	NW	17	3	11	8	1	1
Charlton	40.7	50.6	30.8	66	26	14	23	52	1.60	.50	T	0	N. S	13	11	7	8	....	2
Charles City	35.8	45.9	25.7	60	8, 21	11	23	49	1.73	.50	2.2	0	S	10	9	12	8	....	....
Clarinda	40.9	51.9	29.9	72	26	11	23	61	1.73	.65	1.0	0	S	15	6	10	5	1	1
Clinton	39.6	50.4	28.8	66	25	18	3, 4	48	4.73	1.02	9.0	.....	S	12	8	11	11	....	6
College Springs	39.5	51.8	27.2	72	26	11	23	61	1.35	.63		.... ..	NW	13	7	11	5	....	1
Corning	39.6	51.7	27.6	69	26	12	23	57	.80	.40	.1	0	SW	13	4	14	2	....	....
Council Bluffs	39.6	51.4	27.8	69	8, 14	11	22	58	1.17	.40	....	.. ..	SE	10	12	9	4	....	....
Cresco	34.4	43.2	25.5	59	21	10	23	49	1.70	.56	5.5	.....	NW	13	7	11	6	....	1
Davenport	40.6	49.3	31.8	62	26	20	5	42	4.85	1.60	6.0	0	SW	10	8	13	12	1	6
Decorah	36.7	46.3	27.1	63	21	8	4	55	2.58	.96	6.5	.....	....	....	.....	.....	5	....	....
Denison	36.5	51.5	21.5	68	9	6	30	62	1.35	.50	7.0	.....	S	13	5	13	4	1	....
Delaware †	35.2			59	15	13	4	46	2.12	.61	1.7	.....	NW	12	11	8	8	....	....
Des Moines	39.8	50.1	29.4	67	26	13	23	54	1.35	.66	.4	.... ..	SW	16	8	7	7	1	1
De Soto	38.0	48.7	27.2	70	26	11	23	59	1.59	.66	1.1	.....	NW, S	14	9	8	7	....	....
Dows	35.2	47.0	23.5	64	26	8	23	56	1.57	.53	4.0	.....	NW	14	4	13	8	2	2
Dubuque	37.6	46.7	28.5	60	21	13	3	47	2.78	.65	5.1	.....	S	17	5	9	12	....	....
Eldora	35.0	44.8	25.3	60	21, 30	2	1	58	1.75	.50	7.5	.....	NW	1	26	4	5	....	....
Elkader	37.3	48.2	26.4	65	21	10	4	55	2.67	.79	3.0	.....	N	17	6	8	8	....	3
Fairfield	39.8	50.6	29.1	64	8, 26	16	23	48	2.82	1.00	2.0	.....	.....	16	5	10	8	....	....
Forest City	34.4	45.0	23.7	65	8	8	23, 28	57	1.33	.50	1.0	.....	W	13	6	12	4	....	1
Ft. Madison *‡	44.6			69	16	22	31	47	6.21	1.35	3.0	.....	SW	6	10	15	7	....	6
Galva	36.0	47.6	24.5	67	14	6	22,28,29	61	.82	.45	....	.....	S	4	22	5	4	....	....
Glenwood	41.0	53.8	28.3	68	8, 14	10	22	58	1.18	.50	..	.....	SW	9	13	9	4	....	1
Grand Meadow *	35.0	...	.....	58	21	12	27	46	2.35	.80	6.8	.....	NW	12	9	10	8	....	....
Greene ‡	36.8	48.1	25.5	62	21, 25	10	23	52	1.69	.67		.....	W	12	13	6	5		2
Greenfield	38.7	51.7	25.7	73	26	8	23	65	1.70	.69	2.3	T	S	14	8	9	7	....	4
Grinnell	38.6	49.1	28.0	61	25	11	23	50	1.17	45			.....	8	16	7	6	....	....
Grundy Center	36.2	47.8	24.9	64	21	11	23	53	1.20	.53	2.0	..	SE	7	13	11	5		1
Guthrie Center	37.2	49.3	25.1	71	26	9	23	62	1.31	.55	3.5	T	S	15	7	9	4	1	1
Hampton	35.2	45.1	25.3	63	26	10	23	53	2.37	.84	5.5	.....	NW	9	15	7	6	....	....
Hedrick *‡	39.9			63	26	4	6	59	1.31	.70		.....	.....	24	3	4	3	....	....
Hopeville	39.1	49.9	28.1	67	26	10	23	57	1.48	.63	....	.....	NW	8	12	11	7	....	....
Humboldt	35.3	47.5	23.1	69	26	4	30	65	1.74	.58	10.0	.....	SE	16	8	7	7	1	2
Independence	36.8	47.1	26.4	62	21	13	23	49	1.71	.50	1.5	.....	NW	17	8	6	6	1	1
Indianola	39.4	50.8	28.1	66	26	11	23	55	.79	.32	.2	.....	NW	10	12	9	6	2	1
Iowa City (Veblen)	39.1	49.6	28.6	65	21	17	23	48	3.02	.82	4.0	.....	S	11	9	8	9	....	....
Iowa Falls	35.8	46.3	25.3	63	21	10	23	53	1.14	.33	3.0	... ..	NW	.....	.....	.....	4	....	....
Keokuk	42.8	52.1	33.5	65	8, 16	19	23	46	5.98	2.07	2.0	.....	SE	11	5	15	9	1	7
Keosauqua *a*	41.4	51.6	31.3	65	15, 26	17	23	48	5.00	2.10	1.0	.....	.....	.....	.....	.....	6	....	....
Knoxville	40.5	51.1	29.9	66	26	13	23	53	1.22	.52	T	.....	NW	18	2	11	3	....	....
Lamoni	40.2	51.3	29.0	67	26	13	1,22,23	54	2.37	1.03	T	.....	NW	16	4	11	7	....	1
Lansing	37.6	47.6	27.7	60	27	6	4	54	2.37	.60	.66	.....	.....	16	6	9	8	....	1
Le Mars	36.3	47.6	25.0	66	14	6	22, 23	60	1.26	.59	7.0	.....	S	16	5	10	3	....	....
Lenox	39.0	50.5	27.6	69	26	10	23	59	1.21	40	.7	T	NW, S	12	11	8	7	2	1
Linn Grove (Mt. Vernon)	37.6	47.1	28.0	62	21	15	4	47	1.99	63	3.5	.....	NW	14	3	14	7	....	....
Logan	37.0	48.8	25.2	68	14	7	28	61	2.09	.80	11.0	.....	S	22	4	5	4	1	....
Maquoketa	38.6	49.2	28.0	65	17	11	4	54	2.93	.85	4.0	.... ..	SW	16	6	9	9	....	1
Marshalltown	38.6	50.1	27.0	63	8, 25	12	23	51	.33	.10	....	.....	SE	8	11	12	6	1	1
Mason City	34.0	44.3	23.7	62	26	8	23, 30	54	.75	.35		.. ..	.....	.....	.....	.....	4	....	....
Mooar	40.6	51.4	29.7	67	8	15	24	52	5.33	1.62	....	.....	SE	10	2	19	7	....	....
Monticello	38.9	48.1	28.9	60	16, 21	11	3	49	2.43	.67	5.0	.....	SE	15	3	13	7	1	....
Mt. Ayr	39.7	51.6	27.8	67	26	11	23	56	2.15	.70	T	.....	NE	8	10	13	7	....	....
Mt. Pleasant *	42.2	....	....	62	26	19	23	43	5.60	2.21		.....	SW	17	5	9	10	....	....
Mt. Vernon*	38.6		.....	63	21	16	4, 23	47	2.23	.45		.....	.....	....	.....	....	8	....	....
Neola	37.9	48.9	26.9	67	14	2	22	65	.50	.40	1.0	.....	NW	4	20	7	2	....	....
New Hampton	38.8	50.3	27.2	67	21	11	23	56	1.61	.61	6.0	.....	NW	13	9	9	4	....	....
Newton	39.0	49.8	28.1	63	26	12	23	51	1.16	.44	.8	.....	SE	11	12	8	5	..	....
Northwood	34.6	45.3	23.9	62	26	9	23	53	1.03	.68	3.0	.....	NW	23	1	7	2	....	....
Odebolt	36.0	48.4	23.7	65	14	6	23, 28	59	2.50	1.33	11.0	.....	.....	11	10	10	5	....	2
Ogden	37.3	49.4	25.2	69	26	9	23	60	2.08	83	4.5	.....	SE	17	0	14	7	..	1
Olin *c*	37.2	46.9	27.4	60	22, 27	10	5	50	2.88	.85	2.0	.....	NW	.....	.....	.....	9	..	2
Omaha, Neb	39.2	49.3	29.2	68	8	11	22	57	1.15	.57	7.3	0	NW	12	10	9	8	..	....
Osage †	32.4		.....	.....	...	.....	.. ....		2.01	.76	6.0	.....	NW	10	9	12	5	1	4
Osceola	38.8	49.3	28.4	64	8	14	23	50	1.26	.53	T	..	SW	10	9	12	5	..	....
Oskaloosa	39.2	50.7	27.6	65	8	13	23	52	.87	.35	.8	.....	NW	15	3	13	6	....	....
Ottumwa	39.3	49.5	29.1	65	26	15	23	50	1.90	1.20		.....	W	3	19	9	4	....	....
Ovid	39.0	49.4	28.5	66	26	12	23	54	2.56	95	.8	.....	NW	10	5	16	8	....	6
Plover	35.8	47.2	24.3	65	16	5	23	60	.92	.42	5.0	.....	S	17	3	11	3	1	1
Portsmouth	35.8	50.0	21.7	67	8	5	23	62	1.68	.41	7.2	.....	NW	9	12	10	6	1	....
Primghar	35.6	47.9	23.3	68	19	5	23	63	1.20	.40	5.5	.....	SW	13	14	4	8	....	....
Red Oak	40.0	52.5	27.5	69	26	11	23, 28	58	1.71	.65	....	.....	.....	.....	.....	.....	5	1	....
Ridgeway	37.4	47.4	27.3	60	25	11	23	49	3.12	1.24	7.7	.....	S	16	5	10	8	....	1
Rock Rapids	34.2	47.8	20.6	64	7, 14	2	22, 23	62	.99	.40	4.0	.....	S	14	16	1	4	....	....
Rockwell City	34.2	44.4	24.1	62	8, 14	6	23	56	1.18	.65	7.0	.....	.....	20	3	8	3	....	....
Ruthven *a*	34.4	46.0	22.7	63	14, 15	5	23	58	1.50	.60	7.5	.....	NW	13	1	17	5	....	....
Sac City	34.8	44.2	25.5	61	14	6	23	55	1.82	.80	10.5	1.0	NW	9	12	10	5	....	....
Sibley *e*	33.3	45.3	21.3	64	14, 25	3	23	61	.50	.30	3.0	.....	NW	10	15	6	4	....	....
Sidney	39.0	48.8	29.1	67	14	12	22, 23	55	2.65	.66	3.6	.....	NW	14	10	7	6	....	1
Sigourney	38.9	50.8	28.8	64	8	14	23	50	1.85	.62	..	.....	NW	10	10	11	6	....	1
Spencer	33.4	45.5	21.4	61	21,24,25	4	22, 23	57	.74	.46	4.2	T	S	12	13	6	5	1	....
Spirit Lake	34.5	45.6	23.4	65	21	3	23	62	.87	.37	5.0	.....	N	7	7	17	4	2	....
Sioux City	35.9	46.0	25.8	67	14	6	22	61	90	.25	4.8	.....	S	11	10	10	8	....	....
Stuart	37.3	49.6	25.0	69	26	3	14	66	2.12	1.30	5.0	.....	NW	16	4	11	4	....	....
Toledo	36.9	47.1	26.7	63	21	12	23	51	1.30	.41	5	.....	NW	16	0	15	6	....	....
Thurman	39.6	51.1	28.1	68	14	11	22	57	1.74	.60	6.0	.....	NW	9	13	9	6	1	1
Villisca	38.4	49.8	27.1	71	26	11	23	60	1.80	.56		.....	SW	13	11	7	5	....	....
Vinton *	37.8	...	...	62	21	15	23	47	1.41	.49	T	.....	NW	18	6	7	7	..	....
Washington	38.4	49.4	27.5	65	8	14	23	51	2.67	.80	1.0	.....	NW	.....	.....	.....	6	....	....
Waterloo	37.2	47.3	27.2	63	21	12	23	51	1.89	.48	3.5	... ..	W	14	10	7	8	....	1
Waverly	37.6	47.3	27.9	62	21	13	23	49	1.9	.60	3.2	... ..	NW	11	15	5	9	....	3
Webster City	36.4	46.4	26.3	67	26	10	23	57	2.95	1.50	10.0	.....	SE	10	11	10	4	1	....
West Bend *	33.4			63	14, 25	8	28	55	.97	.50	4.5	... ..	S	6	14	11	3	....	....
West Branch *a*	38.0	47.6	28.4	61	20	16	22, 28	45	2.72	.91	.5	.....	NE, NW	13	10	8	7	....	....
Whitten *	34.8	...		63	8	11	28	52	.45	.30	.....	.....	S	20	6	5	2	....	3
Wilton Junction	38.8	48.6	28.9	65	20	16	4	49	3.58	1.14	4.0	.....	NW	13	3	9	6	....	....
Winterset	37.8	49.3	26.2	68	26	9	23	59	1.51	.55	.. ..	.....	.....	.....	.....	.....	5	....	..
Means	37.5	48.6	26.8	64.9	.....	10.6	.....	54.2	1.94	.....	3.7	....	NW	12	9	10	6	....	....

* Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from three readings. † Means determined from 7 A. M. and 7 P. M. observations. ‡ Received too late to be computed with means. *a* One day missing. *b* two days, etc.

DAILY AND MONTHLY PRECIPITATION FOR MARCH, 1898

STATIONS.	DATE																													Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Adair	T	T	....	....	....	T	....	....	....	.21	....	....	....	....	....	....	....	.18	....	....	....	T	....	....	....	..	.22	....	....	....	....	.61
Afton	....	....	....	....	....	....	....	..	....	....	.47	....	....	....	.18	....	....	.31	.50	....	....	T	....	....	....	..	.61	....	....	....	....	2.07
Albia	.02	T	....	....	....	....	....	....	....	.05	.50	.03	T	.04	....	....	....	.70	T	....	T	.25	..	....	....	.02	.45	..	....	....	....	2.06
Algona	....	....	....	....	.05	T	..	....	....	....	.05	....	....	T	....	....	....	.35	....	T	....	....	....	....	....	..	1 00	....	....	....	....	1 45
Alta (Hadden)	.02	....	....	.01	.04	....	....	....	....	.03	....	....	....	.03	....	..	....	.47	....	....	....	....	....	....	....	..	.75	....	08	....	01	1.44
Amana	.04	....	....	....	..	....	....	....	....	T	.65	.07	.06	....	.15	....	..	.41	.10	..	.02	.02	..	....	....	....	.74	..	..	....	....	2 26
Ames	....	....	....	....	....	....	....	....	....	.14	....	..	....	....	....	....	....	.14	..	....	....	.35	..	..	....	..	.15	.	....	....	.	.78
Ames (near)	....	....	..	....	....	....	.	..	..	.30	....	....	....	....	....	....	....	.30	....	....	T	..	..	....	....	....	.53	..	..	....	..	1 13
Atlantic	....	..	....	....	....	..	..	..	..	.30	....	....	..	.83	....	..	....	.27	..	....	T	..	..	....	....	..	.62	..	..	....	....	2.02
Audubon	..	....	....	..	....	....	....	....	....	.40	....	..	....	.56	....	....	..	....	....	....	.17	..	....	....	..	..	.40	..	....	....	....	1 53
Belknap	..	....	....	....	....	..	....	....	....	..	.50	....	.10	....	.05	..	....	.15	80	....	..	.25	..	....	....	....	.65	.15	..	..	....	2.65
Belle Plaine	.10	T	....	....	....	..	..	....	....	..	.50	.10	....	..	.25	....	..	.20	..	..	.20	.30	..	..	..	..	.40	..	....	..	..	2 05
Bonaparte	....	....	....	....	....	..	..	..	..	.97	..	....	.10	..	.25	....	.37	1.10	....	..	.44	....	....	....	....	.90	.95	....	....	..	..	5 08
Britt	T	T	....	....	....	....	....	....	..	....	.05	.04	....	....	....	..	..	.43	.03	T	T	.28	....	....	..	..	.10	....	....	....	..	93
Burlington	....	....	....	....	....	....	....	....	..	....	1.10	34	....	....	.28	....	....	.49	1.65	....	.03	.37	....	....	..	..	1.70	.17	..	....	.	6.13
Carroll	T	....	..	..	T	....	....	....	....	....	.65	..	..	.30	..	..	T	.26	..	..	.25	T	..	....	....	....	....	.55	..	..	..	2 01
Cedar Falls	....	....	..	....	....	....	....	....	..	....	.20	....	....	....	....	....	....	.30	....	....	....	T	.20	....	....	....	.44	.20	....	..	....	1 34
Cedar Rapids	.12	....	..	....	..	....	....	....	....	.52	....	.02	..	.23	....	..	.22	.08	....	....	....	.06	....	....	....	....	.46	....	....	....	....	1 71
Chariton	T	T	....	....	....	....	....	....	....	.30	.18	.04	....	.17	....	..	..	.30	.05	....	....	.06	....	....	..	....	.50	....	..	....	....	1 60
Charles City	.05	..	.	....	..	....	.	.	..	.65	....	T	..	.37	....	....	..	.37	....	....	....	T	....	....	....	T	.34	....	....	..	..	1.73
Clarinda	....	....	..	..	..	....	....	.	....	....	1.02	....	.28	..	15	....	.59	.28	.12	.01	.05	.11	....	....	....	.75	.84	....	....	..	....	4 73
Clinton	.53	....	..	..	..	..	....	..	..	.28	....	..	....	.10	..	..	..	.6	....	....	....	.04	....	....	..	....	.30	..	....	....	....	1 35
College Springs	....	....	....	....	..	....	....	....	....	....	T	..	....	....	..	..	....	.40	....	....	T	....	....	....	..	..	.40	....	..	..	....	80
Corning	....	....	..	....	..	....	....	....	....	.35	....	....	....	.40	....	....	....	.12	..	....	....	..	..	....	..	....	.30	....	....	..	..	1 17
Council Bluffs	....	....	....	....	....	T	....	..	....	....	.30	....	....	08	....	..	....	.47	....	..	.22	..	....	..	....	....	.56	....	....	....	....	1.70
Cresco	.07	....	....	....	.	T	....	....	....	....	93	.10	.27	..	.28	..	..	.72	.40	T	.03	.30	T	....	....	T	1.39	.21	..	..	....	4.85
Davenport	.21	T	..	....	....	....	....	..	..	.01	....	.54	....	....	....	....	....	....	....	....	....	.81	....	....	..	....	.96	.03	..	..	..	2 58
Decorah	.24	..	..	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Delaware	.07	....	....	....	..	....	..	....	..	.44	....	.10	....	....	.20	....	....	.61	....	..	.23	10	..	....	..	....	.37	..	..	..	..	2.12
Denison	....	..	....	..	T	..	..	....	....	.20	..	..	....	.35	..	..	..	.30	..	..	..	T	....	....	....	....	.50	....	....	....	....	1 35
Des Moines	T	T	..	....	T	..	.	..	....	.02	.41	..	....	..	.05	....	..	.18	T	....	T	.03	..	..	....	T	.64	.02	....	..	T	1 35
De Soto	.01	T	..	....	T	....	....	.	..	02	.43	....	....	.10	.	....	....	.34	..		.20	.03	....	....	....	....	.66	....	....	....	....	1 59
Dows	T	T			.03	....	....	....	..	.30	....	....	....	06			.15	.53	....	....	.20	T	....	....	....	....	.28	....	T	....	.02	1.57
Dubuque	.35	T	T	..	....	..	....		.01	..	.65	.01	.16	..	.46	..	....	.46	.07	..	.02	.30	....	....	....	T	.21	.08	..	....	....	2.78
Eldora	.05	....	..	.	....	..	....	..	..	..	.40	T	....				....	.50	..	..	....	....	....	.50	.30	....	....	....	....	....	....	1.75
Elkader	.24		....	..	....	..	....	....	....	..	.40	07	..	....	06	....	..	.74	....	..	....	.79	....	....	..	.08	29	..	....		..	2 67
Fairfield	T	T	....	....	....	....	....	....	..	T	.30	.05	.15	....	.14	..	....	.65	.20	T	..	.33	....	....	....		1.00	....	....			2.82
Forest City	T	....	....	....	.	....	....	..	..	.10	....	..	....	....	....	....	....	.43	....	T	.30	..	....	....	....	....	f	....			..	1 33
Fredricksburg		.09	....	....	....	....	....		..	....	.26	....	....		.26		....	.40	....		.38	....	....	....	....		8.			....	..	2.37
Ft. Madison	T	T	..	..	..	....	....	....		1.35	....	30	....	50	..	....	..	.61	1.05	..	....	T	....	....	....	1.15	1.25	....		..	..	6 21
Galva	....	....	....	....	....	....	....	....	....	....	....	..	....	.08	.	....	....	28	T	..	T	..	....	....	....	....	.45		T	....	.01	.82
Glenwood	....	....	..	....	T	....	....	....	..	....	.50	..	..	.20	....	....	.18	T	....	..	T	T	....	....	....	....	.30	....	....	....	..	1.18
Grand Meadow	22	....	....	....	..		..	....			.25	.07		....	.08	....	....	....	.37	..	....	.80	....	....	....	....	.56	....	..	..	....	2.35
Greene	..	..	....	....	..	..	....	....	....	....	.23	..	....	....	..	..		.43	..	....	..	.31	....	....	....	....	.67	.05	..	..	....	1.69
Greenfield	T	T	....	....	....	....	....	....	....	.30	....	....	..	.31	..	....	.12	.27	..	..	..	T	....	....	....	....	.69	..	..	..	.01	1.70
Grundy Center	.10	T	....	....	....	..	....	....		T	.20	..	..	....	....	....	..	.10	....	..	..	.27	....	....	..	....	.53	..	.	..	....	1.20
Guthrie Center	T	....	..	....	....	..	..	....	....	.32	..	....	.	.27	....	..		.17	....		..	T	....	....	..	..	.55	..		..	....	1 31
Hampton	....	....	....	....	T	....	..	....	..	.42	....	....		.07	....	.	.18	.58	....	....	28	....	....	....	..	..	.84	....		..	....	2 37
Hedrick	....	....	....	..	....	....	....	....	..	.53	..	.	..	..	....	..	....	.70	....	....	..	....	....	....	..	..	.08	....	..	..	....	1.31
Hopeville	T	T	....	....	....	....	....	..	.22	.11	....	....	....	....	.25	..	..	18	.08	....	....	01	....	....	..	..	.63	..	....	..	....	1 48
Humboldt	....	..	....	....	.04	....	....	....	....	....	.20	....	....	....	.03	....	....	.57	.01	..	....	.31	....	....	....	....	.58	....	....	....	....	1.74
Independence	.15	....	..	....	....	....	....	....	....	.25	....	T	..	.01	..	..	....	.40	....	..	.50	....	....	....	....	....	.40	....		....	....	1 71
Indianola	T	....	..	....	....	....	....	....	....	.04	.32	T	..	..	.13	....	..	.03	....	.06	....	T	T	....	....	....	.21	T	....	..	..	79
Iowa City	.12	....	....	....	....	....	....	....	....	.12	.70	.14	....	....	.48	....	....	.62	....	....	.06	.08	....	....	....	....	.70	....	..	..	....	3.02
Iowa Falls	....	....	....	....	T	....	....	..	....	....	.30	....	....	....	....	....	T	.33	....	....	.25	T	....	....	....	....	.26	....	..	....	....	1.14
Keokuk	T	T	..	..	....	....	....	....	T	.47	1.18	.08	.25	....	.20	..	....	1.09	.28	....	T	.36	....	....	....	T	2.07	....	....	....	....	5 98
Keosauqua	T	T	....	..	....	..	....	..	....	.40	.54	T	.16	....	..	..	..	1.00	.80	....	T	T	....	....	....	T	2.10	....	....	....	....	5.00
Knoxville	T	....	....	....	....	....	....	....	....	....	.52	T	..	....	....	....	....	.29	..	....	T	T	....	....	....	....	.41	....	....	..	....	1 22
Lamoni	T		.	....	....	....	....	.	....	.25	.02	....	..	....	.30	....	....	1.03	.11	....	..	.11	....	....	....	....	.55	....	....	....	....	2.37
Lansing	.29	T	..	..	....	....	....	....	....	....	.53	T	..	....	.11	..	....	.22	.05	....	..	.45	....	....	....	....	.60	.12	..	....	..	2.37
Larchwood	....	....	....	T	T	....	....	....	....	.10	.10	T	....	.80	.25	....	....	.05	....	....	..	....	....	....	....	....	T	....	....	....	....	1.30
Le Mars	....	....	....	....	....	..	....	....	....	.59	....	....	....	.30	....	....	....	.23	....	....	..	....	....	....	....	....	.09	....	....	..	.05	1.26
Lenox	T	....	....	.	....	....	....	..	....	.27	.07	....	....	.12	.11	..	T	.20	....	..	....	.04	..	....	....	....	.40	....	..	.		1.21
Linn Gr've (Mt V.)	....	....	....	....	....	....	....	....	..	.63	....	.21	....	....	.23	....	....	.40	....	....	.05	.04	....	....	....	T	.43	....	....	....	..	1.99
Logan	..	....	....	....	....	....	....	....	....	..	.50	.80	....	....	....	..	....	.19	....	....	....	....	....	....	....	....	.60	....	....	..	.	2 09
Maquoketa	.50	....	....	.	....	....	....	....	....	....	.85	....	.10	.40	....	..	..	.15	.37	T	.02	.24	....	....	....	....	.30	....	....	..	..	2 93
Marshalltown	.01	..	....		..	....	....	..	..	....	.10	T	..	....	.02	..	..	.08	T	..	.02	.03		....	....	....	.07	T	..	....	..	33
Mason City	....	..	..	....	....	....	..	....	....	..	.20	....	..	.15	....	....	....	.35		....	.05		..	..	....	....	..	T	..	..	T	.75
Millman	..	....	..	....	....	....	....	....	....	..	.45	....	....	..	..	..	..	.29	....	..	....	T	....	....	....	....	.56	....	..	....		1 30
Mooar	....	....	..	....	....	....	....	..	....		1.48	....	.30	....	.24	..	....	.56	.73	....	..	.40	..	....	..	....	1.62	....	....	.	....	5 33
Monticello	.20	..	....	....	....	....	..	....	..	....	.67	....	.30	....	....	.	....	43	.23		..	.17	..	..	..	....	.43	....	.	..	..	2 43
Mt. Ayr		....	....	....	....	....	....	....	....	.31	.10	..	....	.25	..	..	....	.52	.12	..	....	.15	....	....	....	....	.70	.	..	....		2.15
Mt. Pleasant	.02	....	....	..		....	....	.	....		.47	.14	....	..	.21	....	..	.45	2.13	.08	....	50	....	....	....	....	1.60	....	..	..	..	5 60
Mt. Vernon		....	....	..	..	..	....	....	....	40	.40	.20	....	....	.25	..	..	45	.08	....	.05	....	....	....	....	....	.40	....	....	....	....	2 23
Neola	....	....	....	....	..	..	....	....	....	.10	....	..	....	.40	..	....	T	T	....	....	....	....	....	....	....	....	....	....	....	....	....	50
New Hampton	....	....	....	....	....	....	..	....	....	....	.40	..	....	....	....	....	....	....	....	....	....	.61	....	....	..	....	.40	.20	....	....	....	1 61
Newton	T	....	....	....	....	....	..	....	....	.44	....	..	..	10	....	....	....	.20	....	....	....	.09	....	....	....	....	.33	....	..	....	..	1.16
North McGregor	.28	.05	T	....	....	....	....	..	....	....	.13	.05	....	..	.15	....	..	.28	.05	..	..	.50	.08	....	....	..	.12	.15	..	....	..	1.84
Northwood	....	....	....	....	....	....	....	....	....	..	..	..	..	....	....	..	..	.35	..	....	T	..	....	.	....	....	.68	....	....	..	..	1.03
Odebolt	..	....	....	....	T	....	....	....	..	..	.33	....	..	.28	....	....	..	.50	..	....	....	.06	....	....	....	....	1.33	....	T	....	..	2 50
Ogden	....	....		....	....	....	....	....	..		.20	..	....		.10	....	....	.20	.07	....	....	.83	....	....	....	....	.65	.03	..		....	2.08
Olin	....	....		....	..	....	....	....	..	.85	..	.11	....	.35	....	....	....	.22	.35	....	.10	.33	....	....	....	.07	52	....	.	....	....	2.88
Omaha (Neb.)	.01	..	....	..	..	..	..	..	....	.09	.17	....	....	.14	.04	..	....	.12	.01	....	....	T	....	....	....	....	.57	....	....	....	T	1.15
Osage	T	T	....	.	....	T	....	....	..		50	..	....	.12	....	....	....	.40	..	....	.23	..	....	T	....	T	.53	.	.	..	..	2.01
Osceola	....	T	....	....	..	....	....	....	....	.13	.22	....	....	..	.21	..	..	.17	..	....	....	..	....	..	..	T	.53	..	....	..	..	1 26
Oskaloosa	....	....	....	....	....	....	..	..	....	.12	....	T	....	.05	..	....	....	.08	.15	....	..	.12	....	....	....	....	.35	..	....	..	..	87
Ottumwa	....	....	....	....	....	....	..	..	....	T	T	....	....	....	....	....	....	50	....	....	..	.20	....	....	....	....	1.20	....	..	....	..	1.90
Ovid	T	T	..	....	..	....	....	....	..	.51	....	.06	..	.23	....	....	....	.95	.05	..	..	.12	....	....	....	.01	.63	....	....	....	....	2.56
Plover	....	....	..	....	..	....	....	....	....	....	T	..	..	....	....	....	....	.42	....	....	....	....	....	..	..	..	40	....	.10	..	T	92
Portsmouth	T		..	....	T	....	..	..	....	.20	.12	..	....	.41	....	....	....	.25			30	T	..	....	.	....	.40	....	....	....	T	1.68
Primghar	....		....	....	.10	....	....	....	....	..	.15	..	....	....	.10	..	..	.40	.05	T	T	....	....	....	....	....	.20	....	.10	..	.10	1.20
Reinbeck	....	..	....	....	....	....	....	....	....	....	..	....	..	....	....	....	....	..	..	..	....	....	....	....	....	....	....	..	..	....	....	3 68
Red Oak	....	....	....	....	....	..	..	....	....	.47	....	....	....	.25	....	..	....	.32	.02	....	..	T	....	....	....	....	.65	....	....	....	....	1.71
Ridgeway	.08	T	T	..	....	..	..	T	..	..	1.24	....	..	..	27	..	..	.73	....	....	....	.30	....	....	..	T	.41	09	....	..	T	3.12
Rock Rapids	....	....	....	T	..	..	....	....	..	.40	....	..	....	....	.35	..	....	.12	....	..	....	....	....	....	..	....	.12	..	....	....	....	.99
Rockwell City	....	....	....	....	....	....	..	..	..	....	.23	..	....	....	....	....	....	.30	..	..	....	....	....	..	....		.65		....	....	....	1.18
Ruthven	T	....	....	....	T	T	..	....	..	....	.05	..	....	....	....	....	....	.60	....	....	....	.15	....	....	....	....	.40	.30	....	....	....	1 50
Sac City	....	..	..	.02	..	..	....	.	..	.25	..	....	....	.50	....	....	..	....	....	....	.25	....	....	....	....	....	80	....	....		....	1.82
Sibley	T	..	..	....	T	.	....	....	....	T	.30	....	....	T	....	..	....	.16	..	T	....	T	..	....	....		3	.	..	....	.01	.50
Sidney	....	....	....	....	T	....	....	..	....	1.00	....	....	....	.32	....	..	.45	04	....	....	....	....	....	....	....	....	.54	....	.50	.	....	2.65
Sigourney	..	....	....	....	....	....	....	....	....	....	.62	T	.07	....	.09	....	....	.35	....	....	....	.10	....	....	....	....	.62	....	....	....	....	1.85
Sioux City	..	..	....	..	T	..	..	..	....	.11	.24	....	.	.25	.07	....	....	14	01	..	..	T	....	....	..	T	.07	..	T	..	.01	.90
Spencer	..	....		....	.02	T	....	....	....	....	.02	....	....	....	T	....	..	23	....	....	..	..	....	....	....	....	.46	T	..	....	.01	.74
Spirit Lake	....	..	....	....	..	..	..	....	....	....	.10	..	..	T	..	..	..	T	.10	....	..	..	....	....	....	....	.30	....	....	....	.37	.87
Stuart	....	.	....			....	..		..	....	.20	....	..		1.30			.32		....	..	..	....	....	....	....	.30	....	....	....	....	2.12
Toledo	.05	....	....	....		....	..	....	....		.41	..	..		.11	.		.23	.10	....	....	..	....	....	....	....	.40	....	....	....	..	1.30
Thurman	T	T	....	..	T	....	....	....	..	60	.20	.	....	.20	.02	....	T	30	....	....	T	T	....	....	....	..	.42		....	....	....	1.74
Villisca	....	....		....	....		..	....	....	.56		....		.36	....	....	....	.50	..	....		.01	....	....	....	....	.37	....	....	....	....	1.80
Vinton	....	....	....	....	....	..	..	....	....	36	....	....	.15	.18	....	....	....	.10	.08	....	....	05	....	....	....	....	.49	.	....	..	....	1.41
Washington	T	..	.	....	..	....	..	....	..	....	.72	....	.10	....	.18	....	....	.69	....	..	..	.18	....	....	.	....	.80	....	....	..	..	2.67
Washta	....	....	....	....	....		....	..	....	.	.05		....	....	.15	..	....	.19	....	....			....	....	....	....	.12	..	.02	....	T	.53
Waterloo	.09	....	....	....	....	....	....	....	....	....	.47	T	....	..	.07	....	....	30	....	....	.04	.44	....	....	....	....	.38	.10	....	....	....	1.89
Waverly	.05	..	....	....	....	....	....	....	....	....	.35	..	.	....	.15	....	....	.36	.04	....	.04	.24	....	....	....	....	.60	.08	....	..	..	1.91
Webster City	....	....	....	....	....	....	....	....	....	....	1.50	....	....	....	....	....	....	.50	T	....	....	.10	....	....	....	....	.85	..	T	....	T	2.95
West Bend	T	T	....	..	.05	....	....	....	....	....	T	..	....	T	..	..	....	.42	....	....	....	....	....	....	....	....	.50	....	....	....	....	97
West Branch	T	T	....	....	....	....	..	..	....	....	.71	T	.16	....	.41	....	....	.25	.12	T	.15	....	....	..	T	T	.91	....	....	....	..	2.72
Whitten	....	....	....	....	T	....	..	..	....	....	....	....	....	T	....	....	....	.30	....	....	T	....	....	....	....	....	.15	....	....	....	.	.45
Wilton Junction	.15	....	....	....	....	....	..	....	....	1.04	....	.18	....	....	....	....	..	1.14	....	T	.17	T	....	....	....	....	.90	..	....	....	....	3.58
Winterset	....	..	..	..	..	..	..	....	....	....	....	.45	....	....	....	....	.15	..	.28	.05	....	....	....	....	..	....	....	.55	....	..	..	1.51

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR MARCH, 1898.

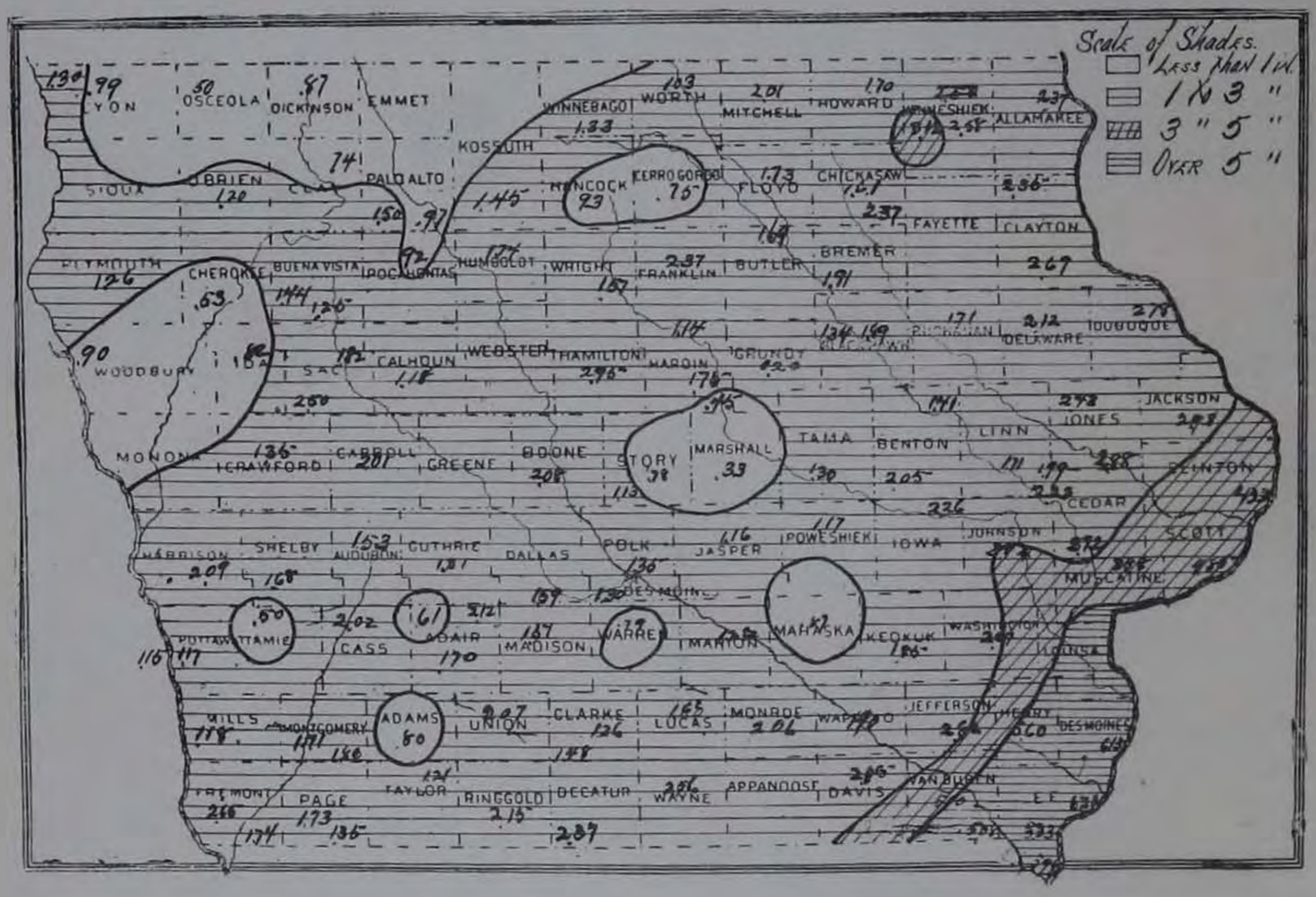
STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max	37	51	44	42	57	54	62	64	58	45	38	44	57	64	57	54	53	51	51	58	61	58	33	57	63	70	63	33	43	47	50	52.3
	Min	23	22	16	21	28	28	30	36	33	24	28	31	28	36	33	33	26	40	33	30	30	15	10	20	39	46	21	13	18	20	24	26.9
Albia	Max	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Min	24	25	27	23	23	27	32	32	30	27	32	33	30	35	36	38	28	41	37	33	34	20	13	22	31	38	22	17	20	24	27	25.2
Alta	Max	27	30	34	33	45	50	58	61	42	36	40	44	56	66	55	46	48	39	44	58	60	20	38	60	62	58	20	34	33	36	46	44 5
	Min	15	23	16	16	29	29	33	40	25	27	25	24	28	37	32	25	21	34	32	25	30	6	5	20	32	28	16	5	18	16	25	23.7
Amana	Max	32	34	38	32	40	45	52	56	50	45	38	40	53	59	58	56	51	47	47	51	61	53	35	52	60	59	54	34	43	43	53	47.6
	Min	24	24	27	17	23	33	29	36	38	25	34	32	27	34	39	39	29	41	39	27	29	24	15	19	31	47	30	18	18	19	22	28 7
Ames	Max	31	32	41	40	47	59	63	64	59	45	42	42	62	64	62	54	50	46	50	59	62	60	37	59	62	67	56	31	35	41	50	50.7
	Min	19	16	19	20	21	30	29	36	33	23	28	32	29	35	34	34	26	39	34	27	25	16	12	23	28	46	22	13	18	19	19	25.9
Atlantic	Max	29	50	46	44	44	56	62	63	46	42	38	41	58	66	55	52	51	46	50	57	58	18	34	57	60	61	24	31	37	45	45	47.3
	Min	23	27	12	21	31	27	34	40	27	20	27	25	28	40	34	27	23	39	31	26	24	14	9	21	32	35	21	11	16	17	27	25 5
Audubon	Max	30	30	45	40	45	54	61	55	50	45	43	43	57	65	55	50	48	45	52	58	62	55	35	57	62	68	32	28	33	40	48	48 4
	Min	19	18	15	18	25	27	33	39	29	22	25	24	27	33	27	30	35	37	31	27	25	10	10	35	31	32	18	10	17	19	28	25.0
Belknap	Max	32	34	45	38	45	51	60	62	50	48	42	44	50	58	58	60	55	58	58	53	58	32	47	60	60	65	41	40	46	55	60	50.4
	Min	22	25	27	24	25	29	32	36	43	30	34	35	31	34	40	40	31	40	44	44	36	32	15	15	30	47	40	20	20	29	28	31.5
Belle Plane	Max	30	38	40	40	43	43	52	58	45	42	42	45	52	56	55	53	46	45	42	54	60	32	28	50	58	56	36	30	38	37	52	45.0
	Min	20	18	25	20	15	28	25	32	35	19	28	30	23	32	30	30	20	34	35	25	24	20	8	12	22	33	28	12	12	11	17	23.3
Bonaparte	Max	32	33	37	34	44	51	60	65	47	48	41	39	58	61	61	61	55	59	61	53	60	55	35	51	61	64	57	38	45	44	53	50 4
	Min	25	24	25	22	24	27	28	38	39	28	35	32	31	36	41	39	29	43	40	33	32	25	17	21	30	48	25	22	22	28	25	30.1
Britt	Max	32	33	33	33	42	42	57	61	47	40	38	45	51	60	56	48	46	40	41	54	60	40	35	55	61	65	30	30	30	34	47	44.7
	Min	15	24	16	14	25	30	32	35	25	20	25	24	27	35	30	29	21	33	31	24	26	12	7	20	30	30	18	8	9	11	24	22.9
Burlington	Max	32	35	35	34	45	52	59	65	63	49	55	40	55	61	62	65	55	56	61	53	60	57	37	49	61	63	63	50	45	44	52	52.0
	Min	25	24	27	21	23	27	29	42	44	32	36	32	28	37	44	44	32	43	43	36	42	28	19	24	33	48	35	23	25	28	26	32.3
Carroll	Max	28	30	41	39	44	54	62	65	45	42	43	42	62	67	57	52	50	48	50	64	62	21	38	58	62	65	24	20	30	40	45	46.8
	Min	18	17	18	16	19	20	35	40	30	21	25	21	35	40	34	30	24	36	28	25	27	19	8	23	30	35	18	10	15	15	20	24.6
CedarFalls	Max	33	35	39	38	42	47	45	58	58	48	42	40	56	60	59	55	54	45	43	56	56	32	36	40	61	57	46	32	40	46	52	46 8
	Min	20	25	25	14	20	31	35	40	35	22	31	35	30	25	35	35	27	38	37	40	38	22	22	14	35	44	28	11	14	18	21	28.2
Cedar Rap	Max	42	32	37	31	43	48	51	58	53	45	37	40	56	61	60	56	52	53	47	53	63	57	34	53	61	62	61	33	41	46	52	48.8
	Min	23	22	25	14	22	30	26	37	34	24	33	32	29	35	43	41	30	40	35	28	30	24	16	23	33	49	25	18	21	22	25	28 7
Charlton	Max	34	35	41	38	48	55	60	63	67	46	39	42	58	62	57	56	52	52	52	54	60	57	34	54	60	68	64	34	45	42	51	50.6
	Min	26	27	28	24	27	29	34	40	39	29	32	34	32	42	37	38	30	42	38	35	36	21	14	24	32	48	23	18	21	24	29	30 8
Charles Cy	Max	32	32	37	32	40	45	55	60	50	44	40	39	50	58	55	53	49	45	41	51	60	53	33	53	59	57	53	28	34	38	47	45.9
	Min	22	25	20	13	25	32	22	37	33	21	29	31	29	36	34	33	25	36	25	26	24	19	11	22	32	43	23	13	16	16	24	25 7
Clarinda	Max	32	34	48	48	51	59	64	68	56	43	40	44	61	67	60	55	54	53	54	60	66	40	37	58	62	72	37	36	50	48	51	51 9
	Min	26	26	20	26	34	32	31	43	33	28	31	30	30	34	39	37	30	43	38	36	40	15	11	23	33	37	23	16	23	26	30	29.9
College Sps	Max	38	33	41	47	48	57	64	66	64	44	39	42	53	67	57	47	54	53	54	60	66	59	35	55	62	72	50	35	45	46	50	51.8
	Min	23	26	19	22	31	28	31	39	31	25	28	27	27	39	32	33	27	40	33	33	33	13	11	22	29	45	19	13	20	22	22	27.2
Corning	Max	43	44	47	47	47	57	47	66	57	45	39	37	58	66	58	57	52	54	53	58	63	63	36	53	62	69	49	36	48	45	48	51.7
	Min	23	22	17	23	31	29	33	41	34	25	29	29	30	38	34	32	27	28	35	33	33	14	12	23	31	47	21	14	20	21	28	27.6
C'cil Bluffs	Max	43	36	47	48	50	58	68	69	53	45	39	47	60	69	59	58	51	48	55	60	65	25	36	64	67	59	37	38	45	45	50	51.4
	Min	23	27	20	24	35	33	33	41	31	25	29	27	28	42	33	33	28	40	34	34	19	11	12	30	34	30	18	12	22	21	34	27.8
Cresco	Max	31	31	37	35	39	44	50	55	46	44	36	37	47	57	56	49	50	40	40	51	59	26	35	53	58	55	54	27	33	39	46	43.2
	Min	20	22	22	12	23	30	30	37	28	24	29	30	29	33	38	33	23	31	33	25	27	16	10	21	31	41	22	12	15	17	23	25 5
Davenport	Max	32	34	34	31	41	49	55	60	58	46	52	37	55	58	60	60	54	52	55	51	60	57	36	43	58	62	61	36	43	42	51	49.3
	Min	26	21	24	22	20	32	28	42	42	33	34	33	29	37	44	42	32	42	40	36	37	28	22	26	35	48	27	22	25	28	29	31.8
Decorah	Max	33	32	38	36	43	46	53	55	52	47	37	42	50	58	57	53	52	43	41	53	63	48	35	43	54	58	57	29	35	41	50	46.3
	Min	22	26	28	8	20	30	31	29	35	22	29	31	30	31	43	35	28	35	34	25	25	18	12	33	41	45	28	12	17	18	21	27.1
Denison	Max	30	32	32	38	36	55	58	60	68	40	47	45	62	65	58	65	58	51	55	57	60	15	43	63	65	65	45	65	63	52	50	51.5
	Min	15	18	20	16	16	15	20	21	28	22	27	24	23	40	31	29	25	21	31	29	28	7	7	21	31	30	16	16	19	6	24	21.5
Des Moines	Max	34	34	45	37	48	54	62	64	57	46	41	42	59	64	59	56	50	48	52	58	60	56	36	56	62	67	39	31	44	45	50	50.1
	Min	23	29	22	26	27	33	35	42	35	27	32	34	32	40	36	38	29	41	36	32	30	15	13	23	35	39	22	16	20	22	29	29.4
De Soto	Max	32	33	45	40	50	55	61	64	55	45	40	45	57	63	58	54	51	49	51	58	62	25	37	53	62	70	34	31	38	40	51	48.7
	Min	21	28	18	20	28	27	31	39	32	29	29	35	30	36	35	34	27	40	35	26	26	15	11	22	31	49	20	14	15	17	20	27.2
Dows	Max	24	32	36	32	42	49	58	61	56	44	39	40	55	63	60	63	48	36	44	56	61	51	36	58	61	64	42	27	31	38	48	47.0
	Min	18	24	13	15	25	29	32	38	30	21	26	26	25	35	30	28	20	24	32	24	25	15	8	20	30	40	18	9	12	14	24	23 5
Dubuque	Max	32	31	35	33	39	46	52	53	51	44	35	38	53	56	59	56	53	46	45	50	60	54	35	50	58	60	59	33	41	42	49	46.7
	Min	25	19	13	15	18	31	27	40	35	27	31	32	29	36	42	38	30	39	34	30	31	25	18	24	34	47	26	19	24	21	26	28.5
Eldora	Max	30	32	44	41	45	40	38	48	33	35	34	41	54	45	50	54	45	38	40	45	60	56	49	40	43	48	45	51	55	60	50	44.8
	Min	2	20	16	19	28	30	26	30	20	24	24	31	32	30	32	35	31	30	20	22	28	27	24	20	22	29	26	25	24	30	27	25 8
Elkader	Max	35	39	40	42	45	49	53	55	51	48	37	39	54	60	60	58	57	45	45	53	65	39	37	55	60	58	45	33	42	44	51	48.2
	Min	25	20	18	10	18	28	26	37	30	21	30	30	29	30	42	38	27	36	30	23	24	22	14	22	32	45	37	17	19	17	20	23.4
Fairfield	Max	31	32	40	35	44	53	60	64	54	48	40	40	59	62	62	59	57	51	51	53	63	55	36	51	62	64	62	37	45	45	53	50.6
	Min	25	25	27	21	22	30	27	35	37	27	34	31	28	31	34	33	28	42	39	31	31	25	16	20	29	47	28	20	20	25	23	29.1
Forest City	Max	31	31	31	35	42	48	56	65	61	39	37	39	52	59	57	50	47	41	40	54	60	42	36	46	61	63	33	30	32	35	43	45.0
	Min	15	24	15	15	24	30	34	35	27	25	25	25	28	45	10	30	21	33	32	26	28	14	8	18	25	33	18	8	13	27	23	23.7
Galva	Max	34	31	34	30	45	52	61	63	53	37	40	45	57	67	57	48	50	44	46	59	62	51	39	62	62	58	28	37	36	41	46	47.6
	Min	16	24	17	16	31	30	35	41	26	21	26	37	27	38	32	29	22	35	31	27	32	6	7	22	33	27	18	6	6	11	28	24 5
Glenwood	Max	43	39	48	55	49	63	65	68	60	45	39	45	67	68	61	56	52	50	53	61	66	63	40	60	64	66	38	38	46	49	52	53.8
	Min	22	26	21	27	34	31	36	44	30	27	27	26	31	43	34	32	26	40	33	34	32	10	11	26	33	37	17	13	20	22	32	28.3
Greene	Max	32	32	37	38	46	50	59	61	54	46	39	42	57	60	57	52	50	45	43	57	62	52	37	57	62	58	55	29	35	40	48	48.1
	Min	20	24	18	15	24	30	31	36	31	22	28	30	28	34	33	31	23	36	34	25	25	19	10	22	30	41	21	12	15	17	24	25.5
Greenfield	Max	35	33	47	43	51	57	63	66	52	46	40	45	59	68	58	53	54	49	52	59	65	57	36	58	63	73	47	33	45	44	52	51.7
	Min	22	24	17	20	28	27	32	40	28	24	28	19	28	32	32	30	24	39	33	29	30	12	8	20	30	47	20	10	17	18	30	25.7
Grinnell	Max	35	32	39	38	42	48	56	60	60	47	42	41	55	60	58	55	53	55	49	51	60	58	32	53	61	60	60	41	40	50	49.1
	Min	22	24	26	20	22	31	32	38	36	25	30	32	29	36	37	38	26	39	36	31	30	19	11	21	30	47	15	16	20	20	30	28.0
Grundy C'r	Max	34	32	37	35	44	51	58	61	50	45	37	40	56	62	58	55	49	45	45	51	61	54	34	57	62	59	37	28	35	39	54	47.8
	Min	21	24	18	18	18	30	29	35	29	25	28	30	29	33	30	34	24	36	32	25	26	15	11	21	21	37	20	13	18	18	24	24.9
Guthrie C'r	Max	37	32	43	41	48	55	61	64	57	45	42	44	57	65	57	52	51	51	51	60	64	21	36	57	63	71	44	32	36	41	50	49.3
	Min	20	23	15	17	29	28	34	38	31	20	28	28	28	35	34	28	23	34	35	25	24	13	9	22	31	42	19	10	15	15	26	25.1
Hampton	Max	32	30	37	34	43	49	57	62	43	46	38	40	53	60	57	51	48	43	43	55	61	24	34	56	62	63	30	27	32	38	49	45.1
	Min	22	25	17	16	25	31	33	39	30	25	28	30	20	33	32	29	23	36	32	30	26	14	10	22	32	35	20	11	17	18	24	25.3
Hopeville	Max	32	31	44	42	48	54	61	62	56	44	36	43	57	64	57	56	52	53	51	54	61	56	36	54	61	67	45	34	43	44	49	49.9
	Min	23	27	19	23	29	28	32	36	34	27	29	32	30	39	35	33	17	41	35	33	33	15	10	22	31	45	20	14	21	22	26	28.1
Humboldt	Max	32	33	36	34	42	47	57	62	55	42	38	42	54	63	58	58	47	45	47	57	62	53	36	59	63	69	33	32	33	38	47	47 5
	Min	18	25	16	14	26	29	34	38	27	20	26	22	28	37	33	22	23	36	23	27	25	13	8	23	33	31	18	8	8	4	23	23.1
Independ'c	Max	32	33	38	39	40	45	52	55	50	46	40	39	54	60	58	56	53	49	45	54	62	55	33	54	60	57	38	34	38	41	51	47.1
	Min	24	25	23	16	17	30	27	33	34	21	30	29	26	33	38	34	25	37	36	24	24	21	13	17	28	45	33	14	19	18	23	26 4
Indianola	Max	36	39	44	40	47	54	62	64	62	49	40	41	60	63	59	55	54	49	50	55	61	57	36	57	61	66	62	32	44	44	52	50.8
	Min	21	28	22	21	26	29	31	41	33	24	30	23	29	39	35	34	26	41	35	32	33	17	11	22	34	49	21	15	19	19	27	28.1
Iowa City	Max	33	38	37	35	45	49	57	61	53	43	38	40	57	62	60	57	55	48	48	53	65	55	36	53	63	61	57	35	44	43	56	49.6
	Min	28	24	27	19	26	30	26	34	40	24	32	29	28	30	42	41	29	40	38	27	29	24	17	19	29	46	29	19	19	21	22	28.6
Iowa Falls	Max	33	30	37	34	43	48	57	61	50	50	40	42	54	61	57	54	50	48	46	53	63	32	35	55	60	62	36	27	27	38	50	46.3
	Min	19	24	16	16	25	28	31	35	28	22	28	29	28	35	41	30	21	37	31	24	25	12	10	20	30	35	20	11	18	26	27	25 3
Keokuk	Max	34	34	36	37	47	52	62	65	63	49	41	40	58	60	61	65	54	65	65	54	58	57	37	52	60	64	64	32	45	44	52	52.1
	Min	27	27	28	24	25	28	32	41	44	32	37	32	30	37	47	44	32	45	45	39	45	28	19	26	32	48	33	25	28	30	31	33 5
Keosauqua	Max	32	34	35	38	42	46	62	..	55	48	41	40	60	62	65	61	59	60	61	60	60	61	39	52	60	65	60	40	48	46	56	51 6
	Min	27	25	25	34	25	27	26	..	42	27	36	32	32	42	45	40	31	44	40	35	33	25	17	22	32	49	30	23	21	28	24	31 8
Knoxville	Max	31	36	49	40	46	54	61	64	58	46	41	42	40	63	60	56	54	51	50	51	61	55	38	55	61	66	65	34	46	45	64	51.1
	Min	24	26	28	23	26	30	33	40	36	27	32	37	31	39	36	37	28	42	36	32	33	20	13	23	32	50	23	17	33	23	27	29.9
Lamoni	Max	36	32	44	44	50	55	62	64	57	44	38	43	58	63	58	56	51	55	55	55	60	57	34	54	60	67	61	35	46	44	52	51.3
	Min	13	28	20	25	30	28	31	38	36	28	31	33	30	38	39	34	28	42	36	35	34	13	13	22	31	49	22	17	23	23	27	29 0
Lansing	Max	34	35	38	38	44	49	54	56	52	50	40	38	52	56	58	57	55	41	44	50	52	48	36	53	57	59	60	37	39	46	48	47.6
	Min	26	26	14	6	17	20	26	40	38	22	30	32	32	30	42	40	29	37	36	25	25	28	16	23	37	47	32	17	19	18	20	27.7
Le Mars	Max	29	33	34	40	44	50	62	63	58	37	37	54	37	66	56	49	49	47	52	56	62	50	41	62	65	51	31	36	37	45	45	47.6
	Min	12	19	20	28	31	30	36	41	24	22	21	26	19	41	41	33	24	33	31	28	30	6	6	24	35	27	16	9	20	13	30	25.0

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR MARCH, 1898—CONTINUED.

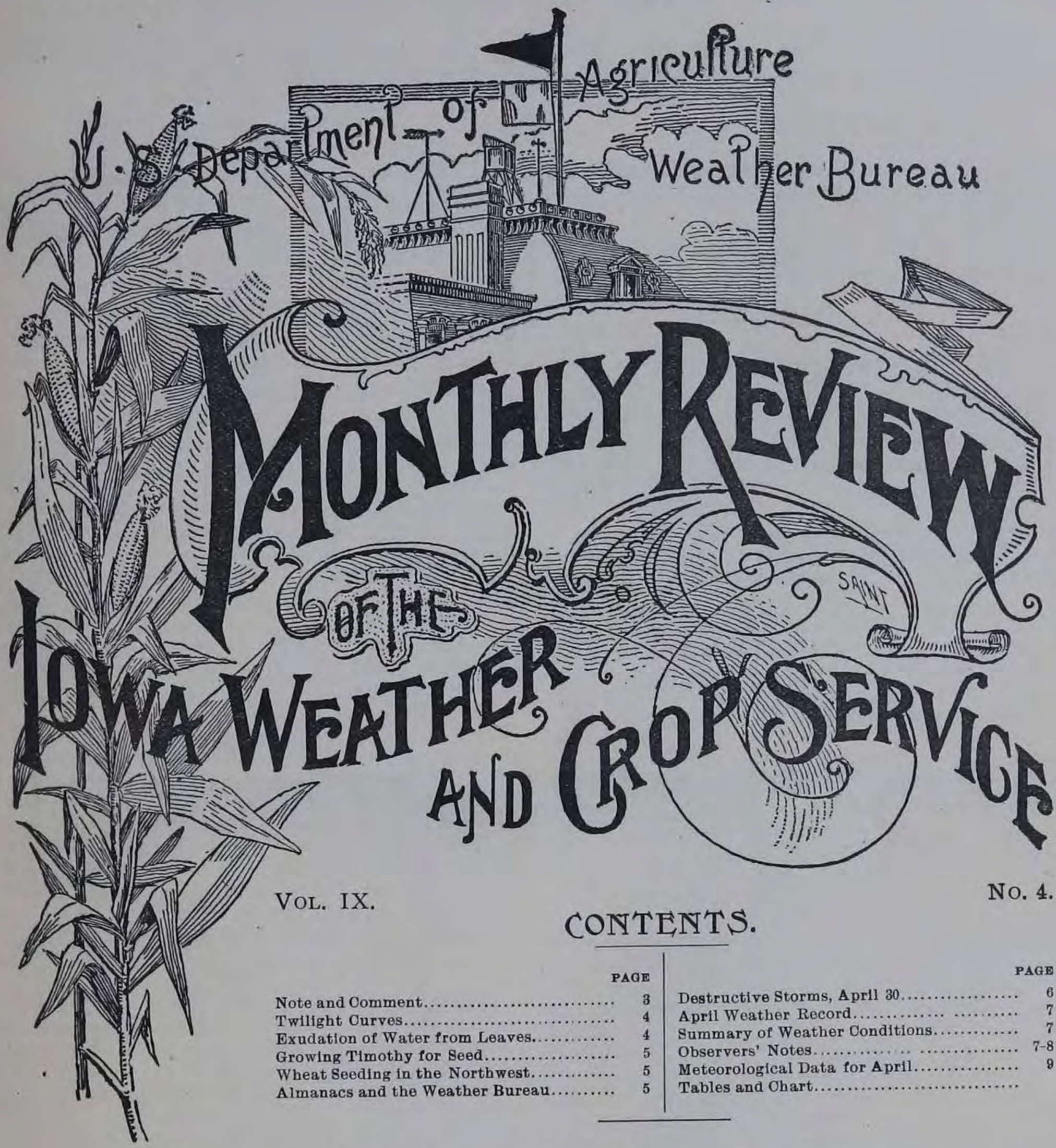
STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Lenox	Max.	38	31	44	43	46	55	61	64	58	44	38	42	57	63	58	54	51	51	53	56	62	58	35	56	61	68	48	35	45	43	49	50.5
	Min	22	27	18	23	31	28	32	39	32	25	28	30	29	39	34	32	26	40	34	33	33	13	10	20	30	46	20	13	21	22	26	27 6
†LinnGrove	Max.	32	31	37	37	42	45	50	53	45	33	47	39	53	57	58	55	52	45	46	51	62	42	35	51	60	57	50	38	42	44	57	47.1
	Min.	24	21	23	15	20	30	29	36	34	27	32	31	26	33	40	37	28	37	39	27	33	20	16	21	31	44	25	18	21	22	28	28.0
Logan	Max.	32	37	45	44	48	56	63	66	47	38	41	43	45	68	67	54	52	44	51	60	65	23	42	62	64	56	30	33	40	45	51	48.8
	Min.	15	25	27	16	19	29	33	39	32	21	22	20	39	40	27	21	23	40	31	40	27	9	9	20	32	28	24	7	14	20	32	25.2
Maquoketa	Max.	34	34	40	31	49	47	48	50	51	54	48	40	51	56	54	60	65	47	37	51	62	60	36	50	59	60	60	52	45	44	50	49.2
	Min.	23	20	14	11	15	28	20	32	35	38	32	31	30	32	36	35	30	37	34	28	29	28	19	21	31	45	43	23	21	20	25	28.0
Marshall't'n	Max.	32	32	42	36	46	52	60	63	57	47	41	41	60	62	60	57	51	47	43	55	63	55	36	57	63	61	59	32	40	44	53	50.1
	Min.	22	25	23	21	25	31	31	40	33	23	30	32	29	31	32	35	26	39	35	26	26	18	12	23	34	45	21	15	18	17	23	27.0
Mason City	Max.	33	33	34	33	43	46	55	60	42	42	40	42	51	59	55	49	46	40	42	57	61	24	35	55	60	62	30	29	31	36	49	44.3
	Min.	18	24	18	12	24	24	32	36	30	22	27	30	29	34	30	32	23	34	33	25	23	16	8	22	31	37	20	10	13	8	11	23.7
Monticello	Max.	35	38	36	32	41	44	48	52	48	45	50	39	53	56	58	60	58	45	48	52	60	52	37	51	58	58	58	35	44	43	52	48.1
	Min.	25	22	11	13	19	25	26	35	35	25	32	32	28	35	35	36	42	36	40	27	28	50	12	20	28	45	52	19	20	19	23	28.9
Mooar	Max.	32	33	38	36	46	50	61	67	54	45	44	43	58	64	63	61	56	59	51	54	59	54	39	52	60	64	58	40	53	45	51	51.4
	Min.	23	25	28	20	15	20	21	31	44	30	36	35	30	36	40	35	30	44	46	33	37	28	19	15	25	48	36	23	19	29	21	29.7
Mt. Ayr	Max.	37	31	45	45	49	57	64	65	57	44	37	43	59	64	58	56	53	54	54	55	62	58	36	56	62	67	60	36	45	45	51	51.6
	Min.	23	27	18	23	29	26	32	38	34	28	29	31	26	37	31	35	28	41	34	33	35	14	11	20	30	46	20	14	22	23	25	27.8
Neola	Max.	33	38	45	41	48	55	58	66	52	47	58	57	58	67	57	52	50	48	51	42	38	28	38	56	60	48	23	41	50	55	58	48 9
	Min	22	12	19	21	24	31	28	26	20	35	40	39	38	31	29	22	32	30	29	28	16	2	20	38	40	34	7	15	32	37	36	26 9
Newton	Max.	33	34	42	36	45	51	59	62	54	48	40	42	58	61	59	55	52	49	49	54	62	56	35	55	62	63	60	31	43	43	51	49 8
	Min.	23	25	26	22	25	31	31	38	34	27	31	33	31	37	36	36	26	40	36	29	30	14	12	22	30	45	22	15	19	19	25	28.1
N. Hampton	Max.	36	37	37	46	48	59	57	63	55	52	49	45	58	61	60	56	64	47	47	52	67	29	41	56	61	59	57	34	41	43	50	50.3
	Min.	22	25	23	16	25	32	31	38	33	25	30	30	29	38	43	34	24	40	35	26	30	20	11	20	30	43	28	15	12	13	24	27.2
Northwood	Max.	33	31	34	41	44	46	55	60	45	39	38	41	50	59	55	48	46	39	40	54	61	48	36	56	61	62	37	30	31	34	47	45 3
	Min.	18	23	12	24	18	29	31	35	30	23	19	29	29	33	30	32	23	33	31	24	25	14	9	20	29	36	20	10	14	15	26	23 9
Odebolt	Max	39	30	35	36	45	53	61	63	59	41	40	43	57	65	58	53	50	43	48	58	62	54	38	60	60	58	32	34	37	41	46	43.4
	Min.	16	24	17	16	17	30	35	41	21	24	26	25	28	32	32	26	32	37	31	28	28	9	6	22	33	31	18	6	10	8	25	23 7
Ogden	Max.	35	31	44	39	47	54	62	63	59	44	42	42	60	65	58	51	49	47	51	60	60	64	36	56	62	69	27	31	35	41	48	49 4
	Min.	19	26	18	19	27	30	32	38	30	24	27	31	26	36	32	31	23	38	23	28	30	15	9	21	31	30	19	10	16	16	27	25.2
Omaha, Neb	Max.	39	34	45	45	47	56	65	68	57	41	36	44	59	68	59	52	49	47	51	58	67	27	41	59	62	51	32	33	39	45	46	49.3
	Min.	23	27	24	25	36	33	38	44	30	29	28	29	32	43	36	36	28	39	34	36	27	11	11	25	36	32	18	13	23	25	34	29.2
Osceola	Max.	31	30	45	42	49	56	62	64	50	45	38	40	59	63	59	57	53	51	55	60	59	40	36	53	53	60	40	38	45	45	51	49.3
	Min.	23	27	21	23	28	32	34	38	35	27	30	33	30	35	35	36	28	42	37	30	30	21	14	31	33	26	22	15	19	22	25	28 4
Oskaloosa	Max.	30	32	42	38	46	53	62	65	52	48	39	43	60	63	60	58	56	50	48	55	61	54	36	55	63	64	59	33	45	44	54	50.7
	Min.	21	25	26	22	24	29	30	36	35	23	32	32	28	37	35	28	26	41	36	28	28	19	13	20	29	40	22	17	18	22	22	27 6
Ottumwa	Max.	33	41	41	40	45	54	62	65	55	47	41	41	62	62	62	61	54	54	49	52	53	34	36	52	60	65	35	35	46	45	53	49 5
	Min.	25	27	29	23	25	30	30	37	36	26	31	32	30	29	36	41	30	40	38	32	32	21	15	19	31	40	23	20	32	27	25	29.1
Ovid	Max.	30	32	45	43	48	57	63	61	57	46	41	41	60	64	61	62	54	53	50	54	59	28	37	39	60	66	32	38	45	49	52	49.4
	Min.	22	25	26	22	27	26	33	39	33	25	31	32	30	38	35	35	27	41	38	32	32	17	12	22	30	46	22	16	21	24	25	28 5
Plover	Max.	32	34	32	36	47	46	59	63	51	36	40	46	64	62	60	65	48	44	42	60	64	36	42	60	64	62	32	28	30	30	48	47.2
	Min.	15	23	14	13	26	26	28	38	29	24	25	24	23	38	32	30	28	35	32	25	25	20	5	22	30	45	15	8	18	10	28	24.3
Portsmouth	Max.	32	30	50	46	48	58	65	67	52	33	48	45	60	66	58	56	60	58	56	60	64	20	41	60	61	62	20	38	46	50	50	50.0
	Min.	18	14	10	16	29	25	28	34	24	19	24	18	20	38	28	26	20	36	29	28	26	9	5	17	28	30	16	4	13	13	27	21.7
Primghar	Max.	37	33	33	35	46	48	59	60	59	39	36	22	25	26	39	29	28	21	33	30	29	16	14	5	20	33	26	14	7	19	18	27	23.3
	Min.	11	21	17	16	28	29	33	41	22	26	22	25	26	39	29	28	21	33	30	29	16	14	5	20	33	26	14	7	19	18	27	23.3
Red Oak	Max.	40	33	47	46	47	59	65	68	62	46	41	42	60	63	60	56	54	51	53	60	64	61	37	58	62	69	45	33	42	45	57	52.5
	Min.	23	27	15	22	33	30	34	40	31	26	30	30	30	40	35	32	27	41	33	30	29	13	11	20	31	43	21	11	18	19	26	27.5
Ridgway	Max.	36	41	46	45	48	50	53	56	46	49	41	39	47	55	57	51	53	40	40	51	59	47	36	54	60	57	50	31	37	45	49	47.4
	Min.	26	28	27	18	27	30	31	37	34	24	30	33	30	31	40	34	24	33	34	24	28	18	11	21	30	43	30	13	17	18	22	27.3
Rock Rap	Max.	30	40	38	38	46	50	64	62	60	50	58	43	54	64	56	52	46	36	42	38	62	62	40	48	45	48	28	46	40	48	48	47.8
	Min.	12	14	14	12	18	24	34	36	32	20	15	20	22	36	32	26	30	32	28	22	18	2	2	16	22	25	14	4	14	20	22	20.6
Rockwell C.	Max.	29	31	39	33	44	48	61	62	42	40	41	44	53	62	52	48	48	44	43	54	56	13	34	58	60	62	22	32	36	39	45	44 4
	Min.	17	19	16	14	29	27	32	34	30	25	26	24	27	35	33	28	22	34	33	26	28	10	6	20	31	39	18	7	18	10	25	24.1
Ruthven	Max.	38	29	29	33	43	46	58	59	59	41	37	42	52	63	63	54	45	45	40	56	..	58	35	60	60	57	34	32	32	37	43	46.0
	Min.	14	21	16	15	27	27	30	39	25	22	18	25	27	33	30	30	20	32	30	30	..	6	5	22	32	32	16	11	10	15	21	22.7
Sac City	Max.	30	31	31	36	38	40	60	60	40	38	40	41	50	61	56	54	52	47	52	60	56	38	37	43	58	60	24	28	31	40	45	44.2
	Min.	21	25	20	24	28	30	32	40	28	20	26	32	28	38	35	33	32	33	35	36	32	9	6	21	29	30	18	7	11	9	24	25 5
Sibley	Max.	35	34	34	37	43	..	62	61	47	38	37	41	52	64	54	44	45	42	40	57	..	..	..	3	..	64	24	15	5	17	12	27	21 3
	Min.	13	20	14	14	27	..	26	42	20	19	18	14	23	37	32	29	20	31	29	24	..	..	..	..	..	60	25	36	45	46	49	48.8
Sidney	Max.	30	32	45	46	46	56	63	66	45	44	36	43	58	67	57	58	52	50	52	59	66	20	37	58	61	65	25	36	45	46	49	48.8
	Min.	23	27	22	25	25	30	36	43	33	28	28	29	33	42	35	37	28	41	35	36	35	12	12	25	33	40	18	15	23	25	29	29.1
Sigourney	Max	32	34	40	38	46	52	59	64	55	49	39	42	60	61	60	58	51	51	50	54	63	55	36	53	62	62	60	33	45	55	55	50.8
	Min.	24	24	26	20	22	30	27	36	39	25	32	32	27	36	38	36	28	38	37	29	32	22	14	20	35	43	24	18	22	22	35	28.8
Sioux City	Max.	30	35	35	41	44	54	65	65	43	36	35	47	56	67	'57	48	47	40	46	58	62	21	42	64	64	32	28	38	38	44	45	46.0
	Min.	20	18	20	21	21	32	32	36	26	23	25	24	28	45	35	27	24	39	32	32	38	6	9	23	34	28	17	11	24	17	31	25.8
Spencer	Max.	30	32	33	34	45	48	57	60	49	36	38	46	54	56	55	47	42	39	45	49	61	54	38	61	61	45	26	46	36	39	41	45.5
	Min.	12	20	15	14	25	25	32	39	24	20	24	24	25	34	31	26	19	32	19	21	25	4	4	18	38	23	15	5	10	15	25	21.4
Spirit Lake	Max.	34	31	31	34	44	48	60	60	41	28	35	42	55	64	55	59	60	49	39	55	65	32	39	61	60	45	25	33	38	46	45	45.6
	Min	17	19	16	17	27	29	34	40	23	22	24	24	27	38	35	35	19	29	28	26	30	5	3	21	32	21	18	15	15	12	23	23.4
Stuart	Max.	43	31	43	39	47	55	60	63	58	45	40	42	58	62	58	53	51	49	50	57	60	56	34	55	61	69	51	30	26	34	48	49.6
	Min.	17	25	15	20	27	28	28	37	32	25	27	31	30	3	32	33	25	38	33	29	20	11	10	22	31	45	19	11	17	28	27	25.0
Toledo	Max.	36	34	39	33	42	48	55	60	46	48	40	41	55	60	58	59	51	46	50	53	63	31	34	54	61	56	35	33	42	44	54	47.1
	Min	25	23	25	20	23	31	30	38	35	22	32	30	29	35	34	37	25	40	30	25	25	22	12	20	21	46	26	15	17	15	21	26.7
Thurman	Max.	42	32	45	45	46	55	64	67	60	40	36	29	25	28	45	34	27	29	41	34	30	30	11	12	25	36	38	18	12	21	21	31	28.1
	Min	23	27	18	24	34	30	33	46	32	26	29	25	28	45	34	27	29	41	34	30	30	11	12	25	36	38	18	12	21	21	31	28.1
Villisca	Max.	30	32	47	47	49	57	63	66	47	45	40	44	59	67	58	54	53	51	54	60	64	22	37	58	62	71	27	35	48	47	50	49.8
	Min.	22	26	16	23	32	28	30	38	32	23	28	28	28	41	33	28	27	40	34	29	28	12	11	21	31	45	20	20	18	21	27	27.1
Washingt'n	Max	31	35	38	34	43	50	60	65	52	48	39	39	59	62	61	59	55	50	47	52	64	47	37	52	61	63	48	36	45	47	54	49.4
	Min.	24	21	24	19	20	31	29	35	32	25	32	30	25	34	40	39	28	41	36	30	32	21	14	18	30	46	22	18	17	22	21	27.5
Waverly	Max.	33	33	39	34	42	46	54	57	50	46	40	39	53	60	58	55	49	45	44	55	62	52	32	56	61	57	57	30	37	40	51	47.3
	Min.	23	26	23	19	26	34	31	38	35	23	31	31	30	38	35	36	26	38	37	26	26	21	13	23	32	45	24	14	18	18	25	27.9
Waterloo	Max	33	34	39	34	41	46	55	55	47	48	45	39	55	60	59	57	50	46	45	55	63	50	33	55	61	59	39	31	39	42	52	47.3
	Min.	23	24	26	20	27	33	29	36	31	22	31	29	30	34	34	39	26	38	33	24	25	19	12	24	31	45	24	14	20	18	24	27.2
Webster Cy	Max.	33	34	38	35	44	49	56	62	52	44	40	41	52	60	52	50	47	44	47	55	60	45	35	55	60	67	41	28	32	34	47	46 4
	Min.	20	26	20	18	27	30	31	37	31	24	27	31	31	37	34	33	24	39	35	28	28	16	10	21	30	41	20	11	15	13	27	26 3
W. Branch	Max.	32	34	35	30	40	45	52	57	..	42	42	36	54	58	56	56	50	48	48	61	54	34	50	59	58	60	59	36	44	48	51	47.6
	Min.	24	26	20	17	20	31	26	36	..	22	32	30	25	34	42	36	39	37	40	30	26	16	19	31	34	45	35	16	19	24	22	28.4
Wilton Jc	Max.	35	38	40	36	40	46	53	58	54	47	42	40	54	58	50	57	52	50	48	65	53	54	35	48	59	61	58	35	45	43	52	48.6
	Min.	25	22	17	16	24	29	27	36	30	25	35	27	34	35	38	39	28	42	40	35	30	29	18	19	31	46	35	20	19	23	23	28.9
Winterset	Max.	31	31	44	41	48	48	56	63	65	49	45	50	43	60	60	59	53	48	64	56	61	21	36	59	63	68	28	32	44	44	52	49.3
	Min.	22	26	17	20	22	22	28	33	37	32	22	28	31	29	34	23	25	39	33	29	28	20	9	21	32	42	26	12	16	19	26	26 2

† Mt. Vernon.

Precipitation Chart March 1898.



April, 1898.



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Central Station, Des Moines, Iowa.

J. R. SAGE,
DIRECTOR.

GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

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1898.

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Eldon	T. Madden.
Eldora	Prof. C. F. Woodward.
Elkader	Chas. Reinecke.
Estherville	M. L. Archer.
Exira	G. W. Guernsey.
Fairfield	Charles J. Fulton.
Fayette	R. Z. Latimer.
Ft. Madison	Miss L. A. McCready.
Fonda	Chas F. Linnan.
Forest City	J. A. Peters.
Fredericksburg	C. E. Wright.
Galva	Jay Crowley.
Garden Grove	M. Wemple.
Gladbrook	Geo. F. Parker.
Glenwood	J. P. Jackson.
Grand Meadow (Postville P. O.)	F. L. Williams.
Greene	J. L. Cole.
Greenfield	J. G. Culver.
Grinnell	Prof. S. J. Buck.
Grundy Center	Geo. F. Ellis.
Guthrie Center	Oscar Klingman.
Hampton	E. C. Grenelle.
Hedrick	J. T. Brooks.
Hawkeye	Miss I. Whorley.
Hopeville	M. T. Ashley.
Humboldt	H. S. Wells.
Independence	E. F. Wulfke.
Indianola	Prof. J. L. Tilton.
Iowa City	Prof. A. A. Veblen.
Iowa City	Mrs. C. M. Hobby.
Iowa Falls	J. B. Parmelee.
Keokuk	*Fred. Z. Gosewisch.
Keosauqua	Prof. J. H. Landes
Knoxville	Casey and Reaver
Lamoni	T. J. Fitzpatrick.
Le Claire	River Observer.
Lansing	G. H. Markley.
Larchwood	F. W. Stokes.
Larrabee	H. B. Strever.
Lenox	J L. Hurley.
Le Mars	Dr. T. E. Cole.
Linn Grove (Mt. Vernon P. O.)	Rev. J. W. Hubbard.
Logan	Mrs. M. B. Stern.
Malvern	R. F. Norton.
Maquoketa	Dr. A. B. Bowen.
Mason City	B. F. Gibbs.
Marshalltown	C. M Cook.
Millman	W. H. Shaul.
Monticello	A. Matthiessen.
Mooar	F. G. Thomas.
Mount Vernon	Prof. A. Collin.
Mt. Ayr	A. F. Beard.
Mt. Pleasant	Dr. Max E. Witte.
Neola	J. H. Garland, Jr.
New Hampton	R. H. Gurley.
Newton	A. Lufkin.
Northwood	A. L. Thompson.
Odebolt	E. Starner.
Ogden	E. Sayre
Olin	Hon. Nathan Potter.
Omaha, Neb	*L. A. Welch.
Osceola	A. W. Lewis.
Ovid	H. C. Miller.
Osage	G. D. Pattingill.
Oskaloosa	Jos. Boyd.
Ottumwa	Dr. J. F. Herrick.
Pella	T. W. Cox.
Plover	J. S. Smith.
Portsmouth	J. W. Dahlheimer.
Primghar	P. R. Bailey.
Red Oak	Geo. W. Holt.
Reinbeck	Dr. L. B. Hathaway.
Ridgeway	Arthur Betts.
Rock Rapids	W. C. Wyckoff.
Rockwell City	C. W. Randall.
Ruthven	Ora Taylor
Sibley	H. G. Doolittle.
Sidney	G V. Swearingen.
Sigourney	Mrs. R. F. Ashbaugh.
Sioux City	*U. G. Purssell.
Sac City	Dr. C. Brown.
Spencer	S. Gillespie.
Spirit Lake	W. C. Drummond.
Stuart	H. M. Bartlett.
Tara	W. E. Humphry.
Thurman	C. R. Paul.
Toledo	Chas. Mason
Vinton	T. F. McOune
Villisca	J. F. McCartney.
Wapello	Geo. W. Schofield.
Washington	Wm. A. Cook.
Washta	H. L. Felter.
Waterloo	M. L. Newton
Waverly	H. S. Hoover.
Waukee	N. C. Wragg.
Webster City	Louis Frank.
Whitten	Dr. Frank P. Butler.
Wilton Junction	J. M. Rider.
Winterset	W. W. McKnight
West Bend	Phil. Dorweiler
West Union	J. W. Bopp.
West Branch	A. A. Madson.

*U. S. Weather Bureau.

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Allerton	James Piper.
Alta	Jonas Cushman.
Ames	S. B. Mills.
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Atwood	J. H. Tanner.
Battle Creek	A. Preston.
Boone	L. C. Morris.
Centerville	Henry Galley.
Charles City	W. B. Towner.
Chariton	C. C. Burr.
Clarksville	F. M. Russell.
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Corwith	Wm. Oxley.
Clermont	Chas. Larrabee.
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Creston	M. V. Ashby.
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Emerson	D. B. Nims.
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Ford	J. C. Richards.
Fort Dodge	R. W. Blaine.
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Laurens	Hon. M. E. De Wolf.
LeMars	Hon Henry Schrooten.
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Lockridge	John F. Farman.
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Mapleton	A. Lamb.
Mt. Pleasant	W. S. Wright.
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Rock Rapids	D. E. F. Merrill.
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Rossville	T. B. Wiley.
Rowley	L. Maxson.
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South Amana	John Cownie.
Spirit Lake	L. Stowe.
State Center	E. P. Thompson.
Sumner	John Dawson.
Tama	W. G. Malin.
Unity	Edw. Hummer.
Van Horne	Spencer Smith.
Willow Creek	W. S. Nicholson.
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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME IX. APRIL, 1898. No. 4.

NOTE AND COMMENT.

The streets of Brussels are sprinkled with antiseptics, creolin being preferred.

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Editor J. S. Trigg, of the Rockford *Register*, visited the Iowa Agricultural college recently, and reports that it is doing better work than ever before in its history. There is progress and development, he says, on broad and enduring lines visible in all departments. This flattering statement is confirmed by all reports coming to us from that most useful institution. It is deserving of patronage by all classes of Iowa people, and especially those whose industry it was established to promote.

***

The United States are inhabited by only 5 per cent, or one-twentieth part of the world, but these 5 per cent of the world's people use one-third of the world's iron, steel and copper, one-quarter of the world's product of wool and more than one-quarter of its cotton. Texas alone makes as much cotton as the entire South did before the war, although less than one-tenth of her area is in cotton lands. Since 1860 the number of farm-owning families in the country has increased from 1,850,000 to 3,392,000, while farm tenants' families are only 2,132,754, against 1,508,750 in 1860. Farm owners are increasing more rapidly than farm tenants, and the two combined 6,000,000 families are at work on the farms.—*Exchange.*

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Not only is the temperature of the winds modified by passing over and through the shaded and cooler spaces of protecting timber belts disposed toward the windward and alternating with the fields, but their velocity is broken and moderated, and since with reduced velocity the evaporative power of the winds is very greatly reduced, so more water is left available for crops. Every foot in height of forest growth will protect one rod in distance, and several belts in succession would probably greatly increase the effective distance. By preventing deep freezing of the soil, the winter cold is not so much prolonged, and the frequent fogs and mists that hover near forest areas prevent many frosts. That stock will thrive better where it can find protection from the cold blasts of winter and from the heat of the sun in summer is a well established fact.—*B. E. Fernow.*

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The New Orleans *Times-Democrat* says: "The United States has by far the best weather service in the world, and it is worth millions of dollars to it each year in shipping cargoes and crops saved. We, in Louisiana, have been able to appreciate the advantages from it, for our chief crop, sugar cane, is one that depends largely upon the weather, and the possibility of the weather bureau telling the planters of a freeze three or four days in advance has robbed sugar planting of one of its greatest dangers. It is a standing joke to laugh at the mistakes, the erroneous predictions of the weather bureau, but as a matter of fact, the mistakes are few, and, as the statistics show, getting fewer every day. With the improvements hoped for by the weather stations we may hope to move closer to protection. The science of meteorology has proved a very progressive one in America.

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Mild winters have been a subject of study in Berlin by Dr. G. Hellmann. He defines a mild winter as one in which the mean temperature of December and January is at least 2° centigrade (3 6° Fahrenheit) above the average; and from the accurate records available he finds that since 1720 Berlin has had forty-eight winters of this type, which have always occurred in groups of two or three years, and especially after a long period of cold winters. From nine to twelve years have elapsed between two groups of mild winters. After a moderately mild winter the chances are 44 per cent that July and August will have a higher temperature than usual, and after a very mild winter the chances of a warm summer reach 68 per per cent. Dry, mild winters, such as the last one, are exceptional. If such a season is not followed by an abundant rainfall in the spring, the summer is likely to be wet, and consequently cool.—*Exchange.*

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Can it be possible that the cutting away of forests affects the amount of precipitation in any locality? To many, no doubt, this question will seem easy of answer, but we find the results of study by no means reassuring, and recent investigations have led to almost diametrically opposite conclusions, depending, somewhat at least, upon the feeling of the writer. When we reflect that our rainstorms are of very wide extent, oftentimes over 1,000 miles in diameter, and may take their origin and bring their moisture from distances of 1,000 miles or more, the thought that man, by his puny efforts, may change their action, or modify it in any manner, seems ridiculous in the extreme. It has been well established that forests have a most important bearing upon the conservation of rainfall; that the forest floor permits a seepage of water to the source of springs and thus maintains their steady flow; that they hold back the precipitation that falls, especially in the form of snow, thus preventing or ameliorating the effects of dangerous freshets. There is not the slightest doubt of their great importance to the welfare of man, but all these facts do not affect the question of their influence upon precipitation.—*Prof. Henry A. Hazen.*

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It is estimated that the tributaries which the Mississippi river receives below Memphis increase the volume of its waters about one-eighth, so that its annual average discharge into the sea may be estimated to be about 107 cubic miles, or about one-sixth of all the rain that falls upon its water-shed. This would leave 513 cubic miles of water to be evaporated from this river-basin annually. All the coal that the present mining force of

the country could raise from its coal measures in a thousand years would not, during its combustion, give out as much heat as is rendered latent annually in evaporating this water. Utterly insignificant are the sources of man's mechanical powers when compared with those employed by nature in moving machinery which brings the seasons around and preserves the harmonies of creation. The amount of heat required to convert these 513 cubic miles of rainwater into vapor and bear it away, had accumulated in the Mississippi valley faster than the earth could throw it off by radiation. Its continuance there would have been inconsistent with the terrestrial economy. From this standpoint we see how the raindrop is made to preserve the harmonies of nature, and how water from the sea is made to carry off by re-evaporation from the plains and valleys of the earth their surplusage of heat, which could not otherwise be gotten rid of without first disturbing the terrestrial arrangements, and producing on the land desolation and a desert. Behold now the offices of clouds and vapor, the adaptations of heat. Clouds and vapor do something more than brew storms, fetch rain, and send down thunderbolts. The benignant vapor cools our climate in summer by rendering latent the excessive heat of the noonday sun; and they temper them in winter, by rendering sensible and restoring again to the air the equivalent of that selfsame heat. —*Maury's Physical Geography of the Sea.*

TWILIGHT CURVES.

In the March issue of the Monthly Review of the Iowa Weather and Crop Service is the following extract:

A most impressive phenomenon seems to have escaped general notice. It is the earth's shadow in the sky, which, according to Prof. W. R. Brooks, of Geneva, N. Y , first becomes visible about half an hour after sunset, as a dark, purplish haze on the eastern sky, and gradually rises until lost in the gloom of early night. The shadow, which is doubtless usually mistaken for cloud or haze, is seen equally well on the western sky before sunrise.—*Exchange.*

This phenomenon, which is called the evening twilight curve, is often seen to great advantage in the pure, dry air of Iowa when the weather is cloudless. After the sun sets a segment of dark leaden hue appears on the eastern horizon. Above it becomes purplish, and still higher fades away in lessening tints of ashes of roses. The earth always casts a conical shadow into space on the side opposite the sun, the condition of night. Between the earth and the apparent sky the shade forms the frustrum of a cone, of which the segment mentioned is one circular base. It rises higher and higher, being observable as it reaches the zenith, and finally the western horizon, when the graduully fading scene is completely closed by darkness. The hues and tints noticed are optical effects produced by reflection of the sun's yellow rays, traversing horizontal layers of the atmosphere of different degrees of density, and at the same time more or less charged with vapor, and affected by different temperatures.

There is also a morning twilight curve, which is far more lively and brilliant, as it appears amid enlarging light instead of growing darkness At first in the western horizon is seen the base of the segment colored reddish or orange-hued, shading off into diminishing degrees of yellow, followed by similar traces of green. When near sunrise the curve reaches closely to the western horizon, and the enlarged segment becomes first yellow, then mainly green, with a purple band in the west. All this constitutes the morning glow. As the sun actually comes into sight we have the sun-burst, and for a short time in the west the curtain becomes rosy, crowned with yellow. No doubt the chromatic features of the twilight curves are due to the more or less transmission, reflection, refraction, diffusion and absorption of the rays of light passing through atmospheric layers of varied density. It is a battle of light with darkness, which the physical observer might eloquently use as an analogue in the rhetorical figure of a moral similitude.—*Dubuque Trade Journal.*

THE EXUDATION OF WATER FROM LEAVES.

BY C. E. BESSEY, PROFESSOR OF BOTANY, UNIVERSITY OF NEBRASKA.

Observations and experiments made upon many plants in the physiological laboratory and the plant houses of the University of Nebraska, show that under certain conditions water may exude in drops from the surface or margins of leaves. It is well known, of course, that water escapes from living leaves in the form of vapor whenever the air is not saturated with moisture. Thus, when a geranium plant is placed upon one of the pans of a pair of scales (after wrapping the pot with sheet rubber so as to prevent evaporation from the soil) it is found that in a little time the loss of water vapor from the leaves is great enough to be readily measured. If the plant be allowed to remain upon the scale pan for a day or two, the amount of water lost will be quite considerable in quantity and weight. This kind of water-loss has been well known for a long time, but there is another loss of water with which we have not been so familiar. To show this, experiments were made as follows:

First.—In a box of sandy soil, fifty or more kernels of wheat were planted and kept growing vigorously until the plants were two or three inches high. They were kept well watered, so that the roots were fully supplied with water. The air of the laboratory during the experiment was pretty dry, requiring the roots to be quite active in absorbing water to make good the loss of water by evaporation from the leaves. The box was then put over a warm radiator, and the soil slowly warmed to a temperature of 77° to 78° Fahrenheit After an hour or so, drops of water were observed upon the leaves, and these continued to increase in spite of the fact that the humidity of the air was shown by observation to be only 31 per cent.

Second.—Another box, containing vigorously-growing wheat plants, was treated as follows: Warm water was slowly poured upon the soil so as to quite considerably raise the temperature. The box was then put under a bell-jar and the temperature of the air suddenly lowered by sprinkling the bell-jar with water, when water was seen to ooze from the leaves, usually near the tips This was repeated again and again, always with the same result.

Third.—Similar trials were made with small plants of maize (Indian corn) with similar results.

Fourth.—In the plant house, small cabbage plants were observed to exude drops of water from the projecting points on their margins under similar conditions.

Here we have an exudation of water-drops (known as "guttation") quite resembling the dew which so often wets the grass. At first we might suppose it to be nothing more than dew, but careful tests, which I need not describe here, show it to be an actual exudation. It appears that the roots in the warm, moist soil become very active in absorbing water to supply the water loss through leaf-evaporation, and when the latter is suddenly checked by the cooling of the air, and consequent increase in its humidity, the root-pressure forces out the water in the little drops just described. When unusually active, the roots may even force out drops in dry, warm air, as in one of the experiments described above. Exudation may thus take place when the soil is moist and warm, especially when, with these conditions, the air is quickly changed from a hot and dry to a cooler and more humid condition.

GROWING TIMOTHY FOR SEED.

The systematic cultivation of timothy throughout the western part of the country has developed practically during the past few years. Prior to that time there was generally sufficient native hay and pasturage to enable the farmer to supply his stock without recourse to scientific cultivation of any particular forage crops. For this reason very few farmers were sufficiently interested to take the trouble to investigate the nature of timothy, or indeed of the soil itself, to enable them to undertake the propagation of timothy intelligently. Consequently most of the efforts at growing this crop were unsuccessful. As the population increased, however, and the natural supply of forage began to be exhausted, the farmers were obliged to begin the cultivation of the timothy crop in earnest and soon came to understand the needs of the crop and soil much better. General cultivation soon produced a change in conditions more favorable for the development of the crop, and to-day, despite the early predictions to the contrary, timothy is one of the most commonly cultivated forage plants throughout a large portion of the great prairie region of the Mississippi and Missouri valleys.

Owing to climatic and soil conditions, it has been ascertained that the timothy grown in the west is preferable to that grown in the eastern portion of the country, owing chiefly to its greater vitality, and hence the growing of timothy for seed has become quite an industry in certain localities. The heads always fill out well, and even when quite thin on the ground the yield is sufficient to render the business a profitablo one on account of the relatively low price of land and the small amount of labor and expense necessary to grow and market the crop. While the vitality of western seed is high, it requires a great deal of care to harvest it in such a manner as to get a high grade in color. An excessively bright sun is very likely to bleach out the seed and thus injure its selling qualities. On the other hand, the ease with which timothy can usually be cured and the seed saved in the west are points in its favor.

As a rule, timothy is cut at about the time the early maturing heads are beginning to be overripe. When the seed in most of the heads is ripe enough to cut, the leaves are still quite green, and hence the straw makes fairly good feed after threshing. The cutting is usually done with a self-binder and the bundles are made rather small and bound somewhat loosely. They are shocked two and two, and the timothy is usually threshed, without stacking, as soon as it is thoroughly dry. The hauling is done, if possible, in racks with tight bottoms, so that the shattered seed may be saved. In this way, though a small amount of seed is often lost because some of the heads are not well ripened, the loss is more than made good by the better quality of the straw, and the farmer gets a yield of from six to twelve bushels per acre of first-class seed in addition to a large amount of forage of a fair quality, which can be used to good advantage as horse feed or as "roughness" for fattening cattle or other stock.

If the timothy is allowed to stand too long, there is danger of as much loss from shattering as there is gain from the later ripening heads, and then the forage is rapidly deteriorating all the time. The shocking must be carefully done and the bundles handled as little as possible in getting them to the threshing machine. The timothy must not be allowed to stand too long in the shock, as again there may be considerable loss from shattering, and the quality of the seed may be injured by bleaching through exposure to sun and rains.

There is little doubt that timothy will continue for many years to come to be the principal grass sown for hay, for, though it lacks some of the characteristics that a perfect forage plant should possess, it is certainly the best hay grass for average farm conditions that is at present available.—*Extract from Yearbook, U. S. Department of Agriculture.*

WHEAT SEEDING IN THE NORTHWEST.

The week has been so favorable in weather conditions that seeding is well done through nearly all portions of the northwest. The season has been dry, and teams were enabled to get on to most of the lowlands. With the exception of 1895, perhaps, this is the earliest seeding and under the best conditions of any late year. A few of the earlier fields had to be resown in a few portions of the south, but, with the exception of waste of first seed and additional work, no serious loss resulted, for the resowing was sufficiently early to justify most favorable expectations for the outcome. Farmers have been making preparations in the south for putting in other small grains, with more or less of such sowings begun.

Various opinions are heard from different sections as to the increase of acreage, and there is a further difference of opinion in the same sections. It is generally put at an increase of 10 to 20 per cent, with 12 to 15 per cent about an average of opinions so far expressed. The actual results are somewhat difficult to determine and will never accurately be known, for there is no general census of acreage taken this season. This increase in acreage calls for an additional amount of seed, reaching probably 2,500,000 bushels above the quantity of seed consumed last year.

Another condition this year, that requires additional quantities of wheat for sowing, is that of the low quality for germination of the seed used. Experimental stations throughout the northwest have taken much pains to disseminate advice to farmers to test their seed grain before sowing, and add an additional quantity equal to the amount found that will not grow Allowing such amount to be 20 per cent, than that much more grain would require to be put in, which would take some 3,000,000 bushels more, suggesting that an extra quantity of seed will be used this year, in the northwest, of no less than 5,000,000 bushels. That would make a further reduction of wheat for shipment and grinding, adding to the scarcity already existing from smaller production than was needed for the year's uses. The scarcity that has been indicated, and frequently pointed out, is already beginning to be manifested somewhat painfully to those who are short of it, to fill their contracts for future delivery, and prices obtained for these futures are already well advanced.—*Minneapolis Market Record.*

THE ALMANACS AND THE WEATHER BUREAU.

During the past few months the editor has noticed a number of newspaper paragraphs discussing the relative merits of the weather predictions published daily by the officials of the weather bureau for one or two days in advance, and those published by the numerous "farmers almanacs" published several months, or even a year, in advance, and sold in large numbers throughout the country. The predictions of the weather, as made by the weather bureau, are based entirely upon the daily maps that show the actual condition of the atmosphere, as reported by reliable observers throughout the country. On the other hand, the predictions in the various almanacs are founded upon a variety of principles among which are the following:

1. The most conservative and rational almanacs are those that compile from the records of many past years a table showing what sort of weather has prevailed most frequently the respective days of the year.

2. The least rational almanacs are those that pretend that the weather is controlled by planetary combinations and stellar influences, therefor, such predictions are properly said to be based upon astrology.

3. An intermediate class publishes predictions based upon the probability of spots upon the sun, thereby assuming it to

have been demonstrated that the solar spots control terrestrial weather.

4. The least scientific system of preparing the almanac predictions was explained to the editor many years ago by a gentleman whose almanac made the greatest pretentions to high scientific accuracy. This gentleman stated that on certain days he felt endowed with a certain ability or inspiration. These were his weather making days, on which he sat down, and with the most absolute confidence in the accuracy of his work, wrote up the weather for the coming year, continuing at the work for a considerable time until the inspiration seemed to leave him, whereupon he necessarily stopped and delayed resuming the work until again filled with the spirit of divination.

Doubtless some almanac makers adopt a combination of the four preceding methods, but, in general, these seem to be the principles most widely recognized in the long-range predictions of the almanacs, except only that in all cases the authors make free use of a system of general and rather indefinite terms that will apply just as well to a thunderstorm, a hurricane, or an earthquake. The warning "Look out for some thing very unusual about this time" is, of course, not a meteorological prediction, and not nearly as definite as the railroad signboard "Look out for the engine when the bell rings."—*Monthly Weather Review, January, 1898.*

DESTRUCTIVE STORMS, APRIL 30TH.

On the afternoon of April 30th a number of localities in the northwest district were swept by severe windstorms, that displayed some of the characteristics of tornadoes at various points in their pathway. The reports indicate that the effects of tornadic action were visible, and funnel-shaped clouds were described by numerous observers.

The principal storm originated in northeastern Nebraska and moved in a northeast direction, passing through the southeast corner of South Dakota, causing some damage and loss of life in the latter state. A report from Newcastle, Neb., states that two tornadoes were observed near that place about 4 P. M., creating much havoc to property in that section. Passing thence near Elk Point, S. D., the storm entered Iowa near Chatsworth, in Plymouth county, and moved apparently up Indian creek. The town of Maurice, in Sioux county, at the crossing of the Sioux City & Northern and Chicago & North-Western railways, was directly in the pathway of this branch of the storm, and the place suffered severely, though happily no lives were lost A special from that place to the Sioux City *Journal* says:

"This town was visited by a destructive tornado at 4:45 last evening, but no fatalities resulted. The funnel-shaped cloud approached from the southwest. Its fearful roaring gave the citizens ample warning, and most of them had sought refuge in storm caves or cellars when the storm broke in its fury In the northwestern part of town the most important structures leveled to the ground and totally destroyed are the following: Sioux City & Northern depot; St. Paul & Kansas City Grain company's elevators, valued at about $2,000, insured. The elevators contained about 1,500 bushels of wheat and the same amount of corn and oats, which will be saved with but little loss. Three cars containing nearly 2,000 bushels of wheat had been loaded and were billed for shipment. These cars were overturned, but the wheat will all be saved, with probably the loss of 100 bushels. The elevator is owned by the Sioux City & Northern railroad and leased by A. D. Thompson & Co. The building is ruined. It contained no grain, as it was not being operated. The dwelling house of J. Nicolay was destroyed with its contents. The residence of C. Van Gorkam, with contents, is a total loss."

The storm moved in a northeasterly course, passing through the southern portion of Sioux and diagonally through O'Brien county, expending its force at Hartley and vicinity. In O'Brien county, a few miles south of Sheldon, two children were killed, and numerous homes were wrecked. Heavy damage to buildings resulted in Hartley. The central line of this storm covered a distance of over eighty miles.

There were evidently a small group of tornadoes, moving on parallel lines, some distance apart, within the belt of disturbance. The little town of Carnes was struck about 4:50 P. M., and badly shattered buildings mark the pathway of the destroyer.

While the storm above described was sweeping through the counties of Plymouth, Sioux and O'Brien, a similar disturbance passed on a parallel line, southwest to northeast, through the northern part of Monona (near Whiting), the southeastern part of Woodbury, across a corner of Ida and through a portion of Buena Vista county. Much damage was wrought by this branch of the same general storm. A special from Oto to the Sioux City *Journal*, said: "The storm began about 4:45 P M., with a terrific rain and hail, and at 5:15 the dreaded funnel cloud was seen to be forming about a mile southeast of here, causing much alarm, carrying away small houses and overthrowing those somewhat larger, and moving even the largest buildings in its path "

The following description of the storm in Buena Vista county is furnished by David E Hadden, voluntary observer at Alta Mr. Hadden writes:

"A severe windstorm, which assumed some of the characteristics of a tornado passed through a portion of Maple Valley and Nokomis townships, Buena Vista county, in the late afternoon of April 30th, which resulted in considerable damage to barns, sheds and other farm buildings. The sky was nearly overcast all forenoon, and partly cloudy in the afternoon of the 30th, with a brisk south to southwest wind. About 4:30 P. M., heavy clouds were observed in the southwest, with occasional murmurings of thunder. About 5 P. M. rain began, with some hail. This continued until 5:40 P M., when rain and wind momentarily ceased, and heavy hail from one half to two inches in diameter began falling, lasting about five or six minutes. Just at this moment I observed the clouds, which were rather low, about two miles south of town, revolving quite rapidly (horizontally), and at intervals the suggestion of a funnel cloud would form about half way from the cloud to the ground, then quickly disperse, and again form and disperse. This was repeated several times, but at no time could the cloud be seen to reach to the ground. I remarked to neighbors at the time, that in all probability a tornado had just passed south of us. At 5:45 P. M. the wind suddenly ceased, but in a few minutes changed to northeast, then north and brisk northwest, accompanied by a very heavy rain which continued until about 6:30 P. M.

"No lives were lost, or persons injured. But little electric disturbance was noted. About three-fourths of the hailstones were of the size of large marbles, and the rest were one to two inches in diameter. The location of debris at each farm proves that the storm was of the tornado type."

Mr. Hadden accompanied his description by photographs and a sectional map showing the pathway of the storm through that portion of the county, but it is not convenient to reproduce them in this issue.

It seems providential that so few casualties resulted from the numerous tornadic storms that swept across our state on that closing afternoon in April.

APRIL WEATHER RECORD.

The average weather conditions for the month were about normal for April, as shown by the records of Iowa stations.

The mean daily temperature, as deduced from the reports of 114 stations, was 48.1°. The highest mean, 53 2°, was reported from Fort Madison; the lowest, 43.8°, at Osage. The extremes of temperature were as follows: Highest, 91° on the 16th at Carroll, Logan, Glenwood, Portsmouth and Ogden; lowest, 14° on the 5th at Rock Rapids.

The average precipitation, as shown by reports from 114 stations, was 2.56 inches, which is about the normal for April in this state. The largest amount was recorded at Mooar, viz., 4.82 inches. Larchwood reported the least amount, being only .27 of an inch.

There were 13 clear days, 8 cloudy, and 9 partly cloudy.

The following table gives the mean temperature and total precipitation for the month of April, at the stations named, for the years from 1872 to 1898, inclusive:

YEARS.	MEAN TEMPERATURE—DEGREES.						PRECIPITATION—INCHES					
	Des Moines.	Davenport.	Dubuque.	Keokuk.	Omaha.	Sioux City.	Des Moines	Davenport.	Dubuque.	Keokuk.	Omaha	Sioux City.
1872	....	50	....	54	51		.....	5 06	....	3.86	3.84	.....
1873	....	47	....	48	45			3 96	....	5 65	3.83	.....
1874		41	45	44	45	....	....	2.64	1.54	2.40	2.03	.....
1875	....	46	49	49	45	....	....	2.30	2.71	.89	3 06	.....
1876	....	51	49	52	51	....	.....	5 39	3.63	3 99	2.65	.....
1877	....	49	49	51	50	....	..	3 28	3.74	4.22	6.25	.....
1878		55	54	57	53	..		2 89	4.34	2 31	3 97	.....
1879	51	50	50	52	54	....	1.03	1 54	2.02	1.56	1.77	.....
1880	51	50	49	55	51	....	1 56	4.50	3 51	4.79	.55	.....
1881	45	45	45	47	44	....	2 36	1 11	1 30	3 12	4.23	.....
1882	51	51	48	54	52	....	3.47	3 15	4 47	3.22	4.31	.....
1883	53	52	50	54	54	....	3.48	3 33	1.93	2 97	3.20	.....
1884	49	50	48	51	48	....	2.97	.77	2.77	1.31	3.88	.....
1885	50	49	47	50	50		3 62	2.47	3.69	3 33	6.34	.....
1886	54	52	52	54	51	....	4.32	1.84	2 12	1 52	1.77	.....
1887	53	52	50	54	54	..	2.48	1.17	1.37	1.84	.88	.....
1888	51	50	48	54	52	..	1.45	1.57	2.58	1 85	2.95	.....
1889	52	50	50	54	52		2 66	3 89	3.56	3 60	1.19	.....
1890	53	53	51	55	55	52	.78	.86	2 94	1.79	1.55	1.32
1891	52	52	51	54	54	53	2.12	3.30	1 63	5 06	2 80	2.22
1892	47	47	46	49	48	46	3 36	5.41	4 37	6.15	4 82	4 76
1893	46	47	45	50	48	45	5.61	4 50	4 32	5 41	3.12	3 56
1894	53	53	52	54	54	52	1.70	1 37	2.27	2 75	2.31	2 79
1895	55	53	54	55	58	57	3.41	.32	.49	3.38	3.56	3.20
1896	56	57	55	60	56	52	3.47	3 41	7.80	2 35	4 28	6 16
1897	49	49	48	51	50	48	7 37	3.69	3.39	3 54	5 67	4.03
1898	50	49	48	52	51	50	2.64	3 01	4.06	4.80	2 74	1.37
Means	52	50	49	52	51	51	3 04	2 84	3.06	3.19	3.25	3 26

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30 08 inches; highest observed, 30.54 inches at Clarinda and Sioux City on the 6th; lowest observed, 29.51 inches at Davenport and Keokuk on the 13th; range for the state, 1 03 inches.

Temperature.—Monthly mean, as deduced from 114 reports, was 48.1°; highest monthly mean, 53.2° at Fort Madison; lowest monthly mean, 43.8° at Osage; the highest temperature reported was 91° at Carroll, Glenwood, Logan, Ogden and Portsmouth on the 16th; the lowest temperature reported was 14° at Rock Rapids on the 5th; the average daily maximum was 60°; the average daily minimum was 36 1°; the average monthly maximum was 83.8°; the average monthly minimum was 20.7°; the greatest monthly range was 75° at Portsmouth; average monthly range, 63.2°.

Precipitation.—Average for the state, as determined from the reports of 114 observers, 2.56 inches; the largest amount reported was 4.82 inches at Mooar; the least amount was .27 of an inch at Larchwood; the greatest daily amount reported was 2.60 inches at Indianola on the 18th; average number of days on which .01 of an inch or more of precipitation was reported, 8.

Wind.—Prevailing direction, northwest; highest velocity reported, 44 miles per hour from the northwest, on the 27th, at Sioux City.

We ther.—There was an average of 13 clear days, 9 partly cloudy days and 8 cloudy days.

PRECIPITATION.

STATIONS.	PRECIPITATION IN INCHES.		No. of clear days.	No. of partly cloudy days.	No. of cloudy days.	No. of rainy days (.01 in. or more).	Total snowfall during month.
	Monthly.	Greatest daily.					
Adair	1.35	.55	12	16	2	3	0
Alta (near)	2 35	1.02	....	....		5	....
Larchwood	.27	.20	5	19	6	3	T
Millman	2.48	.98	....	....		7	....
Washta	1.61	.70	17	8	5	5	....
Le Claire	3 28	1 29	....	....	.....	8	....
North McGregor	2 97	1.00		....	.....	9	....

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.04	30.47	7	29.51	13
Des Moines	30.09	30.52	6	29.74	16
Clarinda	30.09	30.54	6	29.68	30
Cresco	.....	30.50	6	29.82	28
Dubuque	30.06	30.47	7	29.69	13
Omaha, Neb	30.07	30.51	6	29.63	30
Keokuk	30.07	30.53	7	29.51	13
Sioux City	30.11	30.54	6	29.56	30
Means	30.08	30.51		29.64	....

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,687	30	NW	25
Des Moines	6,756	33	SW	16
Dubuque	6,293	32	NW	20
Keokuk	6,198	32	NW	13
La Crosse, Wis	5,281	28	S	30
Omaha, Neb	6,527	30	NW	13
Sioux City	10,586	44	NW	27

OBSERVERS' NOTES.

CLINTON—*Dr. Luke Roberts.* April, 1898, was nearly normal in all meteorological conditions except the movement of the wind, which made a radical departure. The number of miles movement was 3,590, being 2,150 miles less than normal, and the least of any April wind movement in the last 17 years. In April, 1883, the wind movement was 7,380 miles, being the greatest I have a record of, and 3,790 miles greater than in 1898. The maximum velocity was 22 miles an hour, occurring on the 13th. The prevailing direction was from the northeast.

The number of storm days was 11, being 2 more than normal, and furnished rain to the depth of 3 53 inches, or one-half inch above normal. The greatest precipitation during any 24 consecutive hours, was 1.40 inches, occurring on the 13th. The only thunder and lightning for the month accompanied the storm on the evening of the 8th. During the afternoon of the 25th, much thunder prevailed to the east of the city, but no visible flashes of lightning. The rain was only .22 of an inch.

The maximum temperature was 83°, occurring on the 16th. The mean maximum for the month was 60.1°. The minimum temperature was 23°, occurring on the 5th, 6th and 7th. The mean minimum was 36.6°. The minimum was below freezing from the 2d to the 7th, inclusive, and at freezing point on the 11th and 21st.

On the 16th a hot wind from the southwest prevailed, moving at a speed of 9 to 16 miles per hour, stirring up all the loose dust in its track. This was the hottest day of the month. The coldest day was the 5th, giving a mean temperature of 29°.

On the 20th, a meteor was observed, low down, moving to the south, at 10:10 P. M.

Lunar halos were observed on the evenings of the 3d, 29th and 30th, and a solar halo at noon on the 4th.

The storms of the month made no serious hindrance to agriculture, and, although vegetation made slow growth, grass and oats were in fine condition at the close of the month. Cherry and plum trees were blossoming the last days of the month.

SIOUX CITY—*U. G. Purssell.* The mean temperature for April during the nine years that observations have been taken here is 51°, but last month it reached only 50°. The highest was on the 16th, when the mercury got up to 88°, and the lowest was on the 5th and 6th, when it went down to 19°. On the 15th there was a spread of 37° between the highest and lowest, and on the 12th there was a variation of only 7° throughout the twenty-four hours. Notwithstanding the month was below the average in temperature, there is a large excess since New Years, the accumulation being 483°, or an average daily surplus of 4° since the beginning of the year. But most of this was piled up in January and February and early in March, when it couldn't do much good so far as crop-growing is concerned

The total precipitation during April was only 1.37 inches, whereas the average for the month during the past nine years is 3.26 inches, so it will be seen we have had only about 52 per cent of what we had a right to expect. There has been only one year since the station was established here that there has been less precipitation in April, and that was 1890, when it reached but 1.32 inches. In 1896, it reached 6.16 inches, and last year it was 4.03 inches, both being much above the average. The total deficiency for the first third of the year is 2.94 inches. During the month there were 12 clear days, 8 partly cloudy days and 10 cloudy days. There were 7 days on which the precipitation was more than .01 of an inch.

AMANA—*Conrad Schadt.* The weather, although very cool, was favorable for farming, with moisture enough for good prospects.

BELKNAP—*A. W. Rankin.* A cold, wet and backward month. Grass short at close of month, and fruit not in full bloom.

BONAPARTE—*Hon. B. R. Vale.* The frequency of rains, amounting to 3.71 inches, falling at ten different times, almost precluded seeding and farm work; grass doing well; fall grain backward, but improving.

CENTERVILLE—*Geo. Goodlander.* Season has been quite favorable for putting in crops. A severe wind on 13th damaged fences and small outhouses.

FOREST CITY—*J. A. Peters.* Small grain all in before close of month; season about ten days ahead of last year.

GARDEN GROVE—*Hon M. Wemple.* A good month for all kinds of farm work Grass backward on account of cold and dry weather. All orchards burdened with bloom, giving fair prospect for fruit.

GREENFIELD—*J. G. Culver.* On April 30th plums, peaches and cherries were beginning to bloom; no damage by frost.

LOGAN—*Mrs. M. B. Stern.* Quite a thunderstorm on 30th west of us, with considerable hail.

PLOVER—*J. S. Smith.* On the 30th, a tornado passed seven miles west of this station, in a northeasterly direction. A number of buildings were destroyed, and a man and his eight-year-old son were killed. The storm passed about 7 P. M

PRIMGHAR—*Lewis Clarke.* On the 30th, a small "cyclone" passed through the west part of O'Brien county, damaging property to some extent.

RIDGEWAY—*Arthur Betts.* At close of the month grass is green; wheat is up; willows and lilacs are leaved out; early garden vegetables are coming up

WASHTA—*H. L. Felter.* The month has been quite cool with drying winds; plum trees almost ready to bloom.

WEST BEND—*Ph. Dorweiler.* First half quite cool, but on the whole favorable for farm work; small grain looks well.

ERRATA FOR MARCH REVIEW

LOGAN: Precipitation should be 1.59.

MONTICELLO: Mean temperature should be 38.5°.

STUART: Minimum temperature of 3° on 14th, not used; minimum temperature should be 10° on 23d; mean of the minimum temperature should be 25.8°; mean temperature should be 37.7°.

WHITTEN: Precipitation should be omitted.

HEDRICK: Minimum temperature of 4° on 6th; should be 19° on 23d; mean temperature should be 40.3°.

LATE MARCH REPORTS.

ESTHERVILLE: Mean temperature, 34°; total precipitation, .48 inch.

HAWKEYE: Total precipitation, 1.34 inches.

LARRABEE: Mean temperature, 34.4°; total precipitation, 1.09 inches.

FAYETTE: Mean temperature, 35.8°; total precipitation, 2.42 inches.

METEOROLOGICAL DATA FOR APRIL, 1893.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.			Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	Number of hail storms.	No. of thunder storms.
	Monthly mean.	EXTREMES. Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.	Monthly range.	Monthly.	Greatest daily.	Total snowfall.							
Afton	50.1	62.6	37.6	86	16	22	7	64	2.38	.69	.....	SW	4	14	12	6	.....	.....
Algona *	47 2	.....		76	15, 6	23	5	53	2.42	1.50	.....	NW	9	16	5	6	.....	2
Alta	47.2	59 1	35.3	82	16	20	5	62	3.02	1.35	.....	NW	14	11	5	8	1	1
Amana	48.2	60.0	36.5	84	16	20	6	64	3.24	1.47		N	15	6	9	9	1	2
Ames	49 2	61.5	37.0	90	16	22	6, 7	68	1.52	.50	....	.....	15	10	5	7	.....	.....
Atlantic	46.7	58.8	34.6	88	16	19	2	69	2.42	.61	....	NW	11	5	14	7	.....	.....
Audubon	47.8	59.6	36.1	86	16	21	5	65	.83	.35	..	NW	2	13	15	3	.....	.....
Belknap	50.2	61.9	38.4	80	16	23	5	57	2.95	1.25	.....	NW	11	13	6	11	.....	.....
Belle Plaine	.....	55.9	.....	74	16	.....	.....	.....	3.89	1 50		SE	8	13	9	12	1	.....
Britt	45.4	58.1	32.8	79	16	18	5, 6	61	2.79	1.55	....	NE	8	20	2	9	.....	1
Bonaparte	49 4	60 2	38.5	82	16	22	5	60	3.71	1.10	.....	.....	.....	.....	.....	8	.....	.....
Burlington	51.4	61.0	41.8	82	16	23	5	59	2 79	.58	.....	.....	14	7	9	9	.....	.....
Carroll	48.8	60.9	35.8	91	16	20	2, 6	71	1.73	.70	.....	.....	13	7	10	6	.....	1
Cedar Falls	48 4	61.0	35.8	87	16	20	5	67	2 15	.90	....	NW	16	6	8	6	.....	.....
Cedar Rapids	48.8	59.6	37.9	87	16	21	5	66	2 47	.50	.....	NE, NW	17	4	9	12	.....	1
Centerville	49.8	60.1	39 6	81	16	25	5, 7	56	2.33	.98	...	W	14	6	10	8	.....	.....
Chariton	50.0	60.5	39.6	77	17	24	5	53	2.20	.63	.....	N, S	10	12	8	14	.....	.....
Charles City	45.4	56.6	34 2	78	16	19	6	59	1.72	.49	.....	N	18	5	7	9	.....	.....
Clarinda	51.8	62.8	40.8	86	16	26	2	60	3.70	1 53		NW	16	7	7	8	.....	.....
Clear Lake	46.4	57.1	35.7	77	16	21	6	56	2.46	.96	T	SE	18	9	3	8	1	1
Clinton	48 4	60.1	36 6	83	16	23	5, 6, 7	60	3.53	1.40	...	.....	11	10	9	11	.....	.....
College Springs	50.8	63.5	38.1	87	16	25	2, 5	62	2 56	1.05	...	NW	14	11	5	5	.....	.....
Corning‡	50.4	62.7	38 0	87	17	22	2	65	1.68	.65	.	SE	15	6	9	4	.....	.....
Council Bluffs	51.6	64.4	38 9	90	17	24	5	66	2.85	.68	....	S	3	18	9	9	.....	.....
Cresco	44.8	56 1	33.5	79	16	18	5	61	2.80	1.00	T	NE	13	8	9	10	.....	2
Davenport	49 4	58.5	40 2	80	16	24	5	56	3.01	1.27	....	NE	10	6	14	9	.....	2
Decorah	45.7	58.4	33.0	80	16	18	5	62	2 81	.78	.....	.....	.....	.....	.....	9	.....	.....
Denison	47.2	63.9	30.4	84	16	20	4, 7	64	3.25	1.63	....	N	22	.....	8	7	.....	.....
Delaware †	44.6	.....		86	16	20	5	66	2 37	.75	....	NE	9	14	7	.....	.....	.....
Des Moines	50.2	61.0	39.1	90	16	25	5	65	2 64	.92	...	NE	16	7	7	11	.....	1
De Soto	49 2	61.7	36.6	89	16	24	2, 4, 5	65	1.86	.64	.....	SW	15	9	6	7	.....	.....
Dows	47 2	60.3	34 2	83	16	20	6, 7	63	1 88	1.03	...	S	14	8	8	7	.....	1
Dubuque	47 6	57.2	37 9	82	16	22	5	60	4.06	2 07	....	NW	16	7	7	10	.....	2
Eldon	50.0	62 1	38.0	84	16	20	7	64	2.83	1 66	.....	S, NW	18	7	5	7	.....	.....
Eldora	45.0	57.8	32.1	90	16	18	1, 5	72	2 40	.75	...	NE	1	28	1	6	.....	.....
Elkader	46.1	59 3	32.9	84	16	17	6	67	2 64	1.37		N	11	13	6	10	.....	3
Estherville	44.8	59.7	30.0	76	16	17	5	59	1.38	1.10	1 0	NW	.....	.....	.....	3	.....	.....
Fairfield	48.6	60 5	36.8	81	16	21	5, 6	60	3 22	1.52	...	.....	14	11	5	11	.....	.....
Fayette	44.7	56 6	32.8	81	16	16	6	65	3 85	1.29	....	NE, NW	16	5	9	10	.....	2
Forest City	45 4	56.6	34.1	78	15	20	5	58	2 50	1 06	.....	NE	16	4	10	9	.....	.....
Ft. Madison *†	53.2			81	17	26	6	55	4.25	1 65	T	SW	6	11	13	7		2
Galva	48.6	61.8	35.1	88	16	20	5	68	1.90	1.02	.. ..	N	12	9	9	5	1	.....
Garden Grove	48.8	61.0	36.7	85	16	21	5	64	2.31	.57		SW	11	5	14	7	.....	.....
Glenwood	51.0	63.6	38.4	91	16	24	2	67	2.97	.85	..	NW	6	17	7	5	.....	.....
Grand Meadow *†	44 6	.....		76	16	18	5	58	2.78	1.04	...	NE	12	7	11	8	1	.....
Greene e	46.7	60 1	33 3	84	16	20	6	64	1 52	.64	...	N, NE	12	14	4	9	1	.....
Greenfield	48.8	61.4	36 2	89	16	20	5	69	1 97	.40	...	N	16	10	4	10	.....	.....
Grinnell a	48 4	59.4	37.5	83	16	18	5	65	4 31	1.05	...	N	13	10	7	7	.....	.....
Grundy Center	46 8	59.2	34 3	88	16	19	5	69	1 94	.45	....	N	13	7	10	7	.....	.....
Guthrie Center	49.1	61.9	36.3	89	16	19	13	70	.78	.31	...	SE	19	2	9	5	.....	.....
Hampton	47.1	58.6	35.6	83	16	20	6	63	2 29	.80	....	NE	13	13	4	11	.....	.....
Hedrick a	52.2	58 0	46 3	86	16	27	5	59	3 21	1 25	...	.....	17	4	9	5	.....	.....
Hopeville	49.0	60.3	37 6	86	16	22	5	64	2.22	.68	..	S	6	16	8	10	.....	.....
Humboldt	47.6	61.0	34.1	83	16	20	5	62	1 58	.73	.....	NW	14	10	6	8	.....	2
Iowa City (Veblen)	48.4	60 3	36.1	82	16	21	5, 6	61	2.89	.92	...	N, S	12	10	8	7	.....	.....
Iowa Falls	46 5	59 5	33.5	86	16	18	6, 7	68	1.84	.85	....	NE				6	.....	.....
Independence	46.0	58.2	33.7	84	16	16	5	68	1.85	.80	...	N	18	6	6	6	1	.....
Indianola	50.2	61.4	39.0	87	16	20	5	67	4.71	2.60	....	NE, SW	13	5	12	13	.....	1
Keokuk	51 8	60.5	43.0	80	16	25	5	52	4.80	1.82	....	NW	11	10	9	14	.....	4
Knoxville	50.0	61.0	38.9	86	16	22	5	64	2 18	.63	.....	NW	13	7	10	7	1	.....
Lamoni	49.4	60.4	37.9	85	16	25	5	60	1.95	.43	.....	NW	16	5	9	11	.....	.....
Lansing	47.0	59.3	34.8	81	16	19	5	62	3 03	1.44	T	.....	11	11	8	8	.....	.....
Larrabee	46.5	60 0	33 0	86	15	16	5	70	1.82	1.11	...	NW	.....	.....	.....	5	1	.....
Le Mars	48.8	62.4	34.8	84	15, 16	17	6	67	1.96	1.00	..	S	13	10	7	8	.....	.....
Lenox	49.6	61 3	37.9	86	16	23	5	63	2 89	.89		S	12	11	7	13	1	1
Linn Grove (Mt. Vernon)	47.4	58.3	36 4	83	16	19	5	64	3.02	1 20	.....	NW	13	1	16	10	.....	.....
Logan	47.8	61.8	33.9	91	16	20	2, 4, 6	71	2.82	1.25	....	S	11	12	7	6	2	1
Maquoketa	48.0	59.9	36.2	82	16	23	5, 6, 7	59	2.95	1 60	.. .	NW	15	6	9	8	.....	.....
Marshalltown	47.6	58.9	36.3	90	16	19	7	71	1.87	.48	....	SE	8	13	9	10	1	1
Mason City	45.7	57.7	33.7	77	18	20	6	57	1.85	.75	....	.....	.....	.....	.....	5	.....	.....
Mooar	48.8	59.6	37.9	83	16	18	6	65	4.82	1.44	...	NW	9	13	8	13	.....	.....
Monticello d	44.7	58.5	30.9	83	16	19	5	64	2.40	.72	....	NW	.....	.....	.....	7	.....	.....
Mt. Ayr	49.7	61.9	37.5	87	16	24	5, 13	63	2.45	.51	.....	SE	9	11	10	13	.....	.....
Mt. Pleasant *†	51.2	....	.....	74	17	26	5	48	4.02	1.55	...	W, SW	7	14	9	7	.....	.....
Mt. Vernon *†	48.8	...		81	16	20	5	61	2.68	1.00	.....	.....	.....	.....	.....	7	.....	.....
New Hampton	50.7	64.4	37.0	87	16	20	5	67	2.04	.50	.....	NW	13	7	10	10	.....	.....
Newton	49.4	60.8	38.0	87	16	22	5	65	2.23	.53	....	SE	10	14	6	10	1	.....
Northwood	44.4	56.6	32.1	78	16	21	5	57	2.49	.90	..	NW	23	0	7	7	.....	.....
Odebolt	48.6	61.9	35.3	90	16	20	5, 6	70	2.15	1.25	...	.....	16	10	4	5	.....	.....
Ogden	48.6	61.3	35.9	91	16	21	2, 5, 6	70	1 43	.42	...	NW	17	0	13	9	.....	.....
Olin	46.0	57.1	34.8	81	17	19	5	62	2.32	.86	....	NW	13	9	8	8	.....	2
Omaha, Neb	51.2	61.2	41.3	88	16	26	5	62	2.74	.85		N	14	6	10	12	.....	.....
Osage †	43.8	.....	.....	..	.....	.....	.....	..	3.02	.94	.....	N	9	10	11	6	.....	3
Osceola	48.8	59.8	37.7	87	16	22	5	65	1.44	.27	.....	SE	..	.....	.....	11	.....	.....
Oskaloosa	48.4	61.1	35.7	84	16	19	7	65	2.04	.95	....	NW	16	1	13	7	.....	.....
Ottumwa	49.6	61.2	37.9	84	16	22	5	62	2.65	1.10	.....	W	0	18	12	5	.....	.....
Ovid	48.8	60.9	36.6	75	16	23	2, 5	52	2.84	.75	.....	NW	14	1	15	12	.....	.....
Plover	48.5	61.8	35.2	82	15	20	4, 5	62	1.75	1.10	....	S	17	7	6	4	.....	.....
Portsmouth j	45.2	61.1	29.4	91	8, 16	16	1, 2	75	.....	.....	....	.....	.....	.....	.....	.....	.....	.....
Primghar	47.7	61.0	34.4	82	15	18	5	64	2.19	1.15	.....	N, S	12	14	4	8	1	.....
Red Oak	49.8	62.5	37.1	78	17	23	5	55	2.69	.72	.....	.....	.....	.....	.....	11	.....	.....
Ridgeway	46.4	58.6	34.3	85	16	18	5	67	3.09	.88	.2	NE	12	11	7	14	..	2
Rock Rapids	46.3	62.4	30.0	84	15	14	5	70	1.45	.65	T	N	20	6	4	3	..	.....
Rockwell City	46.0	57.7	34.3	82	16	20	5, 6	62	2.23	.66	.....	.....	15	10	5	7	..	.....
Ruthven b	47.4	61.1	47.4	81	16	19	5	62	3.01	2.00	.....	NW	.....	.....	.....	5	.....	.....
Sac City	46.6	58.4	34.7	88	15	20	8	68	2.40	.60	....	N, S	9	9	12	6	.....	.....
Sibley	46.0	59.7	32.2	86	15	15	2, 5	71	1.44	.78	...	NW	11	15	4	10	.....	.....
Sidney	50.6	61.1	40.0	85	16	27	5	58	4.49	1.55	.....	NE	16	10	4	9	.....	1
Spencer a	45.4	59.2	31.7	74	15	18	6	56	3.12	1.80	T	N	12	14	4	7	1	.....
Spirit Lake	46.5	59.6	33.4	84	15	18	5	66	2.34	.94	1.0	S	15	7	8	6	.....	.....
Sioux City	49.6	61.1	38.2	88	16	19	5, 6	69	1.37	.81	.....	N	12	8	10	7	.....	.....
Stuart	47.8	60.6	35.1	85	17	28	4	57	1.75	.52	....	.....	.....	.....	.....	5	.....	.....
Tara	47.8	63.3	32.4	86	16	18	3	68	1.70	.60		NE	10	14	6	5	..	1
Toledo	47.7	60.7	34.7	86	16	17	5	69	2.27	.77	....	NW	17	0	13	5	.	.....
Thurman	50.5	62.2	38.8	86	16	20	2	66	3.79	.90	.....	NE	9	12	9	11	.....	.....
Villisca	49.4	61.8	37.0	88	16	21	2	67	3.05	.76	....	NE	13	12	5	8	.....	.....
Vinton *†	47.1	.....	.....	85	16	22	5	63	2.53	1.06	.....	NW	18	5	7	6	..	.....
Washington	48.2	60.7	35.8	84	16	18	5	66	2.83	1.18	..	NW	.....	.....	.....	8	.....	2
Waterloo	47.0	59.4	34.6	86	16	19	5	67	2.09	.75	....	NW	14	10	6	11	.....	.....
Waverly	47.2	58.9	35.5	84	16	21	5	63	2.03	.54	...	NW	9	13	8	11	1	.....
Webster City	47.8	59.5	36.2	82	16	24	5, 7	58	1.21	.45	.....	NW	8	14	8	5	.....	.....
West Bend *†	45.2	.....	.....	78	16	21	5	57	2.49	.77	.....	NW	9	10	11	5	.....	.....
West Branch	48.1	59.8	36.4	82	15	20	6	62	3.08	.96	....	NE, SE	15	6	9	8	1	.....
Whitten *†					16	24	5	61	1.73	.58	.....	N	14	10	6	7	1	1
Wilton Junction				6	82	16	20	5	62	3.38	1.06	.....	S	16	9	5	7	..	1
Winterset				1	88	16	20	5	68	2.88	1.15	.....	.....	.....	.....	.....	9	.....	.....
Means				1	83.8	.....	20.7	.....	63.2	2.56	.. ...	...	NW	13	9	8	8	...	.....

*Means determined fro ...servations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and ... P. M. obse... to be computed with means. a One day missing, b two days, etc.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR APRIL, 1898.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Afton	Max.	51	53	48	46	47	52	57	67	65	61	69	62	64	60	75	86	78	61	55	60	65	59	62	63	60	65	71	73	76	77	62 6
	Min.	34	25	25	32	33	27	22	37	40	32	32	40	35	34	36	46	55	43	35	35	45	49	40	39	39	34	41	40	40	52	57.6
Alta	Max.	43	51	54	42	42	40	56	66	61	62	69	50	56	63	40	82	53	39	53	58	68	63	59	63	51	66	68	68	74	64	59.1
	Min.	30	25	30	26	20	24	29	37	32	37	32	38	32	32	38	50	43	35	32	32	44	42	39	44	34	34	45	41	42	41	35.3
Amana	Max.	52	50	37	48	41	48	58	51	62	61	66	69	53	61	69	84	70	59	48	59	61	58	61	61	56	63	66	66	72	69	60 0
	Min.	38	28	26	32	21	20	21	40	34	39	31	39	36	35	31	47	56	41	37	35	35	51	42	35	35	36	38	45	37	53	36.5
Ames	Max	45	65	59	60	42	65	53	63	64	62	70	63	69	62	73	90	70	45	51	61	64	60	61	62	60	60	70	71	75	70	61 5
	Min.	33	33	37	31	25	22	22	41	34	33	31	38	35	33	30	48	55	42	35	35	45	49	36	32	40	33	39	39	40	54	37.0
Atlantic	Max.	38	58	42	45	38	48	56	65	65	61	68	50	55	62	76	88	73	45	50	49	59	59	59	60	58	66	66	67	72	67	58 9
	Min.	25	19	32	31	20	22	25	39	29	29	25	41	34	27	26	50	55	39	35	32	45	45	38	41	34	29	44	44	29	54	34 6
Audubon	Max.	41	50	45	45	40	48	54	58	64	60	65	55	55	60	75	86	68	58	55	57	65	63	61	62	55	63	68	67	73	69	59 8
	Min.	28	24	33	30	21	25	24	33	35	29	35	40	24	31	32	47	51	37	35	33	45	48	40	42	40	38	45	43	38	62	38 1
Belknap	Max.	60	60	50	52	49	54	60	62	64	65	70	67	44	62	70	80	75	53	52	58	62	59	63	62	56	66	65	69	73	75	61 9
	Min.	30	28	34	36	23	25	28	32	34	37	39	40	37	35	39	49	57	46	40	39	44	50	44	41	40	37	36	49	46	46	38 4
Belle Plaine	Max.	53	47	57	44	33	45	55	51	62	64	58	65	45	52	..	74	56	45	48	55	54	45	40	56	45	56	60	63	71	72	55 9
	Min	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Bonaparte	Max.	54	52	51	47	39	48	58	51	65	61	65	69	48	61	69	82	79	56	48	61	60	59	62	61	58	60	67	67	73	74	60.2
	Min.	35	27	34	34	22	24	25	40	39	38	33	40	36	35	35	44	55	45	40	38	41	51	47	41	36	37	41	49	41	52	38.5
Burlington	Max	53	51	54	49	40	48	57	52	65	60	65	68	62	62	69	82	78	65	51	61	59	60	60	60	60	62	68	65	73	72	61.0
	Min	39	29	31	36	23	25	27	42	42	40	36	46	42	37	40	60	56	45	41	38	40	51	50	40	39	38	42	56	57	66	41.8
Britt	Max.	92	49	76	40	41	42	56	62	60	60	67	61	57	59	77	79	61	44	46	56	60	57	58	60	54	64	69	67	75	84	58.1
	Min.	31	21	28	25	18	18	24	33	27	30	31	40	28	27	29	46	41	34	33	30	38	42	44	39	34	29	42	41	31	51	33.8
Carroll	Max.	43	48	54	46	40	54	57	68	62	69	69	55	55	65	79	91	69	43	55	60	66	65	62	61	54	66	68	70	74	69	60 9
	Min	30	20	28	30	22	20	27	37	30	30	31	45	35	28	34	54	48	41	33	32	43	45	37	43	35	34	43	43	32	53	38 8
Cedar Falls	Max	48	56	60	56	47	54	60	56	64	64	68	65	44	59	73	87	68	43	49	60	55	65	64	62	63	65	68	68	72	68	61 0
	Min.	30	25	25	24	20	22	49	38	52	36	28	45	38	35	30	58	42	40	36	35	33	35	31	35	36	35	45	35	45	55	35.8
Cedar Rapids	Max.	50	49	58	45	40	49	59	51	61	61	66	68	49	61	70	87	72	53	48	57	61	58	58	61	61	63	66	65	71	70	59 6
	Min	37	29	28	31	21	24	26	41	34	41	24	40	37	36	35	51	52	40	38	36	37	50	43	37	38	37	43	48	41	53	37 9
Chariton	Max.	52	54	47	47	40	50	55	62	65	60	64	67	48	62	71	82	77	62	54	60	60	57	62	63	56	58	66	68	72	74	60 5
	Min.	35	26	38	34	24	28	30	42	40	35	40	45	39	35	36	49	56	44	38	37	47	50	40	39	41	35	43	46	43	53	39 6
Charles City	Max	44	47	53	46	39	46	57	52	58	59	64	65	65	60	72	78	52	48	45	56	55	58	55	59	50	62	64	64	70	65	56.6
	Min	30	21	26	26	22	19	20	38	31	33	28	40	39	33	38	50	44	37	35	32	40	50	34	32	37	36	41	44	32	48	34 2
Clarinda	Max	54	57	43	46	41	52	56	70	71	62	68	59	58	63	76	86	79	59	58	61	67	62	68	62	57	65	71	71	72	73	62 8
	Min	32	26	40	32	27	31	32	42	43	36	37	43	40	35	37	52	59	41	38	40	50	50	45	46	41	36	46	48	43	47	40 8
Clinton	Man	54	59	58	44	39	50	59	56	63	60	67	70	49	64	70	83	70	49	47	59	59	61	64	58	66	68	67	73	68	60	60 1
	Min	36	28	26	29	33	23	23	34	35	43	52	35	45	38	35	41	49	41	40	34	32	51	47	35	34	38	37	49	37	49	36 6
College Springs	Max.	54	65	46	47	40	51	62	70	70	63	69	57	58	62	76	87	..	60	61	61	64	63	66	60	60	67	73	72	76	76	63.5
	Min	52	35	37	33	25	26	29	38	35	31	37	41	35	32	39	49	50	42	35	32	43	56	41	42	39	36	42	43	49	53	38.1
Centerville	Max	54	53	52	48	43	48	55	62	66	60	66	65	49	62	71	81	73	64	54	61	59	58	63	63	58	60	68	69	72	75	60.1
	Min	34	36	38	35	25	28	24	40	40	35	38	45	39	38	40	48	62	44	38	37	44	40	42	39	38	36	41	45	43	51	39.6
Council Bluffs	Max	48	55	43	51	46	52	58	73	70	64	70	54	62	67	79	88	90	53	62	65	72	68	65	63	61	68	68	74	75	71	64.4
	Min	28	25	33	38	24	25	30	40	39	33	40	42	37	33	39	51	50	38	37	24	49	53	46	43	44	33	48	45	50	55	38.9
Cresco	Max	44	47	52	42	41	50	57	47	60	59	66	67	42	61	73	79	54	37	42	59	53	49	55	59	52	64	65	66	70	62	56 1
	Min	28	22	25	33	18	21	22	38	31	33	29	38	37	35	39	48	42	35	33	34	33	40	34	35	37	34	42	42	35	51	33 5
Clear Lake	Max	43	49	54	42	40	47	57	59	58	58	66	61	54	59	74	77	70	44	45	55	56	56	51	59	53	63	65	65	70	62	57.1
	Min	32	24	25	35	24	21	27	36	34	32	36	40	36	31	55	51	42	34	32	33	39	45	35	39	38	31	40	45	38	51	35.7
Davenport	Max	51	48	56	46	57	48	58	52	62	61	64	66	51	62	69	80	71	48	48	58	57	59	56	60	58	60	64	65	71	68	58.5
	Min	36	30	32	26	24	26	30	42	38	44	58	46	43	39	40	51	48	43	40	38	41	52	47	41	41	38	43	51	45	54	40.2
Decorah	Max	47	46	54	48	43	50	62	62	63	60	69	68	45	62	72	80	62	44	44	58	53	59	58	62	53	67	64	65	72	71	58 4
	Min	32	24	32	21	18	22	21	38	33	37	28	42	38	34	38	50	43	36	35	36	32	33	32	32	38	33	40	43	35	34	33 0
Denison	Max	51	57	47	45	47	57	56	52	63	74	71	70	72	73	76	84	72	56	54	65	67	62	66	64	60	65	68	74	73	71	63.9
	Min	28	21	28	20	19	21	20	25	26	28	26	30	26	22	30	27	45	34	31	32	30	45	38	39	32	30	26	41	35	57	30 4
Des Moines	Max	51	54	50	46	42	50	55	64	65	61	67	63	53	63	76	90	75	53	53	60	62	56	62	64	54	61	68	68	72	72	61.0
	Min	35	25	38	32	25	27	27	42	39	34	34	40	37	36	35	54	53	41	37	39	46	50	41	49	42	39	44	47	40	55	39.1
De Soto	Max	50	53	52	46	41	51	57	69	67	61	69	63	55	61	75	89	77	47	55	60	65	57	62	63	53	63	71	69	77	73	61 7
	Min.	26	24	32	24	24	27	29	42	36	32	36	40	35	32	35	53	43	43	36	35	44	46	37	39	38	32	42	44	36	55	36.6
Dows	Max.	45	51	56	60	40	47	58	61	63	60	66	62	57	61	76	83	64	46	49	67	61	60	60	61	58	64	67	67	71	68	60 3
	Min.	31	20	30	26	22	20	20	38	30	32	32	39	34	29	27	48	42	36	33	32	40	46	34	35	28	29	39	43	31	51	34.2
Dubuque	Max.	49	46	55	41	40	49	57	51	60	57	64	66	49	62	69	82	67	44	43	57	55	58	53	60	55	64	63	64	70	65	57 2
	Min	35	28	26	26	32	24	28	37	34	41	35	43	38	36	38	51	44	39	38	37	56	49	44	41	41	39	42	49	42	53	37 9
Eldon	Max	59	54	51	50	41	50	58	51	66	63	68	69	58	62	72	84	80	65	53	62	60	60	64	63	58	62	68	70	75	76	62.1
	Min.	32	27	34	35	23	31	30	59	34	38	30	39	37	35	32	44	59	45	40	39	38	51	45	40	39	37	41	47	47	53	38.0
Eldora	Max.	45	49	56	57	45	50	60	63	55	58	50	45	50	47	75	90	70	45	55	51	65	59	57	70	58	55	60	68	65	60	57.8
	Min.	18	20	24	23	18	20	28	29	34	35	34	33	26	34	38	43	42	35	36	30	31	45	40	37	33	30	34	40	38	36	32 1
Elkader	Max.	48	50	58	45	45	55	62	50	62	63	69	69	43	64	73	84	66	45	44	60	54	61	57	56	55	67	62	68	75	60	59 3
	Min.	29	23	20	27	19	17	20	40	37	40	29	33	37	32	37	44	48	35	32	29	34	44	34	27	31	29	40	42	33	54	32.9
Estherville	Max.	45	56	56	47	41	53	58	68	60	60	71	66	52	65	65	76	68	44	49	60	59	57	61	64	54	69	70	69	73	66	59.7
	Min.	26	19	22	32	17	23	19	36	31	27	31	40	31	25	25	24	40	30	30	31	39	37	35	37	33	25	42	39	32	32	30.0
Fairfield	Max.	54	52	53	48	41	49	57	53	65	61	66	64	54	61	70	81	77	60	51	59	60	60	62	60	56	61	67	67	72	74	60.5
	Min	34	26	32	34	21	21	23	37	37	36	32	38	36	35	34	43	50	44	39	37	37	50	44	38	35	35	38	37	38	52	36.8
Fayette	Max.	47	38	50	46	42	65	52	52	57	53	65	66	49	61	71	81	65	45	46	56	54	57	50	60	51	65	60	61	71	61	56 6
	Min	27	20	22	24	19	16	18	33	31	35	26	36	36	34	27	50	45	37	33	34	30	40	39	29	34	33	38	45	32	51	32.8
Forest City	Max	43	47	55	41	43	47	56	56	61	59	66	60	55	60	78	77	49	45	47	56	55	66	57	60	55	64	66	66	70	69	56.6
	Min	31	23	26	26	20	22	25	37	31	32	35	38	32	30	34	51	41	33	33	33	39	44	37	41	37	32	41	43	35	51	34 1
Galva	Max.	44	42	54	51	40	52	66	68	63	63	69	61	57	66	81	88	76	41	55	60	69	64	60	63	57	66	67	69	74	67	61.8
	Min.	32	24	32	28	20	22	27	39	31	27	34	43	33	28	37	51	45	35	33	32	44	43	40	44	34	30	46	41	34	42	35.1
Garden Grove	Max	45	40	55	57	47	44	50	64	65	60	65	66	63	59	72	85	80	55	56	60	60	57	58	61	55	62	70	68	75	75	61.0
	Min.	32	32	35	31	31	22	37	37	31	30	39	35	34	34	44	51	42	34	34	43	44	37	35	35	32	38	42	37	50	53	36 7
Glenwood	Max.	46	58	49	45	48	52	55	73	69	65	69	63	58	68	79	91	71	64	62	61	70	65	64	60	58	66	73	71	73	73	63.6
	Min.	32	24	37	32	30	25	31	38	37	32	34	41	56	24	33	54	61	41	36	35	45	52	53	43	41	31	45	46	39	53	38.4
Greene	Max	65	51	60	58	45	51	62	56	63	61	71	64	47	62	76	84	69	45	46	58	58	58	60	62	54	70	69	67	76	64	60.1
	Min.	30	30	25	26	23	20	21	37	31	32	29	41	37	31	29	50	44	46	34	33	35	38	32	..	..	..	..	..	34	54	33 3
Greenfield	Max	54	44	47	47	40	52	45	48	63	68	69	59	60	63	77	89	79	56	58	62	68	58	69	64	57	66	73	68	66	73	61.4
	Min	21	22	31	30	20	15	30	30	29	34	37	43	38	29	37	49	56	40	34	34	45	44	29	38	39	32	43	42	43	52	36.2
Grinnell	Max	49	50	55	52	38	47	56	53	63	60	64	65	48	58	67	83	75	60	54	58	60	59	58	60	60	58	64	65	70	72	59.4
	Min	35	25	31	30	18	24	28	38	36	34	42	42	38	34	42	39	48	52	40	36	34	43	49	38	40	32	40	45	45	52	37.5
Grundy Center	Max	46	51	58	44	41	49	59	55	62	61	67	67	45	60	73	88	66	49	48	68	68	57	58	62	52	66	69	66	71	69	59.2
	Min	29	25	27	28	19	20	21	36	34	34	30	36	39	33	30	47	46	37	34	34	35	41	35	31	25	43	39	43	34	53	34.3
Guthrie Center	Max.	38	53	48	45	41	49	52	67	65	62	70	59	58	62	72	89	76	65	54	60	65	61	63	64	57	66	70	74	77	76	61.9
	Min.	34	23	35	28	21	24	26	38	55	30	32	41	19	52	33	52	58	33	29	33	43	47	48	50	31	33	42	35	34	53	36.3
Hampton	Max	45	50	57	44	42	48	58	52	61	61	67	63	51	62	75	83	65	41	47	57	60	59	60	63	53	65	67	65	72	65	58.6
	Min	31	24	26	27	23	20	26	35	34	33	33	39	38	33	35	49	51	37	24	33	38	45	36	40	39	32	42	42	39	52	35 6
Hopeville	Max	49	53	45	46	40	50	54	65	64	60	68	64	53	61	61	86	74	59	55	59	59	58	63	63	55	66	69	69	72	72	60.3
	Min.	31	24	36	32	22	26	29	40	39	32	34	40	36	33	38	48	57	43	36	34	45	43	40	39	39	34	41	44	41	52	37.6
Hedrick	Max.	48	58	62	55	39	50	63	60	49	56	56	72	42	72	76	86	69	59	43	52	63	56	63	..	50	49	59	60	79	67	58.0
	Min.	36	36	43	33	27	30	43	40	46	47	51	49	40	..	59	44	59	47	42	43	53	54	49	..	47	47	54	50	62	49	46.3
Humboldt	Max.	42	50	58	50	40	48	57	66	63	62	68	66	57	63	79	82	75	46	50	59	64	60	61	63	58	67	68	69	75	67	61.0
	Min	30	22	29	28	20	22	23	38	53	30	28	40	33	27	29	52	43	36	34	33	42	44	33	37	37	28	44	45	31	42	34.1
Independence	Max.	48	47	57	53	43	49	58	56	61	60	65	65	45	61	69	84	67	49	46	56	55	57	57	60	51	63	64	65	69	68	58 2
	Min	31	24	24	26	16	22	21	33	30	34	30	35	36	33	34	41	52	38	34	33	53	47	57	35	33	32	16	43	36	51	33 7
Indianola	Max.	51	54	51	48	43	50	55	65	65	61	66	64	50	65	75	87	76	59	52	60	62	67	61	62	62	60	67	67	73	73	61 4
	Min.	35	25	38	32	20	27	28	46	47	32	37	43	36	35	38	51	54	42	36	35	46	50	37	39	30	34	41	46	46	53	39 0
Iowa City	Max.	53	51	61	46	44	49	60	53	62	63	68	68	45	62	69	82	70	48	48	59	63	60	62	62	57	65	67	65	74	71	60.3
	Min.	35	26	27	32	21	21	22	36	33	32	32	37	37	33	36	46	55	41	39	36	45	50	42	35	36	36	37	42	39	52	36.1
Iowa Falls	Max	44	59	57	44	42	49	58	59	63	62	67	65	51	61	75	86	68	46	47	59	58	58	51	32	32	66	67	68	75	68	59.5
	Min.	27	22	27	26	22	18	18	37	31	33	30	39	38	32	28	47	44	37	35	33	36	42	35	..	30	40	44	30	54	33.5

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR APRIL, 1898—CONTINUED

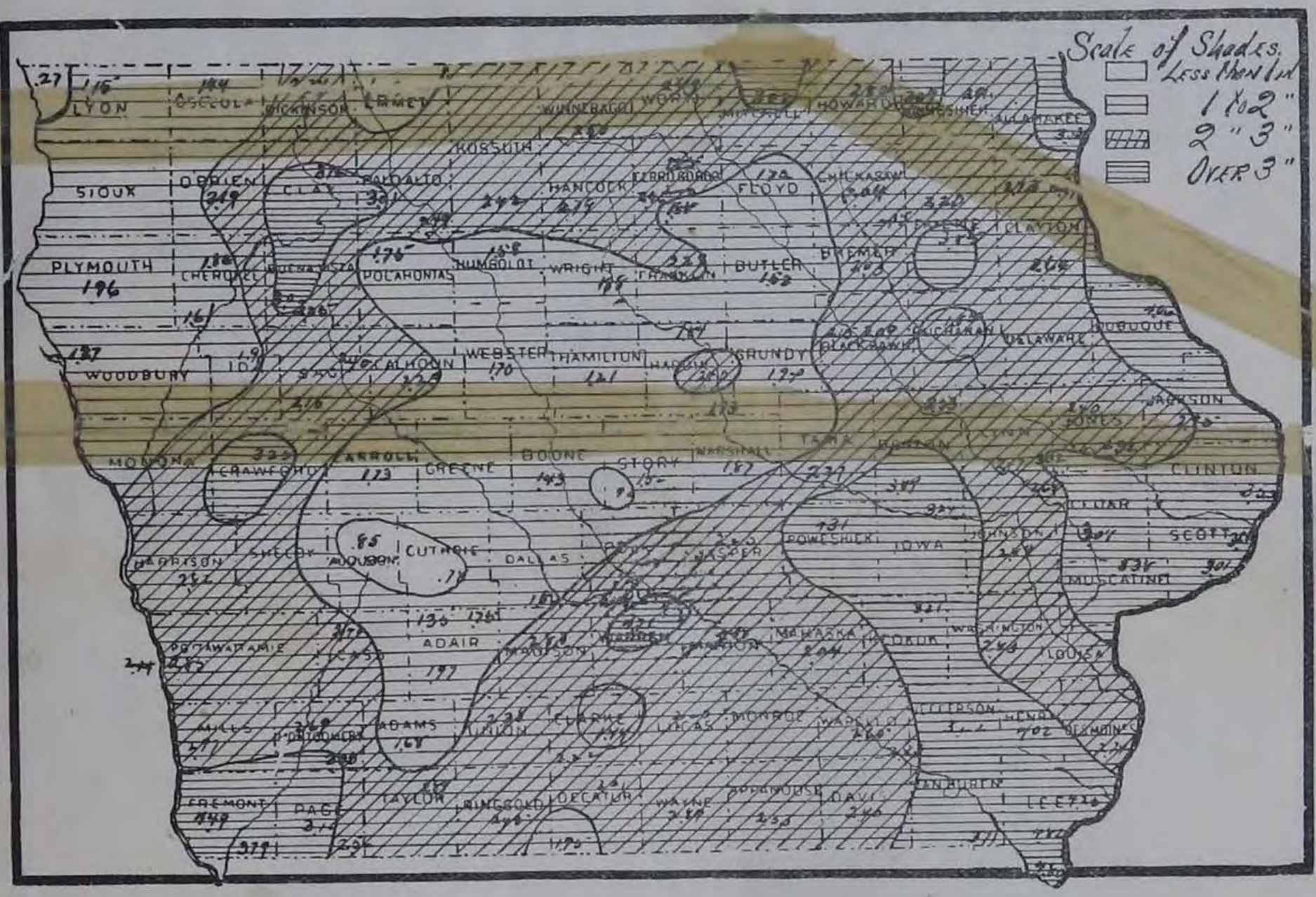
STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Keokuk	Max.	53	51	50	45	37	46	56	53	64	60	67	69	62	62	69	80	78	64	52	59	61	58	61	59	58	61	66	67	75	72	60.5
	Min.	40	30	39	39	25	26	33	45	44	41	40	46	35	38	41	54	61	48	43	42	45	52	52	46	43	40	45	53	48	55	44.0
Knoxville	Max.	55	54	51	50	40	50	58	55	66	61	69	68	46	61	74	86	78	50	53	61	61	57	60	64	56	62	69	70	75	70	61.0
	Min.	35	27	37	33	23	27	30	40	39	39	35	43	40	35	38	50	54	43	37	37	44	50	41	39	39	30	42	45	43	53	38.9
Lamoni	Max.	55	52	44	46	39	48	54	64	65	60	66	65	53	60	72	85	77	54	55	59	59	57	63	61	61	62	69	68	74	74	60.8
	Min	34	26	38	34	25	26	31	40	39	32	36	43	34	32	36	45	53	45	34	36	46	50	40	40	32	30	41	44	40	53	37.9
Lansing	Max.	49	48	56	49	45	51	60	53	62	60	62	70	58	65	71	81	65	46	43	60	54	62	55	64	53	65	64	67	74	63	59.3
	Min.	34	26	22	29	19	20	22	33	38	40	30	40	33	37	31	43	45	40	35	32	30	48	35	31	37	33	38	47	34	49	34.8
Larrabee	Max.	47	55	56	44	42	50	56	66	56	63	67	53	56	66	86	82	57	47	53	56	67	66	58	66	53	65	67	67	67	65	60.0
	Min.	29	18	30	24	16	20	27	37	28	22	32	35	30	26	35	48	42	32	32	30	42	39	38	44	31	29	45	45	35	48	33.0
Le Mars	Max.	45	55	55	51	43	51	55	66	61	62	70	52	68	65	84	84	72	45	54	60	70	68	63	64	57	66	71	69	74	71	62.4
	Min	30	18	31	25	18	17	29	39	31	28	35	38	34	25	40	40	44	36	45	33	45	42	43	43	35	27	49	41	32	52	34.8
Lenox	Max.	51	54	47	45	38	48	53	67	67	60	67	59	56	61	74	86	81	58	57	59	63	58	62	61	59	64	70	69	72	72	61.3
	Min.	34	24	36	32	23	26	29	37	37	30	39	41	35	32	37	50	55	44	36	33	47	50	40	41	38	34	41	42	42	52	37.9
*LinnGrove	Max	56	50	56	43	42	48	60	50	61	60	67	69	44	60	68	83	67	45	47	50	56	59	58	61	54	64	67	64	71	69	58.3
	Min.	40	29	28	30	19	23	26	38	31	39	34	39	34	34	34	44	51	39	36	34	39	45	42	37	32	35	39	41	40	51	35.4
Logan	Max	51	55	53	45	46	58	53	56	59	63	72	54	65	65	82	91	68	49	60	48	66	70	72	62	57	59	70	71	70	72	61.8
	Min	32	20	24	20	23	20	21	30	32	36	45	36	27	21	34	43	40	40	36	40	35	42	43	42	40	31	42	34	36	50	33.9
Maquoketa	Max.	58	47	56	57	39	48	58	53	61	58	65	66	54	60	68	82	76	61	49	58	57	58	58	61	59	64	65	68	72	63	59.9
	Min	35	28	24	29	23	23	23	35	33	45	43	34	38	37	35	42	46	39	37	37	32	48	44	37	35	37	38	47	37	45	35.2
Marshallt'n	Max.	51	54	57	47	43	51	60	56	63	62	67	66	46	62	74	90	69	43	50	53	55	51	52	54	49	62	59	68	74	72	58.9
	Min.	31	23	36	30	20	20	19	40	35	35	29	43	40	35	30	51	51	41	36	33	38	50	36	32	35	34	42	45	34	55	36.3
Mason City	Max	49	44	55	47	41	47	58	59	60	59	60	59	68	63	55	60	76	77	52	55	48	57	57	58	58	59	52	65	68	64	57.7
	Min	32	22	25	24	24	20	22	36	32	32	36	32	30	42	37	30	30	49	44	37	34	33	36	46	31	37	38	35	46	36	33.7
Monticello	Max	53	49	55	35	40	48	58	50	66	60	65	69	44	60	68	83	68	45	47	..	..	..	..	61	61	56	64	65	72	75	58.5
	Min.	36	25	24	25	19	22	22	35	32	42	29	29	31	35	32	41	41	40	37	..	..	..	..	55	45	36	34	44	35	55	30.9
Mooar	Max.	51	51	52	43	42	47	56	52	67	61	67	69	43	62	61	83	76	52	51	62	60	59	63	58	58	60	65	65	74	72	59.6
	Min.	32	29	38	39	27	18	21	37	40	40	32	37	35	37	38	59	50	45	41	38	35	51	51	35	33	37	38	51	39	54	37.9
Mt. Ayr	Max.	50	53	43	48	39	49	57	68	67	60	69	63	54	61	75	87	78	58	58	62	63	58	63	61	57	67	71	69	75	75	61.9
	Min.	36	25	37	32	24	26	27	40	37	30	37	43	24	33	40	45	53	44	35	34	46	40	40	41	37	35	43	45	45	51	37.5
Newton	Max	52	53	56	47	42	50	58	58	64	62	67	68	47	62	73	87	70	53	50	59	62	57	63	64	56	62	67	68	74	72	60.8
	Min	34	25	33	31	22	34	26	40	36	34	37	42	39	34	36	49	52	41	36	35	43	47	40	38	40	34	41	45	43	53	38.0
N.Hampton	Max	61	62	68	56	54	65	63	51	63	72	74	65	45	74	75	87	69	46	49	64	55	70	61	75	61	73	65	71	53	71	64.4
	Min.	32	25	27	36	20	29	26	34	32	36	36	39	38	34	35	50	43	35	35	34	46	49	35	41	38	35	40	44	51	55	37.9
Northwood	Max.	42	48	55	39	41	47	58	55	60	57	62	67	54	59	77	78	61	44	45	48	54	63	56	58	54	64	64	65	71	59	56.6
	Min.	30	25	25	24	21	25	22	36	36	32	30	39	33	33	31	48	41	28	32	33	36	42	34	35	30	32	39	..	..	..	32.1
Odebolt	Max	42	52	48	42	40	51	55	67	63	65	68	54	54	65	80	90	78	45	54	59	66	64	62	64	58	66	65	70	73	69	61.9
	Min.	32	21	31	29	20	20	27	..	..	27	32	43	38	28	36	52	45	37	34	32	43	45	37	44	35	28	46	42	34	54	35.4
Ogden	Max.	43	54	53	46	39	51	56	65	69	62	68	61	64	63	77	91	70	..	53	63	64	60	63	65	55	64	69	71	74	67	61.3
	Min.	35	21	31	30	21	21	27	37	29	32	36	40	38	30	38	54	52	39	34	32	45	47	39	37	37	32	41	44	34	55	35.9
Olin	Max.	52	52	49	56	44	40	48	58	49	62	60	64	68	45	61	68	82	62	45	47	49	..	59	58	61	57	63	66	65	71	57.1
	Min	35	28	24	31	19	21	22	28	32	35	30	33	36	36	33	41	51	45	..	35	31	43	44	37	35	35	37	46	36	49	34.2
Omaha,Neb	Max.	42	52	45	45	40	50	54	69	67	62	67	57	58	63	78	88	72	51	60	58	68	66	61	61	57	64	65	70	70	71	61.2
	Min.	34	28	39	34	26	28	34	43	42	34	43	42	39	38	45	57	50	38	37	37	..	52	43	47	44	35	49	47	47	54	41.3
Osceola	Max.	51	53	48	46	41	50	55	65	67	60	68	63	52	62	74	87	74	49	49	55	53	55	57	54	51	63	68	64	72	73	59.8
	Min.	34	25	37	33	22	26	28	42	39	33	32	44	38	34	39	50	57	44	36	24	43	43	38	34	..	34	42	44	41	52	38.7
Oskaloosa	Max.	53	53	55	46	38	49	60	60	65	62	69	69	45	60	73	84	78	54	46	62	59	53	62	62	54	61	71	..	..	..	....
	Min.	33	23	33	32	20	21	19	39	34	32	31	40	38	33	30	47	50	43	37	35	39	49	40	34	35	35	43	49	43	51	35.7
Ottumwa	Max.	53	54	52	44	34	49	57	58	66	61	66	67	49	70	70	84	77	66	52	60	59	58	63	61	60	58	62	63	73	73	61.2
	Min.	34	27	34	33	22	26	24	32	37	33	33	39	37	35	37	45	56	44	39	38	42	51	44	40	39	36	40	48	42	48	37.2
Ovid	Max.	52	54	48	54	46	53	54	63	64	65	68	57	48	66	74	75	66	50	56	60	54	53	64	67	61	61	68	70	71	74	61.9
	Min.	32	23	37	32	23	24	27	40	38	32	36	41	36	32	35	52	40	42	36	34	43	47	38	37	36	32	41	42	39	52	36.6
Plover	Max	46	59	55	48	52	54	52	70	69	66	71	54	76	55	82	80	55	48	54	60	65	64	65	67	55	68	70	65	74	68	61.8
	Min.	30	22	30	20	20	25	23	40	30	30	28	44	35	29	33	48	46	40	35	34	44	38	35	37	31	36	44	46	42	54	35.2
Portsmouth	Max.	46	55	36	52	46	57	56	91	72	60	70	45	44	71	80	91	72	62	60	66	..	..	..	..	..	..	..	..	..	..	....
	Min.	16	16	30	28	19	19	25	35	27	28	29	40	40	24	27	45	45	35	32	29	..	..	..	..	..	..	..	..	..	..	....
Primghar	Max.	46	63	55	44	42	51	52	65	60	61	63	61	56	65	82	78	70	44	52	57	63	68	65	63	60	65	69	68	72	67	61.0
	Min.	29	22	30	24	18	22	27	37	28	24	37	42	27	32	40	49	42	34	33	31	42	40	40	42	31	34	46	40	40	50	34.4
Red Oak	Max	49	54	42	46	42	50	56	68	63	63	69	56	58	63	75	88	78	62	58	61	63	61	63	62	60	67	73	70	73	73	62.3
	Min	31	29	36	32	23	25	29	39	37	32	31	42	35	28	31	49	61	41	38	38	43	51	42	34	39	31	44	43	35	40	37.1
Ridgway	Max	47	50	55	47	43	53	59	47	61	62	66	68	50	62	75	85	59	39	41	58	53	59	58	66	56	65	65	68	74	63	58.6
	Min	31	23	24	22	18	24	28	37	34	32	35	42	36	31	36	48	40	34	34	34	34	44	..	34	40	30	43	43	41	47	34.3
Rock Rap	Max.	52	56	56	54	58	54	56	70	66	58	70	61	66	68	84	72	56	35	58	62	64	72	60	68	54	68	72	70	63	61	62.4
	Min	28	18	24	23	14	20	22	32	24	25	26	34	30	32	36	44	44	30	30	30	40	38	46	38	30	24	31	33	26	32	30.2
Rockwell C	Max	42	44	48	38	39	48	55	62	64	58	67	47	54	61	77	82	52	41	52	55	67	64	62	60	59	65	65	57	72	68	57.2
	Min	28	22	28	28	20	20	25	39	30	34	35	42	34	26	34	45	45	37	34	33	38	37	37	41	35	32	41	41	39	48	34.3
Ruthven	Max.	59	53	53	53	41	50	..	64	64	57	68	65	56	64	80	81	72	45	50	57	62	61	60	61	61	64	..	78	70	70	61.1
	Min	22	28	25	25	19	22	..	24	28	28	40	42	32	42	38	48	42	32	32	32	40	39	37	37	33	30	..	40	36	48	33.6
Sac City	Max.	40	50	55	50	41	50	52	50	60	65	72	60	51	66	88	72	50	44	47	52	56	58	60	62	58	60	69	70	72	70	58.4
	Min	31	32	35	31	28	30	31	20	34	33	32	31	29	33	46	45	44	40	38	32	35	37	36	35	36	32	36	38	40	42	34.7
Sibley	Max	47	55	56	43	41	52	58	64	58	63	70	51	58	67	86	75	52	41	55	60	62	65	60	64	51	68	69	69	72	61	59.7
	Min	27	15	28	22	15	16	25	35	22	27	28	43	29	26	34	45	42	31	32	31	42	40	40	38	30	30	47	38	33	49	33.2
Sidney	Max	44	54	43	45	42	45	55	69	67	62	68	52	56	61	76	85	75	52	60	59	69	64	65	65	57	64	70	64	69	71	61.1
	Min.	34	28	36	33	27	29	30	29	43	34	39	42	38	37	41	64	61	48	36	36	37	34	46	45	48	36	45	48	44	55	40.0
Sioux City	Max	49	53	49	45	43	51	55	65	62	64	68	53	59	66	82	88	54	45	58	59	70	69	61	62	53	65	72	70	72	74	61.1
	Min	29	21	38	28	19	19	33	40	37	28	42	46	34	31	45	59	46	37	31	33	50	45	46	46	38	32	52	45	39	54	38.2
Spencer	Max	45	47	46	49	47	51	58	65	59	61	69	54	61	64	74	71	52	43	54	59	61	62	61	63	..	64	67	67	73	67	59.2
	Min	21	19	24	25	22	18	22	36	26	29	32	42	42	24	32	41	41	32	32	32	42	39	37	37	..	27	42	40	30	40	31.7
Spirit Lake	Max.	49	53	59	43	45	53	59	68	60	64	70	51	58	59	84	78	59	43	52	60	61	62	63	63	52	54	62	63	73	62	59.6
	Min	20	19	29	25	18	25	26	37	27	28	34	42	32	25	33	47	42	32	32	32	41	39	39	40	31	34	45	38	34	49	33.4
Stuart	Max	45	49	55	44	46	48	49	58	65	68	70	67	60	60	63	80	85	47	55	60	65	57	62	60	59	62	68	68	74	70	60.6
	Min.	35	29	35	28	30	32	35	35	35	30	33	31	30	32	34	35	37	43	35	35	35	42	40	35	31	31	40	43	42	43	35.1
Tara	Max	48	55	45	48	55	68	58	68	65	68	70	63	55	62	80	86	80	60	52	59	63	68	62	60	58	62	65	68	77	70	64.3
	Min.	35	45	18	23	24	35	25	38	30	31	32	28	27	29	33	34	40	30	28	34	39	42	35	31	27	29	34	35	32	59	32.4
Toledo	Max.	49	53	56	46	42	51	60	54	64	64	68	68	45	61	72	86	72	46	50	62	63	58	61	64	56	64	67	69	75	72	60.7
	Min	30	24	28	30	17	19	18	24	34	34	30	42	38	34	30	57	53	42	31	34	32	50	38	32	34	35	41	44	34	53	34.7
Thurman	Max.	44	54	48	40	40	48	54	70	68	63	67	61	58	63	76	88	75	58	61	61	71	65	65	61	59	63	71	70	71	72	62.4
	Min	29	20	39	34	26	25	30	41	31	33	32	42	38	30	31	52	58	44	37	33	49	53	46	44	42	35	50	50	38	48	38.8
Villisca	Max.	51	55	43	46	41	50	55	70	68	62	67	56	57	62	75	88	79	51	59	60	66	61	65	61	57	65	70	69	72	73	61.8
	Min	31	21	37	33	23	27	26	39	35	30	37	44	35	29	31	47	59	45	36	35	47	50	40	42	39	30	42	43	33	51	37.0
Washingt'n	Max	53	53	58	48	41	50	59	49	65	62	67	69	44	63	71	84	77	48	50	61	59	61	62	62	61	62	67	67	75	73	60.7
	Min	31	25	30	30	18	19	22	37	35	37	32	40	35	33	33	45	50	42	37	35	37	50	42	36	35	33	39	47	38	50	35.8
Waterloo	Max	48	51	58	43	42	50	59	52	62	62	65	67	51	61	72	86	73	49	47	59	55	57	59	62	58	64	64	68	71	68	59.4
	Min	30	24	26	27	19	22	21	38	31	35	30	36	37	32	30	49	47	38	33	35	34	49	37	31	35	35	40	45	35	53	34.6
Waverly	Max	47	50	58	47	42	50	59	53	62	61	66	68	46	61	73	84	70	46	46	58	55	59	57	61	53	63	65	67	72	66	58.9
	Min	29	25	28	28	21	22	22	40	32	35	31	41	39	35	30	51	46	39	33	35*	34	50	36	33	38	37	41	43	35	54	35.5
Webster Cy	Max	42	50	54	51	40	46	55	62	61	59	65	60	51	59	74	82	74	49	55	56	62	58	60	67	56	63	67	66	71	68	59.5
	Min	35	25	31	29	24	25	24	39	33	33	34	41	33	34	32	47	46	40	35	34	44	45	38	37	40	32	42	45	35	53	36.2
W Branch	Max.	52	49	55	40	40	47	58	56	61	60	69	58	61	64	82	70	72	56	45	58	61	60	59	60	56	60	69	67	65	72	59.8
	Min	34	27	35	32	20	20	21	34	31	49	31	36	35	35	42	53	48	39	38	35	31	50	45	36	33	35	35	47	37	51	36.4
Wilton Jc	Max.	53	49	57	47	46	48	57	51	68	65	63	68	58	64	67	82	76	53	60	62	58	60	53	62	61	60	67	70	74	69	60.8
	Min	29	25	27	28	20	23	25	36	33	30	40	39	37	35	34	43	52	46	34	33	46	40	34	39	36	33	42	38	44	43	35.6
Winterset	Max.	52	51	53	47	39	67	56	67	66	67	69	62	56	62	73	88	80	47	53	61	61	55	63	65	58	64	71	68	75	74	62.5
	Min	32	28	30	31	20	26	25	39	35	39	34	42	33	34	32	52	55	42	34	34	43	48	33	34	49	32	41	43	43	51	37.1

* Mt. Vernon.

DAILY AND MONTHLY PRECIPITATION FOR APRIL, 1898.

STATIONS.	DATE																													Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Adair	T		T							T	.45							.35									T			.55	1.35
Afton			T									.69	.14				.48	.61				.18					T			.28	2.38
Algona								.08				.20						1 50			.40						.02			.22	2.42
Alta (Hadden)							.02	.03				.30					.10	1.15			.05			.02						1 35	3.02
Alta (near)							.02				.36						.09	1.02												.86	2.35
Amana								.07	.31				1.47					.16	.10		T	.70			.10			.21		.12	3.24
Ames								.01				.36						.50				.47			.01		.03			.14	1.52
Ames (near)								.03				.22						.37			.20						T			.10	.92
Atlantic			.39				T					.40						.61			.18	.08		.25						.51	2.42
Audubon												.18						.35												.30	.83
Belknap				.20					.10				1.25	.05				.15	.05			.55	.05			.10		.05		.40	2.95
Belle Plaine	T							.25	.60	.01		.02	1.50				.03	.25	.02		.01	.65			.25			.30			3.89
Bonaparte			.14					.18					1.10				.26	.53				.73			.15		T			.62	3.71
Burlington								10	.09				1.10				.05	.41	.32			.58					.11	.03			2.79
Britt								.06	.02			.20					.20	1.55			.21	.19			.06					.30	2.79
Carroll	T							.09				.26				.15		.70			.15									.38	1.73
Cedar Falls								.18	T				.90				T	.50			.30				.10					.17	2.15
Cedar Rapids	.02							.34		T		.50	.46				T	.18			.50	.02		.08	.16		.16		.03	.02	2.47
Centerville	T		.38						.10			.02	.98				T	.05	.01			.34									2.53
Chariton	.15		.04	.27				.02	T			25	.63				.09	.05	.07		.02	.24					.01	.09		.27	2.20
Charles City	T							.04	.36			.28	T			T	.03	.49	02		T	.25	.07		T		T	T		.18	1.72
Clarinda				1 53			T					.45					.78	.41	T		.07		.23				T			.23	3.70
Clear Lake	T							.34	T		T	.22					.29	.95	T		.13	.15			.06					.31	2.46
Clinton	.06							.61		.03			1.40					.44				.48			.22			.07		.22	3.53
College Springs			1.05									.48					.41	.42						.20							2.56
Council Bluffs	.08		.55				.04					.68					.34	.34			.10				.20					.52	2.85
Cresco	.06							.10	.05				.49			.01		1.00			.85				.05			.03		.16	2.80
Davenport	T				T			.16	.09	T			1.27				T	.26	.40		T	.42		T	.33	T		.05		.03	3.01
Decorah									.06				.78					.62	.19		.43	.22			.29		.12			.10	2.81
Delaware																															2.37
Denison													.50				.12	1.63	.08		.33		.09							.50	3.25
Des Moines	.01							.07				.30	.16				.81	.31	04	T		.78			T		.10	.03		.03	2.64
De Soto	.01	T	T					.06				.35					T	.64			49	T									1.86
Dows								.17		.01		20						1.03			14				T		.04		.15	.20	1.88
Dubuque	T				T			01	.23	.59			2 07				T	.28	.42		T	.23			.05			.10		.08	4.06
Eldon	T			T				T	.12			T	1.66				T	.19	T		.07	.47			.03					.29	2.83
Eldora								.50	.25	T		.20					T	.75			.10						.50	T			2.40
Elkader								.14					1.37			T	.11	.58			.12	.14			.05		.08			.05	2.64
Estherville									T			.15					.13	1.10			T							T			1.38
Fairfield								.08	.23			T	1.52				T	.20	.05		.06	.61			.15	.01		.03		.28	3.22
Fayette								.15					1.29					.21	.67			.33			.40		.80				3.85
Forest City	T						02	.12				.25				.04	22	1.06			.14	.41								.24	2.50
Fredricksburg								.32				.10	.51					.13	.35	.31	.08							.07		.18	2.05
Ft. Madison	T		.26					.25					1.65				.17	T												.37	4.25
Galva	T							T				.25						1 02	.01					1.24		.31				.60	1.90
Garden Grove			.57					T					.55				.12	.20	T		.48			.02						.34	T	2.31
Glenwood	T		.85				T					.37						.87			.40				T		.05			.48	2.97
Grand Meadow									.21				1.04						.88			.30			.12					.18	2.73
Greene								.17		.04		T	.20				T	.64	.06		.13	.08			T		.05			.15	1.52
Grinnell												.75					.08	.85			1.05						1 05			.23	4.31
Grundy Center								.12				.40	.35				T	.30				T			.12		.20			.45	1.94
Guthrie Center	.07							.01				.23						.31												.16	.78
Hampton							02	.17	.02			30					.36	.80		.03	24			.04			.06			.25	2.29
Hawkeye								.30					.85						.86						.04					.15	2.20
Hedrick							.15						.85					11				.85								1.25	3.21
Hopeville	T		.27	.16				.13				.36					.68	11	T		.08	.12						.03		.28	2.22
Humboldt								.07				.18	T				.07	.73		.01	.08	.14								.30	1.58
Independence								.25	T				.80				T	.42			.12				.25		.01			T	1.85
Indianola	.01		T					.02				.24	.26	T			.11	2.60	.02	.02	T	.82	.01				.10	.02		.45	4.71
Iowa City								28					.92					.31				.48			.34			.19		.34	2.89
Iowa Falls								13				.37					T	.85			T	.29			T		.04			.16	1.84
Keokuk	.06	.06	.02	.30				.06	.34				1.82				.04	.32	.04		T	1.16			.10	.04		T		.44	4.80
Knoxville								10				T	.63				.16	.10				.84		T	T			.14		.21	2.18
Lamoni	.17		.38	.43								.19	.10				.06	.04	.01		.10	.10								.37	1.95
Lansing	.05							T	T				1.44				.06	.28	.53		T	.47			.17		T			.03	3.03
Larchwood												.02					T	.20						T	.05					T	.27
Larrabee								T	T			.34					.15	1.11	T		10									.12	1.82
Le Claire	.02												1.29					.07	.87			.31			.40		.09				3.28
Le Mars							.07					.28					.40	1.00		.02	.03				.15					.01	1.96
Lenox	.03		.46									.46	.01				.89	.29	.05		.03	.14		.08	T		.01			.20	2.89
Linn Grove (Mt. V.)	T							.20		.01		.15	1 05					.35	.07			.37			.32		.17			.13	3.02
Logan			.53									.55					.30		1.25		.06			.13							2.82
Maquoketa								.05	.15			T	1.60					.22	.43		T	T			.16			.10		.24	2.95
Marshalltown	T							19	.02			.30	.36					.48	.13		T	.25					.10	.02		.02	1.87
Mason City								.35	T																		T			.25	1.85
Millman (Des Moines)	.03							T				.63					.06	.32				.68					.13			.03	2.48
Mooar	.04		.10	.28				.20	.33				1 36				.06	.30	.12			1.44			.09	.07		T		.40	4.82
Monticello								.08	.05				.75					.46				.36						.20		.50	2.40
Mt. Ayr	.10		.51	.49								37	.07				.13	.12	.03		.11	.10					.03	.01		.38	2.45
Mt. Pleasant								.15					1.55					1.20				.45			.25			.03		.39	4.02
Mt. Vernon								.33					1.00					.43				.37			.25		.15			.15	2.68
New Hampton								.05	.25			.50					.05	.45	.29			.15					.10		.15	.05	2.04
Newton	T							.25				.37	.29				.12	.36	.01		.53	T			.07		.15			.08	2.23
North McGregor									.13				1.00	.47			T	.10	.90			.25	.04		.03			.05			2.97
Northwood								.20				.10					.35	.90			.50	.20								.24	2.49
Odebolt	T										.26																				
Ogden	.02							.18				.20					.17	1.25	T		.07									.40	2.15
Olin									.15	.05			.86					.42	.03			.26			T	.03	.03			.26	1.43
Omaha (Neb.)	.08		.20	.17			T	.02				.60	.03				.20	.48			T	.31			.07		.20			.20	2.32
Osage								.51					.24				.35	.85			T	.13		.07	.01		T		T	.38	2.74
Osceola	T		.13	.25				T					.19				.07	.94			.74									.24	3.02
Oskaloosa	T							T				21	.54				.12	.25		T	T	.01	.03		T		.02	.01		.27	1.44
Ottumwa								.25				.08	1.10					.10			.95				T		.05			.20	2.04
Ovid	.24		.19	.26				.07				T	.71					T			T	.60			.10		T			.60	2.65
Plover								T	T			.15					.20	.14				.75								.48	2.84
Primghar								.03				.27					.35	1.10	T		T									.30	1.75
Red Oak	.13		.13	.52				.03	T			.49					15	1.15	.08		.17	.04	T							.10	2.19
Rockwell City								.11				.27					.23	.72			.02	.06		.14	T		T			.30	2 69
Ruthven												.22	.02					.66				.50		.02						.44	2.23
Sac City								.20				.50						2.00		.10										.67	3.01
Sibley								.04				.14					.60	.60						.10							2 40
Sidney			1.55				.05					.59					.17	.78	.03		.14	.01		.03	.02				.50	.08	1.44
Sioux City								.01				.25					.25	1.39				.03		.16	.02		T		T	.45	4.49
Spencer								T				.25					.02	.81	.05				T	.05						.17	1.37
Spirit Lake												.28					.22	1.69	.03		.07	.18	T							65	3.12
Stuart	.43		.05									.30					.30	.94			.28	.04								.48	2.34
Tara												.52						.40				.35									1.75
Toledo								.64				.20					.20	.60	.20											.50	1.70
Thurman	T		.70	65			T	.04					.77					.47				.27									2.27
Villisca	.03		.76				T					.55	.03				.10	.90		T	.04	T	.15	.18		T			.45	3.79
Vinton								.61				.39					.46	.45				.42		.21						.33	3.05
Washington								.11	.15				1.06					.38			.28				.07		.13			T	2.53
Washta													1.18				.18	.35				.45			.08					.38	2.83
Waterloo								20		.09		.33					.03	.70	.10			T	T	T					T	.45	1.61
Waverly								.21		.03		T	.75				T	.21	.20		.11	.27			.07	.04	T	.06		.09	2.09
Webster City								.06				.14	.42				.04	.34	.20		.11	.14					.05			.15	2.03
West Bend								T				.25					T	.45	T		T	.15					T			.30	1.21
West Branch	T							.02	.36	T		.20						.77	.55		.66				T					.31	2.49
Whitten								.20	23			.96					T	.26	.12		T	.29			.52	T		T		.55	3.08
Wilton Junction	T							.30				.10	.58				T	.31	T		.22				T					T	1.73
Winterset	.18			.21				T	.07				1.06				T	.67			T				.77		.10			.48	3.38
													.54					1 15	.15			.27						14		.18	2.88

Precipitation Chart April 1898.



May, 1898.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

VOL. IX. NO. 5.

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Central Station, Des Moines, Iowa.

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DIRECTOR.

GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER.
1898.

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Afton.....Hon. N. W. Rowell.
Albia.....R. Moore.
Algona.....C. D. Pettibone.
Alta.....D. E. Hadden.
Alta (Near).....W. J. Minard.
Amana.....Conrad Schadt.
Ames.....Exp. Station.
Ames (6 miles s. e.).....Isaac Young.
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Garden Grove.....M. Wemple.
Gladbrook.....Geo. F. Parker.
Glenwood.....J. P. Jackson.
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Greene.....J. L. Cole.
Greenfield.....J. G. Culver.
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Grundy Center.....Geo. F. Ellis.
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Larchwood.....F. W. Stokes.
Larrabee.....H. B. Strever.
Lenox.....J L. Hurley.
Le Mars.....Dr. T. E. Cole.
Linn Grove (Mt. Vernon P. O.) Rev. J. W. Hubbard.
Logan.....Mrs. M. B. Stern.
Malvern.....R. F. Norton.
Maquoketa.....Dr. A. B. Bowen.
Mason City.....B. F. Gibbs.
Marshalltown.....C. M Cook.
Millman.....W. H. Shaul.
Monticello.....A. Matthiessen.
Mooar.....F. G. Thomas.
Mount Vernon.....Prof. A. Collin.
Mt. Ayr.....A. F. Beard.
Mt. Pleasant.....Dr. Max E. Witte.
Neola.....J. H. Garland, Jr.
New Hampton.....R. H. Gurley.
Newton.....A. Lufkin.
Northwood.....A. L. Thompson.
Odebolt.....E. Starner.
Ogden.....E. Sayre
Olin.....Hon. Nathan Potter.
Omaha. Neb.....*L. A. Welch.
Osceola.....A. W. Lewis.
Ovid.....H. C. Miller.
Osage.....G. D. Pattingill.
Oskaloosa.....Jos. Boyd.
Ottumwa.....Dr. J. F. Herrick.
Pella.....T. W. Cox.
Plover.....J. S. Smith.
Portsmouth.....J. W. Dahlheimer.
Primghar.....P. R. Bailey.
Red Oak.....Geo. W. Holt.
Reinbeck.....Dr. L. B. Hathaway.
Ridgeway.....Arthur Betts.
Rock Rapids.....W. C. Wyckoff.
Rockwell City.....C. W. Randall.
Ruthven.....Ora Taylor
Sibley.....H. G. Doolittle.
Sidney.....G V. Swearingen.
Sigourney.....Mrs. K. F. Ashbaugh.
Sioux City.....*U. G. Purssell.
Sac City.....Dr. C. Brown.
Spencer.....S. Gillespie.
Spirit Lake.....W. C. Drummond.
Stuart.....H. M. Bartlett.
Tara.....W. E. Humphry.
Thurman.....C. R. Paul.
Toledo.....Chas. Mason
Vinton.....T. F. McCune
Villisca.....J. F. McCartney.
Wapello.....Geo. W Schofield.
Washington.....Wm. A. Cook
Washta.....H L Felter.
Waterloo.....M. L. Newton
Waverly.....H. S. Hoover.
Waukee.....N. C. Wragg.
Webster City.....Louis Frank.
Whitten.....Dr. Frank P. Butler.
Wilton Junction.....J. M. Rider
Winterset.....W. W. McKnight
West Bend.....Phil. Dorweiler
West Union.....J. W. Bopp.
West Branch.....A. A. Madson.

*U. S. Weather Bureau.

WEATHER-CROP OBSERVERS

Reporting for the Weekly Bulletin.

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Albia.....Wm. Mercer.
Allerton.....James Piper.
Alta.....Jonas Cushman.
Ames.....S. B. Mills.
Attica.....G. W. Mendenhall.
Atwood.....J. H. Tanner.
Battle Creek.....A. Preston.
Boone.....L. C. Morris.
Centerville.....Henry Galley.
Charles City.....W. B. Towner.
Chariton.....C. C. Burr.
Clarksville.....F. M. Russell
Correctionville.....Hon. W. B. Chapman.
Corning.....Jerome Smith.
Corwith.....Wm. Oxley.
Clermont.....Chas. Larrabee.
Council Bluffs.....L. Prouty.
Creston.....M. V. Ashby.
Danville.....Sherman Matthews.
Emerson.....D. B. Nims
Ely.....Hon. A. J. Fuhrmeister.
Fulton.....Carl S. Frank.
Fontanelle.....Hon. L. M. Kilburn.
Ford.....J. C. Richards
Fort Dodge.....R. W. Blaine.
Geneva.....Wm. H. Thompson.
Grinnell.....A. O. Price.
Guthrie Center.....W. W. Bailey.
Hesper.....G. E. Dillingham.
Humeston.....Hon. S. H. Moore.
Independence.....C. L. Thomas.
Jefferson.....S. M. Taylor.
Larrabee.....H. H. Carnahan.
Laurens.....Hon. M. E. De Wolf.
LeMars.....Hon Henry Schrooten.
Lockridge.....John F. Farman.
Marshalltown.....Hon. S. B. Packard.
Mason City.....Wm. Nettleton.
Mapleton.....A. Lamb.
Mt. Pleasant.....W. S. Wright.
Milton.....Hon. E. C. Holland.
Mount Vernon.....Robert Smith.
Nevada.....Geo. C. White.
Osage.....E. W. Stacy.
Orange City.....H. J. VandeWaa.
Paton.....A. B. Condit.
Pittsburg.....G. C. Duffield.
Rockford (Cerro Gordo).....Hon. J. W. Bird.
Rock Rapids.....D. E. F. Merrill.
Rockwell City.....J. G Palmer.
Rossville.....T. B. Wiley.
Rowley.....L. Maxson.
Sageville.....Hon. F. N. Knoll.
Seymour.....L. B. Sager.
Shenandoah.....Reuben Mullison
Spirit Lake.....L. Stowe.
State Center.....E. P. Thompson.
Sumner.....John Dawson.
Tama.....W. G. Malin.
Unity.....Edw. Hummer.
Van Horne.....Spencer Smith.
Willow Creek.....W. S. Nicholson.
Winterset.....H. A. Kinsman.
Wall Lake.....T. E. Wilcox.
Wilton.....Thos. Boot.
Wiota.....F. S. Coomes.

U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME IX. MAY, 1898. No. 5.

NOTE AND COMMENT.

Sing ho for the good old dairy cow,
Sing hi for the little brown hen;
Such a couple was never on earth below
To feather the nests of men.
With the golden products of good Queen Bess
No "udder" can compare,
While the snowy fruit of the cackling "bute"
Brings a solace for every care.

Men risk their lives for the shining ore
Deep laid in a frozen clime,
When these peaceful servants bring them more,
And peace at the self same time.
With pasture in plenty and bugs galore,
They never lack for feed;
Their stock is at par at the grocery store
For things that the farmers need.

Then three times three for the bovine "she,"
And three for the female fowl;
At the farmer's door which they feed before
No wolf has a chance to howl.
No poet's dream ever hatched a theme
More worthy a poet's pen,
Than the kindly queen of the prairies green,
And the busy, cackling hen.

—*Sioux City Journal.*

***

Rockford *Register:* "Cyclone caves differ from lightning rods in this, that you know when the cave fulfills its mission, but with the rod you don't."

***

In the northern half of this state raspberries and blackberries require some protection in winter. Reports indicate considerable damage by winter-killing. It pays to lay them down in the late autumn.

***

At Rockwell City, on the evening of May 20th, a heavy shower occurred, the government gauge showing a fall of one inch of water within twenty minutes. This item is gleaned from the Rockwell City *Advocate.*

***

Section Director H. B. Hersey, of the New Mexico Climate and Crop Service, has been granted a two years' leave of absence from the Department of Agriculture, and has gone to the front with a major's commission in the First United States Volunteer Cavalry, known as "Roosevelt's Brownies." That regiment will be heard from if actual fighting is done in Cuba. R. M. Hardinge is now serving as director at Santa Fe.

A newspaper special from Atlantic, dated May 26th, says, during a thunderstorm on that date, lightning struck close to the residence of Mrs. Maude Troupe, near Lewis, and the shock caused the lady to become temporarily insane.

***

The men who predicted a very dry season were not saying anything during the latter half of May, and those who predicted a wet spell were remarking, "I told you so" These long-range prophets are most vociferous when they chance to make a correct guess.

***

Prof. S. P. Langtry has now carried his delicate heat-measuring apparatus, the bolometer, to such a degree of perfection that it will register a ten-millioneth of a degree, Centigrade. In a recent description of this device he says that for a certain part of it, the dampening mechanism of the galvanometer, he uses a dragon-fly's wing, on account of its lightness and rigidity.

***

A curious tornado freak is reported from Sabula, this state. When the late destructive storm was about three miles south of the place the iron roof of a large warehouse in town was lifted and thrown into the street. The tornado came no nearer town, and scarcely a breath of wind was stirring at the time. Those near the damaged building report that the air grew hot — *Sioux City Journal.*

***

A well-informed writer says: "Secretary Wilson does well to push the project for the growing of beets for the purpose of supplying the United States with sugar produced at home, rather than sending abroad for it as is done at present. A glance at the following figures will show the extent to which we are annually indebted to foreign countries for this staple article of diet. During 1896 it required the total amount of wheat and flour exported from this country to pay for the sugar imported. During the past year the total value of the live and dressed beef, products and lard exported, was barely sufficient to offset that of the sugar imported Our enormous exports of cotton, which practically supplies the world, are about only twice in value our imports of sugar. Our vast exports of tobacco are equivalent to only one-third the value of our sugar imports Last year it took our total exports of barley, rye, fruits and nuts, vegetable oil, oleomargarine, butter and cheese, pork and hams—all taken together—to pay for our sugar importations."

***

An unusually severe electrical storm visited Fort Dodge on the night of May 20th and the morning of the 21st. A special to the *Marshalltown Times-Republican* says there were several narrow escapes, and considerable damage was done by lightning. "The electrical coil in the striking tower on the court house was burned out by lightning. The home of William Pollock, in the east part of the city, was struck by lightning and

badly damaged. Mr. Pollock was standing in the door at the time, and the shock prostrated him on the floor. The most serious damage occurred Saturday morning. While the rain was descending in torrents, a vivid flash of lightning, accompanied by a crash like a broadside from a battleship, struck the steeple of Corpus Christi church. The upper half was torn into fragments, the street being littered with debris for many rods about. The lofty eminence was an attractive target for the thunderbolt. The top of the cross is 188 feet above the ground and was not protected by a lightning rod. Investigation shows that the electric current followed the iron braces down the steeple until the ceiling was reached, where, after some slight damage was done, it is supposed the gas pipe served as a conductor to harmlessly convey it into the ground.

***

This season has been unusually wet in the larger part of the state, and in the extreme southeastern counties the soil has been saturated, rendering field work well-nigh impossible on all flat or undrained lands. In all districts the rainfall has been excessive at times, and yet the larger streams have not given evidence of an unusual amount of rainfall. The rains came moderately, for the most part, and the soil greedily absorbed the larger portion of the water. Year by year the work of man has been effectively decreasing the annual flowage of our streams by making the earth more receptive and retentive of the water that falls upon its surface. By deep tillage and tile drainage the soil of our prairies has been made as porous and receptive as is the vegetable mould accumulated under the dense forests in the hilly and rocky sections of the east. In fact, deep cultivation and under-drainage on our western prairies have been as effective as forests in conserving the rainfall of this valley. With judicious culture and drainage we do not need extensive forests to conserve moisture in the rich, mellow lands of this midland region. The chief economic value of timber belts in this section is in breaking the force of cold winds of winter, and the evaporative effects of dry, hot winds in summer. For this mechanical effect we need shelter belts and wind-breaks, but we do not need forests to serve as reservoirs for our surplus moisture. By deep culture and tile drainage we may accomplish that purpose more satisfactorily.

***

The Fruitman, a monthly journal of horticulture, edited by M. E. Hinkley, of Marcus, Iowa, is an unusually bright and interesting little publication, especially valuable to Iowa fruit growers. Every number has been well ripened, juicy, and pleasantly flavored. No windfalls or worm eaten fruit are likely to come from that tree. It is worth sampling.

***

W. A. Drake, of Bloomfield township, Polk county, reports a heavy shower on Sunday, May 29th, about 2:05 P. M. It poured down eight minutes, with some hail, and during that brief time over an inch of water fell, according to Mr. Drake's measurement. It caused some damage by washing out corn.

***

The farmers of the United States in marketing the produce of their farms haul 500,000,000 tons of freight yearly over 1,500,000 miles of public roads. As a rule the roads are bad roads. Gen. Roy Stone estimates that the loss because of the difficulty of transportation is not less than $600,000,000 per year, and that this yearly loss would pay the interest at 3 per cent upon an outlay of money sufficient to rebuild all the bad roads and maintain them in proper repair afterwards. General Stone is an expert, and his calculations are probably very nearly correct. But suppose that they are only half correct; can the farmers, and the people not farmers, who traverse the roads afford to go on from year to year throwing away enough money to carry on the federal government, and thus needlessly double their burdens?—*Philadelphia Record.*

IOWA CROP REPORT, JUNE 1, 1898.

SUMMARY OF REPORTS FROM CORRESPONDENTS, SHOWING ACREAGE AND CONDITION OF STAPLE CROPS.

From reports of correspondents of this service, June 1, 1898, the following summary is made, relative to the acreage and condition of the staple crops for the current season. The acreage is obtained from careful estimates of increase or decrease, compared with the number of acres harvested in 1897. The condition is estimated in form of percentage, compared with the average or normal of the several crops

Wheat.—Of winter wheat the number of acres planted last fall and not abandoned appears to be 191,451, a decrease of 3,015 acres compared with last year.

Of spring wheat the acreage is 1,293,231, an increase of 216,394 acres compared with 1897. The total acreage of winter and spring wheat for this harvest is 1,484,682 acres, as against 1,271,303 acres last year. The condition, June 1st, of winter wheat was 101 per cent and of spring wheat, 104 per cent. Last year on the corresponding date winter wheat was 67 per cent and spring wheat was rated 91 per cent.

Corn.—The acreage of corn planted this year is reported to be 8,396,286 acres—a decrease of 213,859 acres compared with 1897, or an average decrease of a little less than 2½ per cent. The condition of the crop June 1st was rated at 101 per cent; last year at the corresponding date it was 79 per cent.

Oats.—The total acreage of oats for the state is 4,299,243 acres, and the condition June 1st was 105 per cent. Last year the area sown was 4,405,782 acres, and the condition June 1st, 88 per cent. This shows a net decrease of 106,539 acres.

Rye.—Total area sown, 210,309 acres; condition June 1st, 100 per cent. Last year the acreage was 226,198, and the condition was 90 per cent.

Barley.—Area seeded, 509,589; condition June 1st, 102 per cent. Last year the area was 551,867 acres; condition 86 per cent.

Flax.—Area seeded, 225,014 acres; condition, 100 per cent; area in 1897, 249,882 acres; condition, 89 per cent.

Cultivated Hay.—Total number of acres, 2,230,455. Last year the area was 2,159,334 acres; an increase for this season of 71,121 acres. The condition of new seeding of timothy is 105 per cent, and of clover, 107; millet is rated 98 per cent. This has been a very favorable season for the grasses.

Potatoes.—The condition of common potatoes is 101 per cent. The area planted is 164,456 acres. Last year the area was 163,248 acres; condition June 1st, 92 per cent.

Condition of other crops are as follows: Broom corn, 91; sweet potatoes, 98; sorghum, 96; apples, 98; pears, [illegible] plums, 80; peaches, 96; grapes, 99; blackberries, 95; raspberries, 94; strawberries, 100; currants, 97; cherries, 97 per cent.

Live Stock.—Condition, cattle, 104; sheep, 101; hogs, 98; spring pig crop, 76; horses, 99; foals, 91 per cent.

Meadows are rated 105, and pastures 106 per cent.

NOTE.—The fact should be borne in mind that estimates of the condition of corn, wheat, oats, rye, and barley were made about June 1st, at which time the grain crops were at their best. Since that date the weather has been very warm and wet, causing a rank growth of small grains, rendering them liable to damage by falling or rust. With normal weather conditions following June 1st, these cereals would have brought forth extraordinary harvests. The excessive moisture has rendered the output quite uncertain. And this furnishes a new illustration of the fact that more damage to small grain crops in this state has resulted from an excess than from a deficiency of rainfall.

IOWA CROPS, 1898—NUMBER OF ACRES BY COUNTIES.

COUNTIES.	Winter wheat—acres.	Spring wheat—acres.	Corn—acres.	Oats—acres.	Rye—acres.	Barley—acres.	Tame hay—acres.	Flax—acres.	Irish potatoes—acres.
Adair	589	11,079	106,226	52,320	693	480	23,900	.....	2,078
Adams	1,980	6,933	74,310	21,823	212	214	22,070	17	680
Allamakee	2,295	2,100	39,974	43,690	7,635	3,591	33,150	351	1,613
Appanoose	3,332	69	46,351	10,258	1,185	.....	43,650	90	517
Audubon	62	25,582	76,913	42,296	523	2,043	13,210	.....	1,346
Benton	392	728	103,610	72,365	2,695	10,035	34,350	85	2,050
Black Hawk	299	90	97,520	66,623	5,177	3,010	33,570	130	1,866
Boone	53	3,224	97,705	47,039	1,462	480	12,250	177	1,150
Bremer	98	181	56,794	51,707	2,221	1,597	18,210	1,887	1,345
Buchanan	.....	70	84,167	59,020	3,384	1,798	32,790	351	1,278
Buena Vista	.....	18,652	104,978	61,050	951	5 993	9,210	3,197	2,279
Butler	50	1,661	103,207	77,175	4,737	2,881	15,270	1,678	1,382
Calhoun	33	8,044	101,557	54,876	1,104	3,095	9,330	4,297	1,450
Carroll	46	17,910	116,772	61,934	1,804	7,282	12 470	1,184	2,208
Cass	3,099	18,906	112,110	50,341	937	1,117	15,240	.....	5,063
Cedar	2,751	383	103,537	42,781	1,288	4,324	47,020	.....	1,465
Cerro Gordo	36	2,173	77,167	68,859	2,931	6,485	5,170	6,695	1,408
Cherokee	.....	40,164	108,425	37,118	614	9,421	15,730	1,509	1,620
Chickasaw	43	994	61,246	63,028	1,504	4,039	18,310	8,010	1,438
Clarke	1,185	246	59,970	19,564	2,198	90	26,550	30	1,039
Clay	.....	25,475	82,359	56,609	3,327	21,367	11,260	8,083	1,361
Clayton	6,691	2,202	74,706	65,791	9,534	4,266	32,330	167	2,463
Clinton	1,944	531	117,192	61,550	7,319	915	50,280	22	1,973
Crawford	57	50,775	143,833	57,390	2,651	8,478	20,210	130	2,015
Dallas	3,361	4,970	104,460	43,115	1,482	270	21,650	.....	1,175
Davis	4,697	99	64,669	22,167	1,701	....	34,580	.....	540
Decatur	6,741	150	77,560	18,603	1,265	70	34,890	.....	1,239
Delaware	164	424	92,195	46,077	5,845	2,523	39,650	47	1,484
Des Moines	6,246	138	54,048	35,716	1,420	.....	18,130	.....	1,456
Dickinson	.....	19,834	27,898	23,113	814	10,336	1,650	6,065	670
Dubuque	567	523	70,775	61,767	4,684	1,015	40,250	.....	2,497
Emmet	33	34,111	37,418	25 526	1,075	10,554	1,710	7,300	621
Fayette	692	1,558	81,828	73,795	4,620	5,000	44,870	3,187	1,938
Floyd	125	2,637	72,440	62,896	2,199	3,692	20,820	4,128	2,926
Franklin	37	4,496	101,618	86,422	1,070	3,200	16,300	7,560	1,482
Fremont	4,348	6,710	96,840	11,430	740	120	11,080	....	760
Greene	25	3,225	104,295	60,270	1,370	1,440	14,250	1,510	1,150
Grundy	40	4,912	90,686	58,620	1,190	8,050	17,580	1,090	1,940
Guthrie	1,090	11,760	98,260	55,600	1,605	790	21,250	260	1,310
Hamilton	.....	3,090	94,4_0	47,140	465	1,130	15,476	3,320	1,015
Hancock	.....	14,275	66,870	60,820	790	12,464	8,650	15,500	960
Hardin	.....	5,825	96,510	62,710	710	2,110	8,240	2,140	1,485
Harrison	280	38,064	92,490	23,900	2,060	710	8 603	.....	1,256
Henry	4,765	220	73,518	37,410	1,330	.....	21.190	.....	1,040
Howard	90	3,584	45,190	55,570	490	9,010	15,540	11,410	1,160
Humboldt	.....	21,390	60,402	35,330	510	2,039	16,050	2,940	1,203
Ida	.....	3,387	92,710	36,813	920	5,407	13,980	126	1,265
Iowa	826	670	97,720	50,520	5,390	1,880	37,680	.....	1,525
Jackson	1,880	937	77,185	43,520	10,150	693	35.190	.....	1,660
Jasper	1,270	9,190	120,189	43,850	1,980	678	2?,730	.....	8,673
Jefferson	4,803	152	59,340	24,610	2,210	.....	24,104	.....	547
Johnson	3,280	725	92,665	42,318	4,450	890	31,020	.....	1,630
Jones	102	187	82,719	31,644	4,238	1,338	35,490	.....	1,009
Keokuk	4,035	336	49,144	46,348	3,349	286	36,118	....	1,156
Kossuth	33	58,327	105,370	80.085	508	14,240	10,785	25,176	1,550
Lee	18,465	45	46,002	18,269	2,015	.....	31,220	....	1,463
Linn	266	325	103,841	45,667	5,192	790	46,780	170	2,390
Louisa	3,626	205	66,293	23,871	1,512	.....	15,450	.....	604
Lucas	4,183	45	65,842	18,541	2,002	225	21,430	.....	528
Lyon	.....	97,843	55,034	38,013	594	51,057	4,250	2,730	1,359
Madison	4,994	8,893	92,484	28,259	1,683	256	27,830	.....	853
Mahaska	5,292	1,028	87,338	28,825	2,872	506	30,700	.....	1,843
Marion	5,270	3,386	96,164	30.269	3,328	399	23 820	.....	2,205
Marshall	221	8,018	71,447	42,204	1,448	1,570	25,560	147	1,347
Mills	1,560	18,395	76,061	17.929	447	220	14,480	.....	2,058
Mitchell	96	5,894	49,166	52,531	2,466	19,366	22,150	14,314	1,335
Monona	67	17,089	115,168	25,944	1,703	2,898	31,130	620	1,231
Monroe	3,675	75	47,263	12,118	2,703	.....	30,350	.....	500
Montgomery	4,294	17,643	101,154	21.315	795	.....	13,360	.....	1,302
Muscatine	5,638	1,159	67,184	24.562	3,015	4,170	28,220	.....	1,676
O'Brien	142	41,338	73,740	50,665	820	40,018	10,380	5,168	1,396
Osceola	.....	50,612	36,230	33.256	430	28,673	4.450	5,346	1,140
Page	11,342	8,052	129,694	21,513	723	196	28,380	.....	1,832
Palo Alto	15	11,537	64,686	58,710	703	5,114	6,460	7,947	1,186
Plymouth	77	101,860	124,614	62,703	1,303	10,397	10.570	2,090	2,907
Pocahontas	.....	13,741	74,644	52,443	950	5,332	5,750	7,342	1,731
Polk	806	7,188	98.344	36.334	1,431	90	22 350	.....	4,636
Pottawattamie	1,259	57,853	205,941	48,239	1,942	2,928	25.029	280	4,240
Poweshiek	613	1,028	94,222	48,469	2,151	1,026	38,540	.....	1,217
Ringgold	2,354	185	93,921	26.848	1,535	297	38,990	.....	795
Sac	.....	17,325	114,705	57,492	1,593	7,018	19,490	3,741	1,523
Scott	13,048	3,559	59,405	30,625	2.271	20,067	27,430	.....	6,344
Shelby	350	34,368	110,776	35,071	1,560	9,117	20,790	.....	2,419
Sioux	.....	150,581	114,369	64,896	600	32,745	3,280	1,610	1,645
Story	122	3.920	110,963	58,269	2,461	806	19,560	350	1,171
Tama	518	5,978	97,870	60,658	2,755	22,212	32,260	.....	1,738
Taylor	6,863	689	95,650	24,957	494	273	36,420	.....	3,347
Union	548	377	71,854	22,785	782	.....	26,970	.....	999
Van Buren	8,010	145	41,575	14,352	1,304	.....	18,110	.....	430
Wapello	7,442	70	61,570	15,570	2,239	.....	31,450	.....	1,290
Warren	914	5,551	85.929	27,682	2,842	.....	30,310	.....	2,126
Washington	2,957	95	90,360	35,894	2,664	.....	41.140	.....	806
Wayne	1,124	.....	73.736	21,336	1,854	.....	47,420	48	1,720
Webster	.....	6,517	112.040	59,723	1,241	.....	9,190	2,225	1,730
Winnebago	.....	23,656	86,239	32,353	116	5,614	4,110	10,175	628
Winneshiek	477	6,000	68,972	68,276	1,782	14.306	33,480	11,254	1,327
Woodbury	151	53,024	161,459	36,424	2,336	3,927	9,330	1,410	2,338
Worth	7	6,792	86,482	51,630	758	10,838	11,110	10,258	842
Wright	.....	7,267	82,873	60,831	318	4,192	12,870	7,940	960
Totals	191,451	1,293,231	8,396,286	4,299,243	210,309	509,589	2,230,455	225,014	164,456

RUBBER FROM CORN OIL.

What promises to be one of the most important discoveries of recent years is to be credited to Chicago chemists in the employ of the Glucose Sugar Refining company. This is the production of rubber or similar substance, in some respects superior to rubber, from corn oil. The value of this discovery is evident, especially if, as is claimed, the rubber so produced is much cheaper than the present product.

E. L. Wemple, the New York agent for the Glucose Sugar Refining company, said yesterday to a reporter of the *Commercial*, that, although the process is still in an experimental stage, its success is confidently expected, as this rubber is derived from vulcanizing the oil of corn, and will prove particularly valuable in the manufacture of mackintoshes, since it is not liable to crack or degenerate with time. Mr. Wemple also said that the new process will be particularly valuable in the manufacture of bicycle tires, as it is thin, durable and capable of withstanding much more pressure than the kinds now in use.

"The process," added Mr. Wemple, "was accidentally discovered several months ago, by one of the chemists in the employ of the company, and five chemists have since been working on it. The glucose company anticipate that the manufacture of rubber under this new process will become a very important branch of their business. I expect to have samples and specimens in New York in a short time. Perhaps it would not be too much to say that the discovery will revolutionize the rubber trade. If the oil of corn, properly treated and vulcanized, will economically produce a superior article to the product of the South American rubber tree, great changes in many departments of the rubber industry may be foreseen." —*New York Commercial.*

BACTERIA ON THE FARM.

The resources of bacteriology are simply inexhaustible, and its beneficent complications are as varied as they are comprehensive, while investigations of theoretical interest are daily assuming a practical importance hardly dreamed of by their original discoverers. Little did Heilriegel, Wilfarth and Beyerinch imagine that when they announced that certain leguminous crops, such as peas, beans, lentils, etc., are able, by means of root nodules, to absorb the free nitrogen of the atmosphere, and that this was accomplished by the aid of a particular bacteria contained in certain nodules, little did they anticipate that a few years later the great firm of color manufacturers, Messrs. Meisk, Lucius & Bruning, at Hochstam-Main, would undertake to deliver as an article of commerce cultivations of such bacteria under the name of "nitragin," wherewith to inoculate and so supply the maintenance of various leguminous crops. This is, however, what Dr. Nobbe, a distinguished follower in the footsteps of Heilriegel, has rendered by his brilliant researches an accomplished fact. Pure cultivations of nodule organisms suitable to the growth of no less than seventeen different varieties of leguminous field crops may now be purchased from this enterprising firm. Each bottle bears a different colored label, according to the crop for which it is destined, while the German, as well as the botanical name of the plant, is also affixed. About one-half an acre of land may be inoculated for half a crown, which represents the price for a single culture bottle. The cultivations are prepared at the Horchst works, under the direction of the former assistant of Dr. Nobbe, and the result of this latest development of practical bacteriology will be awaited with interest.—*London Nature.*

The high price of wheat flour has caused a largely increased consumption of corn meal, which is both cheap and healthful.

WEATHER OBSERVATIONS ON HIGH.

[FROM IOWA STATE REGISTER.]

Some interesting experiments in the way of making weather observations in midair are being conducted at Dubuque, and the indications are that valuable results will be attained. The weather bureau is a greatly abused department of government service, but, notwithstanding that fact, it is a most useful institution, and the benefits derived by the people are invaluable. The most valuable service performed by the department is, of course, on the seacoast, where its warnings to the merchant marine of coming storms have saved much more than the maintenance of the department has cost, besides saving thousands of lives. These warnings have also been of great value to the people of the interior, and the forecasts made by the department influence many a business transaction and the work of many a farmer. Statistics show that the weather predictions are correct more than 90 per cent of the time, but the people do not realize this fact. When the weather bureau predicts a shower and the sun shines, the people say, "That is about as close as the weather predictions usually come to it," but, when the weather predicted comes, the people do not think of giving the department due credit.

The experiments at Dubuque are being carried on by means of the newly-invented, scientific "box-kite," a peculiar-shaped affair, which has the faculty of rising in the air to a great distance. One of these kites was recently sent up at the ball park in this city, and it arose to the height of over half a mile, and had the strength to support a large American flag in midair. The kites at Dubuque are being sent up by the government, and a corps of government officials has charge of all the experiments. The kite is six feet three inches in length, six feet two inches in breadth and four feet two inches in depth; is made of cambric cloth laced to strips of thin maple wood, and looks like an ordinary box with portions of the sides knocked out. A piano wire, with a tensile strength of 210 pounds and some two miles long, is used to control the kite. An instrument is attached to the kite which is a self-recorder of temperature, wind velocity, humidity of the atmosphere and barometric pressure. Observations are made from the different heights, ranging from a quarter of a mile to two and three miles.

That the experiments are proving of value is evidenced by the fact that several hours before the destructive cyclone passed across eastern Iowa and caused a great loss of life, Mr. J. H. Kimball, who has charge of the government kite station at Dubuque, predicted that a terrible cyclone was on its way across eastern Iowa in a northeasterly direction. It is stated that the experiments have proven so successful that the government has about decided to equip all the leading weather stations in the country as kite stations, and that, by means of observations made with the kite, big storms can be predicted some eight or ten hours sooner than by the present method of observation.

CORN AND ITS PRODUCTS.

Corn has long been referred to as the American cereal king, and, in truth, that is the case. Corn is a crop of wonderful magnitude and great value, and its uses, though varied in the past, are annually becoming more numerous. The earliest use of corn was for bread and only when plentiful was it, in its early history, used as a feedstuff. In America it has found many uses, until its commercial products number a half score or more.

After its use as a bread and feedstuff comes its importance as an alcohol producer. This product amounts annually to enormous value. The starch product of corn is also an important article of commerce. Extensive factories are engaged in

extracting this property, which is marketed in several forms. Corn flour is a widely known product which enters into the manufacture of fine confections, is sought for its cakemaking qualities and is extensively used by adulterators of wheat flour. Corn starch is also utilized by some millers to adulterate flours marketed in the south.

As a fuel corn has been extensively utilized in the far west, especially in the prairie country, where wood is not to be had and where coal is more expensive than the grain mentioned.

The syrup product of corn is not inconsiderable. It finds a market among the people of moderate means, its cheapness recommending it.

Then comes the corncob pipe, or the Missouri meerschaum, industry. Corncob pipes are smoked throughout the United States and their sale abroad has become an important item in the calculations of manufacturers. Their nicotine absorbing qualities give them standing popularity with pipe smokers; their cheapness places them within the reach of all who desire them, and their destructibility renders a continuous demand certain.

Corn husks find many uses. Among these may be mentioned the cigarette wrapper, the tamale husk and the mattress filler. The two uses first mentioned do not require a large output, but owing to the selection necessary, the product acceptable is quite valuable. The third use is extensive. For this also the husk must be selected, on which account quite an industry is thus produced.

Cellulose is another new but very important corn product. At this time several extensive factories are engaged in extracting this property from corn growth, and judging from the accounts given out, it is a most profitable enterprise.

Corn also gives up a valuable fiber which is contributing its share to the cordage product of the land, constituting an industry considered impossible but a short time since.

Nor are these all of the uses to which corn in the stalk, husk, or grain is put. It is indeed a wonderful cereal and is certainly entitled to the high position given it in the agricultural world. At the low value of 25 cents per bushel the average corn crop of the United States (2,000,000,000 bushels) is worth $500,000,000. This is for the grain alone, in addition to which the value of stalks, husks, and their products must be computed. No other crop yields such value, and it is not thought likely that corn will soon yield first place to any other product of the soil.

The area of the earth on which corn is profitably produced is wide. It grows in the United States, Mexico, Central and South America, in the Western hemisphere, and in Russia, Roumania, Italy, Egypt, and, to a limited extent, in some other countries of the Eastern hemisphere. But in the United States only is corn king.—*H. E. S., in Modern Miller.*

MAY'S DESTRUCTIVE STORMS.

Though the elements were generally propitious throughout the state, yet the month of May brought its full quota of destructive windstorms; but, happily, their desolating effects were limited to a narrow pathway through four or five counties. The most severe storms of the month occurred on the 17th and 18th.

A wind and hailstorm on the evening of the 17th swept through a portion of Ringgold county, and reports indicate that it assumed the form and force of a tornado in Clinton, Benton and Rice townships. The storm was undoubtedly a continuation of the tornadic disturbance that swept through the southeastern counties of Nebraska, earlier in the afternoon of the same day. It passed near Maloy, a station on the Chicago Great Western railway, but fortunately it was deflected before reaching that place, and no lives were lost, though the destruction of farm property amounted to several thousand dollars. Three persons were injured, one of them quite seriously.

The Mt. Ayr *News* says it was a genuine tornado, its revolving motion being observed by large numbers of people.

It started in Missouri, about 5:30 P. M., at a point about four miles south of Blockton, moving thence northeast, in the direction of Maloy. The path of the tornado, according to the *Record*, was over ten miles long and two hundred yards wide.

Though it did not strike Maloy, yet it passed sufficiently close to lift a portion of the roof of the railway depot and to move buildings from their foundations, turning them partly around. Farm residences, barns, sheds, outhouses and timber lots suffered considerably. Fortunately a considerable portion of the loss of buildings will be covered by insurance. The storm may be classed among the minor disturbances. In Mt. Ayr there was a heavy shower accompanied by hail and a strong wind. On the same date there were heavy local showers in the south central counties.

TORNADO MAY 18.

On the evening of the 18th a very destructive tornado originated near Stanwood, between 3 and 4 o'clock P. M , and moved in a direction north of east, traversing the northern portion of Cedar county, the northwestern part of Clinton county and the southeastern part of Jackson county, crossing the Mississippi river near Sabula, and thence sweeping through a portion of Illinois, in which state there was heavy damage and some loss of life. It was altogether the worst storm of the kind that has visited Iowa since the Pomeroy tornado on July 6, 1893. Its entire course was through prosperous farming districts; but fortunately it missed the populous towns in that section, else the loss of life would have been fearfully large. The fatalities reported in this state were nineteen, and more than double that number were injured more or less severely. The loss of property was very heavy, being variously estimated at three to four hundred thousand dollars.

The day was warm, and the weather conditions were threatening. A well defined cyclone was passing through the upper Mississippi valley, the storm center being near St. Paul at 7 P. M. The morning forecast for Iowa gave warning of "showers and probably severe thunderstorms in the east portion in the afternoon or night." The day has been described by weather observers as "a regular tornado breeder."

The first appearance of the tornado was observed in the vicinity of Stanwood, and Jas. G. McKerron of that place gives the following report. He says: "On the 18th the air seemed oppressive up to about 2 P. M., and then a heavy thunderstorm came from the southeast About 3 o'clock it began to hail, the stones varying in size from size of hickory nuts to walnuts, and two miles north and west the hailstones were much larger. At 3:20 P. M., a heavy cloud was noticed coming from the southwest, the lower part of the mass appearing to be 200 to 300 feet above the earth. When it reached a point one mile south, it formed a funnel, and a part of the cloud shaped like an elephant's trunk darted downward, striking the buildings of Jas. K. Davidson. The main cloud seemed to move in a northeasterly direction, but the part that struck the ground would swing around, making a zigzag track. The funnel united with the thunderstorm when it was about two miles east of this place, becoming very black, and showing a rotary motion, the whirling being from right to left. It followed very closely the track of tornadoes reported to have passed through this section several years ago. There was no loss of life near this place, but several miles east a number of people were killed. Much damage was done to buildings and stock that happened to be in its path. The amount cannot now be estimated." Newspaper reports accord with Mr. McKerron's description of the storm as it appeared near Stanwood.

The storm crossed the track of the Chicago & North-Western railway between Stanwood and Clarence, and swept through the townships of Dayton and Massillon in Cedar county. It missed the town of Clarence by about eighty rods. Crossing the Davenport branch of the Chicago, Milwaukee & St. Paul railway about half way between Massillon station and Oxford Junction, the storm swept eastward through the corners of Clinton and Jackson counties. In its course it closely brushed the towns of Lost Nation, Elwood, Delmar, Riggs, Brown, Preston, Miles, and Sabula. It seems miraculous that it did not hit some of these places when passing so near to their outskirts

Mr. J. E. Gilroy of Lost Nation, describes the storm as it appeared in that vicinity: "The storm appeared at 3:40 P M and was small when first seen in the southwest. It was moving in a direct line towards this town, nearly due east. It destroyed the residence of F. P. Welch and a schoolhouse sixty rods north of his place The Welsh family saved their lives by fleeing to the cellar, and other families near there were saved in the same way. In Sharon township it destroyed the homes and property of Peter McAndrews and Maurice Wolf. No lives were lost in this vicinity, but destruction of live stock was large. Further east the people suffered more, and many were killed. Many curious incidents could be related, such as picking chickens and wrapping barbed wire around stock No rain came with the tornado, but a heavy shower fell about three hours later."

The storm reached the vicinity of Elwood, five miles east of Lost Nation, at about 4 P. M. S. H. Clark, postmaster of that place, sends a description from which we make the following extracts: "A funnel-shaped cloud appeared in the southwest a few minutes before 4 o'clock, and passed Elwood at 4. It struck Brookfield township near the southwest corner, and moved east by north, crossing the east line near the center. For want of a name we call it a 'Kansas twister.' In its track there was not much left worth picking up. In this township there were three hundred head of cattle killed, also four to five hundred hogs, mostly pigs. William Ruggles was cleared of everything in shape of buildings, and his loss is estimated at $7,000. George Teskey's buildings, fences, and most of his stock were swept away. Among the heavy losers were C. C. Ruus, R. Claus, H. H. Hicks, John Severine, J. A. Hiner, E. A. Coverdale, and William Cook. Every tree in the track of the storm appears to be twisted from the roots, the bark all gone. Lumber, buildings, and fences were broken into kindling wood."

George G. Holcomb, postmaster of Riggs, Waterford township, writes that the tornado reached that vicinity at 4:30 P. M , and destroyed everything in its pathway in the farming district, except the crops, which were slightly damaged. When the funnel appeared it seemed to draw every cloud near by into the core of the storm. It appeared very black and clouds twisted in every direction. There was some hail about ten or fifteen minutes before it came, with but little rain.

The storm passed about a mile and a half south of Preston, Jackson county, sweeping eastward nearly on the Clinton county line. Postmaster J. W. Campbell, of that place, in his report kindly furnished this office, says the storm could be seen for more than an hour in the southwest before it reach ed the vicinity of Preston. Its general appearance was funnel-shaped, and from the cloud there was an appendage of a long point or tail, which was swaying with a whirling motion. Five lives were lost, Mr. and Mrs. Charles Flora and three children, comprising their whole family, at a place about two miles south of Preston. In the vicinity of Preston, within five miles each way, the property loss will amount to nearly, if not quite, $50,000.

The *Preston Times* says the storm passed that place about 4:30 P. M. To this it adds:

"The afternoon had been sultry and a storm was expected to result, but an idea of the devastating effects which followed was hardly thought of. When the darkening clouds first appeared many hurried to their homes expecting only a heavy rain, but the heavy black, swirling mass of cloud which appeared in the southwest, quickly warned the citizens what to expect, and the direction in which it was moving, when first seen, made many feel that Preston was to feel the devastating effects of a tornado. A short time previous to its approach a message from Lost Nation stated that a cyclone had passed over that place going eastward, and the time taken in traveling the distance between the two places was about an hour and twenty minutes There was little or no rainfall within the scope of the cloud, but after the storm immense hailstones were picked up in Preston, some measuring twelve to fourteen inches in circumference."

Albert Durant, of Preston, sends the following report of the storm in that section:

The first appearance of the storm was a narrow strip of black cloud reaching from the clouds above to the horizon, slightly to the southwest; but it did not reach this vicinity for over an hour after. The distance near here that the destruction was complete is about seven miles; trees, buildings, fences and stock were entirely destroyed or killed in its track Most of that distance is in Clinton county, just south of our county line, but came into Van Buren township for about one mile. It passed about one and one-half miles south of Preston. Fourteen farm places lay in its track. The damage is not less than $50,000 It was the most severe storm that has ever passed through here. Considerable hail followed the tornado. The cloud as it approached was funnel-shaped, and had a whirling motion, and traveled in its course rather slowly. Very little rain fell with the storm. It struck the ground about five miles west of Preston and did not raise again until about two miles east

The storm was observed at the city of Maquoketa, about six miles north of its track. The *Excelsior* of that place says:

This terrible instrument of destruction was seen by many in the south part of this city and is described as the usual funnel-shaped cloud, but not moving very fast. Its course was from west to east, and it apparently followed the line of the Chicago, Milwaukee & St. Paul railway, going along about a mile south of it. The power of this death-dealing twister was tremendous. Trees were uprooted, large groves of them were stripped down to nothing but their trunks, horses, cattle and hogscarried like straw for three-quarters of a mile or so much further that their owners cannot find them; houses, barns, outbuildings blown no one knows where; green trees stripped of their foliage and even bark, fences gone, people killed or seriously injured, others with their faces driven full of dirt, tell partially of the immense amount of damage done in a strip about a quarter of a mile in width. One of the most remarkable features of the storm was the slowness with which it traveled. It was an hour and twenty minutes traveling from Lost Nation to Preston, a distance of about twenty-five or thirty miles. From Elwood to Delmar a freight train easily ran ahead of it.

Beyond Preston the pathway of the storm was not well defined, but it is known that it crossed the Mississippi river between Sabula and Elk Junction, and reports indicate considerable loss of life and destruction of property in Illinois. The distance traversed in Iowa was about fifty miles, but in that distance there were considerable intervals wherein the damage was relatively slight. It appears to have skipped and swayed from side to side, making a zigzag pathway, but its general course was about as direct as the flight of an arrow. The track varied in width from a hundred yards to about a quarter of a mile.

Though it revolved swiftly on its axis, its progressive movement to the eastward was remarkably slow Warnings were sent on ahead from town to town near its track, furnishing a new basis for the theory that it is possible to establish a system of signals whereby the people may be warned of the approach of that class of destroyers.

The following list of names of persons killed by the storm is copied from a press special, and is probably correct:

Near Riggs' Junction: Michael Hines, Maggie Maloney, James Maloney, Rose Maloney, Mary Call.

Near Delmar: Oba Allison, Pat Hines, Sauren Clemensen, two children of Francis Allison, A. D. Hildebrand, William Grieme.

Near Preston: Charles Flora, Mrs. Charles Flora, three Flora children.

Near Quigley: William O'Meara, child of John Clark.

It is wholly impracticable to compile a list of the persons injured and the losses of property.

The following paragraph is clipped from the Clinton *Herald:*

The steamer Saturn, which was going down the river with a raft, had a very narrow escape. The storm struck her about two miles below Sabula.

Capt. W. A. Krotka was seen by a *Herald* reporter this afternoon, and told the experience of the Saturn. He said the boat was anchored near Sabula when he saw the storm coming. He moved down the stream in order to keep from being blown into the bridge. He says he watched the clouds closely and saw one from the southeast approaching one from the northwest. They met just over the hill near Sabula and took an easterly direction. Captain Krotka said there was no whirling motion until the clouds came in contact. He saw the storm coming directly toward him, and thought the boat would surely be lost. When the cyclone was within a few rods of the Saturn, Mr. Krotka says a fierce wind from the south struck the approaching storm and turned its course enough so that the full force just missed the boat. However, it did not fully escape, and when struck by the wind turned nearly over. He says the engine-room had a foot of water in it when the boat righted itself. During this time Captain Krotka was struck on the head with a board from the pilot-house, and Mate Eugene Clark was injured by a line breaking.

While the storm was passing over, the crew say they saw some animal, either a cow or horse, in the cloud

George Nevitt, who came down the river last evening on the steamer Cyclone with a raft, and was near Sabula when the storm passed, gave a vivid description of what he witnessed He says that they were in the wake of the storm and had a fine view of it as it passed over the river. The air was filled with timbers and trees. Large limbs would float through the air like parachutes and gradually settle to the ground. One board, ten feet long, fell upon the forecastle of the boat and penetrated through the floor. Hail fell in great quantities, chunks being found as large as a man's fist. The barrels on deck were filled with the ice.

Mr. Nevitt says that an island opposite what is known as Dark Schute was completely stripped of its growth of timber. On the banks of the river, where the storm crossed, the timber was torn down to a width of at least 700 feet.

A SMALL TORNADO MAY 31ST.

The Grinnell *Herald*, in its issue of June 2d, under the caption "Wild Wind," reported a small tornado dropping down in Washington and Grinnell townships, Poweshiek county, on the evening of May 31st. The *Herald* said:

A number of people about half-past six Tuesday night observed a funnel-shaped cloud plowing its way through the air in a northeasterly direction, southeast of town. The roaring was distinctly heard a distance of two miles and a good many cool heads along the track of the storm took to cellars for safety. It seemed to be above the ground and to most people who saw it, it meant nothing but an aerial tornado, ugly enough looking, but too high in the air to be dangerous. It was a more serious matter, however, to two families along its track, where it settled to the ground and performed the usual pranks attributed to such storms, destroying everything in its path, uprooting trees, and crushing in its mighty force large buildings to the ground.

The unfortunate homes in the path of the storm were L. P. Spooner's and C. A. Ratcliffe's, the one south and the other east of Maple Grove schoolhouse.

Mr. Spooner had just risen from supper and chancing to step to the south door, he saw a funnel-shaped cloud in the air about a mile and a half to the southwest. He quickly closed the house and with the other members of the family went to the cellar. The storm seemed to come slowly, striking first the north end of G. F. Hyde's grove a few rods south of Mr. Spooner's residence. It then swept through Mr. Spooner's orchard, uprooting large trees, overturning his apiary, striking the house with such force as to unshingle a portion of it, knock out nearly all the windows, and fill it with dirt and water. The windmill was demolished, corncribs unroofed, whole sections being torn from the cribs, and the large barn and other buildings were crushed, and scattered in piles on the ground.

The center of the storm here seems to have been just east of the house, with the west swirl of the wind going southward. Seven horses were in the barn and strange to say none were injured, although the timbers fell all around them and on them. Only three small pigs were killed for Mr. Spooner. Mr. Spooner at once came from the cellar and watched the storm swing northeasterly, but as it stopped in English bottom and seemed to be turning back, he wisely took to the cellar again.

At C. A. Ratcliffe's, one-half mile north of Mr. Spooner's, Mr. R's attention was first called to the storm by the slamming of his barn door, where he was at work. He at once noted the cloud at Mr. Hyde's grove, and so smoky and fiery did it appear, that he thought Mr. Hyde's house was on fire He started to give orders to go down to help Mr. Hyde, but the onward sweep of the storm and the flying of the timbers at Mr. Spooner's showed him a cyclone was coming, and with his family he went to the cellar. The center of the storm seemed east of the house, on the east uprooting trees at Mr. F. F Lee's, a few rods from Mr. Ratcliffe's, and unroofing his corncrib At Mr R's his windmill, stables, large hay barn, 108 feet by 64, went down, in fact everything but his house and one smaller building. Windows in the house were broken and the roof unshingled. Though there were eight horses in the stable and a dozen head of cattle close by, none were injured, except one calf was killed. Here, too, the west side of the storm carried debris south, and ruins of the hay barn northeast of the house, were left in the yard by the house. Mr. Ratcliffe came out of the cellar as soon as the storm was passed, but had the same experience as Mr. Spooner when he saw the cloud stop and appear about to take a backward swing.

It is hardly necessary to describe to Grinnell people the fury and destruction of such a storm. Everything in its path was crushed, and the debris was scattered in all conceivable directions.

CLIMATE AND CROP REVIEW.

Farming operations were begun in the larger part of the state somewhat earlier than usual, with generally favorable conditions of soil, temperature and moisture for plowing, seeding spring grains and preparation of ground for planting corn and potatoes. The exception to this was noted in some of the counties in the southeast district, where farm work was greatly delayed by excessive rains in March, April and the larger part of May. But the season was unusually late in respect to germination of seed, growth of vegetation and the blooming of fruit trees and vines, which were retarded by the recurrence of cold rains and periods of low temperature. On the whole, however, the temperature has been about normal for the months of April and May, and the condition of all crops on the first of June was fairly satisfactory in fully four-fifths of the state. The first half of May was cooler than usual, and the last half warmer, giving an average of about the normal temperature for the month. With ample moisture in all sections, there was a rapid growth of all vegetation during the period of warm weather in the latter part of May.

The season has been especially favorable for the growth of grass and small grain crops. Pastures have afforded ample forage for stock for the past month, and they were unusually fine at its close. Meadows are generally heavy, giving promise of a large hay crop. Wheat, rye, oats and barley have made phenomenal advancement, and the chief drawback in the condition of these crops is the danger of injury from excessive growth of straw.

The bulk of the corn area was planted between the 10th and 25th of May, with the soil in excellent tilth. In the extreme southeast part of the state, the work of planting was delayed by excessive moisture, and much of it remained to be completed after June 1st.

The seed proved to be unusually sound, and germination was generally satisfactory. There has been less than the usual amount of replanting necessitated on account of defective seed, and the condition of that crop on June 1st was much better than it was rated on the corresponding date in 1897. In fact, in a large portion of the state, the condition of corn was above the average of recent years.

LIGHT AND HEAT, AGAIN.

BELLEVUE, Iowa, May 24, 1898.

Editor of Monthly Review:

On account of unavoidable delay I am rather late in answering Mr. O. L. F. Browne's comment in the March REVIEW on my article in the February REVIEW.

While Mr. Browne's theory is based on what is called science, it does not prove that such is correct; in fact, it can be proven to be incorrect by his own illustrations. Mr. Browne says: "It is not held that light and heat, as such, come to us from the sun; but that the vibrations of the ether, which, when arrested, produce the light and heat, come from the sun. In their passage through space in which they are not arrested, they are no more light and heat than the swinging hammer of the smith is a blow." Then again he says: "Radiant energy, vibrations, pass through an ice lens without raising the temperature of the lens, and set fire the combustibles in the focus."

Here is one of the points I make. Is not the ice lens an obstruction? Especially when surrounded by air. But the sun has a different effect on ice from any other heat. Take any piece of ice, lay it in reach of any artificial heat, or in fact in boiling water, and you will find the ice will melt on the outside, and as long as there is a piece left it is solid. But lay the ice in the sun, on the ground or in water that has connections with the ground, and you will find a different result. The ice will melt as much in the center as on the outside, if not more so. One day's sunshine on strong ice has more effect than a week's warm rain. While ice two feet thick will become honey-combed in the sun, in water or out of water if on the ground, in one day, a week's rain will have but little effect, except a slight melting on the surface, and will retain its strength in the center. This shows that there is a current that passes through the ice, and it is the electric current I speak of.

Mr. Browne further says, "Vibrations will pass in, across, and out of a dark room, filled with dust-free air, without lighting the room." This may be true, but not if free circulation of electric currents are allowed to pass through the room. It is an established fact that electricity is light and heat if properly concentrated and developed. The sun has this power; she extracts it from the earth, develops it, and produces light and heat, and when the atmosphere is overcharged, the surplus is returned to the earth, in a condensed form, by lightning, and so the work goes on.

Without electricity, no life could exist; our Arch Mechanic, constructor of heaven and earth, placed iron in our veins, as it is one of the strongest conductors, in order to be well supplied with electricity, and the magnetic power of the sun is absolutely necessary for its development, regardless of any old scientific theory.

A. G. KEGLER.

MAY WEATHER RECORD.

The mean temperature for the month of May, as deduced from the records at 114 stations, was 59.6°, which is about the normal for the state. Keokuk reports the highest monthly mean, 64°; and Rock Rapids reports the lowest, 55°. The highest temperature reported was 92°, at Odebolt and College Springs, on the 24th and 25th; the lowest was 26° at Rock Rapids, on the 6th.

The average rainfall for the state, as deduced from records of 114 stations, was 4.67 inches, which is a little above the state normal for May. Fort Madison reports the heaviest measurement for the month, 7.82 inches. The least amount was 2.22 inches, at Estherville. Clear Lake reports a fall of 3.73 inches on the 21st. For the state there were 9 clear days, 12 cloudy and 10 partly cloudy.

The following table gives the mean temperature and total precipitation for the month of May, at the stations named for the years from 1872 to 1898 inclusive:

YEARS.	MEAN TEMPERATURE—DEGREES.						PRECIPITATION—INCHES					
	Des Moines.	Davenport.	Dubuque.	Keokuk.	Omaha.	Sioux City.	Des Moines.	Davenport.	Dubuque.	Keokuk.	Omaha.	Sioux City.
1872	....	62	....	64	61	...	.....	4.46	....	3.70	6.35	.....
1873	....	59		61	59	...	.....	6.37	.....	3.42	5.59	.....
1874		64	68	67	66	...	.....	3.45	1.08	1.75	1.24	.....
1875	....	60	60	62	63	...	.....	2.01	3.62	6.70	4.25	.....
1876	....	62	61	63	63	....	.....	6.70	5.96	5 28	2.07	.....
1877	....	62	62	62	60	...	....	2 82	3.84	5.55	8.62	.....
1878		58	56	59	58	..		5 14	4.61	3.47	5.77	.....
1879	64	64	63	65	67	....	4.74	5.83	2.94	2.27	5.53	.....
1880	68	67	67	69	69	....	5.84	5.09	3.72	5 92	3.40	.....
1881	68	69	69	70	68	....	3 82	1.34	2 90	1.35	7.94	.....
1882	56	56	54	57	57	..	8.53	5 49	4 16	7.11	4.91	.....
1883	57	57	55	60	57	..	9.76	5.46	7.13	4 87	11.29	.....
1884	61	61	60	62	62	....	4.34	3.79	4.88	3.16	1.45	.....
1885	60	58	58	61	60		1.70	1.94	2.62	2.59	6.34	.....
1886	66	62	62	65	65	....	4.01	3.73	4.17	4.49	4.58	.....
1887	66	67	66	67	66	...	2.31	1.76	2.53	2.54	1.39	.....
1888	55	55	54	58	56	....	7.84	9.23	5.84	5.06	4.36	.....
1889	61	59	59	62	62		4.84	6 34	4.00	5.72	2.67	.....
1890	58	58	56	60	60	58	3.00	4.33	5.36	3.34	2.72	2.29
1891	58	58	58	60	59	59	3.29	2.74	2.54	2.56	4.94	2.41
1892	55	56	55	58	54	52	8 77	8.84	9 18	6.34	8.43	8.56
1893	57	58	57	60	59	57	2.84	2 67	3 06	4 36	3.84	3.17
1894	62	61	62	63	65	62	1.41	1 93	1.75	3 06	.61	1.91
1895	63	63	62	64	64	62	2.86	2.28	2.63	3.15	1.11	2.15
1896	66	68	68	70	67	64	6.50	4.03	7.63	4.40	9.51	6.39
1897	60	60	59	61	62	59	2 31	1.91	2.09	1.86	2.16	1.24
1898	61	61	60	64	61	60	4.22	6.73	4.47	6.70	4 33	4.69
Means	61	61	60	63	62	59	4 65	4 31	4.11	4 00	4.54	3 65

SUNMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 29.92 inches; highest observed, 30.30, at Cresco on the 4th; lowest observed, 29.49, at Davenport and Dubuque on the 27th; range for the state, .81 inches.

Temperature.—Monthly mean, as deduced from 114 reports, was 59.6°; highest monthly mean, 64°, at Keokuk; lowest monthly mean, 55°, at Rock Rapids; the highest temperature reported was 92°, at Odebolt and College Springs on the 24th and 25th, respectively; the lowest temperature reported was 26°, at Rock Rapids on the 6th; the average daily maximum was 70.4°; the average daily minimum was 86.8°; the average monthly minimum was 34.8°; the greatest monthly range was 60°, at Atlantic, Odebolt, and Rock Rapids; average monthly range, 52°.

Precipitation.—Average for the state, as determined from the reports of 114 observers, 4.67 inches; the largest amount reported was 7.82 inches, at Fort Madison; the least amount reported was 2.22 inches, at Estherville; the greatest daily amount reported was 3.73 inches, at Clear Lake on the 21st; average number of days on which .01 inch or more of precipitation was reported, 12.

Wind.—Prevailing direction northeast; highest velocity reported, 53 miles per hour from the southwest, on the 17th, at Sioux City.

Weather.—There were 9 clear days; 10 partly cloudy days, and 12 cloudy days.

PRECIPITATION.

STATIONS.	PRECIPITATION IN INCHES.		No. of clear days.	No. of partly cloudy days.	No. of cloudy days.	No. of rainy days (.01 in. or more).
	Monthly.	Greatest daily.				
Adair	6.74	2.48	7	14	8	10
Alta (near)	4.97	1.41		....		12
Le Claire	3.78	.60	....	....		14
Larchwood	5.38	1.36	5	15	11	10
Millman	5.54	1.31	....	....	....	14
North McGregor	2.44	.60	....	....	.....	13
Hawkeye	4 76	1.38	....	.....	...	10
Washta	4.29	1 25	8	11	12	11

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.91	30.23	4	29.49	27
Des Moines	29.94	30.24	3	29.53	18
Clarinda	29.92	30.22	3	29.55	18
Cresco	.....	30.30	4	29.54	18
Dubuque	29.92	30.27	4	29.49	27
Omaha, Neb	29.91	30.27	6	29.51	18
Keokuk	29.92	30.21	3	29.56	27
Sioux City	29.94	30.29	6	29.50	18
Means	29.92	30.28		29.52	....

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,680	41	NW	18
Des Moines	5,882	37	SW	21
Dubuque	5,436	28	SE	21
Keokuk	5,555	48	W	18
La Crosse, Wis	5,053	28	S	1
Omaha, Neb	5,705	38	SE	20
Sioux City	8,826	53	SW	17

OBSERVERS' NOTES.

AMANA—*Conrad Schadt.* The weather during the month was very favorable for all crops and for farming generally. There is as fine a prospect as there ever was.

BELKNAP—*A. W. Rankin.* An unusual amount of hail, thunder and lightning has characterized the month of May.

BONAPARTE—*B. R. Vale.* Sixteen rainy days, giving 6.11 inches. Not to exceed a week's work in fields during month; 14.80 inches rain since March 1st; exceeds any year since 1892, which gave 15.90 in same time.

CARROLL—*Moses Simon.* A fine month; no frosts; plenty of moisture and very favorable for outdoor work and the growing crops. Small fruit will be plenty.

CENTERVILLE—*George Goodlander.* Crops doing well. All kinds of fruit coming nicely.

CLINTON—*Luke Roberts.* No damage from frost. No damage from storms, except the destructive tornado on the 18th, which passed through a portion of the north part of the county; that was very destructive. On the whole, May was a very fine month.

GRAND MEADOW—*F. L. Williams.* May 7th, corn planting begun. Plums and apples in bloom, 10th to 13th.

HOPEVILLE—*M. L. Ashley.* During thunderstorm on 20th, lightning killed two horses and struck poles along telephone line, at one place melting the wire some distance. It also struck J. S. Claypool's house, burning some clothing and doing considerable damage otherwise.

HUMBOLDT—*H. S. Wells.* Wheat and small grain good; very little replanting corn; grass unusually good; fruit prospect never better.

IOWA CITY—*Mrs C. M. Hobby.* Heavy rain and hailstorm on 19th. Cat birds and golden robins announced their presence May 1st.

LAMONI—*T. J. Fitzpatrick.* On evening of the 18th hail fell in quantity, many stones measuring over half an inch.

LARCHWOOD—*F. W. Stokes.* First thunderstorm of the season on 17th; a severe windstorm passed just east of town at 4 P. M. of that day, doing some damage to small buildings.

LOGAN—*Mrs. M. B. Stern.* Had three thunderstorms during month; one on 19th quite severe; one woman in Logan badly shocked but has recovered; weather cloudy and damp; not much damage from heavy rains.

MAQUOKETA—*Dr. A. B. Bowen.* On afternoon of the 18th a tornado passed about five miles south of this city, causing much destruction to life and property.

MARSHALLTOWN—*C. M. Cook.* Hail fell from 1:15 to 1:20 P. M. on the 18th; largest stones 1 inch, and average size half inch in diameter.

MASON CITY—*B. F. Gibbs.* In half a century of farm life have never seen crops look better than at the close of May.

MT. AYR—*A. F. Beard.* Hail on 18th broke quite a number of window glass in town; a windstorm struck the fair grounds on the 20th, wrecking some of the buildings there

OLIN—*Hon. Nathan Potter.* On 18th, at 3 P. M., hailstones fell 9 inches in circumference, the largest weighing 4 ounces; no wind accompanying the storm.

RIDGEWAY—*Arthur Betts.* A good month; vegetation wonderfully advanced; some pretty mirages on four dates, elevating distances and making queer deceptions; gale on the 27th and a cloudburst two miles away, an awful downpour.

TARA—*W. E. Humphrey.* On the 4th, about 4:30 P. M, a light sleet with rain and snow fell. On the 7th frogs were heard the first time this year.

THURMAN—*C. R. Paul.* A strong wind on night of 20th blew down empty corncribs and a few windmills; only eight days in month that rain did not fall.

VILLISCA—*J. F. McCartney.* On the 26th a barn in town was struck by lightning and partially burned; on 31st, house of Mrs. Goodwin, in town, was struck and Mrs. G. was shocked by the electric bolt.

WEST BEND—*Ph. Dorweiler.* Rain interfered with farm work the latter part of the month; everything looks well; no killing frost in May.

ERRATA, APRIL REVIEW.

Make maximum temperature at Chariton 82° on 16th.
Make mean maximum temperature at Monticello 58 6°.
Make mean minimum temperature at Monticello 34.8°.
Make mean temperature at Monticello 46 7°.
Make maximum temperature at Red Oak 88° on 16th.
Add .03 inch rain on 13th at Ogden, total, 1.46 inches.
Add .25 inch on 22d at Maquoketa, total, 3.20 inches.

METEOROLOGICAL DATA FOR MAY, 1898.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.			Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	Number of hail storms.	No. of thunder storms.
	Monthly mean.	EXTREMES. Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.	Monthly range.	Monthly.	Greatest daily.	Total snowfall.							
Afton	61.4	72.9	50.0	90	24	37	5, 6	53	4.25	1.04	.....	NE	4	13	14	11	...	....
Algona *	59.4	.....	.....	87	26	40	2	47	6.09	2.12	.....	NE	5	20	6	10	1	4
Alta	58.5	68.9	48.1	89	24	34	6	55	4.86	1.55	.....	S	9	12	10	15	....	5
Amana	60.4	70.4	50.4	86	24	35	6, 12	51	4.14	.87	.....	NE	10	9	12	15	....	10
Ames	59.5	70.5	48.5	90	24	35	6	55	3.88	1.61	.....	SE	9	15	7	12	....	....
Atlantic	58.0	68.6	47.3	90	23, 24	30	12	60	4.61	1.72	.....	NE	9	4	18	11	....	5
Audubon	58.5	68.8	48.2	85	24	36	6	49	4.99	1.50	.....	SW	..	14	17	7	....	....
Belknap	61.4	70.1	52.7	86	24	38	6	48	5.78	1.05	.....	SE	..	.....	.....	15	....	....
Belle Plaine	56.6	68.9	44.3	85	27	29	7	56	5.43	1.15	.....	SE, S	9	10	12	13	....	....
Britt	58.4	70.0	46.8	88	23	30	6	58	4.43	2.09	.....	NE	3	25	3	16	....	2
Bonaparte	61.0	70.6	51.5	88	24	37	6	51	6.11	.94	.....	.....	....	..	.....	16	....	.
Burlington	63.0	71.7	54.4	87	24	40	5, 6	47	5.36	2.15	.....	.....	10	11	10	11	....	....
Carroll	58.0	69.4	46.6	88	24	34	6	53	4.72	1.38	.....	.....	11	5	15	12	....	4
Cedar Falls	61.0	72.8	49.2	86	24	37	12	49	7.15	2.60	.....	NW	12	10	9	8	....	4
Cedar Rapids	60.8	70.6	51.1	85	23, 24	37	6	48	3.41	1.03	.....	NW	13	5	13	19	....	1
Centerville	61.2	70.7	51.7	87	24	36	6	51	4.44	1.71	.....	.....	14	.....	17	13	....	3
Charles City	57.8	68.6	46.9	82	24	33	6	49	4.38	1.20	.....	N	22	1	8	16	2	2
Charlton	61.1	70.3	51.9	84	24	36	6	48	5.17	1.35	..	NE	7	11	13	19	1	....
Clarinda	62.2	71.4	53.1	88	24, 25	40	5, 6	48	5.15	2.44	.....	SE	12	7	12	11	....	....
Clear Lake	58.2	68.4	48.0	82	24, 26	34	6	50	6.51	3.73	.....	NE	13	9	9	13	....	3
Clinton	60.6	71.8	49.4	86	24	35	6	51	4.47	1.06	.....	W	8	7	16	14	....	....
College Springs	62.8	73.9	49.6	92	25	35	6	57	4.87	1.71	..	S	8	13	10	6	1	....
Corning	60.8	71.0	50.6	87	27	37	5, 7	50	4.11	1.30	..	NE	12	5	14	9	....	....
Council Bluffs	60.6	70.8	50.4	90	25	36	7, 8	54	2.44	.46	....	S, SE	4	21	6	11	....	....
Cresco	57.9	68.9	46.9	82	24	34	6	48	2.84	.74	....	SE	11	8	12	7	....	5
Davenport	61.2	69.4	52.9	84	24	39	5	45	6.73	1.85	....	NE	8	8	15	17	1	9
Decorah	59.2	71.3	47.2	83	24	36	6	47	3.67	.70	....	.....	.....	.....	.....	10	....	....
Denison	56.8	69.9	43.8	88	24	32	5	56	4.13	.68	..	S	7	7	17	10	....	....
Delaware †	58.6	.....	.....	.....	.....	.....	.....	.....	2.69	.89		S	9	16	6	9	10	.. .
Des Moines	60.7	69.9	51.5	87	24	38	6	49	4.22	.97	....	SE	9	11	11	12	1	8
De Soto	61.0	71.4	50.5	90	24	36	6	54	5.39	.78	....	NE, SE	7	12	12	13	3	2
Dows	58.0	69.8	46.3	84	24	31	6	53	7.22	1.85	....	SW	10	9	12	15	1	6
Dubuque	59.8	69.2	50.5	83	24	37	6	46	4.47	1.34	.....	NE	11	11	9	14	....	6
Eldon	62.2	72.6	51.5	90	24	35	6	55	5.49	1.69	....	NE	17	5	9	15	....	4
Eldora ‡	59.0	74.6	43.4	90	23	32	6	58	4.11	.90		SE	.....	.....	.....	8	....	1
Elkader	60.5	73.1	47.9	89	24	33	6,12,13	56	3.23	.85	....	N	14	11	6	12	....	6
Estherville	56.6	69.7	43.4	88	26	32	6	56	2.22	.90	.....	NW	9	11	11	7	....	3
Fairfield	60.2	70.2	50.3	88	24	34	6	54	6.21	2.03	.....	.....	6	18	7	16	....	....
Forest City	57.8	68.4	47.3	83	26	34	6	49	4.06	1.99	....	NE	15	2	14	11	..	..
Ft. Madison * ‡	65.4	.....	.....	84	24	43	5	41	7.82	2.97	.....	NE	5	10	16	16	....	6
Galvab	59.0	71.3	46.8	89	23, 24	33	6	56	5.49	1.65	....	NE	.....	.....	.....	12	..	....
Glenwood	60.4	71.3	49.5	88	25	36	6, 12	52	4.87	.80	.....	SE	2	18	11	12	....	....
Grand Meadow *	57.9			84	24	36	6	48	4.76	1.12	.....	NE, NW	8	15	8	11	....	2
Greene c	59.6	72.7	46.5	89	23	32	6	57	5.70	2.00	.....	W	11	10	10	12	....	4
Greenfield	61.0	73.0	49.1	90	25	34	6	56	5.82	1.98	....	.....	11	10	10	16	3	5
Grinnell	60.4	70.1	50.7	85	24	34	6	51	4.36	1.10	....	NE	3	18	10	11	....	....
Grundy Center	58.4	69.3	47.5	85	24	32	6	53	5.59	.78	...	SE	14	6	11	14	1	4
Guthrie Center	59.8	71.5	48.0	90	24	32	12	58	4.96	.81	.....	S, SW	8	3	20	14	1	....
Hampton	59.1	70.0	48.2	87	24	35	6	52	4.25	1.02	.....	NE	5	17	9	13	....	....
Hedrick d*	60.7			84	23	45	3	39	4.29	.90	.....	.....	20	.....	11	11	....	....
Hopeville	60.2	69.3	51.1	84	24	35	6	49	5.90	1.65	...	SE	3	16	12	14	....	1
Humboldt	59.8	71.3	48.2	88	24, 25	32	6	56	5.28	2.16	.....	NW	14	6	11	11	....	4
Independence	58.3	69.5	47.1	84	24	32	6	52	4.14	2.10	.....	SW	12	9	10	10	....	....
Indianola c	60.2	70.2	50.1	86	24	34	6	52	4.17	1.11	.....	SE	.....	.....	.....	13	....	5
Iowa City	60.7	71.6	49.8	89	24	35	6	54	4.80	1.90	.....	E, S	7	14	10	13	1	....
Iowa Falls	59.0	71.5	46.4	88	23, 24	32	6, 12	55	3.40	.84	.....	NE, SW,	7	11	13	11	....	....
Keokuk	64.0	72.4	55.6	87	24	42	6	45	6.70	3.10	....	NE	7	14	10	14	....	8
Keosauqua	63.3	72.8	53.8	89	23, 24	37	6	52	5.56	2.68	.....	.....	.....	.....	.....	14	....	....
Knoxville	61.6	72.2	50.9	89	24	36	5	53	5.23	1.62	.....	NE	10	5	16	12	....	....
Lamoni	61.3	70.8	51.8	90	25	35	6	55	6.15	1.68	.....	NE	12	5	14	18	2	....
Lansing	61.3	72.8	47.8	89	24	36	12	53	2.38	.75	...	.....	12	11	8	7	....	4
Larrabee	56.4	67.6	45.2	89	24	31	6	58	3.54	.79	.....	NE	4	18	9	10	..	....
Le Mars	58.0	69.6	46.4	87	24	31	12	56	3.71	.80	.....	E	10	12	9	11	....	....
Lenox	60.2	69.5	50.9	84	24	36	6	48	4.97	1.01	.....	NW	12	7	12	17	2	8
Linn Grove (Mt. Vernon)	59.4	69.9	48.9	85	24	35	6	50	4.50	1.07	...	E	8	3	20	16	....	....
Logan	60.2	72.2	48.1	90	26	35	6	55	4.91	1.15	.....	NE	10	6	15	11	...	3
Maquoketa	59.3	70.1	48.5	84	24	34	6	50	3.64	1.18	.....	SW	13	6	12	12	1	....
Marshalltown	59.5	70.3	48.7	88	24	35	6	53	4.26	1.10	....	SW	3	11	17	14	1	....
Mason City	57.8	69.2	46.5	84	24	32	6	52	5.30	2.50	....	.....	.....	.....	.....	8	....	....
Mooar	61.4	71.5	51.2	88	24	38	12	50	6.87	2.40	....	SE	8	6	17	13	....	..
Monticello	59.8	73.3	46.4	85	24	30	7	55	3.46	1.05	....	NW	10	11	10	10	....	....
Mt. Ayr	62.0	72.0	49.9	89	24	37	5, 6	52	7.29	2.82	....	E	3	17	11	18	1	....
Mt. Pleasant *	62.7	.....	.....	84	24	42	5	42	5.50	1.40	....	SW	7	10	14	11	....	....
Mt. Vernon *	60.9			87	24	37	6	50	4.43	1.25	....	.....	.....	.....	.....	12	....	....
New Hampton a	60.1	71.2	49.0	82	24	35	6	47	3.41	1.32	.....	SE, NW	.....	.....	.....	12	....	....
Newton	60.7	70.8	50.6	89	24	36	6	53	4.04	.68	.....	SE	6	19	6	17	..	....
Northwood	57.2	68.1	46.2	83	23, 26	34	6	49	3.95	1.95	...	NW	12	4	15	7	....	3
Odebolt	59.7	71.1	48.3	92	24	32	6	60	4.79	.74	....	.....	10	8	13	13	..	....
Ogden	59.2	69.5	49.0	87	24	33	6	54	4.73	1.01	....	SE	14	....	17	13	....	1
Olin	58.9	69.0	48.8	83	25	33	6	50	4.70	1.00	.....	SE	8	18	5	14	1	7
Omaha, Neb	61.2	70.0	52.4	87	25	39	6	48	4.33	1.16	.....	N	7	11	13	13	....	....
Osage †	57.0	.....	.....	.....	.....	.....	.....	.....	3.67	1.05	.....	S	6	10	15	12	....	5
Osceola	60.0	69.0	51.1	85	24	35	6	50	5.30	1.20	.....	NE	1	16	14	10	..	4
Oskaloosa	60.1	71.0	49.2	88	24	35	6, 12	53	3.10	.74	.....	SW	9	3	19	14	....	....
Ottumwa	61.0	71.1	50.8	88	24	36	6	52	7.80	2.30	.....	SE	2	13	16	15	..	....
Ovid	60.5	70.6	50.4	86	24	32	6	54	4.23	1.27	....	SW	6	11	14	12	....	....
Pella a	58.1	65.4	50.8	84	24	34	6	50	4.00	1.10	.. ..	SW	11	6	14	11	....	....
Plover	59.2	71.2	47.2	90	24	35	12	55	4.85	1.46	. .	SE	11	15	5	11	....	....
Primghar	59.0	70.8	47.1	88	23	35	6	53	4.49	1.30	.....	NE	11	4	16	10	....	....
Red Oak	61.1	73.2	49.0	90	24, 25	33	6	57	3.79	.70	.....	.....	.....	.....	.....	14	....	....
Ridgeway	59.4	71.3	47.6	84	24, 26	32	6	52	3.30	1.03	.....	W	11	11	9	13	..	4
Rock Rapids	55.0	67.4	42.7	86	23	36	6	60	6.05	1.90	...	N	11	14	6	11	..	....
Rockwell City	58.9	69.6	48.2	89	24	32	6	57	5.29	1.54	.....	.....	15	5	11	11	....	....
Ruthven a	57.2	68.3	46.1	86	23, 26	30	6	56	4.70	1.50	.....	NW	.....	.....	.....	10	..	....
Sac City	58.6	70.3	46.8	85	23	36	12, 14	49	4.63	1.25	.....	NE	8	9	14	11	....	....
Sibley	56.5	68.1	44.9	88	23	33	6	55	5.42	1.30	.. ..	NE	3	21	7	15	....	....
Sidney	60.6	68.9	52.4	85	25	38	5	47	3.94	.92	.....	NW, NE	5	18	8	16	....	4
Sigourney		.....	.....	88	24	.....	.....	.....	2.64	.60	....	.....	.....	.....	.....	10	..	....
Spencer	57.4	70.0	44.9	89	23	30	4, 6	59	5.00	1.76	.....	E	13	12	6	13	....	....
Spirit Lake	57.3	68.4	46.2	88	24	32	6, 12	56	3.28	.95	.....	SE	10	15	6	8	....	....
Sioux City	59.5	68.3	50.7	86	25	35	6	51	4.69	1.31	.....	NW	6	8	17	13	....	....
Stuart	59.2	69.2	49.2	89	24	32	6	57	5.01	1.10	.....	N	.....	.....	.....	9	....	....
Tara	58.8	72.4	45.1	89	24	33	11	56	5.10	1.80	.....	N	10	14	7	7	....	....
Toledo	60.0	70.4	49.7	88	23, 24	32	6	56	3.58	1.00	.....	NW	6	.....	25	9	....	....
Thurman	61.0	72.0	49.9	87	25	36	7, 12	51	5.01	.95	.....	NE	6	9	16	16	....	....
Villisca	60.1	71.2	49.0	87	24, 25	33	6, 12	54	4.52	1.96	.....	SE	9	11	11	13	....	2
Vinton *†	60.0			85	24	39	6	46	3.02	.82	.....	NW	11	8	12	10	....	2
Washington	58.7	70.5	46.9	88	24	33	6	55	4.59	1.47	.....	SW	.....	.....	.....	13	....	....
Waterloo	59.4	70.8	47.9	86	24	33	6	53	4.22	.94	.....	S	8	16	7	12	....	1
Waverly	59.7	70.5	48.9	84	24	34	6	50	5.18	1.59	.....	NE	8	13	10	14	....	....
Webster City	59.9	70.2	49.6	86	23	35	12	51	4.00	.75	.....	SE	6	13	12	8	....	6
West Bend *	58.2	.....	.....	86	24	39	6	47	4.85	2.22	.....	NE	6	9	16	11	....	....
West Branch	57.4	67.2	47.6	83	24	32	6	51	3.30	1.27	.....	SW	8	13	10	10	2	1
Whitten *	55.8	.....	.....	87	24	38	5, 6	49	4.40	1.00	.....	SW	11	10	10	12	....	5
Wilton Junction	60.0	71.6	48.3	85	24	34	6	51	4.51	1.20	.....	NW	7	9	15	17	1	1
Winterset	60.1	71.4	48.8	88	24	34	6	54	4.62	1.27	.....	.....	.....	.....	.....	16	....	....
Means	59.6	70.4	49.0	86.8	.....	34.8	.....	52	4.67	.....	....	NE	9	10	12	12	....	....

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. a One day missing, b two days, etc.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR MAY, 1898.

STATIONS.		DATE.																															Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max.	65	61	60	59	53	58	72	77	71	76	69	72	69	72	58	76	77	82	75	75	70	76	88	90	84	88	74	76	80	75	83	72.9
	Min.	49	50	52	41	37	37	41	41	53	46	45	39	46	46	51	51	50	56	56	58	55	54	52	60	60	59	60	46	56	48	54	50.0
Alta	Max.	51	56	53	50	56	63	73	74	71	74	64	70	72	54	67	76	68	78	70	74	68	74	85	89	83	82	67	71	60	71	76	68 9
	Min.	40	45	40	40	37	34	42	45	48	44	46	40	48	48	48	51	52	53	46	54	52	52	54	63	62	60	55	41	50	46	55	48 1
Amana	Max.	71	62	59	54	54	60	69	75	65	70	59	69	74	59	60	73	72	82	77	71	75	67	84	86	79	82	77	74	75	71	76	70.4
	Min.	59	54	49	43	38	35	41	39	54	41	45	35	39	49	53	48	48	57	60	58	62	56	52	63	60	50	62	57	57	47	52	50 4
Ames	Max	71	60	56	47	54	60	73	77	72	76	63	73	69	53	63	76	72	83	74	71	69	72	88	90	80	85	76	72	68	73	78	70 5
	Min.	48	51	45	42	38	35	42	38	52	42	45	38	40	45	46	46	53	53	54	55	59	55	50	58	58	56	61	51	51	45	54	48.5
Atlantic	Max	52	52	56	47	50	49	71	72	72	75	66	74	66	62	54	74	70	82	77	72	60	69	90	90	86	85	61	72	72	72	78	68.6
	Min.	44	47	46	41	37	33	36	35	47	37	39	30	40	50	51	48	56	58	55	54	50	54	46	65	55	60	59	48	53	42	51	47.3
Audubon	Max.	67	58	55	48	52	58	70	72	69	74	64	67	70	55	60	74	70	79	75	72	64	70	83	85	83	82	68	69	75	68	76	68.8
	Min.	43	47	42	40	37	36	41	41	51	41	44	49	42	49	50	45	55	53	53	54	48	53	49	65	59	61	58	43	52	45	53	48 2
Belknap	Max.	69	61	58	56	50	57	69	75	60	69	67	67	66	61	63	72	71	81	74	76	73	71	84	86	78	79	79	73	78	71	79	70.1
	Min.	58	54	48	47	39	38	44	47	54	47	50	43	49	52	52	54	50	51	59	60	62	57	56	64	64	57	61	56	56	53	52	52 7
Belle Plaine	Max.	67	68	65	50	58	57	70	69	65	60	60	63	69	60	55	67	68	80	76	72	70	75	84	80	76	84	85	69	65	80	70	68.9
	Min.	46	40	39	40	33	30	29	35	40	39	38	33	38	45	49	43	45	50	53	55	56	55	58	50	48	46	47	49	48	50	45	44.3
Bonaparte	Max.	75	65	57	53	48	49	68	75	64	75	67	70	70	60	58	72	71	82	74	75	76	72	84	88	77	80	80	75	80	72	77	70 6
	Min.	57	52	45	42	40	37	42	41	56	43	47	39	42	52	54	54	47	58	59	51	63	57	54	59	58	50	60	57	58	62	52	51.5
Burlington	Max.	75	70	61	56	50	60	67	75	68	72	68	69	72	58	59	72	71	83	80	77	79	73	83	87	76	79	83	73	78	71	77	71.7
	Min.	60	57	59	44	40	40	43	45	56	50	56	41	56	52	54	55	56	59	60	62	63	59	57	64	60	51	61	57	59	57	54	54.4
Britt	Max.	63	53	56	55	57	62	75	79	69	75	72	70	79	56	60	75	69	81	72	69	67	67	88	84	81	80	74	69	60	73	72	70.0
	Min.	46	45	39	40	38	30	35	49	47	38	58	33	38	48	39	49	50	55	45	44	58	53	49	61	60	57	56	46	49	39	58	46.8
Carroll	Max.	56	55	54	48	55	64	70	75	74	72	62	72	69	53	64	78	70	82	76	73	60	73	87	88	84	85	70	70	64	70	77	69 4
	Min.	42	46	44	45	37	34	38	42	50	42	40	35	45	47	43	47	51	50	48	48	52	52	51	62	59	59	59	43	44	43	47	46.6
Cedar Falls	Max.	70	64	60	62	58	60	75	78	75	75	63	74	75	70	66	77	78	80	76	76	70	70	81	86	84	80	77	71	75	74	74	72 8
	Min.	54	51	44	42	40	41	42	45	40	38	40	37	38	40	50	49	50	58	55	56	62	55	60	61	61	55	56	57	50	45	54	49 2
Cedar Rap.	Max.	69	62	57	53	55	61	70	79	65	75	59	68	74	60	59	74	72	82	77	70	78	67	95	85	79	83	78	72	71	72	77	70 6
	Min.	60	52	46	42	39	37	43	43	56	42	47	40	42	53	49	48	49	55	60	55	69	58	64	65	60	53	62	59	51	49	54	51.1
Centerville	Max.	70	61	58	54	49	58	69	74	65	71	67	69	61	65	59	73	72	81	75	77	73	71	85	87	84	82	77	74	78	71	80	70.7
	Min.	56	52	47	40	38	36	42	45	54	45	47	41	49	50	53	53	51	57	57	57	59	56	59	64	62	56	62	51	59	51	55	51 7
Chariton	Max.	67	62	60	55	52	61	67	74	66	75	67	68	66	63	58	72	72	80	75	73	71	72	82	84	79	83	75	74	78	69	80	70.3
	Min.	60	52	47	42	38	36	41	47	54	49	47	41	50	51	52	50	51	58	60	58	61	57	57	64	63	57	58	49	56	48	55	51.9
Charles C'y	Max.	63	56	60	55	57	59	70	78	72	72	63	67	74	62	68	69	67	79	70	67	70	64	81	82	77	80	74	68	62	67	72	68.6
	Min.	51	49	42	45	40	33	37	38	55	36	38	34	35	45	45	46	47	54	51	56	55	54	48	61	59	54	61	53	50	40	52	46.9
Clarinda	Max.	64	60	58	52	49	60	72	73	70	78	77	74	65	70	58	74	74	82	75	73	67	74	85	88	88	85	76	71	78	69	77	71.4
	Min.	50	50	50	42	40	40	42	44	52	47	51	42	51	53	53	51	60	62	61	57	49	57	57	67	64	63	63	57	60	51	59	53 1
Clear Lake	Max.	62	54	55	54	56	61	72	76	70	70	63	68	73	56	69	72	65	79	77	65	70	66	81	82	79	82	79	58	67	68	70	68.4
	Min.	47	46	40	43	39	34	40	46	52	46	43	39	44	47	42	46	48	53	50	54	55	53	55	61	59	55	56	49	48	44	53	48.0
Clinton	Max.	76	70	59	50	57	61	72	78	68	75	61	71	75	66	64	72	72	81	79	69	81	71	84	86	79	81	83	72	68	72	72	71.8
	Min.	58	55	50	41	39	39	38	40	50	42	45	36	38	47	52	49	43	54	59	53	61	57	53	61	57	46	57	61	58	50	49	49.4
College Sp's	Max.	65	60	57	54	49	62	75	77	73	81	84	75	66	72	59	76	76	84	76	80	63	82	87	91	92	89	76	74	79	76	80	73 9
	Min.	47	43	47	40	36	35	36	41	53	45	49	42	47	48	50	53	55	57	53	56	51	52	52	93	60	64	65	46	52	46	55	49.6
Corning	Max.	54	61	51	51	49	60	71	74	69	74	68	71	71	70	71	73	73	80	75	73	72	73	84	84	85	85	87	68	76	73	75	71,0
	Min.	47	47	46	41	37	38	37	42	53	43	48	55	45	50	49	51	56	58	58	56	53	56	56	66	60	56	59	46	57	50	56	50.6
Co. Bluffs	Max.	60	58	58	53	52	58	45	71	74	80	70	74	71	70	59	77	66	84	76	77	67	78	87	88	90	81	74	69	75	72	82	70.8
	Min.	44	47	46	41	40	46	36	36	51	49	46	40	51	53	52	52	57	57	58	58	53	61	57	61	62	63	49	45	47	48	57	50 4
Cresco	Max.	64	54	58	55	58	64	73	77	72	72	64	69	74	60	72	72	68	79	72	67	69	64	80	82	79	78	74	67	58	70	70	68.9
	Min.	52	48	42	44	39	34	39	42	51	39	41	35	39	49	43	45	45	54	50	52	53	54	50	55	58	53	59	51	48	40	51	46.9
Davenport	Max.	73	65	55	50	52	59	70	75	64	70	61	69	72	58	61	70	70	82	75	70	78	68	82	84	76	79	80	70	70	70	74	69.4
	Min.	58	53	48	41	39	42	44	49	55	47	47	42	48	53	53	54	47	58	60	55	63	59	58	64	60	54	64	60	57	52	55	52.9
Decorah	Max.	70	69	63	60	61	64	80	79	73	68	64	67	76	62	73	72	71	78	72	68	71	64	80	83	79	80	76	68	60	70	69	71.3
	Min.	51	48	48	45	40	36	37	43	53	49	38	36	35	48	46	47	42	43	52	53	54	55	52	53	52	49	60	55	50	41	51	47.2
Denison	Max.	65	54	53	48	48	52	78	78	76	70	73	80	72	65	68	70	72	83	75	70	68	72	83	88	85	82	65	65	68	67	74	69.9
	Min.	41	45	38	35	32	36	34	46	40	36	34	35	38	40	42	40	38	42	50	48	46	52	50	52	54	59	56	52	50	42	55	43.8
Des Moines	Max.	65	58	58	53	55	60	70	75	69	77	64	70	67	55	58	75	73	80	74	72	69	72	84	87	79	83	74	73	75	67	77	69.9
	Min.	49	51	48	41	39	38	44	44	53	44	46	41	44	50	52	49	54	60	58	58	60	58	54	63	64	60	60	51	57	48	57	51.5
De Soto	Max.	63	61	61	58	53	60	72	80	73	77	66	70	71	56	59	76	73	84	73	73	69	74	86	90	81	87	74	78	70	69	75	71.4
	Min.	49	51	48	40	38	36	43	40	51	42	44	44	39	50	52	46	55	59	58	57	57	57	61	63	59	60	58	48	55	49	55	50.5
Dows	Max.	67	55	67	52	67	60	72	76	70	75	66	68	72	63	64	72	70	82	74	66	69	67	83	84	77	82	70	68	62	67	77	69.8
	Min.	42	47	40	42	39	31	34	39	44	37	41	32	37	45	45	43	42	56	57	56	55	53	48	59	60	56	57	46	51	42	57	46.3
Dubuque	Max.	72	61	58	52	56	61	72	76	64	70	65	68	74	61	64	68	70	77	77	66	77	64	82	83	76	79	77	70	62	70	72	69.2
	Min.	59	50	49	41	40	37	41	45	56	45	48	41	44	49	51	49	46	51	61	51	54	56	56	60	58	52	62	59	53	48	54	50.5
Eldon	Max.	72	65	60	57	51	60	70	78	70	71	68	70	71	60	59	75	74	84	80	77	76	72	87	90	86	83	81	78	82	73	81	72.9
	Min.	58	54	47	43	39	35	44	37	50	45	45	40	39	52	54	53	50	59	60	60	62	59	51	59	61	51	63	57	64	53	54	51.5
Eldora	Max.	73	67	65	56	58	63	70	84	78	82	67	77	65	72	67	70	78	85	81	65	70	68	90	80	87	88	76	85	80	90	..	74 6
	Min.	43	36	38	38	36	32	37	48	41	50	34	37	36	37	48	39	46	54	49	54	50	47	54	40	45	50	42	45	47	48	..	43 4
Elkader	Max.	72	58	64	55	61	64	77	80	78	73	72	72	79	69	70	75	76	80	78	61	75	65	86	89	85	84	79	74	65	75	74	73.1
	Min.	63	50	44	45	40	33	35	38	55	35	35	33	33	48	50	42	43	53	55	53	54	55	59	59	55	57	62	57	50	45	48	47.9
Estherville	Max.	63	50	52	56	57	63	77	80	72	74	62	75	76	60	72	76	62	80	67	70	64	71	87	84	81	88	70	67	58	73	75	69.7
	Min.	42	37	40	41	37	32	37	41	43	42	39	34	38	46	35	43	48	53	45	50	55	51	51	57	57	58	53	42	46	39	53	43 4
Fairfield	Max.	71	65	58	54	50	59	69	75	58	71	65	68	70	58	58	73	71	82	76	75	76	70	84	88	78	79	78	76	78	71	72	70.2
	Min.	56	51	44	43	38	34	42	42	52	42	44	37	41	52	53	50	47	58	57	61	62	57	53	60	59	51	60	55	58	49	50	50.3
Forest City	Max.	63	56	54	55	58	61	71	76	74	76	62	69	72	63	70	73	65	81	70	66	62	67	82	82	79	83	68	66	58	67	70	68.4
	Min.	46	48	41	43	39	34	39	42	49	45	41	37	42	48	42	47	49	51	45	49	55	52	50	62	62	57	58	46	49	43	54	47.3
Galva	Max.	67	54	52	50	56	63	77	71	71	74	69	74	71	64	..	78	70	78	72	75	67	75	89	89	81	84	83	..	76	72	85	71 3
	Min.	40	46	46	69	38	38	40	45	44	38	44	36	45	48	..	43	52	52	46	56	54	52	52	62	61	52	41	..	42	48	62	46.8
Glenwood	Max.	68	55	55	52	51	61	72	74	70	78	75	70	68	63	60	73	74	82	78	76	68	76	87	86	88	83	73	68	76	70	79	71.3
	Min.	43	45	46	41	37	36	39	40	50	48	46	36	48	50	50	50	56	60	55	56	30	53	56	65	58	63	59	44	55	44	56	49.5
Greene	Max.	66	57	60	55	59	63	79	81	74	75	66	71	79	63	72	73	71	82	76	67	70	69	89	87	84	87	87	72	65	76	78	72.7
	Min.	50	49	44	46	40	32	37	43	54	39	41	34	39	47	45	46	49	54	50	55	56	54	50	65	45	46	..	..	..	..	..	46.5
Greenfield	Max.	65	76	61	50	53	60	73	77	71	76	71	73	72	66	60	77	75	83	77	76	70	73	85	89	90	88	73	78	80	69	80	73.0
	Min.	46	48	46	40	36	34	39	44	51	46	47	37	48	49	50	48	49	57	55	55	54	54	54	62	60	60	59	45	52	43	54	49.1
Grinnell	Max	73	60	60	60	53	57	65	73	72	72	68	66	70	66	58	71	72	79	80	74	71	67	80	85	80	79	81	71	71	66	74	70 1
	Min.	54	53	45	42	37	34	40	46	54	47	47	40	48	50	50	47	50	58	58	60	60	55	56	62	60	56	55	52	54	46	55	50.7
Grundy C'r.	Max.	67	56	58	52	55	58	72	78	70	76	62	70	72	52	63	74	73	80	73	66	71	67	83	85	79	81	76	70	65	69	74	69.3
	Min.	49	48	42	39	38	32	39	40	52	37	41	37	40	44	50	47	50	53	53	56	55	53	50	61	58	53	57	52	51	43	52	47.5
Guthrie C'r.	Max.	66	60	60	52	54	61	73	78	72	72	67	71	72	59	61	76	74	82	77	74	67	73	84	90	88	87	70	73	73	78	74	71.5
	Min	44	48	45	40	36	35	40	47	50	48	38	32	43	48	50	42	53	54	54	54	49	54	54	59	66	60	58	44	53	45	45	48.0
Hampton	Max.	62	53	58	52	58	60	74	78	72	74	65	71	74	54	67	75	68	82	74	65	69	66	83	87	79	82	72	70	68	69	73	70.0
	Min.	49	47	42	41	39	35	41	42	50	42	43	37	41	44	45	48	51	54	50	56	57	54	54	65	60	56	58	47	52	43	51	48.2
Hopeville	Max.	65	59	59	53	49	58	70	74	66	76	68	69	66	66	57	73	73	80	71	71	66	72	80	84	79	81	72	72	76	66	77	69.3
	Min.	50	50	47	41	37	35	40	46	54	47	48	41	49	50	51	52	54	57	57	58	55	55	57	65	61	59	58	48	56	50	56	51.1
Humboldt	Max.	66	54	56	52	57	62	75	77	71	74	68	72	73	67	67	77	70	83	77	72	64	72	87	88	88	86	73	71	63	71	76	71.3
	Min.	44	48	44	42	38	32	41	45	42	40	44	34	42	46	40	43	55	55	49	56	56	56	56	60	61	60	57	47	51	43	56	48.2
Indep'nd'ce	Max.	68	67	59	57	56	61	70	74	73	71	64	67	72	60	63	71	69	77	77	67	73	68	80	84	78	78	76	71	59	60	75	69 5
	Min.	54	57	44	39	38	32	35	38	53	37	42	36	37	44	50	47	46	51	54	53	55	53	52	58	56	49	59	55	50	43	50	47 1
Indianola	Max.	65	58	58	56	52	58	69	75	70	75	..	70	67	56	57	72	80	78	72	69	71	..	84	86	83	82	78	72	76	..	78	70.2
	Min	49	51	46	41	37	34	42	..	53	45	..	40	48	50	51	52	52	56	57	58	56	..	54	51	64	58	58	49	55	..	46	50.1
Iowa City	Max.	70	62	58	52	56	61	72	77	62	73	64	68	75	57	58	76	..	82	78	74	80	67	86	89	81	82	82	75	78	73	78	71.6
	Min.	58	55	45	44	39	35	40	40	49	40	45	37	40	50	53	47	48	50	58	57	62	55	51	60	50	52	62	60	58	50	57	..
Iowa Falls	Max.	67	52	59	54	58	61	74	78	72	76	66	71	76	53	67	77	74	83	77	69	71	70	88	88	83	85	77	72	70	74	76	71.5
	Min.	46	47	41	49	39	33	36	35	47	34	37	33	37	44	46	46	51	55	49	55	56	53	47	60	59	54	57	48	51	40	53	44 4
Keosauqua	Max.	76	65	61	60	55	58	73	73	61	70	69	71	69	62	69	73	76	84	75	75	76	72	89	89	88	84	79	79	81	77	79	72.8
	Min.	58	55	48	44	43	37	44	40	54	47	48	41	42	53	54	58	55	59	61	62	61	59	57	62	62	63	63	57	61	63	56	53.8
Keokuk	Max.	75	69	60	55	48	59	67	75	71	72	72	69	68	62	62	73	72	84	80	77	77	75	86	87	84	80	82	75	79	71	78	72.4
	Min.	59	59	49	42	42	42	48	48	58	53	53	47	54	59	57	58	51	59	3	62	63	61	61	70	61	56	62	60	62	57	55	55.6

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR MAY, 1898—CONTINUED

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Knoxville..	Max.	66	60	63	56	54	58	72	79	69	77	70	71	69	64	60	76	74	83	76	70	73	70	87	89	83	83	79	75	80	73	78	72.2
	Min.	52	52	47	43	36	40	42	45	48	48	45	40	47	50	52	49	50	49	58	59	60	57	56	61	62	58	60	52	56	48	56	50.9
Lamoni.....	Max.	65	62	57	55	49	59	69	75	64	74	71	69	64	69	61	72	74	81	74	76	68	78	83	85	90	81	75	72	77	69	80	70.8
	Min	51	51	48	41	38	35	39	45	55	47	46	41	48	50	51	54	56	58	61	59	56	55	57	65	61	60	60	50	59	52	55	51.8
Lansing.....	Max.	73	68	64	59	63	67	78	78	74	73	67	66	76	73	73	75	70	79	76	66	75	67	85	89	84	82	74	72	63	75	72	72.8
	Min.	51	50	44	45	42	40	38	40	52	37	41	36	38	45	47	48	44	51	56	56	55	57	53	53	54	46	64	57	53	41	48	47.8
Larrabee...	Max.	56	50	55	48	57	65	79	66	66	67	65	67	66	64	67	66	66	79	66	68	66	68	88	89	88	86	66	68	57	68	70	67.6
	Min.	39	43	39	39	37	31	38	40	41	43	43	33	44	46	43	43	50	50	42	51	53	52	51	50	60	60	48	37	49	44	54	45.2
Le Mars	Max.	68	50	54	51	57	64	75	75	72	74	66	70	70	65	69	77	67	76	70	74	65	75	85	87	86	71	68	68	63	70	75	69.6
	Min	39	44	44	43	39	33	40	41	41	46	46	31	46	49	45	43	53	51	40	54	57	53	50	61	62	55	41	46	51	41	52	46.4
Lenox	Max.	65	57	56	54	48	58	70	74	67	77	68	71	65	68	58	72	72	79	72	71	68	73	82	84	83	82	71	69	75	60	75	69 5
	Min.	48	49	47	40	37	36	38	44	53	46	48	40	50	50	51	52	56	58	59	58	54	54	57	66	62	61	59	46	57	47	56	50 9
Linn Grove	Max.	70	62	57	48	55	60	74	77	63	73	56	70	75	56	59	73	72	79	77	69	78	64	83	85	79	82	80	74	72	72	76	69.9
	Min.	47	51	44	40	37	35	39	45	58	43	44	37	43	47	51	47	45	53	57	53	58	55	53	63	57	60	50	58	54	46	51	48.9
Logan.....	Max.	70	71	58	50	56	50	70	71	72	75	76	70	71	60	64	76	74	80	77	78	62	77	86	89	90	80	71	72	79	76	87	72 2
	Min.	43	40	42	42	39	35	38	42	50	45	42	36	40	50	50	42	45	52	52	55	51	54	58	62	64	62	60	56	52	45	49	48.1
Maquoketa	Max.	75	67	58	55	55	59	70	76	67	73	66	67	68	61	62	61	70	78	77	70	78	75	80	84	77	78	79	71	69	70	76	70.1
	Min.	58	55	46	41	38	34	40	40	50	39	43	38	38	45	52	48	73	53	59	51	58	56	54	62	56	45	59	59	56	44	51	48.5
Marshallt'n	Max.	65	57	57	49	55	60	71	78	70	77	61	72	73	53	61	77	72	81	74	69	71	70	85	88	80	83	77	73	72	70	77	70.3
	Min.	51	52	43	47	37	35	40	38	53	39	42	35	40	46	51	46	51	55	55	58	58	55	50	61	60	53	61	52	52	45	54	48.7
Mason City.	Max.	58	58	58	56	52	61	72	79	71	77	62	69	76	55	76	72	68	83	71	68	70	66	82	84	79	82	73	69	59	69	70	69.2
	Min.	48	46	40	44	43	32	38	40	51	40	38	34	38	46	38	44	47	45	48	54	55	53	52	61	58	55	61	50	49	41	52	46.5
Monticello .	Max.	75	74	74	71	56	61	78	76	68	74	58	78	66	66	68	70	70	72	75	81	82	84	84	85	78	82	80	75	71	70	71	73 3
	Min.	55	55	38	55	35	31	30	32	31	38	36	38	32	42	55	44	43	41	43	58	53	54	50	51	58	48	58	58	54	45	50	46.4
Mooar	Max.	75	65	60	47	48	59	68	74	61	67	71	69	66	62	64	76	73	83	73	77	75	75	84	88	87	79	82	75	80	77	78	71.5
	Min.	58	55	45	42	40	44	43	45	40	50	45	38	39	52	52	55	49	59	60	62	62	62	52	56	55	48	56	59	58	55	48	51.2
Mt. Ayr .	Max.	65	59	59	54	49	57	71	78	65	77	73	74	61	71	71	73	75	82	72	72	68	75	86	89	84	85	74	76	78	73	83	72.0
	Min.	49	49	47	40	37	37	39	44	43	47	45	41	44	49	49	53	55	54	54	54	54	54	55	63	64	59	58	47	58	49	55	49.9
Newton.....	Max.	66	61	61	54	54	66	71	76	68	76	61	71	69	57	58	76	73	81	75	74	72	72	86	89	81	83	74	75	73	70	79	70.0
	Min.	52	51	47	40	38	36	41	44	53	46	45	38	45	50	51	48	51	57	57	57	59	55	54	62	63	58	58	57	55	45	56	50.6
N.Hampton	Max.	71	71	..	59	70	72	82	80	76	78	63	69	72	56	68	70	67	78	72	65	69	61	81	82	79	78	75	69	63	69	70	71.2
	Min.	50	42	..	45	40	35	41	44	54	49	50	45	50	47	45	47	60	52	50	50	53	54	50	..	62	52	61	53	48	40	50	49.0
Northwood.	Max.	68	53	57	56	58	61	73	78	69	70	62	69	75	60	73	73	67	82	75	71	72	67	83	87	81	83	71	65	58	70	71	68 1
	Min.	49	46	41	43	39	34	42	39	38	40	41	38	42	47	38	43	45	53	50	51	53	53	53	56	57	54	56	49	48	42	51	46.2
Odebolt ...	Max	67	53	52	50	56	61	77	76	74	77	62	75	72	57	66	79	74	79	77	74	65	73	86	92	86	88	69	72	65	72	79	71.1
	Min.	40	46	45	40	37	32	39	43	48	43	..	33	42	48	46	42	52	55	46	55	54	52	52		60	61	56	42	49	46	45	48.3
Ogden	Max.	59	57	55	47	54	62	72	78	72	78	62	75	68	52	60	74	71	83	75	73	65	72	85	87	80	84	75	72	67	69	75	69.5
	Min.	45	50	45	42	37	33	37	43	52	42	48	40	45	48	50	46	52	57	52	55	56	53	52	61	61	59	58	47	53	44	55	49 0
Olin	Max.	68	71	64	57	48	56	60	70	75	62	73	57	67	71	61	62	70	70	76	76	67	77	77	80	83	75	77	79	71	69	67	69.0
	Min	51	54	47	41	37	33	39	39	49	38	41	35	37	45	51	47	46	50	58	53	53	57	51	62	59	48	61	59	55	54	52	48.8
Omaha,Neb	Max.	62	54	54	49	53	62	73	70	72	77	68	70	66	61	59	74	73	83	73	75	65	77	86	86	87	79	70	68	73	70	81	70.8
	Min.	44	40	46	40	40	39	49	50	51	53	53	44	53	51	52	52	59	60	56	58	54	57	61	66	66	63	56	45	53	51	59	52.4
Osceola	Max.	58	60	58	47	50	59	70	75	65	75	67	70	65	65	57	73	68	80	70	72	61	72	84	85	81	81	73	71	76	70	79	69.0
	Min.	51	50	47	41	37	35	42	51	54	48	46	40	46	51	51	50	54	57	58	60	58	55	55	60	61	61	58	48	56	48	55	51.1
Oskaloosa..	Max.	68	61	60	52	53	59	70	78	63	74	63	70	72	57	58	75	72	82	77	76	75	71	86	88	80	84	77	74	79	70	79	71.0
	Min.	54	51	44	41	36	35	40	37	52	39	41	35	38	50	51	47	48	57	58	59	59	56	51	58	60	58	57	53	57	48	54	49 2
Ottumwa...	Max.	69	62	59	54	53	60	67	76	63	71	66	69	67	69	68	73	74	83	73	77	76	69	85	88	78	81	80	74	79	69	71	71.1
	Min.	40	40	47	41	38	38	41	46	45	44	53	41	43	52	52	51	50	58	57	60	58	57	55	61	61	55	57	65	60	54	56	50.8
Ovid.....	Max.	63	63	61	51	43	64	74	75	66	71	66	72	63	61	59	75	75	81	74	75	70	75	84	86	81	81	75	76	78	71	79	70.6
	Min.	54	51	46	37	40	32	39	45	50	43	45	37	47	51	52	52	50	52	59	58	58	55	52	62	63	63	58	49	58	46	51	50 4
Pella	Max.	58	56	54	62	51	53	66	68	62	68	52	68	59	55	66	70	68	75	67	67	61	63	81	84	76	78	64	70	59	66	75	65.4
	Min.	53	52	45	42	49	34	42	42	53	43	43	38	44	50	51	48	46	55	57	58	60	53	55	61	61	56	61	59	55	53	54	50 8
Plover. ...	Max.	55	58	55	59	55	64	76	76	78	76	64	72	76	55	70	76	70	80	70	76	65	70	89	90	83	89	74	72	64	72	78	71.2
	Min.	44	43	40	42	36	32	42	50	40	38	44	35	47	50	44	48	55	49	43	55	50	46	50	60	59	60	60	48	50	44	58	47.2
Primghar..	Max.	55	55	51	57	57	65	77	78	77	72	72	72	73	63	70	76	70	74	75	70	70	76	88	85	82	84	77	70	68	76	70	70.8
	Min.	41	41	48	39	40	35	38	45	44	47	42	40	49	50	45	46	50	48	45	52	55	52	55	62	60	60	54	40	50	48	40	47.1
Red Oak . .	Max.	65	57	60	54	51	61	76	76	73	78	71	71	71	70	62	78	76	84	79	81	70	79	87	90	90	85	73	65	78	74	84	73.2
	Min.	46	48	48	42	38	33	36	37	54	42	43	35	46	51	51	50	58	59	58	55	52	52	53	62	57	63	60	43	46	45	56	49.0
Ridgway ...	Max	66	59	61	57	62	66	77	80	75	73	69	70	77	64	70	73	67	82	76	65	69	63	83	84	81	84	73	70	67	76	70	71.3
	Min.	55	47	40	42	38	32	39	46	52	42	43	39	43	50	42	44	47	53	50	53	53	53	52	57	56	52	63	54	47	42	51	47.6
Rock Rap...	Max.	48	50	48	52	56	64	76	72	68	70	62	71	69	60	72	76	64	72	70	73	64	72	85	86	84	82	62	64	55	68	76	67.4
	Min.	38	40	40	38	36	26	36	36	34	34	40	29	35	48	40	42	51	48	44	46	48	50	44	58	58	60	52	38	42	40	52	42 7
Rockwell C.	Max.	58	57	51	59	55	61	72	78	72	76	60	72	72	52	64	74	69	80	74	75	63	71	85	89	82	86	72	72	65	69	74	69.0
	Min.	49	48	49	49	39	32	37	42	50	45	42	33	45	46	45	43	53	53	47	55	55	54	54	59	60	59	56	45	50	43	54	48.2
Ruthven ...	Max	63	50	52	50	55	58	76	..	68	72	62	70	70	60	70	74	72	75	76	70	63	67	86	85	76	86	66	65	70	66	74	68.3
	Min.	41	42	40	32	36	30	38	..	42	46	50	40	45	49	40	40	51	42	42	52	55	51	53	61	53	60	54	50	52	44	54	46 1
Sac City ..	Max.	68	60	55	50	54	60	75	72	70	72	68	61	63	65	71	70	75	77	76	84	78	80	85	82	80	76	74	71	68	70	75	70.3
	Min	44	46	45	40	38	41	45	44	43	45	41	36	39	36	41	44	41	56	54	56	57	59	60	59	54	46	45	44	51	52	45	46.8
Sidney.	Max.	52	57	54	50	49	59	69	70	68	75	74	68	66	70	59	70	73	79	73	77	60	74	83	83	85	83	71	68	75	68	77	68.9
	Min.	45	45	46	42	38	40	44	45	53	52	53	44	52	52	52	54	58	60	59	58	54	55	58	64	63	65	62	47	57	50	57	52.4
Sibley ...	Max.	47	48	51	47	58	64	79	74	73	74	64	73	72	56	72	76	63	73	65	72	69	73	88	87	82	85	64	64	55	70	74	78.1
	Min.	40	42	37	42	38	33	37	39	37	42	41	30	42	49	38	45	51	50	45	45	56	50	48	59	59	61	49	40	48	44	54	44.9
Sigourney..	Max.	..	..	..	..	..	..	..	..	..	..	..	62	70	70	60	60	72	75	84	78	77	77	72	80	88	82	83	83	84	80	75	82	....
	Min.	..	..	..	..	..	..	..	..	..	..	..	44	38	42	42	52	50	49	54	60	67	61	56	54	54	58	51	50	57	58	48	56	....
Sioux City.	Max.	49	50	54	51	57	64	74	71	73	74	67	72	68	55	67	75	69	77	66	70	62	76	84	86	89	82	65	65	62	70	77	68.3
	Min.	40	40	45	43	39	35	48	52	44	56	47	37	53	50	46	53	59	54	48	60	52	56	62	68	65	63	54	42	54	47	60	50.7
Spencer.	Max.	63	55	53	50	58	53	76	69	72	76	73	73	73	69	70	73	65	76	70	73	66	72	89	87	79	74	69	70	73	72	77	70 0
	Min.	40	38	34	30	38	30	40	35	42	46	42	42	40	39	40	42	51	52	44	52	59	52	54	60	52	56	54	42	47	44	54	44.9
Spirit Lake	Max.	59	49	54	49	59	65	72	74	71	74	62	74	62	57	74	74	62	74	73	78	64	70	87	88	85	84	65	67	56	70	72	68.4
	Min	42	39	45	41	39	32	34	42	42	42	41	32	42	47	36	46	51	54	57	54	49	55	51	62	59	60	49	47	47	41	56	48.2
Stuart ...	Max.	70	57	58	55	52	60	70	75	73	75	66	70	72	59	57	73	73	80	75	70	60	68	72	89	82	86	70	71	58	70	78	69.2
	Min.	47	52	50	36	34	32	40	44	49	50	47	40	47	49	50	49	37	55	56	55	58	59	55	55	62	60	55	45	57	45	54	49.2
Tara..	Max	68	62	55	53	60	65	75	74	75	75	65	72	75	70	75	77	75	84	78	65	73	71	80	89	88	85	75	70	67	68	71	72.4
	Min.	43	35	39	37	40	40	40	41	42	41	33	35	42	43	41	42	41	52	48	53	55	55	50	53	52	57	60	45	44	43	55	45.1
Toledo.. ...	Max.	66	59	60	59	55	59	72	77	70	75	63	71	74	54	60	76	72	80	72	70	73	68	88	88	78	81	78	75	65	68	76	70.4
	Min.	59	54	48	42	48	32	40	36	53	38	44	35	40	47	51	47	51	58	56	59	61	54	61	58	58	56	62	54	55	44	53	49.7
Thurman ..	Max.	66	56	56	54	50	60	71	71	73	76	75	71	67	67	62	73	74	81	74	79	69	79	86	86	87	83	72	72	74	73	84	72.0
	Min.	46	48	50	42	40	38	36	40	54	42	44	36	48	51	51	54	50	61	57	57	51	51	53	63	56	64	60	46	56	45	58	49.9
Villisca.....	Max.	53	57	58	49	50	60	73	74	69	76	71	74	67	72	61	76	74	82	76	78	64	76	85	87	87	86	72	74	76	72	78	71.2
	Min.	46	48	47	41	38	33	39	38	52	40	42	33	44	50	50	51	58	57	57	58	52	53	50	63	56	63	60	44	57	46	55	49.0
Washingt'n	Max.	72	63	58	49	52	61	70	77	59	71	67	70	71	57	59	73	71	82	75	74	77	68	83	88	79	81	80	73	77	70	78	70 5
	Min.	55	50	42	38	38	33	39	42	52	42	42	36	40	50	52	48	45	56	58	58	58	55	52	60	56	50	60	52	55	47	50	46.9
Waterloo...	Max.	70	56	60	57	58	62	72	78	71	77	65	72	73	62	66	74	72	79	75	67	72	66	84	86	80	81	76	74	67	70	74	70.8
	Min.	54	43	45	41	39	33	38	38	55	37	40	35	38	45	51	46	50	53	54	55	56	55	49	60	59	51	62	56	51	42	53	47.9
Waverly....	Max	65	58	60	56	58	61	72	78	72	74	66	69	75	65	67	73	70	82	76	66	72	67	82	84	77	80	75	71	67	70	73	70.5
	Min.	53	50	42	40	41	31	40	39	54	35	3	33	38	46	51	47	51	54	54	55	57	55	51	61	60	55	62	55	52	45	55	48 9
Webster Cy	Max.	65	57	54	58	57	60	72	75	71	72		70	71	61	66	77	71	82	74	71	69	72	86	85	80	82	73	78	65	71	78	70.2
	Min.	47	46	44	42	40	45	40	41	55	42		35	45	48	47	50	54	58	53	57	59	55	51	62	61	59	58	50	54	45	56	49 6
W. Branch..	Max.	74	67	67	57	63	72	54	63	69	63	61	69	72	81	59	70	70	81	76	69	76	67	68	83	82	81	80	71	72	70	76	67.2
	Min.	58	54	46	46	37	32	34	36	51	52	43	35	37	46	52	44	45	57	57	55	62	57	52	53	45	47	52	50	48	50	51	47.6
Wilton Je..	Max.	74	65	58	53	56	62	68	75	63	72	60	68	75	70	63	68	72	82	79	74	80	74	82	85	77	80	84	67	81	72	72	71.6
	Min.	48	57	43	40	42	34	38	40	50	45	42	35	42	45	47	44	50	55	45	55	54	57	52	65	55	47	60	59	53	48	50	48.3
Winterset..	Max.	58	61	62	46	52	61	72	78	60	76	67		70	80	58	75	73	81	76	71	70	72	87	88	87	86	74	74	79	70	77	71.4
	Min.	47	49	41	44	36	34	40	43	53	43	42	37	42	48	54	46	50	36	55	56	55	53	51	61	60	65	58	45	48	45	53	48.8

DAILY AND MONTHLY PRECIPITATION FOR MAY, 1898.

STATIONS.	DATE																															Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Adair	..	.10	...	.45	.65	T	..	...	.15	...	..	....	....	.60	....	..	T	....	.30	.31	.75	....	....	..	....	2.48	.95	....	....	....	....	6.7
Afton	....	....	....	.43	.41	....	....	...	.18	....	....	....	....	....	.12	....	1.04	.17	..	.25	.16	....	..	T	....	.61	.76	....	....	....	.12	4.24
Algona	....	....	....	.16	..	T	..	....	....	..	..	....	....	.46	....	....	.18	....	.05	....	2.12	..	....	1.80	....	....	.67	....	....	....	.35	6.05
Alta (Hadden)	..	.20	.10	.16	..	T	..	....	....	..	..	....	....	.46	....	....	.23	....	.33	1.55	.11	.08	....	....	....	T	.14	....	.20	....	.15	4.89
Alta (near)	..	.51	..	.21	.60	....	..	.05	....	..	..	....	....	.70	....	....	.23	....	.43	1.41	.09	.02	..	..	....	....	.31	....	.15	....	.16	4.96
Amana	..	.46	....	.72	..	..	..	.07	....	..	..	....	....	.78	....	..	.37	....	.12	.36	.14	....	....	.06	....	....	.69	....	.87	....	.02	4.17
Ames	.10	.23	..	.08	.49	..	....	....	.20	T	....	..	..	.31	.04	....	....	.43	....	.18	.31	....	....	....	....	1.61	.09	....	..	.08	.01	3.84
Ames (near)	.01	.10	....	.61	....	....	..	....	.13	....	....	..	..	.63	....	....	.12	....	....	.25	.25	....	....	....	....	....	.63	....	.07	....	.05	2.88
Atlantic	....	.05	....	..	.55	.05	..	..	.16	....	....	....	....	.57	....	....	.17	....	....	.25	.25	....	....	....	....	....	.41	T	....	....	.20	4.60
Audubon	....	....	....	.90	.03	....	....	....	.27	..	....	..	..	.22	..	....	.12	....	.40	.06	.69	....	....	....	....	1.31	....	....	....	....	.20	4.60
Belknap	....	..	....	.85	....	....	....	....	....	....	....	..	..	.55	....	....	.25	....	....	.75	.25	..	..	....	....	1.50	..	....	....	....	.84	4.91
Belle Plaine	.30	....	....	....	.50	....	..	....	.60	.20	.40	....	..	.35	.40	.20	....	.80	1.05	.40	.40	....	..	....	....	....	.05	.10	.03	....	....	5.79
Bonaparte	..	....	....	.15	.60	T	..	.15	....	.02	T	..	..	.75	T	....	....	1.15	.20	1.00	.50	....	.20	....	..	..	.20	..	.50	..	.06	5.48
Britt	..	....	....	.51	....	....	..	..	.32	.16	.11	....	.03	.45	.72	..	.38	.75	.94	.30	.18	..	....	....	....	....	.10	.11	.15	....	.90	6.18
Burlington	T	.13	T	.19	.11	..	....	..	.02	T	.03	....	....	.67	.02	..	T	.16	....	.06	2.09	.03	....	....	....	.15	.40	.01	.09	....	.27	4.41
Carroll	.64	....	..	.05	.62	....	....	....	.23	.10	....	....	....	.45	.55	....	....	....	.15	.15	.05	....	....	....	....	....	....	....	.37	....	....	5 33
Cedar Falls	..	....	.42	....	.40	.02	....	.09	..	.	....	....	....	.83	....	....	.20	....	.40	....	1.38	....	....	....	....	.24	.09	T	.25	..	.40	4.76
Cedar Rapids	..	.05	..	.22	..	..	....	....	..	....	....	....	....	.83	....	....	....	.70	..	2 60	.45	....	....	....	....	....	.30	....	T	..	2.00	7.12
Centerville	.03	....	.03	.35	.01	....	....	02	.08	.01	T	....	T	T	.33	....	.54	.53	.06	.11	.02	T	.10	T	..	.02	1.03	.03	.08	..	.03	3.45
Chariton	.20	....	....	T	.24	T	....	....	.36	.10	05	..	....	.26	.23	.10	....	1.71	.17	.04	....	....	....	....	....	....	.10	....	....	....	.78	4.41
Charles City	.12	.02	....	.40	.42	.03	....	....	.35	.09	....	....	T	.09	.10	....	....	1.35	.74	.77	.35	....	....	....	....	.05	.21	.02	.03	.02	.01	5.14
Clarinda	.02	.35	T	.05	.12	.06	....	....	....	....	....	....	....	.70	.14	....	....	.39	....	.50	1.20	.02	....	.17	..	....	.55	.02	.07	....	.02	4.37
Clarion	....	.03	.05	.63	....	....	..	T	....	....	....	....	....	.23	30	T	T	.08	.14	....	1.20	....	....	....	....	....	2 44	.05	....	....	....	5.18
Clarinda	.31	....	....	.34	..	..	..	....	.04	.10	.03	....	....	.56	.06	....	....	....	.85	.28	.30	.12	..	....	..	....	.42	....	1.06	....	....	4.45
Clinton	T	.15	T	.13	24	....	....	....	....	T	....	....	....	.59	.04	T	.20	....	.15	.24	3.73	05	..	....	..	.19	.63	....	T	....	.17	6.57
Clear Lake	....	....	....	.68	....	....	....	....	....	....	....	....	....	....	.25	....	....	....	.43	....	1.80	....	....	....	....	61	1.10	....	....	....	....	4.81
College Springs	....	T	T	T	.62	....	..	....	T	....	....	....	....	....	.22	....	.28	....	.18	.10	.95	....	T	....	..	36	1.30	....	....	....	.10	4.17
Corning	.07	.05	....	....	....	....	....	.20	....	....	....	....	....	.36	....	....	.08	..	.57	07	.27	....	..	....	....	.46	.10	..	....	....	.21	2.41
Council Bluffs	..	.38	....	.20	..	..	..	....	....	..	..	....	....	.36	..	....	.37	....	....	.74	.06	..	....	..	..	....	.73	..	T	....	T	2.84
Cresco	.18	..	..	.01	.35	....	.	....	.09	.04	T	....	....	.54	.17	T	..	.25	1.43	.42	.40	.03	....	.63	T	..	.33	.13	1.70	.03	....	6.74
Davenport	.32	....	....	.11	.16	..	....	....	....	....	....	....	....	.62	....	....	.40	....	....	.30	.70	....	..	..	..	....	.66	.02	....	....	.38	3 63
Decorah	..	.10	....	.28	....	....	..	....	....	.05	..	....	....	.75	..	..	.89	.02	.07	..	....	....	....	....	..	....	.40	....	.18	....	....	2.67
Delaware	..	.40	....	.37	....	....	..	....	....	....	....	....	....	.80	....	....	....	.20	T	.60	.68	....	....	....	..	.66	.13	.22	....	....	.07	4.19
Denison	.22	.01	....	.45	.28	T	..	....	.39	T	T	..	T	.29	T	..	T	.45	T	.28	.33	..	....	....	..	47	.60	T	.45	T	T	4.23
Des Moines	.01	T	....	.60	.16	T	..	T	.45	T	T	....	T	.71	.01	....	.23	.30	T	.45	.78	....	....	....	....	.42	.62	..	.65	....	T	5 32
De Soto	....	.25	.08	.12	....	T	..	....	....	....	....	....	....	.67	....	....	.11	....	1.24	.20	1.41	.02	.02	.68	....	.34	1.85	....	.16	....	.07	7 29
Dows	.04	.13	..	.05	.04	..	....	..	.03	T	....	....	....	.50	.54	....	....	.91	.38	1.09	.35	T	....	....	....	....	.26	.02	.13	..	T	4 42
Dubuque	.24	....	....	.07	16	....	....	....	.58	.26	.10	..	T	.41	.83	.03	....	.50	1.69	.06	.30	....	....	....	....	....	.24	..	.02	..	T	5.47
Eldon	..	T	01	.50	..	T	....	T	....	T	....	....	....	.80	T	....	.40	....	T	.90	.50	.25	....	....	....	.75	....	....	....	....	....	4.19
Eldora	..	.12	..	.08	....	....	....	T	.18	..	....	....	....	.45	....	..	.50	.18	.46	.22	.09	..	..	....	..	....	.85	....	.05	....	.05	3.21
Elkader	T	.12	....	T	....	....	....	T	....	....	....	....	....	.13	....	....	T	.50	....	....	.90	.13	....	....	..	T	.24	....	T	....	.20	2.23
Estherville	.22	....	....	.12	.28	....	....	....	.43	.13	.06	..	....	.42	.89	.01	..	.49	2.03	.11	.37	....	....	....	....	....	.41	....	.23	.01	....	6.22
Fairfield	....	.10	T	12	20	....	....	....	....	....	....	....	....	.24	....	....	.05	.17	....	.04	1.95	....	....	....	..	.40	.57	....	....	....	22	4 01
Forest City	05	....	....	.09	....	....	..	..	....	....	....	....	....	.32	....	..	....	.22	....	.23	.27	.02	....	....	....	....	.16	..	..	..	1.34	2.76
Fredericksburg	.41	....	T	T	.95	T	..	..	.36	.25	.09	....	.19	.60	.62	..	....	.42	2.97	.23	....	..	..	....	....	....	T	....	....	....	.73	7.80
Ft. Madison	....	50	....	.45	.18	....	....	....	....	.07	T	....	T	.55	..	..	.33	....	.61	1.65	.40	..	....	....	....	....	28	....	.27	..	.20	5.42
Galva	T	.10	T	.76	T	T	....	15	....	..	....	....	T	.16	T	...	.58	..	.57	.11	.50	....	....	....	....	.45	.57	..	.80	..	.12	4 89
Glenwood	..	.10	....	08	....	....	....	....	.03	....	....	....	....	.54	..	..	....	.84	....	.09	.78	.03	....	....	....	....	1.12	....	.15	..	1 00	4.77
Grand Meadow	....	.74	....	.02	08	.03	....	....	....	..	....	..	....	1 00	0.2	....	....	.37	....	.60	.66	.04	....	....	....	....	2.00	....	.14	....	....	5 76
Greene	T	.03	T	.71	.18	.04	....	.01	.40	..	....	..	T	T	.07	....	.59	.06	.01	.52	1.02	....	....	....	....	1 26	.72	T	08	....	12	5.80
Greenfield	....	....	....	1.10	....	....	....	....	.23	05	.02	..	....	.31	....	....	..	1.10	T	.50	.22	....	....	....	....	....	.25	....	.34	....	24	4.32
Grinnell	....	25	....	.23	.46	....	..	..	.13	....	..	..	....	.76	..	..	....	.42	.26	.66	.46	T	.03	..	..	.78	.18	....	.20	....	.77	5.56
Grundy Center	....	.03	....	.63	.21	.02	....	....	.29	....	....	..	....	.24	T	....	T	.24	.40	.22	.81	....	....	....	....	.57	.51	..	.67	....	.13	4.99
Guthrie Center	T	.70	.09	.13	....	....	..	..	....	T	.02	....	..	1.02	....	....	.20	....	.46	.68	.16	..	....	....	....	.20	.44	..	.11	....	.04	4.26
Hampton	....	.12	....	.13	..	....	T	..	....	..	....	....	....	.56	....	....	.65	....	....	....	1.38	..	....	T	..	..	.43	....	.20	....	1.30	4.75
Hawkeye	....	....	....	.17	..	....	..	..	....	..	....	....	....	.32	.43	....	....	.73	.90	.07	.37	....	....	....	....	....	....	....	.33	....	.51	4.26
Hedrick	..	....	.04	.42	.14	....	....	T	.34	....	..	..	..	.22	.20	....	.93	.33	35	1.65	.37	....	..	....	..	.42	.45	....	....	....	.04	5 99
Hopeville	....	.35	....	.11	.28	..	..	....	....	....	....	....	....	.73	....	....	....	.06	....	2.16	.72	....	....	....	....	.30	21	....	.11	..	.25	5.20
Humboldt	....	.20	....	.18	....	....	..	....	T	.22	T	..	....	50	....	....	....	2.10	.01	..	.01	T	.72	..	....	....	.10	....	.10	....	T	4.18
Independence	.25	.03	....	.49	.24	T	..	....	.18	T	....	....	....	.13	.04	T	.79	.12	.15	.11	....	....	....	....	....	T	.36	T	28	..	T	4.14
Indianola	..	.21	T	.18	T	T	..	....	T	T	....	....	....	.65	....	....	....	.16	....	.74	.84	T	..	07	..	.08	.29	....	T	..	T	6.70
Iowa City	.52	....	T	.04	.46	....	..	....	.23	.31	T	.01	T	.72	.20	.20	....	.44	3.08	.02	.21	T	....	....	....	.23	....	....	.02	....	....	5.50
Iowa Falls	.45	....	..	....	.15	.06	....	....	.43	.11	T	....	T	.41	.50	T	.10	.61	2.07	.15	.40	....	..	..	....	.10	....	....	....	....	....	....
Keokuk	T	T	....	.21	.31	T	..	....	.24	.10	....	....	....	.12	T	....	....	1.62	.44	.61	.31	....	....	....	....	....	.43	..	.69	....	.15	5.26
Keosauqua	.10	....	....	.38	.14	....	..	..	.18	.14	....	....	.01	.18	.28	.01	.53	1.38	1.68	.22	.26	....	....	....	....	.27	.35	....	.01	T	.03	6.13
Knoxville	....	.13	....	....	T	..	....	....	....	..	....	..	....	.37	..	..	....	.75	....	.03	.45	T	..	....	....	....	.13	.52	T	....	T	2.35
Lamoni	....	.09	T	.11	....	....	....	T	....	T	..	....	....	T	....	..	1.00	.60	....	.45	.45	..	..	.18	....	....	1.36	.43	T	....	.71	5.36
Lansing	T	.21	....	.81	....	....	....	01	....	T	..	....	....	.49	....	..	.23	..	.17	.79	..	T	..	....	....	....	.35	..	.23	..	.25	3 58
Larchwood	T	.09	T	.11	....	....	....	T	....	T	..	....	....	T	....	..	1.00	.60	....	.45	.45	T	..	.18	....	....	1.36	.43	T	....	.71	5.36
Larrabee	T	.21	....	.81	....	....	....	01	....	T	..	....	....	.49	....	..	.23	..	.17	.79	..	T	..	....	....	....	.35	..	.23	..	.25	3 58
Le Claire	49	..	..	.22	.01	..	..	....	.01	.02	T	..	....	.60	.03	..	....	.14	.55	.43	.07	....	.02	..	....	....	.18	..	1.01	....	....	3.74
Le Mars	....	.62	....	.35	.29	....	..	..	T	T	....	....	....	.23	....	....	.80	.40	..	.12	.35	....	....	....	....	.15	....	....	.20	..	.20	3.78
Lenox	....	.02	....	.49	.16	T	.04	....	.13	T	....	..	T	.06	.24	.02	1.01	.09	.15	.22	.75	..	..	....	..	.64	.86	....	.02	..	.07	4.91
Linn Grove (Mt V.)	.25	.25	....	.12	.15	....	....	....	.10	T	T	..	....	.25	07	....	.25	.49	.18	.01	.03	T	....	.90	....	....	1.07	....	.35	....	.03	4.57
Logan	.16	..	....	.68	.13	....	....	....	28	....	....	....	....	.56	....	....	09	..	1.15	.75	.19	....	..	..	....	.51	.40	....	....	....	....	4 90
Maquoketa	.04	.40	..	....	.21	..	....	....	.05	.10	....	....	..	.26	.16	..	..	1.18	....	.42	.03	....	....	....	....	....	.07	....	.69	..	....	3.61
Marshalltown	..	.02	..	.52	.17	.02	..	....	.29	T	....	....	....	.37	.01	T	T	.89	..	.23	1.10	T	..	.20	..	....	.35	..	.08	..	.01	4.24
Mason City	T	.20	40	....	....	....	....	....	....	....	....	....	....	.60	....	..	....	....	.10	.35	....	2.50	T	....	....	....	1.00	T	T	....	.15	5 36
Millman	.29	.02	....	.54	.35	....	..	....	.41	T	....	....	....	.25	.03	....	T	.68	T	.15	.21	..	....	....	....	.49	.79	T	1.31	....	.02	5.50
Mooar	.46	....	....	.06	.67	....	..	....	.30	.42	.10	....	T	.90	.50	..	..	.30	2.40	.36	.20	....	....	....	....	....	.20	..	....	....	....	6.84
Monticello	....	.11	....	....	.27	....	....	....	T	T	....	..	..	....	....	....	....	.78	.14	.23	.10	....	....	....	....	1.05	....	..	....	....	....	3 47
Mt. Ayr	.02	....	....	.47	.15	T	..	....	.43	02	..	....	....	.41	.16	.02	.30	.80	.32	2.85	.28	....	....	T	....	.48	.49	....	02	.01	.09	7.26
Mt. Pleasant	.18	....	....	....	.50	..	..	..	29	.10	....	....	....	....	1.17	..	....	.45	1.40	.25	....	....	....	....	....	....	.05	..	.38	..	.71	5.59
Mt. Vernon	10	.25	....	.15	.40	....	....	....	.15	....	....	....	....	.33	....	....	.53	.25	.25	....	....	....	....	.27	....	....	1 25	....	.50	....	....	4 40
New Hampton	.22	....	....	.09	.03	....	....	..	....	....	....	....	....	.69	....	....	....	.27	....	.35	1.32	....	..	.03	....	....	28	.02	.10	..	.01	3.43
Newton	.12	.05	....	.57	....	.06	....	....	28	T	.04	..	..	.39	....	..	.10	.68	.02	.27	.35	....	....	....	....	.37	.24	.03	.25	..	.22	4 01
North McGregor	.08	.06	.05	....	.07	..	....	....	T	..	.06	....	..	....	.50	....	..	.60	....	.22	.25	.20	.02	..	....	....	....	.26	....	07	....	2 44
Northwood	....	....	....	.25	....	....	....	....	....	....	....	....	....	....	....	....	....	.08	....	.20	1 95	.07	....	....	....	....	1.30	..	....	....	.10	3.94
Odebolt	..	.34	.41	.10	....	....	....	..	....	....	....	....	....	.74	....	....	.07	.75	....	.72	.60	.02	....	.42	.16	....	....	....	.30	....	.16	4 75
Ogden	....	.16	..	30	.15	T	....	....	22	T	....	....	....	.65	....	....	T	.09	....	....	.81	.45	....	....	....	1.01	.56	.08	.14	....	.11	4.79
Olin	.05	.16	....	....	.50	....	....	....	08	.48	.02	....	....	.45	T	....	68	.23	1.00	12	..	....	....	.14	....	....	.15	....	.64	....	....	4.73
Omaha (Neb.)	T	.12	T	.62	.03	T	..	T	.21	..	..	..	.05	.69	T	....	.06	....	.44	.92	.64	..	....	....	....	.10	.35	....	T	T	.10	4.30
Osage	....	.13	....	.11	.24	T	..	T	....	....	....	....	....	.52	....	....	.28	....	....	.28	1.05	....	....	.05	....	....	.88	.05	04	....	.04	3 63
Osceola	T	T	....	.30	.15	.20	....	T	.60	T	T	....	T	T	.27	....	1.00	.71	.10	1.20	.19	....	....	....	....	....	.58	T	T	....	....	5 37
Oskaloosa	.12	....	....	.03	.10	....	....	....	.25	.35	T	..	....	.24	.05	....	.08	.74	.22	.50	20	..	....	....	....	....	....	T	10	..	.12	3.10
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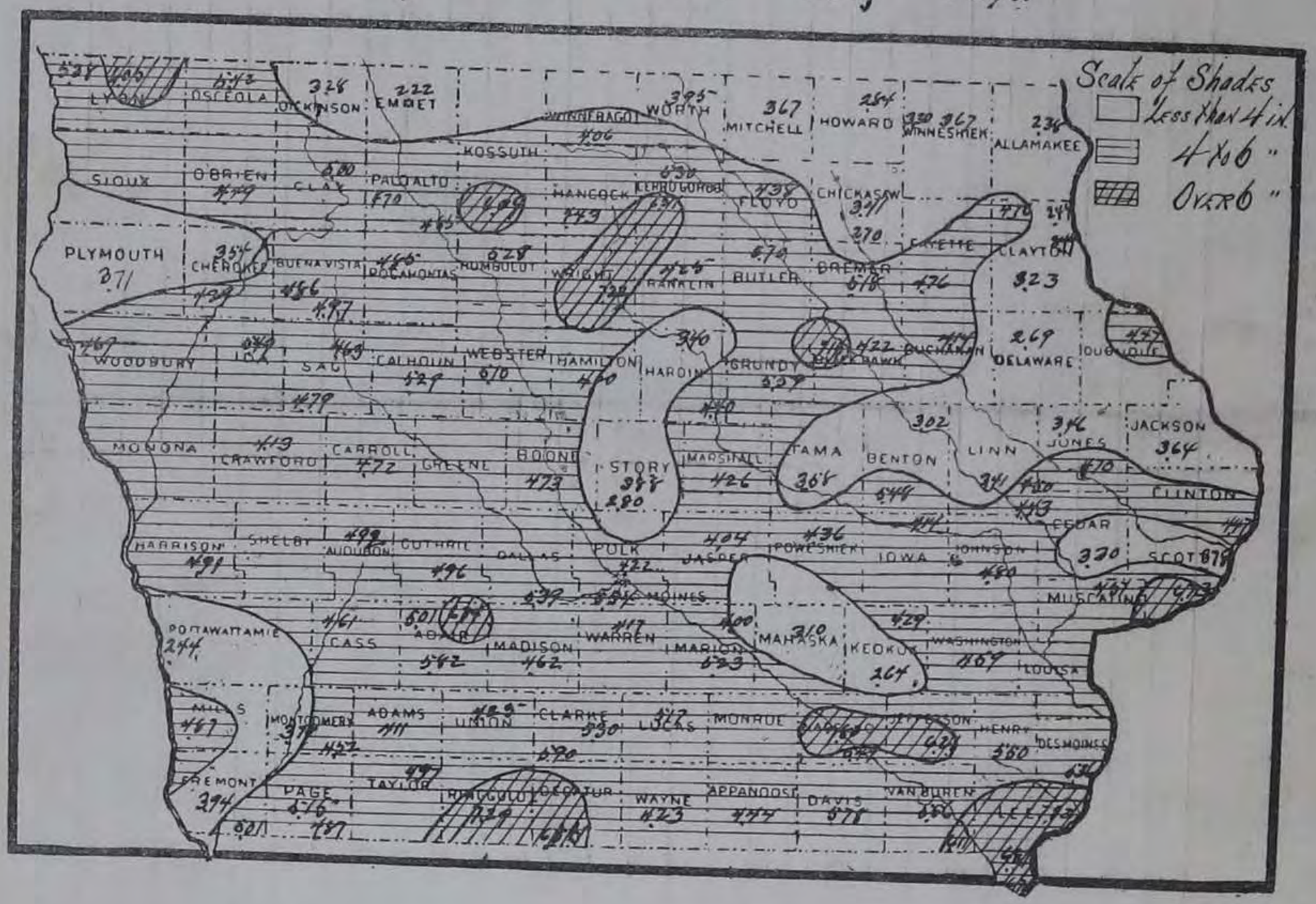
Ovid	28	....	.05	.21	.13	....	....	....	.38	.33	....	....	....	....	....	....	....	1.27	.99	.17	.10	....	....	....	....	....	.30	....	.02	....	....	4.20
Pella	....	....	....	.20	.09	....	....	....	.15	.28	....	....	....	.16	....	....	....	1.10	.31	.41	.29	....	....	....	....	....	.75	....	.26	....	....	4.03
Plover	.10	.30	....	....	.57	....	..	....	....	..	....	....	....	.17	....	....	1.30	..	....	.50	....	....	....	1.00	....	.70	.71	....	....	.22	....	3.79
Primghar	....	.04	T	70	.26	T	..	....	.04	..	..	.02	02	.05	.04	T	.03	....	T	.26	.70	....	..	....	....	....	.53	....	.03	....	.02	3 39
Red Oak	.14	.27	....	.08	.24	....	....	....	.02	....	....	....	....	.53	....	....	....	.87	....	....	1.03	.04	....	....	....	....	.47	.43	....	.22	....	6 00
Ridgway	....	.01	T	.44	....	....	....	....	....	....	....	....	....	.04	..	..	1.25	....	.24	1.00	....	....	....	.05	....	1.90	.25	....	.37	....	.39	5.25
Rock Rapids	....	.35	....	.22	....	....	....	....	....	....	....	....	....	.96	..	..	.04	.07	....	1.54	.50	..	....	....	....	.60	....	....	....	....	.20	4.79
Rockwell City	....	.30	....	.10	.50	....	....	....	....	....	....	....	....	.20	....	....	.26	..	..	.30	1.50	....	....	1.00	....	....	....	....	.50	....	.38	4.60
Ruthven	....	.75	.50	.25	.25	....	....	....	....	....	....	....	....	.75	....	....	.50	....	....	....	....	....	....	....	....	.50	.25	....	.51	....	.40	5.43
Sac City	38	.15	....	.19	.20	..	..	T	.01	....	....	....	....	.16	..	....	.48	.32	....	.25	.88	.04	....	....	.15	....	1.30	....	.02	.16	.02	3.92
Sibley	T	T	.24	.80	.03	....	....	T	.02	....	....	....	.05	....	.22	....	.35	.11	.08	.92	.08	....	....	....	....	.76	.08	....	....	....	.40	2.64
Sidney	....	....	....	....	....	.60	....	....	....	....	T	.06	....	.26	.09	....	....	.40	.12	....	.20	.22	....	....	T	....	.30	....	.11	....	.19	4.64
Sigourney	T	.22	T	.47	10	....	....	.01	..	..	..	..	T	.61	....	....	.25	.24	.12	1 31	.76	....	..	.30	.01	.02	.34	....	.03	....	.17	5 09
Sioux City	....	.25	....	.31	.22	..	..	T	....	....	....	....	....	....	....	....	.39	.54	....	.66	1.76	....	..	....	....	T	.27	T	.05	....	.35	3.20
Spencer	T	.10	....	....	....	....	....	T	....	....	....	....	....	T	....	....	.68	.55	..	.30	.98	....	....	....	....	1.05	....	....	....	....	....	5.08
Spirit Lake	....	....	....	1.10	.38	....	..	.01	....	..	....	....	....	.25	..	....	.02	....	....	1.00	.70	.40	....	....	....	....	.40	....	....	....	....	5.11
Stuart	....	.30	.40	.20	....	....	....	....	....	....	....	....	....	1.00	....	....	....	....	....	1.00	1.80	..	....	....	....	....	....	....	....	....	....	3.50
Tara	....	.04	....	.78	....	....	....	....	....	.15	....	....	....	.51	....	....	....	1.00	.08	.43	.34	....	..	....	....	....	....	....	25	....	....	5.08
Toledo	T	.10	.08	.70	.20	T	....	T	....	..	T	..	T	.35	.15	T	.95	.02	.10	.08	.45	....	....	....	....	.62	.88	.04	T	.02	.18	5.08
Thurman	T	.02	T	53	.13	....	....	.10	....	....	....	....	T	.01	.13	....	.03	.03	.10	T	1.19	....	....	....	....	.90	1 06	T	T	....	.29	4.51
Villisca	....	....	....	.40	....	....	....	....	.15	.10	T	..	....	.50	....	..	.82	.17	.07	.12	.52	..	....	....	....	....	.17	....	....	....	....	3.02
Vinton	.16	....	..	....	12	....	....	....	.19	.12	..	....	....	.27	.45	....	....	.47	1.47	.66	.26	....	....	....	....	....	.03	.37	.13	....	....	4.52
Washington	T	.33	..	.57	.17	T	..	T	.06	T	..	....	....	.20	....	....	.50	....	....	1.25	.25	....	....	....	....	....	.70	....	.02	....	.15	4.29
Washta	T	.04	....	.13	.03	....	....	....	T	T	.03	....	....	.62	....	....	....	.94	....	.89	.61	.43	....	.09	....	....	.18	....	.13	....	.30	4.29
Waterloo	.05	.14	....	..	.03	....	..	....	.08	....	....	....	....	.65	.06	....	.45	....	1.30	.29	1.42	.03	..	....	....	....	.26	....	.16	....	.26	5.12
Waverly	T	.55	....	.30	T	T	....	....	....	T	....	....	....	.65	....	....	T	....	....	.75	.65	....	....	T	....	.45	.30	....	.35	....	T	4.06
Webster City	....	.22	T	.14	.20	T	...	T	....	....	T	....	....	.63	....	....	.21	....	.02	....	2.22	T	....	T	....	.73	.06	T	.08	....	.34	4.80
West Bend	.14	T	....	T	.27	....	....	....	T	T	T	....	....	.47	.06	....	....	.44	.06	1.27	.07	....	....	....	....	....	.42	....	.10	....	....	3.35
West Branch	....	.20	.20	.08	.12	.10	....	....	....	.07	.10	.12	....	.20	....	....	T	40	....	1.00	.90	T	....	.10	....	....	.80	....	.30	....	T	4.40
Whitten	T	....	....	T	.32	....	....	....	.07	.10	.12	....	....	.55	T	....	.55	T	1.20	....	T	T	....	.05	....	....	.61	.04	.00	....	....	....
Wilton Junction	.05	.02	....	.18	.72	.01	.05	....	.48	..	T	....	....	.35	T	....	.66	....	.48	.08	.02	.01	....	....	....	....	1.27	T	.05	T	....	5 61
Winterset	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Precipitation Chart May 1898.



June, 1898.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

VOL. IX. NO. 6.

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Central Station, Des Moines, Iowa.

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DIRECTOR.

GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER.
1898.

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Ames.....Exp. Station.
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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME IX. JUNE, 1898. No. 6.

IOWA CROP REPORT, JULY 1, 1898.

The reports of county and township correspondents of the IOWA WEATHER AND CROP SERVICE made a flattering showing of the condition of the crops, on July 1, 1898, as will be seen by the following summary of averages for the state: Winter wheat, 97 per cent; spring wheat, 99; corn, 102; oats, 98; rye, 97; barley, 100; millet, 98; flax, 98; broom corn, 93; potatoes, 102; sweet potatoes, 97; sorghum, 99; meadows, 108; pastures, 105; apples, 79; pears, 71; plums, 70; peaches, 88; grapes, 99

On the 1st of July, 1897, the same correspondents reported the average condition of the staple crops at much lower figures, as follows: Winter wheat, 61 per cent; spring wheat, 88; corn, 76; oats, 83; barley, 93; rye, 87; flax, 88; millet, 100; broom corn, 82; potatoes, 92; sweet potatoes, 92; sorghum, 85; apples, 84; plums, 72; grapes, 80; timothy and clover, 89.

A COMPARATIVE EXHIBIT.

AVERAGE CONDITION OF IOWA CROPS ON JULY 1ST FOR FOUR SEASONS.

CROPS.	1898.	1897.	1896.	1895.
Winter wheat	97	61	91	83
Spring wheat	99	88	87	96
Corn	102	76	92	101
Oats	98	83	91	102
Rye	97	87	93	82
Barley	100	93	97	96
Millet	98	100	95	93
Flax	98	88	94	96
Broom corn	93	82	91	96
Potatoes	102	92	100	103
Sweet potatoes	97	92	95	93
Sorghum	99	85	92	96
Apples	79	84	83	62
Grapes	99	80	92	42

CLIMATE AND CROP REVIEW.

The month of June was characterized by more than usual warmth and moisture, and all the weather conditions were favorable for the production of an enormous mass of vegetation. In fact it may be stated that the output of vegetable life in all its varied forms at the close of this month has seldom been equaled, and certainly was never exceeded in this state since its settlement by civilized people. In all sections the grasses and small grain crops have made so heavy a growth as to cause apprehension of damage by lodging and rust.

The first and second weeks were unusually warm and excessively wet in nearly all parts of the state, and in all districts the soil was too wet for field work for a number of days in succession. Under these conditions as to warmth and moisture the weeds as well as crops responded to the quickening influence, and more than the usual amount of trouble was experienced in the cultivation of corn.

In the latter half of the month the showers were less frequent, and under normal conditions as to sunshine and moisture good progress has been made in subduing the weeds, and at the close of the month the corn crop was generally clean. The stand was quite uniform, indicating an extra quality of seed as well as a good condition of soil.

At the close of the month the general condition of the corn crop was rated by crop reporters as somewhat above the average The work of cultivation was practically completed except within limited areas where planting and plowing had been retarded by excessive rains.

In the last week of the month the work of harvesting winter wheat, rye and clover was in progress, and some fields of early sown barley were ready to be cut.

The drier and cooler weather that prevailed during the last week was favorable for spring wheat and oats, and making due allowance for all damage by lodging and rust these crops gave promise of a full average yield. On the whole it was a most propitious month for the farmer.

A COMPLIMENTARY NOTE.

The following letter from Prof. Lorin Blodget, of Philadelphia, the eminent and well-known author of "Climatology of the United States," is copied as a matter of interest to the people of this state, as well as a source of gratification to the officials of the Iowa service:

PHILADELPHIA, June 23, 1898.

Hon. J. R. Sage:

DEAR SIR—I write to thank you with special emphasis for your valuable report on the climate and crop service of Iowa for 1897. It is a complete census of the state as to all that relates to the products of agriculture, and I have been able to make the most practical a ıd direct uses of your results. I wish very much the state weather bureaus generally would give like practical statements. This would add greatly to their value, and relieve the weather service generally of much of the criticism now directed against it for confining its work to noting mere changes of the weather.

I believe you have a state appropriation—I hope an ample one. I can assure your state authorities that no better service can be done your state, and, indeed, the whole country, than in the preparation and wide distribution of such reports of its products, their grand totals and values.

Very respectfully, LORIN BLODGET.

CONVENTION OF WEATHER BUREAU OFFICIALS.

Announcement has been made, by authority of the chief of the Weather Bureau, that a convention of Weather Bureau officials will be held at Omaha, Neb , on Thursday and Friday, October 20 and 21, 1898. The sessions of the convention will be held in the rooms of the Commercial club, in the Board of Trade building, which have been kindly tendered for that purpose. Special rates have been conceded at hotels.

Replies to the circular letter announcing the convention indicate that there will be seventy-five or more of the prominent officials of the bureau in attendance, which assures a large, enthusiastic and successful meeting. The chief of the Weather Bureau will be there, and there is a probability that the honorable Secretary of Agriculture will favor the convention by his presence.

All voluntary observers of the weather service in this and other states will be accorded seats as honorary members, and we hope to see Iowa fully represented at that meeting.

NOTE AND COMMENT.

After a service of over two years in the Des Moines Weather Bureau office, as first assistant observer, Mr. Walcott L. Day has been transferred to the east at his own request, on account of family interests, and is now in charge at Block Island, R. I., a station of much commercial importance. Mr. Day is one of the most faithful and efficient officials in the corps of Weather Bureau observers, and his removal was a matter of sincere regret to all connected with this office We hope he will at some future time again turn his steps toward the setting sun. He is especially well quallified for work in the climate and crop division of the service.

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The war has affected the climate and crop service, as well as other branches of public business. Three of the voluntary observers in Iowa are now serving as volunteers in the armies of their country, viz: H. C Andresen, of Charles City; F W. Stokes, of Larchwood; and Jay M. Crowley, of Galva We sincerely hope they will return to their homes in due time, as sound in bodily vigor as when they departed to defend the national honor. Miss Ida Schott is serving as observer at Charles City, and R. F. Walker at Larchwood.

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The Anamosa *Journal*, June 9th, said: "A flock of wild pigeons were observed the other day flying westward. This is the second bunch seen this year. We read recently that the wild pigeon is extinct"

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Hon. John Cownie, in a recent agricultural address, said: "All education is not derived from books, valuable as they are as aids; and practical experience that has won success is just as valuable an education as that secured in a college or university. To become a successful farmer requires natural ability of a high order, supplemented with wide knowledge and painstaking application; for agriculture to-day is no longer a haphazard occupation, opening wide her doors to those who could not succeed or have failed in other occupations; but requires a high order of intellect, and that of a kind not to be had without money and without price, but usually the knowledge acquired is dearly bought and duly paid for, by many severe losses, hard to be borne at the time, but proving in the end a most valuable education when properly applied and the lesson duly heeded in the future."

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Radishes, lettuce, cabbage, cauliflower, asparagus, and onions have been at their best for table use during the recent moist period. And the wet weather has been also favorable for small fruits, of which there has been a great abundance this season. All forms of vegetation have grown vigorously.

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Terrific thunderstorms, accompanied by hail and heavy rainfall, caused great destruction of crops and other property in the northwest and north districts of Hungary during the latter part of June. The estimated loss is about $8,000,000. The disturbance extended into portions of Austria, and numerous lives were lost in both sections of the empire.

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Vermont pays its volunteer soldiers $7 per month in addition to the stipend paid by the government. The hills of that state are steep and its soil is sterile, but as of old it produces a stalwart form of patriotism.

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The *Fruitman* estimates the Iowa strawberry crop for the season to be 50,000 bushels, or 1,600,000 boxes. A moderate estimate of its market value would be about $5,000,000.

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The Iowa exhibit in the agricultural building at the Trans-Mississippi exposition easily excels all others that were installed in June. The artistic display of cereals and grasses is exceedingly beautiful.

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The Iowa fruit exhibit at the Trans Mississippi exposition, under the general management of A F. Collman, is highly creditable to the state, and will be enhanced greatly later in the season.

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There will be a geat quantity of "roughness" for stock this season, but wise and thrifty farmers will cut their corn and utilize the fodder just as carefully as in years of shortage. The fodder of the maize plant is among the best products of the farm for cattle and sheep, and there is no reason why it should be cast out or burned as refuse or garbage. If the farmer has a surplus of forage stuffs he should sell the hay and feed his corn fodder.

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The exportation of corn for the past fiscal year will exceed 200,000,000 bushels. This is a stupendous figure in view of the fact that in the previous years in our history there have been but three years wherein the exports of that cereal exceeded 100,000,000 bushels.

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A rainfall of 31.76 inches in twenty-four hours is reported to have occurred last December at Nedunkeni, in the northern province of Ceylon, where the total fall for 1897 was 121.85 inches, although the average yearly rain is but 64.70. Other great rainfalls on record are 31.17 inches in twenty-two hours at Joyeuse, France; 30 inches in twenty-six hours at Genoa; 33 inches in twenty-six hours at Gibraltar; 24 inches in one night near Bombay; and 30 inches on each of five successive days on the Khasia hills, India. The greatest annual fall is 600 inches the record of the Khasia hills.—*Ex.*

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A local magnetic pole—a point where a dipping needle stands vertical—is reported by Professor Llist to exist at Kotchetovka, in the Russian province of Kursk. It is necessary to move twenty yards from this spot to change the direction of the needle one degree. At the point of this interesting anomaly, the ordinary compass needle swings freely, stopping indifferently in any direction.—*Ex.*

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So-called wireless telegraphy, it is pointed out, cannot become practicable for long distances until the energy now scattered profusely in all directions can be concentrated in one narrow path. Eventually, though probably not at once, it may become possible to focus the electro-magnetic waves, like the rays of a searchlight, upon a point a great distance away. Under present conditions, it is calculated that at a distance of one mile the fraction of the total energy received on one square foot is less than 1-350,000,000 of the total energy radiated.—*Ex.*

A photograph of a landscape by the light of the aurora borealis, with an exposure of only two minutes, is a unique achievement reported from Scotland.—*Ex.*

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Vesuvius presented a rare sight recently, real flames issuing from the summit. Part of the south wall of the crater fell in, blocking up the vents from which the gases had escaped. A few days later, on April 15th, this mass having become red hot, a spurt of flame 200 feet high was sent out, accompanied by a tremendous roar. The column of fire was yellow, with flashes of red, violet and intense blue. Professor Matteucci, who saw it, says that it was the only jet of incandescent gas ever observed on Vesuvius, the light which people usually mistake for flames being merely the reflection of the lava below on the smoke that rises from the crater.—*Ex.*

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Payer, leader of the Austrian expedition to the north pole in 1874, has left remarkable observations about cold It was impossible to smoke because his pipe became covered with ice. Every metallic object caused a severe burn at the slightest contact. The dryness of the air produced abundant perspiration. Although suffering from thirst he might as well have poured molten lead in his mouth as to have touched the frozen snow. The marching men were enveloped in thick clouds from the perspiration which escaped through their furs. It then froze in small crystals, which fell rattling to the ground. Sound could be heard at great distances "Meat was split like wood and mercury could have been used for bullets." Intense cold paralyzed the mental faculties—movement, speech, taste and smell. Contact with a solid body could not be endured in a temperature where the cold of the atmosphere caused no great inconvenience, because the latter is a bad conductor of heat. Metal, being a good conductor, draws off the heat rapidly, and tends to bring the flesh to its own temperature.—*Ex.*

HOT WAVES.

[Extract from an article in The National Geographical Magazine, for March, 1897, by Prof Willis L Moore, Chief of the Weather Bureau]

"From July 28 to August 10, inclusive, 1896, there was a remarkable hot wave in the United States, extending from the Rocky mountains to the Atlantic ocean. The mortality from this cause amounted to many thousands. The hottest region was in the middle Mississippi and Ohio valleys and the Lake region, where the temperature averaged from 6° to 9° above the normal for each one of the fourteen days. During this same period, strange as it may seem, the temperature over the vast Rocky mountain plateau was markedly below the normal, and the cold was not due to altitude, for often we find these conditions geographically reversed.

"For some unexplained reason there came, in summer, periods of almost absolute stagnation in the drift of the highs and lows. At such times if a high rest over the southeastern part of the country and a low over the northern Rocky mountain region, there will result what is popularly known as a warm wave, for the air, on account of its slightly greater specific gravity, will slowly and steadily flow from the southeast, where the pressure is greater, toward the northwest, where the pressure is less, and receiving constant accretions of heat from the hot, radiating surface of the earth, without any whirls or eddies to mix the upper and lower strata, will finally attain a temperature almost unbearable to animal life. This superheated condition of the lower stratum in which we live continues until the low-pressure area in the northwest begins to actively gyrate as an eddy and move eastward, mixing in its course strata of unequal temperatures and precipitating the cool and welcome thunder-shower.

"It is a pertinent inquiry whether such adjacent areas of abnormal heat and abnormal cold can possibly be due to cosmic influences. The only cosmic inauences that meteorology is sure of are the radiation of heat from the sun to the earth and the reception, by space, of the heat that is radiated back by the earth and atmosphere. In the long run, these two balance each other. It is inconceivable that solar insolation, passing outward from the sun along true radial lines, could fall so unequally upon the United States as to cause excessive heat on one side and extreme cold on the other. It follows from the preceding that we must be slow to ascribe any of the local peculiarities that are observed in terrestrial weather to cosmic influences. Weather variations, irregular, annual and diurnal, all probably have their causes at the earth's surface or in the earth's atmosphere, and depend wholly on the mechanics of the latter. The problem, however, is so complex that it would be hazardous to undertake to explain the great difference in temperature during this period of July and August, 1896

"Think of the atmosphere as a mass of air about fifty miles deep, whose upper surface maintains nearly the same configuration and temperature and is almost entirely without motion relative to the earth's surface The solar radiation and the terrestrial radiation penetrate this upper region without appreciable absorption, and the ascending and descending currents of air rarely or never disturb this region, but cease before they reach it. Our weather and climate depend on the changes going on in the middle and lower atmospheres, and among these changes that which affects our surface temperature most is the *motion* of the atmosphere. The great contrast in temperature between two regions lying close together is, therefore, probably not due to any special cosmic influence, but to the flow of air as determined by the distribution of air pressure day by day.

WIND-BAROMEMER TABLE.

BY PROF. E. B. GARRIOTT, IN UNITED STATES WEATHER REVIEW.

The following table presents, in form for ready reference, atmospheric signs which have been found to presage certain weather changes and conditions over the Middle and Upper Mississippi and Lower Missouri valleys, the great lakes, the Ohio valley, and the Middle Atlantic and New England states:

BAROMETER (REDUCED TO SEA LEVEL)	WIND DIRECTION.	CHARACTER OF WEATHER INDICATED.
30.00 to 30.20, and steady.	Westerly.	Fair, with slight changes in temperature, for one to two days.
30.00 to 30.20, and rising rapidly.....	Westerly.	Fair, followed within two days by warmer and rain.
30.00 to 30 20, and falling rapidly....	S. to E .	Warmer, and rain within 24 hours.
30.20 or above, and falling rapidly.	S. to E....	Warmer, and rain within 36 hours
30.20 or above, and falling rapidly.	W. to N...	Cold and clear, quickly followed by warmer and rain.
30 20, or above, and steady	Variable..	No early change.
30.00, or below, and falling slowly..	S. to E ...	Rain within 18 hours that will continue a day or two.
30.00, or below, and falling rapidly.	SE to NE	Rain, with high wind, followed within two days by clearing, colder.
30.00, or below, and rising.....	S. to W ...	Clearing, and colder, within 12 hours.
29.80, or below, and falling rapidly.	SE. to NE	Severe storm of wind and rain imminent. In winter, snow and cold wave, within 24 hours.
29.80 or below, and falling rapidly.	E. to N...	Severe northeast gales and heavy rain or snow, followed in winter by cold wave.
29.80, or below, and rising rapidly..	Going to W.....	Clearing and colder.

The character of the precipitation, whether rain or snow, is governed by the temperature. * * *

In weather calculations the barometer is the pulse and the wind is the breath of storms, and the thermometer registers the variation of the vital function heat. A consideration of these elements, or symptoms, in their various phases constitutes a diagnosis by means of which weather changes of the near future may, as a rule, be approximately determined. Rapid oscillations or changes in the barometer indicate early and marked changes in the weather. When barometric changes of this character occur during fair weather, and are downward, and the wind and temperature respond and co-operate in accordance with recognized rules and laws, foul weather may be expected; when the barometer has a decided upward inclination, and is supported by certain winds and thermal conditions, fair weather, or a return to fair weather, is indicated.

The contents of the table herewith are a key for the determination of weather changes indicated by the barometer and the direction and shifts of the wind. In sections of the United States named at the head of the table the advance of an area of low barometer, or a general storm area, is indicated by the wind going to points between south and east, and when the storm center is approaching from the southwest the winds will change to east or northeast. The shift of wind, if accompanied by falling barometer, will be attended by increasing cloudiness, and the southerly winds will bring the warmth of lower latitudes; and, as warm air has a greater capacity for moisture than cool air, the amount of moisture in the atmosphere will increase. The amount and rapidity of the fall in the barometer will usually indicate the nearness and intensity of the approaching storm. When the center of the low barometer has passed over a given locality the barometer will begin to rise, the wind, still blowing and circulating toward the center of the atmospheric whirl, will shift to west and northwest. the temperature brought from colder latitudes by the winds west of the center, will be lower, and the weather will clear under the influence of an area of high pressure, which always follows in the wake of an area of low atmospheric pressure.

WEATHER CYCLES.

FROM DAVIS' "ELEMENTARY METEOROLOGY."

Many efforts have been made in this country and abroad to discover a periodic recurrence of weather changes of longer and more regular intervals than those between successive cyclonic centers. A weekly recurrence of similar conditions has long been known in a general way, but the conditions which determine its duration and its variations from perfect periodicity have not been discovered and it has seldom been made practically useful. It appears to depend on a double cyclonic period. The control of the weather by the moon has long been a favorite idea, but it has not been found to bear the test of accurate comparisons of weather and lunar phases, except in a very faint and imperfect manner. Whatever slight excess of one weather element or another there may be at certain times of the lunation, they have no sufficient value for use in weather prediction. Thunderstorms in Europe have been found slightly more frequent at the time of new moon and first quarter, but not to a sufficient degree to warrant the use of these poorly-marked cycles in forecasting. A period corresponding to that of the sun's rotation, or 26.7 days has been found to accord with a faint variation in the intensity of various weather elements, and it is argued that this indicates an effect on the atmosphere produced by solar magnetism as well as by solar heat. Besides these periods of an astronomical nature, there are others of an apparently arbitrary duration. These have been sufficiently studied to know how far they may be usefu or to determine their cause, but they appear to be deserving of study.

The control of the weather by the moon or the planets still occasionally finds enough believers to support the publication of elaborate long-range weather predictions. As these are couched in general language and intended to be applicable to large areas of the country, it is not at all difficult to gather a number of verifications for them, but they are no better than the forgotten predictions of astrology of centuries ago.

ADVANTAGE OF THOROUGH TILLAGE.

Prof. C. F. Curtiss, writing to the *Breeders Gazette*, says:

The rainy season through which we have just been passing in this locality has afforded some practical object lessons. One of the most striking of these is the advantage of thorough tillage of cornfields before planting. Successful corn growers are rapidly coming to realize that the time to do effective work in the field is before the crop is planted This also applies to small grains and all other crops.

Two fields of corn have come under my observation this season, one of which was planted quite early under unusually favorable conditions as to moisture and temperature of the soil, with little or no tillage previous to planting; the other was planted ten days later, and disked once, cultivated once, and harrowed twice before planting. The second piece of corn is to-day fully a third larger than the first, and entirely free from weeds and the soil in perfect condition. The other piece, though on well drained land, is uneven, weedy and stunted.

The tillage in preparing the seed bed for the second field may seem excessive, but it began soon after the frost went out of the ground, and continued at suitable intervals until time for planting. In this way a good many weeds were effectually disposed of, and the soil put in the best mechanical condition for growing the crop. It has also been demonstrated by careful experiments that frequent tillage increases the rate of soil nitrification, and thereby results in the larger supply of plant food for the crop. The advantages, then, of this system are three-fold: first, destruction of weeds; second, a good seed bed, insuring rapid and even germination; third, an increased supply of plant food.

The rainy period that followed soon after the corn planting season in Iowa this year permitted the weeds to take possession of many cornfields before the cultivator could be started, and the crop on these lands will not recover from the backset thus given

JUNE WEATHER RECORD.

The month of June was slightly warmer than usual, with an excess of moisture. The mean temperature for the state was 71 4°, which is about one degree above the normal. The average of the north section (a belt three counties in width across the state east and west), was 69 7°; central section, 71.3°; southern section, 72.9°. Fort Madison recorded the highest mean, 76 1°, and the lowest, 67.6°, was recorded at Cresco and Grand Meadow. The maximum reported was 99°, at Belle Plaine, on the 30th.

The average rainfall for the state was 4.72 inches, which is slightly above the normal for June. The averages by sections were as follows: Northern section, 4.36 inches; central section, 4.47 inches; southern section, 5.29 inches. The maximum amount recorded for the month was 12.48 inches at Greenfield, Adair county; minimum amount, 1.90 inches, at Olin, Jones county. At Greenfield 7.21 inches fell on the 9th. The greater

amount of the rainfall came in the first half of the month; the latter half being generally dry and favorable for farm work. There were 13 clear days, 10 partly cloudy and 7 cloudy.

The following table gives the mean temperature and total rainfall for the month of June, at the stations named, for the years from 1872 to 1898 inclusive:

YEARS.	MEAN TEMPERATURE—DEGREES.						PRECIPITATION—INCHES					
	Des Moines.	Davenport.	Dubuque.	Keokuk.	Omaha.	Sioux City.	Des Moines.	Davenport.	Dubuque.	Keokuk.	Omaha	Sioux City
1872	....	72	....	75	73	..	.....	3.78	.....	5.81	3.91	.....
1873	..	78		78	74	.	...	2.16	.....	1.21	5.86	.....
1874		73	72	76	73	...	....	5.37	3.30	4.01	6.93	.....
1875	....	68	66	71	71	..	....	4.91	4.75	8.33	10.95	.....
1876	....	69	68	70	68	....	.....	4.25	7.83	6.73	3 47	.....
1877	....	69	68	72	69	....	....	5 80	6.75	7.82	8.36	.....
1878		68	68	70	67	..		4 36	4.35	3 93	8.48	.....
1879	70	70	69	71	73	....	6.69	4.57	4.99	2.63	4.09	.....
1880	72	72	72	74	73	....	4.11	7.20	6.02	3.06	3 14	.....
1881	72	70	69	72	75	....	15.79	7.94	7.56	8.70	5.56	.....
1882	69	69	66	71	71	...	12.16	8.43	6.26	9.45	12.05	.....
1883	69	68	63	69	69	..	7.75	4 38	5.34	5.88	12 70	....
1884	71	70	70	71	72	....	3.84	3 07	4.89	4.03	6.11	.....
1885	71	68	68	70	71	..	5 03	2 08	6.16	6.97	2.67	.....
1886	73	70	68	71	70	....	1.21	.49	.71	2 86	1.50	.....
1887	72	73	72	73	72	...	2.25	1.66	1.32	1.55	4.56	.....
1888	69	70	69	71	70	....	2 32	3 86	5 28	4.52	3.86	.....
1889	68	67	66	68	69	.	4 39	5 59	3 87	2.97	5.44	....
1890	73	74	74	76	74	72	4.91	4.51	9 59	3.41	5.04	3.61
1891	69	71	70	72	69	68	5.60	3.56	2 34	3.66	6.66	7.63
1892	69	70	68	73	71	69	3 41	10.79	14 16	2.65	1.51	1.50
1893	71	72	72	73	73	72	4.69	3 85	5.49	2 37	7.11	1.63
1894	74	75	73	76	74	72	1.67	2 16	2.25	2 85	4.74	2.74
1895	70	73	73	73	70	68	5 26	1 22	1.05	2.61	4.31	4.95
1896	70	71	71	72	72	70	2.69	2 28	3 11	2 18	1 90	2.94
1897	70	70	68	73	72	68	3 15	1.37	2.36	3.43	1.43	2.13
1898	72	73	71	76	73	71	6.85	3 53	4.36	4.77	5 16	6.61
Means	71	71	70	72	72	70	5 19	4.17	4.97	4.48	5.36	3 75

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 29.93 inches; highest observed, 30.28, at Cresco and Dubuque on the 15th; lowest observed, 29.47, at Cresco and Dubuque on the 24th and 25th; range for the state, .81 inches.

Temperature.—Monthly mean, as deduced from 110 reports, was 71.4°; highest monthly mean, 76.1°, at Fort Madison; lowest monthly mean, 67.6°, at Cresco and Grand Meadow; the highest temperature reported was 99°, at Belle Plaine, on the 30th; the lowest temperature reported was 42°, at Forest City, on the 27th; the average daily maximum was 81.8°; the average daily minimum was 60.8°; the average monthly maximum was 92.8°; the average monthly minimum was 50.3; the greatest monthly range was 54°, at Estherville; average monthly range, 42 6°.

Precipitation.—Average for the state, as determined from the reports of 109 observers, 4.72 inches; the largest amount reported was 12.48 inches, at Greenfield; the least amount was 1.90 inches, at Olin; the greatest daily amount reported was 7.21 inches, at Greenfield on the 9th; average number of days on which .01 inch or more of precipitation was reported, 9

Wind.—Prevailing direction, southwest; highest velocity reported, 66 miles per hour from the northwest, on the 24th, at Sioux City.

Weather.—There was an average of 13 clear days; 10 partly cloudy days, and 7 cloudy days.

PRECIPITATION.

STATIONS.	PRECIPITATION IN INCHES.		No. of clear days.	No. of partly cloudy days.	No. of cloudy days.	No. of rainy days (.01 in. or more).
	Monthly.	Greatest daily.				
Adair	8.72	3 18	21	8	1	5
Alta (near)	3 10	1.39	....	....	....	9
Fredericksburg	3 30	.81	...	.....	....	6
Hawkeye	3.73	1.40	...	...	...	8
Larchwood	4 23	1.20	12	17	1	7
North McGregor	2.40	.77	....	...	.....	8
Le Claire	2.53	.81	....	.....	...	9
Washta	4.67	1 65	16	2	2	7

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.94	30.22	15	29.50	25
Des Moines	29.95	30.20	15	29.53	24
Clarinda	29.94	30.13	14	29.57	24
Cresco	...	30.28	15	29.47	24
Dubuque	29.95	30.28	15	29.47	25
Omaha, Neb	29.91	30.14	15	29.51	24
Keokuk	29.96	30.18	15	29.56	25
Sioux City	29.94	30.16	15	29.62	24
Means	29.93	30.28		29.47	25

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	4,915	26	SW	25
Des Moines	5,641	36	SW	10
Dubuque	4,818	28	SW	25
Keokuk	4,560	36	SE	12
La Crosse, Wis	4,544	29	SW	25
Omaha, Neb	5,478	28	SE	3
Sioux City	8,374	66	NW	24

OBSERVERS' NOTES

AMANA—*Conrad Schadt.* With the close of June we have just entered the harvest season of small grain. Rye is being cut and winter wheat is ripe for the reaper. Barley, spring wheat and oats will follow soon. It will be an extraordinary good crop, as was also hay. Corn and potatoes are in the best condition; in fact there hardly ever was a season when all crops together looked better than they do now.

ATLANTIC—*Hon. J. W. Love* Severe thunderstorm on the morning of the 22d; very hard rain with some hail; reported damage to crops considerable

BONAPARTE—*Hon. B. R. Vale.* An unprecedented wet month; 9 01 inches of rainfall. This beats any one month since 1890, by 1.47 inches and it beats the year 1892 to date, by 3.17 inches. We have had 27 37 inches rainfall since January 1st, which is .40 more than all last year.

CHARLES CITY—*Ida Schott* June 25th cyclone-shaped clouds formed which gradually grew wider; wind blew very hard with heavy rain and sharp lightning.

DOWS—*R. E. Fuller.* Small cyclone twenty miles northwest of here on the 18th, did considerable damage.

FOREST CITY—*J. A. Peters.* A windstorm on the morning of the 24th did considerable damage to trees and growing crops. It was a straight blow. Greatest precipitation of any one month since the establishment of this station, 1894.

HUMBOLDT—*Henry S. Wells.* The month has been wonderful for growth of all crops. Corn is king. Haying is three weeks early.

LARRABEE—*H. B. Streever.* Windstorm on the 24th did slight damage to crops. June has been an ideal month for vegetation. All crops looking well.

PRIMGHAR—*P. R. Bailey.* Severe hailstorm on morning of the 30th, destroying crops in central and south central part of county.

THURMAN—*C. R. Paul.* Heaviest electric and rain storm ever experienced here, noon to 2:20 P. M., June 6th.

CLINTON—*Dr. Luke Roberts.* June, 1898, was exceptionally fine in all respects. The fruitage of the soil seems never to have presented a more gratifying outlook for a generous ingathering than was apparent at the close of the month.

Temperature, sunshine, and moisture were harmoniously blended—the winds were on good behavior, and the storms and atmospheric elictricity were very moderate, except one extraor-

dinary downpour on the 13th, which was entirely local, and covering not more than six or eight square miles. This storm precipitated 4.61 inches of water in three hours, and while the people were in bed and not aware of the flood formation going on around them until they opened the doors in the morning and found submerged gardens, floating sidewalks, and navigable streets and alleys.

This storm caused an increase in the monthly aggregate of precipitation above normal. The rainfall for the month was 8.02 inches, normal being 4.73 inches. Three Junes during the last twenty years have exceeded this, viz : 1881, 8.17 inches; 1882, 8 97 inches; 1892, 9.39 inches.

The movement of the wind was only 1,440 miles, being an average of two miles an hour, and the lowest June record in seventeen years, and lower than for any other month during the last twenty years except August, 1896, which was twenty miles less. June is never a windy month. The highest I have record of is in 1882, when the movement was 4,932 miles. The prevailing direction of wind was southwest to west, and the maximum velocity only thirteen miles an hour, occurring on the 25th.

There were but two abnormally warm days during the month—the 24th and 30th; the former gave a mean temperature of 81° and a maximum of 93°, the highest of the month, and the latter gave a mean of 80° and a maximum of 92°. The maximum was 91° on the 3d, 4th, and 29th, and 90° on the 23d The warmest day was the 24th, mean, 84°. The coldest day was the 15th, mean, 60°. The minimum temperature was 51°, on the 22d.

The number of storm days was 10, cloudy days 8, part cloudy 9, and clear days 13, being 28 in excess of normal. The per cent of sunshine was 65 or 1.8 per cent above normal.

Thunder and lightning occurred on 7 different days, but with no excess in intensity.

This being the close of the first half of 1898, it might be instructive to make comparison with corresponding periods during the last twenty years. During the first six months of those years there has fallen 374.67 inches (equal to 61 feet) of rain. The maximum amount of precipitation for any one of these half year periods was 27 01 inches, occurring in 1898; the greatest monthly excess being in June. March was also much in excess of normal. The minimum precipitation for the same half year period was 12.84 inches, occurring in 1885. A normal rainfall for this twenty half year period is 18.73 inches.

MARSHALLTOWN—*G. M. Cook.* On the 24th, at 11:50 P. M , a fierce windstorm struck this city, doing considerable damage to trees and breaking glass. No casualties reported. Storm came from northwest, and it was accompanied by a great display of electricity.

SEVERE WINDSTORM.

The state happily escaped ravages by tornadoes during the month of June; but it was not wholly exempt from damages by severe windstorms. On the night of the 24th, wind squalls of considerable severity swept through portions of the central districts, from west to east. The storm struck Sioux City about 9 P. M., with a maximum wind velocity of 66 miles per hour The greatest destruction was caused by the collapse of a circus tent filled by a great audience, resulting in the death of two men and an infant, and the serious injury of a dozen or more people.

The storm wrought considerable injury to light structures and crops in the farming districts within some of the central counties, notably in Hardin, Marshall and Tama. In a few localities hailstones added to the damage caused by winds and lightning. At Toledo, the Tama county fair grounds were in the pathway of the storm, and the buildings were much damaged. On the same night, a branch of the storm swept over Emmet county, causing the destruction of numerous light structures. It was a widespread and destructive disturbance of the elements.

ERRATA FOR MAY REPORT.

Centerville rainfall, amount on 19th was .98 inches, making total of 5 25 inches.

Stuart rainfall, total amount should be 4.91 inches instead 5.01 inches.

DAILY AND MONTHLY PRECIPITATION FOR JUNE, 1898.

STATIONS.	DATE																													Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Adair	....	....	....	....	....	T	1.16	T	1.18	2 80	....	....	..	..	..	..	....	.40	....	....	...	3.18	....	....	....	..	....	....	....	....	8.72
Afton	..	..	..	.38	1.60	..	.93	T	.42	13	.03	.73	....	.09	..	..	....	.73	....	....	...	.72	..	..	....	....	....	..	....	....	5.76
Algona	..	..	.05	....	1.05	..	.70	..	....	1 22	....	..	..	..	..	....	1.15	..	....	....	....	....	T	.28	....	T	..	....	.18	T	4 63
Alta (Hadden)	.	..	....	.12	.06	1.03	....	....	.90	.68	.09	..	..	T	..	....	....	.22	....	....	T	..	.02	.13	..	.12	....	....	.04	....	3.41
Alta (near)	.	....	....	.13	.	.85	....	..	1.39	.12	..	..	..	..	.04	.	....	.26	....	.	..	..	....	..	.17	.10	....	....	.04	....	3.10
Albia	.19	.18	..	..	....	..	2.15	.16	1.91	..	..	..	....	..	....	..	....	....	..	..	..	.57	....	T	....	T	....	....	..	....	5.16
Amana	..	....	....	..	..	....	T	..	1 36	..	T	T	..	....	....	..	..	..	..	....	....	1.15	.	.10	.03	..	....	....	....	..	2.54
Ames	....	....	....	1.83	65	...	.59	05	1.93	..	.01	.02	...	...	.30	...	1.07	....	....	....	....	.41	....	.24	....	..	....	....	....	...	7.10
Ames (near)	..	..	..	.10	.95	..	.33	T	1 53	..	....	.28	....	..	.15	....	....	1.16	...	....	....	.35	....	..	.12	T	....	....	....	.03	5.00
Atlantic	...	...	...	1.56	.08	1.04	..	...	1.17	T	.22	.30	T	.	..	.	....	.84	....	....	....	2.93	..	....	....	....	....	....	....	....	8.74
Audubon	...	..	..	.38	..	.55	..	..	.85	..	..	..	...	...	..	..	....	.25	....	....	.71	....	....	....	....	....	....	....	....	....	2.74
Belknap	1.05	...	....	.40	..	...	.10	1.25	1.45	1.10	.10	.10	....	..	..	.10	....	...	....	....	....	1.12	..	..	.10	T	....	..	....	.30	6.25
Belle Plaine	..	..	..	...	.13	..	.10	...	1 75	..	...	.30	...	..	..	....	....	....	.	.	...	.60	..	..	...	.14	....	....	....	....	3 80
Bonaparte	.90	...	...	..	...	.15	79	1.76	1.93	....	.60	...	1.10	...	....	1.04	...	....	....	.	....	.53	..	....	.18	..	.	..	..	....	9.01
Carroll	..	..	..	.56	22	.11	...	...	1.05	..	.04	...	..	.	.01	..	...	.29	.	....	....	.71	...	T	...	.	..	....	.44	5.33
Cedar Falls	....	..	..	....	50	....	.43	...	2 45	..	..	.80	..	..	..	....	....	....	....	....	....	.51	....	.24	....	....	....	.02	....	.09	2 99
Cedar Rapids	...	..	..	..	T	....	....	.42	.53	.06	1 00	.73	...	..	..	....	..	....	....	....	....	.83	T	....	....	.08	....	..	....	....	3 60
Centerville	.18	...	..	.62	.10	....	1.70	.57	.44	....	.06	...	.02	..	.02	.01	T	...	..	.	....	2 00	T	....	....	....	....	....	....	..	4.61
Chariton	.10	..	..	.02	.77	.02	.32	.13	.58	.12	.01	.33	...	..	.20	.02	....	.15	...	..	..	.15	...	....	.24	...	..	..	.35	.05	4.77
Charles City	..	..	...	.05	38	..	.36	..	.29	.73	..	T	T	..	...	...	...	.03	.	..	...	.09	...	...	T	....	...	....	..	...	2 63
Clarinda	..	..	..	.08	.03	.45	...	40	1 25	T	T	.07	...	08	..	...	...	.54	...	..	...	.07	.21	....	.72	..	..	..	.35	....	2 99
Clinton	..	..	..	..	..	T	.20	..	1.01	.44	..	.41	.	4 61	..	..	..	..	..	..	..	..	....	....	....	....	....	....	....	....	8.02
Clear Lake	...	..	.35	..	1 05	T	68	...	.25	.35	...	T	.64	...	T	...	T	.30	..	....	....	..	...	..	....	..	..	...	.12	T	3.74
College Springs	.	..	.11	.12	..	61	...	.81	.85	.72	...	.05	...	.07	....	...	.	.60	..	..	...	..	...	....	....	..	....	....	....	...	3.94
Corning	..	..	..	T	.26	1.72	..	T	88	.24	T	93	..	.50	...	...	...	.82	....	.	...	T	....	....	.	..	....	....	....	....	5.35
Council Bluffs	...	..	.01	.65	.05	.37	..	.04	.90	.16	.16	.	.63	.01	....	..	..	.16	..	.	....	..	....	....	....	....	....	....	....	..	3.14
Cresco	.33	.	...	..	.16	...	.49	.	.72	.	06	.02	.	....	.	.	.03	....	....	.	....	..	..	.09	....	.08	T	..	.20	.05	.38	2.53
Davenport	.26	.	...	..	.	...	.90	.14	64	.70	1	.06	T	..	T	T	....	.	.	...	....	.29	.43	....	.15	.	....	....	.03	12	3 53
Decorah	..	.	.	..	.11	...	.68	..	1.38	.	.	....	.	..	..	..	...	.19	.	...	....	....	....	.	....	.15	..	....	.25	.	2.88
Delaware	.16	..	..	....	....	...	.04	.60	1 02	.68	...	1 40	....	..	...	..	...	....	....	....	....	.35	...	.25	..	.15	...	....	.97	....	5.62
Denison	....	..	.44	..	.09	..	....	..	1.00	.	.70	...	T	T	.	T	.	.15	...	....	.41	..	...	T	..	..	....	....	....	.	2.79
Des Moines	.56	...	..	.05	1 00	T	.60	T	.96	1 27	.46	.66	..	.01	.52	...	.	18	....	....	..	.49	.	T	.09	T	...	..	....	..	6.85
De Soto	.56	...	..	1 67	.82	.52	..	T	.93	2 35	.07	T	..	.36	.22	...	...	.26	....	..	...	1.58	...	...	T	.01	....	....	....	....	9.35
Dows	..	..	.	35	.83	.55	.	..	1 00	07	.	09	T	...	T	.	....	1.52	....	..	....	16	...	.12	...	.16	T	.	.02	.04	4 91
Dubuque	T	...	.	.	.	T	.45	06	.38	.44	.03	1.26	.	T	..	03	...	T	....	.	....	.74	.04	.16	.56	.17	..	....	.01	.03	4 36
Eldon	.58	..	....	.08	.01	...	.58	.14	1.67	.20	.19	.02	.55	...	.06	T	...	...	..	....	....	.67	..	..	....	.01	..	....	.	T	4 76
Elkader	...	...	.	..	...	....	..	..	1.80	.10	...	.28	.	...	..	..	..	..	....	....	....	..	38	..	..	.04	..	....	.24	.52	3.36
Estherville	..	..	.	.18	.50	T	..	..	T	.90	...	T	...	...	..	..	..	.70	..	.	..	..	....	....	.50	..	....	....	....	.70	3.48
Fairfield	.45	...	...	.01	....	....	.20	2.01	69	.38	.13	.02	.05	...	.10	.03	01	..	..	.	..	1.40	.	.03	..	.02	....	....	....	....	5.54
Fayette	.	..	.	.	.	.	.92	...	.58	...	1.14	.22	....	....	..	...	.05	..	....	....	....	....	....	.25	.22	.09	....	....	.03	.03	3 53
Forest City	.	.	.	.07	.70	..	.87	.	.55	.82	.17	.	.26	...	T	..	...	2.00	...	.	..	..	...	.09	.	.	..	....	.47	1.20	7.20
Fredericksburg	..	...	..	..	16	...	81	.	.34	77	.	39	.	....	..	..	..	..	....	..	..	.	...	....	.06	....	....	.	.25	.50	3.30
Ft. Madison	....	.	.	...	..	.	T	.75	05	T	.47	...	....	....	.12	.61	.	..	....	..	..	.60	....	....	.10	.30	.	....	....	....	3.00
Galva	...	..	.37	....	....	....	.55	.	.80	.47	.	.	.03	.	.03	....	....	T	..	..	..	.47	....	.43	....	.18	...	..	.02	....	3.34
Glenwood	..	...	.	1.25	.38	1.67	..	T	.78	...	T	.	.28	.30	.	..	..	...	..	..	..	.	....	....	....	....	....	....	....	....	4.66
Grand Meadow	..	.	..	.	T	.	56	.	.22	1.00	03	.37	...	...	.	...	T	.	....	....	....	T	..	....	.50	.	....	....	.05	.18	2.91
Greene	..	....	....	.07	.42	....	.13	....	.55	.82	.02	.35	.02	.	T	...	.	.20	...	.	....	.28	....	....	.15	.05	....	....	.12	.07	3 25
Greenfield	.	.	..	.15	.61	1.41	.	.49	7 21	.70	.02	.01	.02	T	T	.	...	.59	....	..	....	1 27	....	.	....	....	....	....	....	....	12.48
Grinnell	.	..	..	.30	05	.04	T	.70	.78	....	.01	.72	.	....	.	....	....	....	....	....	....	2.00	..	.	.07	....	....	....	....	....	4.67
Grundy Center	....	.	..	..	.64	1 07	.	....	1 93	.53	T	.24	...	...	T	....	....	..	....	....	....	1 01	...	.25	.78	.08	...	...	T	.49	7.02
Guthrie Center	....	...	..	.06	.54	.46	....	T	1.03	.90	T	.71	T	.	T	..	..	..	....	....	....	.59	...	....	.	T	..	.	....	....	4.29
Hampton	..	..	.20	..	1 30	.25	..	..	1.39	.07	.05	.40	.02	...	T	....	.17	...	....	....	.	.54	...	.27	...	.16	....	....	.13	....	4.95
Hawkeye	..	.	..	..	.08	.80	....	....	.	1.40	...	.80	.	...	...	...	T	..	...	.	.	T	....	.15	...	T	....	....	.50	...	3 73
Hedrick	..	...	....	.05	.15	..	1.20	.22	1.00	.07	...	.	.45	....	.21	....	....	....	....	....	....	.62	...	.	....	....	....	....	..	.14	4.11
Hopeville	...	...	..	59	1.65	...	1 62	.27	.72	.12	.04	.05	.	.28	.08	....	....	.33	....	....	....	.32	...	T	....	....	....	....	....	....	6.07
Humboldt	...	...	....	.15	95	.	1.15	.	.49	99	.	...	.	....	....	..	....	1.50	..	....	....	.02	....	.13	.13	.14	....	....	.02	T	5 67
Independence	...	..	.	...	T	..	1.12	....	.77	2.00	....	.05	.	....	....	..	....	....	..	.	....	.30	....	.20	....	.01	....	....	.20	T	4 64
Indianola	T	..	..	.03	.93	..	.47	.07	.75	.92	.	.26	T	....	.48	T	T	.22	....	..	....	1.22	T	T	....	..	....	....	....	T	5.35
Iowa City	....	..	..	....	..	..	.50	.	1 50	.11	T	T	..	.	.	..	..	....	....	....	....	1.08	.	....	.07	T	....	....	....	....	3.26
Iowa Falls	.	..	..	.11	.81	T	.38	T	.78	.15	T	T	....	....	T	T	..	.87	....	....	....	.72	....	.04	.33	.15	..	..	T	.31	4.15
Keokuk	.98	..	...	..	....	....	.03	.35	.38	.23	.05	.14	.	...	.40	1.08	...	.	...	....	....	.44	.	....	....	.69	....	....	....	....	4.77
Keosauqua	.94	...	...	T	...	...	.40	50	1.90	.25	.37	.03	.16	....	..	..	..	..	....	....	....	.49	..	....	....	14	....	....	....	..	5 18
Knoxville	....	.	.	.16	.50	....	.24	T	.97	.29	T	T	T	T	.44	...	.	.66	..	....	....	.44	.	..	.	..	....	....	....	....	3.70
Lamoni	...	...	.	.15	1.62	...	.59	.47	.75	....	.45	.03	....	....	.17	.12	.	.13	....	....	....	.13	.	....	.	.01	....	....	....	.17	.20	3.00
Lansing	.26	..	..	....	24	.	.64	T	.03	1.00	...	.	....	....	..	..	.	.12	....	....	.	.	....	.	.34	....	....	....	....	1.20	4 23
Larchwood	...	..	....	.93	.80	.07	....	....	.63	..	....	T	..	.	....	....	.	T	....	....	....	....	....	.32	....	....	....	.28	..	T	....	5.90
Larrabee	.	...	.91	.10	....	1.07	..	...	2.70	.27	....	....	....	....	T	...	T	....	....	....	....	....	.40	35	.10	..	....	....	T	....	2.53
Le Claire	.25	..	..	....	....	...	.09	...	.18	.81	.37	.09	..	....	..	....	....	....	....	....	....	....	.48	....	.22	....	....	....	.04	....	4.72
Le Mars	....	....	....	1.60	.20	....	....	.	1.05	.70	.	....	....	....	....	....	....	....	....	....	..	....	....	.67	.30	.15	....	....	.05	....	3.01
Lenox	....	....	....	.20	.61	.20	.34	.16	.23	11	T	54	..	....	....	....	....	.60	....	....	..	.02	..	....	T	....	....	....	....	....	2 87
Linn Grove (Mt. V)	....	....	....	....	....	....	.30	.03	57	.22	.02	.65	..	..	..	T	....	.	....	....	....	.40	....	.30	.36	T	....	....	.02	T	3.25
Logan	.	.	....	.54	.03	....	.09	....	.76	51	....	....	.95	..	....	.37	....	.	....	....	....	....	....	....	....	..	....	....	....	....	2.20
Maquoketa	.08	..	....	....	....	....	....	.07	.71	.28	.05	.10	..	....	....	....	....	....	..	....	..	.19	.13	T	.41	T	....	..	.18	....	6.48
Marshalltown	..	..	....	..	.52	....	.18	T	1.48	2 00	.	.33	....	....	.02	....	....	.12	....	....	....	1.45	....	.	.13	.03	....	....	.17	.02	6.48
Mason City	..	..	...	.35	1.15	...	.25	....	.15	.30	T	.15	.10	...	T	..	T	....	....	....	....	.20	....	....	T	....	....	.15	....	.23	3.03
Mooar	1.06	....	....	....	....	.	T	.46	56	.14	.58	.20	....	..	.34	.56	....	....	....	....	....	.40	....	....	....	.74	....	....	....	....	5 04
Mt. Ayr	....	....	...	.03	1.59	.71	..	.52	.22	....	.05	.40	....	....	....	....	....	.90	....	.	....	....	....	T	.13	T	....	....	....	....	4.55
Mt. Pleasant	....	..	....	..	....	.26	.15	1 02	.	2.47	.13	.22	.38	....	....	.46	....	....	....	....	....	.69	....	....	.06	.03	....	....	....	....	5.86
Mt. Vernon	....	....	..	....	....	..	.33	..	.29	.37	....	.55	....	....	....	....	....	....	.	....	....	.55	....	....	.05	....	....	....	....	....	2.69
New Hampton	....	....	.	....	.40	.	.56	....	.25	.91	....	.38	....	....	....	....	....	.04	....	....	....	.	....	....	.05	....	....	....	.45	35	3.39
Newton	....	....	....	....	.73	....	.20	.06	1.12	1 22	.02	.27	.01	....	.	....	....	.09	....	....	....	.79	....	T	.15	....	....	....	....	....	4.66
North McGregor	.18	.16	..	..	....	..	....	....	.	86	.07	.77	.04	....	....	....	....	T	....	....	....	....	....	....	.27	....	....	....	.05	T	2 40
Northwood	....	....	..	....	.91	..	.33	.	.21	.41	....	.12	.07	....	....	....	....	.22	....	....	....	....	....	....	.20	....	....	....	.33	.20	3.00
Odebolt	....	....	..	.20	....	1.55	.07	....	.72	.38	.06	..	.25	.	....	....	....	....	....	....	....	.85	....	.45	....	.35	....	....	.05	....	4.93
Ogden	....	....	..	.32	1.01	....	.19	.	.84	.89	....	....	.07	...	.07	....	....	1.83	....	....	....	.46	....	.	.20	....	....	....	....	....	5.88
Olin	....	....	....	....	....	....	T	.32	.22	.14	....	.06	....	....	..	....	....	....	....	....	....	.40	....	....	.76	....	....	....	....	....	1.90
Omaha (Neb.)	....	.	....	1.34	.04	.26	01	.01	2 82	.18	T	....	.02	.36	....	....	....	.12	....	....	T	....	....	....	....	....	....	....	T	.	5.16
Osage	....	....	T	T	.82	....	.69	....	..	.40	.12	.04	.03	....	....	....	.11	....	....	....	....	.03	....	....	.09	....	....	....	.29	.53	3.15
Osceola	....	....	....	.13	1.65	....	1.09	.07	.28	..	T	.30	....	.01	.20	.	.	.22	....	....	....	1.00	....	....	....	T	T	....	....	....	4.95
Oskaloosa	..	..	...	.30	.10	.25	....	.04	.44	....	.03	....	....	....	.22	..	....	....	....	....	....	.70	. .	T	.20	....	....	....	....	.12	2.40
Ottumwa	...	....	...	.20	....	..	.40	.10	.90	.	1.25	T	...	....	.20	....	....	....	....	....	....	1.40	....	. .	....	....	....	....	....	....	4.45
Ovid	....	...	...	.07	.46	....	.29	.33	.46	.25	...	.27	...	.03	.26	.	....	....	....	....	....	3.00	....	....	....	....	....	....	....	....	5.42
Pella	....	...	.	....	.18	....	....	..	.87	27	...	30	.	...	.32	...	....	....	....	..	...	.48	....	....	....	....	....	....	....	....	2.42
Plover	....	..	....	40	.39	.65	...	...	.90	.25	T	.	....	...	.04	...	....	.85	....	....	...	....	....	.04	.20	.08	....	....	.42	T	4.22
Primghar	...	..	.65	08	....	.47	...	1.00	....	....	....	....	....	....	.12	....	....	.62	..	....	..	.01	....	.08	.60	....	....	....	.10	2.00	5.10
Red Oak	....	.	...	.32	.01	1.50	.	.14	.85	.98	.05	.06	...	.	.12	...	....	.62	..	....	..	.01	....	....	....	....	....	....	....	....	4.66
Ridgway	.25	..	....	..	.36	....	.56	..	..	1 00	.18	.02	.01	...	....	...	.10	....	....	....	....	....	..	.12	....	....	..	....	.24	.31	3.15
Rockwell City	..	...	..	.14	55	.13	.14	....	1.00	.40	....	....	....	....	....	....	....	.80	....	....	....	.11	...	.20	....	.20	....	....	.05	....	3.22
Ruthven	....	...	..	.25	.67	....	.70	..	.72	.72	...	.	..	...	....	....	....	....	....	....	....	....	....	..	.88	....	....	....	.15	1.32	5.41
Sac City	....	....	..	....	.33	.45	...	43	1.12	25	...	.50	.35	....	....	....	..	....	....	....	....	....	....	.15	....	.25	....	....	....	....	3.83
Sibley	...	...	..	.77	.38	.04	.02	....	.21	.46	.	....	....	....	T	..	....	.31	....	....	....	....	....	T	.34	....	....	....	.31	2.15	4.99
Sidney	....	....	..	2 35	T	1.21	....	.54	.35	.15	.02	.	.15	1.27	....	....	..	.36	....	....	....	....	....	....	....	....	....	....	....	....	6.40
Sigourney	....	....	...	T	T	....	.08	.06	.99	.07	.01	87	.12	..	..	.	....	....	....	....	....	1.10	..	....	.23	....	....	....	....	....	3.53
Sioux City	....	....	....	2 45	.70	.03	T	..	2 04	.28	...	.	..	.01	.02	....	....	22	....	....	.03	....	....	.05	.43	.21	....	....	.14	....	6 61
Spencer	.	....	....	.26	20	1.01	...	..	.72	1.50	..	.	....	....	....	....	..	1.56	....	....	T	....	....	....	1.84	..	....	....	.33	1.75	9.17
Spirit Lake	...	..	..	.15	.30	81	.	....	.61	...	...	..	....	....	....	....	....	1 79	..	....	....	....	....	....	.75	....	..	....	....	.90	5.31
Toledo	....	....	....	.	.25	..	.32	.	.90	1.45	..	.23	..	.	....	....	....	....	....	....	....	1.10	..	....	.12	....	....	....	....	....	4.37
Thurman	...	....	....	1.45	4 65	...	.07	.53	08	.17	.01	...	.55	T	....	....	.11	....	....	....	....	....	T	..	T	....	....	....	....	....	7.62
Vinton	....	....	....	....	.	.36	....	....	.45	.	.05	.16	.08	..	...	..	....	....	....	....	...	.60	....	.74	..	....	....	....	.32	....	2 76
Washington	.48	....	....	..	....	....	....	.30	.18	.22	.12	.02	..	...	..	..	....	....	....	....	....	.92	....	....	.30	....	..	....	..	.25	2.79
Washta	....	....	....	.89	T	1.20	....	....	1.65	.23	..	....	...	..	.	T	...	.40	....	....	.	....	....	.08	.22	....	....	....	....	T	4 67
Waterloo	..	....	....	..	.34	...	.51	....	.80	1.09	.	.49	...	.	T	.01	....	.03	....	....	....	.61	..	T	.14	.15	....	....	.09	.05	4.31
Waverly	.23	....	....	..	.98	....	.58	....	.88	.89	.19	.09	...	...	.	...	..	.03	....	....	....	.56	..	....	.29	.15	....	....	.02	.14	5 03
Webster City	....	..	...	68	.75	...	.67	.10	.99	67	.15	T	T	....	T	T	...	.92	....	....	....	.15	..	....	.08	.12	....	....	T	..	5.28
West Bend	....	....	....	.95	1.23	....	1.11	....	....	1.25	.02	.	...	....	.01	...	1.20	...	..	....	.03	....	....	.03	.20	.02	....	....	.16	T	6.21
West Branch	1.06	....	....	....	T	..	.04	T	.62	1.02	T	T	....	....	....	....	....	....	....	....	....	1.41	....	T	.22	....	....	....	T	T	4.37
Whitten	....	....	..	...	.85	....	.40	T	1.00	.82	T	.30	....	....	T	....	....	....	....	....	.95	....	....	....	1.50	....	....	....	....	....	5.82
Wilton Junction	....	...	....	....	....	....	....	.45	1 06	.42	.14	....	....	....	T	....	....	....	....	....	....	1.13	....	....	.27	....	....	....	....	....	3.47
Winterset	....	....	....	1.15	1.62	...	1.04	....	.60	2.53	...	.83	.05	....	.03	.36	....	.37	....	....	....	..	3.08	T	T	...	....	....	....	....	1.13

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JUNE, 1898.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Afton	Max	87	87	93	86	83	83	81	76	78	82	81	79	86	77	71	85	94	84	81	86	87	91	94	94	90	86	80	91	97	98	85 6
	Min	57	59	67	63	64	62	60	62	62	63	58	62	61	61	60	59	62	64	60	55	57	61	70	70	67	62	52	45	69	71	61.6
Alta	Max	79	89	88	81	78	85	78	80	66	78	76	79	82	70	72	80	90	84	84	83	84	91	94	88	79	78	76	88	86	82	81.5
	Min	58	54	67	62	63	58	60	58	58	58	57	59	60	52	53	58	60	64	59	57	58	64	70	70	60	59	48	52	67	63	59 5
Amana	Max	84	86	90	89	85	83	85	84	74	84	80	83	83	78	70	76	87	84	81	85	80	78	92	92	84	78	74	83	92	93	83.2
	Min	61	52	64	67	68	61	64	66	64	64	62	66	61	64	58	59	60	66	57	53	55	57	66	73	65	58	55	53	70	70	61.9
Ames	Max	82	89	90	83	80	80	81	79	74	89	73	70	84	73	61	82	89	81	81	84	79	80	91	92	81	81	73	88	92	85	81 5
	Min	58	53	61	63	64	59	61	58	58	63	63	60	59	57	57	57	65	64	60	54	55	60	68	70	63	60	55	48	72	68	60.6
Atlantic	Max	84	88	87	74	79	74	81	72	70	74	70	71	83	71	64	79	89	83	81	83	80	88	92	90	83	85	74	86	93	93	80 7
	Min	55	53	68	61	63	56	58	55	61	65	61	59	56	58	57	61	58	63	55	50	59	62	70	76	63	55	50	50	71	70	60.0
Audubon	Max	73	85	85	80	79	80	80	77	70	75	75	78	82	71	70	79	86	82	80	78	80	86	90	90	80	77	72	85	90	93	80,3
	Min	59	57	64	63	64	57	62	62	62	69	62	60	58	57	57	69	60	64	60	48	62	68	71	73	69	57	50	50	72	68	61.8
Belknap	Max	84	85	87	80	80	80	79	77	79	81	79	78	83	77	74	74	80	83	76	80	80	85	90	90	85	74	80	83	90	92	81 5
	Min	60	63	73	66	66	60	63	65	66	63	65	63	63	66	62	59	62	67	63	63	62	63	65	73	70	63	61	55	70	70	64.3
Belle Pl'ine	Max	75	84	78	85	86	88	82	85	72	83	80	86	85	75	73	84	86	84	75	88	72	85	95	94	88	80	76	75	94	99	83.1
	Min	50	55	60	58	62	54	58	60	49	58	55	60	56	60	50	50	58	60	53	47	50	55	60	60	58	54	50	48	55	65	55 6
Bonaparte	Max	85	85	87	87	84	86	84	79	79	82	79	77	83	80	68	72	83	84	78	80	79	72	90	90	84	72	75	82	90	91	81.6
	Min	61	61	68	67	66	66	64	65	66	64	66	67	64	66	62	58	60	65	59	54	57	61	68	70	67	59	60	53	67	69	63.3
Britt	Max	75	88	89	84	78	81	78	82	71	80	79	81	85	70	72	85	91	79	84	86	80	85	92	90	78	82	72	86	84	76	81 4
	Min	55	55	68	61	63	53	59	55	60	60	58	60	54	53	51	56	60	61	55	55	56	60	69	72	61	57	46	43	63	57	57 9
Carroll	Max	82	88	88	82	80	82	80	80	69	76	71	81	85	73	65	80	89	86	82	85	79	90	93	92	80	81	71	88	88	86	81.7
	Min	60	63	59	61	60	55	60	55	62	62	60	57	57	54	55	58	61	64	64	55	56	62	71	74	63	56	47	50	71	65	59 6
Cedar Falls	Max	82	87	91	85	77	84	83	85	73	80	81	82	84	80	80	82	86	86	85	85	84	75	91	91	84	70	77	85	91	90	83 2
	Min	50	55	68	70	66	60	63	69	64	66	63	61	65	57	57	60	56	56	54	60	60	57	66	70	61	61	53	49	60	61	60.6
Cedar Rap.	Max	84	89	93	90	86	82	86	85	71	85	78	79	83	76	64	72	86	84	82	85	78	72	94	94	85	80	71	85	95	92	83.0
	Min	62	53	67	70	69	66	65	67	63	66	65	64	62	61	58	57	65	68	59	57	55	57	66	75	64	63	58	55	70	72	63 4
Centerville	Max	86	87	89	83	89	79	80	80	82	81	78	79	83	79	70	78	83	84	79	81	89	85	90	90	84	82	75	85	90	91	83 0
	Min	58	62	67	65	64	65	63	65	64	65	63	62	62	65	62	58	60	65	61	57	58	60	72	73	74	62	59	53	69	75	63 6
Charlton	Max	86	88	89	81	77	79	78	80	79	80	76	80	85	78	69	77	85	84	78	80	79	85	90	90	84	77	75	84	90	91	81.8
	Min	61	59	67	65	63	61	59	62	64	64	60	62	59	61	58	58	58	63	59	54	56	63	71	73	70	60	55	55	71	70	61.7
Charles C'y	Max	81	82	89	85	78	78	78	84	72	79	74	78	81	75	67	75	84	81	78	84	76	74	92	89	84	74	70	79	80	76	76.7
	Min	58	46	67	68	65	58	60	55	62	65	64	59	58	57	54	57	58	64	68	52	56	56	66	75	62	68	50	45	69	64	62.2
Clarinda	Max	85	89	88	83	78	80	78	72	78	76	76	78	83	73	75	78	87	84	80	84	93	96	83	94	87	80	78	88	96	99	83.3
	Min	64	64	72	67	66	63	62	67	64	67	64	64	62	65	63	66	67	68	59	65	72	74	67	78	70	67	63	58	75	75	66.6
Clear Lake	Max	75	85	88	78	74	73	76	79	71	77	73	76	81	74	68	78	84	80	79	80	79	80	91	88	83	77	68	80	78	75	78.3
	Min	59	49	65	63	61	61	62	55	61	60	63	61	57	52	56	55	60	63	55	58	55	57	62	73	63	61	49	48	63	57	58.8
Clinton	Max	86	87	91	91	89	89	89	85	74	87	82	80	84	81	68	73	85	87	82	85	79	74	90	93	84	74	74	83	91	93	83.6
	Min	62	62	52	61	62	62	62	66	64	63	67	64	60	66	54	58	57	63	56	55	52	51	63	70	64	58	56	55	66	70	60.9
College Sp's	Max	87	93	91	82	84	84	80	72	82	82	78	81	77	75	85	88	92	85	80	87	88	95	93	94	89	79	82	89	95	95	85.3
	Min	59	63	62	63	63	62	59	62	61	62	63	63	62	60	62	60	60	61	62	58	62	69	76	76	69	64	55	56	71	72	63.2
Corning	Max	86	87	88	90	88	79	78	74	79	74	74	77	81	77	70	77	85	85	77	77	81	90	91	91	91	76	76	87	93	92	82 4
	Min	58	60	68	63	64	61	59	63	61	65	61	61	59	61	58	61	61	61	61	58	60	68	69	76	68	63	58	53	73	72	62 8
Co. Bluffs	Max	86	91	89	83	79	78	80	78	77	76	76	80	86	78	78	80	90	88	87	87	90	96	94	95	90	85	80	91	92	95	85 2
	Min	60	65	63	63	62	62	63	60	63	64	62	60	62	62	59	65	68	69	66	60	70	70	76	74	66	64	55	75	73	75	65.2
Cresco	Max	76	80	85	83	73	79	75	78	69	79	71	77	80	69	67	74	82	80	79	82	75	72	91	89	78	78	67	78	79	70	77.2
	Min	57	47	66	65	62	60	59	56	60	60	63	60	58	55	51	54	56	62	51	52	56	53	64	74	64	56	49	43	65	63	58.1
Davenport	Max	83	85	89	89	88	86	86	80	72	84	80	77	82	80	67	71	82	85	79	81	75	71	90	91	83	75	72	81	90	91	81.5
	Min	63	60	64	66	68	67	66	67	65	66	68	66	65	66	58	59	61	68	60	60	54	55	66	73	66	63	61	57	70	72	64 0
Decorah	Max	78	84	88	85	74	80	77	78	79	73	78	80	79	70	73	77	80	82	80	83	76	72	91	88	80	77	67	78	82	72	78,7
	Min	58	44	65	66	67	58	60	55	61	63	61	60	58	57	53	57	56	62	52	54	58	54	63	75	62	57	52	45	68	62	58.8
Denison	Max	80	76	78	86	76	76	75	80	81	78	73	76	80	66	72	75	86	81	77	80	75	89	91	90	80	82	84	83	86	..	79.7
	Min	55	54	58	54	50	56	48	58	56	47	56	55	56	55	56	47	55	64	56	56	59	60	69	74	62	60	56	72	69	..	57.7
Des Moines	Max	84	88	88	81	78	79	80	78	69	78	77	78	81	75	64	78	84	83	80	79	79	85	90	91	84	76	74	85	92	92	81.1
	Min	62	59	70	65	64	61	61	64	63	64	62	62	60	62	58	59	61	65	64	57	60	64	72	76	64	72	56	54	74	72	63.2
De Soto	Max	82	88	90	84	82	81	83	78	69	80	78	80	86	72	65	82	87	80	80	82	81	88	90	91	85	82	74	85	91	91	82.2
	Min	60	66	70	64	66	61	61	63	63	63	63	63	63	60	58	59	62	60	61	55	56	65	73	77	68	60	56	52	74	75	63.1
Dows	Max	77	87	88	83	77	78	77	80	71	74	70	77	82	76	62	77	86	82	79	80	79	79	90	89	79	77	70	82	82	79	79 0
	Min	57	53	67	63	63	54	60	57	62	61	60	58	56	54	54	55	61	63	54	54	56	58	69	74	60	55	47	56	69	64	59.1
Dubuque	Max	83	82	89	88	84	84	81	83	71	82	76	75	83	75	68	70	83	85	82	84	75	71	86	90	84	75	69	78	90	86	80.4
	Min	62	52	62	66	66	65	64	66	65	57	65	64	63	59	53	53	63	67	59	60	65	73	64	60	60	53	70	71	61.8
Eldon	Max	88	89	92	86	83	87	85	79	77	83	81	80	85	83	74	74	86	87	84	82	82	85	93	93	88	85	77	86	93	96	84.8
	Min	62	60	68	68	67	64	62	65	63	60	66	64	62	62	62	59	60	65	61	57	55	61	69	69	68	59	60	52	70	71	63.0
Elkader	Max	85	88	91	90	82	86	85	86	71	84	78	78	85	76	73	76	88	87	86	89	79	71	94	91	83	85	71	84	91	80	83.1
	Min	60	44	62	63	64	59	59	58	62	59	59	63	62	62	53	56	63	65	52	52	55	52	64	74	62	58	51	45	69	68	59.2
Estherville	Max	77	90	92	80	75	81	77	80	70	69	70	78	84	69	70	80	94	81	85	88	81	83	97	91	78	82	88	..	84	66	80.7
	Min	55	58	68	59	62	53	57	53	55	56	53	54	52	48	51	54	59	63	55	55	52	61	67	70	59	57	43	..	64	54	56.8
airfield	Max	80	85	88	86	83	84	82	79	74	81	80	78	83	80	70	74	81	84	80	81	82	82	90	90	85	78	75	82	90	92	82 0
	Min	61	60	65	65	66	63	61	62	64	64	64	63	62	65	61	58	57	64	58	53	55	62	67	72	65	57	60	50	60	67	61.7
Fayette	Max	80	83	80	84	80	82	82	82	68	81	72	71	80	71	68	73	81	82	80	80	72	75	92	89	80	78	71	81	87	77	78 8
	Min	50	44	50	64	67	56	63	57	64	58	62	61	60	60	54	56	55	59	52	50	54	61	73	63	53	55	43	68	66	72	57.6
Forest City	Max	76	86	86	77	76	79	77	77	73	76	73	78	80	74	68	77	84	78	79	78	78	80	90	87	79	76	72	80	80	72	78 2
	Min	58	50	65	63	61	59	59	57	59	59	57	61	57	54	53	52	60	62	59	57	57	60	69	72	65	59	42	45	62	64	58 6
Galva	Max	85	68	..	75	79	83	78	85	71	87	77	..	84	77	74	86	91	84	86	89	..	95	92	92	85	85	88	88	84	81	83.8
	Min	62	56	..	62	63	53	59	62	68	61	57	..	56	52	62	58	61	62	55	55	..	63	68	62	61	57	68	53	66	67	60.4
Glenwood	Max	82	88	88	83	89	75	77	75	78	77	76	81	85	77	71	80	88	85	81	80	82	94	93	92	86	84	77	90	95	94	83.4
	Min	51	62	69	61	62	60	57	59	47	49	58	60	60	60	58	63	64	65	57	57	63	68	72	75	66	61	52	55	72	74	61.2
Greene	Max	80	90	94	87	79	81	82	84	72	81	77	82	83	73	70	82	90	83	84	87	83	79	94	91	83	80	74	85	85	83	82.6
	Min	..	..	..	..	..	..	..	..	..	62	62	59	69	60	53	55	58	65	54	53	56	56	67	74	62	58	49	46	69	64	59 6
Greenfield	Max	92	89	90	85	83	83	84	83	70	76	79	84	85	74	70	84	88	84	80	80	85	89	91	92	82	84	75	87	92	94	83.8
	Min	58	58	68	61	63	59	57	58	62	62	62	59	61	60	57	59	62	62	58	57	58	65	71	74	64	60	50	52	72	72	61.4
Grinnell	Max	81	85	87	87	76	78	89	79	78	80	80	78	81	83	71	74	82	81	76	80	78	76	88	89	80	78	71	80	89	90	80.6
	Min	61	58	68	69	65	62	62	64	63	64	62	64	60	60	57	57	60	66	58	58	64	58	71	74	65	62	54	54	71	72	62.8
Grundy C'r	Max	81	86	90	85	75	80	79	80	68	81	76	80	83	72	64	76	85	82	79	83	81	78	91	89	80	75	69	82	90	80	80 0
	Min	56	50	67	67	63	58	61	57	61	62	59	60	60	57	54	61	55	63	55	53	54	55	66	65	60	58	51	50	67	65	59.1
Guthrie C'r	Max	81	88	89	81	83	83	81	78	70	80	78	82	84	84	66	79	90	89	79	83	82	91	93	91	81	83	74	89	93	96	83.4
	Min	59	56	68	58	63	59	59	58	61	62	61	61	56	57	52	59	61	60	60	55	58	58	71	71	58	58	59	51	51	56	59.2
Hampton	Max	80	87	90	82	75	81	80	82	65	78	74	77	82	71	65	78	85	81	83	82	80	79	92	95	78	75	69	81	83	78	79.4
	Min	58	51	68	64	62	58	60	58	61	61	61	59	57	56	54	55	59	64	57	56	56	55	68	73	63	55	50	49	68	64	59.3
Hopeville	Max	83	85	86	80	78	79	75	73	77	76	74	76	81	74	68	77	82	81	77	77	81	85	89	90	83	75	74	84	90	91	80.0
	Min	61	60	69	64	64	64	61	62	62	64	62	63	60	63	58	59	61	64	62	59	58	65	71	74	68	64	56	55	71	71	63 2
Humboldt	Max	78	89	89	88	78	81	78	80	75	78	73	80	85	75	68	80	88	88	82	83	82	84	92	90	84	80	74	87	83	81	81.8
	Min	60	53	68	63	64	57	60	56	62	60	59	62	58	53	56	68	62	64	57	57	58	62	70	74	62	58	48	49	67	64	60 6
Indep'nd'ce	Max	81	83	87	83	78	80	79	81	76	81	77	77	80	79	66	74	83	81	80	81	78	72	88	87	79	76	75	79	90	82	79.7
	Min	58	49	63	63	65	57	62	58	52	62	59	61	58	59	54	56	55	64	56	52	54	52	63	73	61	59	53	47	66	66	58 6
Indianola	Max	84	87	87	83	80	77	78	77	71	79	76	80	84	76	67	78	85	84	82	81	79	85	89	90	86	78	75	84	91	91	81.5
	Min	61	60	68	66	64	62	66	64	63	63	61	61	60	60	57	58	60	64	60	58	58	64	72	75	68	62	54	55	74	71	63.0
Iowa City	Max	84	89	91	92	87	85	88	85	75	85	80	80	83	79	70	72	86	84	83	84	88	77	92	91	81	78	72	84	93	93	83 7
	Min	62	55	65	67	68	64	66	68	65	64	64	64	62	65	57	56	56	65	57	54	55	56	57	68	64	57	57	53	59	69	61.3
Iowa Falls	Max	80	90	92	84	80	84	84	84	70	82	78	81	85	74	68	85	91	81	87	88	84	85	93	92	79	79	71	86	89	84	83.0
	Min	57	48	67	66	63	56	60	57	63	62	62	58	57	56	53	56	58	63	55	51	53	58	57	73	61	58	49	46	46	65	57.4
Keosauqua	Max	88	88	89	86	85	87	84	80	79	82	81	80	85	80	70	74	82	85	81	85	83	84	93	92	87	73	78	85	91	93	83.7
	Min	62	62	70	69	68	67	65	66	65	66	68	65	68	68	64	62	64	66	61	53	55	62	71	74	71	63	64	55	68	71	65.2
Keokuk	Max	84	87	89	89	88	88	89	80	83	84	81	77	84	82	76	73	84	85	83	81	80	84	91	91	87	82	78	84	90	92	84.2
	Min	63	68	70	70	68	71	68	69	69	66	69	65	66	70	69	62	65	68	62	58	60	63	72	75	76	64	63	61	72	74	66.9
Knoxville	Max	86	88	89	83	79	81	80	82	75	82	78	82	86	80	71	80	86	84	81	83	80	86	91	92	85	78	78	85	92	94	83.2
	Min	60	58	68	67	67	62	62	64	63	64	62	63	62	62	58	58	58	63	60	57	57	63	72	74	70	62	57	54	72	70	63.0

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JUNE, 1898—CONTINUED.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Lamoni	Max	84	88	88	80	80	79	75	77	79	87	77	82	83	76	73	81	85	83	76	81	83	87	89	91	86	75	74	85	90	92	82.2
	Min	61	62	68	66	64	64	61	63	63	65	61	62	62	64	60	61	61	65	61	55	60	67	69	74	69	63	57	54	70	70	63.4
Lansing	Max	83	85	90	87	81	85	82	84	74	82	76	84	84	76	73	75	87	86	83	87	79	76	91	91	85	80	70	81	87	77	82.0
	Min	58	45	62	63	65	65	62	58	58	60	62	64	63	60	54	59	63	64	53	55	57	54	67	77	64	54	52	46	69	63	59 9
Larrabee	Max	80	88	89	84	79	85	78	83	66	80	81	80	87	68	69	87	90	85	85	88	87	94	96	85	79	81	72	84	87	83	82.7
	Min	55	57	65	58	59	52	58	57	52	57	54	55	55	50	53	58	60	61	54	55	55	64	68	57	59	58	44	50	63	60	56.8
Le Mars	Max	76	89	88	79	76	76	78	80	71	73	74	78	84	74	72	87	91	89	84	84	80	92	94	87	83	79	74	89	83	79	81 4
	Min	51	53	68	61	60	53	53	53	57	51	52	55	54	55	53	61	65	65	56	56	60	66	72	70	61	59	48	55	65	71	58.6
Lenox	Max	82	86	85	80	78	77	76	71	75	75	74	77	81	76	70	81	83	80	76	78	81	88	90	90	85	81	76	86	92	92	80.7
	Min	60	60	68	62	63	62	60	62	62	64	61	63	60	61	59	60	61	63	60	57	59	67	71	75	68	64	57	55	73	71	62.9
Linn Grove	Max	83	87	90	90	87	85	87	84	72	85	80	80	83	77	68	72	85	87	87	84	77	74	92	90	79	78	72	83	91	92	82.7
	Min	60	53	62	63	65	63	63	64	63	63	62	63	63	63	55	56	61	65	57	58	53	52	63	67	62	59	55	53	68	69	60 8
Logan	Max	83	91	92	84	80	86	80	84	72	81	74	80	87	82	76	89	90	87	91	89	78	97	97	95	90	85	79	87	91	98	85.8
	Min	58	60	63	60	61	64	62	60	61	60	62	60	65	60	55	58	64	62	60	58	53	62	64	63	62	58	53	64	70	68	61.0
Maquoketa	Max	84	85	90	88	85	83	85	84	77	84	79	79	82	78	71	67	81	85	80	84	77	70	91	92	83	75	74	81	91	91	81 9
	Min	62	50	57	61	62	62	64	66	61	63	55	55	54	56	45	46	62	64	56	52	51	51	62	71	63	59	55	51	70	71	58.6
Marshallt'n	Max	..	89	..	84	77	82	82	82	68	82	76	77	84	75	62	77	86	85	81	82	80	78	92	91	82	79	73	84	92	89	81.1
	Min	62	52	67	67	65	60	62	60	61	63	62	61	59	58	57	57	59	60	57	53	55	58	57	74	63	58	53	50	56	70	59.9
Mason City	Max	76	84	88	80	72	80	78	79	69	79	79	78	83	69	68	79	85	80	79	80	78	76	92	88	79	78	70	78	79	72	78.5
	Min	54	48	66	64	62	54	54	56	60	60	59	59	56	54	52	55	58	61	55	52	53	57	66	74	62	58	48	46	69	66	57.8
Mooar	Max	85	85	88	89	8.	88	84	76	76	82	78	77	83	84	71	73	86	86	75	82	82	84	89	89	88	68	78	84	89	91	82.6
	Min	61	60	65	63	64	61	62	67	65	65	65	65	62	64	59	60	61	62	50	50	51	52	69	70	76	62	57	50	69	69	61.9
Mt. Ayr	Max	87	90	89	80	81	79	87	74	77	78	79	82	84	75	71	84	87	83	78	85	81	92	93	92	86	77	79	88	93	94	83.3
	Min	59	61	66	64	63	63	61	62	61	64	59	62	60	62	59	60	61	63	62	57	61	62	69	74	68	63	57	57	69	70	62.2
Newton	Max	84	88	90	83	79	82	80	82	70	81	79	82	86	75	63	79	85	84	81	84	81	81	92	91	84	79	75	87	93	88	82 3
	Min	63	59	69	69	64	65	65	66	64	65	61	64	63	63	58	59	63	66	61	60	59	63	74	78	66	63	57	53	75	72	64 2
N.Hampton	Max	78	82	87	85	74	79	78	78	70	79	74	78	79	74	68	74	82	81	79	80	81	72	90	88	81	74	72	77	80	78	78.4
	Min	57	47	65	65	64	..	60	57	62	62	63	64	65	56	53	56	55	62	55	54	53	53	63	73	70	55	57	56	70	63	59.8
Northwood	Max	75	85	88	85	77	79	77	80	73	80	76	77	84	67	71	81	89	80	81	84	80	79	92	89	77	78	67	81	82	70	79.5
	Min	54	46	66	64	62	54	59	55	59	58	57	61	63	55	51	55	55	63	57	54	56	56	65	67	61	59	48	43	51	59	57.1
Odebolt	Max	81	89	88	81	80	85	81	83	75	80	73	82	85	73	71	83	93	91	92	94	85	92	93	92	79	79	80	87	87	86	84.0
	Min	60	55	69	62	63	63	60	54	61	62	59	55	65	53	54	58	61	52	55	54	54	54	70	74	69	49	57	60	71	63	59.5
Ogden	Max	82	89	90	81	80	80	81	81	71	77	75	82	85	73	61	78	87	83	79	80	78	80	91	90	82	78	73	85	90	88	81.0
	Min	59	56	63	62	63	59	59	59	62	62	62	61	58	56	57	58	61	62	60	57	57	63	70	79	63	60	48	53	71	70	61.2
Olin	Max	83	83	88	88	84	82	86	82	70	82	78	80	83	77	69	69	80	85	78	83	73	73	88	89	81	73	72	77	..	..	80.4
	Min	59	50	60	62	65	62	64	66	63	63	63	64	65	64	56	56	59	65	56	52	53	52	62	70	63	46	55	57	..	..	59.7
Omaha, Neb	Max	83	90	87	79	78	76	77	73	74	74	74	79	85	70	70	79	89	85	83	81	82	95	94	95	87	83	77	90	91	94	82.5
	Min	62	64	71	62	65	62	61	62	62	65	62	65	65	61	60	65	67	67	65	64	66	68	74	78	68	65	55	60	75	74	65.3
Osceola	Max	84	87	87	80	80	79	77	75	75	79	76	79	83	75	69	80	85	83	78	81	82	87	..	91	84	76	76	86	91	97	81.4
	Min	60	58	67	65	63	62	60	64	63	64	60	62	60	61	58	59	61	64	60	58	55	63	71	..	69	61	56	54	71	71	62.1
Oskaloosa	Max	86	89	90	73	80	79	81	81	76	81	79	81	87	76	67	77	86	84	80	83	81	82	92	92	83	76	75	84	93	94	82.3
	Min	60	58	67	67	64	61	61	62	62	63	60	63	59	63	57	57	58	64	59	51	53	60	69	73	64	56	55	49	70	70	61.2
Ottumwa	Max	82	87	90	89	81	82	82	90	89	82	81	78	85	79	79	79	81	86	79	82	82	83	92	93	82	75	76	85	93	94	83 9
	Min	60	62	68	69	67	65	64	65	64	64	63	63	62	64	60	58	59	61	60	55	56	61	75	71	67	61	59	64	61	70	63.2
Ovid	Max	88	88	87	77	78	80	83	79	81	79	77	79	83	83	71	80	84	87	81	80	81	84	88	89	83	74	76	83	88	89	82.0
	Min	60	60	67	66	63	59	61	60	62	63	60	62	59	62	59	58	60	64	58	56	56	63	69	73	68	63	56	53	70	69	62 0
Pella	Max	80	84	85	74	77	76	75	74	38	76	70	71	80	69	62	74	81	79	76	79	76	83	86	87	81	70	72	82	86	81	77.1
	Min	61	57	62	68	65	60	61	63	62	64	61	60	60	62	55	57	59	66	59	56	57	60	70	74	61	57	56	52	71	69	61.5
Plover	Max	78	89	90	82	81	82	78	82	70	82	76	84	86	70	71	84	95	80	84	90	84	86	77	93	80	92	72	92	90	80	82.7
	Min	55	50	70	60	65	58	60	55	60	64	58	60	64	52	55	55	61	66	60	55	58	64	63	78	60	58	45	47	74	65	59 8
Primghar	Max	77	88	87	84	86	80	82	78	72	74	81	84	82	78	79	74	92	86	85	86	82	90	94	89	96	78	78	88	87	86	84.4
	Min	54	55	68	60	62	57	57	66	67	68	55	59	55	63	64	72	62	64	57	59	75	64	70	72	67	59	45	53	65	68	62.1
Red Oak	Max	87	89	89	85	84	83	82	80	82	78	81	82	83	77	76	85	91	87	84	85	84	93	93	94	90	84	83	91	91	94	85.6
	Min	56	54	69	62	63	60	57	62	62	64	60	61	57	61	59	61	66	63	58	55	60	70	71	71	67	63	52	54	70	74	62.1
Ridgway	Max	80	84	87	85	79	79	81	79	72	80	70	81	82	76	68	76	87	85	84	87	78	70	93	92	81	85	70	80	79	72	80.1
	Min	58	51	66	67	64	62	58	58	60	59	62	60	60	57	52	58	58	63	61	57	57	53	64	74	61	58	52	50	69	64	59.8
Rockwell C.	Max	78	88	88	83	80	81	77	83	73	76	73	79	85	70	68	89	90	82	83	84	84	83	94	91	80	79	74	86	85	84	81.7
	Min	57	52	66	62	64	56	61	56	62	63	60	60	59	53	54	65	61	61	59	56	56	63	68	74	61	58	47	51	70	64	60.0
Ruthven	Max	75	88	88	84	86	80	78	78	71	75	70	72	76	80	68	75	90	84	80	84	86	82	94	94	86	78	75	82	84	70	80 4
	Min	55	55	66	54	55	54	54	55	57	57	54	55	60	50	52	55	62	60	50	59	74	59	64	60	54	56	44	53	60	50	56.6
Sac City	Max	78	85	87	82	77	78	79	77	68	77	78	77	79	82	81	84	86	83	81	85	84	88	92	90	88	77	78	82	75	78	80.9
	Min	53	56	66	65	64	59	62	61	62	61	60	59	60	56	57	61	63	59	58	60	61	62	64	63	60	58	47	50	60	63	59.7
Sidney	Max	80	88	85	80	76	76	75	70	77	74	72	78	82	69	73	77	84	85	78	75	84	91	92	94	85	80	76	90	94	93	81.1
	Min	61	64	63	62	64	62	59	59	62	65	61	63	64	63	60	65	66	65	63	59	63	70	74	77	70	66	57	58	73	75	63.4
Sibley	Max	74	88	89	78	78	79	80	82	69	66	74	79	85	68	71	80	92	84	83	84	82	88	94	87	78	78	73	88	82	66	80 3
	Min	51	52	66	60	62	51	56	51	58	54	50	53	54	46	55	56	59	61	52	53	55	62	67	69	59	56	44	48	63	55	55.9
Sigourney	Max	87	89	90	83	87	86	89	88	81	87	83	83	87	80	72	79	89	88	91	91	85	84	96	95	90	80	73	89	96	98	86.6
	Min	..	56	62	74	66	62	62	65	63	63	62	64	60	63	58	52	58	65	52	52	54	59	69	73	64	57	56	50	62	63	60.7
Sioux City	Max	79	90	88	79	76	78	78	80	65	70	72	78	85	67	72	82	93	85	85	82	78	95	95	91	80	80	75	91	84	86	81 3
	Min	59	60	72	61	60	56	59	58	62	58	55	56	58	55	56	57	63	65	61	62	64	67	71	73	61	60	51	54	56	67	60.6
Spencer	Max	77	89	89	80	80	83	82	83	73	78	82	85	86	72	75	82	93	83	85	85	83	87	93	90	80	78	80	83	86	83	83 0
	Min	54	54	63	57	52	52	58	54	58	57	55	55	57	49	55	57	60	60	63	56	56	62	67	68	59	54	10	56	59	60	56 9
Spirit Lake	Max	75	88	87	85	73	84	80	83	72	67	71	82	84	67	72	79	89	82	88	88	86	85	93	86	76	78	69	86	85	68	80.2
	Min	45	57	56	60	61	57	60	54	58	51	54	55	58	55	53	56	62	63	58	54	58	53	70	66	59	46	59	47	65	55	56 8
Toledo	Max	83	87	91	85	79	81	81	82	68	82	76	80	88	75	67	80	86	84	81	90	79	86	92	90	75	78	73	82	92	93	83.3
	Min	61	53	68	69	65	66	63	61	62	63	62	63	60	59	56	57	57	66	56	51	58	56	54	74	64	59	54	49	70	70	60.9
Thurman	Max	84	88	87	83	79	77	78	73	80	77	76	80	86	78	73	82	89	86	82	82	83	93	92	94	89	86	81	70	96	93	83.9
	Min	57	62	71	62	63	60	58	61	62	65	59	61	59	61	60	64	62	66	59	55	64	71	73	75	67	61	54	54	72	75	63.1
Washingt'n	Max	85	86	88	89	84	84	84	82	73	83	78	77	83	78	70	70	82	87	80	81	80	78	89	91	83	73	75	83	91	91	82.2
	Min	59	57	63	65	65	62	62	62	62	62	62	62	60	62	58	57	57	63	58	54	54	55	67	71	63	57	57	51	67	68	60.7
Waterloo	Max	84	86	91	84	77	83	83	83	68	83	76	80	83	77	68	77	85	84	81	84	80	73	91	90	84	76	72	81	91	81	81.2
	Min	59	50	65	67	66	60	62	58	64	63	62	62	62	59	55	55	55	65	55	53	55	55	64	75	64	60	53	49	68	67	60.2
Waverly	Max	81	84	89	85	77	80	79	80	74	81	76	80	82	76	68	77	83	82	79	82	78	74	91	89	85	75	71	80	86	79	80 1
	Min	60	50	67	69	66	61	62	60	63	63	63	63	61	59	55	58	57	63	57	55	57	56	66	76	64	61	54	50	70	65	61.1
Webster Cy	Max	79	87	88	82	79	80	80	81	70	78	76	81	83	73	66	82	87	84	86	84	80	81	91	93	85	81	76	84	85	84	81.5
	Min	59	55	63	64	65	59	63	60	64	63	63	61	60	57	58	58	64	62	60	59	60	61	69	76	65	62	52	53	68	67	61.7
W. Branch	Max	84	83	88	89	85	82	86	83	84	82	80	80	84	80	..	..	..	81	82	84	77	72	89	90	82	76	74	82	91	91	82.5
	Min	60	52	62	61	65	60	64	66	61	60	62	64	62	66	..	..	..	64	55	51	54	55	66	64	62	54	55	52	67	68	60.5
Wilton Jc.	Max	84	86	90	92	88	85	88	87	75	87	85	84	86	81	76	80	83	87	81	85	78	81	92	90	82	80	80	84	92	96	84.8
	Min	61	53	57	63	61	64	62	65	63	65	60	62	64	61	57	57	61	63	54	56	54	52	65	63	62	58	53	55	60	68	60.2
Winterset	Max	85	87	88	80	79	79	86	76	68	79	75	79	84	76	73	79	86	84	75	81	78	86	91	90	82	78	75	85	93	93	81.8
	Min	56	57	67	60	62	60	58	61	60	61	60	60	59	58	54	51	59	61	51	63	56	60	68	72	65	52	51	53	70	70	60.8

METEOROLOGICAL DATA FOR JUNE, 1898.

NORTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT)								PRECIPITATION, IN INCHES.			Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	Number of hail storms.	No. of thunder storms.
	Monthly mean.	EXTREMES. Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.	Monthly range.	Monthly.	Greatest daily.	Total snowfall.							
Algona *	72.0	....	....	92	23	56	27	36	4.63	1.15	..	SE	9	19	2	7	1	4
Alta	70.5	81.5	59.5	94	23	48	27	46	8 41	1 03	...	S	13	14	3	13	..	7
Britt ‡	69.6	81 4	57 9	92	23	43	28	46	3.96	.94	...	SE		28	2	10		2
Charles City	69.4	76 7	62.2	92	23	45	28	47	2.63	.73	...	SW, NW	20	1	9	10	1	2
Clear Lake	68.6	78 2	58.8	91	23	48	28	43	3.74	1.05	...	SE	13	15	2	8	1	2
Cresco	67.6	77.2	58.1	91	23	43	28	48	2.53	.72	...	SE, SW	13	9	8	11	..	7
Decorah	68.8	78.7	58.8	91	23	44	2	47	2 88	1.38	.....	.....	..	..	..	7	...	....
Dows	69 0	79.0	59.1	90	23	47	27	43	4 91	1.52	.....	SW	12	9	9	12	....	4
Eagle Grove ‡ a	69.8	....	.....	..	....	.....	....	.....	.....	.....	..	....	..	....	....	....	....	....
Elkader	71.2	83.1	59.2	94	23	44	2	50	3.36	1.80	....	SE	11	13	6	7	1	6
Estherville a	68.8	80.7	56.8	97	23	43	27	54	3.48	.90	.....	SW	.....	....	....	6	...	3
Fayette	68.2	78.8	57 6	92	23	43	28	49	3 53	1 14	.....	SW	11	11	8	11	..	7
Forest City	73 4	78 2	58.6	90	23	42	27	48	7 20	2 00	.....	SW	16	3	11	11	..	1
Grand Meadow *	67 6	.....	.....	90	23	50	15	40	2 91	1.22	....	NE, SW	9	12	9	8	...	....
Greene c	71.1	82 6	59.6	94	3	46	28	48	3.25	.82	.....	W	9	14	7	14	....	4
Hampton	69.4	79 4	59.3	92	23	49	28	43	4.95	1.39	....	SE	10	14	6	13	..	..
Humboldt	71.2	81.8	60.6	92	23	48	27	44	5 67	1.50	....	SE	19	8	3	11	..	1
Lansing	71.0	82 0	59.9	91	23, 24	45	2	46	3 00	1.00	.....	..	5	22	3	9	2	5
Larrabee	69 8	82 7	56 8	96	23	44	27	52	5.90	2.70	...	SW	5	21	4	8	...	...
Le Mars	70.0	81.4	58.6	94	23	48	27	46	4.72	1.60	.....	S	15	10	5	8	...	2
Mason City	68.2	78.5	57.8	92	23	46	28	46	3.03	1.15	.....	.....	....	....	.....	10	..	....
New Hampton a	69.1	78.4	59.8	90	23	47	2	43	3.39	.91	.....	NW	7	17	6	9	..	..
Northwood	68.3	79 5	57.1	92	23	43	28	49	3.00	.91	.....	S, NW	20	3	7	10	..	...
Osage †	68 5	....	....	....	...	....	....	....	3 15	.82	.....	S	5	13	12	11	...	8
Pioneer c	70.3	79.6	61 0	92	23	49	27	43	5 55	1 50	.....	S	17	4	9	7	....	5
Plover	71 2	82 7	59.8	95	17	45	27	50	4.22	.90	...	S	16	4	10	11	..	....
Primghar	72 8	83 4	62 1	96	24	45	27	51	5 10	2.00	.....	W	20	....	10	9	1	....
Ridgeway	70 0	80 1	59.8	93	23	50	28	43	3 15	1.00	.....	SW	8	17	5	12	1	11
Ruthven	68 8	80 4	56.6	94	23, 24	44	27	50	5 41	1.32	...	SE	13	9	8	8	1	....
Sibley	68 1	80 3	55.9	94	23	44	27	50	4.99	2.15	...	NE	11	17	2	10	....	
Spencer	69.9	83 0	56.9	93	17, 23	49	14	44	9.17	1.84	.....	S	11	16	3	9	....	1
Spirit Lake	68.5	80.2	56.8	93	23	45	1	48	5.31	1.79	.....	NW	15	10	5	7	....	....
Waverly	70 6	80.1	61.1	91	23	50	2, 28	41	5 03	98	.	S	12	14	4	13	....	5
West Bend * a	69.2	.....	...	94	23	51	15	43	6.21	1.23	..	SE	10	13	7	12	....	
Average	69.7	80.3	58.9	92.6	.....	46.5	.....	46.2	4 36	.....	....	SW	12	11	7	10	.....	....

CENTRAL SECTION.

Amana	72.6	83.2	61.9	93	30	52	2, 28	41	2 54	1.36	.....	S, SW	12	14	4	3	...	4
Ames	71 0	81.5	60.6	92	29	53	2	39	7 10	1.93	.....	.....	13	12	5	11	....	....
Audubon	71.0	80.3	61.8	93	30	48	20	45	2.74	.85	.....	SW	2	17	11	5	....	....
Belle Plaine	69.4	83.1	55.6	99	30	47	20	52	3 80	1.75	.....	SE	7	18	5	7	....	....
Carroll	70.6	81.7	59.6	93	23	47	27	46	2.99	1 05	.....	.....	17	6	7	9	....	5
Cedar Falls	71.9	83.2	60.6	91	23, 29	49	28	42	5 33	2.45	.....	S	17	7	6	6	....	....
Cedar Rapids	73.2	83.0	63.4	95	29	53	2	42	3.60	1.00	.....	NE	14	7	9	9	....	....
Clinton	72.2	83 6	60 9	93	24	51	22	42	8.08	4.61	.....	SW	13	9	8	10	....	....
Davenport	72.8	81.5	64 0	91	30	54	21	37	3.53	1.12	.....	SW	9	8	13	10	..	9
Delaware †	69.7	.....	...	90	29	50	15	40	5.62	1.40	....	S	9	16	5	10	....	....
Denison	68.7	79.7	57.7	91	23	47	10, 16	44	2 79	1.00	.....	S	12	5	13	6	....	....
Des Moines	72.2	81.1	63.2	92	30	54	28	38	6.85	2.19	.....	SW	14	12	4	13	1	9
De Soto	72.6	82.2	63.1	91	24,29,30	52	28	39	9.35	2 35	.....	SW	12	12	6	12	3	....
Dubuque	71.1	80.4	61.8	90	24	52	2	38	4.36	1.26	.....	SE	9	12	9	14	..	9
Galvac	72.1	83 8	60.4	95	22	52	14	43	3.34	.80	.....	SW	.....	.....	.....	10	....	...
Grinnell	71.7	80 6	62.8	90	30	54	28	36	4.67	2.00	.....	SW	7	18	5	9	....	....
Grundy Center	69.6	80 0	59.1	91	23	50	2, 28	41	7.02	1.93	.....	E	9	10	11	10	1	2
Guthrie Center	71 3	83.4	59.2	96	30	51	28, 29	45	4 29	1.03	.....	SE	12	8	10	7	..	....
Independence	69.2	79.7	58.6	90	29	47	28	43	4 65	2.00	.....	SW	15	8	7	8	....	....
Iowa City	72.5	83 7	61.3	93	29, 30	53	28	40	3 26	1.50	.....	S	8	17	5	5	....	....
Iowa Falls	70 2	83 0	57.4	93	23	46	28, 29	47	4.15	.81	....	SW	14	7	9	11	....	....
Linn Grove	71 8	82.7	60.8	92	23, 30	52	21	40	2 87	.66	.....	SE	10	8	12	10	....	1
Logan	73.4	85 8	61.0	98	30	53	21, 27	45	3 26	.95	.	S	16	8	6	7	....	....
Maquoketa	70 2	81.9	58.6	92	24, 29	45	15	47	2.20	.71	...	SW	19	2	9	10	....	....
Marshalltown	70.3	81.1	59.9	92	23	50	28	42	6.48	2.03	.....	.....	11	11	8	12	..	....
Mt. Vernon *	72.7	.....	.....	92	23, 30	59	15, 27	33	2 69	.60	.....	.....	.....	.....	.....	6	....	....
Newton	73.2	82.3	64.2	93	29	53	28	40	4.66	1.22	....	SE	15	13	2	11	....	....
Odebolt	71 8	84.0	59.5	94	20	49	26	45	4 93	1.55	...	.....	18	4	8	11	..	....
Ogden	71.1	81.0	61.2	91	23	48	27	43	5.88	1.83	.....	SE	19	.....	11	10	....	....
Olin b	70.0	80.4	59.7	89	24	46	26	43	1 90	.76	....	NW	.....	.....	.....	6	....	6
Rockwell City	70.8	81.7	60 0	94	23	47	27	47	3.22	1.00	.....	.....	21	7	2	11	....	....
Sioux City	70.9	81.3	60 6	95	22	51	27	44	6.61	2.45	.....	SE	13	7	10	13	....	....
Sac City	70 3	80 9	59 7	92	23	47	27	45	3.83	1.12	.....	SW	9	15	6	9	....	....
Toledo	72.1	83 3	60.9	93	30	49	28	44	4.37	1.45	....	SE	15	.....	15	7	....	....
Vinton *	70.9	.....	.....	90	23	57	21	33	2 76	.74	.....	SW	20	5	5	8	....	....
Waterloo	70.7	81.2	60.2	91	3,23,29	49	28	42	4.31	1 09	.....	SW	10	13	7	12	....	3
Webster City	71.6	81.5	61.7	93	24	52	27	41	5.28	.99	.....	SE	10	18	2	11	..	2
West Branch c	71 5	82.5	60.5	91	29, 30	51	20	40	4 37	1 41	.....	SW	21	6	3	6	....	....
Whitten *	71.7	....	.....	92	24	58	15, 27	34	5 82	1.50	.....	SW	13	15	2	7	1	5
Wilton Junction	72 5	84 8	60.2	96	30	52	22	44	3.47	1.13	....	NW	15	12	3	6	....	....
Average	71.3	82 1	60 6	92.6	.....	50.8	.....	41.8	4.47	.....	.....	SW	13	10	7	7	...	....

SOUTHERN SECTION.

Afton	73.6	85.6	61.6	98	30	45	28	53	4.76	1.60	.....	SW	10	13	7	10	....	....
Albia	74.0	87.4	60.5	....	.....	53	28	.....	5 16	2.15	.....	SE	15	8	7	6	1	2
Atlantic	70.4	80 7	60.0	93	29, 30	50	27, 28	43	8 74	2.93	.....	S	11	7	12	8	1	5
Belknap	72.9	81.5	64.3	92	30	55	28	37	6.25	1.45	.....	S	....	.....	....	11	....	....
Bonaparte	72 4	81.6	63.3	91	30	53	28	39	9.01	1.93	.....	.....	.....	.....	.....	10	....	....
Centerville	73.3	83.0	63.6	91	30	53	28	38	4 61	1.70	.....	.....	18	4	8	12	....	1
Charlton	71.8	81.8	61.7	91	30	54	20	37	4 77	2 00	.....	S	7	15	8	14	....	....
Clarinda	75.0	83.3	66.6	99	30	58	28	41	2 99	1.25	....	S	17	4	9	9	....	....
College Springs	74.2	85.3	63.2	95	22,29,30	55	27	40	3.94	1.66	.....	SW	12	14	4	9	....	....
Corning	72 6	82 4	62.8	93	29	53	28	40	5 35	1.72	....	SW	15	4	11	7	....	....
Council Bluffs	75 2	85.2	65.2	96	22	55	27	41	3.14	.90	.....	S	.....	24	6	11	....	....

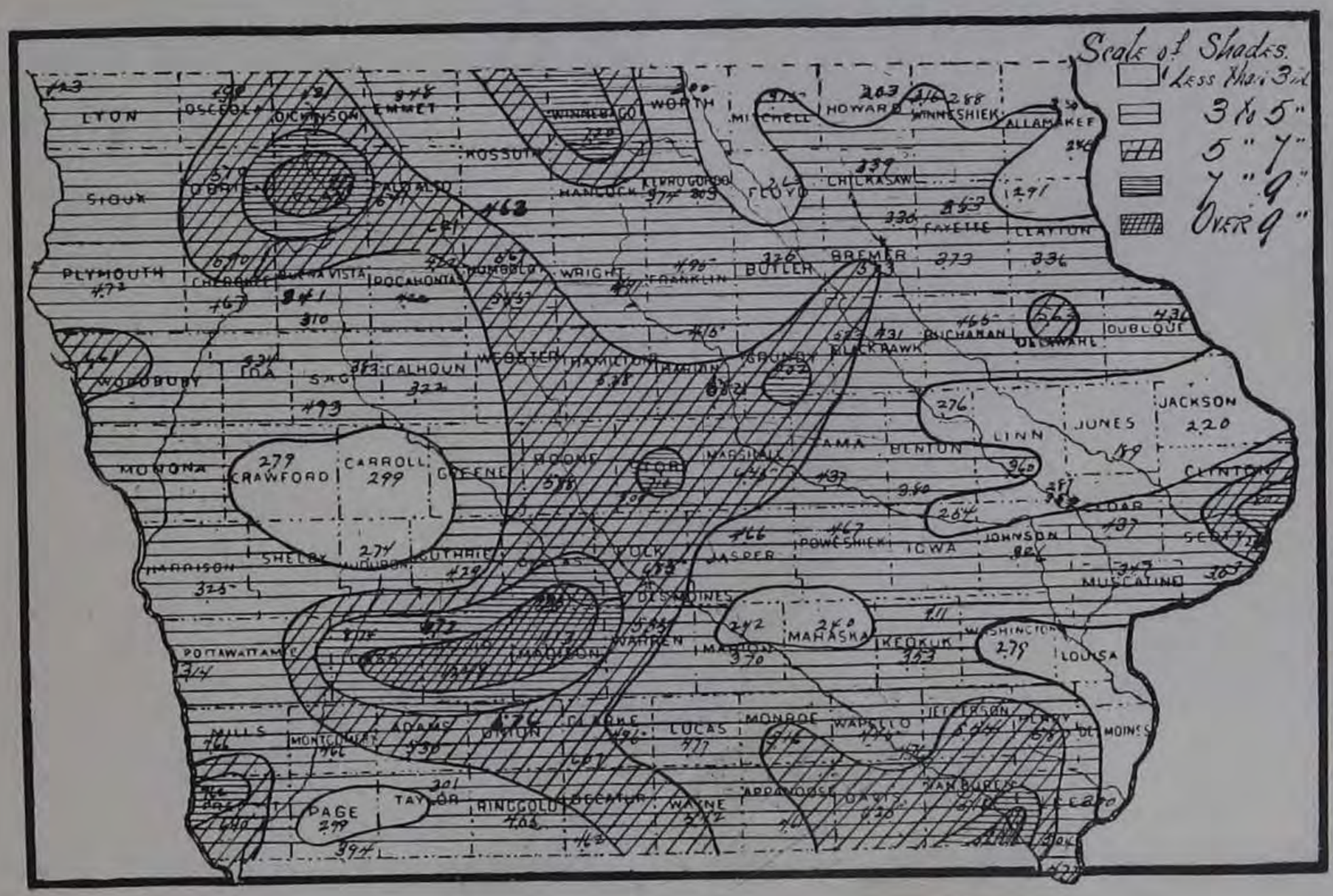
METEOROLOGICAL DATA FOR JUNE, 1898—CONTINUED.

SOUTHERN SECTION—CONTINUED.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.			Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	Number of hail-storms.	No of thunder storms.
	Monthly mean.	EXTREMES						Monthly range.	Monthly.	Greatest daily.	Total snow-fall.							
		Mean maxi-mum.	Mean mini-mum.	Maxi-mum.	Date.	Mini-mum.	Date.											
Eldon	73.9	84.8	63 0	96	30	52	28	44	4 76	1 67	.....	S	24	6		13		
Fairfield	71 8	82.0	61.7	92	30	50	28	42	5.54	2.01	.....	.....	11	16	3	15		
Ft. Madison*	76.1			90	30	62	22, 27	28	3.00	.75	...	SW	7	15	8	10	...	8
Glenwood	72 3	83 4	61.2	95	29	47	9	48	4 66	1.67	.....	SE	8	15	7	6	.....	
Greenfield	72.6	83.8	61.4	94	30	50	27	44	12.48	7.21	.....	S	16	8	6	12	.....	5
Hedrick *b	74 7			94	24	60	26	34	4.11	1.20	.....	.....	18	1	11	10	.....	
Hopeville	71.6	80.0	63 2	91	30	55	28	36	6.07	1.65	.....	S	9	16	5	12	.....	.....
Indianola	72.2	81.5	63 0	91	29 30	54	27	37	5.35	1.22	....	SW	17	5	8	10	..	...
Keokuk	75 6	84.2	66.9	92	30	58	20	34	4.77	1.08	....	SW	15	7	8	11	..	10
Keosauqua	74 4	83 7	65 2	93	23, 30	55	21, 28	38	5 18	1.90	...	.....	...	.....	.....	10	...	..
Knoxville‡	73.1	83.2	63.0	94	30	54	28	40	3.70	.97	.....	SE	14	10	6	8	....	....
Lamoni	72 8	82 2	63.4	92	30	55	20	37	4 62	1.62	.....	SE	20	3	7	12	....	....
Lenox	71 8	80 7	62 9	92	29, 30	55	28	37	3 01	.61	.....	S	18	6	6	10	..	10
Mooar	72.2	82 6	61.9	91	30	50	19,20.28	41	5.01	1 06	....	SE, SW	15	6	9	10	..	....
Mt. Ayr	72 8	83 3	62.2	94	30	57	20,27,28	37	4.55	1.59	....	SW	13	11	6	9	....	...
Mt. Pleasant*	75 0			90	30	62	16, 17	28	5.87	2.47	....	SW	17	9	4	11	....	....
Omaha, Neb	73 9	82.5	65.3	95	22	55	27	40	5 16	2.94	.....	SE	15	7	8	10	....	..
Osceola	71 8	81.4	62 1	97	30	54	28	43	4.95	1 65	.....	SW	6	17	7	10	.	10
Ovid	72.0	82.0	62 0	89	24, 30	53	28	36	5 42	3 00	.....	SE	16	5	9	10	...	....
Oskaloosa *a*	71 8	82 3	61.2	94	30	49	28	45	2.40	.70	..	SW	15	4	11	10	..	....
Ottumwa	73.6	83.9	63.2	94	30	55	20	39	4.45	1.40	.....	S	8	9	13	7	....	....
Pella	69 3	77.1	61 5	87	24	52	28	35	2.42	.87	.....	SW	19	6	5	6	....	....
Red Oak	73.8	85.6	62 1	94	24, 30	52	27	42	4 66	1.50	....	...	...	...	....	11	...	....
Sidney	72.2	81.1	63.4	94	29	57	77	37	6.40	2 35	.....	SW	16	8	6	9	.	....
Sigourney	73 6	86.6	60.7	98	30	50	28	48	3.53	1.10	.....	SW	21	9	...	9	..	1
Thurman	73.5	83.9	63.1	96	29	54	27, 28	42	7 62	4 65	....	SE	10	11	9	9	..	1
Winterset	71.3	81 8	60.8	93	29, 30	51	16, 27	42	11.13	3.08	....	.....	..	.....	....	10	....	....
Average	72.9	82.9	62.8	93.2	.....	53.6	.....	39.9	5.29	.. ...	.....	SW	14	9	7	10	..	....
Average for the state	71.4	81.8	60.8	92.8	.....	50.3	....	42.6	4 72	.....	...	SW	13	10	7	9	....	..

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

Precipitation Chart June 1898.



July, 1898.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

VOL. IX. NO. 7.

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Central Station, Des Moines, Iowa.

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DIRECTOR.

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U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER
1898.

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Algona.....C. D. Pettibone.
Alta.....D. E. Hadden.
Alta (Near).....W. J. Minard.
Amana.....Conrad Schadt.
Ames.....Exp. Station.
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Glenwood.....J. P. Jackson.
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Grinnell.....Prof. S. J. Buck.
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Marshalltown.....C. M. Cook.
Millman.....W. H. Shaul.
Monticello.....A. Matthiessen.
Mooar.....F. G. Thomas.
Mount Vernon.....Prof. A. Collin.
Mt. Ayr.....A. F. Beard.
Mt. Pleasant.....Dr. Max E. Witte.
Neola.....J. H. Garland, Jr.
New Hampton.....R. H. Gurley.
Newton.....A. Lufkin.
Northwood.....A. L. Thompson.
Odebolt.....E. Starner.
Ogden.....E. Sayre
Olin.....Hon. Nathan Potter.
Omaha, Neb.....*L. A. Welch.
Osceola.....A. W. Lewis.
Ovid.....H. C. Miller.
Osage.....G. D. Pattingill.
Oskaloosa.....Jos. Boyd.
Ottumwa.....Dr. J. F. Herrick.
Pella.....T. W. Cox.
Pioneer.....A. W. Hawley.
Plover.....J. S. Smith.
Portsmouth.....J. W. Dahlheimer.
Primghar.....P. R. Bailey.
Red Oak.....Geo. W. Holt.
Reinbeck.....Dr. L. B. Hathaway.
Ridgeway.....Arthur Betts.
Rock Rapids.....W. C. Wyckoff.
Rockwell City.....C. M. Randall.
Ruthven.....Ora Taylor
Sibley.....H. G. Doolittle.
Sidney.....G. V. Swearingen.
Sigourney.....Mrs. R. F. Ashbaugh.
Sioux City.....*U. G. Purssell.
Sac City.....Dr. C. Brown.
Spencer.....S. Gillespie.
Spirit Lake.....W. C. Drummond.
Stuart.....H. M. Bartlett.
Tara.....W. E. Humphry.
Thurman.....C. R. Paul.
Toledo.....Chas. Mason.
Vinton.....T. F. McCune
Villisca.....J. F. McCartney.
Wapello.....Geo. W. Schofield.
Washington.....Wm. A. Cook.
Washta.....H. L. Felter.
Waterloo.....M. L. Newton
Waverly.....H. S. Hoover.
Waukee.....N. C. Wragg.
Webster City.....Louis Frank.
Whitten.....Dr. Frank P. Butler.
Wilton Junction.....J. M. Rider.
Winterset.....W. W. McKnight
West Bend.....Phil. Dorweiler
West Union.....J. W. Bopp.
West Branch.....A. A. Madson.

*U. S. Weather Bureau.

WEATHER-CROP OBSERVERS.

Reporting for the Weekly Bulletin.

Agency.....J. H. Van Zant.
Albia.....Wm. Mercer.
Allerton.....James Piper.
Alta.....Jonas Cushman.
Ames.....S. B. Mills.
Attica.....G. W. Mendenhall.
Battle Creek.....A. Preston.
Blairstown.....T. H. Weil.
Boone.....L. C. Morris.
Centerville.....Henry Galley
Charles City.....W. B. Towner
Chariton.....C. C. Burr.
Clarksville.....F. M. Russell
Correctionville.....Hon. W. B. Chapman.
Corning.....Jerome Smith.
Corwith.....Wm. Oxley.
Clermont.....Chas. Larrabee.
Council Bluffs.....L. Prouty.
Creston.....M. V. Ashby.
Danville.....Sherman Matthews.
Emerson.....D. B. Nims.
Ely.....Hon. A. J. Fuhrmeister.
Farlin.....Jesse Johnson.
Fulton.....Carl S. Frank.
Fontanelle.....Hon. L. M. Kilburn.
Ford.....J. C. Richards.
Fort Dodge.....R. W. Blaine.
Geneva.....Wm. H. Thompson.
Grinnell.....A. O. Price.
Guthrie Center.....W. W. Bailey.
Gilman.....James L. Wylie.
Hesper.....G. E. Dillingham.
Humeston.....Hon. S. H. Moore.
Independence.....C. L. Thomas.
Larrabee.....H. H. Carnahan.
LeMars.....Hon' Henry Schrooten.
Lockridge.....John F. Farman.
Marshalltown.....Hon. S. B. Packard.
Mason City.....Wm. Nettleton.
Mapleton.....A. Lamb.
Mt. Pleasant.....W. S. Wright.
Milton.....Hon. E. C. Holland.
Mount Vernon.....Robert Smith.
Nevada.....Geo. C. White.
Osage.....E. W. Stacy.
Orange City.....H. J. VandeWaa.
Paton.....A. B. Condit.
Pittsburg.....G. C. Duffield.
Rockford (Cerro Gordo).....Hon. J. W. Bird.
Rock Rapids.....D. E. F. Merrill.
Rockwell City.....J. G. Palmer.
Rossville.....T. B. Wiley.
Rowley.....L. Maxson.
Sageville.....Hon. F. N. Knoll.
Seymour.....L. B. Sager.
Shenandoah.....Reuben Mullison
Spirit Lake.....L. Stowe.
State Center.....E. P. Thompson.
Tama.....W. G. Malin.
Unity.....Edw. Hummer.
Van Horne.....Spencer Smith.
Winterset.....H. A. Kinsman.
Wall Lake.....T. E. Wilcox.
Wilton.....Thos. Boot.
Wiota.....I. S. Coomes.

U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME IX. JULY, 1898. No. 7.

AUGUST 1ST CROP REPORT.

Reports received from the county and township correspondents of the Iowa Weather and Crop Service, on or before August 1st, have been tabulated, and the estimates as to the condition of the unharvested crops show the following averages:

CORN, 94 per cent; MILLET, 90; FLAX, 95; BROOM CORN, 90; POTATOES, 78; APPLES, 63; GRAPES, 95; PASTURES, 86.

The fact should be noted that since the dates on which most of these reports were written the copious rains have broken the drouth and greatly improved the condition of the crops that were most injuriously affected by heat and aridity. It remains to be seen whether or not the corn crop has been so materially injured as to reduce the final output below the average. Opinions in relation to that are likely to be somewhat influenced by local conditions or personal inclinations.

CLIMATE AND CROP REVIEW FOR JULY.

With considerable variability in the daily temperatures, the average for July was about normal. The month was generally dry, though scattered localities received excessive amounts of rainfall. Drouthy conditions prevailed generally from the 3d to the 27th, mitigated in a few sections by showers the 6th and 19th. For a period of about twenty-four days the larger part of the state received very little moisture, and the greater portion of the precipitation of the month fell in the last four days. And the drouth was intensified by some high temperatures, ranging from 90° to 100°, with brisk to high winds during a part of the dry period.

Though the dry weather was somewhat unfavorable for corn, late potatoes and pastures, yet there were compensating advantages resulting from the almost ideal conditions for maturing and harvesting the unusually large crops of hay, wheat, oats, rye and barley. In the larger part of the state the bulk of the hay was secured in perfect condition; and, for the most part, the weather was all that could be desired for cutting, shocking and stacking the heavy grain crops, which, because of the great bulk of straw, needed continued dry weather to secure it in good order.

The chief drawback to these favorable harvest conditions was experienced on the night of the 19th, in the form of severe wind-squalls that swept over extensive areas in nearly all districts, causing considerable damage to grain in shock or uncut in the fields, and wrecking many stacks of hay and grain. The damage, though considerable, was not sufficient to reduce the yield of grain or hay crops below an average, and the output of the harvest will be unusually heavy.

The condition of corn was unusually good the first week in July, giving promise of more than an average yield. The dry weather and occasional periods of high temperatures that prevailed from the 8th to the 27th, during the critical stage in the development of the corn plant, unquestionably caused material injury in fields most exposed to the effects of the heat and arid conditions. The copious and well distributed showers, that came during the last week of the month, afforded substantial relief and gave renewed assurance that the corn crop in the aggregate would not fall much short of the average of recent years. Potatoes and pastures were much benefited by the moisture that came at the close of the month.

WEATHER BUREAU CONVENTION.

The convention of Weather Bureau officials, to be held at Omaha, October 20th and 21st, is likely to be the most important and interesting meeting ever held under the auspices of the National Weather Bureau. Voluntary observers are recognized in the official notice of the convention, and we trust that Iowa observers who intend to visit the Trans-Mississippi Exposition will make their plans to go there during the week in which the meeting is to be held. They will be heartily welcomed, and will be accorded full recognition on the floor of the convention. The sessions will be held in the rooms of the Commercial Club, in the Board of Trade building. Special rates will be made at the hotels. The chief of the Weather Bureau will be present, and probably Secretary Wilson will attend at least one day.

NOTE AND COMMENT.

A JULY NOON.

The uplands crowned with garnered grain,
Green waving meadows wait their turn,
A glimmering heat o'er field and plain,
In hedgerows late wild roses burn.

The listless poppy's scarlet wings,
Shine forth from many a garden fair,
The yellow mustard spicy flings
Its fragrance on the heated air.

Down dusty lanes the cattle stray,
Where waters bright through willows gleam
Contented quench their thirst, then stray
To stand midsides in cooling stream.

A faintest hint of wandering breeze,
Soft through the larch and locust trees,
The toiler, drowsy, seeks the trees,
Forgetful in their shade, he sleeps.

—Farm Journal.

All friends of the Iowa Agricultural college sincerely regret the resignation of Prof. J. L. Budd, who has filled the chair of horticulture and forestry for many years. But it is gratifying to be assured that this does not signify his withdrawal from active work in the field wherein he has won a foremost place as an investigator and instructor. He will be active and forceful as long as he lives, and much of his good work will benefit future generations. He has helped to make horticulture a great and profitable industry in Iowa, and his influence has gone far beyond the state lines.

***

The berry crops, of all varieties, have brought liberal returns to the producers. The *Fruitman* was quoted last month as authority for the statement that the strawberry crop produced in Iowa this season by gardeners and fruitmen amounted to 50,000 bushels, or 1,600,000 boxes. The net value to the producers must have been at least $75,000—not $5,000,000, as a ridiculous jumble of figures made the *Fruitman*'s item to read. There is no question but the total value of the fruits grown in Iowa, by farmers, gardeners and orchardists, will reach very high figures when the next official census is made. We have been making good progress along that line of production, but the farmers do not as yet realize the value of good fruits, which contribute so largely to health and enjoyment of life.

***

The Boone *Republican*, in its intelligent review of the crops of that county, says the recent rain has put corn beyond question and the other chief products are safe. To this it adds: "A return to wheat raising has amply paid the farmers for the past few years, especially the present. Never a more ample and well secured crop of wheat has been put in shock. One man reports 28 bushels of winter wheat to the acre, testing 62 pounds."

***

Broomhall, in *Liverpool Corn Trade News*, sums up the wheat situation as follows: "We feel confident that the importing countries next season will require at least 45,000,000 quarters (360,000,000 bushels) of wheat, and that America will not export more than about one-half that quantity, leaving Russia, Roumania, India, etc. to meet the balance of the demand."

***

The hay crop of the United States this year will be the largest on record, says the *Hay Trade Journal*. It is certain that Iowa will contribute a large quota to make up the grand total for the country. And the quality will be good.

***

They do some things better in Germany than in the United States. In cutting spruce for pulp mills the Germans obtain large quantities of timber without impairing the sources of supply. They thin the trees freely but judiciously. In the United States 1,200 large pulp mills are using 2,000,000 cords of spruce annually and they slash off everything in sight. Production of pulp in this country has increased twelvefold since 1882. In ten or twenty years the supply of spruce in the northeastern states will be exhausted. The American waste of the treasures of the forest is most deplorable.—*St. Louis Globe Democrat.*

***

It is reported that the Musquakie Indians, on their little reservation in Tama county, will this season harvest 1,000 bushels of wheat, 3,000 bushels of oats and 20,000 bushels of corn. That indicates a fair measure of progress toward civilization. It is likely, however, that the women of the tribe performed the larger share of the labor in the production of the crop.

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Horseless carriages are being introduced for passenger service on the streets of South African towns. And the dark continent is receiving some of the rays of electric light.

H. Jerolaman, the eastern specialist, is a hard and hopeful worker. He has his ideal, and only asks ten years more to reach it. "Strawberries as big as pineapples" is his pledge to the world About 1910 the lady at the tea table will say: "Do let me help you to another slice of the strawberry."—*The Fruitman.*

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Iowa was credited with 183 nurseries by the census of 1890, and the United States contained 4,510.

***

R. A. Sallee, of Blanchard, writes as follows: "On the afternoon and night of July 6th we had an unprecedented and extraordinary rainfall, continuing about ten hours. It was a steady downpour, accompanied by a blaze of lightning, with no wind or hail. Three persons in this neighborhood report a measurement of between twelve and thirteen inches. Half bushel measures, tobacco pails and upright two gallon jars were observed overflowing. The storm extended over the southwest part of Page county and in the country south and west of it, but in the central part of the county it was only a heavy rain. While this story of the extraordinary amount of rain here will be deemed unreasonable, yet it is a well verified fact."

***

Drouth in Australia, it is stated, has caused the loss of 60,000,000 sheep. This fact should serve as a stimulant to sheep husbandry in this country, as it is likely to affect the mutton and wool markets of the world.

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During the fiscal year ended June 30th, the export trade of the United States amounted to $1,231,311,868, which is double the amount of our purchases abroad. And the fact should be emphasized that 71 per cent of that enormous total of exports represents the products of the farms of this country. These figures afford a striking illustration of the magnitude of our agricultural interests and their important part in our national prosperity.

***

Prof. E. B. Garriott, of Chicago, has been assigned to duty in the forecast division of the Weather Bureau at Washington, with the additional responsibility of superintending the chain of stations established among the West India islands and along the shores of the Caribbean sea, to give warnings of the approach of dangerous hurricanes from those tropical regions. The Washington correspondent of the Chicago *Record* says: "While it was the primary purpose of these stations to give warnings to the American fleets operating in Cuban and Puerto Rican waters, it was also proposed to furnish the information to the merchant marine, and now that the ports of Santiago de Cuba and Ponce, Puerto Rico, have been thrown open to commerce, and the probabilities are strong that all the ports of Cuba and Puerto Rico will soon be open, the new service will prove of great value to commerce. The hurricanes enter the Caribbean sea from the Atlantic ocean through the Windward islands, and it is believed that experienced observers will make it possible, owing to the slow progress of the hurricanes, to give advanced warnings of their approach. Professor Garriott takes the view that the expense of maintaining the new service for a year will be warranted if it results in giving timely warning of the approach of one hurricane. The damage to shipping that generally attends one of these tropical storms is very great, and it is confidently believed that our exporting merchants and ship owners will save millions of dollars during the present hurricane season by the warnings which the department will give. It is intended to make the service almost as complete as that now given upon the lakes and along the sea coast, and it will be continued long after peace is established, and may be permanent."

According to the best calculations obtainable, the world's largest wheat crops were raised in 1893, 1894 and 1895. These were the crops that produced the great surplus which caused the serious decline in prices. The yield of 1896 and of 1897 was small compared with the previous three years, resulting in the consumption of the surplus of the earlier period. All calculations now bear out the conclusion that 1898 will produce another large crop, comparing favorably with the largest yields of other years. Inasmuch as the surplus was so nearly exhausted this season a very large proportion of the early marketings from this crop will go to fill up vacant places made so by the high prices this season. It is fair to conclude that prices of cash wheat will be fairly maintained until at least a reasonable supply has accumulated. It is noticeable that winter wheat has not moved so freely since the threshing began as we generally supposed it would move. It is not unlikely that spring wheat movement will show equal tardiness and that prices will consequently exceed current expectations.—*Minneapolis Market Record.*

***

A phenomenal rain thunderstorm occurred in Philadelphia, Pa., August 3d. Within one hour and forty-five minutes the rainfall measured 5.40 inches. The heaviest previous rainfall was 5.20 inches in 24 hours, about 12 years ago. During the storm on the 3d the electric display was terrific, and great damage was caused by lightning strokes. The floods also caused heavy loss of property in basements and cellars.

***

"The first attempt at scientific forecasting of the weather," says E. J. Prindle, in an article on "Weather Forecasts," in *Appleton's Popular Science Monthly*, July, "was the result of a storm which, during the Crimean war, November 14, 1854, almost destroyed the fleets of France and England. As a storm had raged several days earlier in France, Vaillant, the French minister of war, directed that investigations be made to see if the two storms were the same, and if the progress of the disturbances could have been foretold. It was demonstrated that the two were in reality one storm, and that its path could have been ascertained and the fleet forewarned in ample time to reach safety."

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The heaviest damage by lightning during the past month in this state, was caused by a stroke at Clarinda, on the night of the 27th, resulting in the destruction of Shambaugh & Son's flouring mill; loss reported to be $17,000.

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Straw is seldom included in the statistical tables of soil products, and yet if credited with its actual value it would make a figure of no insignificant proportions. In Iowa the area in small grain harvested this season is a little over 6,500,000 acres. The straw is unusually heavy, the estimated average, after threshing, being one and a half tons per acre. This would give us a total straw product of 9,750,000 tons. One of the best farmers and agricultural writers in this state is authority for the statement that a good farmer can make his straw crop worth at least a dollar per ton, by using it for feeding stock and bedding the stables and sheds. That estimate would give a total value of $9,750,000 for this so-called by-product of the farms. But all farmers are not sufficiently practical and economical to make the most of their straw stacks, so we must allow a rebate on account of the wasteful methods in vogue. Making this allowance it is safe to reckon the actual value of the straw output this season at about $6,500,000, a dollar per acre for the area harvested. If the farmers do not realize that amount from such a vast output it will be their fault or misfortune. If their farms are well stocked they can surely make the straw valuable.

Lilienfeld's discovery of the chemical production of albumen from the products of coal tar and similar waste stuff has excited discussion of the question as to its practical value as a substitute for animal food. An English scientific writer says: "I quite believe it possible for a chemist to make a substance chemically identical with the albumen of nature. The point is, would it be physiologically identical? Chemically speaking, all nutriment necessary for man is found in grass and its seeds, but how would the man fare who tried to live on grass? Every scientist recognizes that man requires phosphorus for his nervous development, but nobody would dream of giving phosphorus in the inorganic state. It is the same with artificial albumen. I cannot say it will replace natural albumen as human food until it has been subjected to a trial on a large scale over a long period. Each animal best obtains nutriment from the kingdom to which it is adapted. Kittens fed on fruit, horses on goat flesh and cattle on fish would not thrive as they would on natural foods."

CLAY BALLAST—ITS COST AND METHODS OF MANUFACTURE.*

BY H. FOSTER BAIN, ASSISTANT STATE GEOLOGIST.

The use of burned clay as a ballast material in railway construction has, in recent years, been rapidly expanding. In Missouri the business amounts to about $1,000,000 yearly. In Iowa the output is smaller but still important. In 1896, the Rock Island road used 76,000 yards at one place in Iowa. Last season 100,000 yards were burned for the Burlington road in two pits and a large amount of material burned about six years ago spread. The material is being investigated by many of the most progressive roads in the middle west, and is fast making friends among constructing engineers. It has been extensively used by the C., B. & Q.; A., T. & S. F.; H. & St. J; Wabash; K. C., St. J. & C. B.; C., R. I. & P. and other roads of the region. This year a considerable amount is being burned for the Iowa Central. The Chicago, Burlington & Quincy has probably had the most experience with it, having begun its use about eleven years ago. The main line of that railway is ballasted with burned clay, and it is interesting to remember that it was over this roadbed that the record run, of April, 1897, to Denver, was made. Of the trunk lines crossing Iowa the Milwaukee has a gravel track, the Northwestern a rock ballast, the Rock Island part gravel and part burned clay, and the Burlington a clay ballast. It is, perhaps, significant that the Burlington, with the long haul to Omaha, still carries the fast mail. The railway officials are so well satisfied with the clay ballast that they have been for some years spreading it along the various lines in Iowa and Missouri, and in 1897 they ballasted up a considerable section of the St. Joe division. A not unimportant factor in the increased use of the material is the decreased cost, which has resulted from the introduction of machinery in its manufacture.

The material used in the production of clay ballast is derived from the surface formations. It is taken from beds which owe their origin, indirectly, to glacial agencies. At Clifton and other points in Missouri, and at Davis City, Iowa, the clay is obtained from river bottom land. It represents the river gumbo clay. At the latter place at least, and probably also at several of the former, the clay was derived from the upland gumbo loess deposit, and has simply been redeposited by river action. The Maxon and Brush pits, which will be more particularly described, as well as several in Missouri, are located upon the upland and the material is taken from the ordinary upland loess, which covers so large a portion of Indiana, Illinois, Missouri and Iowa. This loess is of what is known as the older type or white clay phase. It is a drab to white pebbleless clay, with fine grain and great plasticity. An analysis of clay of this formation gave the following results:

* From the Mineral Industry, Volume VI.

Hygroscopic water	3.76
Combined water	6.89
Silica $Si O_2$	63.31
Alumina $Al_2 O_3$	16.51
Iron oxides as $Fe_2 O_3$	4.06
Manganese oxide Mn O	0.49
Lime Ca O	1.11
Magnesia Mg O	1.10
Soda $Na_2 O$	2.20
Potash $K_2 O$	.96
Total	100.36

In much of the clay the silica would perhaps be lower and the alumina higher. The two prominent physical characteristics are its plasticity and high shrinkage. Wheeler* found the latter to vary from 9 to 12 per cent. In burning to building brick at certain plants in Iowa the clay shrinks about 13 per cent of bulk. According to Wheeler, the tensile strength of the air dried clay ranges from 270 to 410 pounds per inch, as against 100 to 200 pounds in ordinary clays. They have a low specific gravity, 1.98 to 2.05, and are very plastic when mixed with 22 to 25 per cent of water. It is the property of high shrinkage which makes it valuable for clay ballast, since in burning, the clay lumps crack open and allow the heat to penetrate. As a result the clay is thoroughly burned at relatively low heat and with corresponding economy. The shrinkage also causes the clay to "slack," breaking down into small pieces and forming a gravel-like aggregate. Indeed, burned clay is essentially an artificial gravel.

A very interesting factor is that the clay is easily and cheaply worked. For this reason these loose surface clays, which can be handled with plow and shovel and which are spread out over flat areas, are particularly valuable. They represent probably old, water-laid beds, or, possibly, much altered wind deposits, and it is curious to note that the areas least valuable for agricultural purposes furnish the best clay for ballast burning. There is, however, a wide range of clays suitable for the latter purpose, and it seems probable that but little difficulty would be obtained in locating beds throughout the Mississippi valley.

In general the process of manufacture consists of intimately mixing the plowed clay and coal slack and firing it in long ridges on outdoor kilns. Formerly this work was done by hand; now it is almost entirely machine work. A modern plant will have a kiln or pit 3,000 to 5,000 feet long. In preparing for the work, the surface soil to a depth of sixteen to eighteen inches is scraped off, being usually hauled away to use in railway fills. If a trench is not already available, one is dug along one side of the scraped area to a depth of about ten feet. This should be at the bottom nearly as broad as deep. Along the bottom two parallel rows of old cross ties, laid longitudinally and about three feet apart, are laid two deep. The space between these is filled with kindling, and over them is placed one layer of ties put crosswise. A thin layer of dirt is spread over the top and the wood set on fire. As the fire progresses, clay mixed with coal slack is thrown on it. Along the side of the trench is the track upon which the machine runs. The work is carried forward as the burning progresses by the addition of clay and coal slack along the track side, until a ridge about fourteen feet high is built up. As the work goes on, this ridge broadens, the machine tracks are moved sideways from it, and in the end there is a broad pile the full length of the track with fresh clay on the machine side, fully burned ballast on the opposite, and the fire between and approaching the machines. A kiln is usually burned one year and loaded out the next, but ballast burned in the spring may be loaded in the fall.

In the work done by the Iowa Ballast and Improvement company, two machines are used at each kiln. One of these machines is the ballast machine proper, and the other is a pusher used in shifting cars, distributing coal, etc. The pusher consists essentially of a flat car, upon which is mounted a seventeen-horse-power engine geared to an axle by a link belt. This machine will haul three loaded cars from point to point along the face of the kilns. Such an outfit costs about $1,500, and will do nicely all the work for a 3,000-foot pit. For a larger pit, it would probably be economical to use a regular light locomotive, though the pusher in question has the advantage that, in moving to a new site, it can be put into a freight train like an ordinary box car. The work of distributing the coal slack is under the immediate charge of a foreman, who has four shovelers in each car. Besides these men, there is the engineer. The coal is spread out on the slope next to the track, though some of it is thrown over onto the kilns where the supply seems deficient. About three cars of coal can be distributed in ten hours. In general, about one ton of slack coal is used for four or five yards of ballast. The pusher is also used for plowing, the plow being swung from a horizontal arm and raised or lowered to the proper position on the slope by suitable digging. The coal is sometimes distributed over the slope and plowed under. Sometimes the plowing is done first. The object to be attained is, of course, an even mixture of the clay and coal slack.

When the clay has been plowed and the coal distributed the ballast machine, or earth mover, is called into requisition. This machine consists essentially of a large flat car, upon which is mounted a fifty horse-power engine and seventy horse-power boiler. The engine actuates a horizontal shaft running lengthwise of the car and furnishing power to three small steam shovels. These are swung on projecting booms and differ from ordinary steam shovels only in their light weight and the fact that they pull towards rather than away from the machine. The shovels dig up the loose clay and slack and dump it upon a carrier belt running parallel to the car. This in turn throws it upon a similar belt running at right angles to the car and dropping the material over the face of the kiln. The face is covered to a depth of eighteen inches to two feet and the work is ordinarily done about twice a week. If small stretches burn out sooner they are covered separately or, in case these patches are very small, the work is done by hand. The machine is in charge of a foreman and the crew includes an engineer, fireman, three lever men and a helper. In the pit at Brush siding, where the dirt is loose and easily handled, the shovels each take about one yard per minute on short runs, though in general here and at Maxon, the work is slower. Where a long pit, 5,000 feet, is open, four shovels are put on. The side carrier belt is then divided and delivers to each end of the car. There are in that case two delivery belts. By these additions the efficiency of the machine is made greater. At Brush, with a 1,600-foot pit, about 10,000 yards were being burned this summer. At Maxon, with a 3,000-foot pit, about 5,000 cubic yards were burned in the same time. With but slight additional cost a 5,000-foot pit can be operated. Up to that point there is a notable decrease in cost with increased output. It required at Brush fourteen days of preparatory work, and at Maxon not much longer. A ballast machine costs about $4,000 to build. The Maxon crew includes altogether about twenty-eight men. Aside from foremen and superintendent the wages this season were 15 cents per hour with sleeping cabins furnished.

The patents on the machines described are owned by the Iowa Ballast and Improvement company, of Marshalltown, of which C. C. Gilman is president, and Mr. Jesse Stubbs, general manager. The ballast machine, or earth mover, is the result of the inventive genius of Mr. Stubbs, who has had long experience in ballast burning. Another machine invented by him is now controlled by the Western Wheel Scraper company, of Aurora, Ill., and is much used. With it the plowing and distributing of the clay is done at the same time, a system not so flexible as that of the newer machine.

Under the old process of hand burning, such a pit as the one at Maxon would have required the services of about 250 men and the ballast would have cost about 40 cents per yard. When first used, the price was $1. It dropped from that to 80 cents, 60 cents, 50 cents and, finally, 40 cents, which represents about the mini-

* Mo. Geol. Surv., Vol. X, p. 542.

mum for hand work. Present contracts for machine burned ballast range from 10 cents to 20 cents, depending upon the amount, location and terms of contract. In a recent contract calling for about 100,000 yards, the price was 18 cents in the kiln, the railway furnishing the material, scraping the ground and laying the spur back. An estimate of the cost distributed upon the track, with average hauls of thirty miles, was 46 cents, though such an estimate is admittedly of only local value, the variable factors being numerous.

Usually the ballast is delivered to the railway in the kiln, tested before acceptance by cross trenches. It is then loaded out on flat cars, either by steam shovels or hand. In its distribution and use, the work is similar to that in handling gravel.

Clay ballast has many peculiar advantages, and seems to offer large possibilities for the future. At the prices mentioned, it will be seen that it becomes a competition of stone and, under some circumstances, of gravel. Upon one Iowa road 50 cents has been paid for gravel, but, under favorable circumstances, gravel will usually cost less than clay; the latter is, however, available over a wide area where gravels are almost entirely absent. In general, the latter are found only on one or close to the later drift sheets of the interior, while silts and clays suitable for making ballast are much more widely distributed. The ballast is also lighter than gravel, being ordinarily handled with scoop shovels, and about one-third more can be handled at the same time if sideboards be put on the cars. In practice, when the haul is short, this fact is not taken advantage of, the economy in the time of unloading being worth more. Trackmen report, however, that a crew will, in the same time, ballast more track with the clay than with the gravel, because it is easier to handle and to tramp into place. Its advantages in these respects are even greater when compared with stone, and the same properties make the repair of track and the relaying of ties cheaper where clay ballast is u ed. The main and peculiar advantages of the burned clay, however, are the facts that it is elastic, and hence easier on rolling stock, and porous, so that the track is well drained. This increases the life of the ties and helps to keep up the track in bad weather. Among its minor advantages is its sterility, which serves to keep the track free from weeds and grass. It might be suspected that the ballast would crush and churn to dust, but, as a matter of fact, it does not to any extent. As ordinarily burned, it has about the crushing strength of soft burned brick, and, if it were desirable, the strength could, of course, be increased by harder burning. The life of the material now in use, however, as well as the experience derived from the use of burned mine slack, a somewhat similar material, indicates that this is unnecessary. It seems probable that, as the material becomes better known, there will be an increasing demand for it, and that eventually it will be widely applied, not only to ballasting railway tracks, but to surfacing wagon roads as well.

JULY WINDSTORMS.

The month of July brought its full quota of severe windstorms, with some local manifestations of tornadic force. The most severe and destructive windstorms occurred on the 19th and 27th, detailed reports of which have been received in form of newspaper clippings and observers' notes.

On the afternoon and evening of the 19th, wind squalls of considerable severity swept across more than two-thirds of the state, the central line of greatest disturbance extending from the southwest through the central and across the northeast districts, and covering a very wide belt on both sides of the line. The maximum velocity of the wind at the Des Moines station was forty-five miles per hour, but the reports of the damaging effects indicate that a higher velocity was reached at numerous other localities.

The duration was short, and the amount of rainfall was generally light. The storm was accompanied by sharp lightning, and in the northern part of the belt some hail fell in scattered localities. The storm was quite destructive to light buildings, windmills, shade and fruit trees, hay and grain stacks and grain in shocks; and probably the aggregate of damage would make quite an astonishing figure. The insurance companies that cover hazards of that character report numerous losses in all the sections visited by the storm. The character of the storm was that of the ordinary summer squall—a straight blow, with no evidence of tornadic action.

The severest storm of the month, though happily confined to a small area, occurred on the evening of the 27th, extending over portions of the southwest and south central districts. In the central part of the disturbance a small tornado developed and passed through a narrow strip in the eastern part of Mills county and the western part of Montgomery county. The following brief description is from Observer D. B. Nims, of Emerson, Mills county:

"On the afternoon of July 27th a tornado formed about two miles northwest of Emerson and moved in a direction east by southeast. It passed about one mile north of Emerson, but its effect was felt strongly in the north portion of the town in the breaking down of shade trees and shattering various buildings. In the path of the storm all buildings were destroyed, orchards and shade trees were uprooted or twisted into splinters. Whole fields of small grain were blown away, and one group of stacks was blown entirely away, with not a straw remaining to show where it stood. Mrs. Thornton and her little child were involved in the destruction of their home and killed. Three other children were injured, one seriously. Several persons narrowly escaped death. Twenty head of fat steers, feeding in a pasture, were killed, some of them being lifted and blown from ten to forty rods. Crops in the path of the storm were entirely destroyed, and in adjacent fields stacks were blown into shapeless heaps. The storm traversed a distance of about five miles, and was from twenty to sixty rods in width. It increased in violence until it finally spent its force or was lifted into the air. All who took refuge in cellars or caves escaped injury."

The Emerson *Chronicle* gave some interesting details in relation to the storm. Its pathway was through the cemetery of the town, and about sixty monuments were blown down and many of them broken.

The Red Oak *Express* of July 29th published many items of interest in relation to the effects of the storm in Montgomery county. It says the tornado appears to have originated in the eastern part of Mills county. Its path was not over eighty rods wide, but the destruction in these limits was heartrending. Its course was directly towards Red Oak, but was lifted before reaching that place, which only felt the force of a heavy, straight blow. Twelve farm houses and barns were totally destroyed, and the total loss of property amounted to many thousand dollars. The *Express* says: "All the vagaries of a tornado were present. Chickens had their feathers blown off and walked about in their nakedness." Outside of the direct path of the storm lightning was doing its work of destruction, and numerous reports of losses of buildings and stock are made in that section. About 2:30 in the afternoon of the 27th, William R. Penry, residing about eight miles northeast of Red Oak, was struck by lightning and instantly killled. A church near Wallin was struck and burned.

The Glenwood *Tribune* says the storm seems to have started in Indian Creek township, where it destroyed some buildings and took off the top of the Nishnabotna bridge near Hastings. It further says: "Like the majority of tornadoes, its actions and appearances were most peculiar. It went in streaks and by jumps, and did its deadly work in the main by means of twists, everything that came into the grasp of these singular vortexes being wrenched into a shapeless mass, whether it be iron or flesh. The storm was accompanied by a dull, heavy roaring, which could be heard for twenty-five miles around, and struck terror to the hearts of all listening, whether they were in the track of the storm or not."

On the afternoon of the 27th a severe thunderstorm passed near Vandalia, Jasper county. Charles Bowers, residing about two miles south of that place, was instantly killed by a stroke of lightning while driving through a field on a load of grain. In Vandalia four sons of James Phelps were prostrated while standing under a tree during the same storm. All were knocked down by the stroke, and one boy was nearly denuded of his clothing, but all recovered from the shock.

IOWA AS A FRUIT STATE.

The experiences of the early settlers who tried to raise fruit in Iowa, particularly northern Iowa, were very discouraging. These men did not understand the difference in climatic conditions between the east and the west. They planted eastern types of fruit, only to meet with disappointment and failure. They wrongly assumed that it was the degree of cold which settled the life of the tree, entirely overlooking the important matters of lack of humidity in the atmosphere and the intense heat of the summer sun in this inter-continental plateau. And so it came that there is scarce a tree left of the earlier orchard work. We have learned much in the last fifteen years. New varieties have been developed. We have learned to protect the trees from the south and east instead of the north and west. We have learned that it is not cold which kills them, but heat. We have learned that we cannot use the orchard as a stock pasture, and that blue grass and apple trees will not grow together. We have learned that bearing trees need fertilizing, and that the ideal orchard tree is one with a low head. While we still lack a really desirable winter variety of apples suitable to this latitude, we have plenty of fine summer and fall varieties, and the time is not far distant when this winter apple will show up. We are still plagued by the specious artifices of the traveling tree peddler, who foists worthless varieties on the man who would plant an orchard, but who is not posted. We still have too many who when their orchard is set out will not care for it afterwards. At the same time there is much real progress, and it will be hard to find a locality in northern Iowa this year which does not raise an abundant supply of first-class apples for home consumption. In addition to the apple, we can raise the finest of plums and cherries, while nowhere on earth can better raspberries, strawberries, blackberries and other small fruits be produced.—*Rockford Register.*

JULY WEATHER RECORD.

The month of July was seasonable in its average temperature. The average temperature of the northern section (three counties in width across the state) was 72.1°; central section, 73.6°; southern section, 74.6°; average for the state, 73.4°, or about the normal for July. The highest temperature reported was 102°, at Clarinda on the 19th and at Rock Rapids on the 24th. The average range of temperature for the month was 45.5°.

The average precipitation of the state was 2.98 inches, which is a little below the normal amount for July. The averages by sections were as follows: Northern section, 3.02 inches; central section, 2.10 inches; southern section, 3.83 inches. The central belt suffered most from the effects of the drouth, which continued with slight abatement from the 8th to the 27th. A large share of the rainfall fell in the last four days of the month. The records show the heaviest raintall for the month in the extreme southwest, in a portion of Fremont county. The station at Thurman recorded a total of 12.88 inches, of which amount 9.70 inches fell on the 6th and 7th. At Sidney the records show 9.90 inches for the month, the fall on the 6th being 6 inches.

The following table gives the mean temperature and total precipitation for the month of July, at the stations named, for the years from 1872 to 1898, inclusive:

YEARS.	MEAN TEMPERATURE—DEGREES					PRECIPITATION—INCHES.				
	Des Moines.	Davenport.	Dubuque.	Keokuk.	Sioux City	Des Moines.	Davenport.	Dubuque.	Keokuk.	Sioux City.
1872	...	76		78	...	...	3 80		6.73	.....
1873	....	75	76	76	...	....	2 37	2 27	7 73	.....
1874	..	78	78	80	...	.....	3 10	3.24	4 61	.....
1875	...	74	73	76	....	...	3 36	5 39	12.70	.....
1876	..	75	75	77	...	.....	4.82	8.15	6.79	.....
1877	..	75	75	77	...	....	3.42	2 90	7 06	.....
1878	.....	78	76	81	...	.....	2 18	6.71	2.37	.....
1879	77	77	77	80	..	.29	5.87	6 78	1.98	.....
1880	75	74	74	77	..	3.82	4.31	3 55	2.25	.....
1881	78	78	75	79	..	5 57	.91	10.53	3.98	.....
1882	70	70	69	72	..	4 78	4 41	1.48	4.53	.....
1883	75	74	73	76	...	3 37	3 66	7.90	3.15	.....
1884	74	72	70	74	...	2.16	4 51	5 80	2 30	.....
1885	78	76	74	79	..	6.55	1.66	6.35	2.29	.....
1886	80	76	75	78	..	.27	43	.89	65	.....
1887	78	78	78	80	...	1 94	3.09	2 44	1 57	.....
1888	77	74	74	77	...	3.42	7.31	3 59	6.00	.....
1889	74	74	72	75	76	4.37	8.25	4 22	6.78	3.31
1890	77	76	74	78	76	1.10	.85	1 21	2.49	2.59
1891	69	69	69	71	69	2 78	3 29	4.59	2.77	5.77
1892	74	74	74	75	75	8.64	4 16	5 08	6 18	2 61
1893	76	77	76	78	75	3 55	1.75	3.57	2 60	2 29
1894	78	77	77	78	76	29	.44	.02	.37	1.81
1895	73	73	74	74	72	3.10	5 16	1.05	5.46	2.63
1896	73	75	73	76	72	8.15	5 68	7.72	8 01	5 54
1897	76	77	76	78	76	2 88	3.21	4 34	6.75	2 26
1898	74	76	74	77	73	1.85	1 85	2.83	3 06	2.78
Means.	75	75	74	77	74	3.39	3.65	4.27	4 51	3.16

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30 inches; highest observed, 30 26, at Cresco and Dubuque on the 12th; lowest observed, 29.50, at Clarinda on the 19th; range for the state, .76 inches.

Temperature.—Monthly mean, as deduced from 114 reports, was 73.4°; highest monthly mean, 80.2°, Clarinda; lowest monthly mean, 69.7°, at Rock Rapids; the highest temperature reported was 102°, at Clarinda on the 19th, and Rock Rapids on the 24th; the lowest temperature reported was 42°, at Neola on the 31st, and Ames on the 11th; the average daily maximum was 86.3°; the average daily minimum was 60.4°; the average monthly maximum was 96.1°; the average monthly minimum was 50.7°; the greatest monthly range was 58°, at Ames and Neola; average monthly range, 45.5°.

Precipitation.—Average for the state, as determined from the reports of 114 observers, 2.98 inches; the largest amount reported was 12.88 inches, at Thurman; the least amount was .55 inch, at Pioneer; the greatest daily amount reported was 9.70 inches, at Thurman on the 6th and 7th; average number of days on which .01 inch or more of precipitation was reported, 7.

Wind.—Prevailing direction, south; highest velocity reported, 56 miles per hour from the northwest, on the 19th at Dubuque.

Weather.—There was an average of 19 clear days, 9 partly cloudy days and 3 cloudy days.

BALL LIGHTNING.

On the evening of the 27th, while a thunderstorm was still in the distance, and about one hour before rain began, ball lightning struck within 150 yards and directly in front of the observer. The lightning descended almost perpendicularly, as a ball of fire, leaving no illuminated path as is common in other flashes, and was accompanied by a short, sharp report, like that of a rifle.

Several large sparks seemed to fall slowly, in the vi inity where the ball struck. The chimney of a house received the ball and was completely shattered; while several other places on the outside of the same house, distant from the chimney, show fused spots, and had evidently received a weaker discharge. Persons in the house at the time received no shock, although one person sat within six feet of a spot where one of the weaker discharges struck.

FRED Z. GOSEWISCH.

KEOKUK, IOWA.

PRECIPITATION.

STATIONS.	PRECIPITATION IN INCHES. Monthly.	Greatest daily.	No. of clear days.	No. of partly cloudy days.	No. of cloudy days.	No. of rainy days (.01 in. or more).
Adair	2.66	1 10	19	12	0	5
Alta (near)	2 88	.60	..	..	..	8
Larchwood	3 20	.75	22	7	2	9
Millman	1.84	.67	..	....	....	6
Hawkeye	3.95	1.81	..	.....	...	7
North McGregor	3.51	1.60	..	....	....	4
Washta	3 04	70	22	8	1	9
Le Claire	.90	.45	....	....		5

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29 99	30.25	12	29.67	19
Des Moines	30.02	30.25	13	29.65	18
Clarinda	29 98	30.21	13	29 50	19
Cresco		30.26	12	29.70	19
Dubuque	30 00	30.26	12	29.66	19
Omaha, Neb	29.97	30 20	3	29.58	18
Keokuk	30.01	30.25	12	29.73	19
Sioux City	30.00	30.21	3	29.54	19
Average	30.00	30.26	12	29.50	19

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	4,578	38	NW	27
Des Moines	3,623	40	W	19
Dubuque	4,225	56	NW	19
Keokuk	4,321	38	W	28
La Crosse, Wis	4,204	36	SW	2
Omaha, Neb	5,399	32	NE	29
Sioux City	7,911	36	S	18

OBSERVERS' NOTES.

BRITT—*Geo. P. Hardwick.* High wind 1st and 17th. Hail north of station on 19th, doing some damage to grain.

DOWS—*R E. Fuller.* On the morning of the 19th hail as large as hens' eggs fell two and a half miles northwest of the station.

FOREST CITY—*J. A. Peters.* Wind on night of 26th lodged grain badly in places.

HUMBOLDT—*Henry S. Wells.* Corn, potatoes and pastures have suffered from drouth. Hay and harvest have been gathered in the best of shape.

AMANA *C. Schadt.* The severest storm for many years occurred on the evening of the 19th. Trees were broken and uprooted, windmills wrecked and all the shocks in the field blown down, and about half the apples torn from the trees.

GREENFIELD—*J. G. Culver.* A severe storm of wind on the 19th. Many hay stacks blown over; oats and corn suffered considerable damage; trees broken and injured. In the neighborhood of Orient and Spaulding many cribs and light buildings were injured and some destroyed. The windmill owned by the Chicago, Burlington & Quincy, at Orient, was wrecked and the tower blown over.

SIGOURNEY—*Mrs. R. F. Ashbaugh.* On the night of the 2d there was a bright rainbow in the north about 2 A. M. The moon was full and shining bright in the southern sky, while raining far north. Was witnessed by several reliable men.

THURMAN—*C. R. Paul.* A severe rainstorm, which assumed some of the characteristics of a waterspout, passed through this section on the night of the 6th and morning of the 7th, with 9.70 inches of rain.

BONAPARTE—*B. R. Vale.* A cool but seasonable month. No severe storms or extremes in temperature. Rains have been opportune, but not in excess of the need.

ERRATA FOR MONTHLY REVIEW.

AFTON—Total rainfall for June, 1898, should be 5.76 inches instead of 4.76.

CLINTON—Rainfall should be reported as .06 inch on May 31st, making a total of 4.53 inches, instead of 4.47 inches. Rainfall for June should be 8.02 instead of 8.08 inches, as reported on page 12 of the MONTHLY REVIEW.

BELATED REPORTS.

ELDORA—*For June, 1898.* Mean temperature, 71.2°; mean maximum temperature, 86.6°; mean minimum, 55.8°; highest, 95° on the 24th; lowest, 45° on the 1st. Total rainfall, 6.61 inches; greatest amount in twenty four hours, 2 inches on the 23d. Number of clear days, 6; partly cloudy, 22; cloudy, 2. Days on which .01 inch or more rain fell, 10.

STUART—*For June, 1898.* Mean temperature, 73.2°; mean maximum temperature, 82.5°; mean minimum, 63 8°; highest, 95° on the 30th; lowest, 53° on the 28th. Total rainfall, 6.20 inches; greatest amount in twenty-four hours, 2.50 inches on the 22d. Number of days on which .01 inch or more rain fell, 6. Prevailing wind, north.

MONTICELLO—*For June, 1898.* Mean temperature, 72.6°; mean maximum, 83.6°; mean minimum, 61.7°; highest, 93° on the 24th; lowest, 53° on the 20th. Number of clear days, 10; partly cloudy 9; cloudy, 11. Prevailing direction of the wind, northwest.

MILLMAN—*For June, 1898.* Total rainfall, 7.29 inches; greatest amount in twenty-four hours, 2.77. Number of days on which .01 inch or more rain fell, 13.

FAYETTE—*For May, 1898.* Mean temperature, 57.2°; mean maximum, 68 3°; mean minimum, 46°; highest, 84° on the 24th; lowest, 30° on the 12th. Total rainfall, 3.29 inches; greatest amount in twenty-four hours, 1 inch on 17th and 18th. Number of clear days, 11; partly cloudy, 7; cloudy, 13; on which .01 inch or more fell, 15. Prevailing wind from northwest.

VILLISCA—*For June, 1898.* Mean temperature, 71.8°; mean maximum, 82.1°; mean minimum, 61.4°; highest, 93° on the 29th; lowest, 51° on the 28th. Total rainfall, 3.92 inches; greatest amount in twenty-four hours, 1.08 inches. Number of clear days, 12; partly cloudy, 14; cloudy, 4. Number of days on which .01 inch or more fell, 10. Prevailing direction of wind, southeast.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JULY, 1898.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max.	94	95	77	85	83	85	90	90	83	86	87	87	89	93	92	95	96	98	101	82	89	91	93	94	90	97	93	89	76	89	78	89.1
	Min	70	65	60	56	57	61	60	70	57	53	54	56	53	62	63	64	65	66	66	58	58	64	63	65	68	61	63	63	60	64	58	61 7
Alta	Max.	92	74	79	84	84	88	89	83	82	80	82	82	85	87	89	89	90	92	89	77	85	89	93	93	80	90	90	85	77	81	75	85 0
	Min	62	58	53	54	58	67	64	68	58	55	55	58	58	76	63	63	63	72	69	54	56	61	65	64	59	56	65	60	56	54	55	60 6
Amana	Max.	92	93	75	83	84	89	87	87	81	79	82	85	86	89	91	91	92	92	96	80	85	87	92	95	89	90	96	92	80	79	81	87.1
	Min	71	73	63	54	57	61	72	69	58	56	47	51	53	52	65	65	66	68	75	59	54	60	59	64	71	62	67	66	56	54	58	61.5
Ames	Max	92	87	77	87	84	90	85	..	80	82	82	87	88	90	92	93	94	96	99	82	98	92	96	100	..	97	93	89	70	78	67	87 5
	Min	69	72	61	52	52	63	70	61	50	58	42	52	52	55	62	60	64	69	71	57	5	61	60	62	64	60	65	65	66	49	54	59 4
Atlantic	Max.	91	85	77	82	82	76	88	85	80	82	82	86	86	86	88	90	90	92	95	84	87	92	94	98	91	97	92	86	72	77	65	85.7
	Min	71	61	63	50	56	66	68	65	53	60	49	55	49	47	57	59	65	70	63	48	48	50	58	59	64	52	65	61	59	59	53	57 9
Audubon	Max.	91	85	75	83	84	85	85	84	81	79	84	84	85	86	90	93	92	95	97	80	90	92	93	98	16	95	92	85	70	80	68	86.1
	Min	71	62	62	48	48	67	69	67	59	59	50	56	50	50	57	61	63	71	72	54	60	60	58	60	65	55	64	63	59	54	55	59 6
Belknap	Max	90	91	80	81	84	88	85	85	80	75	81	81	83	86	88	89	89	90	96	80	84	88	91	95	95	92	92	86	80	77	78	85 7
	Min	71	74	65	67	61	62	70	69	60	60	56	56	57	58	67	67	69	70	76	65	60	58	63	6	69	69	68	67	66	58	57	64.6
Belle Pl'ine	Max	90	94	90	85	79	9	90	80	78	70	80	78	80	85	98	100	90	96	96	78	80	80	85	89	86	85	86	90	78	75	74	85 1
	Min	69	65	60	56	60	62	65	60	55	50	45	49	55	50	60	65	60	70	72	55	55	50	58	60	65	63	60	62	65	50	55	58 6
Bonaparte	Max	90	90	80	84	84	87	81	87	82	79	78	83	85	86	89	90	90	90	96	83	84	91	93	97	94	89	96	89	78	79	77	86 5
	Min	71	72	64	54	58	61	69	69	59	58	51	55	55	56	63	65	68	67	69	66	59	63	61	68	71	67	67	68	60	57	58	87.9
Britt	Max.	90	87	78	86	84	93	93	82	77	81	83	88	89	89	93	92	92	94	87	78	87	92	92	97	83	92	92	85	75	80	61	86 2
	Min	63	64	55	50	55	63	65	63	50	48	48	53	53	48	57	61	64	56	63	53	48	58	60	61	58	52	66	50	50	59	53	16 1
Carroll	Max.	93	85	77	85	86	89	88	86	83	85	80	86	86	87	90	91	92	94	91	82	87	92	94	95	88	95	92	87	73	80	81	87.1
	Min	71	70	54	55	51	67	68	66	55	56	55	58	51	49	60	61	66	65	75	48	51	58	62	72	62	50	62	60	58	52	56	19.5
Cedar Falls	Max.	92	90	80	85	85	92	90	88	84	80	83	87	91	92	94	94	93	93	93	81	87	91	96	97	89	92	90	91	74	82	79	88 2
	Min	65	70	53	62	62	62	72	67	54	60	47	51	61	53	65	68	70	70	70	58	53	59	65	64	60	59	65	65	55	50	53	60.7
Cedar Rap.	Max.	95	95	78	83	88	91	83	85	80	79	83	87	86	89	91	93	94	94	100	81	85	89	93	99	88	92	96	94	74	81	80	88.0
	Min	71	71	63	57	60	64	72	63	59	56	52	54	55	56	68	67	70	70	66	62	57	61	63	66	71	64	71	67	57	54	59	62 9
Centerville	Max	89	90	86	81	84	84	84	86	81	79	79	82	82	85	88	89	90	91	97	82	85	89	93	96	93	93	92	94	84	80	80	86.7
	Min	70	72	61	55	60	64	70	68	60	60	54	56	57	59	64	65	67	65	75	63	58	65	62	67	71	67	65	65	59	56	60	63.2
Charlton	Max	89	90	76	79	82	83	85	86	81	87	79	81	82	85	88	87	87	89	93	82	83	87	89	93	90	91	89	90	76	78	76	84 9
	Min	71	68	59	64	59	65	66	70	56	56	52	57	54	57	64	65	56	68	66	57	56	63	60	62	66	62	64	64	58	53	60	61 2
Charles C'y	Max.	89	88	74	83	37	89	90	82	72	76	81	83	87	87	93	89	92	94	91	76	87	85	89	93	83	88	91	89	71	78	73	84.8
	Min	67	71	60	50	57	64	67	70	54	48	48	54	52	51	61	64	64	69	72	54	57	59	59	65	62	53	67	59	51	49	52	59.0
Clarinda	Max	96	97	80	86	90	86	90	92	87	87	86	88	90	90	92	96	96	98	102	84	90	92	95	98	92	95	98	92	81	79	80	90.4
	Min	79	70	68	62	64	74	73	77	68	70	64	69	63	62	71	71	74	78	72	66	64	77	74	73	77	70	74	72	67	61	63	69 9
Clear Lake	Max	90	84	73	83	82	87	86	87	77	76	79	82	85	85	89	88	89	90	85	73	83	84	90	92	90	88	86	86	85	76	72	83.4
	Min	60	62	56	63	60	61	64	60	55	51	53	57	55	56	60	67	67	69	65	55	52	58	62	62	60	55	66	59	55	62	63	59.7
Clinton	Max.	93	93	81	86	87	89	88	88	84	80	83	86	89	91	93	92	93	93	99	85	86	91	94	95	89	90	92	93	81	82	81	88.6
	Min	69	72	64	55	59	62	65	66	59	55	48	51	53	56	66	66	65	68	68	65	58	59	61	65	69	58	65	65	57	56	58	61 3
College Sp's	Max.	94	96	79	84	89	82	87	83	81	79	83	84	85	82	89	91	91	94	92	81	86	90	92	95	90	95	98	83	77	79	80	86 7
	Min	70	64	60	57	60	67	61	61	60	61	58	59	57	52	65	65	66	71	61	18	57	67	67	65	68	62	61	64	60	55	58	61 9
Corning	Max	93	90	75	81	83	80	88	87	85	78	78	81	86	87	87	89	91	93	98	82	85	88	91	95	89	91	91	90	76	77	75	85 7
	Min	73	65	60	53	57	68	67	69	59	62	57	58	55	53	65	66	68	69	64	56	55	66	64	63	65	60	59	64	62	53	57	61.7
Co. Bluffs	Max.	93	81	82	84	86	81	..	..	..	83	83	85	87	89	88	92	92	96	94	85	83	91	93	95	90	96	93	89	88	89	80	88 1
	Min	77	63	60	58	62	69	69	65	63	61	64	63	61	57	65	67	67	72	64	57	63	70	69	68	65	60	70	64	58	64	64	64 5
Cresco	Max	87	86	73	82	81	84	87	83	78	77	80	83	86	88	91	90	92	93	84	76	82	85	90	92	83	88	92	88	64	79	70	83 7
	Min	61	62	58	54	58	61	68	65	54	49	52	55	56	56	64	64	66	68	64	55	53	60	59	62	55	68	63	52	48	53	58.8
Davenport	Max	90	91	78	83	84	87	82	86	82	78	80	82	86	87	90	82	90	89	96	83	83	89	91	97	89	88	91	90	80	80	79	86.1
	Min	74	75	64	59	63	66	72	70	62	58	59	59	60	61	69	72	73	71	68	66	64	60	66	68	72	65	65	71	60	58	62	65.5
Decorah	Max.	88	78	74	82	83	86	88	84	78	77	82	83	87	86	93	89	93	94	88	77	82	85	88	89	92	84	87	91	88	78	78	84.9
	Min	68	64	66	53	57	60	60	63	58	47	46	53	52	53	53	65	67	69	65	57	50	60	65	65	82	64	54	78	62	47	46	59.0
Des Moines	Max.	89	90	77	80	81	84	84	86	82	80	78	81	84	87	88	88	89	91	97	81	83	88	92	94	89	91	89	86	70	80	72	84.9
	Min	74	63	62	56	61	68	77	71	60	62	54	57	58	60	66	65	68	71	65	59	60	66	66	67	69	66	64	67	61	54	57	63.5
De Soto	Max.	90	89	77	82	83	84	87	85	81	80	80	82	85	86	90	92	92	94	99	80	85	89	92	96	87	94	90	85	71	80	74	85.8
	Min	76	65	62	52	73	66	72	70	58	62	54	54	54	54	63	65	69	69	72	60	55	67	63	64	68	60	66	67	62	53	57	62.9
Dows	Max.	89	86	75	84	83	86	86	84	80	79	80	83	86	88	89	90	91	93	92	76	85	89	93	95	87	90	88	85	72	80	70	85.0
	Min	63	63	50	54	56	62	68	67	51	50	47	52	51	52	59	60	65	69	69	50	50	50	58	59	60	57	62	57	51	48	53	51.4
Dubuque	Max	91	90	74	84	83	87	86	86	79	77	80	82	86	89	91	90	92	92	95	80	82	86	89	94	83	87	89	90	73	79	75	85.2
	Min	67	69	63	57	63	65	70	69	60	54	53	59	58	55	70	69	71	70	62	65	58	58	63	66	71	61	69	69	69	53	57	63.0
Eldon	Max	93	94	86	87	87	89	88	89	84	82	87	82	90	91	92	92	91	94	99	85	89	93	97	99	91	95	96	90	80	81	80	89.4
	Min	71	73	64	59	55	63	70	69	60	60	49	52	53	54	62	63	66	69	71	66	55	69	59	66	74	69	68	67	61	57	61	63 2
Elkader	Max.	93	93	77	87	86	90	92	89	83	81	85	87	90	92	95	94	91	95	93	84	87	89	95	97	87	92	92	92	70	83	79	88.4
	Min	61	69	60	53	57	59	67	46	53	46	45	49	51	49	60	59	64	70	65	57	51	56	55	61	65	55	64	64	50	50	52	56.9
Estherville	Max.	92	88	77	87	..	91	88	84	81	83	81	90	91	92	92	94	95	98	88	77	89	..	95	96	81	91	65	86	73	79	..	86 6
	Min	57	57	53	52	..	61	60	64	51	48	49	56	55	52	54	59	63	67	56	51	45	..	58	60	55	50	57	62	52	49	..	55 5
Fairfield	Max.	91	90	81	83	85	89	83	88	82	78	77	83	87	89	89	89	90	90	96	82	81	90	93	97	91	91	93	89	79	79	78	86 5
	Min	70	72	63	52	58	61	68	68	57	56	50	54	50	55	62	65	61	67	68	65	56	61	57	68	69	66	66	67	61	56	60	61.6
Fayette	Max.	91	90	74	84	84	87	84	..	81	78	84	86	88	90	92	92	93	92	93	77	83	85	89	92	83	88	88	88	72	80	76	85 5
	Min	63	66	61	52	56	57	65		56	48	45	51	52	48	60	68	68	67	18	56	52	60	54	64	62	56	61	63	51	47	51	57.3
Forest City	Max	87	79	74	81	80	81	88	81	77	78	78	82	85	86	88	87	88	89	85	75	83	88	90	90	89	88	87	84	75	78	64	82 7
	Min	57	62	55	53	53	62	68	66	64	53	51	64	56	60	65	62	65	68	65	53	60	60	62	63	59	54	61	55	55	52	53	59.4
Glenwood	Max.	93	87	86	83	86	80	87	85	81	80	80	82	83	85	86	90	89	94	97	81	86	81	90	94	88	94	93	88	75	76	72	85 5
	Min	72	62	54	49	61	69	67	70	59	62	57	60	55	53	62	63	68	72	68	53	55	68	65	64	66	56	69	62	60	52	56	61 6
Greene	Max.	95	90	78	90	89	94	93	87	81	85	87	92	93	95	97	95	97	96	88	80	88	92	93	96	86	96	88	88	78	81	75	89 1
	Min	62	64	60	53	56	63	68	69	52	48	48	52	52	52	60	63	67	69	64	54	52	58	59	64	62	55	66	60	52	49	54	58 3
Greenfield	Max	94	86	79	81	83	84	89	89	78	78	80	82	85	87	88	91	90	93	96	79	86	91	91	94	86	92	90	90	80	83	74	86 1
	Min	70	63	60	55	59	65	69	68	56	59	55	57	58	57	62	64	66	68	63	54	56	62	62	63	65	61	65	64	68	58	51	61 1
Grundy C'r	Max.	89	89	75	83	82	88	87	84	79	79	81	84	86	88	90	88	91	92	97	80	87	90	94	98	86	91	91	90	69	80	72	85 7
	Min	64	62	60	54	57	62	69	63	54	52	49	50	52	52	60	61	63	67	67	55	51	55	56	61	63	57	64	62	52	46	52	54.6
Guthrie C'r	Max	92	89	78	83	85	87	87	85	87	84	82	86	85	87	92	90	94	95	100	80	82	92	93	98	92	89	92	81	70	81	81	86.8
	Min	71	61	59	54	57	64	61	67	61	53	55	53	53	50	62	65	65	65	76	53	56	62	62	81	51	51	61	61	52	53	53	59.7
Hampton	Max.	91	88	75	84	83	89	87	85	81	82	83	85	90	90	91	90	92	93	90	77	86	90	94	95	86	90	89	87	68	78	64	85.6
	Min	62	62	59	58	58	64	67	69	58	57	50	55	55	54	62	65	65	70	70	55	53	58	58	64	63	57	65	61	54	52	55	59 7
Hopeville	Max.	88	89	73	77	81	79	85	85	79	77	77	79	83	86	85	87	89	91	91	79	83	87	89	93	87	90	89	86	74	75	75	86 3
	Min	72	65	60	58	60	66	69	70	59	60	56	57	59	59	66	67	67	69	68	58	58	60	66	67	67	63	65	67	59	55	60	63 0
Humboldt	Max.	91	87	76	87	84	90	88	84	79	81	82	87	88	89	92	93	93	95	90	78	88	92	94	98	88	94	86	85	83	79	70	86 7
	Min	64	60	57	53	56	66	67	68	53	53	52	58	54	52	60	61	66	71	70	52	52	60	62	62	60	52	64	57	54	53	56	58 9
Indep'nd'ce	Max.	88	92	90	90	84	88	87	86	81	77	80	83	87	89	90	90	92	93	95	78	83	86	92	94	92	89	90	90	73	80	78	86.7
	Min	63	70	71	70	65	64	69	67	54	51	47	50	54	55	63	62	63	64	63	58	55	57	58	62	61	60	67	63	53	47	53	60 1
Indianola	Max.	89	89	75	80	82	84	85	86	82	79	77	81	84	86	87	88	89	91	95	81	85	88	91	94	89	92	89	86	77	78	76	85.3
	Min	72	66	60	56	60	66	70	67	57	60	57	57	58	57	66	66	67	70	65	58	59	68	63	64	66	62	65	65	59	53	54	62.4
Iowa City	Max.	93	92	77	85	87	93	88	88	82	81	83	86	88	92	93	92	95	95	99	83	88	92	96	99	91	92	9	92	81	84	81	89.2
	Min	70	73	63	55	57	58	59	70	55	61	49	53	53	53	58	65	65	66	72	62	55	58	61	64	70	63	63	67	60	54	57	61.0
Iowa Falls	Max.	92	90	77	88	85	94	93	85	80	86	84	88	90	92	94	94	95	95	96	80	89	91	94	96	86	93	91	86	71	81	65	87.8
	Min	62	61	59	49	53	61	68	65	54	49	44	50	49	48	58	59	61	69	66	53	48	57	54	60	61	52	63	60	52	47	50	56.2
Keosauqua	Max.	92	92	82	84	86	87	82	86	81	77	82	85	86	88	88	91	88	91	97	85	86	91	95	97	92	93	95	91	78	79	78	87.3
	Min	71	74	67	56	58	65	71	70	61	60	52	55	55	57	64	69	72	70	76	70	69	60	61	68	72	70	68	69	64	58	59	64.6
Keokuk	Max.	95	91	86	82	84	86	82	86	83	78	79	83	85	87	88	90	91	89	94	83	85	88	91	97	93	87	93	87	83	77	79	86.5
	Min	71	76	67	60	62	65	70	73	65	60	60	63	62	64	68	72	74	74	76	67	67	66	68	72	74	70	74	69	68	62	63	67.7
Lamoni	Max.	89	91	75	78	87	82	84	85	79	76	79	80	81	83	92	91	92	93	95	82	84	88	90	94	..	..	..	..	..	..	..	85.7
	Min	71	69	60	57	57	67	67	70	59	59	54	57	58	63	62	63	65	65	60	56	67	62	65	..	..	..	..	..	..	..	..	61.8
Lansing	Max.	91	90	76	86	84	87	91	88	80	80	82	79	83	91	93	92	94	94	88	80	82	81	92	94	87	88	89	91	80	82	77	86.3
	Min	63	54	63	55	64	61	67	70	56	46	46	54	53	53	59	65	66	70	66	60	54	60	56	62	69	56	65	65	52	48	53	59.0
Larrabee	Max.	94	76	79	88	85	89	90	85	83	83	82	88	85	88	89	90	91	95	86	79	89	96	95	98	85	91	88	85	74	73	72	83.0
	Min	60	57	51	53	60	67	62	64	62	53	55	58	56	55	59	62	63	72	63	47	53	58	63	65	55	55	63	56	56	54	55	58.5
Le Mars	Max.	92	84	77	83	84	89	88	85	81	81	75	83	85	86	87	90	90	94	87	79	87	90	94	93	81	92	87	85	75	76	73	84.9
	Min	64	58	53	53	60	70	64	65	53	61	60	61	57	64	59	65	66	71	65	53	59	64	66	68	53	54	65	57	56	54	56	60.1

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JULY, 1898—CONTINUED.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	5	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Lenox	Max.	89	90	73	80	83	79	84	84	79	77	78	81	83	85	86	88	89	91	96	80	84	87	90	92	86	90	91	88	76	76	76	84 2
	Min	72	67	60	57	59	67	67	70	59	60	58	58	59	57	66	66	68	69	68	67	57	66	65	66	65	62	67	65	60	54	58	63.2
Linn Grove	Max.	92	92	74	86	85	90	88	87	82	80	82	86	88	90	91	90	92	92	98	81	85	87	93	94	87	90	93	93	78	82	78	87.2
	Min	70	71	61	56	60	59	70	67	56	53	52	54	55	55	66	67	66	67	65	59	57	57	62	64	70	60	68	64	57	52	56	61.2
Logan	Max	95	70	78	88	84	88	87	88	82	85	87	88	89	90	91	94	95	95	90	92	90	94	99	95	98	98	82	75	78	81	78	87.9
	Min	68	62	60	64	60	61	63	60	68	60	64	58	57	60	60	61	60	62	74	50	48	62	64	68	69	65	58	54	56	58	50	60 7
Maquoketa	Max	92	91	90	83	86	88	86	83	80	76	81	83	86	89	90	91	93	93	96	84	84	87	91	95	87	90	90	91	84	79	79	87.0
	Min	67	73	64	53	56	61	66	65	56	52	48	51	51	52	58	64	65	64	75	54	55	56	59	50	55	53	64	55	56	54	55	58.3
Marshallt'n	Max.	89	93	92	77	85	89	84	85	81	79	80	84	85	87	90	91	92	93	96	82	85	88	92	96	89	93	92	90	89	81	73	86.5
	Min	69	69	68	61	57	64	68	67	56	56	49	51	53	53	62	60	68	69	69	56	53	60	58	63	69	60	65	66	55	51	54	60.6
Mason City	Max.	90	87	74	83	82	90	87	86	76	76	81	83	85	85	90	89	91	91	86	79	85	86	89	92	83	88	89	84	69	78	61	83.1
	Min	62	70	57	54	54	56	65	69	53	51	50	53	53	54	55	63	62	68	69	54	51	58	60	60	60	54	54	56	57	51	53	61.7
Monticello	Max.	91	86	81	89	81	86	78	88	81	86	87	88	89	90	92	92	93	98	96	91	86	92	92	90	87	85	84	85	80	78	78	86.0
	Min	76	62	70	67	66	60	61	66	67	57	50	56	59	62	63	64	67	75	75	76	72	74	76	68	62	60	65	60	56	55	51	64.8
Mooar	Max	90	90	86	85	84	86	79	86	84	78	80	86	90	87	88	90	95	86	93	85	87	91	96	100	96	89	93	87	76	78	84	87.2
	Min	71	72	62	59	52	59	60	69	61	60	46	52	53	59	61	64	68	67	74	67	58	65	60	68	67	65	67	67	64	60	60	62.5
Mt. Ayr	Max	90	91	75	82	85	82	86	86	80	78	81	83	83	86	88	88	89	92	94	80	85	89	91	95	88	94	94	89	74	79	78	85.0
	Min	70	67	59	59	59	66	66	70	58	60	56	55	61	60	64	64	65	68	66	58	65	67	65	69	68	65	66	63	60	54	55	62.5
Newton	Max.	92	91	76	84	85	90	87	87	82	81	82	85	87	89	90	91	92	92	97	83	87	90	93	97	90	93	92	91	73	80	77	87 3
	Min	72	68	62	56	59	66	71	63	58	59	52	53	57	57	64	64	66	70	67	57	57	62	62	65	69	64	64	65	59	52	57	61 9
Neola	Max.	84	90	80	74	84	90	93	98	95	92	90	92	94	96	94	92	88	90	95	98	94	92	90	94	99	100	92	77	74	72	68	89.1
	Min	60	55	50	45	60	65	61	70	68	68	74	73	70	65	64	62	68	70	72	70	68	64	62	60	51	50	60	51	60	55	42	61.7
N. Hampton	Max.	86	65	70	75	75	85	86	82	77	77	78	81	85	86	91	90	89	91	78	77	80	84	88	91	83	86	88	85	75	77	72	81.7
	Min	61	60	60	65	60	66	67	71	66	51	51	53	66	71	72	64	63	67	67	54	65	58	64	64	63	60	63	61	59	47	55	61 7
Northwood	Max	89	87	73	84	81	82	90	81	76	79	82	86	87	87	93	9	91	92	87	77	85	89	91	94	88	89	91	84	73	79	79	85 0
	Min	60	60	55	54	53	60	63	61	54	50	48	51	53	54	60	60	68	67	65	49	60	57	60	60	58	53	60	54	50	51	49	56 7
Odebolt	Max.	92	89	80	89	86	90	92	89	85	86	84	89	91	92	91	96	93	97	96	86	91	97	100	99	90	99	96	86	82	83	76	90.0
	Min	66	58	55	51	54	67	56	65	55	57	53	56	53	50	58	62	63	70	77	60	55	56	61	60	62	52	63	56	56	55	55	58.6
Ogden	Max	90	89	77	82	83	87	85	85	81	79	80	85	85	87	90	91	91	94	99	81	86	90	93	97	87	92	89	80	69	81	63	85 7
	Min	72	62	59	53	59	65	70	69	55	57	50	57	57	55	55	63	66	70	75	51	55	61	63	63	64	60	63	64	59	52	56	60 4
Olin	Max.	92	91	90	75	80	83	87	86	86	81	76	80	83	85	83	90	90	92	93	97	80	83	86	92	95	88	89	93	93	78	79	86 5
	Min	62	62	63	53	57	60	68	66	55	53	46	51	51	55	61	64	64	69	73	62	53	53	60	63	73	58	65	65	54	53	55	59.6
Omaha, Neb	Max	92	81	77	82	84	80	84	86	81	81	79	82	83	86	85	89	90	95	92	82	85	88	89	92	86	92	90	88	76	75	71	84.6
	Min	75	64	60	60	65	68	69	71	65	66	64	63	63	61	68	68	69	73	71	60	63	70	71	71	69	64	71	66	59	59	60	66 0
Osceola	Max	88	90	75	80	82	81	86	86	80	78	79	82	83	87	86	88	88	91	94	81	85	90	91	94	89	92	90	88	74	77	75	84.8
	Min	71	68	60	57	59	64	69	70	58	59	52	52	55	55	63	66	64	69	69	58	56	64	63	64	69	62	64	66	59	54	60	61 9
Oskaloosa	Max.	93	93	76	83	85	90	88	87	81	79	82	86	87	89	92	92	92	92	98	81	88	91	93	99	91	95	95	88	76	79	80	87.8
	Min	70	69	60	53	56	65	69	58	59	57	48	49	51	53	62	65	66	68	67	59	53	61	58	63	68	64	65	64	57	53	59	60.3
Ottumwa	Max.	92	92	78	82	85	89	88	88	83	79	80	84	83	86	89	91	92	92	98	82	86	90	93	97	93	92	95	89	78	77	75	87.0
	Min	70	71	60	54	58	65	67	68	59	59	52	54	54	56	61	67	59	65	67	62	57	62	60	66	71	67	62	65	54	57	54	61.3
Ovid	Max.	87	88	78	82	82	79	85	88	83	80	77	81	85	86	86	88	88	89	98	83	85	89	91	95	94	92	89	91	75	81	77	85.5
	Min	71	71	60	55	58	64	69	70	56	55	52	55	56	55	63	65	67	68	74	57	56	64	62	65	66	63	64	65	60	54	58	61 9
Pella	Max	85	74	73	78	79	81	82	81	69	74	73	80	82	83	81	84	78	88	70	78	82	86	91	92	86	89	79	80	60	74	74	79 5
	Min	75	70	61	55	59	65	70	69	58	57	53	55	56	57	65	66	67	69	68	61	55	62	59	67	69	63	66	64	58	52	52	62.0
Pioneer	Max	90	83	79	88	81	90	91	83	80	84	80	89	90	91	93	93	92	95	90	81	90	95	94	98	84	97	87	86	76	76	69	86 9
	Min	66	73	56	57	61	66	70	63	54	54	52	65	57	58	65	66	65	71	72	53	57	68	67	68	62	58	63	59	56	58	56	61.8
Plover	Max.	96	90	85	82	88	92	90	82	88	80	82	90	90	90	93	93	95	95	92	80	90	94	95	97	84	96	90	80	88	84	78	88.7
	Min	65	80	54	50	55	60	70	65	55	64	52	55	60	53	64	60	65	70	72	54	50	60	58	65	58	55	63	55	52	56	52	59 6
Primghar	Max	88	88	78	83	84	87	90	86	83	85	82	86	86	86	88	92	90	94	92	82	86	90	95	95	84	90	90	85	86	86	86	87.2
	Min	60	56	54	50	57	64	64	56	56	55	58	59	59	58	64	64	65	72	65	48	58	60	60	63	57	60	64	59	54	54	56	59.0
Red Oak	Max	93	92	82	85	88	81	89	90	87	84	84	85	88	89	89	91	92	95	99	85	88	92	91	95	92	94	93	90	78	80	77	88 4
	Min	71	64	60	52	56	69	68	67	58	62	54	55	53	52	63	64	65	71	61	55	55	61	66	65	67	65	66	63	61	51	58	61 3
Ridgeway	Max	87	85	77	88	80	85	84	85	81	80	81	87	85	87	88	91	90	89	83	80	82	87	92	91	87	90	91	88	74	78	73	84 8
	Min	61	67	58	57	60	62	68	71	58	52	54	56	59	61	64	67	66	70	73	56	56	60	63	66	64	61	70	62	54	53	55	61 4
Rock Rap	Max	88	73	76	82	84	80	78	76	80	82	82	84	84	86	89	88	89	91	86	82	85	92	94	92	84	90	80	82	74	78	74	83 6
	Min	54	55	52	50	56	56	58	54	56	52	54	56	56	52	56	60	62	68	66	58	50	58	62	64	52	50	62	50	52	50	52	55 8
Rockwell C.	Max	91	86	78	87	85	90	87	85	81	80	83	86	87	88	94	95	94	96	94	80	85	90	94	95	84	94	90	87	70	81	69	86.6
	Min	64	60	56	54	58	64	69	69	51	55	50	57	54	53	56	62	62	70	73	50	52	58	62	61	62	56	63	59	55	51	56	58.8
Ruthven	Max	89	90	74	84	94	88	86	87	84	80	78	84	85	88	90	92	94	94	86	84	80	90	96	94	84	92	94	92	84	74	68	86 4
	Min	67	59	53	57	61	71	69	67	62	61	59	61	61	63	67	69	73	66	56	57	55	59	69	67	59	61	67	58	57	50	54	62.1
Sac City	Max.	83	73	75	81	82	85	83	81	80	78	72	76	83	82	83	88	90	91	88	78	84	89	93	94	84	90	86	84	83	76	67	82.8
	Min	65	59	55	59	58	60	61	60	59	58	50	53	59	50	59	60	60	61	59	51	54	59	61	63	61	60	60	61	59	59	57	58.4
Sidney	Max.	91	86	76	79	84	80	81	83	77	79	78	79	80	83	84	87	89	91	96	78	82	84	91	91	84	89	93	85	76	72	76	83 4
	Min	73	73	60	59	51	70	67	72	61	64	61	60	60	60	67	66	67	72	77	61	63	71	70	72	70	65	76	64	64	59	59	65 9
Sibley	Max	90	65	77	84	83	89	87	83	82	83	75	85	86	87	89	91	90	91	84	78	85	93	93	91	83	92	85	86	74	80	80	84.5
	Min	58	55	53	51	56	65	61	63	52	51	55	58	55	52	58	59	64	69	61	47	53	57	61	63	55	53	63	52	52	48	53	56.5
Sigourney	Max.	95	95	85	89	87	93	92	90	85	88	85	90	91	94	95	96	95	95	99	85	91	93	97	102	94	96	98	91	83	82	83	91.4
	Min	69	71	60	54	55	61	69	66	57	54	48	51	53	63	64	64	66	64	69	61	54	57	58	63	68	62	63	64	52	52	58	60.3
Sioux City	Max.	92	69	78	83	84	86	87	84	80	82	78	84	83	86	88	92	91	94	85	79	86	89	93	92	83	92	89	85	77	78	73	84 6
	Min	64	59	56	58	61	64	66	67	57	59	61	63	63	56	62	66	67	67	72	56	65	64	67	69	61	59	64	61	59	58	57	62.2
Spencer	Max.	90	79	80	86	84	89	91	86	85	85	75	89	85	89	91	91	90	95	86	80	86	95	93	95	84	92	88	85	77	79	83	86 5
	Min	60	58	56	52	55	63	63	65	54	51	52	58	54	54	59	61	61	69	59	50	52	56	54	61	56	52	62	55	55	50	52	56 7
Spirit Lake	Max.	89	76	79	85	82	90	90	83	83	88	86	87	75	95	97	92	93	93	90	80	93	95	98	95	85	92	88	87	73	85	70	86 8
	Min	58	58	54	65	65	64	67	64	55	52	53	58	56	53	61	63	65	70	61	51	54	67	65	65	57	78	65	67	57	54	54	60.5
Stuart	Max	90	68	80	82	82	85	87	85	80	82	82	85	85	90	92	92	93	90	90	90	82	89	90	95	92	96	93	86	77	80	67	85 7
	Min	72	60	60	58	64	65	70	58	60	55	57	60	57	65	67	67	70	75	74	57	58	65	65	62	58	61	62	65	60	65	56	63.0
Tara	Max	85	80	85	89	88	89	90	82	83	82	80	85	87	85	90	93	91	92	92	82	86	92	96	97	95	95	92	86	85	78	78	87.4
	Min	53	50	52	53	51	52	65	57	53	52	47	50	51	52	53	53	60	62	72	49	52	56	58	60	60	53	56	55	54	50	47	54.6
Toledo	Max	92	91	75	83	84	90	83	85	80	77	82	83	83	87	96	90	92	93	96	80	85	87	92	95	87	91	92	92	72	81	77	86.2
	Min	72	72	61	51	57	64	70	67	55	56	47	49	54	53	58	62	67	68	75	56	52	57	56	63	66	54	65	65	55	50	50	59.6
Thurman	Max.	91	88	80	83	86	81	87	85	84	81	79	81	83	84	85	88	88	94	96	81	83	88	88	91	88	90	93	86	76	73	73	85.0
	Min	74	63	60	50	62	68	67	71	60	62	57	61	56	53	34	65	69	72	62	57	57	69	66	66	69	58	68	63	63	53	57	62.6
Villisca	Max	89	90	76	80	83	80	86	86	81	79	80	83	84	85	85	88	88	92	94	81	85	89	91	93	89	92	91	88	79	71	75	84.9
	Min	72	72	60	51	53	69	66	68	56	61	50	56	50	53	60	61	63	71	76	50	52	65	63	60	62	56	68	62	56	51	56	60.3
Wapello	Max.	91	98	85	84	86	87	83	88	86	81	80	83	87	88	89	91	94	90	92	89	84	91	95	95	97	88	92	96	80	79	76	87.9
	Min	68	73	60	58	59	60	69	68	57	58	50	55	52	57	61	67	69	70	77	62	56	60	63	68	72	65	63	65	60	59	56	62.3
Washingt'n	Max	89	91	79	82	84	89	83	88	83	78	79	84	87	89	90	88	91	92	97	82	86	88	94	96	92	89	94	90	82	78	78	86.8
	Min	71	71	61	53	58	60	68	65	55	51	50	53	53	55	63	68	67	67	67	62	56	58	61	65	70	62	65	65	58	54	60	61.0
Waterloo	Max.	92	91	76	83	85	90	89	87	82	80	82	86	88	91	93	91	94	94	94	81	87	89	95	97	87	92	90	92	80	84	79	87.8
	Min	64	67	62	53	56	60	71	68	55	50	46	50	52	53	67	62	66	69	70	57	53	57	57	65	65	58	69	65	58	50	53	59.6
Webster Cy	Max.	90	88	78	85	82	89	93	89	81	83	82	86	88	89	90	94	91	94	94	80	86	90	92	97	88	92	89	85	74	78	69	86.6
	Min	66	65	61	55	58	65	71	70	56	55	52	56	57	55	65	64	65	70	73	56	55	63	62	64	65	56	67	63	59	53	56	62 2
W Branch	Max.	92	92	82	84	85	89	85	86	80	77	80	84	84	88	91	91	92	94	98	82	84	87	92	95	89	90	84	92	82	89	87	87.3
	Min	70	72	52	54	55	59	70	65	69	53	44	49	48	48	61	64	65	66	62	64	56	53	58	65	68	60	69	68	67	57	58	60.1
Wilton Jc	Max.	93	92	82	86	88	91	88	91	86	78	82	85	85	91	92	96	95	93	98	89	87	90	92	97	93	88	93	92	84	79	83	88.9
	Min	67	70	64	52	56	60	64	66	56	52	47	50	55	58	64	62	69	67	69	53	56	58	60	65	67	60	67	65	61	55	57	60.4
Winterset	Max.	89	90	76	81	82	80	86	80	81	78	79	87	83	85	88	89	89	90	95	86	82	87	96	93	81	91	89	87	75	80	75	84.9
	Min	70	69	57	52	54	62	67	67	55	58	49	51	53	54	61	65	62	66	74	53	53	61	60	64	64	58	61	62	66	56	55	59 9

RAINFALL AND MONTHLY PRECIPITATION FOR JULY, 1898.

STATIONS.	DATE.																															Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Adair	....	.50	....	....	....		....	....	....	..	....	....	....	....	....	....	....	....	....	T	....	....	....	....	....	.86	1.10	08	.12	....	....	2.66
Afton	....	.26	.25	....	....		..	T	....	....	....	....	....	....	....	....	....	....	.25	..	T	....	....	....	....	....	1.09	....	.24	..	.58	2.67
Algona	....	40	..	....	....	.08	....	....	....	....	....	....	....	..	....	..	T	....	..	..	....	....	....	T	....	.25	....	....	.37	....	.30	1.40
Alta (Hadden)	..	.52	..	..	....	....	..	..	T	..	.10	....	....	..	....	..	..	....	..	..	....	....	....	.0.	....	.29	..	.40	....	26	.70	2.32
Alta (near)	...	.55	....	....	....	....	....	....	....	.02	.53	....	....	....	....	..	..	....	....	....	....	....	....	.06	....	..	.23	....	.39	.10	.60	2.88
Albia	...	1.56	....	....	....	....	.42	.07	....	....	..	....	....	..	....	..	....	....	.32	....	....	....	....	....	....	....	1.32	T	.75	....	.22	4 64
Amana	...	T	.68	....	....	....	T	T	....	....	..	..	....	..	..	..	.21	.27	34	13	....	....	....	....	....	....	.05	..	.71	.01	.26	2.66
Ames	...	.2(	..	..	....	....	.6.	....	....	....	....	....	....	....	....	..	....	..	.0.	....	....	....	....	.06	....	....	.27	....	.09	..	.36	1 10
Ames (near)	....	.10	....	....	....	....	..	.	....	....	..	.	....	....	....	....	....	....	.07	....	....	....	....	T	..	....	.10	....	.02	..	.03	.52
Atlantic	..	.74	....	..	....	T	....	....	....	....	.	....	....	..	....	....	....	..	T	..	....	....	....	....	....	....	1.4.	.08	.32	..		2.60
Audubon	....	....	....	....	....	....																					3 70		.32	..	.32	4 34
Belknap	..	...	.05	..		...	.90	.10	....	....	....	..	....	....	....	....	....	....	..	.10	....	....	....	....	..	....	.10	1 90	.05	.10	....	3.50
Belle Plaine	....	.50	.50	..	....	....	....	.20	....	..	....	....	....	....	..	....	.10	T	.50	..	..	.20	....	.30	..	....		..				2.30
Bonaparte	..	....	....	....	..	....	1 48	....	....	....	....	....	....	....	....	....	..	.28	34	..	..	....	....	....	....	....	.93	....	.25	....	16	3 15
Britt	.07	..	....	....	....	.04	....	T	..	..	....	....	....	....	....	....	....	....	.18	..	..	....	....	T	....	....	.18	T	.28	T	.24	1 27
Carroll	..	....	T	....	....	....	....	.27	T	....	.10	.05	....	..	..	....	....	.28	T	..	..	....	....	..	....	....	1.55	T	2.	T	.41	2.61
Cedar Falls	...	.35	....	....	....	....	....	....	....	....	....	....	....	..	..	....	....	....	.95	....	....	....	....	..	....	....	....	....	T	....	.75	2 05
Cedar Rapids	..	1.19			....	T	T	17	....	....	....	....	....	....	....	....	T	T	.33	....	....	....	....	..	....	....	T	....	15	....	06	1 90
Centerville	....		.20	....	....	....	1 80	....	....	....	..	..	....	....	....	..	....	....	.19	.03	....	....	....	..	.05	..	.74	.44	.10	..	02	3 63
Chariton	....	.75	1 60	....	..	01	1.55	03	....	....	....	..	....	....	....	..	....	....	.89	.02	.03	....	....	....	....	....	.82	11	.46	.03	1.14	6 94
Charles City	:15	.32	....	....		55	T	....	..	..	....	....	....	....	....	..	....	T	1.37	....	....	....	....	....	....	....	T	....	.09	....	.50	2 88
Clarinda	..	.40	....	..		....	.69	.10	.	....	....	....	..	..	....	....	..	....	38	....	....	....	....	....	1.18	..	1.47	....	2	.05	.	4 49
Clinton	....	....	....	..	.	....	....	.07	..	..	....	....	....	....	....	....	..	....	.85	....	....	....	....	....	.35	..	1.	03	.4	....	.04	1 89
Clear Lake	.	.28	.			3.15	....	....	....	....	..	..	..	....	....	....	....	.38	.48	....	..	....	....	....	....	....	.22	....	.35	....	.28	5.14
College Springs	...	.13	.20		.	1 70	2.95	.13	..	....	..	..	..	....	....	....	....	....	3.	..	..	....	....	....	....	....	2 4.	.35	....	....	..	8 26
Corning	...	.45	....	....	....	.12	....	.10	....	....	.	....	....	....	....	....	....	....	.22	....	....	..	....	....	.47	....	.35	..	.6	....	....	2.31
Council Bluffs	....	.06	....	..	..	2.90	....	....	....	..	.02	05	..	..	....	....	....	....	....	....	....	..	....	....	....	....	.12	.05	.48	..	....	3 68
Cresco	....	.77	..	....	..	.66	....	..	....	....	....	....	....	....	....	....	.48	.69	....	....	....	....	....	....	....	....	....	....	.14	....	.17	2.91
Davenport	..	....	....	....	....	....	T	.22	....	....	....	.	....	....	....	....	T	....	....	.56	....	....	....	....	....	.08	....	....	....	....	T	1.85
Decorah	.41	.35	....	..	..	..	....	....	....	..	..	....	....	..	....	....	.11	.90	....	....	....	....	....	....	....	....	.04	.68	.10	.17	1.27	3 04
Delaware	..	75	..	.		....	....	....	..	....	..	....	....	....	....	....	T	.59	..	....	....	....	....	....	....	....	....	....	....	....	.11	1.45
Des Moines	..	.44	.13	..	..	....	.25	....	....	....	..	....	....	..	....	..	..	.24	....	....	....	....	....	....	....	....	.64	T	.10	....	06	1.86
De Soto	..	.51	....	....		..	.03	.08	....	....	T	....	....	..	....	....	....	.34	....	....	....	....	....	....	....	....	1.14	.02	.04	.20	.10	2 46
Dows	..	.39				.03			....	....	..	....	....	....	....	....	....	.14	....	....	....	....	....	....	....	....	.61	.02	.12	.05	.41	1.75
Dubuque	.02	....	.51	..		....	T	.02	....	....	....	....	....	..	....	....	T	1 06	1.17	....	....	....	....	....	....	....	.04	....	T	.01	T	2 83
Eldon	....			.		..	.85	.03	....	..	..	....	....	..	....	....	....	....	....	11	..	....	....	....	....	....	46	.57	.07	.04	05	2 18
Elkader	..	.80	....			....	....	.	....	..	....	....	..	....	....	..	....	2 50	..	....	....	....	....	....	....	....	T	.	.20		.05	3 55
Estherville	..	2 30	..			.25			..	....	..	....	....	..	....	....	....	.10	..	....	....	....	....	1.70	....	....	....	....	.39	.05	60	5.39
Fairfield	....		....		..	..	1.03	.16	....	....	..	....	....	..	....	....	T	....	.06	.07	....	....	....	....	.80	....	.38	.14	.04	.12	.04	2 84
Fayette	...	47	.17	....	....	.04		..	..	....	....	....	....	....	....	....	.22	.09	.46	2.00	....	....	....	....	....	....	....	....	.07	....	.94	4.36
Forest City	....	.22	....	....	..	.70			....	....	..	....	....	..	....	....	....	.15	.53	....	....	....	....	T	..	..	....	T	.30	..	.24	2.14
Ft. Madison	..		....	..	....		1.75	..	....	....	....	....	....	....	..	....	....	T	.40	....	....	....	....	....	....	....	.24	..	.24	T	....	2.63
Glenwood	....	T	....	..	....	1.86	2.20	..	....	T	T	....	..	....	....	....	....	....	.11	....	....	....	....	....	....	....	1.68	T	....	....	....	5.85
Grand Meadow	.45	.60	.05		....	....	....	....	....	....	....	....	....	..	....	....	.02	.10	1.95	....	....	....	....	....	....	....	....	....	.03	....	.82	4.12
Greene	....	.26	..	..	....	.15	....	....	....	....	....	....	....	..	..	....	....	T	2.70	....	....	....	....	....	....	....	.15	.	.18	....	.23	3 67
Greenfield	....	.26	.17	....	..	17	T	f	..	....	..	....	....	....	....	....	....	....	.38	....	....	....	....	.02	.02	....	.95	.07	.46	....	.16	2.63
Grundy Center	....	.24	.10	.	.	T	....	....	....	....	....	..	....	....	....	....	....	....	.26	....	....	....	....	....	....	....	12	T	T	....	.60	1 32
Guthrie Center	....	.45	....			..	..	T	....	....	T	....	....	..	....	....	....	....	T	..	....	....	....	T	....	....	.12	T	.24	T	.26	3.07
Hampton	....	.20	....			T	....	....	....	....	....	....	....	..	....	....	....	....	.53	..	....	....	....	....	....	.25	..	T	.22	....	20	1 46
Hawkeye	..	.47	33			.30	....	.	....	....	....	....	....	....	....	....	.29	....	....	1 81	....	....	....	....	....	....	T	....	.25	....	55	3.95
Hedrick	....	....	....			....	.41	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	.34	....	.87	....	.70	2 32
Hopeville	..	.89	....			f	.22	.13	....	....	....	....	....	..	....	....	T	.20	....	T	....	....	....	.25	....	6.	T	.41	.14	..	3 92
Humboldt	..	08	....		..	....	....	....	....	....	....	....	....	..	....	....	....	.11	....	....	....	....	....	....	....	.40	.10	.21	T	.32	1 22
Independence	..	.25			..	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	T	....	.40	1 66
Indianola	..	.40	.46	T	T	....	.05	T	....	....	....	....	....	....	....	....	.01	1 00	15	....	....	....	....	....	....	....	....	....	....	.02	2.86
Iowa City	..	.45	....		..	....	....	69	....	....	..	....	....	.	....	....	....	04	38	....	....	....	....	....	.82	.29	.12	.20	.3.	....	.03	2 27
Iowa Falls	..	.52		..		....	....	....	....	....	....	....	.	....	....	....	....	....	.12	....	....	....	....	....	.43	..	05	..	.20		.48	1 73
Keokuk	..	..	....	....		....	1 85	T	....	..	....	..	..	..	....	....	....	..	..	.46	....	....	....	....	....	T	T	.43	.11	.21	....	3 06
Keosauqua	..	..	..	..		T	.91	.09	....	..	....	....	....	....	....	T	....	....	....	28	....	....	....	....	.16	....	.84	..	.05	.74	....	3 07
Lamoni	....	....	.89	..		.06	.70	....	....	....	....	....	....	T	....	T	....	....	.87	01	....	....	....	....	....	....	....	..	....	....	....	2 53
Lansing	.43	.54				....	....	....	....	....	....	....	....	..	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
Larchwood	..	48		..	12	....	04	....	18		.75	....	....	..	....	..	..	84	.90	.08	....	....	....	....	....	....	....	....	.05	....	28	3 12
Larrabee	....	.47		..		T	....	.12	.10		.39	..	..	..	....		....	....	.32	..	....	....	....	.32	..	....	....	....	.54	.45	....	3.20
Le Mars	..	24	..			....	....	25	..		63	.17	..	..	....		....	....	07	..	....	....	....	1.86	....	.63	....	T	.53	.48	.41	5.06
Lenox	..	.29	30			.07	82	.04	..	....	....	....	..	..	....	....	....	....	12	..	..	....	....	.33	....	..	.20	..	.55	....	.85	3 34
Linn Grove(Mt. V)	.	1.62				....	.20	..	..		....	....	..	..	....	....	....	....	.09	....	....	....	....	....	.65	..	.55	.02	.28	..	....	3.11
Logan	..	.43			35	....	....	....	....	..	.15	..	..	..	....	....	T	T	1.06	..	....	....	....	....	T	..	.01		.15	..	.14	3 18
Maquoketa	..	..	.01		..	....	.96	....			....	..	..	....	T	....	.03	....	..	.58	....	....	....	....	....	..	.03	..	.19	..	.35	1.50
Marshalltown	..	..	.33	.		.87	.26		....		....			....			....	....	.40		....	....	....	....	....	..	.28	.31	.20	.34	.02	2 45
Mason City	.40	....	....			1 10	.	....	....	....	....	..	..	....	....	..	.45	.42		....	....	....	....	....	....	....	T	....	.42	.11	....	2 67
Milliman	..	.50	.17			.	.17	....	....	....	....	....	....	....	....	..	....	.34		....	....	....	....	....	....	....	58	T	T	.08	....	1 84
Mooar	....	....	....		..	..	1.16	T	....	....	..	..	..	....	....	....	....	....	....	.36	....	....	....	....	....	....	....	.50	.20	.13	T	2 35
Monticello	..	....	....	....	.	....	....	....	....	....	..	.	..	....	....	....	....	....	....	.68	....	....	....	....	....	....	95	....	.02	..	.06	1 71
Mt. Ayr	..	1 05	.38		....	.11	1.41	..	....		....		....	....	....	....	....	....	.35	..	T	....	....	....	....	....	.20		.19	....	....	3.69
Mt. Pleasant	..		....	....	..		1.14	.10	..		....		....	....	....	..	..	....	.20	....	....	....	..	.07	..	.73	..	.15		10	2 49
Mt. Vernon	....	.15	1.00		..		....	.75	....	....	....	....	....	....	....	..	..	....	.40	....	....	....	..	....	....	....	....	.70	..	20	3 20
Neola	..	..		T	....	20	....	..	....	....	....	....	....	....	....	..	..	....	....	....	....	....	....	....	T	1 20	.50	....	..	T	1.90
New Hampton	24	.10			....	.71	....	....	....				....	....	....	..	..	....	1 70	..	....	....	..	....	....	....	....	....	..	.17	3 05
Newton	..	.16	.30			..	.18	..	....		..	....	....	....	....	..	..	....	.15	....	....	....	....	....	....	....	.49	..	.15		....	1.43
Northwood	.08	.22	....		.	.58	....	....	....	..	....	....	....	....	....	..	..	....	.32	..	....	....	....	....	....	....	.18	..	.14	....	.28	1 80
Odebolt		.37		..		....	..	.07	..	..	.20	.14	..	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	.30	.32	1.80	5.05
Ogden		..	.02			....	....	08	....	....	....	..		..	....	....		....	.19	....	....	....	....	....	1 85	..	.86	..	.13	.02	.43	1.69
Olin		52				....	....	....	....					..	....	....		....	.25	....	....	....	....	.12	..	....	T	....	47		.27	1 51
Omaha (Neb.)	....	.02	.01	....	....	3.55	.01	..	....	T	....	.14	..	..	....	..	....	....	T	..	....	....	....	....	....	....	T	T	.42	..	.05	4 29
Osage	.16	83		..	..	87	....	.	....		....		..	....			.01	.37	....	....	....	..	....	....	....	....	.02	....	.18		41	2 85
Osceola		1.60	.58	..	....	T	.36	T	....	T	....	....	..	....				.09		T	....	....	....	T	....	1.38	T	.53	..	.23	4.77
Oskaloosa	.50	.94	..	..	..	..	.10	.	....	..	..	..	..	....	....	..	....	.30	..	....	....	....	....	....	....	1.00	T	....	....	.50	3.44
Ottumwa	..		..	..	.	....	..	..	..	..	..	....	....	..	..	.10	....	....	....	....	....	....	....	....	....	1 65		.44	1.10	3 52
Ovid	..	.57	.90	....	..		2.45	.	.04	....		....	....	....	....	..	..	.33	....	....	....	....	....	....	....	1 42		.34	T	.22	6 29
Pella			.71				....	.	..		..			....	....	..	....	....	.35	....	....	....	....	....	....	....	42	.20	.21	....	1 00	2.89
Pioneer	..	T	....	.			....	....	..		..			..	..	..	....	....	....	.26	....	....	....	....	....	....	20	T	T	T	.35	.55
Plover	....	.51	..	..		65	....	....	..		..		..	..	....	....	T	T	....	....	....	....	T	....	....	....	....	....	....	....	.36	3.30
Primghar	.30					.90	....	....	..		..		..	..	....	..	.04	....	....	....	....	....	.13	....	....	.80	.06	50	.25	.36	3 30
Red Oak	.	.70	.06	....	....	.23	.15	..	..	..	.30	..	..	..	....	.	....	....	10	....	....	....	2 25	....	....	....	....	....	....	....	.07	4 52
Ridgeway	..	.61				1.00	....	..	..	..	T	..	..	T	..	..	T	.57	....	....	....	....	....	....	....	1.23	....	43	..	T	3.37
Rock Rapids	T	.34			.	.24	....	..	T	..	..	..	.34	....	....	....	.78	.80	....	....	....	....	....	....	.02	.01	..	13	..	.29	3 64
Rockwell City	....	.07				....	....	....	..	....	....	....	....	..	..	..	....	....	....	....	....	....	....	....	....	....	.63	..	40	1 95
Ruthven	....	.40	.05		.	.34	....		....	..	....	.25	....	....	....	....	....	T	....	....	....	....	....	....	25	85	.20	..	.75	2.12
Sac City	....	.25	....	....	..	....	....	....	.10		.10	..	....	..	..	....	40	....	T	....	....	....	.88	....	....	.30	..	.44	.08	60	3.74
Sibley	....	.84	....	..	....	.27	....	.05	....		.03	..	....	..	..	....	....	..	....	..	....	....	....	T	....	.35			25	.50	1.55
Sidney	....	.05	.70		....	6 00	....	....	....	.02	.01	.	..	..	....	....	..	..	.22	....	....	....	....	....	....	.25		60		.43	2.69
Sigourney	....	....	1.27	.	..	....	.78	....	....	....	..	..	..	..	21	.	..	....	.24	.31	....	....	....	....	....	2.56	.10		15		9.90
Sioux City	....	.26	....		....	....	....	.03	T	.01	.07	.01	..	..	..	..	....	....	04	..	....	....	....	....	....	.45	.06	40	.	.45	3.86
Spencer	....	.27		....	....	.37	..	.02	....	....	.02	.22	..	..	..	..	....	....	.35	..	....	....	....	08	....	1.14	....	.5	.09	.45	2.78
Spirit Lake	....	.50	..	..	....	.30	....	..	....	..	....	.10	.	.	....	....	....	....	.34	..	....	....	....	21	....	1.38	.05	.49	.30	41	4.09
Stuart	.	....	..	....	..	.	....	....	....	....	....	....	.	....	..	....	1 00	....	....	....	....	....	....	1.23	....	....	....	.19	30	.50	3.46
Tara	....	....	..	....		..	..	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	2 60	.55	....	....	....	....	4.15
Toledo	....	.51	..	..	..	..	.49	.02	....	....	....	....	....	....	..	....	....	12	....	....	....	....	....	....	....	.40	..	....	....	.50	.90
Thurman	....	.27	25	....	..	4.32	5.38	.05	....	T	....	.14	....	....	....	....	....	.55	....	....	....	....	....	....	....	.17	..	.05	....	....	1.36
Villisca	....	.65	.07	....	..	.07	..	....	....	....	....	....	....	....	....	....	....	.31	....	....	T	....	....	....	....	1 75	..	.06	.11	T	12.88
Vinton	....	.75	.	....	.	....	....	....	....	....	....	....	....	....	....	....	....	.10	....	....	....	....	....	....	....	1 01	....	.14	....	....	2 25
Wapello	....	....	....	....	..	....	.08	.46	....	....	....	....	....	....	....	....	....	.26	....	....	....	....	....	....	....	T	....	....	....	....	....	.85
Washington	....	..	....	....	....	....	.20	....	....	....	....	....	....	....	....	....	....	22	....	....	....	....	....	....	.16	..	....	.28	....	.05	1.29
Washta	....	.70	....	....	....	....	.02	....	T	....	.30	.10	....	....	....	..	....	T	....	..	....	....	....	..	T	10	....	90	....	.25	1 67
Waterloo	....	.24	.09	....	....	T	....	....	....	....	....	....	....	....	....	....	T	32	....	..	....	....	.08	....	....	57	..	.38	.42	.47	3.04
Webster City	....	.25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	T	....	....	....	....	....	....	....	09	....	.05	....	.87	1.66
West Bend	....	.47	....	....	....	.25	....	....	....	....	....	....	....	....	....	....	.16	.24	....	....	....	....	.06	.21	T	.35	.20	10	T	.45	1.35
West Branch	....	....	.54	....	....	....	T	.02	....	....	....	....	....	....	T	....	....	....	....	31	....	....	....	.02	....	03	....	.22	T	....	1.14
Whitten	....	.30	..	....	....	....	....	....	....	....	....	....	....	....	....	..	....	.35	....	....	....	....	....	....	....	.38	....	T	T	.35	1.38
Wilton Junction	....	.10	....	....	....	....	....	.20	....	....	....	....	....	....	....	....	....	.65	....	....	....	....	....	....	....	.75	....	.61	..	.07	2.98
Winterset	....	....	.98	....	....	....	.40	....	2.70	....	....	....	....	....	....	....	....	....	.36	....	....	....	....	.60	....	2.20	.20	.03	.88	.03	7.79

METEOROLOGICAL DATA FOR JULY, 1898.

NORTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT)								PRECIPITATION, IN INCHES.			Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	Number of hail storms.	No. of thunder storms.
	Monthly mean.	EXTREMES. Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.	Monthly range.	Monthly.	Greatest daily.	Total snowfall.							
Algona *	74 3	.....		93	25	57	31	36	1.40	.40	....	SE	16	15	....	6	....	2
Alta	72 8	85 0	60 6	93	24, 23	53	3	40	2.32	.70	.....	S W	21	7	3	7	....	3
Britt	71 2	86.2	51 1	97	24	48	10, 11	49	1.27	.23	....	S	6	25	....	7	....	....
Charles City	71.9	84.8	59.0	94	18	48	10, 11	46	2.88	1.37		SE	26	1	4	6	....	....
Clear Lake	71.6	83 4	59.7	92	24	51	10	41	5 14	3.15	.....	SE	23	8	....	7	....	1
Cresco	71.2	83.7	58.8	93	18	48	30	45	2 91	.77	....	SW	23	6	2	6	....	5
Decorah	72 0	84.9	59.0	94	18	46	11, 31	48	3.04	1 27	....	.....	.....	.....	.....	5	....	....
Dows	71.2	85.0	57.4	95	24	47	11	48	1 75	.61	....	SW	17	8	6	8	....	2
Elkader	72 7	88.4	56.9	97	24	45	11	52	3.55	2 50	....	SE	22	7	2	4	2	3
Estherville b	71 0	86 6	55 5	98	18	45	21	53	5.39	2 30	....	S	....	....	....	7	....	....
Fayette a	71 4	85.5	57.3	93	17, 19	45	11	48	4.36	2 41	....	S W	23	5	3	9	....	4
Forest City	71.0	82.7	59 4	90	24, 25	51	11	39	2.14	.70	.....	S W	19	7	5	6	....	....
Grand Meadow *	70.1			90	18, 23	56	10, 11	34	4.02	1 95	.....	SE, SW	19	9	3	8	....	....
Greene	73 7	89 1	58.3	97	15, 17	48	10. 11	49	3.67	2.70	.....	S	22	7	2	6	....	1
Hampton	72.6	85.6	59.7	95	24	50	11	45	1.46	.53	.....	S W	18	12	1	5	1	2
Humboldt	72.8	86 7	58.9	95	18	52	10, 14	43	1.22	.40	....	SE	25	6	....	6	....	1
Lansing	72 6	86.3	59.0	94	17,18,24	46	10, 11	48	3.12	90	....	.....	19	10	2	7	....	4
Larrabee	70.8	83.0	58.5	98	24	47	20	51	5.06	1.86	....	S W	12	19	....	10	....	....
Le Mars	72.5	84.9	60.1	94	18, 23	53	3, 20	41	3.34	.85	.....	S	20	9	2	9	....	....
Mason City	72.4	83 1	61 7	92	24	50	11	42	3 02	1 10	.....	.....	.....	.....	.....	5	....	....
New Hampton a	71 7	81.7	61 7	91	15, 18	47	30	44	3 05	1.70	....	SW, NW	23	5	3	6	....	....
Northwood	70.8	85 0	56.7	94	24	48	11	46	1.80	.58	....	S	26	1	4	7	....	1
Osage †	71.0								2.85	.87	....	S	11	14	6	8	....	5
Pioneer c	74.4	86 9	61 8	98	24	52	11	46	.55	.35	.....	S	23	1	7	2	....	2
Plover	74 2	88 7	59.6	97	24	50	4, 21	47	3.30	.80	.....	S	25	3	3	9	....	....
Primghar	73.1	87.2	51.0	95	23, 24	48	20	47	4.52	2.25	.....	.....	.....	.....	.....	6	....	....
Ridgeway	73 1	84.8	61.4	94	21	52	10, 30	42	3.64	1 00	....	S W	19	11	1	8	....	7
Rock Rapids	69.7	83 6	55.8	94	23	50	4, 30	44	1.95	.63	....	S	15	15	1	5	....	....
Ruthven	74.2	86.4	62 1	96	23	50	30	46	3.74	.84	.....	S W	19	2	10	10	....	....
Sibley	70 5	84 5	56.5	93	23, 23	47	20	46	2 69	.84	.....	S	15	15	1	8	....	....
Spencer	71.6	86 5	56 7	95	18, 23	50	20, 30	45	4.09	1.38	....	S	16	13	2	12	....	..
Spirit Lake	73 6	86.8	60.5	98	23	51	20	47	3.46	1.23	....	S W	22	7	2	8	....	....
West Bend *a	71 4			96	23	54	31	42	2.93	.76	.....	S	12	15	4	10	....	6
Average	72.1	85 4	58.9	94.5	.....	49.5	...	45	3.02	.....	....	S, SW	19	9	3	7	....	....

CENTRAL SECTION.

Amana	74 3	87 1	61.5	96	19, 27	47	11	49	2.66	.71	.....	S	22	7	2	9	....	7
Ames b	73.4	87 5	59.4	100	24	42	11	58	1 10	.36	....	.....	20	9	2	7	....	....
Audubon	72.8	85.1	59 6	93	24	48	4, 5	50	4 34	3.70	....	S	17	7	7	3	....	....
Belle Plaine	71 8	85.1	58 6	100	16	45	11	55	2.30	.50	....	SE	14	16	1	7	....	....
Carroll	73.3	87.1	59.5	95	24, 25	48	20	47	2 61	1.55	.....	.....	20	7	4	6	....	....
Cedar Falls	74 4	88 2	60.7	97	24	47	11	50	2.05	.95	.....	S	26	3	2	3	....	....
Cedar Rapids	75.4	88.0	62 9	100	19	52	11	48	1.90	1.19	....	S	24	5	2	5	....	....
Clinton	75 0	88.6	61.3	99	19	48	11	51	1.89	.85	.....	NE	21	7	3	7	....	1
Davenport	75.8	86.1	65 5	97	24	58	30	39	1 85	.72	.....	S W	20	8	3	7	1	5
Delaware †	72.0	.....	...	96	19	51	11	45	1.45	.75	.....	S	17	12	2	3	1	....
Des Moines	74.2	84.9	63.5	97	19	54	11, 30	43	1.86	.64	.....	S	22	8	1	7	...	6
De Soto	74.4	85.8	62 9	99	19	52	4	47	2.46	1.14	.....	S W	19	12	.....	9	...	5
Dubuque	74 1	85 2	63 0	95	19	53	30	42	2.83	2.23	.....	S	24	4	3	7	1	4
Grundy Center	70 2	85.7	54.6	97	19	46	30	51	1.32	.60	.....	S	23	4	4	5	....	....
Guthrie Center	73.2	86.8	59.7	100	19	50	14	50	3.07	2.12	.....	NE	17	9	5	4	....	1
Independence	73.4	86.7	60.1	95	19	47	11. 30	48	1.66	1 00	.....	SE	25	5	1	4	....	....
Iowa City	75 1	89.2	61 0	99	19	49	11	50	2.27	.69	.....	S W	12	17	2	8	....	....
Iowa Falls	72.0	87 8	56.2	95	24,19,24	44	11	52	1.73	.61	.....	S	23	3	5	4	....	....
Linn Grove	74.2	87.2	61.2	98	19	52	11, 30	46	3.18	1.62	.....	SE	25	3	3	6	....	....
Logan	74.3	87.9	60.7	99	24	48	21	51	1.50	.43	.....	S	23	8	.....	6	....	....
Maquoketa	72.6	87.0	58.3	96	19	48	11	48	2.45	.96	.....	SE	22	6	3	7	....	....
Marshalltown	73.6	86.5	60.6	96	19, 24	49	11	47	2.67	.87	.....	.....	15	14	2	7	..	1
Monticello	75.4	86 0	64.8	98	19	50	11	48	1.71	.95	.....	SE	28	.....	3	4	....	..
Mt. Vernon*	75 5		.....	95	24	58	30	37	3.20	1.00	....	.....	.....	.....	.....	6	....	....
Newton	74.6	87.3	61.9	97	19, 24	52	11, 30	45	1.43	.49	....	SE	20	10	1	6	....	....
Odebolt	74.3	90.0	58.6	100	23	51	4	49	5.05	1.85	.....	.....	25	1	5	8	....	....
Ogden	73.0	85.7	60.4	99	19	50	11	49	1.69	.86	.....	SE	24	1	6	8	....	1
Olin	73.0	86.5	59.6	97	20	51	11, 12	46	1.51	.52	.....	S	22	9	.....	4	....	....
Rockwell City	72.7	86 6	58 8	96	18	50	11	46	2.12	.85	.....	.....	24	6	1	5	....	....
Sioux City	73.3	84 6	62.2	94	18	56	20	38	2.78	1.14	.....	S	16	8	7	11	....	....
Sac City	70.6	82.8	58 4	94	24	50	11	44	1.55	.50	.....	S W	16	11	4	6	....	....
Tara	71.0	87.4	54 6	97	24	47	11, 31	50	.90	.50	.....	S W	9	22	.....	2	....	....
Toledo	72 9	86.2	59.6	96	15, 19	47	11	49	1.36	.51	.....	S	23	.....	8	6	....	....
Vinton *c	73.6	.....	.....	96	19	56	14	40	.85	.75	....	S W	30	1	....	2	....	....
Waterloo	73 7	87.8	59.6	97	24	46	11	51	1.66	.87	.....	S	21	8	2	6	....	....
Webster City	74.4	86 6	62.2	97	24	52	11	45	1.35	.45	.....	S E	17	10	4	5	....	....
West Branch c	73.7	87 3	60.1	98	19	44	11	54	1.14	.54	.....	S W	26	4	1	6	....	....
Whitten *	74.0	.....		96	23	52	31	44	1.38	.38	.....	S W	20	6	5	4	....	3
Wilton Junction	74.6	88.9	60.4	98	19	47	11	51	2.98	.75	.....	S	23	2	6	7	....	2
Average	73 6	86.8	60 4	97.2	.....	49 6	...	47.6	2.10	.....	.....	S	21	7	3	6	....	....

SOUTHERN SECTION.

Afton	75.4	89 1	61.7	101	19	53	10	48	2.67	1.09	.....	S W	13	17	1	6	...	....
Albia	74 0	87.4	60.7	98	7	52	11	46	4.66	1.56	.....	S E	24	4	3	7	...	6
Atlantic	71.8	85.7	57.9	98	24	47	14	51	2.60	1.48	.....	S	.....	.....	....	4	....	5
Belknap	75 2	85.7	64 6	96	19	56	12	40	3.30	1.90	.....	E	21	8	2	8	...	....
Bonaparte	74.7	86 5	62 9	97	24	51	11	46	3 15	1.48	.....	.....	.....	.....	.....	5	....	....
Centerville	75 0	86 7	63 2	97	19	54	11	43	3.63	1.80	.....	.....	25	1	5	9	....	....
Chariton	73.0	84 9	61 2	93	19, 24	52	11	41	6 94	1.60	.....	S	18	8	5	13	...	3
Clarinda	80.2	90 4	69.9	102	19	61	30	41	4.49	1.47	.....	S	18	10	3	9	....	....
College Springs	74.8	86 7	61.9	96	2, 27	52	14	44	8 26	4.65	.....	S W	16	11	4	8	...	....
Corning	73.7	85.7	61 7	98	19	51	4, 30	45	2.31	.60	.....	S E	21	4	6	7	....	....
Council Bluffs c	76.3	88.1	64.5	96	18, 26	57	14, 20	39	3.68	2.90	.....	S	.....	.....	....	7	....	....
Eldon	76.3	89.4	63 2	99	19	49	11	50	2.18	.85	.....	S	21	6	4	8	....	....

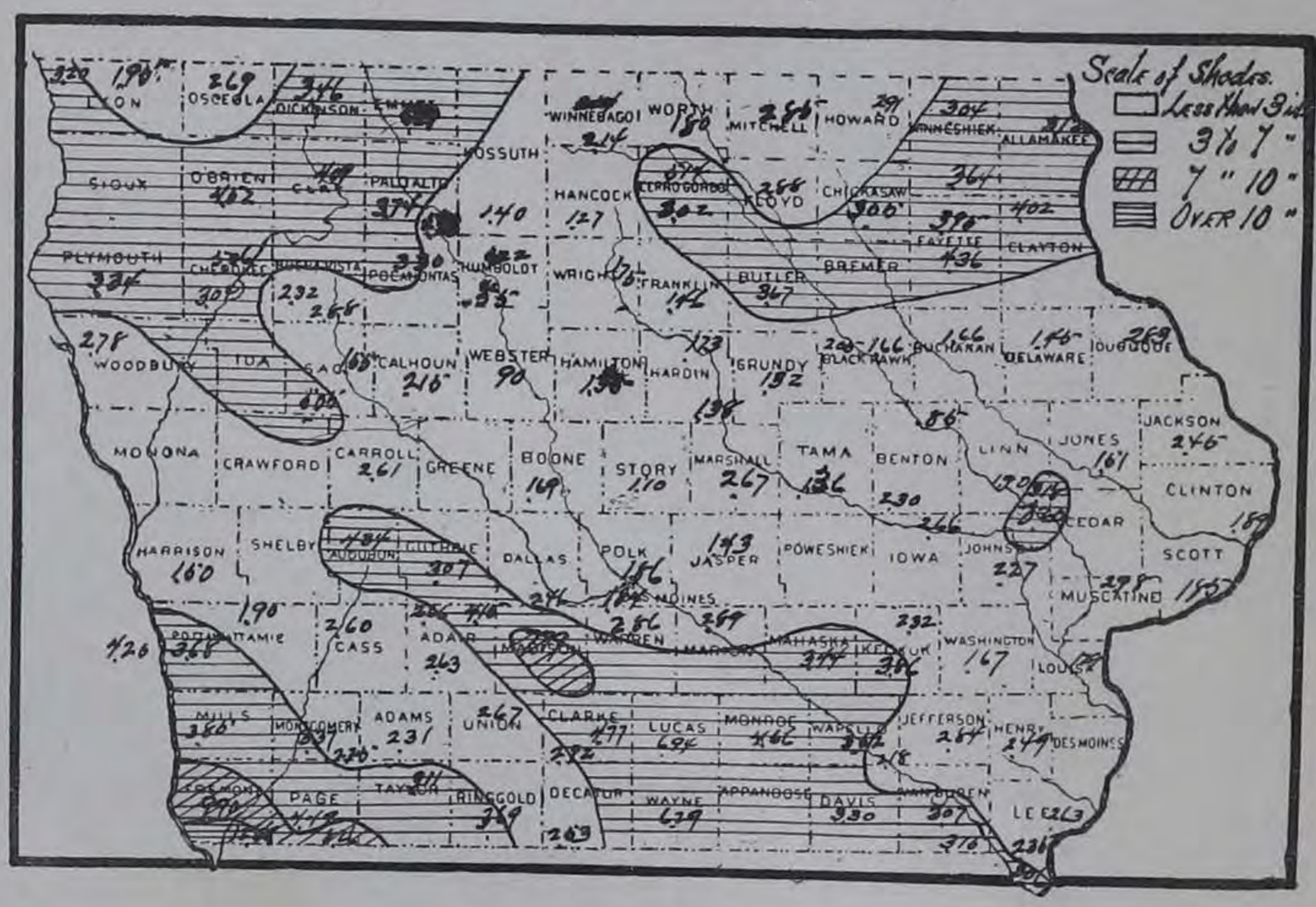
METEOROLOGICAL DATA FOR JULY, 1898—CONTINUED.

SOUTHERN SECTION—CONTINUED.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.			Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	Number of hail-storms.	No. of thunder storms.
	Monthly mean.	EXTREMES.						Monthly range.	Monthly.	Greatest daily.	Total snow-fall.							
		Mean maxi-mum.	Mean mini-mum.	Maxi-mum.	Date.	Mini-mum.	Date.											
Fairfield	74 0	86.5	61.6	97	24	50	11, 13	47	2 84	1.03	.....	.....	12	19	0	10	....	4
Ft. Madison*	78.1			92	24	62	11	30	2.63	1.75	.....	S, SE	8	19	4	6	....	4
Glenwood	73.6	85 5	61.6	97	19	49	4	48	5 85	2.20	.....	SE	11	18	2	4	1	1
Greenfield	73.6	86.1	61 1	96	19	51	31	45	2 63	.95	.....	S	20	11	0	10	1	6
Hedrick *i	77.7	.....	.....	98	19	63	12	35	2.32	.87	.....	.....	27	1	3	5	....	....
Hopeville	74.6	86.3	63.0	94	19	55	30	39	2 92	.89	.....	S	6	23	2	8	....	....
Indianola	73.8	85.3	62.4	95	19	53	30	42	2.86	.82	.....	SE	15	13	3	10	....	3
Keokuk	77.1	86 5	67.7	97	24	56	11	41	3.06	1.85	.....	S	20	6	5	5	....	5
Keosauqua	76.0	87 3	64.6	97	19, 24	52	11	45	3 07	1.00	.....	.....	.....	.....	.....	7	....	1
Knoxville ‡	74.7	86.9	62.5	97	24	53	11	44	4.32	1.51	.....	SE	22	6	3	7	....	....
Lamoni *g*	73 8	85.7	61.8	95	19	52	11	43	2.53	.89	.....	SE	..	...	....	5	....	....
Lenox	73 7	84.2	63.2	96	19	54	30	42	3.11	.82	.....	NE	19	10	2	10	...	7
Mooar	74.8	87.2	62.5	100	24	46	11	54	2 35	1.16	.....	S	17	7	7	5	....	..
Mt. Ayr	73.8	85.0	62.5	95	24	54	30	41	3 69	1.41	.....	SE, SW	14	15	2	7	...	...
Mt. Pleasant*	76.1			92	19	63	30	29	2.49	1.14	.....	SW	21	8	2	7	....	..
Neola	75.4	89.1	61.7	100	26	42	31	58	1.90	1.20	....	SW	24	5	2	3	...	...
Omaha, Neb	75.3	84.6	66.0	95	18	59	30	36	4.20	3.56	...	SE	18	11	2	7	..	....
Osceola	73.4	84.8	61.9	94	17, 24	52	11, 12	42	4.77	2.18	.....	NE	9	14	8	7	.	...
Ovid	73.7	85 5	61 9	98	19	54	30	44	6 29	2.45	.....	SE	18	5	8	9	....	9
Oskaloosa	74.0	87 8	60.3	99	24	48	11	51	3.44	1.00	.....	E	....	.....	.....	7	....	....
Ottumwa	74.2	87.0	61.3	98	18	52	11	46	3.52	1.65	....	SE	9	19	3	4	....	....
Pella	70 8	79.5	62.0	92	24	52	31, 31	40	2.89	1 00	...	SE	21	10	0	6	...	2
Red Oak	74.8	88 4	61.3	99	19	51	30	48	3.37	1.23	....	.....	...	....	.....	7	....	....
Sidney	74.6	83.4	65.9	96	19	59	4, 30	37	9.90	6.00	.....	SE	21	7	3	9	1	4
Sigourney	75.8	91.4	60.3	102	24	51	12	51	3.86	1.27	.....	SW	23	8	0	8	...	...
Stuart	74 4	85.7	63.0	96	26	55	10	41	4 15	2.60	..	S	25	3	3	3	....	....
Thurman	73.8	85.0	62.6	96	19	50	4	46	12.88	9.70	....	SE	10	15	6	10	1	3
Villisca	72 6	84.9	60.3	94	19	50	11, 13	44	2.25	1.01	.....	SE	16	15	0	6	..	2
Wapello	75.1	87 9	62.3	98	2	50	11	48	1.29	.46	...	SW	22	7	2	6	....	5
Washington	73.9	86.8	61.0	97	19	50	11	47	1.67	.90	....	SW	....	...	....	5	....	....
Winterset	72.4	84 9	59.9	95	19	49	11	46	7.79	2.70	....	.....	....	...	.....	9	..	....
Average	74.6	86.6	62 0	96.7	.....	52 9	.....	43 8	3.83	.....	.....	SE	18	10	3	7	...	....
Average for the state	73 4	86.3	60.4	96.1	.....	50.7	.....	45 5	2.98	.....	.....	S	19	9	3	7	....	....

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

Precipitation Chart July 1898.



August, 1898.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

VOL. IX. No. 8.

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Central Station, Des Moines, Iowa.

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DIRECTOR

GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER
1898.

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Alta	D. E. Hadden.
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Amana	Conrad Schadt.
Ames	Exp. Station.
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Clinton	Luke Roberts.
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Dubuque	*E. H. Bowie.
Eagle Grove	Smallpage Bros.
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Eldora	Prof. C. F. Woodward.
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Garden Grove	M. Wemple.
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Glenwood	J. P. Jackson.
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Greenfield	J. G. Culver.
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Guthrie Center	Oscar Klingman.
Hampton	E. C. Grenelle.
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Hawkeye	Miss I. Whorley.
Hopeville	M. T. Ashley.
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Independence	E. F. Wulfke.
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Iowa Falls	J. B. Parmelee.
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Larrabee	H. B. Strever.
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Le Mars	Dr. T. E. Cole.
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Marshalltown	C. M. Cook.
Millman, (Des Moines P. O.	W. H. Shaul.
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Mooar	F. G. Thomas.
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Mt. Ayr	A. F. Beard.
Mt. Pleasant	Dr. Frank T. Stevens.
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West Bend	Phil. Dorweiler
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West Branch	A. A. Madson.

*U. S. Weather Bureau.

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Reporting for the Weekly Bulletin.

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Corning	Jerome Smith.
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Creston	M. V. Ashby.
Danville	Sherman Matthews.
Emerson	D. B. Nims
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Mason City	Wm. Nettleton.
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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME IX. AUGUST, 1898. NO. 8.

IOWA CROP REPORT, SEPTEMBER 1ST.

The regular crop report, September 1st, made by the county and township correspondents of the Iowa Weather and Crop Service, has been tabulated and the results are given below. The report gives estimates of the condition of the unharvested crops, and the yield per acre of the cereal crops so far as may be ascertained from threshers' returns and other sources of information.

CORN.—The condition of this important crop is shown to be unusually variable, or "spotted" as some reporters describe it, as a natural result of the unequal distribution of rainfall in the critical stage of its growth The estimates of condition show a very wide range in different counties and districts, the figures ranging from 60 to 120 per cent. The average of all the estimates of condition is 86 per cent for the state at large. This is a reduction of 8 per cent as compared with the August report

The crop reporters were asked to make a careful estimate of the probable yield of corn in their respective localities, and the result accords with their estimate of condition. The average of the estimates by counties indicates an average yield of 34 bushels per acre for the state at large, or 5 bushels per acre above the average output in 1897. If their estimates are sustained by the final returns of the harvest the corn crop of Iowa for 1898 will be slightly above the average of the past 15 years, which is about 33 bushels per acre. This report, however, is only a preliminary estimate by the crop reporters, nearly all of whom are practical farmers; and it may be materially reduced by husking returns.

It is interesting, however, as showing that the standard of estimate is high; and the average crop reporter understands 100 per cent to signify a crop of 40 bushels of sound corn per acre.

As showing the variable condition of corn, the fact may be noted that the reports from 17 counties indicate a yield of 25 to 30 bushels per acre; 66 counties give promise of 30 to 40 bushels; and 16 counties make a showing of 40 to 45 bushels per acre

If the estimates of our reporters are sustained by the husking returns, the corn crop of Iowa this year will be about 280,000,000 bushels, or 40,000,000 bushels in excess of the total in 1897.

WHEAT.—Threshing returns from the counties that produce winter wheat show an average yield of 18 bushels per acre; and the reports indicate an average of 16 bushels per acre of spring wheat. These figures, if borne out by the later returns, will give the state a total wheat harvest of 24,137,814 bushels. This amount is 9,524,760 bushels in excess of the wheat output of last year.

OATS.—The yield of oats appears to be 33 bushels per acre, as the state average. This indicates a total yield of 141,875,000 bushels, or 9,304,000 bushels more than in 1897.

BARLEY —Average yield per acre, 28 bushels; total yield, 14,268,492 bushels.

RYE.—Average yield per acre, 17 bushels; total yield, 3,575,253 bushels.

Timothy seed averages 4.2 bushels per acre. Tame hay yields 1.8 tons per acre, which will give a total of 4,014,819 tons, which amount is 652,532 tons in excess of the output last year.

Wild hay will average 1.4 tons per acre, making a total of over 2,000,000 tons.

The condition of the minor crops is rated as follows: Millet, 91 per cent; buckwheat, 86; potatoes, 75; apples, 58; pastures, 84.

CLIMATE AND CROP REVIEW FOR AUGUST.

The average temperature of August for the state was very close to the normal, the first half being cooler than usual and the last half unseasonably warm.

The rainfall was very unequally distributed, ranging from less than an inch to more than 10 inches, the heavier amounts being reported from stations in the southeast district. The larger part of the state received considerably less than the normal rainfall for August.

The first two weeks brought some measure of relief from the drouthy conditions that prevailed through the larger part of July. Though the nights were too cool for the rapid development of corn, yet the reports showed fairly good progress of that crop, and at the middle of the month the general conditions gave promise that it would reach maturity in advance of the usual period of killing frosts. During the last half of the month the prevalent high temperatures and dry weather hastened the ripening process of the belated portion of the corn crop and brought the larger part to a sufficient degree of maturity to be cut and shocked. In some sections the extreme heat caused a measure of damage to late corn, but generally the crop was benefited by the conditions which carried so much of it beyond the danger line. The potato crop suffered some damage by the dry and hot weather in the latter part of August.

In considerable portions of the state there was sufficient moisture in the soil to facilitate plowing, and more than the usual area had been plowed at the close of the month, and a good beginning had been made in sowing winter wheat and rye. On the whole, August was a favorable month for farm operations and for the ripening of crops.

NOTE AND COMMENT.

Dairy Commissioner Gates is authority for the statement that during the dry spell in July the milk supply at butter and cheese factories fell off fully 33 per cent. The fact should be noted that the dairy farmers who made ample provision for that dry period, in the form of soiling forage, and used it liberally to supplement their pastures, suffered but little loss on account of shrinkage in the supply of milk. With good, pure water for the stock, and an abundance of succulent forage, the dairyman may go through the usual mid-summer drouth with very little decrease in the output of his dairy. But the loss of 33 per cent for the month of July signifies a reduction of hundreds of thousands of dollars in the aggregate returns of the season to the farmers of the state.

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The drouth has been broken in New South Wales and other portions of Australia and the farmers are jubilant at the improved prospects. The wheat harvest will be abundant.

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Dun's Review, in referring to the unprecedented bulk of trade in August, says: "The smallest failures ever recorded in any month for five years were those of August, 1898."

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We desire again to remind the voluntary observers of this service of the fact that a National Weather Bureau convention is to be held in Omaha, Neb., October 20 and 21, 1898, and also that by the terms of the call they are included and will be received as members. This will afford a good opportunity to visit the Trans-Mississippi exposition in that city, and to participate in the sessions of a convention that will be interesting and profitable. We trust the Iowa corps of observers will be well represented.

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An unusually heavy thunder and rainstorm visited Hampton on the night of the 19th and early morning of the 20th. Observer Grenelle writes that from 9 P. M. till 6 A. M. there was but little cessation in the roar of thunder and the flashes of lightning, and from 4 to 5 A. M. it exceeded any storm of the kind ever known in that part of Iowa The total amount of water that came down in nine hours measured 3.57 inches in the government gauge.

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Good judges of the grain situation are convinced that the shortage in Russia's crops will assure a profitable market for our exportable surplus of both wheat and corn. The crop of wheat in this country is unusually large, but the aggregate yield of corn is below the average in the corn surplus states.

LATENT HEAT.

The energy required to change a substance from the solid to the liquid state, or from the liquid to the gaseous state is called *latent heat*. This term is essentially a misnomer. It was introduced into the science of physics at a time when very different ideas concerning the nature of heat prevailed from those that are now current. It was then thought that heat was an imponderable form of matter, and that this imponderable matter had to enter any liquid, as water for example, in the process of evaporation; but as evaporation is not attended necessarily by a rise of temperature, the heat thus entering the water was said to become *latent*. As now understood, heat is not a form of matter, but a condition of matter, and latent heat is not heat, but is simply the energy needed to overcome the intermolecular attractions of the evaporating substance; yet the name *latent heat* is still universally employed. The student must be careful to avoid being misled by its apparent meaning. It is simply a special name for the energy, from whatever source, expended in a certain task; its addition does not cause any change of temperature whatever.

The amount of energy required to melt a pound of ice at 32° would raise a pound of water from 32° to 172°. If a pound of fresh snow at a temperature of 32° were placed in a pound of water at 172°, the resulting two pounds of water would have a temperature of 32° Hence the latent heat of liquefaction of a pound of ice is equal to 140 units of heat,—a unit of heat being the amount needed to raise the temperature of a pound of water 1° Fahr.

The amount of heat required to evaporate a pound of water is much greater than that required to melt a pound of ice. About 1,000 units of heat are needed to transform a pound of water into a pound of vapor; the precise amount varying with the temperature at which evaporation takes place. At 32° it is 1,092 units; at 212° it is 966. The latent heat of water vapor is therefore very high.—*Davis' Elementary Meteorology.*

LATENT HEAT FROM RAINFALL.

When the cloud mass of a cyclone is formed and its rainfall has begun, then not only the sensible heat of the warm air but the latent heat of the condensed vapor promotes the convectional action of the storm. As the warm air ascends in its spiral whirl around the central region of a cyclone, it must expand; and at first it draws only on its sensible heat for the energy needed to push away the surrounding air. Its temperature then falls at the rapid rate of 1.6° for every 300 feet of ascent; but, as the whole mass is very damp, a moderate ascent is sufficient to reduce the temperature sufficiently to overtake the falling dew-point and cause condensation. At this moderate altitude the clouds begin to form. Expansion continues during ascent to greater heights, but the energy for expansion is then drawn from two sources; a part comes from the sensible heat of the ascending air, and the remainder from the latent heat of the vapor that is condensed in the ascent.

Here, as in all cases where vapor is condensed, it may be looked on as giving up the store of energy that was acquired from absorbed insolation when the vapor was formed, perhaps many days before and hundreds of miles away. In the case of tropical cyclones, the store is abundant and its aid is most effective. The cyclonic inflow comes at first from the doldrums, and afterwards from the trades when the storm area increases and when its progression carries it to higher latitudes. The air thus supplied has a high temperature and a high relative humidity. Enormous masses of heavy clouds are formed, and rain falls from them in drenching torrents. The greater the altitude of the cyclonic mass in which the temperature is higher than that of the surrounding air, and the greater the excess of the central temperature, the stronger the gradients and the more violent the winds. As both the excess of central temperature and the altitude of ascent are greatly promoted at high temperatures by the condensation of vapor and the liberation of its latent heat, it is manifest that the presence of vapor is a very important element in the development of tropical cyclones.

In order to realize the enormous amount of energy needed to develop a tropical cyclone, we may quote a comparison that has been drawn between such a storm and a large ocean steamer. The air in a cyclone 100 miles in diameter and a mile high weighs as much as half a million 6,000-ton ships; and yet this enormous mass is set in rapid motion, averaging over 40 miles an hour, in the course of a few days, and its motion may be continued for a week or more. Again, the Cuban hurricane of October 5–7, 1844, is calculated on very moderate estimates to have worked during the three days of its progress along our

southern coast with an energy of at least 473 million horse-power. The continued maintenance of so enormously powerful a disturbance calls for the rapid supply of a vast amount of energy; just as the active steaming of a large engine calls for a plentiful supply of coal under its boilers. In the case of a fully-developed tropical cyclone, it is believed that the energy is chiefly supplied from the latent heat of the heavy rainfall; and reasonable estimates of the amount of condensation within the storm disc show that this source of energy is ample in amount.—*Davis' Elementary Meteorology.*

AGRICULTURAL COLLEGES AND THE FARMER.

[Extract from an address by Secretary Wilson, at College Park, Md., in June, 1898.]

The state of Maryland can well afford to sustain a college for the farmer's boy, for the sole purpose of keeping her soil in fertile condition She can afford to maintain a college for the purpose of enabling the sons of toil to increase their earning capacity. The uneducated man earns on the farm from $10 to $20 a month; the educated man easily earns from $50 to $100. The native horse, without blood or development, in some of our northwestern states, is valued at $10 a head; a well-bred, well-developed horse is worth from $100 to $1,000. The native cow in some of our newer states yields $7.50 worth of products in a year; the improved cow in the hands of a skilled dairyman yields $75 worth of products in the same time. Corn in Iowa, some years, is worth 10 cents a bushel where it is the one crop of the farm; but the skilled feeder makes it worth 40 cents a bushel. The native pineapple weighs from three to four pounds, and sells from 10 to 20 cents apiece; the scientist hybridizes the same pineapple and makes it weigh from eight to twelve pounds, and sells it for 75 cents to $1 apiece. The uneducated laborer produces cotton as his sole crop and sells it for 5 cents a pound; the educated laborer diversifies his industry and puts high-selling products on the market The young man's labor when he comes to college is worth no more than that of the uneducated farm hand; but if he studies the sciences related to some one industry his labor is in demand everywhere. His earning capacity was equal to one laborer when he entered; it is equal to half a dozen when he graduates.

THE DEPARTMENT OF AGRICULTURE.

The good work done by college and experiment station is being recognized by all classes of society in our own land and by educated men abroad. The department of agriculture is a clearing-house for the colleges and stations of the several states with regard to their work. It co-operates with them, sympathizes with them, supplements their work, gives publicity to progressive work, yet avoids all appearance of dictation or meddling. The department at Washington does work which is beyond the financial ability of state institutions very often, however, through the scientists of the state institutions, many of whom, in their specialties, are not excelled in the wide world.

It is the aim of the department to encourage work that bears directly upon the requirements of the farmers of the country, to help in the solution of problems that the former cannot grapple with, for want of time, training and apparatus; and with regard to education in the colleges, to insist, mildly, that it shall be along lines having regard to science as the major study, rather than to belles-lettres.

Our agricultural colleges are endeavoring to induce young farmers to avail themselves of the facilities offered to study the sciences relating to their work. Many of them are succeeding as well as could have been expected, when we consider the influences that surround the farm boy and girl.

A POST-GRADUATE COURSE.

The graduates of the agricultural colleges of the several states, who have laid the foundations of a scientific education, should be invited by congress to go to Washington to pursue their studies in special lines and get facilities and direction from the chiefs of divisions, without expense to the students. They could have access to the departmental and congressional libraries, to the museums of the departments and of the Smithsonian Institution, which contains departmental material. The university that George Washington had in mind is in existence now in the capital city. It lacks only the students. I shall, in my next annual report to the president and congress, ask that this authority be given to the secretary of agriculture No additional appropriations would be necessary until large numbers required a lecture-room, which congress would promptly provide. I have strong faith in our great-hearted president and our far-seeing legislators that they will favor the farm boys and girls in this regard.

KILLING GRASSHOPPERS WITH FUNGUS DISEASES.

[By Lawrence Bruner, Professor of Entomology, University of Nebraska.]

It has been known to entomologists for a number of years that different locusts are subject to the attacks of certain diseases. Some of these diseases are also known to result from the presence and growth within the bodies of the victims of several kinds of mold or fungus. Not only are locusts subject to the attacks of these fungus diseases, but also many other insects fall victims to them In fact, for several years past certain destructive insects have been combated more or less successfully by the artificial propagation and spread of different kinds of these insect-destroying fungi.

At least two, and possibly three, distinct species of locust-attacking fungi have been especially brought before the public in different parts of the world during the past few years. Not that they are the only ones of these plants which select the bodies of acridiahs as proper places for development, but because they, among the others, have been most persistent and active in their results.

The North American locust killing fungus which has been most noticeable is the one known to botanists as the *Empusa gyrllæ* It is the cause of the disease that frequently attacks and destroys myriads of both native and migratory grasshoppers. This disease sometimes becomes epidemic over wide areas, and at such times destroys almost every 'hopper in the region. If there is any particular condition of climate during which the disease works best it is in warm, rather humid weather in midsummer. It also seems to attack the mature insects much more readily than it does the younger ones, though at times these latter also suffer greatly from it.



When an insect has once been attacked by this native fungus it becomes rather sluggish in movement, and shortly before death climbs up the stem of some weed or other plant and securely attaches itself by tightly hugging the plant by its front and middle pairs of legs, as seen in the illustration. In this position it dies and remains clinging for some time after death. The bodies of the insects which die from the attacks of this fungus become somewhat swollen

and quite soft, and afterwards brittle A few days after death the body opens at the joints and permits the brown, dust-like spores to escape and be blown about by the winds. Other locusts when eating vegetation upon which such spores may be resting, if the weather and other conditions are favorable, likewise become attacked and die from the disease. It is principally the presence of this fungus, with perhaps a few others, that keeps the various species of grasshoppers within reasonable limits during ordinary years Thus far, however, we have not been successful in handling the disease with sufficient certainty to permit of its being generally used in checking these insects.

While in South America last year the writer discovered another locust disease which, if it will be found to attack our North American grasshoppers, may be m reuseful in artificially destroying the insect, since it is very closely related to the fungus used in destroying chinch bugs in some portions of the United States At present, however, we know nothing about methods that might be used in spreading the disease among our native species, and a series of experiments have just been begun here at the University of Nebraska with this end in view.

Locusts which have been attacked by this South American fungus (a *Sporotrichum*), instead of climbing to the tops of various plants so as to get as much air as possible, creep away from the light and seek dark, moist places in which to die. Consequently, they are most often found hidden away among the roots of grass bunches, in the midst of dense, juicy foliage, etc. Here, after death, their bodies become entirely filled with the mycelial threads and spores of the fungus. In many cases, under certain conditions, the spores also partly cover the outside of the body, and give the insects the appearance of small wads of white, fluffy cotton.

While we have not thus far been able to make these fungus diseases work under all conditions, or even under a few conditions with certainty, it is hoped that before many years we may be able more easily to handle them and use them for the destruction of our grasshopper pest. A later issue of the report for the Nebraska section will contain the results of the experiments in this line which are now in progress —*Nebraska Climate and Crop Report for July.*

SIMPLE TESTS FOR WATER.

[MASSACHUSETTS MEDICAL JOURNAL.]

First boil and fill a bottle made of colorless glass with the water and look through it at some dark object The water should then appear perfectly colorless and free from suspended matter; a muddy or turbid appearance indicates the presence of soluble organic matter or of soluble matter in suspension.

If this test is passed successfully, empty out some of the water, leaving the bottle about half full; cork up and place it for a few hours in a warm place. Shake up the water, remove the cork and critically smell the air contained in the bottle. If it has any smell, and especially if the odor is in the least repulsive, the water should be rejected for domestic use. The advantage of heating the water is that th[illegible]ometimes develops an odor that would not otherwise be perceptible.

Pure water should be tasteless and remain so after being warmed. It should also be odorless.

A very practical test for sewerage contamination or the presence of putrescible organic matter is as follows: A clean pint bottle is filled three-fourths full of water to be tested, and in the water is dissolved a teaspoonful of the purest sugar—loaf or granulated sugar will answer. The bottle is then corked and kept in a warm place for two days. If after from twenty-four to forty-eight hours the water becomes cloudy or muddy, it is unfit for domestic use. If it remains perfectly clear, it is probably safe for use.

CLIMATE AND SOIL FERTILITY.

HEAT AND ARIDITY AS IMPORTANT FACTORS IN THE PRODUCTION AND MAINTENANCE OF A FERTILE SOIL.

A recent bulletin issued by the experiment station at Brookings, South Dakota, presents some interesting facts and theories relative to the causes which have operated in the production of the wonderfully fertile soil of that portion of the great central basin. We copy the following extract of this valuable report, and append thereto some brief comments:

All that portion of South Dakota lying east of the Missouri river is covered by what is known as drift or boulder clay, except a few small, isolated areas. This formation varies in depth from a few feet to two or three hundred feet, and when the entire mass of the deposit is considered, it is of a remarkably uniform character throughout the state. Its chief characteristic is a light yellow color, with numerous small, calcareous masses and more or less boulders, stones and pebbles in the subsoil, gradually merging into a dark brown or black loam on the surface This dark color is due to the presence of decaying vegetable matter and the action of the elements.

Everywhere drift soils are recognized as containing practically inexhaustible quantities of the elements of fertility, but in most glacial areas the ice-sheet, in its movement from the north, encountered so many exposed ledges of rock that the material it deposited was composed largely of boulders that had not yet been reduced to soil; so that, while drift soils are universally recognized as fertile soils, they are usually so stony as to be difficult to till. Fortunately for this state, the character of the country to the north of us for hundreds of miles was such that little raw material in the form of rocks was added to the moving mass of ice and soil, but the materials which it did bring had been so thoroughly mixed up and ground down by the time that it reached its present location that it is composed almost entirely of thoroughly disintegrated soil material. Thus we have all the advantages of a drift formation, with far less stones than are usually found in drift or boulder clay.

In addition to the foregoing there have been other very potent factors in producing a soil of great uniformity and remarkable fertility throughout this region Most important of these is the fact that this has been a region of light rainfall for a great length of time. We have become accustomed to associate the ideas of humidity and fertility on account of the very luxuriant growth of vegetation which is found in those countries having a heavy annual rainfall. But the very same causes that produced the heavy growth of forest and underbrush will, as soon as that forest growth is removed, begin to carry away, not only those elements of stored up plant food in the soil, but in many instances the soil itself; so that in many of the humid districts the luxuriant forest areas of one generation become the washed and worthless hillsides of the next. No such wasting effects have been experienced upon our open prairies, although they have been unprotected by forest growths for ages; but, on the contrary, there has been a steady increase in the store of available plant food as a direct result of those chemical and physical changes which are constantly going on in the soil. Had this been a region of heavy rainfall, the salts which result from these changes would have been washed off or leached out as fast as formed, and no such store of available plant food would have been possible.

The influence of temperature in soil formation is also an important one It has an effect upon both the chemical and the physical changes which take place in the soil Other conditions being equal, all chemical changes taking place in soil formation are accelerated by high, and retarded by low, soil temperatures. The very high soil temperatures which have been observed in this region during the summer and fall months have contributed in no small measure to the reduction of the soil to its present condition. The effect that temperature has upon the physical changes that take place in soil formation is largely due to expansion and contraction. There are but few regions that have experienced such frequent, sudden and violent changes as this. So it seems probable that the temperature conditions of this climate have had a beneficial effect upon the physical, as well as the chemical, changes which are necessary for the production of fertile soil.

The all important question to be considered is how to till the soil so as to place it in the best possible physical condition for plant growth. The object of all tillage is to secure the proper arrangement of the soil particles with relation to each other. It is true that tillage has a very beneficial effect in the destruction of weeds, but any system of tillage that will keep

the soil in the best physical condition will also keep the weeds down, so that destruction of weeds does not need to be considered.

There is probably no locality where the question of tillage needs more careful study, nor where it promises greater rewards. We have everything that is needed for a rich, prosperous agricultural state; a soil of particularly inexhaustible fertility, easily and cheaply worked, favorable conditions of temperature and sunshine, and, if properly husbanded, sufficient rainfall. That there is frequently an insufficient supply of moisture to produce a full crop under the wasteful and oftentimes thoroughly shiftless system of farming which has been so extensively practiced in the past, admits no denial. That the normal precipitation is sufficient for the production of good crops under a proper system of tillage, we believe can be demonstrated. What the best system of tillage is, we are not yet prepared to say.

Much of the foregoing extract relating to the effects of geologic forces and climatic conditions is applicable to a large portion of the upper valley lying westward of the Mississippi river. In all this region the thoroughly disintegrated drift formation is capped by a deep layer of dark loam that is marvelously rich in all the elements of fertility. And unquestionably this wonderful surface deposit of available plant food is a direct product of the climatic conditions that have prevailed in the vast period of time since the glacial epoch.

In our deep, rich soil we find irrefutable proof of the statement that both heat and aridity have been important factors in its production. The rainfall must have been relatively light for a very great length of time; and the ready inference is that there has been no essential change of general climatic conditions for many centuries. This tendency toward aridity for so large a portion of the year is a powerful conservator of the vast store of fertility that is the heritage of the people of this favored region. As a rule we have ample rainfall for the production of an abundance of the staple crops, and not so much as to wash off and leach out the salts and other essential elements of our fertile soil.

AUGUST STORMS.

Though August is usually the mildest period of the year in this region, the month of August, 1898, brought severe wind and hailstorms, with violent electric disturbance, extending over considerable areas of the state.

On the evening of the 16th a windstorm of much force passed through the country east of Fairbank, near the line of Buchanan and Fayette counties. The Waterloo *Reporter* describes the storm as a "cyclone" (tornado), though the reports do not show the usual effects of a genuine funnel-shaped storm. The destruction of buildings and crops was quite heavy within the limited area over which it passed. Six or seven houses and other farm buildings were razed or badly damaged within a short distance of the place where the storm began. No human lives were lost, but several horses and other stock were killed.

The most widely extended and destructive windstorm of the month occurred on the evening of the 19th. The disturbance was wide-spread, showing its destructive force at numerous points in the northwestern part of the state, and extending as far south as the main line of the North-Western railway. Within this wide belt there were many local wind-squalls of much severity, and considerable destruction by hail and lightning. The greatest destruction by hail occurred within an area 10 miles wide and 15 to 20 miles long, covering most of the distance between Spencer and Emmetsburg. The corn crop in that area was almost totally ruined, and other crops suffered great damage.

At Spirit Lake and vicinity the windstorm is described as the worst that ever visited that region, with a total rainfall of 3.50 inches. The local papers contained reports of losses and damage to prominent buildings, showing a very heavy aggregate of loss resulting from the storm at that point. Windows were broken by hail, houses and other buildings were unroofed by wind, telegraph and telephone poles were prostrated, summer cottages about the lakes were wrecked and trees were broken or uprooted. At Milford, Arnold's Park, Monument Park, Superior, West Bend, Estherville, and other localities in that section the storm caused a great amount of damage and aroused much terror among the people. The following extract from the Estherville *Republican* gives a vivid idea of the nature of the disturbance:

> Friday was one of the most sultry days of this month and all day it seemed to indicate a storm, but not one of such severity as came. About 6 o'clock in the evening it began to sprinkle a little and the distant rumble of thunder could be heard in the northwest. No one expected anything more than a severe thunderstorm. At about 7:30, however, the wind suddenly turned to the northwest and north and blew a terrific gale for fully one hour, accompanied by some hail and the heaviest downpour of water that has visited this section for years. It was almost a water spout. The strongest buildings creaked from the force of wind and several large windows about town were blown in and the apartments flooded. In the country great havoc was done generally to corn and flax fields and grain stacks, and hardly a windmill was left standing. In several places the roofs of barns were blown off. West of Estherville, and particularly at Spirit Lake, the storm was a great deal more destructive. Several cottages were wrecked, one residence was blown to pieces, the roof of the Crandall House was blown off, half of the sanitarium was smashed into kindling wood, the restaurant west of the Hotel Orleans was taken up bodily and carried across the railroad track and completely torn to pieces, the Moran boathouse was demolished, the railroad tank badly damaged and about half of the platform of the Burlington, Cedar Rapids & Northern, in front of the Hotel Orleans, was taken up and strewn over the grounds of the state fish hatchery; one chimney on the hotel was blown down and it crashed clear through the roof, but otherwise the hotel did not seem to be injured. Two freight cars in Spirit Lake were blown over and two at Montgomery, one of them being utilized for a temporary home by John Montgomery. He was in the car at the time and was badly shaken up, but luckily escaped without serious injury or broken bones.
>
> The only fatalities heard of occurred near Petersburg, a few miles north of Superior. Mr. and Mrs. Eglenstein were living in a barn not far from the state line. The barn was blown to pieces and both occupants killed.
>
> The wind and rain was followed by an electrical storm of great severity and also magnificence. In Estherville, Painter Greenfield was struck by lightning and his shoes completely torn off, and his stockings perforated with holes as if made with shot. He was badly shocked, but is recovering. Marcus Coon, who was near Mr. Greenfield at the time, was smoking a briar pipe that had a metal band about the stem. The lightning tore this off and pulled the bowl and stem of the pipe from the mouth piece, leaving Mr. Coon with only the latter sticking from his mouth.
>
> At the residence of F. C. Williams the electrical fluid cut up some queer antics. It seemed to come in under the door in a blaze and crackled in an alarming manner. Clarence Williams was severely shocked.

Newspaper clippings have been received showing that the storm of the evening of the 19th reached localities in Boone and Story counties, causing considerable damage and bringing a heavy fall of rain. Chas Bassett, a farmer residing near Boone, was killed by lightning, and the same bolt killed a valuable team belonging to Bassett. And northeast of Ames lightning destroyed a barn containing 150 tons of hay, belonging to Orrin Shaw. Near Reinbeck, Grundy county, a barn was burned by lightning, causing loss of hay and 17 cows and calves. The details of losses would fill many columns.

The following interesting item is clipped from the Mt. Ayr *News* of August 26th: "The barn of James Moore, south of Kellerton, was struck by lightning Tuesday, August 23d. The electricity seemed to penetrate every part of the building, which was immediately wrapped in flames. Nine men and 11 horses were in the barn, but all got out safely. Besides the barn, 20 tons of hay, 350 bushels of corn, and farm implements were destroyed."

AUGUST WEATHER RECORD.

The first half of the month was cooler than usual, and during the most of the last half it was unseasonably warm, the mean temperature for the state being 71.2°, as shown by the records of 110 stations. The mean for the northern section was 67.8°; central section, 71.6°; southern section, 74 3°. The average was therefore about normal The maximum temperature reported was 103°, at Clarinda and Council Bluffs on the 20th, and the lowest was 40°, at Britt on the 1st. There was an average monthly range of 47.4°.

The average precipitation for the state was 3.44 inches, as shown by the records of 118 stations. This amount is slightly above the average of recent years. The distribution was very unequal, the lowest amount reported being .58 of an inch, at Adair, and the largest total 10.56 inches, at Bonaparte. The averages by districts were as follows: Northern district, 3.43 inches; central, 3.71 inches; southern, 3.17 inches.

The following table gives the mean temperature and precipitation for the month of August, at the stations named, for the years from 1872 to 1898, inclusive:

YEARS.	MEAN TEMPERATURE—DEGREES					PRECIPITATION—INCHES.				
	Des Moines.	Davenport.	Dubuque.	Keokuk.	Sioux City.	Des Moines.	Davenport.	Dubuque.	Keokuk.	Sioux City.
1872	...	74	....	77	..	...	9.38	..	1.97	. ...
1873	....	78	74	73	....	.....	.51.	5.88	.54	. ....
1874	....	74	74	76	....	.....	3.68	2.13	3.87	.....
1875	....	69	68	70	....	.....	1.73	1.07	3.83	.....
1876	....	75	73	76	....	.....	4.27	5.92	4.03	. ....
1877	....	72	73	74	...	.....	3.21	3.96	2 52	.....
1878	78	74	74	73	...	2.21	5.07	1.72	5.27	.....
1879	73	72	72	75	....	1.98	4.33	2.43	4.57	.....
1880	72	75	74	78	....	6.69	5.90	7.15	3.81	.....
1881	78	77	76	80	....	5.29	.83	2.46	.86	.....
1882	71	72	71	73	.. .	3.14	2.29	2.29	3.09	.....
1883	70	70	69	71	....	2.83	1.02	2.70	1.32	.....
1884	69	70	69	72	....	3.84	3.84	4.25	2.74	.....
1885	69	68	67	71	....	5.10	12.68	8.02	5.98	.....
1886	77	74	75	73	....	1.10	2.67	.67	5 90	.....
1887	72	72	71	75	....	2.66	3.23	4.40	2 38	.....
1888	69	70	71	72	....	4.52	2.79	1.73	2.07	....
1889	72	72	72	73	73	2.25	1.11	.26	.95	1.19
1890	70	70	70	71	69	3 35	1.66	6 00	1.77	3.64
1891	70	70	70	71	70	4.22	5 54	3 31	6 10	3.54
1892	72	73	73	75	72	2.45	1.53	2.51	1.07	4.14
1893	70	72	71	72	70	1 60	1.12	.58	1.16	5 85
1894	76	75	73	77	75	1.89	2.02	1 32	.51	1 68
1895	74	75	75	76	73	3.52	4 79	1.75	2.68	1.54
1896	73	73	73	75	72	5.49	3 12	2.05	3.90	.86
1897	70	71	71	72	68	1.77	.68	1.51	.65	2.51
1898	74	73	71	76	72	1.09	4.96	4.37	6.92	3.10
Means.	72	73	72	75	71	3.19	3.51	3 09	2.79	2.80

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 29.94 inches; highest observed, 30.18, at Cresco, on the 9th; lowest observed, 29.63, at Omaha, Neb., on the 22d; range for the state, .55 inches.

Temperature.—Monthly mean, as deduced from 110 reports, was 71.2°; highest monthly mean, 80.6°, at Clarinda; lowest monthly mean, 66.5°, at Osage; the highest temperature reported was 103°, at Clarinda and Council Bluffs, on the 20th; the lowest temperature reported was 40°, at Britt, on the 1st; the average daily maximum was 82.9°; the average daily minimum was 59.4°; the average monthly maximum was 95 2°; the average monthly minimum was 47 9°; the greatest monthly range was 56°, at Atlantic and Garden Grove; average monthly range, 47.4°.

Precipitation.—Average for the state, as determined from the reports of 118 observers, 3.44 inches; the largest amount reported was 10.55 inches, at Bonaparte; the least amount was .58 inches, at Adair; the greatest daily amount reported was 5.16 inches, at Wapello, on the 16th; average number of days on which .01 inch or more of precipitation was reported, 6.

Wind.—Prevailing direction, south; highest velocity reported, 33 miles per hour, from the south, on the 4th, at Sioux City.

Weather.—There was an average of 17 clear days, 9 partly cloudy days and 5 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.94	30.13	5	29.73	22
Des Moines	29.96	30.15	12	29.72	22
Clarinda	29 93	30.15	12	29 70	23
Cresco	29.93	30.18	9	29.68	22
Dubuque	29 95	30.15	13	29.69	22
Omaha, Neb	29.92	30.12	12	29.63	22
Keokuk	29.96	30.15	5	29.78	23
Sioux City	29.96	30.12	12	29.74	22
Average.	29.94	.....	...	.....	....

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	4,360	30	NW	23
Des Moines	3,886	27	SW	30
Dubuque	4,300	27	N	15
Keokuk	4,555	20	SW	17
La Crosse, Wis	3,818	22	SW	14
Omaha, Neb	5,065	24	SE	5
Sioux City	7,707	33	S	4

OBSERVERS' NOTES.

AMANA—*Conrad Schadt.* The soil is very dry and roads dusty. Rain is needed badly.

BONAPARTE *Hon. B. R. Vale.* Rainfall, 10.55 inches; for the year up to date, 41.14, which exceeds any since this office kept a record. Very warm at close of month.

BRITT—*George P. Hardwick* Electrical storm night of the 19th, with high winds blowing down corn and other crops. Some live stock killed by lightning.

CENTERVILLE—*George Goodlander.* No severe storms except heavy rain on the 7th If weather continues warm corn will do well.

CLINTON—*Luke Roberts.* The heavy rain of the 15th and 16th was accompanied by terrific thunder and lightning, doing damage in many places. Rainfall was much above normal.

CRESCO—*Gregory Marshall.* The month ends very hot and dry; pastures are burned up, grass seeding is killed, and corn, which was quite promising, is reduced by 25 per cent. Rainfall has been below average for past four months.

FOREST CITY—*J. A. Peters.* Very wet month for August. Ground in splendid condition for plowing Corn will be out of danger of frost by September 10th to 15th.

HUMBOLDT—*Henry S. Wells.* A portion of the corn badly blown down. Hay and grain well secured. Corn has matured rapidly the past ten days. Hogs usually doing well and pastures good.

LAMONI—*T. J. Fitzpatrick.* The month has been too dry for pasture and plowing

LOGAN—*Mrs. M. B. Stern.* The month has been very dry and hot. Vegetation is suffering for want of rain. Hot winds one day.

WEST BEND—*Phil Dorweiler.* A pleasant month. The first half rather cool Small grain yielding above the average.

CLINTON—*Dr. Luke Roberts.* August, 1898, an exceptionally enjoyable summer month, had, so to speak, a marked individualism as compared with the same month in any of the last

twenty years, where the normal precipitation was 2.84 inches, while in August, 1898, it was 7.87 inches, being 5 03 inches in excess of normal, and greater than any August except that of 1885, when the precipitation was 10.02 inches, or 2 15 inches more than that of 1898.

There were nine days on which rain fell. In the storm which commenced on the 15th, .45 of an inch of water fell in the morning before 6 o'clock; then at 6:40 P. M. a severe storm set in, lasting until 4:45 A. M. the 16th, and precipitated 3.01 inches of water, making 3.46 inches in about twenty-four hours. This downpour was accompanied by a frightful and terrorizing electric storm, the lightning doing damage in many places.

A storm similar, but of somewhat less severity, occurred on the evening of the 23d, between 5:50 and 8 o'clock, leaving two inches of water.

The precipitation for the month was no greater than the need, and growing crops were greatly benefited The stacking and threshing of grain was interfered with, and some damage was done to oats, but the corn crop was increased by many thousands of bushels, and pastures were put in fine condition.

The maximum temperature was 93°, occurring on the 23d. This was 3.7° below normal. The minimum temperature was 51°, occurring on the 4th and 12th, being 5.4° above normal. This gave a less range of temperature below normal by 3.7°. The daily mean was 71.2°, being 1.1° above normal. The warmest day was the 23d, giving a mean of 79.5°, which is .9° below normal. The coldest day was the 13th, giving a mean of 61.7°, which is 3.2° above normal.

The mean temperature of the first half of the month was cooler than the last half by 3.9°. The movement of the wind was light, being only 1,280 miles, or an average of about 1¾ miles an hour. The maximum velocity was attained during the storm of the 15th, reaching a speed of about 24 miles an hour, and a speed of about 21 miles during the storm of the 23d. The prevailing direction of wind was south.

LATE REPORTS.

FREDERICKSBURG—*For July.* Total rainfall, 3.46; greatest amount in 24 hours, 1.84. Rain fell on 6 days.

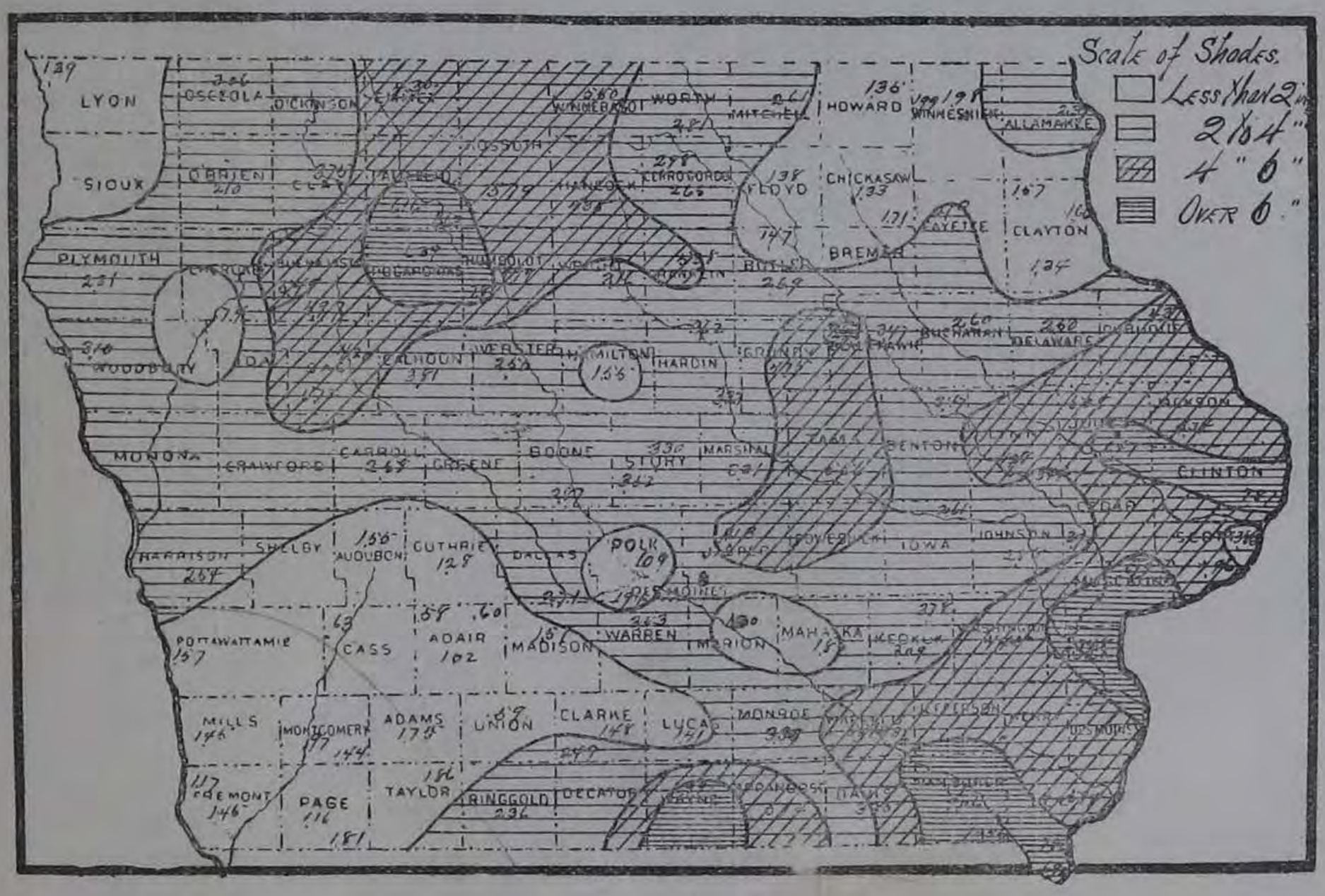
ELDORA—*July.* Mean temperature, 74 9°; mean maximum temperature, 91.1°; mean minimum, 58.7°; highest, 102°, on the 19th and 24th; lowest, 45°, on 11th and 31st Total precipitation, 2.40; greatest amount in 24 hours, 1.00 on 31st. Prevailing winds, southwest. Number of clear days, 1; partly cloudy, 30; cloudy, 0; rain fell on 4 days.

WAVERLY—*For July.* Mean temperature, 72 6°; mean maximum temperature, 84 5°; mean minimum, 60 8°; highest, 94°, on 24th; lowest, 50°, on 11th and 30th; total rain, 2 28; number of clear days, 12; partly cloudy, 17; cloudy, 2 Rain fell on 6 days. Prevailing wind, south.

ERRATA FOR JULY.

MARSHALLTOWN Rainfall for July should be 2.75 inches instead of 2.67. Amount on 3d should be .41 inch instead of .33.

Precipitation Chart August 1898.



MAXIMUM AND MINIMUM DAILY TEMPERATURE FOR AUGUST, 1898.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max.	76	80	75	82	88	87	89	82	87	82	82	81	85	92	90	89	87	90	91	98	97	98	96	89	93	89	84	94	93	99	96	88 4
	Min.	49	59	57	53	53	67	67	62	53	63	57	53	63	64	70	65	62	65	65	69	69	68	69	62	57	68	54	62	68	67	67	62 2
Albia	Max.	76	73	72	78	84	81	85	81	81	82	81	79	80	86	90	89	83	80	83	90	90	92	96	86	87	87	82	90	87	92	90	84.3
	Min	49	59	56	50	56	64	66	61	51	61	54	51	64	63	69	71	65	66	57	66	67	68	71	64	57	65	53	61	68	68	68	61 5
Alta	Max.	78	73	76	81	89	86	84	78	82	76	74	78	80	81	89	87	80	83	88	88	88	94	75	81	87	76	80	87	86	96	90	83.0
	Min	48	55	49	54	64	66	64	60	53	58	56	54	58	60	66	66	53	57	58	66	66	66	69	58	57	59	50	65	57	64	69	59.4
Amana	Max.	78	70	69	79	82	83	88	83	84	82	81	79	70	78	89	90	81	81	83	85	86	92	93	85	85	81	79	86	87	94	91	83.0
	Min	57	55	58	49	57	65	67	64	50	62	58	50	55	63	66	69	64	63	55	66	67	68	71	66	57	60	55	57	57	66	70	60 9
Ames	Max.	80	66	76	82	85	79	88	81	86	82	77	83	75	81	92	93	84	87	88	88	91	95	84	85	88	80	80	88	90	99	91	84.6
	Min	48	54	57	50	58	66	62	60	48	61	57	51	59	59	70	69	56	58	58	65	66	71	74	62	60	60	51	64	55	65	67	60 0
Atlantic	Max.	78	80	76	83	87	89	79	82	84	80	78	83	83	88	92	96	83	89	88	98	98	97	90	88	95	94	93	92	94	98	93	87.7
	Min	42	42	54	47	61	61	67	58	46	59	49	46	62	65	70	69	61	57	63	69	63	71	70	54	46	63	66	58	68	69	68	59.5
Audubon	Max.	72	68	68	78	86	87	85	77	81	77	75	79	77	85	88	89	79	84	88	92	90	93	85	84	87	80	80	85	88	97	90	83.0
	Min	46	47	53	51	62	67	63	61	49	58	57	50	62	63	69	70	60	59	63	68	66	67	67	59	52	62	62	69	54	64	69	60.3
Belknap	Max	74	74	69	78	79	83	82	83	83	81	80	79	79	80	88	88	81	78	84	90	92	94	95	89	88	89	78	88	90	93	89	83.8
	Min	55	57	56	54	60	64	69	64	55	60	59	55	61	63	67	74	70	69	60	66	78	78	75	68	63	62	60	63	69	70	70	64 3
Belle Pl'ine	Max	68	69	66	73	78	80	84	82	76	80	78	75	88	80	89	85	78	77	78	75	80	90	90	84	81	79	75	83	85	93	90	80.1
	Min	50	52	10	58	48	62	65	62	50	50	48	50	55	59	60	68	60	63	57	65	60	63	68	61	55	59	52	57	58	60	65	58.1
Bonaparte	Max	75	72	78	77	81	85	81	83	84	84	81	81	76	78	88	89	79	77	80	89	92	92	95	86	87	91	78	90	87	93	89	83.8
	Min	56	55	58	52	58	64	67	64	57	64	59	52	63	60	70	69	68	65	58	65	70	73	71	67	58	65	60	61	68	71	68	63.1
Britt	Max.	81	61	75	81	83	83	83	75	83	79	73	77	78	81	91	85	72	81	90	94	90	92	77	77	82	75	78	85	87	95	91	81.8
	Min	40	54	55	49	61	65	58	57	46	57	53	45	55	56	63	58	50	58	55	62	63	69	60	58	52	53	46	62	47	60	67	55.9
Carroll	Max.	78	61	79	81	88	80	86	81	83	79	77	80	78	83	93	93	83	86	89	96	92	97	81	86	93	83	84	90	91	99	93	85 3
	Min	45	56	52	61	62	65	63	60	47	58	54	48	58	60	67	67	51	55	58	67	68	66	72	59	53	59	46	63	51	63	70	58.9
Cedar Falls	Max	79	63	72	82	82	83	91	84	84	82	81	83	77	81	90	92	83	83	86	85	91	93	85	85	86	81	82	88	91	96	93	84.3
	Min	49	53	55	49	60	65	63	61	46	60	57	51	55	58	68	67	56	61	57	65	67	68	69	60	57	58	51	59	53	59	67	58.8
Cedar Rap	Max.	79	71	69	81	85	84	89	83	86	82	81	80	71	78	90	92	80	80	84	88	89	95	94	88	85	81	80	90	87	98	94	84.3
	Min	58	56	59	57	60	61	66	65	53	65	60	54	56	62	68	67	64	62	58	66	68	70	71	66	60	60	56	62	58	68	74	62 6
Centerville	Max	77	71	71	80	84	83	85	83	85	83	83	81	80	86	89	90	81	79	86	92	96	93	96	90	91	92	90	88	90	94	91	85.8
	Min	52	59	59	52	59	64	68	63	54	62	56	53	62	67	70	73	70	68	59	66	70	70	72	66	59	67	57	63	67	70	68	66 4
Charlton	Max	74	76	73	78	81	81	96	83	81	80	81	79	79	85	88	90	81	78	85	91	94	93	94	89	91	91	79	90	87	94	89	84.9
	Min	50	56	57	62	59	64	68	61	50	60	55	50	61	64	70	72	64	65	58	68	69	72	62	55	67	58	64	67	69	67	67	62.3
Charles C'y	Max	74	70	71	82	80	81	90	80	82	81	80	79	77	78	92	91	79	78	85	86	88	94	82	81	81	79	78	87	88	96	95	83.0
	Min	46	53	55	49	60	67	57	62	45	48	54	97	52	53	66	64	52	59	56	65	57	67	69	56	54	61	49	59	67	64	64	54.5
Clarinda	Max	80	80	79	83	91	88	89	86	87	83	82	82	87	92	94	94	87	88	91	103	102	101	90	91	94	94	88	94	96	99	95	90.2
	Min	68	66	64	61	69	72	74	70	63	70	62	60	70	73	78	76	75	72	76	79	75	78	74	70	69	76	67	72	74	78	74	70.9
Clear Lake	Max.	74	69	73	81	80	80	90	75	80	78	73	75	77	78	87	87	78	91	86	85	87	90	81	75	78	75	76	84	85	94	90	81.0
	Min	46	55	55	60	64	69	64	58	63	59	55	49	54	54	68	60	52	58	55	62	68	68	65	58	58	56	49	60	53	61	68	58 8
Clinton	Max.	78	79	73	81	84	87	84	85	84	82	83	80	63	77	88	85	81	77	81	83	80	92	93	85	83	79	80	86	84	91	90	82.8
	Min	58	59	59	51	59	61	68	64	56	59	62	51	53	60	63	65	64	58	54	64	69	66	69	67	59	59	57	57	60	65	68	60.8
College Sp's	Max	77	78	78	81	89	86	87	83	85	81	82	81	86	89	94	95	84	89	90	90	99	97	88	87	96	92	81	95	97	99	93	88.5
	Min	56	58	57	55	61	67	65	62	55	61	55	54	62	68	70	67	66	65	67	71	69	70	64	62	65	66	58	65	68	70	67	63.5
Corning	Max	75	74	75	81	88	84	87	83	82	80	79	81	82	87	96	92	87	87	86	97	95	95	97	88	92	90	85	91	99	98	95	87.3
	Min	47	60	57	52	50	60	66	62	51	62	55	49	62	62	71	70	65	63	64	70	71	72	71	62	56	70	55	67	71	72	69	62 4
Co Bluffs	Max	80	76	78	83	90	87	98	84	88	89	78	84	84	90	93	94	86	88	90	103	101	101	88	93	96	87	88	92	96	100	94	89.6
	Min	58	59	63	61	68	68	64	59	62	59	59	63	65	70	70	68	67	65	68	76	71	71	68	61	57	64	67	59	72	72	69	65.2
Cresco	Max	75	82	72	81	79	78	85	77	80	79	78	77	78	79	91	88	79	68	82	84	88	95	80	82	85	77	78	89	87	96	94	81 4
	Min	48	54	55	52	61	65	59	59	49	61	56	46	54	53	69	63	53	52	55	65	63	68	65	57	55	56	51	61	50	61	70	57.5
Davenport	Max	76	76	68	79	81	84	83	84	83	83	81	80	67	74	88	86	80	77	81	82	88	92	93	86	86	79	77	85	87	92	89	82.2
	Min	58	59	60	56	61	66	70	66	60	65	62	56	58	62	66	66	68	61	59	67	74	71	69	69	61	65	58	61	67	68	72	63 9
Decorah	Max.	74	65	69	78	79	80	86	78	80	79	77	74	78	80	88	86	78	68	79	84	87	94	84	82	83	76	80	87	85	93	93	80.8
	Min	52	56	54	48	60	65	59	58	46	62	56	49	48	57	67	60	52	57	51	65	64	67	66	57	54	55	46	47	52	56	73	56.6
Des Moines	Max.	76	70	75	78	83	79	89	83	83	82	80	81	76	84	89	92	82	83	85	94	93	96	92	89	90	83	80	91	88	99	90	85.0
	Min	51	58	58	53	60	67	64	64	52	64	57	53	61	62	72	73	64	64	62	69	68	72	70	62	57	64	58	65	63	68	69	62.7
De Soto	Max.	75	70	13	79	84	84	88	82	86	81	79	82	80	87	92	93	81	82	86	94	90	96	94	87	89	82	80	90	88	97	93	85.3
	Min	49	60	58	52	62	70	65	63	50	65	58	59	63	65	72	74	64	62	64	70	73	74	77	63	66	62	62	62	62	69	73	64.1
Dows	Max.	76	70	75	80	82	81	86	80	82	80	76	79	83	80	92	90	81	82	82	86	87	92	84	80	83	77	78	85	88	96	90	82.7
	Min	43	51	55	49	60	55	62	58	43	56	53	45	55	58	63	63	53	59	67	61	64	70	67	67	51	53	47	62	52	62	68	57.2
Dubuque	Max.	75	73	67	80	81	81	86	82	81	81	80	77	68	73	85	84	78	76	78	86	89	92	92	84	84	77	76	86	82	91	90	80.9
	Min	60	59	59	53	60	66	67	65	54	64	62	53	55	60	62	66	64	59	58	65	70	67	68	65	60	59	56	60	60	62	73	61.6
Eldon	Max.	78	74	70	81	83	84	85	86	86	85	84	82	78	78	90	90	83	81	84	92	92	96	99	88	90	90	82	92	90	97	93	85.9
	Min	56	54	60	51	58	65	69	65	56	65	60	53	62	63	71	74	70	68	59	67	71	71	73	69	59	65	59	63	67	70	71	64 0
Elkader	Max.	80	69	71	85	84	85	91	86	87	86	83	82	78	80	92	90	84	74	83	86	93	97	92	87	87	80	83	90	90	93	95	85 3
	Min	55	50	56	48	53	63	63	59	45	57	56	46	47	54	65	63	54	55	51	65	65	62	71	60	53	55	48	55	49	53	68	58.2
Estherville	Max	..	68	78	83	87	82	81	78	76	69	73	79	78	77	81	83	79	82	85	87	88	94	84	78	84	78	84	84	..	98	96	81 8
	Min	..	53	60	51	60	62	59	53	56	55	53	43	53	52	62	57	49	57	47	59	60	65	60	56	54	56	42	56	..	57	65	55.6
Fairfield	Max	78	70	68	78	81	82	84	84	84	82	81	81	79	78	88	89	84	81	80	89	89	92	96	86	88	88	80	89	88	94	90	83.9
	Min	56	54	59	49	56	63	67	62	53	64	59	51	61	64	71	70	69	66	58	65	69	71	70	67	57	65	67	60	64	68	68	62 4
Forest City	Max	76	63	74	79	82	80	81	74	80	77	70	74	75	77	85	84	79	79	86	87	88	91	81	76	81	75	76	86	88	95	90	80.3
	Min	44	55	55	53	62	61	62	59	54	59	56	50	55	56	65	67	52	59	58	64	66	70	66	59	56	58	49	49	55	62	67	58.2
Glenwood	Max	76	71	77	82	89	83	86	82	86	81	79	79	81	90	92	91	87	85	91	100	102	100	92	92	96	90	87	96	94	101	93	88 1
	Min	48	60	54	59	62	67	66	60	51	60	56	53	63	65	70	64	64	62	69	75	69	71	73	57	55	66	55	69	65	68	67	62.7
Greene	Max.	81	76	76	85	87	85	88	81	87	82	78	81	81	82	94	93	85	79	90	90	93	95	84	83	85	80	83	90	92	100	96	85 9
	Min	45	53	55	49	60	66	60	57	47	55	57	46	53	52	67	65	52	58	58	65	67	69	68	63	58	58	47	60	51	59	67	57 6
Greenfield	Max.	74	79	75	79	87	85	91	83	82	81	81	81	84	88	94	91	89	91	93	96	95	92	95	90	92	88	84	92	90	97	91	87.4
	Min	51	59	55	54	60	67	63	54	61	55	57	50	62	64	71	68	62	68	69	72	70	67	69	60	56	65	52	66	65	68	68	62.3
Grundy C'r	Max.	78	63	71	82	82	82	90	80	84	79	79	81	75	80	90	92	80	83	86	84	88	93	92	84	83	78	79	87	88	95	91	83.2
	Min	47	52	54	50	59	62	64	59	45	57	56	51	54	59	68	66	54	59	54	62	65	68	65	60	56	58	51	60	54	60	67	57.9
Guthrie C'r	Max.	72	72	82	80	87	78	87	87	84	80	84	84	80	95	92	92	85	80	88	98	92	97	88	88	91	82	82	92	91	100	94	86.6
	Min	45	45	55	55	59	67	62	59	50	56	56	50	61	62	70	58	57	57	67	67	67	68	71	65	70	49	49	58	58	58	68	59.3
Hampton	Max.	76	63	74	81	82	82	82	79	82	78	75	78	68	78	90	92	83	80	81	85	86	92	73	76	82	78	77	85	86	95	90	80.9
	Min	47	53	54	51	61	65	65	61	50	59	56	51	55	62	69	65	54	60	56	63	66	69	67	60	59	59	49	62	55	61	69	59 1
Hopev lle	Max.	74	76	73	78	84	80	83	80	81	79	77	80	80	87	88	91	81	80	85	92	94	94	92	87	92	89	81	90	92	96	89	84 7
	Min	50	59	58	56	60	65	59	63	55	63	57	55	63	65	71	72	65	65	63	71	72	72	71	63	59	67	57	64	68	69	67	63 7
Humboldt	Max.	78	78	76	80	85	83	83	77	82	78	73	78	78	61	88	88	78	82	88	87	88	93	86	85	84	88	78	85	86	95	89	82.3
	Min	45	44	56	52	62	67	63	59	48	60	57	64	57	58	67	62	52	60	58	64	66	70	68	61	56	60	47	65	52	63	67	59.0
Indep'nd'ce	Max.	77	76	68	80	81	81	87	81	82	80	79	78	74	78	88	89	79	80	81	83	88	91	87	84	83	79	78	87	88	95	92	82.4
	Min	53	54	56	46	52	57	60	60	49	61	56	50	55	57	65	63	56	58	56	55	64	67	69	58	54	55	51	57	55	60	66	57 3
Indianola	Max.	76	74	74	79	82	81	85	83	82	80	79	80	76	84	87	92	87	80	84	92	91	93	94	88	90	86	80	91	87	98	90	84 7
	Min	49	58	57	53	59	66	67	62	52	62	58	53	61	63	71	72	63	64	60	68	70	70	74	63	57	68	54	64	65	68	68	62.5
Iowa City	Max.	82	75	70	83	84	84	86	85	85	83	83	83	70	78	89	89	85	83	84	88	90	94	94	87	88	83	83	88	93	97	94	85 2
	Min	58	55	58	50	52	62	66	64	53	53	59	51	54	57	65	67	65	62	56	57	65	69	71	66	57	58	55	57	59	61	69	59 7
Iowa Falls	Max.	80	61	76	87	85	84	87	80	86	81	80	80	81	83	93	92	85	85	90	89	90	93	79	82	89	80	79	86	87	94	91	84.2
	Min	44	50	55	47	60	65	58	58	42	58	55	46	53	52	67	64	53	57	56	63	65	68	67	59	57	57	46	61	52	60	68	56.8
Keos uqua	Max.	73	75	78	80	82	85	82	83	85	84	83	82	76	78	87	89	79	78	82	90	95	94	97	87	89	89	83	89	87	92	90	84.6
	Min	57	57	60	52	60	65	69	66	59	66	61	55	63	66	71	75	71	68	60	67	73	78	74	69	61	69	61	64	70	72	71	65.5
Keokuk	Max.	75	74	66	77	81	86	81	86	85	84	81	80	79	78	89	88	83	76	81	89	92	94	97	86	87	91	80	90	93	94	91	84.2
	Min	58	61	61	56	61	65	71	69	65	68	64	56	68	66	72	76	69	68	61	69	76	76	76	70	64	71	62	64	71	76	72	67.2
Knoxville	Max.	76	74	73	79	82	83	85	83	84	80	81	84	75	80	89	91	82	82	84	90	93	94	93	87	90	86	82	89	86	94	90	84 5
	Min	51	56	57	54	59	65	65	63	61	66	60	60	60	63	71	72	63	65	60	67	69	71	73	65	68	68	55	63	65	69	69	63.6
Lamoni	Max.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	83	86	91	93	92	97	86	88	90	80	94	93	95	90	....
	Min.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	68	62	68	69	67	68	63	57	66	57	62	66	68	65	....
Lansing	Max.	79	70	70	82	81	82	89	81	82	84	80	78	80	80	87	86	84	72	81	86	89	95	88	85	85	77	78	90	84	93	94	83.0
	Min	57	52	56	50	59	67	61	60	48	50	58	48	50	52	59	58	50	55	53	68	66	67	70	57	53	57	48	58	52	55	70	56.9
Larrabee	Max.	83	75	78	83	89	85	85	78	84	78	73	82	82	80	88	87	80	85	88	89	89	96	89	82	88	76	84	88	88	97	92	84.5
	Min	47	45	46	53	65	62	62	58	52	57	53	50	58	58	62	59	50	56	57	65	65	64	65	54	57	57	47	64	51	64	68	57.1

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR AUGUST, 1898—CONTINUED.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Le Mars....	Max	77	70	71	80	88	82	84	81	84	82	75	78	80	88	87	87	76	83	87	92	89	97	89	82	89	82	89	88	89	98	92	84.4
	Min	51	56	48	55	65	66	61	57	52	57	50	56	58	60	62	60	62	57	61	68	62	67	66	59	53	59	49	68	55	67	70	59.3
Lenox.....	Max	75	73	73	79	86	83	85	81	82	79	78	79	82	87	89	92	82	80	84	94	94	94	92	89	90	89	82	92	91	96	89	85.2
	Min	49	69	57	54	60	68	67	62	56	62	56	50	62	64	64	68	65	64	66	66	71	71	74	63	60	69	56	66	68	70	68	63.1
Linn Grove	Max	79	69	68	81	83	84	86	82	83	83	82	78	74	78	88	87	80	79	81	86	88	91	92	85	83	82	79	85	86	93	90	82 7
	Min	57	55	58	52	53	53	65	64	52	62	58	49	56	60	64	66	63	59	55	65	68	68	72	64	55	59	51	57	58	62	68	59 7
Logan.....	Max	81	78	80	82	87	87	85	82	87	85	87	83	80	91	93	91	93	88	95	98	98	99	84	90	92	88	87	89	92	100	95	85.4
	Min	48	52	50	54	60	58	52	50	56	52	50	52	48	63	64	63	58	60	62	64	65	68	60	64	68	56	50	47	50	61	68	57.2
Maquoketa.	Max	77	76	68	79	81	84	88	81	82	82	81	78	67	81	84	86	82	77	78	80	89	92	93	83	81	78	76	87	83	91	89	81.7
	Min	58	55	58	49	54	61	64	56	52	63	61	51	50	43	53	64	59	53	56	55	68	63	72	64	56	53	51	57	52	62	69	57.5
Marshallt'n	Max.	79	66	74	81	83	80	89	84	85	80	80	82	73	82	90	94	84	84	86	88	89	95	91	86	88	82	80	90	89	99	92	84 7
	Min	48	53	55	49	58	65	62	60	47	60	55	50	56	63	70	69	58	60	58	65	65	70	75	62	55	59	50	62	55	65	70	60.3
Mason City.	Max.	77	62	76	81	80	81	83	75	82	79	74	75	77	79	89	88	89	80	88	87	87	87	72	77	80	76	78	86	85	95	93	81 2
	Min	44	48	44	51	60	61	61	58	47	57	55	49	55	54	55	61	51	55	64	65	68	67	58	57	56	47	55	51	54	67	65	56.1
Monticello..	Max.	..	78	75	68	80	83	85	85	88	87	85	86	83	84	86	89	90	..	..	..	..	..	..	..	84	83	82	80	90	96	94	83.1
	Min	..	52	54	52	48	55	57	62	62	55	57	60	53	56	56	60	60	..	..	..	..	..	..	..	55	54	50	48	53	69	70	57.6
Mooar ..	Max	75	71	68	80	78	87	87	88	85	85	84	81	80	76	88	86	86	80	80	87	94	95	95	87	88	90	84	88	98	92	88	84.9
	Min	56	53	60	50	52	61	64	65	58	60	62	52	53	53	64	71	68	67	59	63	69	70	70	68	56	65	62	60	60	70	67	61 5
Mt. Ayr	Max	75	78	74	82	87	84	89	83	87	83	80	83	87	88	91	94	80	83	85	93	97	94	94	88	93	91	82	90	94	95	91	87.1
	Min	50	59	57	56	58	67	69	62	57	61	55	53	60	65	69	68	60	63	64	69	69	69	70	62	65	67	58	64	67	67	66	62 8
Newton.....	Max.	78	70	73	80	82	83	89	82	83	80	81	80	74	80	89	91	83	83	84	90	93	94	87	88	85	80	90	89	97	91	84 6
	Min	49	56	57	52	60	66	65	63	52	62	57	52	61	62	71	73	62	63	59	65	68	73	73	64	60	65	54	63	62	67	69	62.1
Neola.	Max.	70	62	88	84	90	88	90	88	87	88	92	90	88	92	94	92	97	102	98	94	92	88	87	85	88	92	90	94	96	94	90	89 4
	Min	50	48	52	60	64	60	58	48	50	52	50	54	52	54	58	60	70	68	64	68	64	62	60	58	60	57	58	54	56	58	60	57.6
N.Hampton	Max	74	67	72	78	80	79	85	79	81	80	77	76	76	78	88	90	78	71	83	81	86	92	84	80	82	77	77	87	85	95	91	80 9
	Min	46	52	54	53	59	64	60	59	66	65	55	49	53	53	65	64	64	58	57	65	65	67	66	65	55	58	54	59	70	61	67	59.8
Northwood.	Max.	79	67	75	81	87	82	83	75	80	73	74	79	81	80	87	85	89	80	87	89	90	92	79	76	80	74	78	85	87	94	91	81.6
	Min	45	55	54	49	59	65	61	58	52	47	49	54	52	60	62	62	52	58	52	64	62	67	64	56	56	55	46	60	50	55	62	56.2
Odebolt	Max	82	79	80	84	89	85	86	81	85	80	76	84	81	85	95	90	87	80	91	98	97	100	92	87	93	70	80	92	95	101	91	87 3
	Min	57	56	61	53	63	66	63	50	51	62	63	50	58	61	66	76	66	57	58	68	67	69	67	60	55	65	57	56	52	65	69	60.9
Ogden	Max.	76	66	75	80	85	81	88	82	83	81	77	80	76	80	91	93	82	86	88	80	90	94	85	85	88	81	80	89	89	98	92	84.2
	Min	46	56	56	52	60	66	62	61	48	59	53	49	58	61	68	68	57	58	60	65	66	70	72	61	55	64	51	63	55	66	67	59.8
Olin..... ..	Max.	78	74	75	67	78	80	83	83	82	81	82	80	78	70	74	86	86	80	79	76	82	86	90	90	85	81	80	76	84	83	92	80.7
	Min	57	55	59	49	56	61	66	65	56	61	59	50	52	57	61	65	65	59	55	54	65	66	74	65	56	57	54	58	54	66	68	59.5
Omaha,Neb	Max.	75	68	76	80	89	80	87	81	88	78	77	77	82	89	92	90	82	85	89	100	00	100	85	89	91	85	85	90	93	99	91	86.2
	Min	55	59	56	63	66	69	68	66	61	62	61	60	63	67	72	72	66	66	71	75	73	74	73	65	63	68	60	71	71	73	71	66 5
Osceola	Max.	76	77	74	84	82	88	82	82	83	81	79	81	82	87	89	93	82	80	86	94	95	94	93	89	93	90	83	90	91	97	90	86.0
	Min	50	58	58	52	66	69	62	52	52	62	56	56	61	64	70	73	64	66	61	70	70	70	74	63	60	69	55	64	67	69	69	63 0
Oskaloosa..	Max.	77	70	71	81	82	82	85	82	84	82	81	81	78	82	89	91	81	82	84	90	91	94	96	89	89	90	83	91	88	98	93	85.1
	Min	49	50	57	48	58	64	68	63	49	62	54	50	60	62	69	71	63	65	57	64	68	71	69	64	53	63	53	61	61	67	69	60.7
Ottumwa...	Max.	74	70	69	79	79	81	84	82	84	82	80	80	78	79	89	90	83	79	81	90	90	95	99	87	90	90	80	91	86	96	95	84 3
	Min	54	56	54	56	64	59	64	62	54	63	59	53	60	62	66	52	66	66	58	65	66	70	68	68	58	66	58	61	66	69	68	61.5
Ovid.	Max.	75	74	74	79	82	79	84	84	83	84	82	81	80	85	87	91	82	78	85	90	95	93	95	88	91	92	81	88	89	93	88	84.9
	Min	48	57	58	52	57	64	69	60	51	60	55	52	62	66	70	72	66	64	59	67	68	69	69	63	59	65	56	63	68	68	68	62 1
Pella	Max.	72	68	69	76	78	74	76	78	77	80	73	78	74	77	85	86	78	78	79	88	88	89	96	83	82	77	75	85	83	88	82	79 7
	Min	50	56	57	52	60	54	67	64	50	61	57	53	62	63	71	74	64	64	58	60	69	70	74	63	56	66	53	63	63	68	68	61.6
Pioneer.....	Max.	78	70	80	80	85	83	83	78	82	78	73	79	79	82	89	88	81	83	87	87	89	93	74	79	36	76	78	85	87	95	90	82 5
	Min	46	56	54	57	64	66	67	59	62	59	58	55	59	60	68	60	52	60	60	65	66	0	66	61	58	56	51	64	57	64	67	60 2
Plover.....	Max.	80	..	80	84	88	66	88	90	88	86	82	83	85	82	89	86	84	85	88	89	88	93	82	80	82	80	84	88	87	95	93	84 1
	Min	44	54	50	48	64	60	62	56	48	64	55	52	54	55	60	53	60	58	54	64	66	68	65	56	55	56	47	55	54	60	65	58.8
Primghar ..	Max.	77	68	80	80	88	85	87	81	83	75	78	78	80	80	86	87	88	89	89	90	88	95	95	82	89	82	81	87	89	95	95	84 7
	Min	49	55	48	55	65	65	64	66	54	66	55	55	60	60	65	51	59	60	63	65	65	65	65	58	55	57	78	71	68	75	78	61.8
Red Oak....	Max	79	77	79	82	79	86	89	84	85	80	80	80	82	83	90	95	92	86	89	99	91	92	90	91	92	89	87	94	93	98	92	87.3
	Min	47	59	57	54	62	68	65	60	52	61	52	51	52	56	58	60	62	63	67	72	69	63	62	59	54	67	54	65	66	66	68	60 5
Ridgeway ..	Max.	74	67	69	80	78	78	84	80	79	82	78	76	78	78	88	87	77	69	80	88	87	92	82	80	82	79	79	84	86	95	93	80 9
	Min	50	56	54	54	61	65	63	61	54	62	59	53	57	54	66	64	54	60	55	65	66	70	70	58	58	60	52	60	57	62	72	59.7
Rockwell C.	Max	88	61	75	80	87	82	84	77	83	80	75	80	78	80	90	90	79	86	87	88	87	94	76	83	85	70	80	86	88	97	92	82 8
	Min	46	56	52	52	56	65	63	58	53	59	54	50	58	59	62	62	53	57	59	65	64	68	67	60	55	59	49	48	54	65	67	57.6
Ruthven ...	Max	76	75	74	78	85	86	82	86	82	82	76	78	78	82	85	86	84	81	84	86	85	95	92	78	86	86	80	85	89	98	92	83 3
	Min	48	54	50	56	63	65	63	52	52	58	53	48	55	64	56	45	51	46	66	52	64	68	66	58	8	58	50	54	55	63	54	55 6
Sac City....	Max.	96	92	80	82	79	81	83	79	81	80	82	84	83	90	95	85	81	85	90	95	93	91	87	82	81	84	83	86	92	96	92	86.0
	Min	60	64	61	57	49	51	63	47	59	60	58	59	60	61	60	55	54	54	57	65	62	63	61	60	58	59	61	59	60	62	67	58.9
Sidney. ...	Max.	75	72	75	82	89	83	86	82	84	77	77	78	82	88	90	88	80	84	89	98	97	96	98	83	86	87	84	93	98	96	91	86 1
	Min	55	61	55	61	61	68	67	64	58	62	61	60	64	67	72	69	67	66	71	74	71	74	76	64	66	71	61	71	68	69	68	65.9
Sibley	Max.	78	65	79	80	88	86	83	80	82	76	76	79	78	80	83	82	83	82	89	91	88	97	77	83	89	76	81	87	90	98	94	79.4
	Min	45	55	47	49	63	65	56	55	46	55	49	45	58	55	60	57	50	50	55	63	62	65	63	54	51	57	47	66	51	65	68	55 7
Sigourney..	Max.	82	71	73	83	84	82	89	87	87	85	84	85	80	80	92	91	88	87	85	92	96	95	97	90	88	89	84	82	90	98	93	86.7
	Min	54	53	56	49	54	62	66	62	50	62	54	49	60	60	68	69	63	62	64	63	6	70	67	64	56	61	52	60	60	64	67	59.9
Sioux City..	Max.	78	63	77	80	90	85	85	79	85	78	76	78	79	85	88	86	80	85	89	95	92	100	76	83	93	80	85	89	91	101	93	84.6
	Min	56	58	52	55	60	66	67	63	56	58	59	56	58	62	64	66	54	56	60	67	65	66	69	64	58	59	55	57	56	59	71	60 4
Spencer	Max	79	68	..	77	79	82	83	79	82	77	75	80	80	80	86	86	80	83	87	87	87	93	75	80	83	75	80	85	87	94	90	82 0
	Min	46	54	..	56	54	60	58	56	50	57	52	46	56	58	61	58	51	57	55	60	63	66	62	67	55	57	45	61	65	69	63	57 3
Stuart.....	Max	75	70	72	78	85	85	87	80	84	82	77	83	84	85	92	90	82	81	87	96	92	92	90	87	90	83	80	85	97	95	92	85 3
	Min	50	68	59	55	60	60	67	54	52	62	60	55	62	65	62	72	62	60	62	70	72	72	73	62	59	65	56	67	65	67	69	62.7
Tara	Max	80	75	80	80	85	83	85	80	83	75	74	81	79	80	93	92	83	88	83	90	91	92	95	91	90	80	80	88	90	97	93	85 3
	Min	43	45	43	45	60	59	60	59	46	55	54	49	56	56	56	60	50	58	50	59	56	59	65	58	55	59	57	62	50	60	67	55 2
Toledo.....	Max	81	62	71	82	83	82	88	82	78	80	79	80	75	80	89	91	80	81	84	87	85	92	91	81	85	80	77	87	88	94	90	82.9
	Min	47	46	56	49	61	65	62	61	47	56	55	50	50	62	70	71	60	60	55	65	65	65	73	62	55	58	51	61	54	64	69	58 9
Thurman .	Max.	74	70	78	80	88	84	85	81	86	80	78	78	83	89	93	89	82	84	89	99	98	98	89	87	89	87	85	95	90	97	91	86.3
	Min	48	61	54	58	65	65	65	60	52	60	52	55	62	66	70	64	65	64	70	75	66	72	72	60	58	67	59	67	63	68	72	63.1
Villisca .	Max.	78	75	75	80	87	83	86	81	83	79	77	79	84	87	91	91	83	83	88	97	95	95	92	88	91	89	86	90	91	96	91	86.2
	Min	45	57	56	49	60	67	63	57	51	59	51	49	61	65	71	67	63	61	66	70	67	70	72	58	53	65	57	65	63	68	65	61 0
Wapello	Max	76	71	68	77	80	86	82	84	85	84	..	84	71	72	87	84	88	76	79	85	88	91	94	85	84	81	77	85	83	92	88	82.2
	Min	58	53	50	69	57	62	68	64	54	63	..	59	58	63	64	65	68	64	58	64	64	73	74	69	58	63	58	61	65	68	70	62.8
Washingt'n	Max	76	68	66	79	78	82	82	85	83	83	82	83	73	75	88	87	82	89	82	86	89	92	94	86	85	85	80	88	86	93	9.	82.9
	Min	55	55	60	50	56	63	67	62	52	62	56	51	58	60	70	65	65	60	55	63	68	72	66	63	57	62	54	58	63	64	68	63 9
Waterloo...	Max.	77	75	72	83	82	83	90	82	81	81	80	80	74	79	90	92	81	82	87	86	89	93	86	85	85	79	81	88	89	95	93	84 0
	Min	49	53	55	49	58	64	62	60	47	60	56	49	54	54	65	69	56	60	55	65	55	67	68	61	56	56	50	54	54	63	66	58.1
Waverly....	Max	74	68	71	80	81	81	87	80	81	80	78	77	73	77	89	90	80	80	84	83	86	93	79	82	83	78	78	86	85	96	91	81.0
	Min	49	55	55	50	60	66	62	61	49	60	56	49	55	57	66	67	54	62	59	66	67	69	69	61	58	58	49	62	54	61	69	59.2
Webster Cy	Max	76	71	78	80	83	82	85	79	82	80	75	80	78	82	90	89	81	82	85	86	87	93	85	80	83	78	79	84	86	94	90	82 7
	Min	47	58	57	53	61	66	63	61	49	60	57	50	59	62	63	68	58	63	61	65	69	72	70	62	59	64	52	59	60	66	72	60.7
W. Branch..	Max.	78	79	68	80	81	82	86	82	85	86	84	79	69	89	87	82	78	79	84	87	86	92	93	86	84	83	81	88	90	93	92	83.6
	Min	58	51	60	47	52	62	67	57	51	..	..	..	..	76	67	68	64	60	58	57	70	66	71	63	61	55	56	56	58	56	59	60 4
Wilton Jc..	Max.	80	77	79	82	84	86	86	85	84	86	84	79	72	80	91	86	83	80	81	87	93	92	94	87	85	82	79	88	88	92	90	84 6
	Min	55	54	53	49	53	62	64	58	53	59	58	50	53	62	65	64	60	58	53	61	67	65	70	67	60	56	54	58	59	68	66	59 2
Winterset..	Max.	75	76	73	78	83	83	87	82	83	83	80	80	81	86	87	90	81	84	84	94	91	94	93	88	89	89	82	92	85	96	94	85 6
	Min	41	55	55	50	57	64	63	58	56	58	55	49	58	60	67	68	60	57	60	65	60	65	70	57	54	52	54	69	62	64	65	58.8

METEOROLOGICAL DATA FOR AUGUST, 1898.

NORTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).									PRECIPITATION, IN INCHES.			Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	Number of hail storms.	No. of thunder storms.
	Monthly mean.	EXTREMES.						Monthly range.											
		Mean maximum.	Mean minimum	Maximum.	Date.	Minimum.	Date.			Monthly.	Greatest daily.	Total snowfall.							
Algona *	71.2	.....	.....	90	30, 31	55	1, 12	35		5.79	2.20	.....	SE	13	17	1	4	....	1
Alta	71.2	83.0	59.4	96	30	48	1	48		5.49	4.70	.....	S	19	11	1	7	....	3
Britt	68.8	81.8	55.9	95	30	40	1	55		4.35	1 34	.....	NE	.....	30	1	7	..	1
Charles City	68.8	83.0	54 5	96	30	45	9	51		1.38	.74	.....	SE	25	1	5	5	....	....
Clear Lake	69.9	81.0	58 8	94	30	46	1	48		2.98	1.68	...	SE	18	12	1	5	....	...
Cresco	69 4	81.4	57.5	96	30	46	12	50		1.35	.49	....	SW, NW	22	5	4	6	....	7
Decorah	68.7	80.8	56.6	93	30, 31	46	9	47		1.98	.66	.....	.....	.....	.....	.....	5	....	..
Dows	70.0	82.7	57.2	96	30	43	1	53		3.16	2.16	.....	SW	17	8	6	10	....	4
Eagle Grove †	70.8	.....	.....	.....	.....	.....	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Elkader	70.8	85.3	56.2	97	22	45	9	52		1.34	.48	....	N	22	6	3	7	....	2
Estherville *b*	68.7	81.8	55.6	98	30	43	12	55		4.30	2.20	...	N	.....	.....	.....	3	1	...
Forest City	69.2	80.3	48.2	95	30	44	1	51		5.50	2.02	.....	SW, NW	18	6	7	7	....	....
Fredericksburg	.....	.....	.....	.....	.....	.....	.....	.....		1.71	.70	.....	.....	.....	.....	.....	3	....	....
Grand Meadow *	68.1	.....	.....	95	31	54	3, 12	41		1.57	.48	.....	SW	15	9	7	8	....	....
Greene	71.8	85.9	57.6	100	30	45	1	55		1.47	.81	....	E	9	20	2	6	....	....
Hampton	70.0	80 6	59.1	95	30	47	1	48		5.38	4.00	.....	NW	14	14	3	7	....	....
Hawkeye	.....	.....	.....	.....	.....	.....	.....	.....		2.60	.70	.....	.....	.....	.....	.....	7	....	....
Humboldt *a*	70.6	82.3	59.0	95	30	44	2	51		5.99	2.84	.....	SE	25	4	2	6	....	4
Lansing	70.0	83.0	56.9	95	22	48	9, 12	47		2.37	.79	....	.....	19	9	3	9	....	3
Larchwood	.....	.....	.....	.....	.....	.....	.....	.....		1.39	1.00	....	SE	21	9	1	3	....	....
Larrabee	70.8	84.5	57.1	97	30	45	2	52		4 07	3.25	.....	NW	13	17	1	4	....	....
Le Mars	71 8	84.4	59.3	98	30	48	3	50		2.31	1.75	....	S	21	9	1	3	..	...
Mason City	68.6	81.2	56.1	95	30	44	1, 3	51		2.65	.75	...	.....	.....	...	...	5	....	....
New Hampton *a*	70.4	80.9	59.8	95	30	46	1	49		1 33	.65	...	NW	11	15	5	7	....	...
Northwood	68.9	81.6	56.2	94	30	45	1	49		2.81	.76	...	S, NW	24	3	4	5	...	....
Osage †	66.5	.....	.....	.....	.....	.....	.....	.....		2.61	93	.....	S	12	11	8	7	...	3
Pioneer	71 4	82.5	60.2	95	30	46	1	49		7.81	4.30	....	SE	23	6	2	3	....	4
Plover	70 4	84 1	56.8	95	30	44	1	51		6.39	3.54	....	.....	25	2	4	3	..	....
Primghar	73.2	84 7	61.8	95	22, 30	48	3	47		2 10	1.55	.....	SE, S	25	.....	6	2	...	...
Ridgeway	70.3	80.9	59.7	95	30	50	1	45		1.99	.87	.....	S	17	8	6	9	...	6
Ruthven	69.4	83.3	55.6	98	30	45	16	53		6.16	3.00	.....	SW	21	6	5	5	....	....
Sibley	67.6	79.4	55.7	98	30	45	1, 12	53		3 06	.98	....	S	17	13	1	8	...	...
Spencer	69.6	82.0	57.3	94	30	46	1, 12	48		3.75	1.77	.....	S	20	9	2	3	....	
Spirit Lake *i*	70.3	83.6	57.0	99	30	49	3, 12	50		5.52	3 50	.....	S	.....	.....	.....	.....	....	1
Waverly	70.4	81.6	59.2	96	30	49	1, 27	47		2.69	.70	.....	S	13	14	4	8	....	4
West Bend *	69.0	.....	.....	96	30	54	1	42		6.63	2 95	...	S	12	15	4	5	...	....
Washta	.....	.....	.....	.....	.....	.....	.....	.....		.74	.74	.....	S	21	7	3	1	....	...
Average	67.8	79.4	55.6	92.5	.....	45 1	.....	47.5		3.43	.....	.....	S	17	10	4	5	....	....

CENTRAL SECTION.

Amana	72.0	83 0	60.9	94	30	49	4	45		2.61	1.04	.....	SE	17	9	5	9	...	3
Ames	72.3	84 6	60 0	99	30	48	1, 9	51		3.30	2.02	.....	.....	16	14	1	5	....	....
Audubon	71.6	83.0	60.3	97	30	46	1	51		1.55	1.03	...	S	13	13	5	3	...	..
Belle Plaine	69.1	80.1	58.1	93	30	48	5, 11	45		7.85	4.15	.....	E	13	12	6	7	..	....
Carroll	72.1	85.3	58.9	99	30	45	1	54		2.58	1 38	.....	.....	20	6	5	5	....	5
Cedar Falls	71 6	84.3	58.8	96	30	46	9	50		4.42	1.75	.....	S	9	18	4	7	....	....
Cedar Rapids	73 3	84.3	62.6	95	22	53	9	42		4.38	1.42	.....	E	12	14	5	13	..	...
Clinton	71.8	82 8	60.8	93	23	51	4, 12	42		7 87	3.01	....	SW	13	10	8	9	....	...
Davenport	73.0	82.2	63.9	93	23	56	12	37		4 96	2.24	.....	SW	15	6	10	12	....	7
Delaware ‡	68.6	.....	.....	95	23	52	12	.....		2.50	1.78	.....	S	15	11	5	9	....	....
Des Moines	74 0	85.0	62.7	99	30	51	1	48		1.09	.68	.....	SW	21	6	4	5	..	5
De Soto	74.7	85 3	64.1	97	30	49	1	48		2.71	1.45	.....	NE	21	6	4	6	....	5
Dubuque	71.3	80.9	61.6	92	22	53	4	39		4.37	2.46	.....	NW	13	11	7	11	....	5
Grundy Center	70.6	83.2	57.9	95	30	47	1	48		4.75	2.75	.....	N	14	10	7	4	....	....
Guthrie Center	73.0	86.6	59.3	100	30	45	2	55		1.28	.90	.....	SW	19	10	2	3	..	....
Independence	69.8	82.4	57.3	95	30	46	4	49		2.60	.80	.....	SE	19	7	5	7	....	....
Iowa City	72.4	85.2	59 7	97	30	50	4	47		2.85	.70	.....	S	9	12	10	8	...	....
Iowa Falls	70.5	84.2	56.8	94	30	42	9	52		3.62	2.32	.....	NE	21	5	4	6	..	....
Le Claire	.....	.....	.....	.....	.....	.....	.....	.....		3.86	2 07	.....	.....	.....	.....	.....	9	..	....
Linn Grove	71.2	82.7	59 7	93	30	49	12	44		3.44	1.00	.....	NE, E	16	4	11	9	....	....
Logan	71.3	85.4	57.2	100	30	47	28	53		2.54	1.65	.....	S	26	2	3	2	....	....
Maquoketa	69.6	81.7	57.5	93	23	43	14	50		4.34	2.16	.....	SW	22	1	8	11	....	....
Marshalltown	72.5	84.7	60.3	99	30	47	9	52		3.31	1.78	.....	.....	9	14	8	6	..	....
Millman (Des Moines)	.....	.....	.....	.....	.....	.....	.....	.....		1.94	1.02	.....	.....	.....	.....	.....	6	..	....
Monticello *h*	70.4	83.1	57.6	96	30	48	4	48		5.08	1.98	.....	.....	.....	.....	.....	8	..	....
Newton	73 4	84.6	62.1	97	30	49	1	48		4.13	1.31	.....	SE	19	10	2	7	....	....
Odebolt	74.1	81.3	60.9	101	30	50	12	51		5.72	5.08	.....	.....	25	2	4	2	....	....
Ogden	72.0	84.	59.8	98	30	46	1	52		2.87	1.20	.....	SE	25	0	6	7	..	2
Olin	70.1	80.7	.5	92	31	49	4	43		6.37	.....	.....	S	18	9	4	7	..	2
Rockwell City	70.2	82.8	5	97	30	46	1	51		3.81	1.77	....	.....	22	8	1	4	..	....
Sioux City	72.5	84.6	60.4	101	30	52	3	49		3.10	2.52	.....	S	16	12	3	3	..	....
Sac City	72.4	86.0	58.9	[illegible]	1, 30	47	8	49		4.20	3.50	.....	SW	18	12	1	3	..	....
Tara	70.2	85 3	55.2	[illegible]	30	43	13	54		2.50	1.50	.....	NW	2	29	0	3	....	...
Toledo	70.9	82.9	58.9	94	30	46	2	48		5.56	2.33	.....	SE	23	0	8	6	....	....
Vinton *c*	70.9	. .	...	95	30	50	9	45		1.67	1.00	.....	SW	23	4	4	5	....	...
Waterloo	71 0	84.0	58.1	95	30	47	9	48		3.47	1.69	.....	S	18	6	7	8	....	....
Webster City	71.7	82 7	60.7	94	30	47	1	47		1.55	1.00	.....	SE	14	12	5	4	...	....
West Branch *d*	72 0	83.6	60.4	93	23, 30	47	4	46		3.94	1.14	.....	SW	19	4	8	8	....	....
Whitten *	70.4			95	30	50	2	45		3.33	1.85	.....	SW	20	5	6	4	....	....
Wilton Junction	71.9	84.6	59.2	94	23	49	4	45		6 19	4.38	.....	S	15	4	12	7	...	....
Average	71.6	83.6	59.6	95.9	.....	48.0	.....	47.9		3.71	.....	.....	S	17	9	5	6	...	...

METEOROLOGICAL DATA FOR AUGUST, 1898—CONTINUED.

SOUTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.			Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	Number of hail-storms.	No. of thunder storms.
	Monthly mean.	EXTREMES						Monthly range.	Monthly.	Greatest daily.	Total snowfall.							
		Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.											
Adair	.....	.....	.....	...	.....	...	...	....	.58	.38	.....	NE	27	4	0	2	....	...
Afton	75.3	88.4	62 2	99	30	49	1	50	.59	.24	.....	SW	8	21	2	5	....	...
Albia	72 9	84.3	61.5	96	23	49	1	47	3.39	1.18	.....	SE	22	6	3	6	...	3
Atlantic	73.6	87.7	59.5	98	20, 30	42	1, 2	56	.63	.54	.....	N W	13	11	7	2	....	...
Belknap	74.0	83.8	64.3	95	23	54	4	41	3.75	1.00	.....	S, SW	.....	..	....	10	....	...
Bonaparte	73.4	83.6	63.1	93	30	52	4, 12	41	10.55	2.66	.....	.....	.....	...	.....	9		...
Centerville	76 2	86 0	66 4	96	21, 23	52	1, 4	44	5.12	2.35	....	....	26	1	4	7		....
Chariton	73 6	84 9	62 3	96	7, 23	50	1, 9, 12	46	1.41	37		S	13	11	7	10		....
Clarinda	80 6	90.2	70.9	103	20	58	1	45	1.16	.50	....	S	21	7	3	5	....	...
College Springs	76.0	88.5	63.5	99	21, 30	54	12	45	1.81	.80	.....	S W	21	9	1	3	..	...
Corning	74 8	87.3	62 4	99	29	47	1	52	1.75	.73	.....	SW	25	3	3	4		...
Council Bluffs	77.4	89.6	65 3	103	20	57	25	46	1 57	.82	....	S	16	12	3	2	....	...
Eldon	75.0	85 9	64.0	99	23	51	4	48	5 36	2.32	...	S	10	7	14	9	1	4
Fairfield	73.2	83.9	62.4	96	23	49	4	47	3.53	.80	.....	....	13	13	5	12	..	...
Ft. Madison*	75.6			90	22	59	4	31	5 92	1 75	....	S W	13	6	12	13	....	6
Glenwood	75.4	88 1	62.7	102	21	46	1	56	1 45	1.45	....	SE	15	15	1	1	..	...
Greenfield	74 8	87.4	62.2	97	30	50	12	47	1 02	.62	....	S	21	6	4	5	..	4
Hedrick*‡	74.1	....	.....	95	23	61	3	34	3.78	.95	.....	... ...	24	4	3	6	..	...
Hopeville	74 2	84 7	63.7	96	30	50	1	46	2 49	1.35	....	S	11	18	2	6	....	....
Indianola	73.6	84.7	62 5	98	30	49	1	49	3.53	1.96	..	SE	17	10	4	5	..	5
Keokuk	75.7	84 2	67.2	97	23	56	4, 12	41	6 92	2.15	.	SW	17	4	10	7	...	8
Keosauqua	75.0	84 6	65.5	97	23	52	4	45	9.06	4 08	....	... ..		....	.....	12		...
Knoxville	74.0	84.5	63.6	94	22, 30	51	1	43	1.77	1.04	.....	SE	19	6	6	4		...
Lenox	74.2	85.2	63.1	96	30	49	1	47	1.86	.66	...	S	23	4	4	6	...	3
Mooar	75.2	84.9	61.5	98	29	50	4	48	7.82	3.20	....	SW	14	9	8	6		....
Mt. Ayr	75 0	87.1	62.8	97	21	50	1	47	2.36	.75	.....	S	16	13	2	8	....	...
Mt. Pleasant†	74 8			95	21	63	1	31	6.36	2.30	.....	SW	21	6	4	7	....	...
Neola	73 5	89.4	57.6	102	18	48	28	54	2.35	1.05	....	W	27	3	1	3		....
Omaha, Neb	73.7	86.2	66 5	100	20	55	1	45	1.98	1.25	.....	SE	23	4	4	5		..
Osceola	74.5	86.0	63.0	97	30	50	1	47	1 48	.94	.....	S	12	14	5	6	..	...
Ovid	73.5	84.9	62.1	95	21, 23	48	1	47	6.99	4 67	.....	SW	17	6	8	7	..	6
Oskaloosa	72.9	85.1	60.7	98	30	48	4	50	1 85	1.00	.....	SW	22	3	6	7	..	....
Ottumwa	72 9	84.3	61.5	99	23	52	16	47	5.84	2.75	.....	SE	[illegible]	18	6	5	..	...
Pella	70.6	79.7	61.6	96	23	50	1	46	1.30	.71	....	SW	22	[illegible]	4	4	...	1
Red Oak	73.9	87.3	60.5	99	20	47	1	52	.97	.90		....	....	....	....	2	....	...
Sidney	76 0	86.1	65.9	98	20, 29	55	1, 3	43	1.45	.88	.....	SE, SW	25	6	0	6	...	...
Sigourney	73.3	86.7	59.9	98	30	49	4, 12	49	3.09	.77	....	SW	19	11	1	0	1	1
Stuart	74.0	85.3	62.7	97	29	50	1	47	60	.60	...	N	15	10	6	1	....	...
Thurman	74.7	86.3	63.1	99	20	48	1	51	1.17	.55	...	SE	13	12	6	3	.	....
Villisca	73 6	86 2	61 0	97	20	45	1	52	1.44	.52	.....	SE	20	10	1	5	....	....
Wapello *b*	72 5	82.2	62 8	94	23	50	3	44	7.32	5.16	....	SE	.....	.....	.....	9	....	7
Washington	73.4	83.9	63.9	94	23	50	4	44	4.45	1.72	.....	SW	...	.....	.....	8	...	1
Winterset	72.2	85.6	58.8	96	30	41	1	55	1.57	.91	.....	....	...	....	....	5	....	...
Average	74 3	85.7	62 9	97.3	.....	50.6	.....	46.7	3.17	.....	...	SW	18	9	4	6	....	...
Average for the state	71.2	82.9	59 4	95 2	... ..	47.9	.....	47.4	3.44	.....	....	S	17	9	5	6	....	....

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

DAILY AND MONTHLY PRECIPITATION FOR AUGUST, 1898.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Adair	....	.38	....	....	....	.20			....		....	..	....	....	....	....	....	..	..	..	....	....	....	....	....	....	....	....	....	....	....	....	
Afton	....	.03	....	....	..	.24			....		..		.04	....	....	..	....	.06	..	....	....	....	..	.22	..	..	....	..	....	..	....	.58
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Alta (Hadden)	..	.73	..	....	..	4.70		..	.	..	....	....	....	....	....	....	.01	....	.02	....	....	....	.02	....	....	....	....	....	....	....	..	5.79
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Amana	....	.54	..	....	..	03	....	....	..	.28		..	.40	....	.02	T	.14	....	..	.86	.18		.16	..	....	..	..	..	..	..		3.39
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Ames (near)	....	.97	..	....	..	.05	..	....	..	....	....	....			....		..	....	....	2.50	..	..		..	....	..	..	....	..	..	..	3.30
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Belknap	.10	.50	1.00	..		..	.80		..	.15		....	.50	.10	....	.10	....	....						.40		....		....	.10	..	....	
Belle Plaine	.75	.70	..	..	..	.20	....	....	....	20		.60	..	..		..	....	....	....	4.15	1.25	..	..	..		....		....	....	..	....	
Bonaparte	..	2.55	.	..		1.75	.15	....	..		..		.50	2.66		.15	1.64	.		....	.28			.87	..	....		....	....	..	..	..
Britt	....	70	.59		.04	1.20	.	..	..	.38		.	T	..	..	..		.10		1.34	..		T	....	..	....			....		....	
Carroll	.	.95	....		..	1.38	..	..					.14	....	....	..	..	....	..	03		....	.08	..	..			T	....	..	....	4.35
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Chariton		.37	T			.16	.02		..		..		36	27	..	.06	.01			T			.03	.10			....	.03	....			5.12
Charles City	.05	.45	.09	....	05	T			..		..	T						T	T	.74			T									1.41
Clarinda	..	.50		....	.35							T						.04					.27	..	..							1.38
Clinton		.40	..			65	.34	...					.33	.38	.45	3.01				.31	....	....	2.00								....	1.16
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De Soto		1.12	.04	..	....	03					..		1.4	.06						.01			T	....	....	..						1.09
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Ovid	...	47	.10	....	....	4.67	.03	..		....	..	T	.65	2.75	....	....	....	....		....	..	..	.74	..	..	..	....	..	..	..	..	....	5.84
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Sigourney	....	.58	T	....		T	..	....	..	..	..	..	.37	.30	.04	.03	.02	....	....	.13	.77	....	..	.88	....	..	..	..	....	....	....	....	1.45
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Tara	..	.50	.	....	.50	..	....	..	..	..	..	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.60
Toledo	...	1.10	1 62	....	..	.10			....	....	....	..	.28	....	....	..	....	1.50	..	....	....	....	....	....	....	....	....	....	....	....	....	....	2.50
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Villisca	....	.27			..	.52	.32	..	..					....	T			T	....	T	....		T	.50	..	....	....	....	....	....	....	....	1.17
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Waverly	....	.70	.30	..	....	....	....	....	....	....	....	....	.09	....	.35	....	....	.02	....	.64	....	....	.53	....	..	.06	....	T	....	....	..	..	2.69
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West Branch	....	.62	.10	....	....	1.14	....	....	....	T	..	....	.58	T	.83	.12	....	....	....	.52	..	....	.03	....	....	....	....	....	....	....	....	....	3.94
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September, 1898.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

VOL. IX. NO. 9.

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Central Station, Des Moines, Iowa.

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F. R. CONAWAY, STATE PRINTER
1898.

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Cherokee	A. S. Van Sandt.
Clarinda	A. S. Hawley.
Clear Lake	Luke Roberts.
Clinton	A. M. Finley.
College Springs	John W. Bixby.
Corning	J. B. Rishel.
Council Bluffs	Gregory Marshall.
Cresco	*J. M. Sherrier.
Davenport	Wm. Ball.
Delaware	F. H. Baker.
Decorah	James H. Holmes.
Denison	*Geo. M. Chappel, M. D.
Des Moines	R. E. Fuller.
Dows	*E. H. Bowie.
Dubuque	Smallpage Bros.
Eagle Grove	T. Madden.
Eldon	Prof. C. F. Woodward.
Eldora	Chas. Reinecke.
Elkader	M. L. Archer.
Estherville	Charles J. Fulton.
Fairfield	R. Z. Latimer.
Fayette	Miss L. A. McCready.
Ft. Madison	Chas F. Linnan.
Fonda	J. A. Peters.
Forest City	C. E. Wright.
Fredericksburg	Jay M Crowley.
Galva	M. Wemple.
Garden Grove	Geo. F. Parker.
Gladbrook	J. P. Jackson.
Glenwood	F. L. Williams.
Grand Meadow (Postville P. O.)	J. L. Cole.
Greene	J. G. Culver.
Greenfield	Prof. S. J. Buck.
Grinnell	Geo. F. Ellis.
Grundy Center	Oscar Klingman.
Guthrie Center	E. C. Grenelle.
Hampton	J. T. Brooks.
Hedrick	Miss I. Whorley.
Hawkeye	M. T. Ashley.
Hopeville	H. S. Wells.
Humboldt	E. F. Wulfke.
Independence	Prof. J. L. Tilton.
Indianola	Prof. A. A. Veblen.
Iowa City	J. B. Parmelee.
Iowa Falls	*Fred. Z. Gosewisch.
Keokuk	Prof. J. H. Landes
Keosauqua	Casey and Reaver
Knoxville	T. J. Fitzpatrick
Lamoni	Ritter Observer.
Le Claire	G. H. Markley.
Lansing	R. F. Walker.
Larchwood	H. B. Strever.
Larrabee	J. L. Hurley.
Lenox	Dr. T. E. Cole.
Le Mars	Rev. J. W. Hubbard.
Linn Grove (Mt. Vernon P. O.)	Mrs. M. B. Stern.
Logan	R. F. Norton.
Malvern	Dr. A. B. Bowen.
Maquoketa	B. F. Gibbs.
Mason City	O. M Cook.
Marshalltown	W. H. Shaul.
Millman, (Des Moines P. O.	C. E. Heisey.
Monticello	F. G. Thomas.
Mooar	Prof. A. Collin.
Mount Vernon	A. F. Beard.
Mt. Ayr	Dr. Frank T. Stevens.
Mt. Pleasant	J. H. Garland, Jr.
Neola	R. H. Gurley.
New Hampton	A. Lufkin.
Newton	A. L. Thompson.
Northwood	E. Starner.
Odebolt	E. Sayre
Ogden	Hon. Nathan Potter.
Olin	*L. A. Welch.
Omaha, Neb	A. W. Lewis.
Osceola	H. C. Miller.
Ovid	G. D. Pattingill.
Osage	Jos. Boyd.
Oskaloosa	Dr. J. F. Herrick.
Ottumwa	T. W. Cox.
Pella	A. W. Hawley.
Pioneer	J. S. Smith.
Plover	J. W. Dahlheimer.
Portsmouth	P. R. Bailey.
Primghar	Geo. W. Holt.
Red Oak	Dr. L. B. Hathaway.
Reinbeck	Arthur Betts.
Ridgeway	W. C. Wyckoff.
Rock Rapids	C. M. Randall.
Rockwell City	Ora Taylor
Ruthven	Dr. C. Brown.
Sac City	H. G. Doolittle.
Sibley	G V. Swearingen.
Sidney	Mrs. R. F. Ashbaugh.
Sigourney	*U. G. Purssell.
Sioux City	S. Gillespie.
Spencer	W. C. Drummond.
Spirit Lake	H. M. Boatright.
Stuart	R. D. Minard.
St. Charles	W. E. Humphry.
Tara	C. R. Paul.
Thurman	Chas. Mason
Toledo	T. F. McCune
Vinton	C. E. Matteson.
Villisca	Geo. W. Schofield.
Wapello	Wm. A. Cook.
Washington	H. L. Felter.
Washta	M. L. Newton
Waterloo	H. S. Hoover.
Waverly	N. C. Wragg.
Waukee	Louis Frank.
Webster City	Dr. Frank P. Butler.
Whitten	J. M. Rider.
Wilton Junction	W. W. McKnight
Winterset	Phil. Dorweiler
West Bend	J. M. Lisher.
West Union	A. A. Madson.
West Branch	

*U. S. Weather Bureau.

WEATHER-CROP OBSERVERS.

Reporting for the Weekly Bulletin.

Agency	J. M. Van Zant.
Albia	Wm. Mercer.
Allerton	James Piper.
Alta	Jonas Cushman.
Ames	S. B. Mills.
Attica	G. W. Mendenhall.
Battle Creek	A. Preston.
Blairstown	T. H. Well.
Boone	L. C. Morris.
Centerville	Henry Galley
Charles City	W. B. Towner
Chariton	C. C. Burr.
Clarksville	F. M. Russell
Correctionville	Hon. W. B. Chapman.
Corning	Jerome Smith.
Corwith	Wm. Oxley.
Clermont	Chas. Larrabee.
Council Bluffs	L. Prouty.
Creston	M. V. Ashby.
Danville	Sherman Matthews.
Emerson	D. B. Nims.
Ely	Hon. A. J. Fuhrmeister.
Farlin	Jesse Johnson.
Fulton	Carl S. Frank.
Fontanelle	Hon. L. M. Kilburn.
Ford	J. C. Richards.
Fort Dodge	R. W. Blaine.
Geneva	Wm. H. Thompson.
Grinnell	A. C. Price.
Guthrie Center	W. W. Bailey.
Gilman	James L. Wylie.
Hesper	G. E. Dillingham.
Humeston	Hon. S. H. Moore.
Independence	C.L. Thomas.
Larrabee	H. H. Carnahan.
LeMars	Hon Henry Schrooten.
Lockridge	John F. Farman.
Marshalltown	Hon. S. B. Packard.
Mason City	Wm. Nettleton.
Mapleton	A. Lamb.
Mt. Pleasant	W. S. Wright.
Milton	Hon. E. C. Holland.
Mount Vernon	Robert Smith.
Nevada	Geo. C. White.
Osage	E. W. Stacy.
Orange City	H. J. VandeWaa.
Paton	A. B. Condit.
Pittsburg	G. C. Duffield.
Rockford (Cerro Gordo)	Hon. J. W. Bird.
Rock Rapids	D. E. F. Merrill.
Rockwell City	J. G. Palmer.
Rossville	T. B. Wiley.
Rowley	L. Maxson.
Sageville	Hon. F. N. Knoll.
Seymour	L. B. Sager.
Shenandoah	Reuben Mullison.
Spirit Lake	L. Stowe.
State Center	E. P. Thompson.
Tama	W. G. Malin.
Unity	Edw. Hummer.
Van Horne	Spencer Smith.
Winterset	H. A. Kinsman.
Wall Lake	T. E. Wilcox.
Wilton	Thos. Boot.
Wiota	I. S. Coomes.

U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME IX. SEPTEMBER, 1898. NO. 9.

LOSSES BY LIGHTNING.

Blanks for the collection of statistics of losses due to lightning were sent out last spring to agents and adjusters of insurance companies, and to others who were willing to aid in this undertaking. The inquiries covered a wide range, relating to the losses and the conditions under which they occurred. The responses have not been as general and comprehensive as we hoped to receive, but perhaps they were as numerous and specific as could be expected at the inception of this work.

Up to date, October 1st, we have received 186 reports, mainly from adjusters of losses of insurance companies doing business in this state.

These reports give details of the loss or damage by lightning of 37 buildings, and the killing of 266 head of live stock, including 37 horses and mules, 32 sheep, 40 hogs, and 157 cattle.

The aggregate loss on buildings burned or damaged, with their contents, is $17,336. Of the number of buildings struck, there were 28 barns and 9 houses. Of the dwelling houses only two were burned, causing a total loss of $1,000; and 7 were struck and damaged to the amount of $180. Barns suffered much more heavily than houses, 17 of the 28 being consumed with their contents, the loss amounting to $16,156. Of all the buildings struck, two were reported to have been provided with lightning rods, and these were barns. The rods were of rough iron, but we have no information as to the manner of attachment, or the ground connection. One of the rodded barns was only slightly injured, and the other was consumed.

The reports show that 14 barns were struck by lightning in the months of July and August, and of that number 11 were totally consumed; whereas, in May and June, 12 barns were struck, and only 5 were burned. This affords evidence of the fact that barns suffer greater loss after the hay and grain harvest, when they are filled with the products that generate large quantities of vapor. Records show that of the number of barns struck before harvest only 41 per cent were consumed, while after harvest 78 per cent were burned by the fiery bolts. And yet there was greater electric energy displayed in the early, than in the latter, part of the season, as shown by the fact that the live stock killed in the months of May and June were double the number reported in July and August.

These reports show the interesting fact that of the 266 head of live stock killed by lightning, 118 were found in close contact with wire fences; and also that these wire fences were not provided with ground wires. That is to say, over 44 per cent of the losses of live stock may have been caused by contact with wires charged with electric force.

Unquestionably, wire fences, as now constructed, serve as death traps to live stock, causing a vast amount of loss every year. And it is also quite evident that a considerable percentage of danger may be avoided by the use of ground wires at frequent intervals, in the construction of wire fences. In some of the reports it was stated that there were evidences that the lightning struck the fence at a considerable distance from the point where the stock was killed

As an illustration of this matter, Mr. J. R. Chandler, of Dexter, reported the loss of a flock of 32 sheep, on the premises of G. F. Lenocker, in Madison county, June 22d. They were found lying along the wire fence, against which they were driven by the storm, and it was observed that the lightning struck the fence 20 rods from the place where the sheep were killed. That deadly bolt might have been sent into the earth within a few feet of where it struck. This emphasizes the need of careful observation of all the conditions connected with losses of that kind, to discover the causes and possible means of prevention.

Of the 186 destructive strokes reported, we find that 55 occurred on low, moist ground, and in 41 cases near timber or trees. The others were on dry land, and in open fields.

It is hoped that during the next season we may awaken sufficient interest to bring out a largely increased number of reports. By the systematic collection and tabulation of the details, and a careful study of all the facts that may be gathered in this form, we may possibly gain some knowledge of practical utility as well as of scientific interest.

CLIMATE AND CROP REVIEW FOR SEPTEMBER.

September brought almost ideal weather for ripening the late-growing crops, for threshing and garnering the small grains, and for fall plowing and sowing fall wheat and rye The mean temperature was slightly above the normal for the month, and there was abundant sunshine to afford normal ripening conditions The rainfall was generally ample for current needs, to facilitate plowing and to maintain growth in the pastures though in a portion of the state the supply of moisture was somewhat deficient. The larger part of the rainfall came during the first half of the month, at the time when it was most needed; and the bright, clear weather of the last fifteen days brought the belated fields of corn and other crops to full maturity without a touch of frost. At the close of the month more than the usual amount of fall plowing and seeding had been accomplished. On the whole it has been a season of bountiful production, bringing ample rewards to all faithful and intelligent tillers of the soil.

NOTE AND COMMENT.

In an acre of corn, planted in hills at the usual width of rows, there are a little over 3,200 hills. If each hill produces an average of one good ear, or two small ears, weighing 12 ounces of corn and cob, the yield of that acre will be 34 bushels, or a little more than the average yield of corn for the past 15 years. If each hill produces a single nubbin weighing 8 ounces of corn and cob, the yield will be two-thirds, or 67 per cent of our average. So when we use the descriptive terms, "half a crop" or "two-thirds of a crop," we should be careful to explain a little more clearly what we mean by a full crop or an average. There is a vast deal of wild, indefinite talk about crops, and there is need of more specific statements.

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Hon. John G. Smith, of Algona, in a note to the editor, reports an unprecedented destruction of birds in a recent storm. He says: "During a very severe storm, which occurred August 19th, thousands of birds were killed in the north part of Kossuth county. In the town of Bancroft a man picked up 320 sparrows, one robin and one blue jay under a group of three trees, and there were dead birds found under nearly every tree in the town. Birds are very scarce at present in that part of the county."

***

No country can produce pork cheaper than can the United States. It is mainly because of the fact that the United States is the greatest corn growing country in the world. While other feeds are desirable and can be used to advantage, there is nothing that can fill the place of American maize The great bulk of this grain can only be marketed through feeding cattle and hogs. Hogs are a necessary and important factor in the marketing of corn. No matter how much corn may be abused and decried as a feed for hogs, it is nevertheless the sole feed that gives the United States its superiority over any other country in producing pork. Of course all of the grass and all the bi-products of the dairy, and of the mill that can be fed along with corn, is beneficial to the hogs and enables them to get that much more out of the corn fed to them The cheapest of all feeds is doubtless a good pasture, but pork can not be made on grass alone. It needs grain to give it the finishing and fattening touches. And corn is the great cheap feed for that purpose.—*Ex.*

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A special to the Marshall *Times-Republican*, dated Rock Rapids, Lyon county, September 13, 1898, says: "A peculiar well was struck on the farm of Dan McGraw, five miles southeast of town, Saturday morning, at a depth of 252 feet. A vein of air which nearly threw the drill out of the well was opened, and has continued to blow pure air with a tremendous force. A three and a half inch tube was forced into the hole and a heavy steam whistle was attached, which blew a blast that could be heard for miles "

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A noteworthy balloon ascension was made from the Crystal Palace, London, September 15th. The balloon was inflated with pure hydrogen, to the amount of 56 500 cubic feet, and it attained an altitude of 27,500 feet, which is over five miles. At the height of 25,000 feet the air was so rarified that the occupants of the car were compelled to breathe compressed oxygen by tubes. The temperature was 61° below the freezing point, or 29° below zero. The air was clear, and the coast was distinctly visible. The balloon finally descended near Romford, in Essex. It was next the highest balloon ascension on record.

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The canning establishment at Atlantic, Iowa, recently closed its season's packing, with a total output of 3,500,000 cans of corn and 500,000 cans of peas. This is said to be the largest pack of the kind ever put up in a single season by any factory in the world. This great industry furnishes in and out freight to fill 700 cars a year, at a cost for transportation of over $50,000. During the season 325 people were employed, their wages amounting to $15,000. The contracts with farmers covered the product of 2,800 acres of sweet corn, amounting this season to 8,000 tons, for which the producers received over $30,000. The canned goods have been sold, the larger part going to the Pacific coast and to the Orient. The output was materially reduced by the hot and dry weather of midsummer.

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The Hon. Robert G. Cousins was the orator of the day at the Omaha Exposition on Iowa day, September 21st. In his eloquent eulogy of his native state, the orator said:

"Since the civil war the state of Iowa has increased in population to almost 2,225,000 of people, and most of the time has had the least illiteracy of any state in the Union. Doubtless for that we are indebted to many of the older states, whose enterprising and courageous citizens constitute so large a portion of our population. With but half a century of statehood, and with an area of but 55,475 square miles, the state of Iowa produces the greatest quantity of cereals of any state in the Union. As long ago as the last federal census, taken in 1890, it produced more corn, more oats, more beef, more pork than any state in the Union. The Hawkeye butter ladle has achieved a cunning that challenges all Columbia. The Iowa cow has slowly and painfully, yet gradually and grandly, worked her way upward to a shining eminence in the eyes of the world. The state of Iowa has on her soil to-day, if nothing ill befalls it, $100,000,000 worth of corn. The permanent value of land is estimated by its corn-producing qualities. Of all the products of the earth, corn is king and it reigns in Iowa."

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During the eight months ending with August, American exports of breadstuffs were: Flour, 9,749,242 bbls; wheat, 80,927,916 bushels; corn, 125,723,050 bushels; oats, 39,825,042 bushels; rye, 10,806,814 bushels; barley, 3,318,884 bushels.

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The Weather Bureau of the United States, on which the nation spends less than a million dollars a year, contributes greatly to the comfort and health of the people and to the protection of their property, yet its number of stations for weather observation is manifestly insufficient, and the number of places at which warnings are conspicuously given is also insufficient. In the year ending June 30, 1897, that is, before the war, the country spent twice as much on mere repairs of naval vessels as it did on the Weather Bureau.—*Abstract of an address by President Eliot, of Harvard University.—Science, September, 1898.*

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Mount Sangay is the most active volcano in the world. It is 17,500 feet high, and is situated on the eastern chain of the Andes, South America. It has been in constant eruption since 1728, and the sound of its explosions is sometimes heard at Quito, a distance of 150 miles. As many as 267 distinct explosions have been counted within an hour.

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A German paper, the *Frankfurter Zeitung*, in an article on the present position and resources of the United States, says: "With what force and energy the United States enters upon its rightful position among the controlling nations of the world, will be shown by a glance at its material resources and productive capacity. For the year ending June 30th, its surplus of exports over imports amounted to $595,000,000, while all the European nations show a more or less important deficit in their balance of trade—Germany about $166,000,000 and England $571,200,000. In 1890 the property of the United States

was valued at $62,000,000,000, while the property of the whole world was estimated at $290,000,000,000. It has 182,000 miles of railways, half as much as the remainder of the entire world. In 1892 the freight transported in the United States was equivalent to $845,000,000 carried a distance of 100 miles; all other countries together transported the same distance only $583,000,000. The annual earnings of the railroads of the United States are about $1,000,000,000, nearly one-half of the railway receipts of the whole world. The steam marine of the country registers 14,400,000 horse power, one-third of the registered steam tonnage of the world. In 1896 the United states produced 10,000,000 bales of cotton as against 3,000,000 by the rest of the world, and consumed 3,500,000 bales. Its product of cereals is more than one-fourth of the crops of the world. Its output of coal was 198,000,000 tons, while all other countries combined produced only about 400,000,000. The telegraph lines in the United states in 1897 were 4,908,000 miles, or more than one-half of the lines of the world. The United States can no longer be compared with any other single nation in respect to resources and capacity of performance; the comparison must be made with the rest of the world.

***

Electricity in the air is assigned by Loemstroem, of Helsingfors, as the cause of the rapid development of vegetation during the short northern summers; but his theory is that the effect is indirectly produced through chemical changes in the atmosphere brought about by the electricity, and that it is not a result of electrification of the plants. The problem will be studied in the researches he is to make in Finland with Professor Bailey, of Cornell.—*Ex.*

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Moist air is much more transparent than dry air, and this, under certain conditions, will give a premonition of an approaching storm. It may, at least, indicate the humidity of the atmosphere.

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Considerable quantities of peaches have been grown this season in southern Iowa and in portions of the central belt of this state. The Burlington *Saturday Evening Post*, in its issue of September 24th, said: "Some of our local journalists do not seem to be very well posted on the situation out in the rural districts. One of them announced a few days ago that the largest peach crop in the county this year was on a farm near Danville, which was expected to yield 200 bushels There are probably 100 orchards in the county that have a larger crop than this, while O. G. Van Winkle has already picked 400 bushels from his orchard and has 600 bushels now ripening on the trees."

***

A violent earthquake was recently reported in the town of Rieti, on the Velino, in Italy; but the effects of the shock showed that it was quite unlike the ordinary earthquakes of that region. According to a correspondent of the *Osservatorie Romano*, it was not an earthquake, but an "airquake" The air shook or vibrated like a violently agitated liquid; great rents were made in tall buildings and towers, and walls were thrown to the ground. The earth, however, seemed to be undisturbed, and no shifting of the street pavement was noticed. It is said that many felt the air vibrations and were thrown to the ground, while others were almost suffocated. A dense, black cloud hung over the town while the phenomenon was passing. The church steeples, the savings bank, the theater and no fewer than six palaces were more or less wrecked, as well as eighty or a hundred dwellings.

***

Excellent work has been done by some of the higher educational institutions by means of lectures delivered by members of the faculties in the towns and cities of the state; and it is gratifying to note the fact that the Iowa Agricultural college has taken the foremost place in this line of public service. For many years the president and nearly all the professors of that college have generously responded to calls to deliver lectures at farmers' and teachers' institutes, and at the meetings of numerous associations organized on practical lines. All honor to the faithful and laborious members of that faculty.

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On the evening of Sunday, September 4th, a severe storm of wind, rain and hail swept through the townships of Liberty and Rose in Hamilton county, causing considerable damage to crops and buildings within a belt five or six miles wide, and ten or twelve miles in length. Corn fields were blown flat and the fodder was nearly ruined, but the ripened ears were not much injured. The loss in corn was probably 5 to 10 per cent, according to the stage of ripeness Many windmills were wrecked, and some buildings were unroofed or moved. It is described as the worst storm that has visited that section in many years.

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Hon. B. R. Vale, voluntary observer at Bonaparte, Van Buren, county, reports 7.30 inches of rainfall for September, and 48.24 inches for the nine months ending September 30, 1898. He adds: "The drouth is broken" Well, it must be badly soaked as well as broken. Isn't this country in danger of all drying up?

A DESTRUCTIVE HURRICANE IN THE WEST INDIES.

On the night of September 11th, the Windward islands of the West Indies were swept by the most severe and destructive hurricane that has visited that region in recent years. The islands of Barbadoes and St. Vincent, lying in the direct pathway of the hurricane, suffered great damage and loss of life from the effects of the terrific force of the wind. A majority of the dwellings on the two islands were destroyed, and two-thirds of the dense population of 162 to the square mile were rendered homeless. Scores, and probably hundreds, of human lives were lost, and the crops were almost entirely ruined. The United States Weather Bureau furnished the following statement for publication:

The hurricane which created such destruction in the West Indies on Saturday night, September 10th, was detected at its inception by the West Indian hurricane service of the weather bureau of the department of agriculture. At 8 o'clock Saturday morning observations on the islands of Martinique and Trinidad gave slight indications of a disturbance southeast of the Windward islands At 12:40 P. M a special observation taken at Barbadoes indicated a fall of nearly one-tenth in the barometer during the preceding two hours. This movement of the barometer at Barbadoes, taken in connection with the whole atmospheric display made four hours previous, satisfied the forecast officer that the hurricane would soon develop over the Windward islands, although to a non-expert there were no indications of a coming storm

Hurricane warnings were immediately dispatched to all parts of the islands of Barbadoes, Martinique, St. Kitts and St. Thomas, and they were advised to prepare for a destructive storm. Cable communication was perfect and the warnings were promptly received They were informed that the hurricane would move from a point south of Barbadoes, and that it would travel slowly northwesterly, with wind increasing to a hurricane velocity. Advisory messages were sent to Colon, San Domingo, Trinidad and Santiago. A message was also sent to Admiral Watson's fleet lying in the harbor of Caimanera, Cuba.

How completely these warnings were verified by the coming of the storm twenty-fours later is shown by the press dispatches of this morning. While the destruction of life and property has been great, there is no question that hundreds, if not thousands, of lives and millions of property were protected by the complete warnings given by the United States. These warnings were of profit to the commerce of all nations. Without considering the saving of human life, they have, from

a commercial standpoint, fully justified the president in asking for the necessary appropriation and in personally directing the inauguration of a complete, efficient meteorological service. Secretary Wilson said that many did not realize that the area embraced in this daily atmospheric survey is fully as great as that covered by the continental area of the United States. Ten years ago a prominent scientist and resident of the island of Jamaica made a trip to England and put forth great efforts for the purpose of inducing the English government to take the initiative in inaugurating that which the president has lately put into effect.

The Barbadoes *Agricultural Reporter*, of September 13th, said it was the most fearful hurricane that had visited those islands since the memorable 11th of August, 1831. For days previous the weather had been unsettled and much rain had fallen, but the barometer remained steady, and it was only on Saturday that it gave signs of an approaching hurricane. The velocity of the wind, registered at the United States Weather Bureau station in Bridgetown, Barbadoes island, was seventy-five miles per hour, but as the station observatory was blown down it is possible that a higher velocity was reached. Numerous small vessels were wrecked, and others were swept from their moorings and driven to sea. The rainfall recorded by the gauge at the United States station, for the forty-eight hours after 9:30 P. M. on the 10th, was 11.23 inches. And at another point on the island it was 22.98 inches during the two days, 10th to 12th. On the evening of the 10th, the mercurial barometer showed a fall of .36 of an inch within the period of five and one-half hours, from 4:30 P. M. to 10 P. M.

ESTIMATING CROP CONDITIONS.

[FROM THE BREEDERS' GAZETTE.]

TO THE GAZETTE.—Your issue of September 28th, contained the following note:

James Patterson writes as follows from Cedar county, Iowa: "I notice crop reports being published giving corn at 70 to 80 per cent. This is a mistake, and why it should be so, no farmer can understand. The truth is, that if a man will go through a field of corn, he will soon become convinced that he has a very light half crop. Looking as we pass along the road we say, 'Good for sixty-five bushels,' but go through the field and we do not find half a crop. This is the case in Cedar county, one of the best corn-producing counties in Iowa."

This suggests a need of a better general understanding of the terms and figures used in reporting or discussing crop pros pects. Referring to corn, what do we mean when we say it is 70 to 80 per cent? What does 100 per cent signify, in actual bushels per acre?

There is evidently a wide range of difference in the popular significance attached to these figures in crop estimates Mr. Patterson's note implies that, in his estimation, a field of corn good for sixty-five bushels should be rated 100 per cent, and what he terms "half a crop" would measure out thirty-two to thirty-three bushels per acre. There are thousands of good business men and farmers who appear to use the same rule, making the maximum of production the normal or standard of estimates.

We need a general agreement as to the value of the figures employed. What is 100 per cent? Should it represent the maximum or the minimum, or the mean of production? The figures, as generally used to-day, are on a sliding scale, ranging all the way from the mean to the maximum. In Iowa the normal or average yield of corn for the period of fifteen to twenty years has been thirty-two to thirty-three bushels per acre. Why should not the figures 100 be made to represent the normal yield of the crop, as shown by the actual output of past years? But the larger number of crop reporters make 100 to represent forty to forty-five bushels per acre. That would work all right if all would use the same standard.

The crop reporters of our state weather and crop service were asked, on September 1st, to report the condition of corn at that date, on the per cent scale, and to add below their estimate of the average yield in bushels per acre. The result showed that the reporters generally used a high standard of estimate, the average for the state being 86 per cent in condition, and thirty-four bushels per acre as the prospective yield. So it appears that the reporters generally made 100 per cent to represent a prospective yield of about forty bushels per acre. But there was a wide range in their ratings, as for example: one reporter in Adair county rated corn 50 per cent, prospective yield thirty bushels; another, in same county, 75 per cent, and twenty-five bushels; another, 85 per cent, and twenty-nine bushels; another, in Warren county, 75 per cent, and thirty-five bushels; and still another, 80 per cent, and forty-five bushels.

Here are sample reports from Cedar, Mr. Patterson's county, justly described as one of the best corn-producing counties in the state:

	CONDITION.	YIELD PER ACRE.
No. 1	75 per cent.	30 bushels.
No. 2	80 per cent.	40 bushels.
No. 3	75 per cent.	30 bushels.
No 4	60 per cent.	40 bushels.
No. 5	95 per cent.	40 bushels.
No. 6	90 per cent.	40 bushels.
No. 7	100 per cent.	40 bushels.
Average	82 per cent.	37 bushels.

These figures illustrate the need of elementary instruction in the use of percentages in crop reports. The state and government reporters do not differ widely in their estimates of prospective yield per acre, but in handling percentages, they are at "sixes and sevens," no two having the same standard.

As to the final output of corn this season we are just now awaiting the verdict of the huskers. They will express it in measured bushels per acre, and not by percentage scales. The stand is almost perfect, whereas last year it was at least 25 per cent below the average. There are many stalks that brought forth no ears, or only nubbins; but if for every hill planted there is an average yield of one good ear—or its equivalent of twelve ounces of corn and cob—this great corn state will this year show a full normal output, or about thirty-three bushels per acre.

JOHN R. SAGE,
Director Iowa Weather and Crop Service.

Des Moines, Iowa.

INSTINCT AS A WEATHER PROPHET.

The Kissimee (Fla.) *Gazette* says that the Seminole Indians of Florida predict mild winters in Florida for the next thirty years, which gives the citrus industry of that state a long lease of life. Of the Indian powers of weather forecasting it says: "His instruments are his five senses, which he works in the bureau of instinct. He can instinctively smell, hear, taste, see and feel a fat year or a cycle of fat years coming, with far more certainty than the Weather Bureau dares to say whether it will be hot or cold, wet or dry, during the next twenty-four hours."

This facetious paragraph expresses the serious thought of a considerable, though somewhat diminishing, number of people who still adhere to the traditional notion that the instinct of the animal or savage is more trustworthy than the science of civilized man. In their estimation, science is at a discount when pitted against the "bureau of instinct," wherein musk-rats, wild geese, ground hogs and savages are chiefs. The term "instinct" is suggestive of the supernatural. It is used to conjure with, and all sorts of fakirs in medicine and meteorology profess to be endowed with a large measure of that occult power. The seventh sons of seventh sons, the so-called divine healers, and the astrologers who conjure with

the planets in framing their long range weather forecasts, are as full of "instinct" as the leading gander of a wild goose flock, or the chief "medicine man" of the Flatheads.

Unquestionably, as much reliance may be placed upon the thirty-year forecast of the Seminole Indians of Florida, as upon the weather almanacs of the astrological school of long range prophets. And the Indians are to be commended for making their prediction for a given locality — the state of Florida — whereas, our astral weather prophets cover a wide range of latitude and longitude and time in their prophecies and claims of verification. As there is no basis in any known modern science for the forecasts of the Indians and the astrologers, they must surely emanate from that occult and mysterious thing that has been named "instinct."

BREEDING IMPROVED CEREALS.

The *London Corn Circular* is authority for the following: "It has been left to two young men in Lancashire, after eighteen years of hard, unremitting and unremunerative work to open up a vast field of new discoveries in the cultivation of cereals and grasses, which bids fair to revolutionize agriculture. In 1880, John and Robert Garton, the sons of a Lancashire corn merchant, began their experiments in the production of new varieties of cereals by means of cross-fertilization at Newton-le-Willows. Already they have succeeded in producing varieties of wheat, the average weight of grains of which is 60 per cent heavier than the average weight of grains of wheat in ordinary cultivation With oats they have been even more successful. I saw (says a correspondent) a field of black oats growing at Newton, which was just ready to be harvested, and the grains were just as much finer than the best Poland White oats as these latter are larger and finer than ordinary Tartarians. Already they have varieties of wheat and oats which promise to yield 30 to 40 per cent more per acre than ordinary varieties, and so increase the national production by that amount. Nothing has been left to chance. The whole world has been ransacked for specimens of different kinds of cereals, every one of which has been carefully grown and its peculiarities noted through several seasons. Nearly 350 varieties of wheat have been collected. Here is an illustration of the value of some of these. The ordinary British oat has a thick and tough hull. When oats have to be prepared for human food this hull has to be removed by a process which impairs both its flavor and its value as a food stuff. But the common wild oat in China, which is very hardy and prolific, growing in any soil and producing a large quantity of grains, has this peculiarity, it has no husk or hull. By crossing several varieties of British oats with the Chinese variety, an oat has been produced which has no hull at all, and it can be used at once for preparation as human food. It has a beautiful bright yellow grain, which looks very much like an elongated corn of the finest white wheat.

VESUVIUS IN A STATE OF ERUPTION.

The recent violent eruption of Vesuvius has attracted the attention of scientific men in Europe, and excited apprehension of disaster within a considerable region surrounding the mountain. The fierceness of its outbreaks, and the volume of lava flowing from its craters, threaten the destruction of the observatory erected on the side of the mountain to aid scientists in their study of the subterranean forces that are in operation beneath the masses of rocks upon which the structure is perched. It is liable to be swallowed up by a sudden subsidence of its base, or it may be consumed by the fiery torrents of lava flowing from some of the numerous craters that have been opened since the present outbreak began.

In a recent interview, reported in a Chicago paper, Prof. George W. Hough, director of the Northwestern University observatory, said:

The observatory on the side of Vesuvius has been of benefit in predicting some time in advance that an eruption was about to take place. Its seismograph has recorded all seismic disturbances, showing the direction in which they are moving, whether horizontal or vertical. In foretelling eruptions this station has been of great importance, as many lives and much portable property have been saved.

The scientists at the station have made a specialty of the study of subterranean conditions. Still, little is known of the interior of the earth. No one has been able to discover the cause of earthquakes or eruptions. With present instruments eruptions can be foretold a short time in advance, but nothing as to their probable extent can be determined. In the last 100 years scarcely anything new has been learned of the substrata of the earth.

Astronomically, the earth ought to be nearly as rigid as cast iron to account for its movements, the variations of latitude and the tides. Volcanoes are now thought to be local pockets of molten matter. Through some undiscovered cause these masses of liquid fire break forth at unexpected times. They exhibit no regularity, method or system in the intervals or manner of their appearance.

Perhaps the most startling instance of volcanic eruption was that in the island of Krakatoa, in the Straits of Sunda, between Java and Sumatra, in 1883. This upheaval shook the earth for hundreds of miles. In the huge tidal wave which it raised, 30,000 people were drowned. The atmospheric disturbance which it created extended around the entire globe. Ashes were thrown to an unknown height in the air, and were sustained there around the earth for a year. The sun looked red through an atmosphere of ashes.

In the present eruption Vesuvius is not likely to be especially destructive. A repetition of such activity as destroyed Pompeii and Herculaneum can hardly occur. The reason for this is that it has been active for a number of years past and has had an outlet for its gases.

The first recorded eruption of Vesuvius was in the year 79, when it overwhelmed and buried Herculaneum, Pompeii and Stabiae. On that occasion, the records state, the ashes, or dust of the explosion, were carried to Rome, and also across the Mediterranean to points in Africa. The most notable eruptions since that period occurred in 1036, 1779, 1822, 1839, 1855 and 1872.

SEPTEMBER WEATHER RECORD.

The mean temperature of September for the state at large was 65.3°, which is slightly above the normal for the month. The mean of the northern section was 63.4°; central section, 65°; southern section, 67.6°. Clarinda reported the highest monthly mean, 72.6°. The highest temperature reported was 99° at Galva, on the 1st, and the lowest was 29° at Britt, Estherville, Sibley and Spencer, on the 30th.

The average precipitation for the state was 2 69 inches, slightly below the September normal. By sections the averages were as follows: Northern section, 1.38 inches; central section, 2.67 inches; southern section, 4.02 inches. The maximum amount reported was 8.45 inches at Fort Madison; least amount, .41 of an inch at Estherville.

There were 16 clear days, 5 cloudy, and 9 partly cloudy.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 29 98 inches; highest observed, 30.60, at Cresco, on the 10th; lowest observed, 29.62,

at Des Moines and Cresco, on the 4th and 29th; range for the state, .98 inch.

Temperature.—Monthly mean, as deduced from 104 reports, was 65 3°; highest monthly mean, 72.6°, at Clarinda; lowest monthly mean, 59.6°, at Estherville; the highest temperature reported was 99°, at Galva, on the 1st; the lowest temperature reported was 29°, at Britt, Estherville, Sibley and Spencer, on the 30th; the average daily maximum was 78.2°; the average daily minimum was 53.0°; the average monthly maximum was 93.7°; the average monthly minimum was 40 1°; the greatest monthly range was 68°, at Estherville; average monthly range, 53.6°.

Precipitation.—Average for the state, as determined from the reports of 110 observers, 2.69 inches; the largest amount reported was 8.45 inches, at Ft. Madison; the least amount was .41, at Estherville; the greatest daily amount reported was 28.9 inches, at Keokuk, on the 4th and 5th; average number of days on which .01 of an inch or more of precipitation was reported, 7.

Wind.—Prevailing direction, south; highest velocity reported, 50 miles per hour from the south, on the 29th, at Sioux City.

Weather.—There was an average of 16 clear days, 9 partly cloudy days and 5 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.97	30.52	10	29.66	22
Des Moines	29.99	30.57	10	29.62	4
Clarinda	29.99	30.53	10	29.65	4
Cresco	.....	30.60	10	29.62	29
Dubuque	29.99	30.58	10	29.64	4
Omaha, Neb	.....	.....	.....	.....	....
Keokuk	29.98	30.51	10	29.65	22
Sioux City	29.99	30.57	10	29.63	29
Average	29.98	30.60	10	29.62	29

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	4,804	28	NW	4
Des Moines	4,721	35	SW	29
Dubuque	4,317	28	SE	22
Keokuk	4,781	24	SE	13
La Crosse, Wis	4,299	36	SE	29
Omaha, Neb	.....	.....	.....	....
Sioux City	7,864	50	S	29

OBSERVERS' NOTES.

ATLANTIC—*J. W. Love.* Thin ice formed on the morning o the 30th.

ALTA—*David E. Hadden.* On the 2d a low, flat, but bright aurora was observed. A very dry month.

BONAPARTE—*Hon. B. R. Vale.* Another wet month; 7.30 inches rainfall following August with 10.55, and 35.12 the last five months, and 48.24 since January 1st, is evidence sufficient that the soil is full of water. Fall seeding not nearly done.

CENTERVILLE—*George Goodlander.* Very warm and dry during the entire month.

CLINTON—*Luke Roberts.* A fine month for the maturing of crops. Latter part of the month warm.

ESTHERVILLE—*M. L. Archer.* Killing frost on the 30th; thin ice formed on standing water.

FOREST CITY—*J. A. Peters.* Corn all out of the way of frost. A splendid fall for all kinds of work. Pastures afford plenty of feed for cattle. Great deal of fall plowing done. Hog cholera quite bad.

GRAND MEADOW—*F. L. Williams.* Ice formed on low ground on morning of 12th; no damage on high ground. Extremely warm and dry.

LARRABEE—*H. B. Strever.* Another warm September. Vegetation on low ground killed by frost on 30th. Corn ripe.

OSKALOOSA—*Joseph Boyd.* The month of September was noted for high and low temperature, which was favorable for maturing the corn.

OVID—*H. C. Miller.* The most tender vegetation is green yet. The corn crop in this county is the largest ever known.

SIDNEY—*G. V. Swearingen.* A severe thunder and hailstorm the 5th, which damaged all kinds of fruit; stripped apple trees and grape vines of about all their fruit. A strip from four to six miles wide crosses the county from west to east. Hail as large as hens' eggs and smooth.

LATE REPORTS.

FAYETTE—*August.* Mean temperature, 68.8°; mean maximum temperature, 80.7°; mean minimum, 56.8°; highest, 93°, on 30th; lowest, 44°, on 9th. Total rain, 2.81; clear days, 17; partly cloudy, 7; cloudy, 7; rain fell on 8 days; prevailing winds, SE-NW.

GALVA—*July.* Mean temperature, 74 3°; mean maximum, 88.1°; mean minimum, 60.5°; highest, 99°, on 19th; lowest, 52°, on 9th. Total rainfall, 1.15; greatest amount, .62, on 2d; prevailing wind, southwest; rain fell on 3 days.

CORRECTION FOR AUGUST.

Highest barometer at Cresco should be 30.18 on the 13th.

DAILY AND MONTHLY PRECIPITATION FOR SEPTEMBER, 1898.

STATIONS.	DATE.																													Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Adair	...	...	....	.50	...	....	....	....	....	...	...	2 17	.10	....	....	...	....	....	....	...	T	....	....	....	...	....	...	....	...	....	2.77
Afton	....	....	.10	T	.43	....	....	....	....	.34	T	1 70	...	.14	..	....	.03	....	....	....	...	T	....	....	....	....	....	....	....	.55	3.29
Algona	....	.04	...	.50	....	....	....	....	....	....	....	..	.50	..	....	....	....	....	....	..	....	....	....	....	....	....	....	....	.15	....	1.19
Alta (Hadden)	..	....	.43	.09	....	....	....	....	....	....	....	.39	.12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	....	....	1.03
Alta (near)	....	...	.39	.33	..	....	....	....	....	..	....	46	.03	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	..	1.11
Albia	...	...	....	.85	.65	...	....	...	....	.14	....	1.15	...	...	....	....	....	....	....	....	T	.10	....	....	..	.	....	....	....	....	3.07
Amana	..	...	.27		1 85	.29	...	....		T	..	.06	.18	...	....	...	....	..	....	...	.06	1.22	....	....	..	....	....	....	.18	..	4.14
Ames	....	....	.25	1.08	23	..	....	....	.20	...	..	.64	.52	...	....	....	....	..	....	..	...	....	....	....	....	....	....	....	..	.21	3.07
Ames (near)	....	..	.03	1.50	.02	.01	...	..	15	..	.02	..	1.17	..	...	...	..	...	...	....	....	T	....	....	....	....	....	....	.15	....	2.90
Atlantic	...	..	.	..	.05	....	...	...	.24	.14	....	2.02	...	...	....	..	...	....	....	....	...	..	....	..	....	...	....	..	.27	....	2.72
Audubon	....	...		.52		..		..	.23	...	...	1.39	...	...	...	..	...	....	....	....	...	...	....	..	..	...	....	....	.12	....	2.26
Belknap	...	...	...		1 80	1 20	...	..	.	...			1 00	....	..	..	.	...	...	...	...	1.00	..	...	..	...	...	....	..	....	5.00
Bonaparte	..	...	...	2 20	.97	1.60	.	..	..	....	..	.51	.41	....	...	....	..	..	..	....	.50	.95	...	.16	...	....	....	.	..	...	7.30
Britt	..	..	14	.80	.0	..	...	...		...	...	.13	.70	...	..	..	..	....	...	..	...	...	...	....	....	..	....	...	.09	....	1.88
Carroll	...	..	.52	2.14	.18	...	...	..	.35	...		...	1.05	.22	....	..	..	..	..	....	...	...	..	.	...	..	..	....	.31	...	4.77
Cedar Falls	...	...		85	.30		...	..	T	...	T		.60	...	.	..	....	..	....	....	....	.14	..	....	....	....	..	..	.33	...	2.22
Cedar Rapids	.03		T	1.05	.35	T	....	.02	01	..	...	.08	.10	.	....		..	.	...	..	52	80	...	...	.	...	....	...	.12		3.11
Centerville	..	....	....	.10	.62	1.00	...	...	.	.09	...	.60	32	....	...	....	....	...	..	....	T	.10	.02	..	.15	...	..	...	..	T	3.00
Chariton	...	..	03		1.14	15	....	...	..	.15	.01	1.31	.65	...	..	...	.06	.	....	...	...	.22	...	..	...	....	.	...	...	.51	4.26
Charles City	..	...	.10	.17	03	.	...	...	..			T	.50	T	..	...	..	...	...	...	...	.13	...	...	....	..		...	..	..	1.13
Clarinda	....	..	.08	.03	2.40		...	...	.20	.56	1.04	1.27	T	.	....	...	..	...	...	...	...	....	....	....	...	....	..	..	.16	..	5 74
Clinton	....	...		1.09	...	.13	....	....	..	..	..	..	35	.10	..	..	..	....	..	....	....	1.13	....	..	..	..	..	..	....	..	2 80
Clear Lake	....	...	.10	.73	...	..	..	...			...	.11	.69	.10	.	...	..	....	..	..	...	T	....	..	..	..	....	..	.12	..	1.85
College Springs	..	.	.08	.01	2.00	...		...	.02	.28	....	2 30	.03	....	..	..	..	....	..	..	..	..	..	..	..	..	....	.36	..	....	4.82
Council Bluffs	...	....		57	.52	...		...	.71	.39	1.62	..	.	.	..	...	..	....	..	..	...	..	..	....	..	....	....	....	...	..	3.21
Cresco	....	...	.09	.13	...	....	...	..	...		.	.09	14		...		...	....	..	...	.45		..	....	...	....	..	..	.13	..	1.03
Davenport	..	...	....	.12	.58	.40	..	..	..	T		...	.39	.01	.13	...	T	....	....	...	..	1.51	T	.	.	.	.	....	....	..	3.14
Decorah	.	.10	..	...	12	..	.	..	.28	....	T	..	..	...	...	..	....	.11	..	..	...	.76	..	..	..	....	....	.36	..	....	1.73
Delaware	...	....	..	1.73	.18	...	...	...	04	..		....	.18	...	..	..	....	..	..	..	...	1.18	..	..	..	..	..	....	.16	.	3.47
Des Moines	...	..	.01	.01	.24	T	....		T	.01	.02	.95	.27	T	..	..	....	..	..	....	..	21	..	..	..	..	..	....	..	..	.16	1.91
Dows	..	..	75	.40	02		...	..	.01	...	T	.	1.18	.15	...	...	....	....	....	...	T	.01	T	..	..	..	...	..	11	..	2 69
Dubuque	.06	.	T	...	.89	.14	...	.	.11		...	...	.51	.01	....	...	....	....	..	....	....	1.31	.03	T	....	..	....	..	T	.01	3.07
Eldon	....	...	T	.19	1.24	1.35		..	...	.03	.	.30	.52		..	...	....	....	....	..	.52	.92	...	T	..	..	....	..	..	T	5.07
Eldora	....	...	1 00	..	.01		....	..	50	..	.01	.50	1.10	T	..	....	....	....	....	.25	....	..	..	..	....	....	....	....	..	.50	2.52
Elkader	.	...	.17	.50	.15	....		..	..	....	...	.05		10	.	...	....	....	....	..	..	1.03	..	..	....	....	....	....	.50	..	2.50
Estherville	...	..	T	T	T	..	...	T	..	....	....	.05	.36	T	.	...	....	....	....	..	..	T	..	..	....	....	..	..	T	...	.41
Fairfield	....	..	...	.16	.62	.88	...	...	..	03	...	.34	.30	..	.05	...	..	....	....	..	.13	1.10	..	T	....	..	....	....		T	3.61
Fayette	....	....	.12	53	.13	....	..	..	....	....	..	..	17	.06	..	...	....	..	..	..		.47	..	..	..	..	....	....	.38	.	1.86
Forest City	....	..	.03		.03	....	...	..	..	....	..	..	.52	...	...	....	..	....	....	....	...	...	....	...	..	..	..	...	.10	....	.68
Fredericksburg	...	....	.15	.19	....	...	...	..	..	....	...	..	.35	.09	...		...	....	....	....	...	.26	..	..	.	..	....		....	.53	1.57
Ft. Madison	..	..	..	1.80	2.27	.30	..	....	....	T	...	.50	.09	..	....	T	1.75	...	..	...	T	1.60	..	.14	..	...	....	....	..	....	8.45
Galva	....	.30	...	...		..	...	..	..		...		1.18	T	....	...		...	....	....	..	..	...	...	..	..	....	..	....	.	1.48
Glenwood	..	..		.	.81	...	..	....	.10	.64	...	1.25	T	...	...	....	...	..	..	....	...		...	..		....	..	.	T	....	2 80
Grand Meadow	....	..	.15	.06	.10	....	..	..	...		..	..	.18	10	...	.	....	..	...	...	..	1.05	...	..	....	..	..	.	.35		1.99
Greene	...	..	15	.25	...	..	..	..					.85	.11	....			...	....	....	..	.15	...	....	..		..		..	.05	1.56
Greenfield	....	..	.05	.02	.10		..	....	.06	18	.02	1.75	.09	.10	..	....	....	..	..	..	.07	..	..	..	..	..	..	....	.01	..	2.48
Grinnell		....	....	1.24	.36	T	..		.05			T	T	...	..	.	..	..	..	..	.03	.30	....	..	..	..	..	....	.07	....	2 05
Grundy Center	T	...	.01	1.43	.28	.	.	..	.20		.02		93	....	...	..	..	...	....	....		.20	..	....	..	..	..	..	.24	..	3.31
Guthrie Center	..	....	T	....	.40	T	....	.	.21	20	T	1.20	.13	.	..	..	..	....	....	....	....	.	..	....	....	..	....	..	..	25	....	2 39
Hawkeye	...	...	.20	.30	.35	..	..	....			T		.40		....	..	....	....	..	..	...	.80	..	..	..	..	....	..		.58	2 63
Hopeville	..	....	.13	.02	1.73	...	...	..	T	.28	.23	1 63	.13	.01	..	...	..	..	..	..	...	.05	.03	....	..	..	..	..	.39	....	4.63
Humboldt	...	....	.53	.48	01	..	.	..	.	..		.39	16	03	..	...	..	..	..	..	....	...	...	..	..	..	..	..	.20	....	1.80
Independence	....	...	T	1.72	.30		...	..	.01	...		.05	T	.01	.	...	..	..	..	..	..	..	05	...	..	..	..	..		...	2 14
Indianola	...	....	.01	....	.56	T	..		T	02	.02	1.01	.11	04	..	....	....	..	..	..	....	.15	...	..	..	....	..	..	07	...	1.99
Iowa City	....	.	....	.76	.35	....	..	....	..	T	...	.18	.14		..	...	T	...	..	....	..	1.02	..	....	...	...	.	..		.09	2.54
Iowa Falls	....	...	.84	1.05		07	...	..	T		T	.05	.50	.04	...	...	...		...	..	.03		...	....	..	..		.11	....	2 69
Keokuk	..	..	....	1 28	1 61	1.96	..	..	..	T	..	.14	.28	.23	....	..	..	...	....	..	50	1.10	.53		.44	..	..	...		T	8.07
Keosauqua	....	...	..	1.41	2 40	1.00	..	..	.	.12		.31	...	...	..	..	..	...	....	..	.65	.91	...	.09	.02	....	....		.19	.09	7.22
Lamoni	....	....	.01	.69	1.93	.01	..		T	.30	.24	1.45	26		....	...	..	....	....	...	T	.16	....	...	....	..	..	...	....	.57	5.62
Lansing	.08	....	..	T	.17	T	....	T	..			...	.17	18	..	...	.	..	....	....	..	1 70	...	..	....	...	..	....	....	.34	2.64
Larchwood	...	....	....	....	....	..	....	..	..	....	....	..	.98	..	....	....	....	....	....	..	....	....	....	....	....	..	....	....	....	....	.98
Larrabee	....	....	.46	....	..	..	..	..	..	..	..	.50	..	....	..	....	....	....	....	..	....	....	..	....	....	....	..	....	T	....	.96
Le Claire	....	....	....	....	.75	.20	....	..	..	....	....	..	.54	.	.06	..	....	....	....	....	....	1.12	..	....	....	....	....	....	..	....	2 67
Le Mars	...	...	.10	....	...	..	..	...	..	..	..	.50	.10	....	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.70
Lenox	....	....	.95	.14	.81	.04	....		.01	.57	.07	1.98	.06	.06	...	....	....	....	....	....	....	.01	....	....	....	....	....	....	..	.16	4 87
Linn Grove	T	....	.13	1.51	.31	T	...	.01	01	....	..	.02	.03	...	....	..		....	....	....	.25	1 03	...	....	....	....	....	....	..	....	3 30
Logan	....	....	....	..	.09		..	..	.22	..	.89	.06	.46	..	..	....	....	....	....	..	....	....	....	....	....	....	....	....	..	....	1 72
Maquoketa	...	....			1 07	.26	...	...	.03	...		.10	.44	...	....	...	..	..	....	....	....	1.19	...	..	...	....	..	....	..	T	2.99
Marshalltown	..	..	.05	1 05	.36	T	...	..	.27	..	T	.19	.93	.	....	...	..	..	....	....	.06	.19	...	..	..	....	..	....	...	.38	2.48
Mason City	..	...	.	1.10		..	..	...					.65		.	..		..	....	....	....	..	....	....	..	....	..	....	.15	.	1.90
Millman	....	....	.05	03	.21	...	..	....	T	.05	.01	1.17	.16	..	...		....	....	....	....	....	.10	....	...	..	....	..	....	.12		1.93
Mooar	...	....	..	.40	2 30	2.06	.	....				.09	.20	.25	...	.	....	....	....	....	.50	.70	.30	....	.24	..	..	....	..	T	7.04
Mt. Ayr	...	.74	...		2 0	..			T	.52	28	1.58	.08	.01	..	..	..	..	..	....	....	..	..	....	T	....	..	....	.14	5 36
Mt Pleasant	....	....	...	2.00	.30	...	...		....	.03		...	.44	.03	...	.	..	..	....	....	..	1 62	..	T	..	....	....	....	....	....	4 42
Neola	...	....	..	T	T	..	..	T	.10	.40	.20	.80		..	...	...	..	..	....	....	..	....	....	....	..	....	....	....	T	....	1 50
Newton	..	..	.13	....	.74	T	..	..	.01	...	07	.52	.76	.03	....	....	..	..	....	....	.36	T	.01	..	....	..	....	....	.16	....	2.82
Northwood	..	..	....	.52	..	....	....	..	..	....		..	.29	.	..	....	....	.	....	....	....	..	....	..	....	..	....	....	....	.07	.88
Odebolt	....	....	.40	.87	.16		...	...	T	..		.60		..	..	...	.	.	..	....	....	..	..	....	..	....	....	....	.06	....	2 09
Ogden	..	..	.51	1.00	.96	.02		...	.21	..	T	96	.21	02	...	..	....	..	...	..	..	T	..	..	..	..	....	....	..	.02	3.91
Olin	...	...	..	1 56	.33	T	...	...	T	....	....	.	.23	...	...	....	..	....	...	..	..	1.06	....	...		....	....	....	...	.17	3 35
Osage	T	....	.15	.19		..	...	...	..	..	..	..	.58	..	..	...	T	...	....	....	..	.04	..	...	..	....	....	....	.24	....	1.20
Osceola	..	....	.03	..	68	T	.	....	T	.21	.06	1.62	..	T	..	...	T	..	...	...	..	.14	...	..	....	....	....	....	.35	....	3 19
Oskaloosa	....	....	.12	.15	.10	...	..	...	...	..	....	25	1.25	...		....	..	..	...	....	.01	10	..	...	...	....	....	....	.20	....	2.21
Ottumwa	.20	.		..	.50	..	..	...	....	....		.48	.80	.	.	...	.	...	....	.	.40	.60	....	....	....	....	....	....	..	....	2.98
Ovid	...	....	T	.67	.93	..	....	....	...	.15	.04	1.73	.14	....	...	...	....	....	..	..	.03	.28	.22	...	..	....	....	..	.26	....	4 45
Pella	...	...	..		.10	.50	...	....		....	....	.38	.55	....	...	..	....	....	....	....	....	.13	....	....	....	....	....	....		.23	1.89
Plover	....	....	..	.33	....	....	..	..	....	....	....	.30	.39	...	...	..	....	....	....	....	....	..	....	....	....	....	....	....	.04	....	1.06
Primghar	...	....	....	..	....	....	...	....	....	....	....	..	.55	..	...	....	....	....	....	....	..	..	..	..	..	....	....	....	....	....	.55
Red Oak	..	....	....	.47	.45	...	...	...	T	65	T	1.67	.30	...	...	...	..	....	....	....	.	....	....	....	....	....	....	....	.29	....	3.83
Ridgeway	....	....	.11	.17	.01	...	...	.01	....	....	..	.10	.11	.05	....	..	..	..	....	....	....	58	....	....	....	....	....	....	.37	....	1.51
Rockwell City	...	....	.21	.58	.06	...	...	...	.05	....	...	.68	.31	.06	....	...	....	....	....	....	....	..	....	....	....	....	....	..	21	..	2.16
Sac City	...	....	.50	.25	.15	...	....	....	T	..	....	50	35	..	....	....	....	....	....	....	..	....	....	....	....	....	....	....	.25	...	2 00
Sibley	....	....	.20	....	..	..	..	..	..	..	..	.14	.32	.01	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.67
Sidney	....	....	....	05	1.10	.80	....	....	.45	.80	.79	1.05	.11	..	....	....	....	....	..	..	T	....	....	....	....	....	....	....	25	....	5 40
Sigourney	...	....	T	T	.18	.44	....	...	..	.02	...	.20	.70	.	..	....	.03	....	....	...	.16	.89	..	T	....	....	....	....	.	.21	2.83
Sioux City	....	....	.22	....	T		....	....	T	..	....	.52	.21	T	...	....	....	....	....	....	....	....	....	....	....	....	....	....	T	....	.95
St. Charles	....	....	.03	..	.50	T	...	....	T	.03	.03	1.22	.05	...	...	....	T	....	....	....	....	....	....	....	....	....	....	....	....	.03	1.89
Spencer	....	....	.03	.34	.02	....	..	....	....	....	.22	.33	T	....	..	..	....	....	....	....	....	....	....	....	....	....	....	T	....	..	.94
Spirit Lake	...	....	...	...	....	....	....	...	....	....	....	.20	.30	...	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.50
Stuart	....	....	..	....	.03	...	....	...	....	....	...	2.20	...	...	....	....	...	....	....	....	....	....	..	....	..	....	..	....	....	....	2 23
Tara	...	....	.50	1.00	....	..	...	....	....	....	...	..	.70	...	....	..	..	....	..	....	..	....	....	....	....	....	....	....	.25	....	2 45
Toledo	....	...	...	2.73	.27	....	...	....	.22				.75	...	.	..	....	....	....	....	.20	....	....	..	....	....	....	....	....	.47	4.64
Thurman	....	....	..	T	.80	....	....	....	.20	1.05	.07	1 38	.10	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	.35	....	3.95
Villisca	....	....	.25	T	.30	....	....	....	....	.25	.65	1.15	1.45	.10	....	....	..	....	..	....	....	....	....	....	....	....	....	....	....	....	4.15
Vinton	....	....	...	1 38	....	....	....	....	.20	....	...	.26	T	..	....	..	..	....	..	....	.39	....	....	....	....	....	....	....	.25	....	2.22
Washington	...	....	...	.15	.38	...	....	...	..	....	....	...	.38	...	.23	...	....	....	....	....	....	1.30	....	.02	....	....	....	....	....	....	2.46
Washta	....	....	.85	.05		...	....	....	...	..	...		.50	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	...	1 40
Waterloo	....	....	T	.95	30	..	....	....	.05	....	T	T	.42	.05	...	....	....	....	..	....	....	.09	....	....	....	....	....	....	....	.21	2.07
Waverly	.02	....	.11	.18	.05	.06	...	....		...	..	.02	.44	.15	....	....	....	....	....	....	....	.27	....	....	....	....	....	....	....	.46	1.76
Webster City	....	....	.45	1.00	T	....	....	....	T	..	T	.25	.75	T	....	....	....	....	....	....	....	T	....	....	....	....	....	....	.20	...	2.65
West Bend	....	....	.15	.45	T	....	...	....	....	...	....	.43	T	....	....	....	....	...	....	....	....	T	....	....	....	....	....	....	.10	....	1 1
West Branch	....	....	.58	..	.46	...	....	...	....	T	...	T	.10		...	....	T	....	....	....	....	.98	....	....	....	..	....	....	..	T	.
Whitten	....	....	....	.88	.35	....	....	....	.13	....	T	T	.77	.20	....	....	....	....	....	..	....	....	....	....	..	....	....	....	T	....	
Wilton Junction	....	....	.	.77	.42		....	....	....	....	....	....	.45	..	....	....	....	....	....	....	....	1.08	....	....	....	....	....	....	....	....	
Winterset	...	....	.13	..	.30	.20	...	...	....	.11	....	.27	1.31	.04	...	....	....	....	....	..	....	.09	....	....	....	....	....	....	....	....	
Wapello	..	.	....	.08	.15	.	...	....	....	....	....	...	.39	....	....	....	....	....	....	....	....	1.08	....	....	.06	....	....	....	....	....	

MAXIMUM AND MINIMUM DAILY TEMPERATURE FOR SEPTEMBER, 1898.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Albia.....	Max.....	91	91	91	88	83	80	68	76	65	65	67	67	71	78	89	82	83	83	87	87	86	71	82	80	82	88	77	89	85	80	80 4
	Min	70	78	73	59	55	52	42	46	44	45	48	49	51	51	51	54	54	58	59	57	57	59	56	57	56	63	43	51	63	45	55 0
Afton	Max....	97	96	92	88	89	65	72	78	60	54	57	55	67	73	79	76	80	89	87	88	84	73	87	80	85	88	87	85	80	71	78 7
	Min	69	69	71	56	56	50	42	47	43	45	45	48	50	50	50	54	57	67	57	61	60	61	58	57	58	58	54	57	53	43	54 8
Alta.....	Max....	91	93	82	84	77	66	70	62	60	62	66	52	68	62	72	76	78	86	78	86	84	76	83	77	83	89	79	89	84	70	76.0
	Min	69	71	66	56	52	44	38	45	44	45	42	48	52	49	50	50	52	52	54	51	62	52	58	51	52	60	48	56	62	38	52.2
Amana.....	Max....	91	93	90	83	79	70	68	70	58	65	65	70	72	71	76	76	80	81	81	80	83	70	77	76	78	82	74	86	85	72	76.7
	Min	71	72	73	54	63	55	44	48	50	49	43	46	58	52	47	49	52	58	50	54	56	63	52	56	51	59	47	55	61	45	54.4
Ames.....	Max.....	94	96	87	86	79	68	72	66	52	60	61	56	68	68	78	76	74	86	83	86	84	72	81	80	86	83	79	92	87	71	77 0
	Min	69	71	72	52	58	50	45	45	45	48	46	50	50	54	45	49	52	58	54	51	60	62	55	54	48	54	44	53	60	40	53 2
Atlantic....	Max....	93	95	88	87	77	68	75	73	47	53	57	56	63	68	80	76	79	90	90	88	82	76	88	82	88	88	84	92	86	76	78 2
	Min	70	75	74	47	50	49	35	41	40	45	47	48	50	50	44	46	50	55	50	55	51	55	58	47	49	51	41	60	57	39	51.1
Audubon...	Max....	92	93	85	86	82	85	70	65	52	55	58	55	65	66	74	75	79	85	86	84	81	77	83	78	84	82	80	90	85	70	76.8
	Min	69	69	59	50	47	47	40	45	42	47	48	49	52	51	45	45	45	55	56	57	60	56	55	48	49	57	47	60	57	41	51.6
Belknap....	Max....	92	92	89	80	83	65	65	77	64	57	63	63	77	76	79	77	85	87	89	88	79	70	80	81	80	87	79	90	85	72	78.4
	Min	71	75	75	63	65	55	47	47	47	46	47	46	55	55	55	59	58	60	61	65	66	61	58	58	57	65	55	59	65	52	58.3
Bonaparte.	Max.....	91	93	90	83	79	63	71	78	63	59	65	69	73	77	81	78	83	87	89	84	79	69	78	81	78	88	77	90	87	75	78 6
	Min	71	70	71	63	65	52	45	58	47	50	46	49	58	54	54	59	57	60	59	58	60	62	55	63	58	61	64	59	65	53	57.9
Britt.....	Max.....	92	93	86	91	79	66	70	58	60	67	67	62	71	68	72	77	79	84	76	81	89	85	83	78	81	78	78	90	86	69	77.2
	Min	67	69	72	46	45	44	40	42	41	41	35	50	47	47	47	41	43	43	53	51	49	47	48	41	42	48	42	54	57	29	47.4
Carroll.....	Max.....	94	95	86	87	80	68	73	68	55	60	63	55	66	67	79	77	81	89	92	87	85	75	85	82	87	85	81	92	82	72	78.3
	Min	70	72	68	49	50	46	39	43	42	45	42	48	50	53	43	44	48	49	54	53	60	54	56	45	48	56	43	52	65	38	50.8
Cedar Rap..	Max.....	94	95	91	89	81	70	69	69	56	64	62	72	75	72	78	76	82	85	78	81	86	69	81	79	82	82	77	91	89	76	78.3
	Min	73	74	75	56	64	56	47	54	49	50	44	46	58	55	50	50	53	61	54	57	58	62	54	58	50	61	50	58	65	46	58.3
Cedar Falls	Max.....	93	94	90	89	84	80	81	71	58	67	60	70	71	69	74	78	82	82	86	84	74	70	80	82	82	85	78	90	87	74	78 8
	Min	71	71	71	51	61	50	45	43	48	47	40	45	54	55	50	45	50	51	53	52	62	62	50	50	44	53	41	55	41	40	51.7
Centerville.	Max....	91	92	90	79	84	77	74	79	63	56	62	58	71	78	79	79	83	87	90	87	81	72	82	81	81	91	78	89	85	84	79.4
	Min	70	71	73	60	64	50	42	47	45	47	46	50	56	54	53	57	59	59	59	60	62	61	56	60	59	65	53	59	65	51	57.1
Chariton....	Max.....	90	91	90	79	83	67	73	80	62	56	59	53	69	74	80	78	84	88	90	87	82	73	85	83	84	92	78	93	85	74	78 8
	Min	70	71	72	58	62	52	44	48	43	47	45	49	55	50	54	56	57	58	60	60	60	62	58	58	57	65	49	58	65	46	56 3
Charles C'y	Max.....	95	95	89	88	82	71	69	63	62	64	65	71	69	66	71	75	80	85	79	82	85	78	79	77	82	80	77	90	88	81	77.9
	Min	70	70	71	50	55	50	43	49	45	45	33	43	56	52	50	41	49	47	52	55	57	60	43	46	42	48	38	56	57	39	50.6
Clarinda ...	Max....	97	97	95	88	90	70	70	78	67	57	60	61	70	77	80	80	82	87	90	90	86	80	89	82	83	90	86	92	89	74	81 4
	Min	78	79	75	67	67	60	45	58	52	52	55	54	60	60	60	66	67	65	65	70	70	68	67	68	70	68	66	68	70	43	63 8
Clear Lake.	Max....	88	92	85	84	78	77	68	62	73	63	64	65	70	65	70	74	77	83	76	81	83	71	79	75	80	78	77	87	86	68	76.0
	Min	66	71	67	57	51	45	41	46	42	40	36	40	53	48	50	40	53	51	51	49	56	56	50	52	42	57	43	51	63	37	50.1
Clinton.....	Max....	91	91	90	85	80	72	68	73	60	66	68	73	72	73	79	77	80	81	78	76	82	75	78	78	78	82	74	84	86	74	77.5
	Min	69	70	71	58	62	50	46	48	51	50	45	44	57	58	55	52	52	60	52	54	54	62	56	58	50	58	51	54	60	56	55.4
College Sp's	Max....	96	96	95	..	85	..	..	..	..	..	..	..	..	..	81	79	80	86	87	87	84	78	87	81	87	91	84	90	85	74	85.6
	Min	69	70	70	59	58	50	41	42	43	43	47	47	53	53	57	59	59	59	59	62	62	58	62	58	61	62	55	60	62	45	56 2
Co. Bluffs..	Max....	97	97	91	91	84	72	76	72	52	53	59	58	64	74	80	71	82	90	91	88	85	82	84	87	87	90	87	95	90	77	80 2
	Min	72	72	58	59	56	48	48	50	46	47	49	49	50	55	52	51	54	54	65	64	60	65	60	57	55	57	54	64	55	54	55 9
Cresco	Max....	91	95	89	88	80	65	70	58	64	65	67	73	67	65	71	77	82	88	76	81	88	66	79	78	82	79	77	90	87	67	76 7
	Min	71	70	64	51	61	49	43	46	44	43	34	43	54	52	49	40	51	45	52	53	57	56	48	49	43	52	42	52	60	37	50.4
Davenport.	Max....	90	91	89	86	78	67	68	73	59	64	66	71	74	74	79	78	80	84	81	78	81	67	78	79	80	86	75	86	86	74	77.4
	Min	73	74	74	62	61	53	49	52	51	52	46	48	57	59	58	58	59	65	59	58	57	62	56	63	58	63	54	57	63	56	58.8
Decorah.....	Max.....	92	95	90	88	80	68	67	60	64	65	65	73	68	66	68	75	82	87	75	80	87	72	74	68	80	78	78	88	84	68	76.2
	Min	73	72	68	52	58	52	45	50	45	42	31	38	55	53	50	49	50	49	48	51	57	57	52	48	43	48	39	63	62	39	51.7
Des Moines.	Max....	91	94	92	87	83	68	72	70	54	62	60	57	68	70	79	79	80	87	90	87	84	72	84	82	85	87	80	93	86	72	78.5
	Min	72	73	68	56	59	52	45	52	50	49	50	50	57	54	49	56	57	58	58	57	62	62	58	57	55	60	52	56	63	45	56.4
Dows	Max....	90	93	85	85	79	70	69	68	60	63	67	62	69	65	74	75	80	86	73	85	84	72	79	79	82	81	76	81	87	74	76.4
	Min	67	70	67	49	65	46	40	42	43	44	42	48	52	49	47	43	47	48	54	52	58	57	48	46	41	50	43	53	60	35	50.2
Dubuque...	Max.....	89	91	88	86	81	69	68	66	56	63	67	69	70	69	72	76	79	84	75	74	81	68	78	79	79	79	73	84	85	74	75.7
	Min	72	74	73	61	64	53	47	53	49	48	40	42	58	57	53	48	54	61	55	56	58	61	55	59	50	57	48	56	67	49	55.9
Eldon	Max...	94	95	91	84	84	73	72	79	65	61	66	67	73	77	81	81	85	88	91	88	81	70	80	82	81	91	80	92	87	77	80 3
	Min	72	70	75	58	67	56	43	48	47	50	46	52	58	54	53	59	58	57	56	60	61	62	56	61	60	60	53	59	65	52	57.6
Elkader....	Max....	95	97	94	93	88	68	72	67	61	68	72	74	73	67	75	81	86	92	80	82	93	66	83	82	84	83	80	91	89	74	80 3
	Min	70	71	66	50	61	49	45	44	48	40	32	35	55	55	47	41	46	51	48	46	56	61	51	53	42	52	40	45	61	41	50 0
Estherville	Max....	93	97	85	85	74	65	75	62	60	63	68	61	70	67	72	79	81	..	76	82	87	71	82	81	88	78	81	92	87	72	73 2
	Min	63	68	63	47	48	41	37	41	37	38	33	42	49	45	44	44	44	..	47	40	59	49	53	46	36	53	37	53	51	29	46.1
Fairfield...	Max.....	90	93	90	82	84	72	71	78	64	63	69	68	73	77	81	79	84	85	90	85	79	69	79	81	79	89	79	90	86	71	79 3
	Min	70	67	73	57	64	57	42	47	46	49	43	49	57	52	53	56	56	59	57	56	59	61	54	59	56	60	52	58	62	50	56.0
Fayette ...	Max.....	91	93	89	88	81	64	69	64	61	65	63	71	70	68	71	76	81	87	74	80	83	76	79	78	81	80	77	89	86	70	76.9
	Min	70	70	68	55	62	54	43	42	46	44	31	37	55	52	53	40	46	51	54	50	50	50	47	43	41	54	37	51	60	38	49.8
Fonda	Max....	..	..	..	..	..	..	..	..	..	..	53	54	56	67	80	84	89	88	74	89	93	90	87	92	98	93	89	80	90	65	80 6
	Min	..	..	..	..	..	..	..	..	..	..	40	44	49	48	46	49	46	45	42	47	51	48	47	48	48	42	52	63	35	40	44.5
Forest City.	Max....	88	90	88	92	90	85	75	63	70	54	59	64	65	62	70	76	79	85	79	83	84	77	80	73	81	79	78	90	86	70	77.2
	Min	68	70	67	51	45	40	43	41	41	41	49	51	54	47	48	48	49	49	56	52	54	62	51	50	49	53	43	53	60	31	50.6
Galva'.....	Max.....	99	94	89	..	..	..	..	..	..	..	..	..	57	68	75	76	81	88	81	87	85	77	76	80	85	85	82	90	78	74	....
	Min	49	47	51	..	..	..	..	..	..	..	..	..	52	50	45	45	45	48	54	53	63	53	58	50	41	51	49	59	60	35	....
Glenwood .	Max.....	96	97	88	91	89	70	75	78	61	52	57	56	66	75	79	72	81	90	91	88	85	80	89	83	89	92	85	90	90	89	80.9
	Min	71	73	66	55	53	50	41	50	44	45	49	48	52	50	52	55	56	59	61	64	62	51	60	53	57	59	48	63	68	46	55.4
Greene	Max.....	96	98	88	85	85	70	74	80	64	68	66	74	72	69	75	78	83	88	80	85	87	74	83	80	85	82	80	92	89	80	80.3
	Min	69	72	70	64	60	40	45	48	45	45	34	46	55	51	51	43	50	49	58	50	56	60	48	48	43	50	40	53	60	37	51.2
Greenfield..	Max....	93	94	90	87	84	65	74	76	56	59	59	57	67	74	75	78	81	84	89	91	85	76	86	78	87	86	81	91	86	76	78.8
	Min	70	71	64	60	53	48	38	47	45	42	48	47	51	50	51	51	55	55	62	62	62	60	58	54	57	60	49	58	60	42	54 3
Grinnell....	Max. .	88	90	87	82	79	69	67	66	55	60	62	64	68	68	74	..	74	80	84	81	80	70	77	76	82	81	74	84	83	76	75.3
	Min	73	72	74	60	63	52	44	48	46	46	44	50	55	52	49	..	52	64	62	54	60	62	55	56	54	64	50	57	65	44	56 1
Guthrie C'r.	Max.....	96	96	88	97	88	64	72	74	55	57	57	55	64	69	72	76	81	82	89	89	89	89	86	80	82	84	90	92	87	80	79 3
	Min	70	78	54	64	64	58	40	47	41	47	45	47	54	51	45	47	52	55	54	54	58	58	56	52	47	44	58	51	64	41	53.2
Grundy C'r.	Max.....	90	93	89	88	81	65	70	64	55	62	59	67	71	68	74	75	80	82	75	82	83	68	79	78	81	81	76	90	86	70	76.0
	Min	69	69	60	49	57	49	41	44	44	45	38	46	52	50	47	44	50	53	53	51	55	57	48	50	43	55	41	51	58	38	50.2
Hopeville ..	Max.....	92	93	88	82	88	66	72	78	56	51	56	57	66	73	78	76	79	86	88	85	80	72	85	80	85	88	80	89	84	72	77.5
	Min	72	71	71	59	59	52	44	52	46	47	47	49	53	52	53	57	60	61	62	64	63	61	60	59	61	66	52	60	64	46	57.4
Humboldt..	Max.....	89	92	83	83	78	63	70	69	60	63	64	57	57	66	73	74	78	82	74	64	83	83	81	78	80	79	78	89	86	68	74.9
	Min	68	72	67	52	50	46	42	41	42	46	38	50	55	59	51	44	48	48	52	52	63	57	56	46	43	52	40	55	58	37	50.7
Indep'nd'ce	Max.....	91	94	90	89	83	64	68	67	56	64	62	70	72	67	73	75	79	81	79	73	80	68	76	78	80	81	75	89	86	77	76 3
	Min	68	69	72	49	60	54	43	47	45	46	39	43	54	51	44	44	49	55	52	53	54	59	60	62	44	57	45	52	58	37	52.2
Indianola...	Max.....	91	94	91	84	81	67	72	76	64	60	60	58	68	72	80	77	80	86	90	87	83	71	84	81	84	89	80	91	86	79	78 9
	Min	71	71	71	58	58	56	44	60	44	47	47	49	55	53	51	54	56	58	60	57	62	62	58	66	58	64	50	58	66	42	56 9
Iowa City..	Max.....	92	96	91	80	85	66	68	75	61	68	69	77	76	74	81	80	83	87	86	84	85	71	81	80	83	86	79	91	88	76	80.0
	Min	70	69	71	54	61	58	44	47	47	49	45	46	48	47	49	49	50	54	52	53	55	56	53	53	53	59	49	49	56	48	53.1
Iowa Falls..	Max.....	91	93	88	87	83	65	70	68	62	67	65	67	70	71	75	76	78	82	82	85	84	71	80	77	81	81	77	89	86	71	77.4
	Min	69	69	63	50	54	48	42	42	42	45	38	49	52	50	47	42	48	47	47	52	58	38	47	46	41	47	40	54	58	36	48.8
Keosauqua.	Max.....	90	93	90	79	81	64	72	78	66	59	64	65	74	78	78	78	80	85	87	84	77	69	78	78	79	86	76	87	82	74	77.6
	Min	71	78	74	64	64	58	47	51	50	50	47	52	56	56	56	61	59	62	60	63	63	63	58	59	60	61	57	61	64	55	59.3
Keokuk	Max....	92	94	93	83	81	75	70	79	69	60	65	69	75	79	81	79	82	84	90	83	75	70	77	81	82	88	76	90	86	72	79.4
	Min	73	76	76	68	68	58	49	54	51	52	50	52	60	59	61	61	64	62	65	61	64	63	61	72	60	66	62	64	71	60	62.2
Lamoni.....	Max.....	92	92	94	78	85	66	70	75	63	52	58	56	67	73	80	79	81	84	85	85	85	73	84	79	82	88	77	87	83	72	77.5
	Min	69	68	70	53	63	52	41	45	45	45	46	49	53	50	50	59	59	58	56	60	61	61	57	59	62	63	52	58	60	48	55.4
Lansing.....	Max.....	90	95	92	80	90	72	71	67	64	68	65	72	67	68	69	77	83	88	80	77	87	79	79	78	80	78	77	87	88	80	78.3
	Min	72	73	75	62	52	56	45	51	46	44	35	39	55	54	53	44	49	60	52	47	53	62	52	54	48	44	43	47	58	42	52.2
Larrabee...	Max.....	92	94	84	88	73	67	72	58	62	64	67	56	70	64	72	73	80	88	78	87	87	78	86	80	86	82	82	89	89	68	77.4
	Min	67	70	63	50	47	46	37	42	43	44	39	47	50	48	48	47	43	47	51	51	60	60	56	41	46	52	46	58	53	32	49.5
Le Mars....	Max.....	93	94	90	86	75	69	72	70	62	61	66	60	69	70	73	73	80	87	80	87	85	78	82	78	84	82	84	90	85	74	78.0
	Min	71	72	66	50	47	45	38	42	45	45	42	48	53	53	43	45	44	46	50	54	54	51	53	43	42	51	53	61	60	33	50.3

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR SEPTEMBER, 1898—CONTINUED.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Lenox	Max	90	92	87	71	86	66	70	76	64	52	55	55	63	70	76	76	77	84	84	84	80	73	84	79	84	88	79	88	84	76	76.1
	Min	71	71	71	60	59	51	42	51	45	44	48	48	53	51	53	57	60	59	66	63	63	61	60	57	61	64	53	62	64	44	57.1
Linn Grove	Max	91	92	89	85	81	65	67	69	55	65	64	71	73	70	76	76	80	83	76	78	83	67	77	77	78	82	83	84	86	77	76.7
	Min	69	70	71	56	61	53	43	48	49	48	42	45	56	50	49	48	53	57	53	54	53	60	52	56	50	62	50	58	61	50	54.2
Logan	Max	97	98	87	93	88	80	74	68	60	57	58	62	64	69	72	76	79	84	89	87	85	82	86	79	84	82	80	78	77	76	78.7
	Min	68	70	72	70	60	47	42	43	42	45	44	51	53	53	50	60	46	41	50	50	59	52	60	48	46	47	45	46	48	40	51.8
Maquoketa	Max	90	91	88	89	80	74	67	69	63	64	66	71	71	73	75	74	78	81	75	78	80	66	76	87	78	79	73	83	85	77	76.7
	Min	69	71	72	54	64	55	45	50	47	50	43	39	56	57	48	46	47	59	44	45	47	53	55	49	46	53	46	53	46	50	51.7
Marshallt'n	Max	93	95	91	88	82	68	71	58	50	63	61	65	72	69	79	78	82	87	82	85	85	70	80	81	83	84	78	91	87	70	77.6
	Min	70	72	74	51	57	51	43	47	47	47	42	49	55	54	46	46	52	56	51	54	57	62	51	51	45	56	43	53	64	40	52.9
Mason City	Max	91	94	87	87	79	63	69	58	61	65	65	67	71	65	63	76	80	83	80	82	86	72	81	77	82	78	78	89	86	67	76.2
	Min	68	70	68	51	49	46	42	46	43	41	36	40	55	49	44	43	44	44	48	50	55	57	48	49	41	50	40	51	49	34	48.5
Mooar	Max	90	93	90	78	83	66	69	70	69	61	62	67	74	77	80	84	84	82	89	82	74	70	77	84	86	88	80	88	84	74	78.5
	Min	71	70	71	68	61	56	44	45	46	51	50	48	58	55	56	60	60	60	55	59	60	62	56	68	68	59	60	62	62	59	58.7
Mt. Ayr	Max	92	94	10	82	86	67	72	78	65	52	53	55	67	76	80	75	80	87	88	86	80	74	86	80	86	90	80	89	85	75	78.3
	Min	69	70	68	60	60	51	42	44	45	46	47	48	53	50	54	57	59	57	60	62	62	61	59	60	63	65	54	59	62	46	55.8
Newton	Max	91	93	90	86	81	68	70	69	60	64	64	63	69	71	77	77	80	82	88	85	84	70	79	78	82	85	76	90	85	71	77.6
	Min	72	72	73	55	61	51	44	48	46	48	46	49	55	53	49	53	55	58	59	56	60	62	57	55	54	60	51	58	64	43	55.6
Neola	Max	90	88	84	86	82	78	70	72	52	59	60	66	72	78	82	82	90	92	90	88	82	90	90	92	88	90	88	86	80	74	80.7
	Min	60	58	48	42	38	36	40	40	42	45	45	48	52	58	58	60	62	64	50	49	48	52	54	58	54	56	58	54	42	56	50.9
Northwood	Max	91	93	87	88	80	65	70	58	60	67	67	70	71	65	69	71	79	84	77	84	85	74	82	78	81	77	78	88	86	70	76.5
	Min	62	67	63	47	46	44	42	46	41	37	36	45	53	45	47	40	48	45	52	49	55	55	45	47	41	51	50	52	53	31	47.9
Odebolt	Max	96	96	89	90	79	67	73	70	62	63	65	58	66	65	78	75	80	90	89	88	85	79	85	83	87	83	87	92	87	73	79.3
	Min	70	70	67	50	49	46	40	44	43	44	42	48	58	50	45	40	41	48	53	52	61	53	58	43	44	58	60	42	65	35	50.6
Ogden	Max	92	94	88	87	80	67	72	66	53	60	60	55	70	69	78	77	82	87	89	86	85	72	83	83	85	84	80	92	87	72	77.8
	Min	70	71	71	53	52	48	40	44	44	47	45	49	53	51	47	51	52	54	58	54	62	60	52	50	51	59	49	55	63	39	53.5
Olin	Max	89	90	90	89	84	79	64	67	68	55	64	64	70	72	71	75	75	79	82	75	76	81	67	76	72	77	82	73	85	85	75.9
	Min	70	71	73	53	60	59	44	49	49	46	42	43	49	53	47	48	56	57	50	55	52	56	51	50	46	49	45	52	59	47	52.6
Osceola	Max	92	93	90	83	88	67	74	79	56	54	57	58	67	73	80	76	82	88	90	87	81	72	85	89	86	66	81	85	84	66	77.6
	Min	70	71	71	57	59	51	44	50	43	47	46	49	53	52	53	55	58	62	58	59	60	61	59	56	46	64	50	50	44	50	54.8
Oskaloosa	Max	94	95	92	81	84	70	71	78	56	61	63	64	72	74	80	78	82	84	89	86	83	70	81	79	83	89	79	91	89	74	79.1
	Min	70	70	69	63	63	52	40	42	47	47	44	50	55	52	48	53	54	58	55	55	59	60	59	57	54	59	51	56	64	45	54.7
Ottumwa	Max	91	93	90	89	81	68	71	79	61	66	65	65	73	76	82	82	84	85	91	87	81	75	80	80	80	89	79	91	87	75	79.9
	Min	71	70	72	73	65	49	50	50	46	47	45	46	55	53	52	54	57	59	58	57	60	60	56	59	58	61	53	58	64	49	55.3
Ovid	Max	89	90	89	79	84	64	74	79	67	55	59	56	69	77	80	76	84	88	91	88	81	72	84	83	85	94	82	91	85	74	78.5
	Min	70	70	71	56	64	53	42	48	43	47	45	46	53	50	52	54	58	56	59	62	61	61	58	57	59	62	41	58	65	45	55.6
Pella	Max	86	87	83	76	70	64	68	64	59	57	64	76	64	70	75	74	77	80	80	78	74	68	74	72	78	74	72	81	80	65	72.0
	Min	73	72	72	56	62	54	42	48	45	48	59	50	56	56	50	60	56	59	58	56	60	60	56	56	57	60	50	57	64	45	56.5
Plover	Max	94	95	85	84	82	65	74	60	62	60	64	55	72	70	68	74	80	85	80	90	88	84	90	85	86	78	80	92	88	84	78.5
	Min	66	70	65	50	48	44	35	42	45	45	38	50	52	40	54	44	42	41	50	50	58	54	52	51	45	46	45	54	60	62	50.3
Primghar	Max	92	94	96	76	74	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	80	86	86	86	80	85	85	85	84	92	88	....
	Min	66	62	65	45	40	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	74	78	77	69	56	59	62	59	53	59	56	....
Red Oak	Max	94	95	88	89	84	67	72	76	63	55	60	56	64	73	78	79	79	85	86	86	83	77	87	80	85	88	88	89	81	72	78.6
	Min	70	75	75	54	56	57	44	45	44	46	48	49	50	59	52	52	57	56	52	59	60	51	61	53	51	57	48	62	64	44	54.7
Ridgeway	Max	91	94	90	87	78	71	69	63	65	64	68	71	66	66	68	76	81	84	76	80	87	76	77	78	81	78	87	88	90	78	77.3
	Min	72	73	74	56	58	52	44	49	45	42	42	45	54	52	51	47	54	51	53	52	59	63	55	52	51	58	51	54	62	41	53.7
Rockwell C.	Max	92	94	85	88	79	68	70	63	59	60	64	54	70	67	70	75	80	83	81	87	84	74	82	77	82	80	79	80	86	70	76.4
	Min	66	70	68	52	49	46	38	43	42	45	42	49	53	51	50	48	50	50	55	51	61	57	56	46	49	54	46	54	59	39	51.3
Sac City	Max	91	92	87	85	79	66	71	64	58	56	61	53	63	60	75	72	79	86	81	85	82	72	81	81	84	80	80	90	82	70	75.6
	Min	67	71	62	51	50	46	40	44	42	45	41	42	43	50	47	44	46	49	52	50	50	52	52	45	42	55	41	55	55	45	49.1
Sidney	Max	93	94	86	87	81	65	71	78	58	52	57	55	63	70	77	71	77	86	87	85	81	75	85	77	85	76	82	91	85	71	79.7
	Min	70	72	76	63	58	51	46	45	45	44	49	49	52	53	64	59	58	62	64	65	63	59	61	60	60	62	56	62	67	48	58.4
Sibley	Max	94	95	84	86	80	67	75	61	62	63	68	55	68	63	75	73	81	91	78	90	88	80	85	82	88	73	85	90	83	77	78.3
	Min	67	70	63	46	45	41	34	41	40	40	38	49	50	44	43	53	42	45	50	50	62	48	49	42	43	43	46	58	53	29	47.5
Sigourney	Max	94	95	91	84	89	69	72	80	63	65	70	76	75	77	86	84	85	89	92	83	86	71	83	82	84	90	81	91	89	77	83.3
	Min	68	69	70	54	60	53	38	44	47	46	40	46	52	48	48	50	52	52	54	51	54	59	51	53	53	56	46	53	61	43	52.7
St. Charles	Max	92	95	90	85	79	66	72	76	54	59	58	56	67	70	79	76	81	85	89	87	83	70	85	81	87	89	80	92	86	70	78.0
	Min	75	75	74	63	59	51	45	51	45	47	47	49	55	53	51	54	55	59	62	59	62	61	59	57	59	66	50	57	66	44	57.0
Sioux City	Max	95	96	85	88	76	68	75	64	60	60	64	57	66	68	76	73	82	88	85	87	86	79	88	81	86	84	85	90	85	75	78.4
	Min	70	71	67	54	54	46	44	44	45	46	46	46	48	54	45	47	48	48	51	58	61	53	54	53	46	48	53	63	62	41	51.9
Spencer	Max	92	94	83	87	75	65	62	59	64	62	66	58	70	65	73	75	79	83	75	85	85	76	84	83	85	75	80	90	88	78	76.5
	Min	65	71	56	47	44	42	36	42	41	41	38	48	51	45	42	42	41	45	50	50	60	50	52	49	48	48	38	56	50	29	47.2
Spirit Lake	Max	92	91	90	92	82	67	74	67	62	68	75	53	72	67	75	77	82	91	82	91	87	82	85	82	88	82	82	93	82	80	79.8
	Min	67	65	64	66	49	42	38	42	38	40	40	44	60	46	46	49	45	46	50	52	65	55	56	45	46	52	52	57	42	34	49.3
Stuart	Max	92	93	86	85	80	65	70	70	48	58	56	60	65	68	75	75	79	84	86	86	83	80	87	77	85	84	78	90	85	78	76.9
	Min	71	70	73	60	60	50	43	48	43	46	44	48	48	51	47	53	60	68	58	58	56	53	57	55	60	63	52	53	65	42	55.5
Tara	Max	94	95	95	87	85	77	78	74	70	68	65	65	69	66	78	80	83	85	83	82	85	83	82	81	82	83	81	82	75	70	79.4
	Min	65	67	65	60	50	50	49	42	41	40	40	42	54	49	45	41	43	42	45	50	60	47	45	44	43	44	42	47	43	40	47.8
Toledo	Max	92	92	88	87	80	56	67	66	53	62	61	67	72	69	75	77	77	88	80	81	84	70	78	76	78	80	74	86	83	69	75.6
	Min	71	71	74	50	61	53	39	44	48	46	42	43	57	52	45	46	51	56	52	54	56	62	52	53	47	56	46	45	64	43	52.8
Thurman	Max	94	95	88	88	83	68	74	77	66	52	58	56	64	74	78	73	80	88	88	85	82	78	88	82	86	90	83	92	87	73	79.0
	Min	72	73	74	54	55	51	38	51	44	44	48	48	51	50	51	57	55	55	58	59	63	53	61	55	58	56	49	63	65	44	55.2
Villisca	Max	90	93	90	85	86	65	73	80	65	53	65	58	68	75	78	78	80	86	88	87	85	78	87	82	85	90	83	90	90	75	79.6
	Min	70	65	68	50	53	50	36	40	40	45	45	45	47	50	45	46	52	54	54	54	57	55	55	50	55	56	45	59	57	40	51.3
Washingt'n	Max	90	92	89	83	81	65	70	77	62	60	65	68	80	74	78	78	81	82	87	83	82	67	80	79	80	86	76	88	86	74	78.1
	Min	71	69	70	58	61	56	41	45	47	48	42	45	55	51	53	52	54	58	58	52	56	59	52	57	57	58	50	55	63	47	54.7
Waterloo	Max	93	96	91	91	84	67	70	66	58	65	63	70	72	70	75	78	82	86	78	83	85	70	81	81	83	84	79	91	87	72	78.4
	Min	72	72	73	50	60	52	43	46	46	51	39	42	56	52	47	44	51	57	50	52	55	61	49	50	42	55	40	52	58	40	51.9
Waverly	Max	91	94	88	87	81	65	69	65	61	64	62	69	71	68	72	75	80	84	77	81	84	79	80	79	81	82	78	89	88	79	77.2
	Min	72	72	72	53	61	52	46	46	48	47	37	46	57	53	50	45	51	52	53	53	58	62	50	51	44	54	42	58	61	42	52.9
Webster Cy	Max	90	94	85	86	79	65	68	64	60	64	63	59	67	66	72	73	76	80	75	80	78	72	78	79	80	78	75	87	91	83	75.6
	Min	70	71	67	55	54	49	46	46	45	47	44	52	53	50	51	47	51	52	56	62	62	52	64	52	50	47	47	55	60	41	53.3
W. Branch	Max	91	89	84	82	72	70	71	73	70	68	64	72	72	71	80	80	80	79	76	80	81	70	77	76	81	84	84	86	82	81	77.5
	Min	69	68	64	65	52	47	53	56	56	58	44	45	56	52	46	54	47	51	52	48	57	62	60	60	50	56	56	54	52	51	54.7
Wilton Jc.	Max	92	91	88	85	82	65	67	72	60	64	68	73	72	75	80	77	82	82	82	86	83	77	78	74	78	82	74	85	84	73	77.6
	Min	68	69	66	53	58	47	42	43	52	49	43	45	54	58	53	51	54	56	52	55	59	58	53	53	51	48	49	53	60	48	53.3
Winterset	Max	90	92	90	93	81	63	70	76	54	57	57	55	57	70	77	75	80	82	87	87	88	72	84	79	83	89	..	93	87	72	77.2
	Min	67	68	67	52	52	47	40	46	42	42	43	48	48	49	45	50	52	52	56	55	59	59	53	54	53	58	56	53	61	42	52.2
Wapello	Max	88	91	89	83	77	75	77	73	66	61	65	70	72	72	77	75	78	80	82	80	78	74	77	75	78	81	72	85	84	75	77.0
	Min	71	71	69	59	63	49	45	50	49	49	44	47	57	56	52	56	55	61	54	57	56	62	53	63	56	62	54	56	65	55	56.9

METEOROLOGICAL DATA FOR SEPTEMBER, 1898.

NORTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).									PRECIPITATION, IN INCHES.			Prevailing direction of wind.	Killing frost.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	Number of hail storms.	No. of thunder storms.
	Monthly mean.	EXTREMES.							Monthly range.	Monthly.	Greatest daily.	Total snowfall.								
		Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.													
Algona *	64.1	...	.....	90	2	40	30	50		1.19	.50	.....	SE	..	9	18	3	4	....	1
Alta	64 1	76 0	52.2	93	2	38	7, 30	55		1.02	.43	.....	S	...	16	9	5	4	....	2
Alta (near)	.....	....	....	...	.....	.....	.....	.....		1.11	.46	.....	.....	....	....	.....	.....	4	....	...
Britt	62.3	77.2	47.4	93	2	29	30	64		1.88	.80	...	S	30	6	24	0	6	....	...
Charles City	64 2	77 9	50.6	95	1, 2	33	11	62		1.13	.50	.....	S	11	14	13	3	6	...	1
Clear Lake	63.0	76.0	50.1	92	2	36	11	56		1.85	.73	.....	SE	....	19	8	3	6	1	1
Cresco	63.6	76.7	50.4	95	2	34	11	61		1.03	.45	.....	S	...	20	5	5	6	....	4
Decorah	64 0	76.2	51 7	95	2	31	11	64		1.73	.76	.....	.....	30	.....	.....	.....	6	....	...
Dows	63 3	76.4	50 2	93	2	35	30	58		2.69	1.18	.....	SW	...	18	4	8	8	....	4
Eagle Grove †	62.8	...	....	.....	.....	.....	.....	.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Elkader	65.2	80 3	50.0	97	2	32	11	65		2.50	1.03	....	N	11	12	15	3	7	...	3
Estherville a	59 6	73.2	46.1	97	2	29	30	68		.41	.36	.....	S	30	.....	.....	.....	2	....	...
Fayette	63.4	76.9	49.8	93	2	31	11	62		1 86	.53	.....	SW	11	14	13	3	7	....	4
Fonda	62.6	80.6	44 5	98	25	35	29	63		.....	.....	.....	.....	....	.....	.....	.....	.....	.....	.....
Forest City	63 9	77.2	50 6	92	4	34	30	58		68	.52	.....	SE	30	22	1	7	3	....	...
Fredericksburg	.....	....	.....	..	.....	.....	.....	.....		1.57	.53	....	.....	....	.....	.....	.....	6	..	...
Grand Meadow *	63.5	.	....	92	1	42	11	50		1.99	1 05	.....	SW	..	17	8	5	7	....	...
Greene	65.8	80.3	51.2	98	2	34	11	64		1.56	.85	.....	S	..	10	17	3	6	...	....
Hawkeye	.....	.....	.....	.....	.....	.....	...	.		2 63	.80	.....	.....	...	...	...	...	6	...	....
Humboldt ‡	62.8	74 9	50.7	92	2	37	30	55		1 80	.53	.....	SE	...	22	5	3	7	....	...
Lansing	65.2	78.3	52.2	95	2	35	11	60		2.64	1.70	.....	.....	29	11	14	5	6	....	5
Larchwood	.....	.....	.....	.....	.....	.....	.....	.....		.98	.98	.....	S	....	22	4	4	1	....	....
Larrabee	63.4	77.4	49 5	94	2	32	30	62		.96	.50	.....	NW	30	15	10	5	2	....	....
Le Mars	64.2	78.0	50.3	94	2	33	30	61		.70	.50	.....	S	30	18	8	4	3	....	....
Mason City	62 4	76.2	48.5	94	2	34	30	60		1.60	1.10	.....	.....	...	.....	.....	.....	3	....	....
Northwood	62 2	76.5	47.9	93	2	31	30	62		.88	.52	....	S	30	23	5	2	3	....	....
Osage †	59.8	.....	.....	.....	.....	.....	... ..	...		1 20	.58	.....	S	....	12	9	9	5	....	3
Plover	64.4	78.5	50.3	95	2	35	7	60		1.06	.39	.....	S, SW	....	18	10	2	4	..	...
Primghar	.....	... .	.....	96	3	.....	.....	.....		.55	.55	.....	.....	.....	.....	.....	.....	1	...	...
Ridgeway	65.5	77.3	53.7	94	2	41	30	53		1.51	.58	.....	S	....	17	10	3	9	....	4
Sibley	63.9	78.3	47.5	95	2	29	30	66		.67	.32	.....	S	30	16	10	4	3	..	....
Spencer	61 8	76 5	47.2	94	2	29	30	65		.94	.34	.....	S	30	14	12	4	5	..	...
Spirit Lake	64.6	79 8	49.3	93	28	34	30	59		.50	.30	.....	SW	....	20	6	4	2	....	....
Waverly	65 0	77.2	52.9	91	2	37	11	57		1.76	.46	.....	S	...	11	16	3	9	....	4
West Bend *	61 6	....	.....	94	2	35	30	59		1.13	.45	.....	S	..	14	9	7	4	....	....
Washta	.....	....	....	.....	.....	.. ..	.....	.....		1.40	.85	.....	S	...	19	9	2	3	..	....
Average	63.4	77.5	49.8	94.2	.....	34 0	...	60.0		1.38	.....	.....	S	...	16	10	4	6	..	....

CENTRAL SECTION.

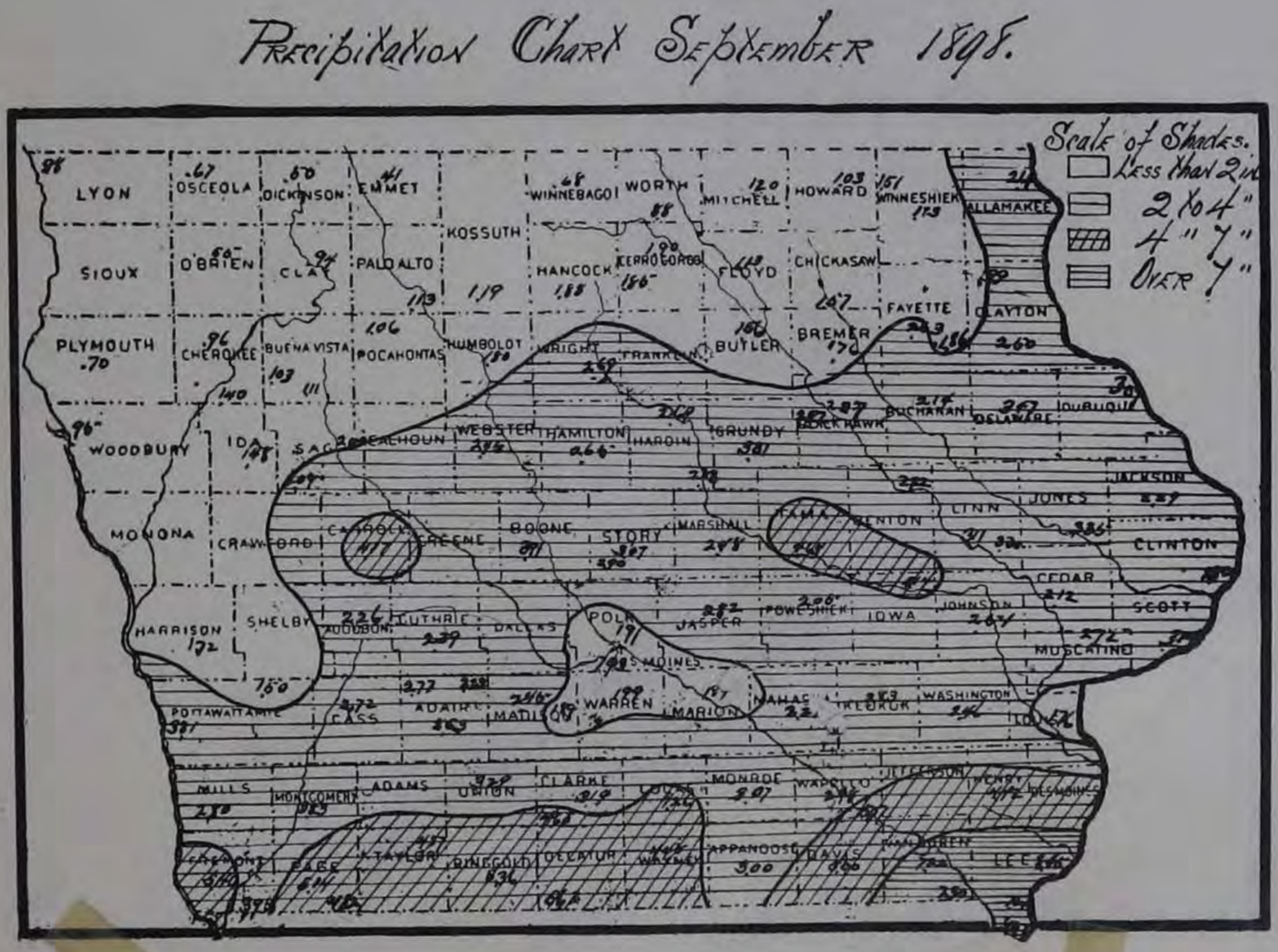
Amana	65 6	76.7	54.4	93	2	43	11	50		4.14	1 85	....	S	....	14	13	3	8	...	5
Ames	65.1	77.0	53.2	96	2	40	30	56		3.07	1.08	..	S	....	18	9	3	7	....	....
Audubon	64.2	76.8	51.6	93	2	40	7	53		2.26	1 39	.....	SW	....	12	11	7	4	....	....
Carroll	64 6	78.3	50 8	95	2	38	30	57		4 77	2.14	....	.....	..	20	5	5	8	....	....
Cedar Rapids	67.3	78.3	56.3	95	2	44	11	51		3 11	1.05	....	S, E	....	17	7	6	10	....	....
Cedar Falls	65.2	78.8	51.7	94	2	40	11	54		2.22	85	....	S	..	15	7	8	5	...	...
Clinton	66.4	77.5	55.4	91	1, 2	44	12	47		2.80	1.13	.....	E, SW	....	16	7	7	5	..	...
Davenport	68.1	77.4	58.8	91	2	46	11	45		3.14	1.51	.....	SW	...	14	10	6	7	....	3
Delaware †	62.2	.....		93	2	44	11	49		3.47	1.73	....	S	....	17	11	2	6	...	....
Des Moines	67.5	78.5	56.4	94	2	45	7	49		1 91	.96	.....	SW	....	17	8	5	9	....	4
Dubuque	65.8	75.7	55.9	91	2	40	11	51		3.07	1 34	....	S	....	17	10	3	9	....	8
Galva	65.7	81 0	50.4	99	1	35	30	64		1 48	1.18	....	SE	....	.....	.....	.....	2	...	...
Grinnell	65.7	75.3	56.1	90	2	44	7,11,30	46		2 05	1.24	.. .	S	....	15	2	13	6	....	...
Grundy Center	63.1	76 0	50.2	93	2	38	11,30	55		3 31	1.43	....	SW	....	14	8	8	8	....	...
Guthrie Center	66.2	79.3	53 2	96	1, 2	40	7	56		2.39	1.20	.....	SW	....	19	3	8	6	....	...
Independence	64.2	76.3	52 2	94	2	37	30	57		2.14	1.72	.....	SE	...	17	10	3	6	....	....
Iowa City	66.6	80 0	53.1	96	2	44	7	52		2.54	1.02	.....	S	....	12	15	3	7	....	....
Iowa Falls	63.1	77.4	48.8	93	2	38	11	55		2 69	1.05	.....	SE	..	17	6	7	8	....	....
Le Claire ‡	.....	.....	.....	.....	.....	.....	.....	.....		2.67	1.12	..	.....	...	...	....	...	5	....	....
Linn Grove	65.4	76 7	54.2	92	2	42	11	50		3.30	1.51	.....	S	..	18	3	9	9	....	....
Logan	65.2	78.7	51.8	98	2	40	30	58		1.72	.89	.....	S	...	23	1	6	5	....	....
Maquoketa	64 1	76.7	51 7	91	2	43	11	48		2 99	1.33	.....	SW	..	20	3	7	5	....	....
Marshalltown	65.2	77.6	52.9	95	2	40	30	55		2.48	1.05	.....	SE	..	10	13	7	9	.. .	2
Millman (Des Moines)	.....	.....	.....	.....	.....	.....	.....	.....		1.93	1.33	....	.....	....	.....	.....	.....	9	...	....
Newton	66.6	77 6	55.6	93	2	43	30	50		2 82	.76	....	SE	...	13	13	4	10	...	....
Odebolt	65.0	79.3	50.6	96	1, 2	35	30	61		2.09	.87	.....	.....	...	22	2	6	5	....	....
Ogden	65.6	77.8	53.5	94	2	39	30	55		3.91	1.00	....	SE	..	19	2	9	9	....	....
Olin	64.2	75.9	52.6	90	2, 3	42	11	48		3 35	1.89	....	S	....	19	9	2	5	....	....
Rockwell City	63.8	76 4	51.3	94	2	42	9, 11	52		2.16	.68	..	.....	...	17	8	5	8	1	....
Sioux City	65.2	78.4	51 9	96	2	41	30	55		.95	.52	.....	S	....	18	2	10	3	....	....
Sac City	62.3	75.6	49 1	92	2	35	30	57		2.00	.50	.....	NE	....	14	7	9	6	..	....
Tara	63.6	79.4	47.8	95	2, 3	40	10,11,30	55		2.45	1.00	.....	W	....	1	29	0	4	...	....
Toledo	64.2	75 6	52.8	92	1, 2	39	7	53		4.64	2.73	....	SE	....	17	0	13	6	..	....
Vinton *	64.7	.....	.....	93	2	42	11	51		2.22	1.38	.....	SW	....	22	3	5	5	....	1
Waterloo	65.2	78.4	51.9	96	2	39	11	57		2.07	.95	....	S	..	20	4	6	7	...	....
Webster City	64.4	75.6	53.3	94	2	41	30	53		2.65	1.00	....	SE	..	12	13	5	5	1	....
West Branch	66.1	77.5	54.7	91	1	44	11	47		2.12	.98	....	SW	..	14	10	6	4	....	....
Whitten *	62.2	.....	.....	94	2	41	30	53		2 33	.88	.....	SW	...	16	7	7	5	...	2
Wilton Junction	65.4	77.6	53.3	92	1	42	7	50		2.72	1.08	..	SW	...	20	5	5	5	....	....
Average	65.0	78.4	53.0	93 7	.. ..	40.8	.....	52.8		2.67	.... .		SW	....	16	8	6	7	...	....

METEOROLOGICAL DATA FOR SEPTEMBER, 1898—CONTINUED.

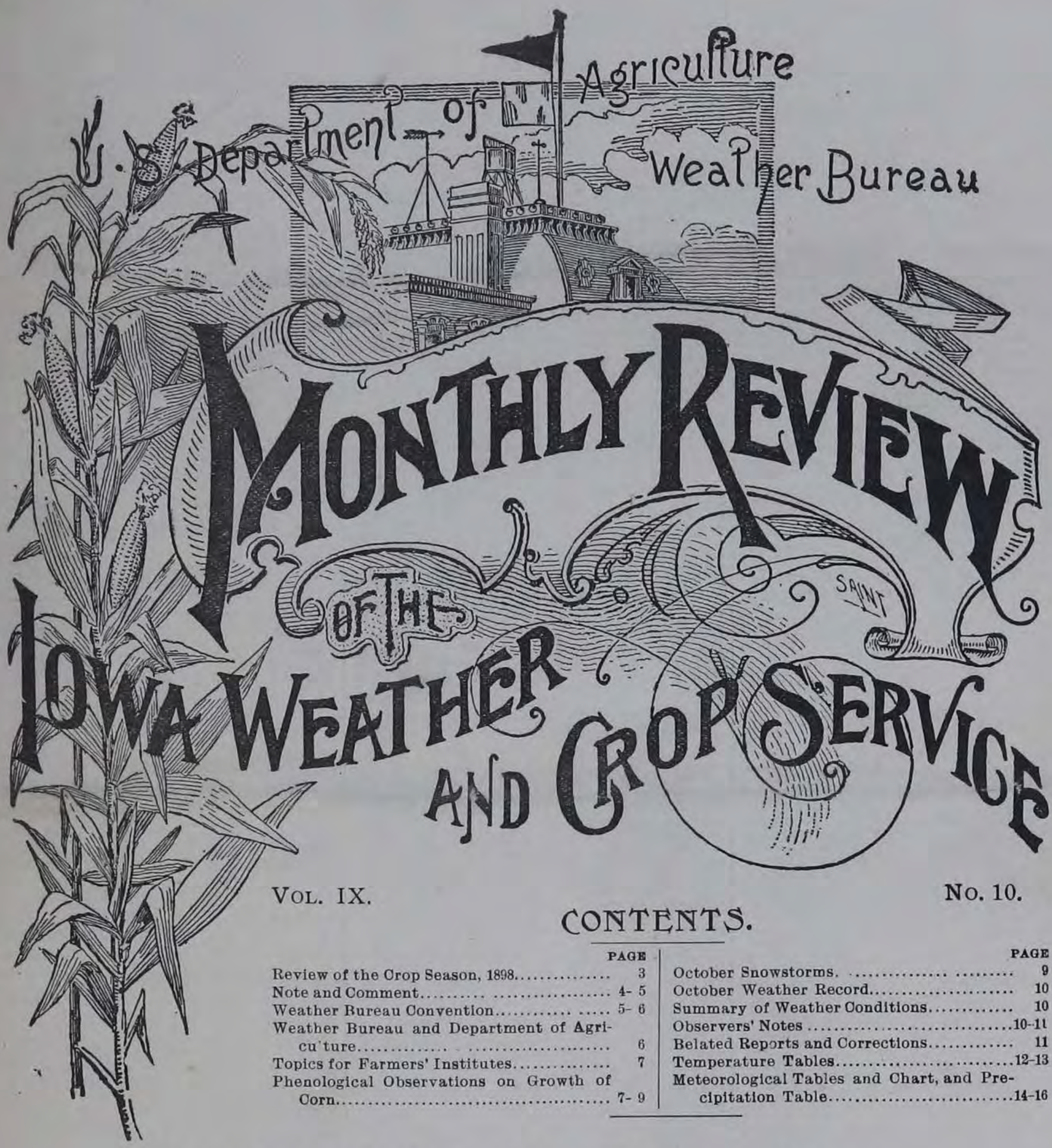
SOUTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.			Prevailing direction of wind.	Killing frost.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	Number of hail-storms.	No. of thunder storms.
	Monthly mean.	EXTREMES.						Monthly range.	Monthly.	Greatest daily.	Total snow-fall.								
		Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.												
Adair	....	.....	....	.....	..	.....	.....	2.77	2 17	.....	SE	...	16	13	1	3	...	....	
Afton	66.8	78.7	54.8	97	1	42	7	55	3 29	1.70	.....	SW	....	12	13	5	7	....	....	
Albia	67.7	80 4	51.5	91	1, 2, 3	42	7	49	3.07	1.15	....	SE	....	17	8	5	6	....	3	
Atlantic	64.6	78.2	51.1	95	2	35	7	60	2.72	2.02	.....	NE	.. .	15	8	7	5	....	1	
Belknap	68.4	78.4	58.3	92	1, 2	46	10, 12	46	5.00	1.80	....	E	....	21	6	3	4	....	....	
Bonaparte	68.2	78.6	57.9	93	2	45	7	48	7.30	2.20	.....	.....	....	.....	.....	.....	3	....	....	
Centerville	68.2	79.4	57.1	92	2	42	7	50	3.00	1.00	.....	.....	....	20	1	9	9	....	....	
Chariton	67.6	78.8	56.3	93	28	43	9	50	4.26	1.31	.....	S	....	14	7	9	10	....	....	
Clarinda	72 6	81.4	63.8	97	1, 2	43	30	51	5 74	2.40	.....	S	....	19	6	5	8	1	....	
College Springs[b]	70.9	85.6	56.2	96	1, 2	41	7	55	4.82	2.30	.....	S	....	17	9	4	8	....	....	
Council Bluffs	68.0	80.2	55.9	97	1, 2	46	7, 9	51	3.81	1.62	.....	S	....	17	6	7	5	....	....	
Eldon	69.0	80.3	57.6	95	2	43	7	52	5.07	1.35	.....	SE	....	16	3	11	8	...	3	
Fairfield‡	67.6	79.3	56.0	93	2	42	7	.....	3.61	1.10	.....	.....	...	12	16	2	9	....	....	
Ft. Madison*	70.2			87	1	53	9	34	8.45	2.27	.....	SW	....	9	10	11	8	....	6	
Glenwood	68.1	80.8	55.4	97	2	41	7	56	2.80	1.25	.....	SE	....	13	11	6	4	....	....	
Greenfield	66.6	78.8	54 3	94	2	38	7	56	2.48	1.75	.....	S	....	16	8	6	10	...	3	
Hopeville	67.4	77.5	57 4	93	2	44	7	49	4.63	1.73	.....	S, SW	....	12	14	4	11	....	....	
Indianola	67.9	78 9	56.9	94	2	42	30	52	1 99	1 01	.....	SW	....	16	8	6	10	....	3	
Keokuk	70.8	79.4	62.2	94	2	49	7	45	8.07	2.89	... ..	SW	....	10	13	7	10	....	8	
Keosauqua	68.4	77.6	59.3	93	2	47	7, 11	46	7.22	2 40	.....	.....	....	.....	.....	.....	11	....	....	
Lamoni	66.4	77.5	55.4	94	3	41	7	53	5.62	1.45	.....	SW	....	17	3	10	10	....	....	
Lenox	66.6	76.1	57.1	92	2	42	7	50	4 87	1.98	.....	S	....	20	4	6	12	....	3	
Mooar	68.6	78.5	58.7	93	2	44	7	49	7.04	2.30	.....	SE	....	9	10	11	10	....	....	
Mt. Ayr	67.0	78.3	55.8	94	2	44	8	50	5.36	2.01	.....	S	....	14	11	5	8	...	1	
Mt. Pleasant*	69.6			83	25	52	8, 9	31	4.42	2.00	.....	SW	....	23	4	3	6	....	1	
Neola	65.8	80.7	50.9	92	18, 24	36	6	56	1.50	.80	.....	SW	....	21	5	4	4	...	....	
Osceola	66 2	77.6	54.8	93	2	43	9	50	3.19	1.62	.....	SW	....	12	5	13	7	....	....	
Ovid	67 0	78 5	55.6	94	26	41	27	53	4.45	1.73	.....	SE	....	15	6	9	10	....	3	
Oskaloosa	66 9	79.1	54.7	95	2	40	7	55	2.21	1.50	.....	SW	....	20	4	6	8	....	....	
Ottumwa	67 6	79.9	55 3	93	2	45	11	48	2 98	.80	.....	SE	...	9	16	5	6	....	....	
Pella	64.2	72.0	56 5	87	2	42	7	45	1 89	.55	.....	SW	....	20	3	7	6	....	1	
Red Oak	66 6	78.6	54.7	95	2	44	7, 9, 30	51	3.83	1.67	....	.....	....	.....	.....	.....	6	....	....	
Sidney	67.4	76 7	58.1	94	2	44	10	50	5.40	1.10	....	SW, NE	...	21	3	6	9	1	1	
Sigourney	68.0	83 3	52.7	95	2	38	7	57	2 83	.89	.....	SW	....	15	12	3	9	....	...	
St. Charles	67.5	78 0	57.0	95	2	44	30	51	1 89	1.22	.....	SE	....	15	9	6	8	....	1	
Stuart	66 4	76.9	55.5	93	2	42	30	51	2.23	2.20	.....	S	....	17	2	11	2	....	....	
Thurman	67.1	79.0	55.2	95	2	44	9,10,30	51	3.95	1 38	.....	SE	...	.....	...	.....	7	....	....	
Villisca‡	65.4	79.6	51 3	93	2	36	7	57	4.15	1.45	....	S	....	23	3	4	7	....	....	
Wapello	67 0	77.0	56.9	91	2	44	11	47	1.76	1.08	.....	SE	...	13	16	1	5	...	1	
Washington	66.4	78.1	54.7	92	2	41	7	51	2.46	1.30	.....	SW	....	.....	.....	.....	7	....	....	
Winterset	64.7	77.2	52.2	93	4, 28	42	10, 30	51	2 45	1.31	.....	.....	....	.....	.....	.....	8	....	....	
Average	67.6	78.8	56.1	93.2	.....	45.4	.....	48.1	4.02	.....	.....	SW	....	16	8	6	9	...	....	
Average for the state	65.3	78.2	53.0	93.7	.....	40.1	.....	53.6	2.69	.....	.....	S	....	16	9	5	7	....	....	

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.



October, 1898



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Central Station, Des Moines, Iowa.

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U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER
1898.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME IX. OCTOBER, 1898. No. 10.

GENERAL REVIEW OF THE CROP SEASON, 1898.

The winter months were warmer than usual, with generally light precipitation, and the advent of spring was relatively early. March was warm and favorable for early farm operations, except in the southeastern counties where the soil was saturated by excessive rains. More than the usual amount of spring grain was sown in March, and there was a marked increase in the acreage of spring wheat compared with recent years.

April was nearly normal in all weather conditions, and generally favorable for preparation of soil and seeding. The bulk of small grain was sown before the middle of the month, except in the extreme north and in some of the southeastern counties where work was retarded by excessive moisture.

The first half of May was cooler than usual, retarding the germination of seed and the growth of corn; but the last half was sufficiently warm to bring the temperature of the month up to the normal. The spring months were especially favorable for the growth of grass and small grain. The pastures afforded ample feed for stock, and the meadows gave promise of a large crop of hay. On the first of June, wheat, rye, oats and barley had made phenomenal advancement, and the chief drawback was the danger of injury resulting from an excessive growth of straw. The bulk of the corn area was planted between the 10th and 25th of May, and the soil was in excellent tilth The seed was unusually sound, and the germination was almost perfect, resulting in an exceptionally good stand. And on the 1st of June the condition of corn was above the average for that date in recent years.

June was warmer than usual, with excessive moisture in a large part of the state, and all the conditions were favorable for a rank growth of vegetation, especially of the grasses, cereals and weeds. In portions of the southern districts, and notably the southeastern counties, the heavy rains caused considerable damage and greatly retarded field work. At the close of the month, however, the weather conditions were about normal, and corn was rated above the average, with small grain crops exceptionally good and promising.

With considerable variability in the daily temperatures, the average for July was about normal. The month was generally dry, though scattered localities received excessive amounts of rainfall. Drouthy conditions prevailed generally from the 3d to the 27th, mitigated in a few sections by showers the 6th and 19th. For a period of about twenty-four days the larger part of the state received very little moisture, and the greater portion of the precipitation of the month fell in the last four days. And the drouth was intensified by some high temperatures, ranging from 90° to 100°, with brisk to high winds during a part of the dry period.

Though the dry weather was somewhat unfavorable for corn, late potatoes and pastures, yet there were compensating advantages resulting from the almost ideal conditions for maturing and harvesting the unusually large crops of hay, wheat, oats, rye and barley. In the larger part of the state the bulk of the hay was secured in perfect condition; and, for the most part, the weather was all that could be desired for cutting, shocking and stacking the heavy grain crops, which because of the great bulk of straw, needed continued dry weather to secure it in good order.

The condition of corn was unusually good the first week in July, giving promise of more than an average yield. The dry weather and occasional periods of high temperatures that prevailed from the 8th to the 27th, during the critical stage in the development of the corn plant, unquestionably caused material injury in fields most exposed to the effects of the heat and arid conditions.

The average temperature of August was very close to the normal, the first half being cooler than usual and the last half unseasonably warm. The rainfall was very unequally distributed, ranging from less than an inch to more than 10 inches, the heavier amounts being reported from stations in the southeast district. The larger part of the state received considerably less than the normal rainfall for August. The first two weeks brought some measure of relief from the drouthy conditions that prevailed through the larger part of July. Though the nights were too cool for the rapid development of corn, yet the reports showed fairly good progress of that crop, and at the middle of the month the general conditions gave promise that it would reach maturity in advance of the usual period of killing frosts. During the last half of the month the prevalent high temperatures and dry weather hastened the ripening process of the belated portion of the corn crop and brought the larger part to a sufficient degree of maturity to be cut and shocked. In some sections the extreme heat caused some damage to late corn, but generally the crop was benefited by the conditions which carried so much of it beyond the danger line. The potato crop suffered some damage by the dry and hot weather in the latter part of August.

In considerable portions of the state there was sufficient moisture in the soil to facilitate plowing, and more than the usual area had been plowed at the close of the month, and a good beginning had been made in sowing winter wheat and rye. On the whole, August was a favorable month for farm operations and for the ripening of crops.

September brought almost ideal weather for ripening the late-growing crops, for threshing and garnering the small grains, and for fall plowing and sowing fall wheat and rye. The mean temperature was slightly above the normal for the month, and there was abundant sunshine to afford normal ripening conditions. The rainfall was generally ample for current needs, to facilitate plowing and to maintain growth in the pastures, though in a portion of the state the supply of moisture was somewhat deficient. The larger part of the rainfall came during the first half of the month, at the time when it was most needed; and the bright, clear weather of the last fifteen days brought the belated fields of corn and other crops to full maturity without a touch of frost. At the close of the month more than the usual amount of fall plowing and seeding had been accomplished.

The first half of October was favorable for outstanding crops, and corn was fully ripened and nearly dry enough to crib before killing frost. But the last half of the month was cold and wet, with severe storms of rain, wind and snow flurries, causing material injury to the unharvested corn that was more or less flattened by wind and snow. The conditions were generally favorable for early sown fall wheat and rye, which have made a good stand, with an increased acreage. On the whole the crop season of 1898 has been propitious, and this state has seldom harvested more abundant yields of the staple products of the soil.

NOTE AND COMMENT.

The Iowa Agricultural Report for 1897 contains a number of scientific papers of practical value to farmers; and also a Farmers' Institute Department, containing selected papers read before the county institutes during the past year. Secretary Fowler has a considerable number of volumes which will be forwarded by express to the secretary or president of institutes for free distribution at the next session, if application is made in due season. The Secretary announces that it is desired to give large space in the next annual report to institute papers and addresses, and officials are requested to bear that fact in mind and secure copies of the papers that they deem worthy of publication.

***

Northern Iowa this year has been found to be strictly within the fruit zone. But the people therein are not as yet inclined to invest largely in the culture of bananas and oranges. For that line of fruit production they will patiently await the full development of the climatic change which many of them believe to be in progress.

***

In a recent number of the *Electrical Review*, Nikola Tesla describes a possibility in electric power transmission. His inventions for transmitting electricity at high pressure over long distances have been successfully applied at many natural sources of power. Probably the most important of these plants in the United States is at Niagara Falls, costing over $6,000,000 to install, which supplies electricity to many large factories and supplies electric power for running the trolley lines of the city of Buffalo, twenty-six miles distant. The announcement is now made that by employing an apparatus which he has invented, capable of generating electrical pressure vastly in excess of any heretofore used, located at natural sources of power, the current can be conducted to a terminal maintained at an elevation where the rarefied atmosphere is capable of conducting freely the particular current produced; then at a distant point where the energy is to be used commercially, to maintain a second terminal at about the same elevation to attract and receive the current and to convey it to earth through special means for transforming and utilizing it. With the article an illustration is presented showing streams of electricity issuing from a single terminal giving an estimated pressure of two and a half million volts. The *Electrical Review* comments on Mr. Tesla's novel and startling ideas as follows: "Tesla now proposes to transmit, without the use of any wires, through the natural media—the earth and the air—great amounts of power to distances of thousands of miles. This will appear a dream—a tale from the Arabian Nights. But the extraordinary discoveries Tesla has made during a number of years of incessant labor, which are authoritatively described in our present issue, make it evident that his work in this field has passed a stage of laboratory experiment and is ready for a practical test on an industrial scale. The success of his efforts means that power from such sources as Niagara will become available in any part of the world regardless of distance"

***

The discovery that a good article of printing paper can be manufactured from cornstalks to sell at a cent a pound will, if verified by practical tests in a commercial way, mean the birth of a vast new industry, the conservation of the forests and a new impetus both to farming and to journalism. In fact, it will make the corn field a factor in the intellectual development of the country. But it would be premature to speculate upon the economic possibilities which, if they be anything like as great as the present claims suggest, will not be long in materializing in a dividend-paying form.—*Philadelphia Record.*

***

The Fruitman says: "The latter part of November is sufficiently early to cover grapes, roses, and tender shrubs. Earth is the most convenient material. Don't uncover until April."

***

The steamer Reael, while passing through the Gulf of Tonimi on the morning of August 8th, experienced a shower of mud that continued three hours. The sky was darkened and a tremendous sea rolled. On the deck and masts there was a layer of mud more than six inches in thickness. It is supposed the shower came from an active volcano on an island in the Gulf of Tonimi.

***

It has been shown by observations that there is a regular recurrence in Great Britain, at intervals of about thirty-five years, of cold and wet periods. This appears to sustain the statement of Bruckner that such periodicity occurs in various parts of the world.

***

There seems no longer any reason to doubt, says the *New England Farmer*, that our Indian corn, supposed to be a distinct genus, and named Zea-Mays, by Linnaeus, is nothing more than an improvement by selection from a wild, coarse grass of Mexico named Euchlaena Luxurians, and which, after all, is found to be only a strong, wild variety of a more slender form common to a wide extent of country, and named Euchlaena Mexicana. This more luxuriant form is known to the Mexicans under the name of teosinthe. The relation of maize to teosinthe is precisely the same as that of the common carrot and parsnip to the wild carrots and parsnips of our fields and fence corners

***

Nearly all crops show a better growth directly over a tile drain than they do a few feet distant on either side. Take a few observations and note the good effects of thorough drainage. The productive capacity of many farms may be increased two-fold by properly constructed tile drains.

***

Professor Storer, in *Agriculture*, clearly sets forth the beneficial effects of aeration of the soil by tile drainage and thorough tillage. He says:

"Every well tilled field provided with tile drains is in some sort a saltpeter yard. In such a field much of the manure and of the remains of plants and of the humus in the soil will readily be converted into saltpeter, and all experience teaches the great value of this substance considered as a manure. Indeed, when the soil is merely stirred as with a hoe or harrow or cultivator, it must often happen that the formation of nitrates is promoted, and some part of the significance of the summer tillage of crops may be fairly attributed to an actual increase of fertility through changes brought about by the action of oxygen on organic matters in the soil. But even if saltpeter be left out of consideration, it will still be true that the good effects produced by frequent plowing, harrowing and hoeing, and by draining also, result not merely from an alteration in the mechanical condition of the soil, but largely from the admission of air and moisture, which not only go to feed the plants directly, but so act upon various substances in the soil as to fit them to be taken up by plants."

***

According to a recent report issued by the U. S. Geological Survey, Iowa is sixth in the list of coal producing states, being surpassed only by Pennsylvania, Illinois, West Virginia and Ohio. The total product of bituminous coal in 1879 was 4,611,865 tons, worth at the mines $5,219,502, giving employment to 10,703 men.

***

By noting the perturbations of the planet Vulcan, which may be clearly seen "in the mind's eye," and by careful computations based upon the directions indicated by the horns of the new moon in October, together with certain occult doings among various members of the solar system, we are enabled to make a long range forecast for the approaching winter. In many portions of the northern hemisphere there will be extremely low temperatures, with heavy snows and fierce blizzards. In fact, it will be a hard winter, and the inhabitants of all regions north of the Arctic circle had better cover up their vines, add somewhat to the thickness of their ice huts and increase their supply of blubber. Whenever the moon is reduced to its last quarter, in the Vulcan period, there will be much distress and disturbance of the elements, particularly in the upper Yukon, Greenland and northern Siberia. From December 1st to March 1st every day will be excessively cold and stormy—at several points in the northern hemisphere. This may be regarded as absolutely certain, but we are unable to locate the exact spots where the worst sort of weather will be experienced. In this portion of the Mississippi valley we shall have cool waves and warm waves in periods of variable duration, intermingled with snow, sleet and rain at irregular intervals, just about as we have experienced since this country was settled. It may keep Vulcan, Venus, Mercury and the man in the moon quite busy to work all the changes in temperature, and to bring on the storms at the rate of six to ten each month, but we may rest assured they are attending strictly to business in that line.

If any one asks for a more specific forecast of the coming winter, giving exact dates and localities of the occurrence of cold or warm, fair or foul weather, we would respectfully refer him to the astrological almanacs issued by our long range weather prophets. It is not necessary to buy a new almanac for the coming year; any old almanac will do as well as a new one.

***

A Washington special, of October 15th, contains the following interesting paragraph: "A meeting of scientific men has just concluded its labors at Bristol, England, in connection with the meeting of the British Association for the Advancement of Science. This meeting was composed of the leading authorities on the study of terrestrial magnetism. The questions submitted for deliberation concerned the preparation of a plan for a systematic magnetic survey of the entire globe, and the deliberations of the convention resulted in a general recommendation for that purpose. The principal work of the conference, however centered in the wider questions involving magnetic observations, their present unsatisfactory distribution over the globe, and their inadequacy as regards numbers. It is here that the United States is in a position to take a most important step in the advancement of knowledge by establishing and maintaining a well-equipped magnetic observatory on one of the Hawaiian islands."

***

A correspondent makes inquiry concerning the construction of ground wires on wire fences, to protect stock from the deadly effects of lightning that is frequently conducted many rods along the fences. A ground wire, to be effective, should have contact with every wire on the fence, and should enter the ground far enough to reach moist earth, or at least two feet below the bottom of the fence post; the deeper the better. In the construction of a fence the wires may be most easily sunken to the required depth in the bottoms of post-holes, before the posts are set, by the aid of a slender bar or pointed rod of steel. The contact with the fence wires may be made on the posts, and it would be well to have the ground wires long enough to allow points to be elevated a few inches above the posts, serving as lightning rods. A good ground wire attached in this manner to every fourth post, where the posts are set a rod apart, ought to afford a large measure of protection. The cost of wire is trifling, and if the ground wires were placed two rods apart the expense for labor and material would not be burdensome.

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A Boston circular says: "About 2,000,000,000 bushels of corn are of late years consumed in this country, 1,000,000,000 bushels of which is fed to meat-producing animals, 600,000,000 bushels to working animals, 200,000,000 bushels for human food, and 200,000,000 bushels for seed, for distilling and other purposes. Expert authorities claim that the quantity fed to animals the past crop year was largely increased by reason of the protracted drouth last fall and resultant loss of pasturage, and that the quantity used for human food was also much greater by reason of the abnormally high price of wheat and flour."

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At the seventieth session of the "Congress of German Men of Science and Physicians," held at Dusseldorf September 19th, Professor Martius gave an address on the causes of illness, in which he argued that the pathogenic microbes were not the true cause, but only the occasion of illness.

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A prominent and well informed grain dealer of Chicago, says: "Low values increase consumption and waste. Crop damage is always overestimated; large crops are also overestimated; and small crops are usually underestimated." This is true, and the experience of the past few years affords ample verification. There is a tendency in human nature to exaggerate everything of an unusual character, as, for example, extremes of heat or cold, severe storms, big crops or the extent of damage or disaster to crops, etc. And usually the exaggeration grows as the years pass by; the old-time cold was much colder, and the big crops were much greater than the bumper yields of recent years. The "oldest inhabitant" can tell of phenomenal events that occurred away back in the first half of the century.

WEATHER BUREAU CONVENTION.

Pursuant to notice a convention of officials of the United States Weather Bureau was held in Omaha October 13th and 14th. There were over sixty officials in attendance, representing all sections of the country, and a goodly number of voluntary observers were guests of honor with full privileges of membership. The sessions were held in the spacious and elegant rooms of the Omaha Commercial Club, which were generously tendered for the occasion.

Prof. Willis L. Moore, the honored Chief of the Bureau, called the convention to order, and opened the session by a felicitous address, referring to the auspicious condition of the country, the progress that has been made in this branch of the public service, and the work of betterment that should be accomplished in the future. He closed by calling upon Prof. Cleveland Abbe, who has been connected with the Bureau since its organization, to serve as temporary chairman.

The papers and oral discussions covered a very wide range of topics, relating to the practical working of the service and its relation to the public, and a high order of ability was evinced in the matter and manner of presentation. The proceedings throughout the session were deeply interesting and profitable, and we are glad to be assured that a very complete report will be published by the Department and widely distributed. The following selections from the program will serve to show the scope and practical character of the topics presented and discussed:

Relation of the Weather Bureau to the public.
Forecasts and Special Warnings.
Relation of the Weather Bureau to Agriculture.
West India Hurricane Service.
Relations with Commercial Bodies and Scientific Organizations.
Meteorological Statistics and How to Improve Them.
Effect of Forest Clearing and Cultivation Upon Water Supply, Rainfall and Temperature.
Primary Work on Meteorology for use of Schools.
Bulletins of the Climate and Crop Sections.
Aerial Observations.
Is the Weather Map Appreciated and Understood by the Public?
Studies of Climate.
Voluntary Stations, Their Object and Collateral Functions.
Development of the Weather Map.
Storm Signals on the Lakes.
Distribution of Forecasts by Mail.
Utility of Hygrometric Observations.
Long Range Weather Forecasts.

Within our limited space we are unable to publish a synopsis of the papers and discussions; but we hope to find room in future issues for some of the many excellent papers that were read before the convention.

An enjoyable feature of the meeting was the banquet at the Millard on the night of the 13th.

RELATION OF THE WEATHER BUREAU TO THE DEPARTMENT OF AGRICULTURE.*

BY E. B. CALVERT.

There are three things, more than any other, upon which the prosperity of a nation depends—its climate, agricultural products and mineral deposits. It is difficult to conceive of a progressive and wealthy nation without these natural resources. The products of the soil and the earth beneath the soil give life to the people and material and products that are the basis of commerce and manufacturing; but however rich a land may be in soil and minerals it cannot reach its fullest development unless the climate of that land is favorable. In our own United States we have all the conditions of a prosperous nation.

"Nature was here so lavish of her store,
That she bestowed until she could bestow no more."

The work of the Weather Bureau is so closely interwoven with two of the great factors of prosperity that we have named—climatology and agriculture—that one cannot be considered without the other. If the climatology of a section is accurately determined, the scientific agriculturist knows what crop the lands will bring forth in greatest abundance. Experience has been called our great teacher, but something else is required of the successful agriculturist. He must get close to Nature and learn her secrets. It is not sufficient for him to know that a certain piece of land produces an abundance of one kind of grain, while another farm product cannot be grown thereon. He must know why these things are so; he must understand the composition of the soil he cultivates, how much rain annually falls on his possessions, and the movement of this moisture in the soil. He must understand the nature of the economic plants, the plant foods required in growing and maturing them, and the amount of moisture and sunshine necessary for perfect maturity. Climatology is surely a part of agriculture.

The United States has an Agricultural Department, of which the Weather Bureau is a part, the most complete in the world; and at its head is a practical farmer, a scientific farmer—one who has guided the plow as the furrows were turned, and one who has studied the science of agriculture in Nature's laboratory as well as in his own. Under him serve what Sir Richard Armstrong, of England, declares to be the ablest aggregation of agricultural scientists to be found anywhere in the universe.

The homeseeker obtains from the Weather Bureau information as to the climate of any state or county in which he wishes to locate; the divisions of soil and chemistry inform him as to the nature of the land he will cultivate and what crops will best thrive thereon; the botanist and vegetable pathologist name the flora and the diseases to which it is subject, and give a remedy for the disease; the agrostologist advises him as to the grasses to be sowed for feeding his flocks; and the department publications keep him abreast of the science of farm work as it expands and develops. The Agricultural Department is a monument of which the people can be justly proud—a monument built of divisions and bureaus whose functions are separate and useful, yet working together in one harmonious whole. The Weather Bureau is a part of this grand monument. A great portion of its work necessarily has no connection with agriculture, but along certain lines its identity with the department is clearly established. This is particularly true in regard to climatology, and its climate and crop work. The botanist, biologist, agrostologist, agriculturist, chemist and soil physicist, all understand and appreciate its value. It is just as necessary for the Weather Bureau section directors of the state climate and crop services to have a certain knowledge of the work done by these scientists as it is for them to understand something about climatology. The section director is better fitted to intelligently report the crops of which he writes, if he understands these things. It is all a part of his work. He can aid the soil physicist, botanist, and chemist, while they in turn impart to him useful knowledge. A successful forecaster in the Weather Bureau, in addition to his knowledge gained by experience and empirical reasoning, must know the physical laws connected with the meteorological conditions he foretells. Just so, the section director, in addition to his skill as an executive and his ability as an organizer, should understand the principles of agricultural chemistry, and the physical requirements of the staple crops. This knowledge raises him above the plane of a mechanical worker to the eminence of a practical scientist and student. The climatological and agricultural field is large. Our knowledge of it is but a grain of sand on the ocean shores as compared to the laws that have not yet been unfolded to any man. But Nature holds her secrets with jealous care. She only reveals her jewels to those who, by sweat of the brow and concentration of the brain, earnestly dig down into her depths. There is legitimate work in this line to be done, and it behooves the officials of the Weather Bureau to remember that we are but an integral part of a great Department, and that we should become acquainted with the aims, objects and developments of the other branches, to the end that we may grow together, one assisting the other, to a perfect organization.

*Paper read at Weather Bureau Convention, Omaha, October 14, 1898

TOPICS FOR DISCUSSION AT FARMERS' INSTITUTES.

Answering numerous requests we have prepared a list of topics from which selections may be made in the preparation of programs of farmers' institutes. It is by no means complete and exhaustive, but the list covers a very wide scope and it may at least serve to illustrate the fact that scientific agriculture is a very broad and comprehensive field of study and experimentation. It is not supposed that one-fourth of the topics enumerated could be fairly well discussed within the limited time consumed at an annual session of a local institute. Some of the topics may be outside of the usual range of discussion, but they are all of sufficient importance to entitle them to consideration:

1. Conservation of Moisture in Dry Periods: Deep plowing, subsoiling—tile drainage—rolling—mulching, etc.

2. Conservation of Fertility: Rotation of crops—clovering—maintaining the proper ratio between grass and grain production—application of manure, etc.

3. Soil Washing: How to prevent it—grasses as soil binders, etc.

4. Shelter Belts and Groves: Proper location—practical value—nut-bearing trees and trees valuable for timber or fuel.

5. Tile Drainage: Practical value in wet or dry seasons—construction and location—effects in conserving fertility and moisture.

6 Permanent Water Supply on Farms: Deep wells—artificial ponds or pools fed by springs or tile drains—cisterns, etc.

7. Windmills or engines for Power.

8. Irrigation for Gardens, Fruit Fields and Lawns: To what extent is it practicable and profitable?

9. Profits in Thoroughbred Poultry: Fowls as scavengers and insect destroyers.

10. The Up-to-Date Farmer: Some of his strong points and characteristics—business methods applied to farming.

11 Farm Dairies and Co-operative Dairying.

12. Preventable Wastes and Losses in Farming.

13. Losses by Lightning: To what extent are they preventable?—wire fences, ground wires, lightning rods, metallic roofs, etc.

14. Horse Breeding for Profit: Size, form, weight, style and action.

15. Thoroughbred and Grade Stock vs. Scrubs.

16. Swine Breeding, Feeding, and Prevention of Disease.

17. Winter Wheat in Crop Rotation: Is it a profitable crop at less than a dollar per bushel?

18. Soiling crops for Dairy Cows in Dry Spells: Best varieties for forage.

19. Equities Between Land Owners and Renters.

20. Corn Growing: Preparation of soil—selection of seed—most prolific varieties—planting and cultivating—when and how to lay it by—utilizing the fodder—should the farmer be content with only an average yield?

21. Sheep Husbandry: Value of fleece and flesh—utility of the animal in destroying brush and weeds and fertilizing the soil.

22. The Farmers' Vegetable and Fruit Garden: Varieties—methods of culture, etc.

23. Weeds and Their Destruction.

24. Fungus Diseases of Farm and Horticultural Crops and their Prevention

25. Bacteria and their Relation to Agriculture—in dairying—in sanitation—plant food, etc.

26. The Forage Problem: Grasses adapted to meadows and pastures

27. Chemistry and its Relation to Agriculture: Food of plants—composition of milk and its products—testing milk, etc.

28. Diseases of Animals: Prevention and cure—need of instruction in elementary veterinary science.

29 The Department of Agriculture; Are Farmers Deriving their Full Share of Benefit Therefrom? If not, why not?

30 The Weather Bureau and its Relation to Farmers: How to make practical use of its forecasts and reports—need of elementary instruction in relation to origin and movement of storms—value of weather observations and records.

31. Household Economics: Care of health—nutritious diet—cleanliness—sunlight and shade—healthful sleeping rooms—pure drinking water—sanitary surroundings—comfortable clothing—value of cheerfulness, etc.

32. The Social Side of Farm Life: Cultivation of amenities—innocent recreations and amusements—picnics and holiday gatherings, etc.

33. Rural Educational Advantages: Value of good country schools and church privileges—organization of literary societies—circulating libraries and an abundant supply of good and pure literature.

34. The Iowa Agricultural College: The good work it has done for practical farmers—how may it be made still more serviceable?—need of brain culture in modern agriculture.

35. The Agricultural Paper: Mission and value in the home—an exponent of the farmers' interests—worthy of patronage, etc.

PHENOLOGICAL OBSERVATIONS ON THE GROWTH OF CORN.

BY E. R. HODSON.

In this paper are given the results of an experiment seeking to show the effects of temperature and moisture on a growing crop.

Certain varieties of corn were selected out of a plot containing 380 varieties. The height of four varieties was measured at certain periods throughout their growth. At these periods the averages per day of the air temperature, soil temperature, maximum and minimum temperatures in degrees F., relative humidity of the atmosphere, and rainfall are given.

In the first part of the paper four varieties are followed through their growing season in this manner.

The second part of the paper seeks to show the influence of temperature and moisture on the different kinds of corn—sweet, dent, pop and flint. In this case the averages are given at maturity for the whole period and at the end of the germination period only, the object being to show the influence of temperature and moisture on the different classes of corn, not on individuals, at different periods of growth.

In some cases the differences are slight and appear trivial, but these figures are all averages for periods and must be judged accordingly.

PART 1.

TABLE I.

VARIETY.	Planted.	Kernels plant'd.	Germinated.	Per cent of germination.	Pollinated.	Matured
Early Mastodon	May 9	12	May 20	50	July 5	Aug. 30
Negro Equality	May 9	12	May 20	66⅔	Aug. 18	Sept. 24
Southern Horsetooth fodder corn	May 9	12	May 20	66⅔	July 22	Sept. 14
Sandford corn	May 9	12	May 20	75	July 2	Sept. 1

HEIGHTS OF CORN AT THE DIFFERENT PERIODS.

VARIETY.	May 30.	June 11.	June 26.	July 6.	July 16.	July 26.	Aug. 5.
Early Mastodon	6½ i.	17 i.	2 f. 11½ i.	4 f. 7½ i.	6 f. 9 i.	8 f.	8 f. 3 i.
Negro Equality	5 i.	13 i.	2 f. 7¾ i.	4 f. 5½ i.	5 f. 6½ i.	7 f. 3 i.	7 f. 3 i.
Southern Horsetooth fodder corn	6½ i.	19½ i.	2 f. 7¾ i.	4 f. 5 i.	5 f. 9½ i.	7 f. 2 i.	7 f. 7 i.
Sandford corn	8½ i.	16 i.	2 f. 5½ i.	3 f. 8 i.	5 f. ½ i.	5 f. 6½ i.	6 f. 1 i.

TABLE II—MAY 9-20.

VARIETY.	Period of germination.	Average temperature of air	Average soil temperature.	Average maximum.	Average minimum.	Average per cent relative humidity.	Average rainfall.
Early Mastodon	May 9-20	61.8	61.5	78.5	46.5	92.3	.073
Negro Equality	May 9-20	61.8	61.5	78.5	46.5	92.3	.073
Southern Horsetooth fodder corn	May 9-20	61.8	61.5	78.5	46.5	92.3	.073
Sandford corn	May 9-20	61.8	61.5	78.5	46.5	92.3	.073

TABLE III—MAY 20-30.

VARIETY.	HEIGHT.	Average temperature of air.	Average soil temperature.	Average maximum.	Average minimum	Average relative humidity.	Average rainfall.
Early Mastodon	6.5 inches	66.1	72	81.7	51	90.2	.22
Negro Equality	5 inches	66.1	72	81.7	51	90.2	.22
Southern Horsetooth fod'r corn	6.5 inches	66.1	72	81.7	51	90.2	.22
Sanford corn	8.5 inches	66.1	72	81.7	51	90.2	.22

TABLE IV—MAY 30-JUNE 11.

Early Mastodon	17 inches	69.1	72.9	79.1	53.4	92.9	.422
Negro Equality	13 inches	69.1	72.9	79.1	53.4	92.9	.422
Southern Horsetooth fod'r corn	19.5 inches	69.1	72.9	79.1	53.4	92.9	.422
Sanford corn	16 inches	69.1	72.9	79.1	53.4	92.9	.422

TABLE V—JUNE 11-26.

Early Mastodon	2 ft. 11⅓ in.	73.1	73.3	85	64.6	83.7	.127
Negro Equality	2 ft. 7¾ in	73.1	73.3	85	64.6	83.7	.127
Southern Horsetooth fod'r corn	2 ft. 7¾ in	73.1	73.3	85	64.6	83.7	.127
Sanford corn	2 ft. 5⅓ in	73.1	73.3	85	64.6	83.7	.127

TABLE VI—JUNE 26-JULY 6.

Early Mastodon	4 ft. 7½ in	74.3	79.8	87.5	57.6	86.3	.02
Negro Equality	4 ft. 5½ in	74.3	79.8	87.5	57.6	86.3	.02
Southern Horsetooth fod'r corn	4 ft. 5 in	74.3	79.8	87.5	57.6	86.3	.02
Sandford corn	3 ft. 8 in	74.3	79.8	87.5	57.6	86.3	.02

TABLE VII—JULY 6—16.

Early Mastodon	6 ft. 9 in	75.5	80.7	92.1	52.9	82.5	.003
Negro Equality	5 ft. 6½ in.	75.5	80.7	92.1	52.9	82.5	.003
Southern Horsetooth fod'r corn	5 ft. 9½ in.	75.5	80.7	92.1	52.9	82.5	.003
Sandford corn	5 ft. ½ in.	75.5	80.7	92.1	52.9	82.5	.003

TABLE VIII—JULY 16-26.

Early Mastodon	8 feet.	77.4	82.5	95.5	58.6	82.9	.015
Negro Equality	7 ft. 3 in	77.4	82.5	95.5	58.6	82.9	.015
Southern Horsetooth fod'r corn	7 ft. 2 in	77.4	82.5	95.5	58.6	82.9	.015
Sandford corn	5 ft 6½ in	77.4	82.5	95.5	58.6	82.9	.015

TABLE IX—JULY 26-AUGUST 5.

Early Mastodon	8 ft. 3 in	67.6	71.7	79.0	53.2	81.4	.175
Negro Equality	7 ft. 3 in	67.6	71.7	79.0	53.2	81.4	.175
Southern Horsetooth fod'r corn	7 ft. 7 in	67.6	71.7	79.0	53.2	81.4	.175
Sandford corn	6 ft. 1 in	67.6	71.7	79.0	53.2	81.4	.175

TABLE X—AVERAGES FOR ENTIRE PERIOD.

VARIETY.	PERIOD OF MATURITY.	Average temperature of air.	Average soil temperature.	Average maximum.	Average minimum	Average relative humidity	Average rainfall.
Early Mastodon	May 9 to Aug. 30	71.3	73.9	85.8	55.1	86.3	.128
Negro Equality	May 9 to Sept. 24	70.1	74.1	84.8	54.9	85.8	.126
Southern Horsetooth fod'r corn	May 9 to Sept. 14	70.5	74.1	85.2	55.0	86.0	.126
Sandford corn	May 9 to Sept. 1	71.4	74.0	86.1	54.6	86.4	.128

Table I is a summary giving the heights at the different periods, per cent of germination, time of pollination, time of maturity, etc.

Table II gives the averages during the period of germination from May 9th to May 20th. It will be noted that conditions are favorable for germination. While the rainfall is low, the relative humidity is high. The soil is warm and moist. However, the range of temperature is a little high, being 32°.

Table III gives the height and averages during the first period of growth from May 20th to May 30th. The rainfall is higher than during the preceding period while the relative humidity is slightly lower. The range of air temperature is lower, being 30.7°. The soil temperature is 10.2° higher. Under these favorable conditions the corn made good growth.

Table IV gives the height and averages during the period from May 30th to June 11th. During this period the rainfall is very high and also the relative humidity. The soil temperature is still high. The growth not so rapid.

Table V gives the height and averages from June 11th to June 26th. This period is longer than the others and must be judged accordingly. The range of temperature is low, being 20.4°. The rainfall and relative humidity are low. However, the growth is good, being from one foot to one and a half feet.

Table VI gives the height and averages from June 26th to July 6th. During this period the rainfall was low. The relative humidity a little higher than in the preceding period. The soil temperature is 6.6° higher. These conditions, together with the root system which the corn has developed by this time, make the growth quite large, being from one foot to one foot ten inches.

Table VII gives the height and averages from July 6th to July 16th. During this period the rainfall was very low, the range of temperature being 39.2°. The soil temperature was slightly higher. This was the period of maximum growth, being, in one variety, 25.5 inches.

Table VIII gives the height and averages from July 16th to July 26th. During this period the soil temperature reached its maximum. The rainfall and relative humidity remain low. The range of temperature is still high, being 36.9°. The maximum temperature reached its highest point during this period; also the air temperature.

We find that the relative humidity and rainfall are very low, both in this and the preceding periods, while the temperatures are the highest. Its effect is shown on the corn, the growth being reduced from 6 to 20.5 inches, while during the preceding period the growth was from 13 to 25.5 inches.

Table IX gives the height and averages from July 26th to August 5th. During this period the rainfall increased and relative humidity slightly decreased. The soil temperature falls 10.8°. The maximum temperature decreases 16.5°. The range of temperature is 25.8°. The growth is slight, as the season of growth is almost over.

Table X gives the averages of temperature and moisture throughout the whole period, from time of planting to maturity. As might be expected, the differences are slight.

CONCLUSIONS.

In examining the tables, it is found that the period of greatest growth is from June 26th to July 16th. Although during that period the rainfall is very low, being not larger than .02 of an inch per day, yet the soil is moist, owing to heavy rainfall early in the season. The temperature is high, and, as the corn is well developed, the growth is rapid.

In the next period, July 16th to July 26th, the rainfall still continues low and the temperature high, we notice a decrease in growth. The decrease of moisture has commenced to take effect.

The conditions are favorable during the first period of growth—May 20th to May 30th. Corn had a good start, and ought to have grown rapidly during the next period—May 30th to June 11th—but owing to the excessive moisture, the rainfall being almost a half-inch per day, the growth is not so rapid.

PART II.

TABLE I—DENT CORN.

VARIETY.	Period of growth.	Per cent of germination.	Pollinated.	Height.	Average temperature of air.	Average soil temperature.	Average maximum.	Average minimum	Average relative humidity.	Average rainfall.
White Cap Yellow.....	May 19 to Sept 8..	58⅓	July 5	6 feet...	70.9	73.8	85.6	55.3	85 9	.14
Extra Early Huron.	May 19 to Sept 5..	100	July 18	6¾ feet..	71 4	74	86	55.6	86 2	.143
Waterloo Extra early.	May 19 to Aug. 31.	91⅔	July 5	7 feet....	71.3	73.9	86	55 3	86 3	.127

TABLE II—POPCORN.

Queen's Golden.	May 20 to Aug 27.	62½	July 3	5 feet....	70.5	75.4	85.2	56	83.2	129
Mammoth Rice..	May 17 to Aug 27.	92 6-7	July 1	4½ feet.	70.5	75.4	85.2	56	83.2	.129
White Rice	May 17 to Aug. 16.	100	June 29	6 feet....	70 5	74 2	84.8	54 6	86 3	.124

TABLE III—SWEET CORN.

Henderson.....	May 19 to Sept 13	37½	June 29	5½ feet.	71.9	74.1	86	55.5	86.1	124
Early Minnes'ta	May 18 to Aug 16.	75	June 29	4 ft. 5 in	70.5	74.2	84.8	54.6	86.3	.124
New Early.....	May 18 to Aug. 12.	87½	June 29	6 feet .	70.5	74.1	85 4	54.1	86.6	.129

TABLE IV—FLINT CORN.

Silver Flint.....	May 19 to Sept. 2.	100	June 30	4 feet....	71.5	74.1	86.1	55 6	86.3	.125
Longf'll'w Flint	May 19 to Sept. 3.	100	June 20	8⅓ feet..	71 6	74 1	86.1	55.7	86.3	126
Mam'th 8-rowed	May 20 to Aug. 28	75	July 13	5 feet....	70.7	74 4	85 3	55 1	86.3	.129

TABLE V—DENT CORN.

VARIETY.	PERIOD OF GERMINATION.	Per cent of germination.	Average temperature of air	Average soil temperature.	Average maximum	Average minimum.	Average relative humidity.	Average rainfall.
White Cap Yellow..... .	May 9 to May 19	58⅓	61 5	61	78	45	91 3	.08
Extra Early Huron	May 9 to May 19	100	61.5	61	78	45	91 3	.08
Waterloo Extra early. ...	May 9 to May 19	91⅔	61.5	61	78	45	91 3	.08

TABLE VI—POP CORN.

Queen's Golden.....	May 7 to May 20	62½	61.5	61.2	78	44 7	91	066
Mammoth Rice.....	May 7 to May 17	926-7	59 8	60	76	42	91 3	08
White Rice..... ..	May 7 to May 17	100	59.8	60	76	42	91.3	08

TABLE VII—SWEET CORN.

The Henderson	May 7 to May 19	37½	61 3	61.1	76	44	91	.068
Early Minnesota	May 7 to May 18	75	60 7	60 5	76.1	43 2	91	.073
New Early.....	May 7 to May 18	87½	60 7	60.5	76 1	43 2	91	073

TABLE VIII—FLINT CORN.

Silver Flint	May 9 to May 19	100	61.5	61	78	45	91 3	.08
Longfellow Flint	May 9 to May 19	100	61 5	61	78	45	91.3	08
Mammoth 8-rowed. ...	May 9 to May 20	75	61 8	61.5	78 5	46.5	92 3	073

Part II gives the results for dent, pop, sweet and flint corn. The first four tables give the averages of temperature and moisture during the period of growth.

The last four give these averages for the germination period.

It will be noticed that the averages for the whole period of growth do not vary much. The varieties of sweet corn pollinate and mature early. This, however, is because they are earlier varieties than the others.

The period of popcorn is almost the same as that of sweet corn. The dent and flint varieties are later, and have almost the same period.

During the germination period, the time being shorter, there are larger differences in the averages. The time taken for germination is not much longer for one class than for another. Sweet corn has the longest period.

In regard to per cent of germination there is a vast difference. In figuring the per cent of germination, flint and dent corn were classed together.

Out of 380 varieties it was found that 42 per cent of flint and dent varieties gave 90–100 per cent of germination, and only 5 per cent of the varieties gave a per cent of germination below 50; 10.5 per cent of the sweet varieties gave a per cent of germination of 90–100 per cent and 38 per cent below a 50 per cent germination

Popcorn was a little better; 14.5 per cent of the varieties gave a per cent of germination of 90–100, and 12 per cent of the varieties below a 50 per cent germination.

The difference in germination between the sweet varieties and the dent and flint varieties is 31.5 per cent between the range of 90–100 per cent.

OCTOBER SNOWSTORMS.

On the 16th and 17th, and again on the 25th, large portions of the state were visited by storms of rain, followed by snow with high winds and almost blizzard conditions. Though not unprecedented, these storms were unusually severe in this region for the month of October.

The snowstorm of the 17th, following heavy rains on the 16th, was most severe in the western part of the state. The following newspaper paragraphs describe conditions that prevailed over a wide area along the Missouri slope. The *Enterprise*, of Defiance, Shelby county, says:

A regular old-fashioned blizzard swept down upon this section early Monday morning, October 17th, from the northwest, and continued without a break during the entire day and far into the night. The temperature remained above freezing point, and the snow melted considerably, though not nearly as fast as it fell The storm was general in western Iowa and Missouri and Nebraska, and in many places telephone and telegraphic communication was badly crippled. The blizzard of October 17, 1898, will long be remembered because of its severity and the early date on which it came.

Mr. H. H. Fitch, agricultural editor of the *Sac City Sun*, says:

Monday, October 17th, was a blustering, snowy day, and reminded old settlers of an October day eighteen years ago. But the weather was less cold and the storm much less severe this year. In that year (1880) we had an early winter and many severe storms, accompanied with high winds and a great fall of snow. Early in November we had a light fall of snow and quite cold, wintry weather. About the 20th of the month the snow fell so deep as to render corn-husking difficult, and much of the ungathered corn was left in the field until the next spring. This was practically worthless, as the melting snows soaked it with water and left it partially imbedded in the soft mud, long before the snow had disappeared.

The storm of the 25th swept over about two-thirds of the state, but attained its maximum of force and volume in the eastern districts. The *Clinton Herald* of October 26th, reported the storm as follows:

Tuesday afternoon and night (October 25th) Clinton experienced one of the worst blizzards that ever visited this city during the month of October and it would have done credit to the chilly blasts of December or January. About noon the rain turned to snow, which was accompanied by a severe wind from the northeast The snow came down in buckets full, and had not considerable of "the beautiful," which fell during the fore part of the afternoon, melted it would have been much deeper this morning. The mercury continued to fall as the fury of the storm increased, and early in the evening reached the freezing point. The rain soaked everything it came in contact with and the laden trees presented one of the pretty scenes that which is witnessed on such occasions. The accumulating of the snow proved to be disastrous to many of the beautiful shade trees in this city. It was impossible for them to bear the enormous weight and branches, both large and small, came to the ground by the hundreds. Telegraph, telephone and electric light wires and poles suffered severely.

The telegraph wires were all out of working order early in the evening. Trains had to be run on their time and not by order. The natural result was many delays. It was indeed fortunate that there were no accidents, because while the snow was falling cars and engines could be seen only a few yards, and bells gave out no more ring than if made of boards.

The Iowa Telephone company suffered considerable loss. At Lyons several poles, covering a distance of two or three blocks, fell over in the street

OCTOBER WEATHER RECORD.

The month of October was cooler than usual, with more than the normal amount of precipitation. The first half of the month was generally fair and seasonable, and the last half wet and cold, with storms of unusual severity.

The average temperature for the state was 47.5°, which is about 3° below the October normal. The average for the northern section was 45 8°; central section, 47.2°; southern section, 49.5°. The highest temperature reported was 90° at Maquoketa on the 3d; lowest temperature, 17° at Estherville on the 31st.

The average precipitation for the state was 3.56 inches, which is about 1.33 inches above the October average. By sections the averages were as follows: Northern section, 3.51 inches; central section, 3.76 inches; southern section, 3.42 inches. The maximum amount for the month was 5.75 inches at Ridgeway; least amount reported, 1.27 inches at Larchwood. The greatest daily precipitation was 3.42 inches at Hawkeye on the 21st. Snow fell at various localities on the 17th, 18th and 25th. There were 7 clear days, 9 partly cloudy, and 15 cloudy. The average percentage of sunshine was unusually low.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30.02 inches; highest observed, 30.55, at Clarinda on the 30th; lowest observed, 29.39, at Davenport and Des Moines on the 17th and 18th; range for the state, 1 16 inches.

Temperature.—Monthly mean, as deduced from 119 reports, was 47.5°; highest monthly mean, 53°, at Maquoketa; lowest monthly mean, 42 5°, at Denison; the highest temperature reported was 88°, at Clarinda on the 2d; the lowest temperature reported was 17°, at Estherville on the 31st; the average daily maximum was 57.1°; the average daily minimum was 38.1°; the average monthly maximum was 80.8°; the average monthly minimum was 22.8°; the greatest monthly range was 68°, at Sigourney; average monthly range, 58.1°.

Precipitation.—Average for the state, as determined from the reports of 122 observers, 3 56 inches; the largest amount reported was 5.75 inches, at Ridgeway; the least amount was 1.27, at Larchwood; the greatest daily amount reported was 3 42 inches, at Hawkeye on the 21st; average number of days on which .01 inch or more of precipitation was reported, 8.

Wind.—Prevailing direction, northwest; highest velocity reported, 50 miles per hour from the south, on the 9th, at Sioux City.

Weather.—There were 7 clear days, 9 partly cloudy days, and 15 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES. Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.99	30.35	6	29.39	18
Des Moines	30.04	30.45	30	29.39	17
Clarinda	30.03	30.55	30	29 44	18
Cresco	.....	30.44	6	29.49	17
Dubuque	30 01	30.41	6	29.44	17
Omaha, Neb	30.03	30.46	30	29.49	18
Keokuk	30.02	30.42	30	29.40	17
Sioux City	30.05	30.53	30	29.52	18
Average	30.02	30.55	30	29.39	17-18

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	6,395	30	E	17
Des Moines	6,008	31	NW	12
Dubuque	6,774	36	NW	30
Keokuk	6,616	32	S	17
La Crosse, Wis	6,214	32	N	25
Omaha, Neb	7,044	30	NW	17
Sioux City	12,068	50	S	9

OBSERVERS' NOTES.

AMES—*Isaac Young.* More rain this October than has been observed in many years.

ALBIA—*R. Moore* Heavy wind and snowstorm on the 25th—an October blizzard

AFTON—*Hon. N W. Rowell.* First frost on 6th; second frost on 14th, and froze ice. On 26th ice formed half inch thick.

AMANA—*Conrad Schadt* First killing frost on the 14th, but many tender plants escaped total destruction. The snowstorm on the 25th was quite unusual for this month. It was like a regular blizzard, only not so cold. When it ceased the snow measured 4 inches, and traces of the snow were still visible on the 30th.

ATLANTIC—*J W. Love.* Severe snowstorm on the 17th, melting in large part as it fell.

ALTA—*David E Hadden.* First snow of the season fell on the 17th—an old-fashioned blizzard, with high northwest wind, continuing until early morning of the 18th. About 6 inches of heavy snow remained on the ground after the storm, and it would have made fully 9 inches in all if it had been colder. It was the severest storm at this time of the year for 18 years.

BONAPARTE—*Hon. B. R Vale.* A cold, wet month, not favorable for fall grain or the maturing of corn; soil full of water

BEDFORD—*Prof. E. H. Griffin.* Snow fell from before daylight till night on the 17th, the greatest depth observed being 4 inches. There had been no killing frost and vegetation was nearly as green as in midsummer. Rain and snow on the 25th; first freeze on 26th Petunias and many other flowers were not frozen until the 26th.

CLEAR LAKE—*A. S. Hawley, M. D.* On the 18th the first snow fell—only few flakes.

CRESCO—*Gregory Marshall.* The first real killing frost was on the 22d, and up to that date tomato plants were growing green in the yards.

CLINTON—*Dr. Luke Roberts.* The storm of the 25th was rain, snow and wind; the snow clinging tenaciously to trees and shrubs Most of the trees had parted with few of their leaves and consequently held more snow than the limbs had strength to support, and great damage resulted. Corn was also damaged badly.

DOWS—*R. E. Fuller.* First frost of the fall occurred on the 6th; and on the 14th there was a killing frost, exceeding severe.

DENISON—*Jas. H. Holmes.* First killing frost on the 6th; snowed all day on the 17th.

ELDON—*T. Madden.* On the 14th the first killing frost was noted; on the 25th, rain, snow and sleet.

FOREST CITY—*J. A. Peters.* October has been a very wet month; pastures are good, and conditions were favorable for farm work except threshing

FORT MADISON—*Miss L. A. McCready.* The storm of the 25th—rain, snow and wind—caused considerable damage to trees.

GREENFIELD—*J. G. Culver.* On the 7th tree toads were heard; first snow fell on the 17th, with heavy north wind; on the 20th first ice observed.

GRUNDY CENTER—*Geo. F. Ellis.* October 18th the first snow of the season began falling at 5 A. M., and changed to rain; many potatoes still unharvested.

GRAND MEADOW (Clayton Co.)—*F. L. Williams.* On the 17th and 18th, 2.60 inches of rain fell, and mostly went into the soil. On the 25th a heavy, wet snow fell nearly all day; surface of ground is very wet.

HUMBOLDT—*H. S. Wells.* Snow on the 17th; probably about 4 inches. The month has been good for pastures and for seed to germinate; corn is being cribbed in good condition.

IOWA FALLS—*J. B. Parmelee.* A continuous rain fell from early morning of the 16th to 3 P. M. on the 17th; on 18th, rain and snow flurry.

KEOSAUQUA—*John H. Landes.* Snow fell nearly all day on the 25th, but most of it melted as it came and only 2 inches remained when the storm ceased.

LOGAN—*Mrs. M. B. Stern.* The 17th brought an unusual snowstorm for the season; the next morning I found 10 inches of wet snow on the ground, and 1.63 inches of water in the gauge.

MT. AYR—*A. F. Beard.* The first frost came on 14th; very heavy on low ground, but light on upland farms.

MONTICELLO—*C. E. Heisey.* A heavy snowstorm visited these parts on the 25th, falling from 9 P. M. on the 24th till 6 P. M. on the 25th, making .90 of an inch when melted; said to be the hardest storm on record for October.

MARSHALLTOWN—*C. M. Cook.* Light frost on 6th; heavy frosts on 14th, 23d and 31st.

NEWTON—*A. Lufkin.* Last half of the month was very unfavorable for farming operations.

OVID—*H. C. Miller.* Snow fell on the 18th, but melted as it came. Snow on the 25th was very damp, leaving 6 inches on the ground at close of storm. It was the worst storm in October for 35 years.

OLIN—*Rev. Nathan Potter.* A remarkable snowstorm occurred on the 25th, melting about half as fast as it came, leaving 6 inches at its ending. Leaves were green and it was a remarkable sight for this latitude.

OGDEN—*E. Sayre.* On the 17th the first snow of the season was observed, amounting to 2 inches.

PELLA—*T. W. Cox* First heavy frost on 14th, killing all vegetables. On the 18th light snow, melting as it fell. On the 25th, snow fell from 6 A. M. till 12 M., and melted rapidly.

ST. CHARLES—*R. D. Minard.* Tender plants killed; petunias, chrysanthemums, pinks, verbenas, pansies and other hardy plants were still growing at close of the month.

SIDNEY—*G. V. Swearingen.* On the 17th a very wet snow fell, making 2.75 inches of water when melted, the heaviest that has fallen here in the forty-one years I have lived in this place. On the 25th 1 inch of snow fell.

TARA—*W. E. Humphrey* Heavy white frost on the 14th. On the 17th 1 inch of snow fell, with cold northwest wind.

VILLISCA—*C. E. Matteson.* Storm of 16th and 17th was severe on stock, because unseasonable. Light snow flurries on the 25th. From the 16th to 21st the sun was visible only fifteen minutes.

WAPELLO—*G. W. Schofield.* An unprecedented snowstorm, almost a blizzard, occurred on the 25th; 3 inches of snow was on the ground when it ceased. Bad weather for drying corn.

WHITTEN—*Frank P. Butler.* First snow on 18th; cold, wet month. Corn husking about two weeks behind usual time; yield of corn good.

WEST BRANCH—*A. A. Madson.* Light snow with rain on 18th; snowed from 5 A. M. till 5 P. M. on the 25th, with strong northwest wind.

WASHTA—*H. L. Felter.* Snowed all day October 17th, but melted rapidly.

BELATED REPORTS.

Late reports, received too late to publish in last month's REVIEW:

Corning—September. Mean temperature, 67°; mean maximum temperature, 78.3°; mean minimum, 55 6°; highest 94°, on 2d; lowest 37°, on 7th; total rainfall, 3.34: prevailing winds southwest; number clear days, 20; partly cloudy, 3; cloudy, 7; rainy, 6.

Belle Plaine—September. Mean temperature, 64.3°; mean maximum temperature, 76.1°; mean minimum temperature, 52.5°; highest temperature, 95°, on 3d; lowest temperature, 41°, on the 6th; total rainfall, 5.87 inches; prevailing wind, southeast; number of clear days, 13; partly cloudy, 12; cloudy, 5; rainy, 7.

Knoxville—September. Mean temperature, 67 6°; mean maximum temperature, 78.6°; mean minimum, 56°; highest, 92°, on the 2d; lowest, 44° on the 7th; total precipitation, 2 14 inches; prevailing wind, southeast; number clear days, 16; partly cloudy, 7; cloudy, 7; rainy, 6.

Monticello—September. Mean temperature, 66.5°; mean maximum temperature, 79.8°; mean minimum, 53.2°; highest, 95°, on 1st and 2d; lowest, 39°, on the 8th; total rainfall, 3.59; inches; prevailing wind, southwest; number clear days, 24; partly cloudy, 2; cloudy, 4; rainy, 6.

New Hampton—September. Mean temperature, 68°; mean maximum temperature, 76.9°; mean minimum, 59 1°; total rainfall, 1 41 inches; prevailing wind, southeast; number clear days, 14; partly cloudy, 13; cloudy, 3, rainy, 4; highest temperature, 93°, on 2d; lowest, 47°, on 27th.

Ruthven—September Mean temperature, 64°; mean maximum temperature, 78°; mean minimum, 50°; highest, 94°, on 2d; lowest, 35°, on 30th; total rainfall, 1 50 inches; prevailing wind, southwest; number clear days, 15; partly cloudy, 12; cloudy, 3; rainy, 4

West Union—September. Total precipitation, 1.97 inches; prevailing wind, east; rainy days, 4.

Hedrick—September. Mean temperature, 65.8°; highest, 93°, on 1st and 2d; lowest 40°, on the 10th; total rainfall, 2.09 inches; number of clear days, 23; partly cloudy, 3; cloudy, 4; rainy, 3.

Hampton—August. Mean temperature, 63.8°; mean maximum temperature, 75.8°; mean minimum temperature, 51.7°; highest, 93°, on 2d; lowest, 33°, on 30th; total rainfall, 3.11 inches; number of clear days, 16; partly cloudy, 12; cloudy, 2; rainy, 7; prevailing wind, southeast.

ERRATA FOR AUGUST.

Bonaparte—Maximum temperature should be 95° on 23d.

College Springs—Total rainfall should be 1.91 inches.

Hedrick—Mean temperature should be 75.1°.

Logan—Mean maximum temperature should be 88.6°; mean temperature, 72.9°.

Monticello—Mean maximum temperature, 84.4°; mean temperature, 71.°.

Ft. Madison—Total rainfall should be 5.12 inches.

Albia—Precipitation on the 16th should be .09, making a total of 3.29 inches.

ERRATA FOR SEPTEMBER.

Iowa Falls—Minimum temperature should be 36° on 30th.

Osceola—Total precipitation should be 3.09 inches.

Rockwell City—Minimum temperature should be 38° on 7th.

Thurman—Minimum temperature should be 38° on 7th.

Vinton—Total precipitation should be 2.47 inches.

Winterset—Minimum temperature should be 40° on 7th.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR OCTOBER, 1898.

STATIONS.		DATE.																														Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max	74	86	74	85	70	58	63	69	68	70	61	68	58	60	72	62	39	40	39	37	39	44	67	59	42	40	49	53	64	39	39	57.0
	Min	57	67	54	54	39	32	44	48	47	47	44	40	40	31	42	37	32	33	33	32	34	21	31	41	30	21	27	29	30	30	23	37.5
Albia	Max.	87	81	73	80	77	60	68	62	70	80	67	70	65	40	70	60	67	52	43	48	60	45	65	65	47	40	41	60	58	46	58	62.1
	Min.	59	65	56	51	43	31	45	46	47	57	45	39	40	26	37	40	47	34	34	33	31	32	37	44	31	20	26	31	31	31	22	39.4
Alta	Max.	73	79	57	63	48	60	64	70	64	70	62	60	53	53	69	44	34	41	38	41	38	45	63	42	42	48	49	64	48	40	60	54.2
	Min	58	64	42	40	34	30	38	42	46	55	40	42	31	28	38	40	30	32	32	50	32	26	35	37	29	24	32	32	32	25	25	36.2
Amana	Max.	70	75	71	76	69	59	62	67	69	70	61	53	52	48	68	60	52	43	43	39	46	41	61	61	47	36	40	54	47	42	50	55.8
	Min.	63	67	58	52	45	35	46	46	40	59	47	34	40	29	32	51	41	34	38	36	36	32	26	47	30	24	21	32	40	34	22	40.1
Ames	Max.	72	85	55	85	53	56	63	73	65	73	63	65	52	54	73	52	42	40	40	38	40	45	65	47	40	47	45	64	49	38	56	56.0
	Min.	52	66	50	49	38	32	47	44	39	52	46	36	29	29	39	41	34	33	35	33	35	33	29	40	33	25	32	31	40	30	23	39.7
Atlantic	Max.	72	82	55	84	55	57	62	73	74	72	64	67	56	59	73	47	33	36	38	37	37	41	68	43	43	50	49	67	49	42	60	56.4
	Min.	54	56	52	50	37	28	41	40	40	53	40	37	34	27	45	40	32	32	33	32	34	30	31	39	32	21	35	21	37	25	21	36.6
Audubon	Max.	72	83	65	82	51	53	60	68	68	73	68	65	52	58	70	63	42	38	38	39	38	43	63	53	42	47	50	63	49	39	50	53.3
	Min.	41	58	48	45	36	31	35	40	42	53	45	40	35	28	53	41	31	33	32	31	33	29	33	33	32	24	33	33	32	29	20	36.6
Belknap	Max.	72	80	75	85	58	60	63	70	70	73	65	63	53	57	72	57	48	41	41	40	42	47	60	66	31	43	47	65	50	40	40	58.0
	Min.	65	62	60	55	47	41	50	50	50	50	49	42	43	32	34	50	40	35	34	34	35	34	32	37	33	27	30	38	35	33	25	41.2
BellePl'ine	Max.	70	76	75	73	58	55	63	67	66	69	61	60	48	46	68	59	59	49	42	41	40	45	60	55	33	35	40	55	42	50	55	55.3
	Min	45	62	55	52	43	34	34	45	44	55	45	36	35	28	33	38	48	32	30	33	35	33	28	44	30	23	27	30	34	31	22	37.5
Bonaparte	Max.	69	75	76	81	67	59	61	70	69	74	65	60	52	56	75	60	55	39	42	40	45	43	64	62	44	41	48	61	51	41	53	58.1
	Min	65	67	63	55	49	42	50	50	46	63	49	40	42	29	40	51	45	34	37	36	36	35	29	48	31	23	28	34	37	33	24	42.4
Britt	Max.	70	85	70	79	52	62	64	70	69	71	60	55	50	50	70	64	40	45	40	41	38	42	63	53	40	43	41	62	49	38	50	55.7
	Min.	52	65	43	48	34	24	32	37	38	55	40	32	35	24	37	38	32	34	34	32	34	30	23	36	27	20	31	30	36	26	20	35.0
Burlington	Max.	70	75	80	75	70	60	60	65	70	70	65	65	60	55	70	60	55	50	40	40	45	40	60	60	60	40	50	60	50	55	60	59.1
	Min.	65	70	70	60	50	45	55	50	45	65	50	55	40	30	40	55	40	30	35	35	35	35	35	50	35	25	25	35	40	35	40	44.4
Bedford	Max.	72	86	76	85	62	57	66	66	74	74	66	71	57	61	73	61	60	37	40	40	39	46	47	49	44	48	52	64	52	41	62	58.0
	Min.	63	65	54	55	41	36	47	46	49	66	41	41	41	31	47	41	32	32	34	33	34	32	31	40	32	24	32	29	39	28	24	39.8
Carroll	Max.	71	84	75	81	55	61	65	74	69	73	61	62	54	55	73	33	31	36	38	39	41	45	65	52	53	51	52	68	57	42	61	57.4
	Min.	52	55	45	48	35	29	40	38	40	52	39	38	35	26	38	29	30	30	30	32	28	33	35	43	41	37	34	38	35	25	22	36.6
Cedar Falls	Max.	70	75	77	79	57	56	66	73	65	70	70	51	50	53	59	60	52	50	44	40	42	60	61	61	58	45	57	58	57	39	57	58.7
	Min.	40	65	41	57	42	34	46	39	42	58	46	33	38	30	32	38	41	36	36	35	36	36	30	24	25	23	31	30	37	33	24	38.0
Cedar Rap	Max.	71	75	72	78	64	59	62	69	71	70	64	56	54	48	71	63	54	41	43	40	45	40	63	58	48	38	44	59	51	42	52	56.9
	Min	63	68	59	54	45	38	48	44	41	60	47	36	40	30	34	45	40	36	37	36	36	33	30	46	31	27	25	35	41	36	26	40.9
Centerville	Max	74	81	71	83	68	57	63	69	71	64	65	65	56	56	75	57	45	40	40	40	41	46	66	65	41	40	48	64	52	40	58	58.1
	Min	64	67	58	54	49	39	50	48	48	60	41	40	43	39	42	42	37	33	35	34	34	33	31	45	31	28	30	34	44	30	28	41.4
Charlton	Max	72	83	74	84	75	58	63	72	66	74	66	66	58	58	72	63	48	40	40	40	40	49	66	62	47	45	45	66	55	43	57	59.6
	Min	59	68	56	54	43	36	49	47	48	57	45	41	42	27	43	39	35	34	35	33	35	33	31	42	30	23	30	35	40	28	23	40.0
Charles Cy	Max	69	78	74	72	56	59	63	69	68	70	65	48	49	48	65	63	50	49	42	40	42	40	59	56	43	41	41	56	52	43	48	55.4
	Min	50	65	51	50	41	30	35	44	36	57	45	32	37	29	33	41	39	35	32	35	36	33	28	40	32	26	26	33	39	35	22	37.8
Clarinda	Max.	76	88	74	87	60	59	67	72	78	78	70	71	60	64	73	65	48	40	44	41	40	47	67	59	47	52	55	65	56	45	64	61.5
	Min.	70	72	64	60	39	32	43	53	59	64	56	50	39	38	54	45	37	35	33	34	38	32	38	45	33	28	38	33	38	28	26	44.3
Clear Lake	Max.	67	81	74	70	60	60	63	68	66	69	63	50	52	47	67	59	47	44	41	40	39	40	61	52	42	41	49	60	56	39	48	55.3
	Min.	54	64	45	38	36	29	35	43	57	51	42	39	35	29	35	39	31	34	36	33	34	31	33	35	30	24	30	30	33	29	22	36.8
Clinton	Max	70	74	77	76	68	64	58	65	71	71	62	59	53	48	66	66	56	42	45	44	48	46	58	63	58	38	42	54	52	48	49	57.9
	Min.	60	67	63	58	48	41	48	47	42	58	47	35	43	32	32	52	41	37	40	37	38	38	28	51	31	25	20	30	38	38	25	41.6
College Sps	Max	76	88	78	88	60	60	67	72	81	75	67	71	60	64	73	54	35	35	41	41	39	47	67	57	44	47	57	63	58	44	63	60.3
	Min.	63	65	54	53	39	34	44	45	55	56	45	46	35	35	45	35	31	30	32	31	32	30	32	39	30	21	32	30	38	24	21	38.9
Corning	Max	72	87	81	85	66	57	64	71	71	72	52	50	57	50	57	68	33	35	37	35	33	37	65	43	38	47	48	57	..	43	62	55.9
	Min.	60	66	53	53	40	35	46	45	49	58	45	45	35	30	47	38	32	32	33	32	34	31	35	41	32	26	33	33	33	29	26	39.3
Co. Bluffs	Max.	74	84	61	75	59	64	63	73	82	73	68	71	61	64	74	49	31	35	40	39	40	53	69	48	45	54	61	64	54	49	74	59.7
	Min.	58	60	53	43	35	33	48	46	49	52	45	44	38	38	50	40	44	32	32	32	32	30	46	32	29	22	35	32	33	28	29	39.6
Cresco	Max.	72	76	58	77	52	57	62	69	69	68	57	46	43	47	60	53	48	38	42	40	42	38	58	48	34	41	40	55	42	36	48	52.1
	Min.	55	64	52	50	37	30	36	42	39	55	41	32	36	32	32	40	39	35	35	35	37	28	28	39	30	24	28	33	36	32	23	37.2
Davenp'rt.	Max.	69	73	78	76	65	62	59	66	71	70	62	58	55	50	68	61	57	40	42	41	45	42	60	66	50	38	43	57	50	44	50	57.0
	Min.	62	68	64	59	47	41	50	52	45	60	48	40	41	33	36	52	38	36	38	36	36	34	32	50	31	26	29	38	42	37	33	43.0
Decorah	Max.	74	73	70	77	55	67	62	68	70	68	62	55	48	47	60	59	61	41	44	42	44	42	60	62	42	41	43	55	42	44	52	55.9
	Min.	40	65	52	46	37	30	37	40	35	58	45	30	36	32	30	31	39	36	36	25	36	30	27	36	29	23	36	34	38	36	22	36.0
Denison	Max.	..	..	..	..	..	..	..	..	70	70	62	62	54	56	70	46	32	37	37	38	39	45	67	43	44	47	50	65	49	39	61	51.4
	Min.	..	..	..	..	..	..	..	..	39	55	42	42	32	26	42	39	30	31	32	31	31	28	33	33	32	20	34	30	38	27	25	33.6
Des Moines	Max.	72	84	73	85	56	57	63	71	67	73	65	67	54	56	72	63	41	43	40	40	41	46	67	61	41	47	46	64	51	38	57	58.1
	Min.	60	68	58	51	42	37	50	47	45	58	47	40	38	30	42	39	34	36	35	34	34	33	37	32	27	34	35	37	29	28	40	40.4
Dows	Max.	68	84	77	84	55	58	63	74	64	71	64	56	58	55	71	66	44	45	38	38	39	41	65	58	43	45	44	64	61	41	50	57.5
	Min.	56	64	46	47	38	29	38	39	38	56	42	32	35	23	36	38	33	33	33	31	34	31	28	37	31	21	30	32	33	29	22	35.9
Dubuque	Max	69	73	74	74	63	57	58	70	69	68	61	53	49	49	63	61	55	44	43	42	45	43	57	62	51	39	41	54	46	44	47	55.6
	Min.	60	67	59	56	45	38	49	43	43	60	49	38	41	34	32	53	41	36	36	38	39	34	33	51	30	28	25	35	42	37	28	42.0
Eldon	Max.	87	79	73	85	75	64	65	72	70	74	65	63	60	57	76	64	49	42	43	41	43	45	65	67	50	42	47	63	52	43	55	60.5
	Min.	65	67	61	53	48	41	47	50	49	63	48	45	43	29	41	45	39	35	38	36	36	34	29	45	30	25	27	33	42	33	22	41.9
Eldora	Max.	89	88	90	85	70	60	70	78	72	82	70	56	68	65	64	65	56	53	45	40	45	50	57	50	47	50	56	51	48	60	50	62.3
	Min.	60	62	60	45	40	28	42	38	38	50	43	32	42	22	32	38	37	30	28	30	31	28	27	30	27	22	28	29	28	31	30	35.7
Elkader	Max.	71	73	68	80	59	67	68	77	72	72	63	48	48	54	66	56	53	43	45	43	46	43	60	62	34	46	42	60	45	42	52	56.7
	Min.	60	61	55	54	38	29	41	40	34	59	43	32	39	30	35	45	40	35	34	36	38	30	28	45	30	23	23	34	37	35	23	38.2
Estherv'le.	Max.	71	81	62	..	..	..	66	72	63	72	67	61	50	53	69	62	41	40	39	38	38	46	62	55	41	47	49	63	54	42	53	55.6
	Min.	50	59	38	..	..	..	27	35	35	53	38	32	29	19	35	37	28	31	30	28	30	25	31	31	23	18	30	29	33	22	17	32.1
Fairfield	Max.	69	75	74	84	71	62	64	71	70	73	..	63	59	56	75	60	52	39	41	39	45	45	64	66	32	48	46	62	51	43	54	59.5
	Min.	65	37	61	53	47	39	49	48	45	62	48	36	40	28	39	49	38	32	36	36	35	36	28	47	30	25	26	32	43	34	22	41.2
Fonda	Max.	82	78	60	71	73	70	77	73	85	78	75	73	68	60	62	66	62	60	58	42	43	40	42	50	47	38	43	45	41	45	40	59.6
	Min.	45	43	47	35	32	29	32	30	32	42	40	41	33	28	30	33	29	27	30	25	27	21	31	41	40	30	31	29	27	25	22	32.5
Forest City	Max.	67	83	71	75	50	61	66	71	40	72	61	53	52	51	68	63	42	45	39	42	38	43	61	59	36	42	44	63	55	39	49	54.9
	Min.	57	55	43	49	36	30	38	41	62	56	42	51	32	29	36	38	32	35	33	34	32	31	29	33	23	24	31	31	35	29	21	37.1
Galva	Max	74	80	65	63	50	63	65	72	68	71	..	66	54	58	70	63	55	39	37	39	37	47	67	57	42	57	55	65	49	42	62	57.8
	Min.	63	62	43	47	34	27	32	37	42	56	..	40	31	30	42	40	31	32	33	32	32	27	33	36	28	27	31	33	32	25	24	36.0
Glenwood	Max.	76	87	74	82	56	60	62	73	84	80	69	70	60	64	73	40	84	46	44	41	39	51	70	57	45	53	57	68	61	47	60	61.0
	Min	43	66	52	53	39	30	45	46	49	57	44	46	36	32	50	33	31	32	32	32	32	29	37	39	32	22	33	31	38	36	26	38.8
Greene	Max.	70	83	75	83	56	60	66	73	67	70	64	53	51	51	68	66	58	48	42	39	40	40	62	46	43	43	43	61	50	41	50	56.8
	Min	55	65	52	51	40	30	31	44	38	56	44	33	36	29	33	40	39	35	34	34	36	30	30	30	34	23	28	30	38	32	21	37.1
Greenfield	Max.	86	87	70	86	53	60	64	71	70	75	74	69	57	60	73	60	40	40	41	40	40	46	69	56	41	49	53	67	57	40	60	59.8
	Min	56	56	48	48	39	32	44	46	49	55	45	42	40	30	42	36	32	33	33	32	31	30	33	40	30	21	30	34	34	27	24	37.8
Grinnell	Max.	68	78	64	79	69	56	60	67	67	67	63	55	53	48	69	61	48	41	39	37	41	41	61	58	44	38	41	56	50	40	51	55.2
	Min	60	64	58	52	43	35	47	47	47	57	46	40	40	29	38	41	39	32	34	34	34	33	32	44	29	24	30	30	40	32	25	39.0
Grundy C'r	Max.	69	79	80	80	51	55	62	70	68	69	61	54	48	48	71	61	53	42	40	39	41	40	64	55	40	41	42	60	50	39	51	55.6
	Min.	53	65	58	51	38	31	44	41	40	56	40	34	34	27	34	38	37	33	31	32	34	27	27	37	28	23	29	30	34	27	20	36.5
Guthrie C'r	Max.	81	87	86	84	64	57	70	71	65	72	63	68	56	56	73	49	40	41	39	41	39	70	70	45	45	49	35	56	57	57	59	59.2
	Min.	42	42	40	38	38	28	44	44	45	64	44	36	29	36	36	37	32	33	32	32	30	29	35	35	35	22	31	35	35	32	29	35.8
Hampton	Max.	70	81	57	80	52	60	62	70	66	69	59	53	48	48	69	53	41	41	42	40	39	38	64	48	39	43	43	63	43	43	50	54.2
	Min.	62	68	50	50	38	30	37	44	40	58	42	42	33	28	35	37	33	31	30	32	32	30	30	36	33	25	29	33	30	25	22	36.9
Hopeville	Max.	72	84	73	84	55	57	63	70	69	71	64	69	55	57	72	62	39	38	39	37	39	45	65	56	40	44	48	63	53	40	60	59.1
	Min.	61	68	56	55	42	36	48	51	50	58	44	43	42	33	45	38	33	34	34	32	34	30	32	40	30	25	31	32	39	31	25	40.4
Humboldt	Max.	71	83	73	76	54	59	62	68	65	70	64	61	52	52	72	62	41	40	41	41	39	44	65	60	42	49	53	65	59	44	53	57.4
	Min.	41	54	44	46	37	29	32	42	39	56	44	37	38	24	38	40	35	35	32	32	34	30	31	40	31	31	34	30	38	28	23	36.3
Indep'n'ce.	Max.	68	72	71	76	69	55	64	71	69	68	65	49	44	50	67	63	54	43	42	39	43	41	60	56	34	39	41	56	43	43	49	55.0
	Min	56	64	57	53	42	31	43	38	37	57	45	30	36	29	30	48	40	34	33	34	34	34	28	43	28	23	23	31	39	34	20	37.8
Indianola	Max.	..	84	75	84	80	65	63	71	..	71	66	66	57	56	72	64	49	40	40	39	40	46	66	62	44	44	45	64	62	45	56	59.2
	Min.	..	60	57	54	41	32	47	47	..	57	47	42	40	30	42	45	34	34	34	33	34	32	32	42	31	24	30	34	40	36	24	39.1
Iowa City	Max.	70	70	75	80	71	63	64	71	71	72	63	56	55	60	73	60	57	43	41	40	47	42	63	56	48	38	42	61	48	48	53	58.1
	Min.	47	65	58	52	47	38	48	48	41	60	52	36	42	30	40	48	43	35	36	35	36	36	27	47	32	26	24	33	40	36	24	40.1
Iowa Falls	Max.	69	85	70	83	51	59	63	69	68	70	60	55	50	47	71	67	45	42	39	38	39	40	65	54	39	43	44	61	51	40	51	55.4
	Min.	53	64	52	46	37	28	40	38	35	57	38	32	30	26	36	39	36	34	31	33	35	29	28	38	31	22	29	31	33	23	20	35.7
Keosauqua	Max.	71	75	73	81	70	60	61	65	67	72	64	60	61	54	72	59	56	40	42	41	44	44	63	66	66	41	61	61	51	41	54	59.2
	Min.	67	68	62	56	49	43	51	52	46	61	50	39	40	32	42	52	40	36	38	37	37	38	32	49	31	26	29	35	40	35	25	43.1
Keokuk	Max.	70	75	79	82	72	61	59	66	69	72	65	63	57	55	73	58	54	41	42	42	45	42	65	60	43	41	50	61	52	41	54	58.6
	Min.	66	68	70	62	52	49	53	54	50	65	52	43	45	32	42	51	39	37	38	38	37	36	34	56	31	28	30	38	44	36	29	45.3
Lamoni	Max.	73	83	73	83	73	55	63	67	70	73	64	71	58	59	70	60	39	40	39	38	39	44	65	61	42	44	49	62	52	43	59	55.5
	Min.	61	66	59	55	43	38	50	48	48	57	42	40	41	30	45	38	32	32	34	32	33	32	30	42	31	23	29	30	28	28	23	39.4

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR OCTOBER, 1898—CONTINUED.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Lansing	Max.	72	72	72	76	69	57	65	72	70	70	60	53	48	50	59	61	53	53	45	44	47	45	60	58	49	45	43	58	48	45	49	57 0
	Min.	50	66	56	54	45	31	39	42	56	58	48	33	38	33	27	53	43	37	33	38	37	37	26	48	32	27	23	36	40	37	23	39.5
Larrabee	Max.	71	78	57	58	60	63	67	68	70	68	62	65	55	57	68	58	40	40	39	38	38	47	66	50	43	50	55	50	47	42	57	55.7
	Min	60	52	42	38	32	27	31	38	40	50	40	38	28	26	38	39	30	30	31	27	31	26	33	30	23	19	33	31	34	24	24	33.8
Le Mars	Max	74	76	63	53	51	60	65	73	71	73	63	63	56	58	69	60	44	37	37	40	37	47	64	54	54	56	56	64	53	41	63	57.3
	Min.	60	61	43	43	33	27	30	36	39	54	41	41	32	28	43	42	31	31	32	30	32	28	38	37	28	18	32	28	28	25	28	35.5
Lenox	Max.	71	84	74	83	70	56	62	68	70	70	66	68	58	58	71	65	38	36	38	37	37	44	64	61	43	45	50	62	56	44	60	58.4
	Min	60	66	54	53	40	35	45	46	51	57	43	45	38	32	46	37	32	32	32	31	33	30	33	41	30	24	31	31	39	28	26	39 4
Linn Grove	Max	68	72	73	77	58	60	62	67	69	69	61	54	49	47	67	60	52	41	42	47	47	42	60	63	57	37	43	56	43	41	49	55.3
	Min.	59	65	58	42	50	35	47	43	42	61	46	36	37	29	33	49	44	35	35	36	35	30	22	47	33	24	29	32	38	35	24	40.0
Logan	Max	74	86	58	54	54	60	65	70	80	72	68	68	60	64	71	61	51	39	40	42	48	45	47	40	45	48	58	50	56	44	66	57.5
	Min.	52	64	48	40	37	42	41	41	50	54	35	45	32	35	41	50	31	32	32	34	30	32	32	31	20	26	41	24	39	26	24	37.5
Maquoketa	Max	71	73	80	77	67	68	61	71	76	72	68	70	65	59	65	63	68	73	64	65	75	74	58	65	39	37	43	55	58	59	61	64 5
	Min	49	51	65	56	36	48	54	43	45	45	34	43	29	35	43	40	45	48	53	54	46	46	29	38	28	25	28	32	35	33	31	41.5
Marsh'll't'n	Max.	69	83	74	83	65	55	61	73	69	73	65	56	55	50	73	65	50	43	40	39	42	43	65	58	42	45	43	62	51	42	53	57.7
	Min	55	66	55	50	41	31	47	44	40	57	45	35	38	26	36	40	39	35	35	33	35	35	30	42	31	24	29	35	32	32	21	38.5
Mason City	Max.	69	83	65	79	51	59	63	70	69	70	58	56	48	47	67	50	45	41	43	42	40	41	60	44	39	42	43	62	44	39	44	53.6
	Min	45	62	46	47	33	27	32	44	38	55	43	33	36	27	34	40	35	35	32	33	34	32	30	32	33	24	30	31	34	30	23	35.8
Monticello	Max	69	74	73	79	70	59	62	72	71	72	63	54	52	52	66	62	61	44	42	44	49	42	59	63	55	39	40	56	..	..	..	58.7
	Min	60	64	60	52	45	34	48	41	35	61	46	31	39	28	26	36	43	35	35	35	35	35	25	42	35	24	20	30	..	..	..	39 3
Mooar	Max	70	75	78	84	67	62	62	69	68	70	66	61	50	59	74	58	54	38	41	42	42	42	52	66	40	46	51	60	59	40	52	57.7
	Min	65	65	67	67	50	49	50	50	52	45	49	35	39	31	40	45	39	35	38	56	36	36	29	45	30	28	24	37	37	32	22	42.0
Mt. Ayr	Max.	73	87	79	85	65	55	64	71	70	75	65	71	52	60	72	63	40	47	37	37	39	46	67	61	40	46	49	64	64	49	61	60.5
	Min.	60	65	55	55	41	36	46	48	52	57	43	43	40	34	44	37	32	32	33	31	34	30	31	40	29	23	30	32	40	24	25	39.4
Mt Pleas'nt	Max.	74	75	75	79	70	62	63	68	70	76	67	65	65	51	75	68	62	44	48	46	47	46	66	70	60	44	58	64	58	54	62	62 3
	Min.	65	67	64	55	49	39	50	50	50	55	49	34	35	30	38	31	38	34	38	35	36	37	28	50	32	27	27	35	44	34	24	41 3
Newton	Max.	70	81	72	81	58	58	63	70	68	70	62	58	52	52	72	61	47	41	39	38	41	43	64	59	58	42	44	61	52	40	55	57.2
	Min	59	67	62	52	42	35	47	47	44	57	46	38	36	27	38	39	38	33	35	34	35	34	31	43	30	24	30	33	37	31	23	39 3
NewH'pton	Max	71	76	71	78	62	52	65	69	69	69	60	62	48	49	65	61	50	55	42	54	44	42	58	61	43	42	41	55	47	37	49	56.4
	Min	53	53	54	50	40	38	45	44	40	55	48	38	38	31	32	39	39	34	33	33	34	27	34	40	30	25	27	35	34	30	23	38 3
Northwood	Max.	69	83	68	77	51	61	64	70	69	71	60	49	50	54	65	58	47	43	44	41	40	39	58	53	39	40	42	61	48	38	48	54.8
	Min.	51	64	43	45	37	27	37	32	34	44	40	34	33	29	33	39	36	34	34	33	34	33	27	34	30	29	23	29	35	27	21	34.9
Odebolt	Max	72	84	68	67	52	63	65	73	69	70	62	65	53	57	70	59	42	49	39	38	37	41	66	58	43	49	59	65	58	43	61	58.0
	Min	57	65	45	45	35	28	36	36	44	56	43	41	33	27	39	40	31	32	31	30	33	28	34	35	30	23	35	33	48	26	28	37 0
Ogden	Max.	72	87	77	77	54	57	64	73	68	75	64	65	56	55	73	60	40	41	39	40	40	46	67	62	44	50	48	66	58	40	57	58.5
	Min.	57	66	50	48	37	32	46	41	43	56	43	39	39	24	39	39	30	33	33	32	33	31	32	37	32	20	31	31	38	29	25	37.4
Olin	Max	70	69	73	72	76	57	60	71	67	67	69	61	54	46	48	68	60	50	40	41	41	46	45	59	65	36	37	42	57	45	42	55.9
	Min	49	63	61	52	46	37	38	42	37	43	44	33	47	35	28	39	47	35	34	36	33	35	28	37	35	22	21	30	38	37	26	38.4
Omaha	Max.	73	82	65	73	55	59	62	70	82	73	66	69	59	62	73	61	42	35	39	38	38	50	69	55	45	50	55	64	54	45	65	58.9
	Min.	62	65	52	47	39	35	46	51	55	57	45	45	38	39	51	42	32	32	33	32	34	30	39	36	33	27	36	38	39	29	33	37.6
Osceola	Max.	74	85	67	85	56	58	64	72	71	72	65	69	56	59	73	52	56	40	39	33	34	33	34	32	34	40	32	24	31	35	40	32	24	39 5
	Min.	45	52	55	55	42	34	48	49	47	64	45	39	41	33	44	39	33	35	34	33	34	32	34	40	32	24	31	35	40	32	24	39 5
Oskaloosa	Max.	73	80	70	83	61	61	64	69	69	73	64	60	54	55	74	60	50	40	42	40	41	46	65	62	41	42	45	65	49	41	57	57.9
	Min.	61	66	57	52	43	36	48	47	43	58	44	33	37	24	38	39	38	33	35	34	34	32	29	41	29	21	30	32	34	30	21	39 6
Ottumwa	Max.	88	78	72	70	72	73	70	69	70	70	65	64	80	75	55	49	50	41	42	42	42	46	65	67	39	45	47	64	50	50	55	60 2
	Min.	52	61	58	44	58	56	55	45	43	49	46	38	45	35	40	35	35	32	36	34	33	33	30	33	29	24	27	32	34	32	22	39.5
Ovid	Max.	68	84	72	85	65	67	62	74	67	74	66	66	57	62	71	60	36	40	44	38	40	59	62	53	34	46	45	67	54	43	58	58.7
	Min	61	67	56	52	43	36	51	48	49	58	43	40	38	38	42	40	36	36	35	33	34	33	32	42	30	31	30	34	35	27	22	40 1
Pella	Max.	68	76	61	78	49	57	58	62	63	67	51	60	48	49	65	44	40	40	38	37	40	40	62	45	35	36	44	54	44	37	52	51.6
	Min.	60	67	59	54	43	34	48	46	45	57	43	40	41	28	41	44	38	32	36	35	35	34	30	45	31	25	34	32	40	37	23	40.5
Pioneer	Max.	..	..	..	..	.	60	63	69	63	70	64	62	51	51	71	48	35	39	39	40	..	..	65	48	40	48	41	48	.	47	53	52.8
	Min.	..	..	..	..	36	39	36	47	53	66	44	40	37	28	39	40	32	35	35	34	..	..	33	37	32	24	25	32	33	28	27	36.5
Plover	Max.	70	86	70	64	65	70	74	72	64	74	72	70	62	54	70	45	36	40	38	37	35	40	65	38	42	42	44	48	45	42	40	56.3
	Min.	31	66	45	40	35	25	40	44	38	55	41	35	38	23	40	38	32	28	32	31	32	29	28	30	30	35	20	30	32	33	26	34.9
Primghar	Max	72	80	69	52	54	54	68	78	64	75	65	62	55	58	70	60	41	37	35	38	38	40	64	45	35	45	42	63	50	35	56	54.8
	Min.	55	65	41	43	33	28	42	42	46	60	40	45	28	31	39	41	31	31	32	30	31	30	43	27	18	20	34	31	35	24	28	36.3
Red Oak	Max	74	85	77	85	58	60	65	70	78	73	64	69	59	62	72	67	42	37	44	42	40	45	66	61	44	47	53	64	57	47	62	60.2
	Min.	65	66	55	53	39	32	47	47	47	58	41	42	36	39	45	40	32	32	33	33	32	31	33	40	32	22	34	29	39	26	21	39.2
Ridgeway	Max.	72	74	71	76	73	57	63	69	72	67	62	49	49	50	64	58	54	54	45	41	43	43	57	53	43	49	42	57	50	41	47	56 3
	Min.	55	64	53	51	41	31	42	45	43	59	45	37	37	33	33	49	39	37	36	36	37	33	28	41	33	25	25	33	41	35	24	39.4
R'ckR'p'ids	Max.	74	70	74	48	52	62	66	70	68	64	62	58	38	32	24	28	34	32	32	32	30	32	28	34	30	28	24	26	26	18	26	22	32 6
	Min.	32	38	36	38	26	34	38	46	54	54	38	38	32	24	28	34	32	32	32	30	32	28	34	30	28	24	26	26	18	26	22	32 6
Rockwell C	Max.	74	82	58	75	49	60	62	69	64	73	62	65	54	54	71	45	43	40	40	41	40	44	67	50	42	47	50	64	55	38	58	56 1
	Min.	62	64	44	44	38	30	37	44	42	57	42	40	35	27	39	39	31	33	33	31	35	29	31	37	32	21	32	31	37	27	25	37.0
Ruthven	Max.	70	79	79	80	50	58	63	58	70	70	69	58	51	60	68	42	34	38	38	38	36	44	62	42	40	42	50	61	46	38	64	54.9
	Min.	55	64	40	20	33	29	32	55	41	55	40	40	31	23	36	40	32	32	32	29	29	25	39	37	28	20	32	32	36	24	26	35 1
Sac City	Max.	69	79	62	67	49	60	64	66	71	69	80	62	51	55	68	56	42	37	36	38	37	48	66	47	60	49	47	66	48	39	57	56 3
	Min.	55	65	55	45	35	28	35	40	43	45	44	39	34	27	40	40	31	32	32	31	33	28	35	38	31	24	32	33	34	24	23	36.5
Sidney	Max.	73	83	58	82	55	58	61	67	81	73	64	69	57	63	73	49	33	35	37	38	38	44	67	46	42	48	57	52	41	41	..	56.0
	Min.	62	66	54	53	40	36	48	49	56	59	45	48	39	38	49	41	30	30	33	33	33	30	37	40	32	28	38	37	28	28		41.3
Sibley	Max.	72	78	62	62	50	63	68	74	64	70	63	61	54	55	70	..	..	62	37	35	40	36	47	64	55	43	51	58	63	52	..	57.1
	Min.	56	62	39	42	31	26	32	44	38	54	38	37	28	25	38	..	..	31	32	31	29	30	26	30	34	27	18	31	26	34	..	34.6
Sigourney	Max.	70	78	73	86	70	66	67	72	74	71	66	57	57	57	75	65	54	47	42	41	44	43	67	67	41	40	47	64	55	41	41	59.3
	Min.	61	64	57	48	43	33	46	54	41	46	43	43	35	24	33	47	36	32	33	32	32	32	26	45	28	20	23	29	33	31	18	37.4
Sioux City	Max	74	76	57	53	51	61	65	71	77	69	66	64	58	60	69	48	36	35	37	38	37	50	67	43	45	51	56	62	51	44	64	56.0
	Min	43	62	43	43	35	30	30	38	38	52	46	45	33	33	35	40	32	32	32	31	31	29	39	38	30	24	37	37	37	26	27	36 6
Spencer	Max.	73	76	57	54	47	59	65	72	65	73	65	63	52	65	70	62	..	..	..	..	45	63	45	47	..	47	50	53	..	..	55	59.5
	Min.	54	52	41	43	32	22	27	37	37	54	40	35	30	28	37	27	29	31	28	31	25	31	37	30	..	19	31	28	..	..	23	33.5
Spirit Lake	Max.	82	82	60	51	46	51	52	73	64	71	61	61	52	58	70	61	40	37	39	37	37	65	41	42	43	51	52	55	49	45		54.1
	Min.	53	58	40	42	32	30	35	45	43	50	40	36	31	24	38	41	31	32	30	30	26	34	28	29	28	23	32	28	31	25	25	34.5
StormLake	Max.	..	..	..	..	..	..	..	..	..	..	..	.	..	54	66	63	41	36	36	36	38	46	65	55	43	47	48	64	60	40	58	46.4
	Min	..	..	..	..	..	..	..	..	..	..	..	..	..	28	39	39	31	32	32	30	33	25	35	37	30	22	33	33	37	25	23	37.0
St. Charles	Max.	72	85	74	86	55	57	65	73	68	74	65	69	56	56	74	60	40	41	39	38	40	48	67	61	41	48	46	68	52	39	57	59.5
	Min.	59	68	54	54	41	33	47	48	49	57	47	42	41	31	43	39	32	35	34	33	35	32	33	42	31	25	31	33	36	27	24	39.9
Stuart	Max.	72	87	74	84	60	66	61	69	68	70	69	60	52	60	71	63	63	53	40	37	38	42	68	60	42	45	42	63	48	35	58	58.4
	Min.	57	61	52	47	38	31	47	47	54	58	57	47	38	50	57	33	32	33	31	32	32	30	33	38	20	25	30	30	30	28	23	39 6
Tara	Max.	72	70	68	67	65	67	68	70	75	70	68	70	68	69	38	60	50	48	47	42	42	43	49	48	46	45	48	60	45	48	50	55.4
	Min.	41	40	37	35	32	30	35	37	41	39	37	32	30	31	31	29	28	29	31	29	29	30	33	32	32	32	31	35	33	31	25	32 8
Toledo	Max.	74	78	64	78	54	57	62	67	70	68	61	55	46	44	62	65	50	42	40	39	44	42	62	50	34	38	43	56	45	40	52	54.3
	Min.	41	66	56	50	42	33	42	46	39	58	45	34	39	27	32	50	40	35	36	34	35	34	28	44	30	22	26	33	40	33	21	38.4
Thurman	Max.	74	84	76	83	57	60	63	69	82	78	67	71	59	64	73	68	45	36	42	39	40	49	68	65	45	49	55	65	60	44	69	61.3
	Min.	44	66	54	54	39	34	45	44	50	57	40	42	37	32	42	40	31	30	32	33	34	30	32	38	32	23	38	30	37	27	23	38.4
Villisca	Max	74	87	60	85	57	60	72	75	65	75	65	70	56	62	73	68	35	38	43	43	39	45	68	56	45	60	65	64	53	50	54	60.1
	Min.	40	62	54	49	35	29	40	42	36	55	39	38	35	28	38	45	28	27	30	26	30	26	25	34	30	28	25	31	29	26	28	35.1
Wapello	Max	74	72	76	74	71	71	68	63	70	69	66	68	58	66	69	71	64	71	68	50	66	62	60	68	70	48	46	58	59	..	51	64.9
	Min.	56	54	64	55	50	40	51	50	42	60	48	37	35	32	35	50	38	35	37	36	37	32	30	34	32	27	27	34	43	..	25	40.9
Washingt'n	Max.	69	72	73	79	60	64	62	67	71	69	63	58	47	55	73	58	53	40	40	39	45	42	63	67	40	40	47	62	47	43	52	56.8
	Min.	62	65	56	51	42	36	49	47	44	58	39	36	35	29	35	48	35	33	35	33	33	28	28	43	30	23	25	32	32	31	21	38.6
Waterloo	Max.	69	76	72	78	56	56	65	72	70	70	63	59	53	53	69	63	53	42	41	40	42	40	61	57	41	43	41	57	45	40	52	56.1
	Min.	55	67	53	52	41	32	45	42	38	56	45	33	37	27	32	40	41	35	36	35	36	32	27	45	30	24	27	32	36	34	21	38.4
Waverly	Max.	70	76	73	78	59	54	63	71	69	70	63	51	48	49	68	63	52	47	41	40	42	40	62	56	45	43	42	57	44	42	49	55.7
	Min.	59	66	53	55	43	34	44	44	40	63	47	35	38	30	34	41	40	36	37	36	37	36	30	42	32	23	28	35	40	33	23	39.9
WebsterCy	Max.	71	68	65	79	50	59	62	67	65	69	60	60	58	50	69	62	38	41	43	40	40	45	62	53	42	44	46	60	49	48	53	55.4
	Min.	59	57	58	49	39	31	44	44	42	56	46	41	38	27	39	42	33	35	36	35	35	33	30	40	33	25	34	39	32	31	25	39.0
W. Branch	Max.	70	74	72	62	60	58	60	62	59	70	60	58	50	49	68	61	60	45	38	40	47	42	40	65	48	36	42	59	60	52	61	55.8
	Min.	52	50	48	32	42	45	46	48	50	58	42	32	38	30	30	48	45	36	34	36	35	36	28	47	30	26	25	31	34	24	36	38 5
Wilton Jc.	Max.	74	76	75	77	67	63	64	66	72	70	62	59	..	..	..	..	..	..	42	43	49	42	60	58	55	38	46	57	47	45	51	58.3
	Min.	60	56	54	52	46	37	47	48	38	58	43	34	..	..	..	..	..	..	39	36	35	35	27	48	32	24	23	32	43	36	42	41 0
Winterset	Max.	73	87	60	85	55	53	64	62	68	72	64	67	54	68	73	59	35	40	40	38	40	45	67	47	39	48	48	67	52	37	67	57.1
	Min.	60	67	55	53	40	32	46	45	45	57	45	40	40	36	49	50	32	34	34	38	37	31	32	41	31	24	31	33	40	31	30	40.7
WhatCheer	Max.	70	74	68	67	63	62	72	76	67	75	63	65	65	53	69	62	56	53	43	35	40	40	63	65	34	52	47	70	58	54	60	59.4
	Min.	64	70	63	54	36	40	45	49	40	55	40	35	35	28	38	42	41	38	33	33	35	31	27	45	30	29	25	32	33	34	22	39.4

METEOROLOGICAL DATA FOR OCTOBER, 1898.

NORTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.			Prevailing direction of wind.	Killing frost.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	Number of hail storms.	No. of thunder storms.
	Monthly mean.	EXTREMES. Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.	Monthly range.	Monthly.	Greatest daily.	Total snowfall.								
Algona *	47.0			79	2	28	30	51	3.61	1.22	3.0	NW	6	7	13	11	5		
Alta	45.2	54.2	38.2	79	2	22	26	57	3.24	1.27	6 3	NW	6	8	12	11	9		
Alta (near)									3.00	1.18	8.0						8		
Britt	45.3	55.7	35.0	85	2	20	31	65	4.04	1.00	.5	NW		1	21	9	9		1
Charles City	46.6	55.4	37.8	78	2	22	31	56	4.30	2.00		SE		1	12	18	11		
Clear Lake	46.0	55.3	36.8	81	2	22	31	59	4.59	1.36	T	NW	6				10		
Cresco	45.6	52.1	37.2	77	4	23	31	54	4.90	2 45		NW	6	7	6	18	11		
Decorah	46.0	55 9	36.0	77	4	22	31	55											
Dows	46.7	57.5	35.9	84	2, 4	21	26	63	3.95	1.62	T	NW	6	6	10	15	10		2
Eagle Grove †	43.7																		
Elkader	47.4	56.7	38 2	80	4	23	26,27,31	57	4.86	1.44	4.0	N		6	10	15	13		1
Estherville c	43.8	55 6	32.1	81	2	17	31	64	1.28	.50		NW					9		
Fonda	46.0	59.6	32.5	85	9	21	22	64											
Forest City	46.0	54.9	37.1	83	2	21	31	62	4.54	2.04	T	NW		7	14	10			
Fredericksburg									4.22	1.75				4	8	19	9		
Grand Meadow *	45.5			70	2	22	25	48	4.69	2.45	3.0	NW					10		
Greene	47.0	56.8	37.1	83	2, 4	21	31	62	4.34	1.90		NW	6	4	9	18	11		
Hampton	45.6	54.2	36.9	81	2	22	31	59	4.02	1.55	T	NW	6	5	13	13	9		
Hawkeye									5.24	3.42	3.0		6	2	13	16	13		
Humboldt	46.8	57.4	36.3	83	2	23	31	60	2.61	.69		NW					7		
Lansing	48.2	57 0	39.5	76	4	23	27 31	53	5 20	1.93	2.0		6	11	6	14	7		
Larchwood									1.27	.68	3 0	NW		2	9	20	13		1
Larrabee	44.8	55.7	33.8	78	2	19	26	59	2.92	1.32	9 0	NW	5	9	10	12	4		
Le Mars	46.4	57.3	35.5	76	2	18	26	58	1.89	1.00	8.0	N		4	17	10	6		
Mason City	44.7	53 6	35.8	83	2	23	31	60	3.20	1.50				11	8	12	4		
New Hampton	47.4	56 4	38.3	78	4	23	31	55	4.05	2.40		NW	5						
Northwood	44.8	54.8	34.9	83	2	21	31	62	4.70	1.70			14	8	5	18	8		
Osage †‡	44.1								4.20	1.80				8	6	17	6		
Pioneer ‡	44 6	52.8	36.5	71	15	24	26	47	3.87	1.50	T	S	6	3	1	27	8		3
Plover	45.6	56.3	34.9	86	2	20	27	66	2.88	1 25	3.0	W	6	12	6	13	4		
Primghar	45.6	54.8	36 3	80	2	18	25	62	2 40	1 40	4.0	N	6	8	3	20	6		
Ridgeway	47.8	56.3	39 4	76	4	24	31	52	5.75	3.05	1.0	S & W	6	15	0	16	3		
Rock Rapids	42.8	53.1	32.6	74	1, 3	18	29	56	2 08	1.25	1 0	NW		5	3	23	20		
Ruthven	45.0	54.9	35.1	80	4	20	4, 26	60	3.45	1.25	2.0	S	1	6	17	8	3		
Sibley c	45 8	57.1	34 6	78	2	18	26	60	1.38	.38		N & NW	4	11	4	16	9		
Spencer g	46.5	59.5	33.5	76	2	19	26	57	2.41	.80	1.5						7		
Spirit Lake	44.3	54.1	34.5	82	1, 2	23	26	59	2.28	1.20	4.0	N		7	13	11	9		
Waverly	47.8	55.7	39 9	78	4	23	31	55	3.96	2.00	2 0	NW	5	16	6	9	4		
West Bend *	43.8			71	8	21	26	50	2.74	.97	2.0	NW	6	5	9	17	11		
Washta									2.88	1.27	8.0	N	6	6	12	13	7		
Average	45.8	55.8	36.0	79.4		22		58.1	3.51		3.2	NW		6	13	8	10	5	

CENTRAL SECTION.

Amana	48.0	55.8	40.1	76	4	22	31	54	3.56	2 08	4 0	SE, NW	14	7	9	15	10		
Ames	47.0	56.0	37.9	85	2	23	31	62	5.03	2.33			6	7	13	11	9		
Audubon	46.4	56.3	36.6	83	2	20	31	63	2.84	.80	8.0	N, NW	6	1	11	19	5		
Belle Plaine	46.4	55.3	37.5	76	2	22	31	54	3.96	2.00	6.0	SW	6	4	11	16	8		
Carroll	47.0	57.4	36.6	84	2	22	31	62	3.23	1 00	6 5		6	6	4	21	7		
Cedar Falls	48.4	58.7	38 0	79	4	23	26	56	4 38	2.78	4.0	S	6	6	4	21	7		
Cedar Rapids	48.9	56 9	40.9	78	4	25	27	53	2.92	2.13	4.5	NW	14	9	4	18	5		
Clinton	49.8	57.9	41.6	77	3	20	27	57	4.97	2.06	5.0	S	14	4	8	19	12		
Davenport	50.0	57.0	43.0	78	3	26	26	52	3 38	1 66	2.9	SE	23	5	5	21	10		
Delaware †	45.4			70	4	24	26	46	3.77	.93	1.5	S	12	4	9	18	13		
Denison h	42.5	51.4	33.6	70	9,10,15	20	26	50	3.00	.96		S							
Des Moines	49.3	58.1	40.4	85	4	26	31	59	3.56	1.88	1.7	N	14	8	9	14	10		1
Dubuque	48.8	55.6	42.0	74	4	25	27	49	3.86	1.26	3.6	NW	15	3	14	14	14		
Eldora									5.25	1.75	3.0	NW	6	0	21	10	7		1
Galva a	46 9	57.8	36 0	80	2	24	31	56				S	5						
Grinnell	47.6	55.2	39.9	79	4	24	26	45	4.17	2 14	1.0	NW	14	4	11	16	8		
Grundy Center	46.0	55.6	36.5	80	3, 4	20	31	60	5.29	1.52	2.0	NW, SE	6	4	7	20	11		
Guthrie Center	47.5	59.2	35.8	87	2	22	26	65	3.12	.83		SW	6	7	12	12	6		
Independence	46.4	55.0	37.8	76	4	20	31	56	4.51	2.52	4.0	NW	6	10	6	15	8		
Iowa City	49.1	58.1	40.1	80	4	24	27, 31	56	4 38	2 15	4.0	S	14	5	9	17	13		
Iowa Falls	45 6	55.4	35.7	85	2	20	31	65	3.49	.85		NW	6	7	10	14	8		
Le Claire									3.49	1.53							10		
Linn Grove	47.6	55.3	40.0	77	4	22	23	55	2.91	1.34	6.0	SE	14	3	8	20	11		
Logan	46 5	57.5	37.5	86	2	20	25	66	2.93	1.63	10.0	N	13	14	3	14	4		
Maquoketa	53.0	64.5	41.5	80	3	25	26	55	3.74	1.09	3.0	NW	13	15	1	15	9		
Marshalltown	48.1	57 7	38.5	83	2, 4	21	31	62	3.94	1.58	T	N, SE	6	3	11	17	10		
Millman (Des Moines)									3.16	2.07	2.0						9		
Monticello	49.0	58.7	39.3	79	4	20	27	59	3.25	1.30		NW	6	4	9	18	9		
Mt. Vernon *	48 7			76	3	24	26	52	3.40	1.55							6		
Newton	48.2	57.2	39.3	81	2, 4	23	31	58	4 17	2.27	3.0	SE, NW	14	6	13	12	12		
Odebolt	47.5	58 0	37.0	84	2	23	26	61	2.57	.67	6.0		6	14	6	11	9		
Ogden	48.0	58 5	37.4	87	2	20	26	67	3.91	1.09	2.0	NW	6	14	0	17	9		
Olin	47.2	55.9	38.4	76	5	21	27	55	4.47	1.18	6.0	N	12	9	10	12	13		
Rockwell City	46.6	56.1	37.0	82	2	21	26	61	4.56	1.45	1.0		6	14	5	12	10		
Sioux City	46.3	56.0	38.6	77	9	24	26	58	1.36	.73		NW	6	12	5	14	6		
Sac City	46.4	56.3	36.5	80	11	23	31	57	4 15	2.15	6.0	NW	6	4	14	13	6		
Tara	44.1	55.4	32.8	75	9	25	31	50	2.00	1.00		W	5	1	20	10	3		
Toledo	46.4	54.3	38.4	78	2, 4	21	31	57	4.08	2.16		SE	6	9	0	22	7		
Vinton *	42.7			73	2	25	26	48	3 90	2 30		NW	6				7		
Waterloo	47 2	56.1	38.4	78	4	21	31	57	4.79	2.43	6.0	E, NW	6	4	8	19	13		
Webster City	47.2	55.4	39.0	79	4	25	26, 31	54	3 90	.85	T	SE	6	6	6	19	6		
West Branch	47.2	55.8	38.5	74	2	24	30	50	3.42	1.42	3.0	NW	4	9	6	16	9		
Whitten *	44.9			83	2	25	31	58	5.68	1.84	2.0	N	14	8	8	15	7		
Wilton Junction c	49.6	58 3	41.0	77	4	23	27	54	3.36	1.26	3.0		12				5		
Average	47.2	56.7	38.3	79.4		22.6		56.3	3.76		3.5	NW		7	8	16	9		

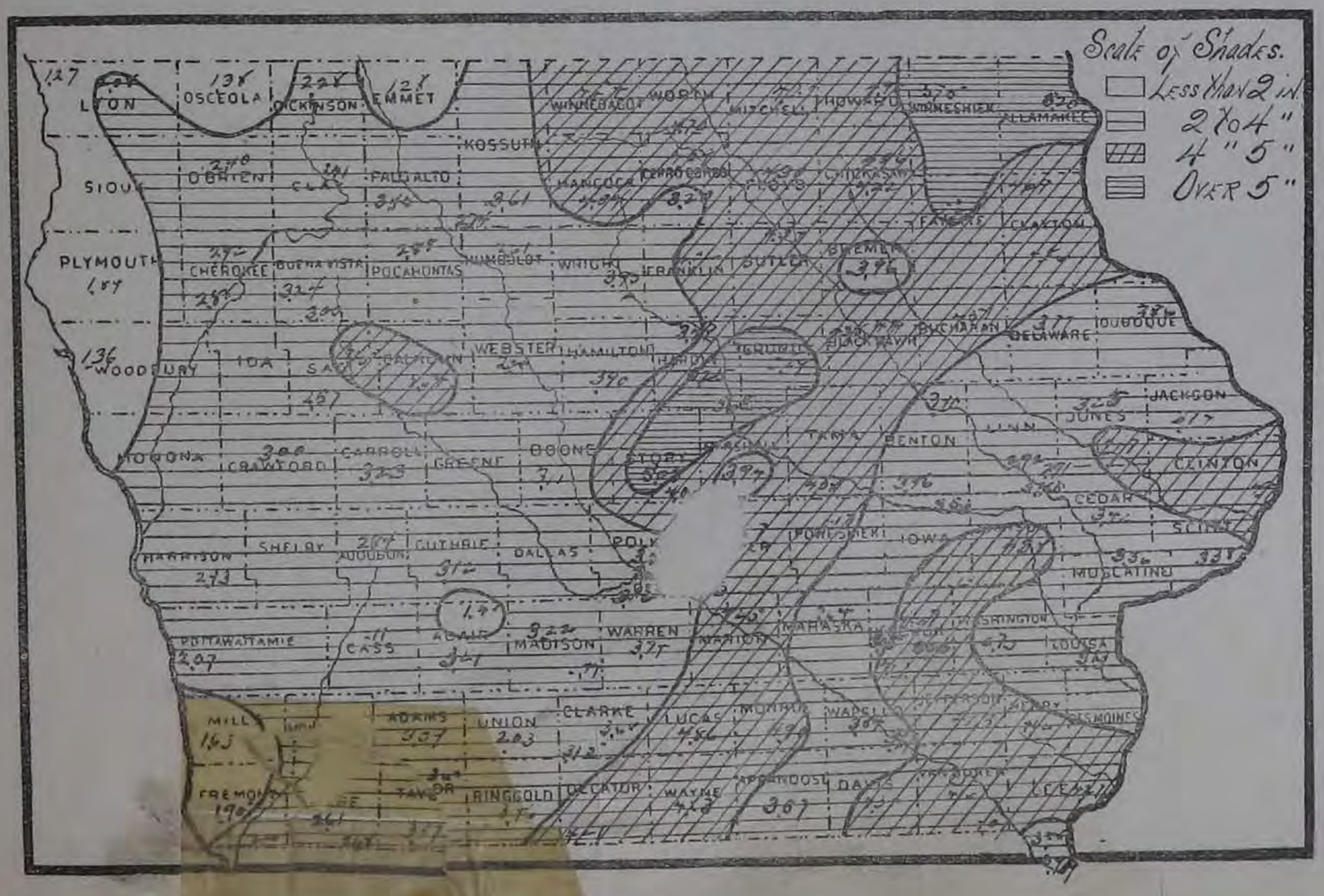
METEOROLOGICAL DATA FOR OCTOBER, 1898—CONTINUED.

SOUTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.			Prevailing direction of wind.	Killing frost.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).	Number of hail-storms.	No. of thunder storms.
	Monthly mean.	EXTREMES. Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.	Monthly range.	Monthly.	Greatest daily.	Total snowfall.								
Afton	47.8	57.8	37.8	86	2	21	22	65	2.03	.94	4.0	SW	6	4	15	12	5	....	....
Albia	50.8	62.1	39.4	87	1	20	26	67	4.90	3 00	5.0	SE	14	4	13	14	6	....	....
Atlantic	46.5	56.4	36.6	84	4	21	26, 31	63	2.11	.58	.....	NW	6	9	5	17	8	....	....
Bedford	48.9	58.0	39 8	86	2	24	26, 31	62	3 87	1.48	5.0	NW	14	7	14	10	7	..	....
Belknap	49 6	58 0	41.2	85	4	25	31	60	4.30	2.20	4.0	NW	14	.....	.....	.....	8	....	....
Bonaparte	50.3	58.1	42.4	81	4	24	31	57	4 09	2.20	.....	.....	14	.....		.....	...	....	...
Burlington	51.8	59.1	44 4	80	3	25	26, 27	55	.....	.....	.....	.....	14	.....	.....	.....	...	....	....
Centerville	49.8	58.1	41.4	83	4	28	26, 31	55	3.57	1.20	2.0	.. ..	14	12	0	19	9		...
Chariton	49.8	59.6	40.0	84	4	23	26, 31	61	4.86	2.22	4.3	N	6	4	17	10	13	....	....
Clarinda	52.9	61.5	44.3	88	2	26	31	62	2.61	1.20	10.5	NW	6	8	12	11	5	..	....
College Springs*j	49.6	60.3	38.9	88	2, 4	21	26	67	2 68	1.34	8.5	NW	6	11	10	10	4	..	....
Corning a	47 8	55.9	39 6	87	2	26	26, 31	61	3.09	1.54	5.0	NW	14	13	6	12	4	..	....
Council Bluffs	49.6	59.7	39.6	84	2	22	26	62	2 07	.64	3.0	W, NW	6	15	3	13	6	...	...
Eldon	51.2	60.5	41.9	87	1	22	31	65	3.97	1 73	2.4	SE	14	10	5	16	9	..	....
Fairfield	50.4	59.5	41.2	. .	.....	22	31	...	4.13	1.55	4.0	.....	14	5	17	9	7	....	....
Ft. Madison*	52 1	...	...	73	2, 3, 4	31	31	42	4.27	1.94	2.5	SW	14	4	6	21	7	..	....
Glenwood	49.9	61.0	38.8	87	2	22	26	65	1.63	.80	.....	NW	6	6	14	11	3	....	....
Greenfield	48.8	59.8	37.8	87	2	21	26	66	3.21	1.06	6 3	.....	...	11	10	10	9	....	....
Hedrick e*	48 2	...	.....	76	2	29	26	47	4.17	1.00	.....	.....	...	.....			6	....	....
Hopeville	49 8	59.1	40 4	84	2, 4	25	26, 31	59	3.15	1 20	.....	NW	14	2	18	11	8	....	...
Indianola b	49.2	59.2	39.1	84	2, 4	24	26, 31	60	3 74	1 21	4.0	NW	6	.....	.....	...	8	...	....
Keokuk	52.0	58 6	45 3	82	4	28	26	54	3.99	1.90	3 0	NW	14	8	8	15	8	....	....
Keosauqua	51 2	59.2	43 1	81	4	25	31	56	4.16	1 35	2.0	.....	14	.....	....	...	6	....	...
Lamoni	47.4	55.5	39.4	83	2, 4	23	26, 31	60	4.21	2 79	1.0	NW	14	13	6	12	8	....	....
Lenox	48.9	58 4	39.4	84	2	24	26	60	3.60	1.55	9.1	NW	14	10	10	11	8	...	.. .
Mooar	49.8	57.7	42 0	84	4	22	31	62	3.88	1 60	2 0	S	14	9	6	16	5	...	....
Mt. Ayr	49.6	60.5	39.4	87	2	23	26	64	3.46	1.29	6.0	NW	14	3	17	11	6	..	....
Mt. Pleasant	51.8	62.3	41.3	79	4	27	26, 27	52	4 12	1.75	1.0	SE	14	10	11	10	7	....	....
Omaha	50.0	58 9	37.6	82	9	27	26	55	2.54	.87	5.2	NW	....	7	13	11	8	....	....
Osceola	47.5	55.5	39.5	85	2	24	26, 31	61	3.68	1 15	3.0	S	...	3	15	13	7	..	....
Ovid	49.4	58.7	40.1	85	4	22	31	63	4.33	1.60	6.0	NW	14	6	5	20	9	....	....
Oskaloosa	48.8	57.9	39.6	83	4	21	31	62	3.64	1.00	3.5	NW	12	11	4	16	8		....
Ottumwa	49.8	60 2	39.5	88	1	22	31	66	3 84	1 30	...	NW	18	8	10	13	3	....	...
Pella	46 0	51.6	40 5	78	4	23	31	55	4 25	1.70	....	SE	14	9	11	11	9	....	....
Red Oak	49.7	60.2	39.2	85	2, 4	22	26	63	2 20	1.42	.....	.....	6	.....	.....	.....	4	..	....
Sidney a	48.6	56.0	41.3	83	2	28	26,29,30	55	1.95	.86	8 0	NW	17	16	6	9	9	....	....
Sigourney	48 4	59.3	37 4	86	4	18	31	68	4.67	2 04	3.5	SE, NW	6	12	9	10	6	....	....
St. Charles	49.2	58.5	39.9	86	4	24	31	62	3.44	1.75	4.0	NW	6	5	16	10	8	...	....
Stuart	49 0	58 4	39 6	87	2	20	25	67	1.48	1.28	3 0	N	16	0	23	8	2	....	....
Thurman	49.8	61.3	38 4	84	2	23	26, 31	61	2.66	1.30	6.6	NW	6	8	10	13	5	....	....
Villisca	47.6	60 1	35.1	87	2	25	23, 27	62	2.90	1.20	.9	S	6	17	3	11	5	....	....
Wapello a	52.9	64.9	40.9	76	3	25	31	51	3.13	1.20	3.0	SE	14	9	13	9	6	....	....
What Cheer	49.4	59.4	39 4	76	8	23	31	54	3.05	1 60	1.5	SE	14	15	1	15	9		....
Washington	47.7	56.8	38 6	79	4	21	31	58	3.73	1.77	....	SE	14	.. ..	... ..	.....	8	....	....
Winterset	48.9	57.1	40.7	87	2	24	26	63	3.22	1.35	3 0	.....	....	.....	....	.....	9	..	1
Average	49 5	58.9	40.0	83.6	.....	23.7	.....	59.9	3.42	.....	4 2	NW	..	8	10	13	7	...	....
Average for the state	47.5	57.1	38.1	80.8	.....	22 8	.....	58.1	3 56	.....	3 6	NW		7	9	15	8	....	....

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing *b* two days, etc.

Precipitation Chart October 1898.



DAILY AND MONTHLY PRECIPITATION FOR OCTOBER, 1898.

STATIONS.	DATE.																													Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	..	...	...	...	....	.	..	....	...	.41	....		..	..	....	.30	.94	.18	....						.20	...	....	....	....	...	...	2.03
Algona	T	...	...	...		...	...	..	T	1.22	..	.03	..	..	.70	1 22	....		....	T	...	..	...	...	...	...	....	....	...	...	3.61
Alta (Hadden)	T		...	T	..	...	..	....	.02	1.20	..	.03	..	..	..	.19		1.27	.05	.09	T	..	..	....	....	..	..	.44	....	....	...	3 24
Albia	T	07	....	...	....	.21	....	..	T	.57	..	T	..	..	..	1.00	.25	..	..	...	T	..	..	....	.8.	..	....	.39	....	....	...	3 24
Amana	..	.09	..	...	...	...	...	..		.29	.01	.02	.01	....	..	.38	1.70	.09	..	..	...	..	..	....	.79	..	..	.18	...	...	4 90
Ames	.04	...	...	.12	..	...	...	..	60	.85	..	.17	....		..		2 33	.07				..	..		....	..	..	.85	..	....	3.56
Atlantic	...		..		..	..		....	....	.48	..	.09	..	..		.52	.58	.07		.08	..	..	..	..	....	..	..	.13	.16	....	...	5.03
Audubon	...	..	...		..	...		..	..	.39	.51	...	..	....	..		.52	.80				..	..		....	..	..			....	...	2.11
Belknap	T	....	..	...		..	..	..		.30	..	T	...	..		.10	2 20	.50		T	.05	.05	....	...	1.00	.10		.62	..	..	..	2.80
Belle Plaine	.10	20	..	..		.02	..		.01	.60	..	.03	...	..			2.00						....	..	1 00					....	..	4.30
Bonaparte			..				.05	..		10						.20	2.20	.27		.02	..	...	..	1.00	.25	..	..					3.56
Britt	.04		..	T			...	..	.27	1.00		.21		..	..	1.0	71	25	02	T	T	..	...	...	...	..	..		.54	..	..	4.09
Bedford	T		..		..			..	.09	1						.68	1 75	38	..		.07	....			1.07	..	....	..		..	..	4.04
Carroll	.05		..			..		..	.41	45		.05	..			1.00	.6			..	..		..			..		.62	....	..	..	3.87
Cedar Falls		.10	..					..	.47	35		25		..		2.78			.0.		..	..		..	.40	..	....		....	..	..	3 23
Cedar Rapids	T	T				.1.	..	..		.20		.04					2 13					...			.45			T	..	...		4 88
Centerville	.10	.05	03					..	T	.62						1.10	1 20	.16			.05				.50				...		..	2.02
Charlton	.01	.02					4.		.1.	88	01					.82	2 2.	.2.	03		.04	.02	..						...	..	..	3.57
Charles City	T		08	1.	.27				.(6			.27	T	..		.2.	2 00	.0	T	T	T					..	..	....	.01		....	4 86
Clarinda	...		.		..		T		T	5.						05	1 2.	.8		T				..	.0.			.68	....		4.30
Clinton	.11	..			.01		2.0.			.0.		.0	03			.4	.50	.15	T	.0.		.1.			06	..	..	....	....	..	...	2.04
Clear Lake	T			.2					.1.	6		2.	T			93	1.3	.09	.15	.0.	T		..	T	1.53							4.97
College Springs		..					..			.4.				..		1.34	75									..		.75	..	..	4.59
Corning	T	..								70		T				.55	1 54								.10	..						2.18
Council Bluffs		..				.0		.3		.5.				..	..	6		46							.30	..		T				3.09
Cresco	.01			64						3		.28				.35	2.45	0.	02	.05	.01							.06				2.87
Davenport	.01	03	.	..		T	5.			.0.		T		..		15	.65	04	T	T	.01	26			1.6.	T	..		T	..	..	4.90
Delaware	08		..		.0	0.				3.		.21			..	.7	.9	.3	.0.	06	.3				.52				.13	....		3.76
Denison	...	...							1	9.		06				.46	58	.4	T	.01	T											3 77
Des Moines	T	T			.01		T		.2.	.21	.01	11				6	1 58	15	T	T	T	T	..	T	.18			.23				3.60
Dows	.04	T	T	21					3.	5		.0.	T	..			1.62	.1.	02	T	03			T				.91	.47			3.56
Dubuque	.01	.06	T			.24	.04			.41		11	0	..		.0.	1.26	22	0.	T	T	.23			1.0.	.0		T	T	..	..	3.35
Eldon	.09		..	..			2			.1						94	1 75	21	.01		.04				.62							3.86
Eldora	....	...	.2.	...		..			.70	8		2				50	1 75	T	T	T			1 00		T	..				..	..	3.97
Elkader	.10		..	1.					0.	4.		34				1 44	1.17	.0.	04	04	20				.75	...		.17		..	..	5 25
Ksthorville	T								.0.	5.		10		..		.0.	20	0	10	10	.10											4 86
Fairfield	T	.08					.3			1		T		..		6	1 85	.2		T	T	..	....					T				1 28
Forest City	.01								.15	9.		.24				1.14	.98	.58	.15	T				T	1 12				T	..	..	4.13
Fredericksburg		.10	..		17			.04	.33			.2			5.	1 75			2.4									.49	..		4.64
Ft. Madison	10					T				.70	T				.32	1 50	.2			.10	..	..		1.94	35	..		.33	..		4.22
Glenwood	T						T			.3.						5.	.30															4 27
Grand Meadow		.05							.03	.47		55					.45	.15	T	.09	.19	.20			.30			T				1.63
Greene				.12	.25				.2	4.		.17				35	1 90	1.											.21	T		4.69
Greenfield	T	T		T		T		T	T	75		.04				7.	1.0.	.1.	02	.01	T				.17			.75				4 34
Grinnell	.10									.75		0.				.18	2 1.	.20								.39		.26	T			3 21
Grundy Center	.10	.2.		2.					.24	.4.		2.				7.	1 5.	.7	T	T	T			T	.20			.33				4.17
Guthrie Center	T								2.	.4.		T				83	63	37	T									1 04				5.29
Hampton	05	.03	.02	0.					.10	.60		.07			.07		1 55	51		.0	03			T					.56	..	..	3 12
Hawkeye	..	20		20				..		40				45	..																	4.02
Hedrick	.	...				1.00	....			9.						.5.	.97	2.		....	3 42				.30	....		.27	..	...	5 24
Hopeville	..		...		T	T			1.	.74	...	T		..		1 2.	68	.1	.0	..	.01	..	....	..	.45				..	..	..	4.17
Humboldt	....	...		.39			...		.3.			.10				.6.	.6.	1							.29					....	..	3.15
Independence										.02	..	.1.				.6	2 52	.08	T	01	T							.31	..	..	2.62
Indianola	T	T			T					.44	11	08	...	..		1.0.	1 21	.15		T	T				.40			.18	..	..	4.51
Iowa City		.10	..		11	..	.48	....		.38	03	.04	....	..		.2	2 1.	02	.08	.02	T	....	..	T	.40	..		.26				3 74
Iowa Falls	T	...	..	.15		..			.1.	.50		.12		..		.85	.75	2.		..	T			T	.70			.05				4 38
Keokuk	.05	T		..		...	..	..		.08		T		....		.55	1.1	.22	.0.		T	.01	..			T		.70	..			3.49
Keosauqua	.04	T		..		..	.02	..		T	..			....			1 35	.3.		T	T		..		1.90	T	..					3 99
Lamoni	.02	T	..	..	...		.15	..	.12	58	..	T		....		1.2	1 25	10			T		...		1.18	T	..		....	..	..	4.16
Lansing	..	T			.27	....				.58	..	.3.	09	.04		1.5.	1.2.	10			T				.45							4 21
Larchwood		..	..	.25					.68	...	..	...		..		.30	1 9	.19	.0.	T	07	.14	..	..	.57	..	..	..	.58	....	..	5 20
Larrabee	T	..	..	T														.27	..	.07												1.27
Le Claire		02	..	..		..	.31	03	1 32	.02		.10					1.25	T	T													2.92
Le Mars			..							.60			T	..	..	.07	.56	49	.26		.21				1.53			25		..		3.49
Lenox									.43	.4.				..			1 00	.10														1.89
Linn Grove	.05	.02	..	..	09					3						.53	1 55	25			.06							19				3.60
Logan			..			.21				.66	..					2	1 34	.10	.0	T	01				22							2.91
Maple Valley	....	....	....	.0.		..	T		.2.	1.18				....		44	1 63	..							.50			.03	..	..	2.93
Maquoketa	.04	..	....	...		.21	..	..	.04	.43	....	.		....		25	.96		07	.12											3.00
Marshalltown	.03	..		..	.12	..	..	..	.21	.38	T	.18	....	....	..	08	.8.	1.09			.16	.19	..	..	.74	....	..	.35	..	..		3.74
Millman				..		....			.30	.19	T	.10		....	..	3.	1.68	23	.02	T	.03	..	..	T	.22	..	..		.33	....		3.94
Mooar	T	T	....	..	....	..	....		..	.14			..	....		.40	1 5	24	T		T				1.60	..	..	....				3.16
Monticello	....	.21		..	..	..	....	..		.24			..	....		0.	1.30	20	1.	..	23		....	..	.90	....	....	..	.05	..		3 88
Mt. Ayr	T		..		..		..	..	.01	.46	..	T	..	....		95	1.2.	.15														3.25
Mt. Pleasant	..	.13	..				.05	..		.1.	T		..	....	..	45	.75	19	..		T	..				.60							3.46
Mt. Vernon		.10	..					..		.40			....	....		.15	1.55	.10							1 36	..	....	..	..	..	..	4 12
New Hampton		.08	....		.33	..	....	..	.05	.21	..	.28		....		21	2.40						....		1.20	..	....	..	..	..	..	3.50
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Odebolt	....	..	.12	..	..	..	....	..	.18	.27	..		..	....		.32	.67	.60		.09	.12	....	..		....	....	....	..	.51	....	..	4 70
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Oskaloosa	T		..	..	..	.85	..	..	T	.30	.04	T	....	....	.75	1.00	....	.25	....	T	..	..	..	..	.40	....	..	..	.05	..	....	3 68
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Pella	....	..	..	..	....	..	..	..	..	89	.42	.03	....	....	....	.44	.26	1.70	.01	..	..	....	....	....	.15	....	..	....	.35	..	..	4.33
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Red Oak	....	..	..	....	..	..	..	....	T	.20	....	T	....	....	....	.50	1.42	T	..	..	....	..	..	..	....	..	..	....	....	....	....	2.40
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Ruthven	....	....	..	.13	..	..	..	....	.14	1.25	....	.80	....	....	....	.13	....	.20	.20	..	.40	..	....	....	....	..	..	.51	....	....	....	4.54
Sac City	T	..	..	.25	..	..	..	....	2.15	....	....	T	....	....	....	.50	.75	....	.25	..	....	..	....	....	....	..	..	.20	....	....	....	3.45
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Sidney	.05	....	....	..	....	....	.07	..	.02	.26	....	T	....	....	....	.46	.86	....	....	.05	..	....	....	....	.18	....	....	....	....	....	....	1.38
Sigourney	T	.03	....	....	....	....	.86			.65	..	T	....	....	....		2.04	.24	....	T	T	....	....	....	.85	..	....	....	....	....	....	1.95
Sioux City	....	..	..	T	....	..	....	....	.10	.73	....	T	....	....	....	.01	.30	.16	T	T	T	....	....	....	....	....	....	....	....	....	....	4.67
St. Charles	....	....	....	....	....	....	....	....	.31	.16	....	....	....	....	....	.75	1.75	.23	.01	T	.01	....	..	..	....	....	..	T	.06	..	....	1.36
Storm Lake	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.20	.63	.12	.02	..	.05	....	..	..	....	....	T	.03	.30	....	....	1.45
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Stuart	....	....	....	....	....	....	....	....	....	..	1 28	....	....	....	....	....	.20	..	..	..	....	....	....	....	....	....	....	....	....	....	....	1.48
Tara	..	..	..	....	....	....	....	....	....	....	....	.70	....	....	....	....	1.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.00
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Waverly	....	.10	....	01	.10	....	....	....	.19	.46	....	21	.03	....	....	.28	2 15	.10	....	T	0.	....	....	....	....	....	....	.28	....	....	....	3 96
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November, 1898



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

VOL. IX. No. 11.

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Central Station, Des Moines, Iowa.

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LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER
1898.

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Mooar	F. G. Thomas.
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Mt. Ayr	A. F. Beard.
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West Union	J. M. Lisher.
West Branch	A. A. Madson.

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Ames	S B. Mills.
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Mapleton	A. Lamb.
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Sageville	Hon. F. N. Knoll.
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Shenandoah	Reuben Mullison.
Spirit Lake	L. Stowe.
State Center	E. P. Thompson.
Tama	W. G. Malin.
Unity	Edw. Hummer.
Van Horne	Spencer Smith.
Winterset	H. A. Kinsman.
Wall Lake	T. E. Wilcox.
Wilton	Thos Root.
Wiota	I. S. Coomes.

U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME IX. NOVEMBER, 1898. No. 11.

NOTE AND COMMENT.

Heap high the farmer's wintry hoard;
Heap high the golden corn!
No richer gift has autumn poured
From out her lavish horn.

—*John G. Whittier.*

***

John S Hazen, who served as an observer of the U. S. Weather Bureau station at Des Moines since May, 1892, has received an assignment as observer in charge of the station at Springfield, Mo This is a well-earned promotion of a most worthy and faithful official of the Bureau, made in pursuance of the well-established rule of the honored chief that merit alone shall be the basis of advancement and reward in this service. While sincerely regretting to part with Mr. Hazen, all connected with this office are gratified that his fidelity has been duly recognized.

***

The imports of American corn at Hamburg and Bremen for 1897 were 861,815 tons, an increase of 50 per cent over the previous year. The Germans are learning that corn is valuable for human food, as well as for cattle and swine.

***

"A scientist looking for microbes says there are absolutely none on the Swiss mountains at an altitude of 2,000 feet," says *Meehan's Monthly*. "Here is the place for the purity party and scaremongers who are forever horrifying the public with the dismal fear of microbes. They would have to take their supply with them, most of which are useful to man. It is pleasing to observe that the microbe does not give himself lofty airs, but as a fellow creature comes down to our level and dwells cheerily in our midst."

***

It is unwise to follow methods that deplete the soil, as has been done in the east. Diversification is the keynote of success in agriculture, and mixed farming the only way to permanent prosperity. Corn is king. This being true, the king must have supporters in order to maintain his kingly dignity. Other crops and a retinue of cattle, sheep and hogs are necessary to maintain King Corn.—*The Farmers' Voice.*

***

Consul-General Stowe, at Cape Town, reports a heavy and continued demand for American corn and corn meal in South Africa.

***

We are asked if the climate of Iowa has really changed. We do not think it has, save as conditions, the result of climatic influences, have been altered by settlement and cultivation of the soil. We look in the future for just as wet seasons, just as heavy falls of snow and big drifts, just as severe, cold weather as we have had in the past.—*Rockford Register.*

Some months ago the Russian minister of agriculture wrote to *The Gazette*, stating that his government was considering the question of making an experimental purchase of Poland-China pigs in the United States, and asking for information and suggestions relative to their selection and shipment. The necessary information was promptly furnished and the attention of the United States secretary of agriculture called to the matter as indicating that some demand for stock of this character might be built up abroad. As a result of this correspondence the Russian government has recently purchased twelve head of pigs of this distinctively American type and they have been started on their long journey. Six head were taken from the Iowa Agricultural College farm at Ames and six from the herd of Mr. H. G. McMillan of the same state.—*Breeders' Gazette, November 23d.*

***

Yellow fever is referred to as "a diminishing terror." It will, in the near future, be almost wholly driven out from its incubating places in the tropical islands, where Yankee enterprise and commerce will renovate and purify the cities.

***

B. T. Elliott, crop reporter for Lincoln township, Union county, writes as follows about the ravages of hog cholera in his section: "In the northeast part of our township the loss has been about 80 per cent; in other parts little loss has been reported. The disease seems to follow a watercourse." This accords with reports from numerous localities, where the cholera has followed the course of streams flowing through several farms. The lesson is apparent.

***

The total production of corn in the southern states for 1898 shows an increase of 114,000,000 bushels as compared with 1897. The price in the south averages above 40 cents per bushel.

***

Fruit trees may be protected from damages by rabbits by using strips of wire cloth six to eight inches wide. The cost is about 2 cents per tree.

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Prof. John Tyndall, in his lectures on heat, referring to the important part played by aqueous vapor in meteorological phenomena, said: "The sun raises the vapors of the equatorial ocean; they rise, but for a time a vapor-screen spreads above and around them. But, the higher they rise, the more they come into the presence of pure space; and, when, by their levity, they have penetrated the vapor-screen, which lies close to the earth's surface, what must occur? It has been said that, compared atom for atom, the absorption of an atom of aqueous vapor is 16,000 times that of air. Now, the power to absorb and the power to radiate are perfectly reciprocal and proportional. The atom of aqueous vapor will, therefore, radiate

with 16,000 times the energy of an atom of air. Imagine, then, this powerful radiant in the presence of space. and with no screen above it to check its radiation. Into space it pours its heat, chills itself, condenses, and the tropical torrents are the consequence. The expansion of the air, no doubt, also refrigerates it; but, in accounting for deluges, the chilling of the vapor by its own radiation must play an important part. The rain quits the ocean as vapor; returns to it as water. How are the vast stores of heat, set free by the change from the vaporous to the liquid condition, disposed of? Doubtless, in great part, they are wasted by radiation into space. Similar remarks apply to the cumuli of our latitudes. The warm air, charged with vapor, rises in columns, so as to penetrate the vapor-screen which hugs the earth; in the presence of space, the head of each pillar wastes its heat by radiation, condenses to a cumulus, which constitutes the visible capital of an invisible column of saturated air. Numberless other meteorological phenomena receive their solution by reference to the radiant and absorbent properties of aqueous vapor."

IOWA CROP REPORT, 1898.

FINAL REPORT FOR THE SEASON, SHOWING AVERAGE PER ACRE AND TOTAL YIELD OF STAPLE SOIL PRODUCTS.

AVERAGE HOME PRICES DECEMBER 1, 1898.

Final reports for the season have been received from the county and township correspondents of the Iowa Weather and Crop Service, giving the average yield of the staple soil products, and the average home prices obtainable therefor on or about December 1st. The reports have been tabulated by counties, and the following summary is made for the state.

WHEAT: Winter wheat made a large yield considering the reported condition of the crop at the close of winter. The average yield as reported is 16.5 bushels per acre, and the total output for the state is 3,168,916 bushels. The average home price is 55 cents per bushel. Spring wheat brought a total product of 19,152,352 bushels, an average of 14.8 bushels per acre. The home price is 52 cents per bushel. The aggregate amount of both winter and spring wheat is 22,321,268 bushels, valued at $11,702,126.

CORN: There has been an unusually variable output of this great staple, the county averages as reported ranging from 25 to 42 bushels per acre. The stand was perfect everywhere, and in many counties the yield was far above all previous estimates. Fifteen counties report 25 to 30 bushels, fourteen counties 40 to 42, and seventy counties range from 31 to 39 bushels per acre. The aggregate for the state, figured from the several county totals, is shown to be 289,214,850 bushels, produced from an area of 8,396,286 acres. The average for the state is therefore 34.5 bushels per acre. The average home price on December 1st, was 23 cents per bushel, and the present value of the crop is therefore $66,519,405. The greater part of the crop, however, is not sold on the market, but is used as raw material in the manufacture of animal and dairy products, at an average increment of 40 to 50 per cent above the current prices paid for corn.

It should be stated in this connection that a considerable percentage of the corn crop in this state, probably 20 per cent, was still unharvested on December 1st, the work having been seriously retarded by the early advent of winter. A portion of the unharvested corn will likely be materially damaged, and it may be estimated that fully 10 per cent of the crop of the state will be unmerchantable, though it may possess some feeding value. The general condition of the cribbed corn is good.

OATS: The total yield of oats is 139,915,346 bushels; an average of 32.5 bushels per acre; the average home price is 21 cents per bushel, making the present market value of the crop $29,383,222.

RYE: Total product, 3,370,550 bushels; average per acre, 16 bushels; home price, 38 cents per bushel, present value, $1,280,809.

BARLEY: Total product, 14,032,471 bushels; on an acreage of 509,589 acres; average yield, 27.5 bushels per acre; home value, average 30 cents per bushel; value of crop, $4,209,741.

FLAX: Total product, 2,376,604 bushels; average per acre, 10.5 bushels; average home price 80 cents per bushel; total home value, $1,901,283.

POTATOES: Total bushels harvested, 12,538,411; average per acre, 76 bushels; home value, 31 cents per bushel; value of crop, $3,886,907.

CULTIVATED HAY: Total number of tons harvested, 3,852,561; average per acre, 1.7 tons; value, $4 30 per ton; total value, $16,566,012.

PRAIRIE HAY: Product, 1,645,419 tons; value, $5,758,966.

BUCKWHEAT: The average yield is 13.8 bushels per acre; total product, 169,740 bushels, worth $84,870.

TIMOTHY SEED: Average yield, 3.9 bushels per acre; yield (estimated), 725,000 bushels; valued at $768,500.

CLOVER SEED: Yield per acre, 1.7 bushels; total product (estimated), 87,550 bushels; value, $288,915.

MILLET SEED: Product, 19 bushels per acre; total yield, 161,500 bushels, worth $61,370.

SWEET POTATOES: Product (estimated), 245,000 bushels; value at home, $218,250.

SORGHUM: Yield per acre, 94 gallons; estimated value, $350,000.

BROOM CORN: Estimated value, $25,000.

CORN FODDER: In shock and field, worth $8,250,000.

PASTURAGE: Estimated worth, $30,000,000.

FRUITS AND VEGETABLES: Estimated value, $6,200,000.

The reports show the average farm price of horses to be $50 per head; milch cows, $35; average price of wool, 16 cents per pound. Amount of fall plowing is estimated at 88 per cent.

The reporters were asked to estimate the percentage of loss of hogs, by cholera or other disease, for the year ending December 1st. The reports show an average loss of 17 per cent for the state at large. The county estimates indicate a wide range in the ravages of the disease, from 1 per cent in several counties to 72 per cent in the county reporting the greatest loss.

GENERAL CROP STATEMENT, 1898.

CROPS.	YIELD PER ACRE.	AGGREGATE YIELD.	HOME VALUES DEC. 1ST.
Winter wheat	16.5	3,168,916 bus.	$ 1,742,903
Spring wheat	14.8	19,152 352 bus.	9,959,223
Corn	34.5	289,214,850 bus.	66,519,405
Oats	32.5	139,915,346 bus.	29,383,222
Barley	27.5	14,032,471 bus.	4,209,741
Rye	16.0	3,370,550 bus.	1,280,809
Potatoes	76.0	12,538,411 bus.	3,886,907
Cultivated hay	1.7	3,852,561 tons.	16,566,012
Prairie hay	1.2	1,645,419 tons.	5,758,966
Buckwheat	13.8	169,740 bus.	84,870
Flax	10.5	2,376,604 bus.	1,901,283
Timothy seed	3.9	725,000 bus.	768,500
Clover seed	1.7	87,550 bus.	288,915
Millet seed	19.0	161,500 bus.	61,370
Sweet potatoes	.....	245,000 bus.	218,250
Sorghum	94 gals.	Estimated.	350,000
Broom corn	.....	Estimated.	25,000
Corn fodder	.....	Estimated.	8,250,000
Pasturage	.....	Estimated.	30,000,000
Fruits and vegetables	.....	Estimated.	6,200,000
Total	.....	.....	$ 187,455,376

To the above figures should be added the increment in value gained by consumption of crops in the production of beef, pork, mutton, wool, dairy products, poultry and eggs, horses, etc. The aggregate value of the soil products of Iowa for the year 1898 is not less than $225,000,000.

FINAL CROP REPORT, 1898—AVERAGE PER ACRE AND TOTAL YIELD BY COUNTIES.

COUNTIES.	WINTER WHEAT.		SPRING WHEAT.		CORN.		OATS.		RYE.		BARLEY.		FLAX.		POTATOES.		CULTIVATED HAY.		WILD HAY.	
	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Tons per acre.	Total tons.	Tons per acre.	Total tons.
Adair	20	11.620	11	121,710	25	1,655,620	24	1,255,680	12	5,160	22	7,040	....	.....	65	135,070	1.4	33,460	1.2	11,170
Adams	17	33,660	14	97,020	25	1,857,750	27	588,720	11	2,300	21	2,910	....	.....	40	27,200	1.6	25,310	1.0	2,180
Allamakee	18	41,220	16	33,600	35	1,398,950	25	1,092,250	15	114,525	20	71,820	12	4,210	50	80,650	1.8	59,670	1.5	3,105
Appanoose	12	39 984	...	.....	53	1,529,580	26	266,705	11	13,095		.....	7	630	70	36,190	1.8	77,570	1.0	2,185
Audubon	20	1,240	16	409,312	30	2,307,390	25	1,057,400	14	7,320	23	46,989	....	.....	75	100,9 0	1.8	23,775	1 5	11,340
Benton	20	7,840	14	10,192	30	3,108,300	30	2,169,940	10	26,950	31	310,085	...	.....	95	194,750	1.6	54,960	1.0	13,460
Black Hawk	20	5,980	18	1,620	41	3,998,320	35	2,331,805	15	76,850	32	96,320	...	.....	95	177,270	2.0	67.140	1.3	19,590
Boone	18	950	15	48,210	35	3,419,675	25	1,175,975	15	21,930	20	9,640	8	1,040	50	57,500	1.7	20,825	1.4	890
Bremer	20	1,960	16	2,89	37	2,102,378	33	1,964,860	10	22,210	25	39.925	10	18,870	68	91,120	1.8	32,778	1 4	36,556
Buchanan	22	440	15	1,050	35	2,945,845	33	1,947,660	18	17.118	30	53 940	10	3,510	110	140,580	2.0	65,580	1.5	27,045
Buena Vista	...	....	15	279,780	41	4,304,098	35	2,136.7 0	15	14,265	30	179,790	10	31,970	90	205,110	1 7	15,660	1 2	40,750
Butler	18	900	15	25,745	38	3,92 ,860	39	3,090 825	20	94,740	30	86.4 0	13	22.480	78	107,796	1.8	27,846	1.4	26.740
Calhoun	...	.....	20	160,880	30	3,016.710	40	2.195,010	20	22,080	21	64 995	11	47.190	48	69,600	1.9	17,727	1.0	38,120
Carroll	18	820	16	286,560	29	3,388,385	35	2,167,690	20	36,050	33	240 306	11	13,020	77	170,016	1.7	21.190	1.5	33,603
Cass	20	61,980	12	226,872	29	3,251,190	26	1,308,860	16	14.990	21	23,450	....	.....	48	243.024	1 8	27.432	1.0	6,350
Cedar	20	55,020	16	6,128	35	3,623,775	33	1,411,770	17	21,890	24	95,128	...	.. ..	78	114.270	1.6	75,230	1.0	1,800
Cerro Gordo	..	....	16	34.768	38	2,932,346	38	2,616.376	17	49,810	25	162,125	11	73,590	80	112.640	2.0	10,340	1.5	21,250
Cherokee	....	.....	17	682,788	42	4,553,850	38	1,410,484	17	10,438	30	282.630	10	13,090	75	121,500	1.8	28,314	1.4	25,508
Chickasaw	15	650	16	15,904	35	2,143,610	38	2,395,064	18	27,072	28	112,280	11	88,110	75	107.250	1.3	23,803	1 0	19,560
Clarke	19	22,515	13	3,120	32	1,919,040	26	508,660	10	21,980	...	.....	..	.....	60	62,340	1 5	39,825	1 0	410
Clay	....	... ...	15	382,125	42	3,439,078	34	1,924,706	15	48,405	30	641.010	10	80,830	75	102,110	1.5	16,890	1.2	35,560
Clayton	18	120,438	17	37,434	37	2,763,122	38	1,480 0 8	15	143,110	25	106,650	12	2,008	110	270,640	1 9	61,427	1.5	7,490
Clinton	22	42,768	15	7,980	33	3,867,336	32	1,969,600	20	146,380	27	24,570	...	.....	90	171,270	1 8	90,542	1.2	5,040
Crawford	18	912	16	812,400	33	4,746,489	30	1,721,700	20	53,020	20	169,560	....	.....	58	116.870	2.0	40.420	1.5	23,160
Dallas	17	57,130	16	79,520	33	3,447,180	31	1,336,565	14	20,740	17	4,590	....	.....	70	82,250	1.8	38,970	1.4	20,910
Davis	12	56.364	...	.....	32	2,070,3 8	25	554.125	13	22,113	.. .	.....	....	.....	50	27,320	1.6	55,328	...	...
Decatur	15	101,115	11	1,650	32	2,481,920	25	465.075	13	16,445	....	.....	....	.....	73	90,520	1.6	55,824	1 3	2,080
Delaware	20	3.280	16	6,785	36	3,318,920	35	1,602,690	18	105,210	36	90,828	12	564	120	174,880	1.3	51,545	1.0	12,620
Des Moines	17	106,182	14	1 932	35	1,891,680	30	1,071,480	13	18,460	...	.....	....	.....	80	116,480	1.9	34,440	1.0	850
Dickinson	...	... ...	18	357,012	38	1,060,124	40	924.520	20	16.280	25	258.400	12	72,780	75	50,250	1 5	2.475	1.0	22.520
Dubuque	16	9,072	15	7,835	40	2,881,000	36	2,223,612	16	74,944	25	25,375	....	.....	90	224.730	1.5	60,375	1 3	4,173
Emmet	20	660	17	579,885	41	1,531,135	39	995.510	19	20,425	20	211 080	11	80.300	103	63.960	2 0	34.200	1.4	40,550
Fayette	20	13,840	17	26,845	34	2,782,152	34	2.389.030	20	92,400	31	155.000	9	28,620	102	197.670	1 7	76,270	1 5	30,420
Floyd	18	2,250	14	36 918	33	2,380,520	35	1,210,260	14	30,786	30	110.760	12	49,536	95	217,970	1.5	31,23	1 0	4,280
Franklin	...	.....	15	67,440	31	3 150,158	34	2,940,388	20	21,400	27	86,400	11	83,160	71	105,220	1.5	24,550	1.3	30,173
Fremont	20	86,960	14	93.940	28	2,711,520	33	377,190	16	11,840	25	3,000	..	.....	67	50.920	1.8	19 940	1.3	5,690
Greene	18	450	15	48.375	32	3,337 440	30	1,898,100	13	17,510	26	37,440	10	1,510	72	82,800	1.9	27,075	1 5	12,310
Grundy	....	.....	17	83,504	42	3,808,812	36	2,110.320	16	19.040	28	125,400	16	24,160	93	106.950	2.0	35.160	1.2	18,252
Guthrie	21	22,890	14	164,640	32	3,194,320	30	1,668,100	18	28,890	24	18,960	10	2,600	84	110,040	1.7	36,125	1.2	12 980
Hamilton	....	.....	19	58.710	37	2,503,170	38	1,791,320	20	9,300	30	33.900	12	39,840	74	75 110	1.8	27,857	1.3	53,872
Hancock	....	.....	17	242,675	41	2,741,670	35	2,128,700	20	15,800	29	361,456	11	170,500	97	93,120	1.7	14,705	1.4	50,115
Hardin	....	.....	17	99,025	36	3,474,360	33	2,069,430	18	12 780	32	67,520	9	19,260	70	103,950	1.7	14,008	1 4	29,778
Harrison	20	5,600	17	647,08	31	2,867,190	35	836,500	24	49,440	22	46,420	....	....	82	102,992	2 0	17,206	1.5	33,075
Henry	16	76,240	15	3,300	39	2,860,202	30	1,122.300	16	21, 80	...	.....	...	.....	61	63,440	2.0	42,380	..	...
Howard	12	1,080	14	35.840	31	1.400,890	32	1,778,240	18	8.920	27	243,270	10	114,100	88	104,08	1 6	24,868	1.2	22,086
Humboldt	....	.....	18	385,020	40	2,41 ,080	39	1,377,870	19	9,690	23	46,667	11	32,340	60	72,180	1.8	28,890	1.5	47,325
Ida	..	....	14	47,418	39	3,615,690	31	1,141,203	20	18,400	26	140,582	10	1.260	72	91 080	1 9	26 462	1.3	11,219
Iowa	25	20,650	16	10,720	37	3,625.640	30	1,515,600	20	107,800	30	56.400	....	.....	95	144,875	2 0	75,360	.	....
Jackson	17	31,690	16	14,992	36	2,778 660	35	1,52 ,200	14	142.100	25	17.575	....	.....	73	121,180	1.5	52,785	1.0	2,530
Jasper	18	22,860	16	147,040	32	3,845,760	31	1,359,350	20	39,600	30	20,340	....	.....	93	776.589	1.8	46,314	1.5	4,380
Jefferson	13	62,439	11	1,672	34	2,017,560	25	615,250	12	26.520		.....	....	.. ..	66	36,102	1 8	43.387		...
Johnson	20	65,600	16	11.610	34	3,150,610	31	1,311.858	17	75,650	22	19,580	....	.....	93	151.590	1.8	55,836	1.0	3,042
Jones	....	.....	16	2.992	30	2,481 570	38	1,202.472	20	84,760	33	44,154	....	.....	120	121,080	1 9	67.431	1.5	3,058
Keokuk	19	76,665	15	5,040	35	1,720,040	30	1,390,440	16	53,48	25	7,150	...	...	77	89,102	1.8	65,012	1.5	1,533
Kossuth		.....	18	58,327	41	4,320,170	38	3,043.230	16	8,128	25	356,000	10	251,760	96	148,800	1.7	18,334	1.2	96,300
Lee	12	221.580	7	315	29	1,334,058	18	328,842	11	23,265	...	....	....	.....	73	106,790	1.6	49,952	1.0	210
Linn	20	5 320	17	5,5 5	37	3,842.117	33	1,507,0 1	18	92,456	31	24,490	....	.....	94	223,720	1.8	84.204	1 5	13.620
Louisa	17	61,642	12	2.460	31	2,055,083	30	716,130	14	20,168		.....	....	.....	90	54,360	1.5	23,175	1.5	1,600
Lucas	15	62,745	12	540	40	2,633,680	28	519,148	14	28,028	20	4,500	....	.....	78	41,18	2.0	42,860	1.0	550
Lyon	...	....	14	1,369,802	42	2,311,028	38	1,444,490	15	8,910	28	1,429,595	10	27,300	75	101.925	1.8	7,650	1.2	13 260
Madison	17	84.898	12	106,716	31	2.867,004	28	791,252	17	28,610	25	6,400	....	.....	78	66,534	2	55,660	1.5	4,860
Mahaska	16	84,672	14	14.392	36	3,144,168	32	922,400	15	43,080	30	15,180	....	.....	86	158.498	1 8	55,368	1 0	1,205
Marion	17	89,590	14	47,404	32	3,077,248	26	786,994	17	56,576	28	11,172	....	.....	62	136.710	1.6	38,112	1.0	1,640
Marshall	15	3,315	16	123.288	36	2,572,092	34	1,434,936	19	27,512	28	43,960	9	1,323	76	102,372	1 9	48,564	1 3	4,190
Mills	20	31,200	14	257,5 0	27	2,053,647	35	627,515	20	8.940	..	.....	....	....	75	154.350	1 5	21,720	1 2	7,220
Mitchell	18	1,728	16	94.304	33	1,622,478	33	1,733.523	15	36,990	30	580,980	11	157,454	86	114.810	1.5	33,225	1.0	4,903
Monona	21	1,407	19	324,691	40	4,606,720	34	822.096	20	34,060	25	72,450	10	6,200	95	116,940	1 8	22,260	1.0	31,350
Monroe	11	40,425	11	825	39	1,843,257	28	339,304	12	32,436	...	.....	....	.....	68	34,000	1.7	51,595	1.0	440
Montgomery	17	72,998	14	247,002	33	3,338,082	34	724,710	15	11,925	...	.....	....	.....	73	95,046	2.0	26,720	1.0	3,130
Muscatine	20	112,760	12	13,908	30	2,015,520	29	712 298	14	42,210	23	95,910	....	.....	93	155,868	1.6	45,152	1.0	2,760
O'Brien	...	.....	15	620,070	42	3,097.080	37	1,874 605	16	13,120	29	1,160,520	11	56,848	125	174,500	1.5	15,570	1.0	18,241
Osceola	....	.....	15	759,180	38	1.376,740	32	1,064,192	17	7,310	26	745,498	11	58,806	88	100,320	1.5	6,675	1.4	21.938
Page	19	215,498	14	112,728	36	4,728,984	32	688,416	18	13.014	31	6,078	....	....	58	106,256	1 8	51,084	1.5	5,650
Palo Alto	...	... ...	14	161.518	32	2,069,952	34	1,996.140	17	11,951	26	132,964	10	79,470	78	92,508	1.7	10,982	1.0	51,110
Plymouth	20	1,540	15	1,527,900	35	4,361,480	35	2,194,605	13	16,930	27	280,719	10	2,090	72	209,30	2 0	21,140	1.0	36,070
Pocahontas	...	.....	16	219,856	35	2,612 540	37	1,940,891	17	16,150	31	185,291	11	80,762	52	89,492	1.7	9,775	1.4	60,170
Polk	20	16,120	16	115.008	34	3,343,606	30	1.090.020	17	24,327	....	....	..	... ...	47	217,892	1.8	40,230	1.5	16,395
Pottawattamie	16	20,144	15	867,795	33	6,796,053	32	1,543.748	15	29,130	24	70,272	...	.....	68	284,320	2.0	25,029	1.0	21,300
Poweshiek	19	11,647	16	16.448	34	8.203,548	32	1,551.008	15	32,265	27	27,702	....	.....	110	133,870	2 0	77,080	1 5	2,550
Ringgold	20	47,080	12	2 220	31	2,911.551	25	671,200	19	29,165	20	5,940	..	.....	58	45,110	1.8	70,182	1.0	1,850
Sac	...	...	16	277,200	38	4,398,790	40	2,299.6 0	15	23.895	30	210.540	10	37,410	90	137.070	1.6	31,185	1.0	21,220
Scott	15	195,720	13	56,267	30	1,782.150	26	796,250	13	29.523	24	481,608	....	.....	75	181,425	2.0	41,580	1 0	9,490
Shelby	19	7,650	16	549.888	34	3,877,160	37	1,297,627	12	18.720	25	277,925	...	.....	87	143,115	1.8	5,904	1.0	34,140
Sioux		.....	15	2,258,715	39	4,460,391	32	2,176,672	18	10,800	27	884,115	11	17,710	59	69,089	1.8	35,208	1.0	26,230
Story	24	2,928	17	66.640	38	4,004,668	34	1,981.146	19	46 739	25	20,150	10	3,500	95	165,110	1.9	61.294	1.0	11,280
Tama	19	9,842	15	86.670	35	3.425,450	28	1,698,424	15	41,325	27	599,724	...	.....	40	133,880	2.0	72 840	1.0	2,180
Taylor	21	144,123	15	10,33	30	2,869,500	27	673,839	15	7.410	22	6,006	...	.....	52	51 948	1.7	45,849	1.0	1,018
Union	19	10,412	22	8,294	28	2,011.912	28	637,980	12	9,384	....	.....	...	.....	64	27.520	1.8	32.598	..	.....
Van Buren	12	96,120	12	1,740	30	1,247 250	18	258,336	9	11.736	....	....	...	.....	70	90,300	2.0	32.900	....	.....
Wapello	20	148,840	15	1,050	32	1.970,240	33	513,810	17	38,063	...	... .	...	.....	62	131,812	1.7	51,527	1.0	2,105
Warren	17	15 538	13	72 163	30	2,577,870	30	330,480	17	47.974	....	.....	....	.....	74	59,644	1.7	69.938	1.0	670
Washington	17	50,269	14	1,330	33	2,981,880	31	1,112,714	15	39.960	....	.....	...	.....	78	134,160	2.0	94,840	1 0	680
Wayne	12	15,488	...	.....	36	2,654,496	24	513,064	12	22.008	....	.....	...	... ...	43	74.390	1 8	16,542	1.0	48,420
Webster	...	... ...	17	110,789	35	3,921,400	40	2,388,920	20	24,820	30	96,300	10	22,250	107	67,196	1 5	6,165	1.0	38,610
Winnebago	...	.....	16	376.928	37	1,340,843	35	1.132,255	16	1,856	40	224,560	13	132,275	75	99,525	1.6	53,548	1.0	9.330
Winneshiek	19	9,063	18	108,000	38	2,620.936	35	2,389.660	18	32,076	28	400,568	12	135.048	75	121,576	1.6	14,928	1 0	30,130
Woodbury	18	2,700	17	901.408	37	5,973,983	31	1,129.144	20	44,720	26	102 102	8	11.280	52	86,726	1.8	19,998	1.0	21,115
Worth	....	.....	15	101,880	36	1,385,352	36	1.859.400	16	12,128	28	303.460	10	102,580	103	66,340	1 8	23,066	1.0	35,501
Wright	...	.....	18	130,806	35	2,900,555	35	2,129,085	19	6,042	31	129,952	9	71,460	69					
Total yield	...	3,168,916	....	19,152,352		289,214,850	...	139,915,340	....	3,370,550	....	14,032,471	....	2,376,604	....	12,538,411	..	3,852,561	..	1,645,419
Average per acre	16 5	.....	14.8	.....	34.5	.....	32 5	.....	16	.....	27.5	.....	10 5	.....	76	.....	1.7	.....	1.2	.....

"AN OLD-FASHIONED WINTER."

"We're going to have a regular old-fashioned winter."

This remark has been heard frequently, and has appeared in the newspapers with some variations in form, since winter made an early advent in the last decade of November. Now we are always alert when we hear or read anything in the form of a definite forecast of the weather at long range, but this statement in relation to the character of the coming winter is too indefinite for any practical use We file a motion for a more specific statement. What is an old-fashioned winter? Has there been any marked change in the fashions, styles and trimmings of winters in these latter days, as compared with the years when Iowa was wearing the short dress of territorial girlhood? Were the old-fashioned winters cut decollette or high in the collar and fur-trimmed?

This is our thirtieth winter in Iowa, and during these three decades we have not noted any appreciable change in the fashions of the seasons. Did the change in the wintry styles of weather occur along in the sixties, just previous to our coming, or when did the transformation take place?

We remember hearing the Hon. Thomas Mitchell relate facts and incidents in regard to some phenomenally mild and genial weather in the winter months away back in the territorial years when the present site of the capital city was known as Raccoon Forks, or Fort Des Moines. But Mr. Mitchell possessed a warm and sunny nature, that possibly made all kinds of weather seem mild and genial. At any rate his excellent memory held firmly to the fact that in the early period there were many fine and balmy months, as well as stormy ones, in the winter seasons. Others among the "oldest inhabitants" seem to possess a faculty for remembering only the fearfully cold, stormy weather that occasionally came in the years when the country was new and settlers were far apart, and houses with modern conveniences were unknown in the west.

Those who predict "an old-fashioned winter" undoubtedly mean to warn us that we shall experience great severity of storms and extremely cold weather. Possibly that may be the character of the coming winter; but the point we make is that it will not be more "old-fashioned" than a milder type. In other words, there is no substantial basis for the vague notion or tradition that severe winters were quite in fashion in former times, or more prevalent than in recent years. So far as records have been preserved they show no material change in the type of winters in this region. But the records show marked variability all through the years since the early settlement of this country.

Records of temperature were kept at the military post at Council Bluffs in the years 1820 to 1825, and the average of the three winter months for those years was 21.7°, which is about the normal of recent years. At Fort Des Moines the military records from 1843 to 1846 show a mean for the winter of 28.9°, which is warmer than the average for the last ten years. Complete weather records have been kept at Monticello since 1854, and within that period the coldest winter was in 1885. The average temperature for the winters from 1854 to 1864 was 20°, and from 1880 to 1890 the average was 18° for the winter months. That would appear to indicate that the modern winters are slightly colder than the ancient sort But, in matter of fact, a careful study of all the records of all stations in Iowa do not afford any evidence whatever that the climate of Iowa has changed in respect to temperature, rainfall or other meteorological elements. We may rest securely in the belief that our mundane possessions are reasonably stable. People change, but the old world jogs along serenely Our memories play us more fantastic tricks than the weather or climate.

PREVENTING LOSSES BY LIGHTNING.

The growing value to the farmers of Iowa of the Weather and Crop Service of that state, which under the direction of J. R Sage seeks to benefit the agriculturist at every point, is once more illustrated by the report of Mr. Sage's investigation into the losses sustained by the farmers of that state through lightning, his study of special causes and search after methods calculated to lessen the loss occasioned thereby.

Mr. Sage began his investigations last spring by securing the aid and co-operation of the insurance men of the state. Blanks for the collection of the necessary statistics were sent out to agents and adjusters, and, up to October 1, 186 reports were received. These reports gave details of the loss or damage by lightning throughout the state of thirty-seven buildings, and the killing of 266 head of live stock. The loss upon buildings and contents alone footed up $17,336. We quote from Mr. Sage's summary which appears in a recent issue of the MONTHLY REVIEW published by his office:

"These reports show the interesting fact that of the 266 head of live stock killed by lightning, 118 were found in close contact with wire fences; and also that these wire fences were not provided with ground wires. That is to say, over 44 per cent of the losses of live stock may have been caused by contact with wires charged with electric force."

But Mr. Sage does not see in this fact any reflection upon the wire fence. He does, however, insist that the experience proves the need of better and more scientific methods in their construction. He says:

"Unquestionably, wire fences, as now constructed, serve as death traps to live stock, causing a vast amount of loss every year. And it is also quite evident that a considerable percentage of danger may be avoided by the use of ground wires at frequent intervals, in the construction of wire fences. In some of the reports it was stated that there were evidences that the lightning struck the fence at a considerable distance from the point where the stock was killed."

We may scarcely overestimate the importance of investigations of this kind, tending as they do to reduce to the minimum the destruction of life and property by lightning. Properly protected barns and houses, scientifically constructed wire fences, and the many precautions which will be taken as a result of them must result in increased immunity from the blighting effect of this death-dealing element. Farmers everywhere owe Mr. Sage a debt for his timely and intelligent efforts.—*Farmers' Voice.*

CORN AND OATMEAL.

Nearly all the European countries, says the New York *Comm rcial*, seem to be developing a taste for our corn. Great Britain, which took less than 40,000.000 bushels in the nine months of 1886, has taken 58,000,000 bushels in the nine months of 1898. France increased from less than 4,000,000 bushels in 1896 to over 8,000,000 bushels in 1898; Germany from less than 13,000,000 bushels in 1896 to over 32,000,000 bushels in 1898. To British North America the exports of corn were less than 8,000,000 bushels in the nine months of 1896, while they are over 21,000,000 bushels in 1898, though it is probable that a considerable percentage of this is sent into Canada in transit and passes thence to European ports.

American oatmeal is rapidly making for itself a market abroad. It was only a little over a quarter of a century ago that the manufacture of oatmeal in the United States was begun, its use being suggested by the fact that during the war period the production of rice in the United States was materi-

ally reduced, thus leading to the establishment of oatmeal mills, which have not only cultivated the American taste in this direction, but made for the American product a place in the markets of the world. The exportation of oatmeal in 1888 was but 4,329,239 pounds; in 1892, 20,908,190 pounds; in 1896, 38 592,504 pounds; in 1897, 47,310,251 pounds, and in the fiscal year 1898, 85,500,270 pounds. The large proportion of this goes to Europe, Great Britain having last year taken more than one-half of the total quantity exported, Netherland about one-fifth, the remainder being distributed to Germany, Austria-Hungary, Sweden and Norway, Denmark and Italy, while a considerable quantity went also to the British West Indies and British Africa.

Already applications for this government supervision have been filed by timber land owners representing 1 000,000 acres. In the Adirondacks region 100,000 acres of land are now being treated according to the working plans provided by the department, and fourteen lumber camps are at work under this direction. If the knowledge of forestry were general, so that privately employed experts were abundant, this plan, it is said, would never have been tried, for it would smack too much of paternalism. But in present conditions, when scientific forestry is almost unknown, and public interests, particularly in regard to the water supply, are so great, it is believed to be practical and meritorious.—*Washington correspondent New York Evening Post.*



SCIENTIFIC FORESTRY.

Early in October, the Department of Agriculture issued a circular containing a proposal intended to be of practical advantage to farmers, lumbermen and others in handling their forests. It was pointed out that the preservation in productive condition of the privately owned timber lands was of vast importance to the nation. These, in point of fact, are usually held for the immediate returns they can be made to yield, and the owners have, as a rule, hardly come to understand that it pays better to protect the forest in harvesting the timber crop than to destroy it.

For this reason, the department decided to undertake a series of practical examples of improved treatment of private lands, in which the present interest of the owner and the protection of public rights should both have weight. The department offered upon application of private owners, to prepare a plan for harvesting the crop and to supervise the execution thereof, so far as might be necessary. The government stood ready to defray the expenses of its agents in this work, but in return reserved the right to publish, for the enlightenment of farmers and others, a report of the financial results of the various experiments.

THE ENGLISH WEATHER BUREAU.

The forecasting of our meteorological office is based on long observation and an inductive system. The weather at any place, to put it briefly, depends on the distribution of atmospheric pressure, the direction of the wind, and some other factors over a large surrounding area, and a skilled observer, if only he can obtain sufficient information, can foretell almost with certainty whether there will be gale or calm, rain or sunshine, for several hours to come. In our islands we have not yet arrived at an ideal condition, though observatories are not few and forecasts are made thrice daily. The prophets sometimes prophesy falsely, but for this, as we shall see, they generally are not to blame.

During the twelve months ended with March last they were successful, taking the average of all the districts and using the evening forecasts, in which the fullest information is to hand, in 55 per cent of the instances, and were partially so in 26 per cent, while only 6 per cent were complete, and 13 per cent partial, failures. They were accordingly quite or fairly accurate in eighty-one cases out of 100. This seems to be about as near as they can get, for during the last ten years the number

ranges between seventy-nine and eighty-four. Curiously enough, these two extremes came in successive years.

Of the storm warnings, nearly 92 per cent were justified, if not by storms, at least by strong winds, and only eight unforeseen gales broke on our coasts Hay harvest forecasts also are issued, and, like the other reports, are telegraphed to applicants at small cost. Of these 90 per cent have proved useful. But why is it that the record of correct predictions did not exceed 55 per cent? We have only to study the tabulated statements for the different districts to see the reason why a higher degree of accuracy is hard to reach. The successes are most numerous on the eastern side of England—the southern district being at the head—and least so in Ireland and the west and north of Scotland. Most of our bad weather comes from the Atlantic, and the observers often get no intimation of the approach of a depression till it is nearing our western shores; and if it be traveling fast it may have broken on them, and even upset everything in the neighboring districts, in the interval between two calculations If it were possible to establish stations well out in the Atlantic the percentage of accurate forecasts would go up with a bound. But as we live in an island country, with an ocean on the west and a gulf stream in it, we must, for the present at least, put up with a changeful climate and occasional failures in weather forecasts. —*London Standard.*

NATIONAL BULLETIN FOR NOVEMBER.

WASHINGTON, D. C., December 1, 1898.

The average temperature for November, 1898, was about normal in Minnesota, over portions of the central Mississippi valley and middle Atlantic states, along the immediate Pacific coast, over western Texas, and the southern portions of New Mexico and Arizona. The month was milder than usual over the greater part of the lake region, northern New England, in Florida, and over limited areas on the Oregon and southern California coasts, the greatest excess in temperature occurring over the northern portion of the upper lake region where it ranged from 3° to 4° per day. While over much the greater part of the country the month averaged colder than usual, the departures from normal have not been marked. Deficiencies ranging from 3° to 5° are shown over portions of the plateau region, eastern Rocky mountain slope, upper Missouri and central Mississippi valleys, and in the gulf states.

Two cold waves occurred during the month. The first, which was also the first marked type of winter weather of the season, made its appearance over the northern Rocky mountain region on the evening of the 19th, and spreading southward and eastward slowly, but with great regularity of movement, embraced all portions of the country east of the Rocky mountains, except Florida, and reached the Atlantic coast region on the 23d. While severest over the Rocky mountain districts and western plains, where the temperature fell from 40° to 50°, its effects were but slightly less pronounced in the western lakes and central valley regions. East of the Alleghany mountains the cold moderated somewhat, though it was quite severe for the season. Falls of from 20° to 30° were experienced in northern Georgia, and the line of freezing temperature extended south to the east gulf coast during the night of the 22d, a rare occurrence in November. Very cold weather continued in the west for several days, the zero line dropping well down into Kansas on the night of the 22d. The lowest temperature recorded during this cold spell was 26° below zero, at Williston, N. Dak., on the 22d.

The second cold wave developed in the Lake Superior region during the night of the 25th, and moving rapidly southeastward caused temperature falls of 20° and more throughout the upper Mississippi and lower Missouri valleys on the morning of the 26th. Its progress was somewhat less rapid during the 26th, and on the morning of the 27th its crest was over Tennessee, but the freezing line had extended very nearly to the east gulf coast and embraced all the Atlantic states, except Florida. The scope of this cold wave was small as compared with its predecessor, but its effects were severer in the middle and south Atlantic states, especially in the latter.

PRECIPITATION.

There was more than the usual amount of precipitation along the gulf and south Atlantic coasts, and from Maryland northward to eastern Maine including portions of the lower lake region, the total for the month generally ranging from four to seven inches. There was also more than the usual precipitation in southern Minnesota, Iowa, northern Missouri, and from the eastern portions of Kansas and Nebraska westward to the north Pacific coast, including portions of Montana and the southern plateau region, the total amount on the north Pacific coast ranging from four inches in northern California, to more than fifteen inches at Neah, Wash Over much the greater part of California the month was drier than usual, the total rainfall ranging from an inappreciable amount in the vicinity of Los Angeles, to about a half inch at San Francisco and Sacramento, one and a quarter inches at Red Bluff, and more than four inches on the extreme northern coast.

The month was also drier than usual in the upper Missouri, Ohio, and central Mississippi valleys, over the greater part of the lake region, portions of the middle Atlantic states and Florida, New Mexico, Oklahoma, and the greater part of Texas, the deficiency ranging from 1 to 2 inches over portions of the upper lake region and lower Ohio and central Mississippi valleys.

At the close of the month there was from 3 to 16 inches of snow on the ground in New England and the northern portion of the middle Atlantic states, from 1 to 14 inches in the upper Mississippi valley, and from 1 to 10 inches at northern Rocky mountain stations; in the lake region and the Ohio valley there was a light covering ranging from trace to 1 inch. The southern limit of snow at 8 P. M., November 30th extended from northern Colorado eastward to the lower Ohio valley and thence to the southern New Jersey coast.

NOVEMBER WEATHER RECORD.

The first and second decades of the month were generally mild, but the last decade brought severe storms of rain, snow and sleet, and weather of the wintry type. The advent of winter was nearly a week earlier than usual in this section.

The mean temperature for the state was 32.2°, as shown by records at 112 stations. By sections the averages were as follows: Northern section, 29.8°; central section, 32.2°; southern section, 34.5. The state average, 32 2°, is slightly below the normal for November.

The precipitation by sections was as follows: Northern section, 1 56 inches; central section, 1.40 inches; southern section, 1 41 inches; average for the state, 1.50 inches. The precipitation was largely in the form of snow and sleet, and was fairly well distributed. The "norther" on the 21st and 22d was unusually severe for the month of November. At Sioux City on the 22d the wind attained the extreme velocity of 60 miles per hour.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30.06 inches; highest observed, 30.53, at Clarinda on the 23d; lowest observed, 29.30 at Davenport and Dubuque on the 21st; range for the state, 1.23 inches.

Temperature.—Monthly mean, as deduced from 112 reports, was 32.2°; highest monthly mean, 39.3°, at Ft. Madison; lowest monthly mean, 26.5°, at Osage; the highest temperature reported was 78°, at Corning, on the 3d; the lowest temperature reported was 17°, at Spirit Lake and Algona, on the 22d and 26th; the average daily maximum was 42 7°; the average daily minimum was 22°; the average monthly maximum was 67.4°; the average monthly minimum was -6 9°; the greatest monthly range was 85°, at Thurman; average monthly range, 74 2°.

Precipitation.—Average for the state, as determined from the reports of 112 observers, 1.46 inches; the largest amount reported was 3.61 inches, at Indianola; the least amount was .33, at What Cheer; the greatest daily amount reported was 1.76 inches, at Hampton, on the 21st; average number of days on which .01 inch or more of precipitation was reported, 6.

Wind—Prevailing direction, northwest; highest velocity reported, 60 miles per hour, from the northwest, on the 22d, at Sioux City.

Weather.—There were 14 clear days; 8 partly cloudy days, and 8 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.04	30.49	24	29.30	21
Des Moines	30.08	30.49	26	29.49	20
Clarinda	30.08	30.53	23	29 39	20
Oresco	.....	30.49	9	29.46	21
Dubuque	30 04	30.52	24	29.30	21
Omaha, Neb	30.06	30.52	6	29.40	20
Keokuk	30.08	30.49	11	29.38	21
Sioux City	30.06	30.51	9	29.44	20
Average	30.06	30.53	23	29.30	21

WIND MOVEMENT.

STATIONS	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	6,430	37	NW	5
Des Moines	6,194	37	SW	4
Dubuque	6,158	42	NW	5
Keokuk	6,710	36	NW	5
La Crosse, Wis	5,835	30	NW	5
Omaha, Neb	6,180	34	NW	21
Sioux City	10,262	60	NW	22

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* A "norther" raged all day of 21st, the high northwest gales continuing until evening of the 22d. Snow drifted greatly and in places was five or six feet deep. It was one of the severest blizzards in this section for many years A cold wave followed which continued nearly all week.

BONAPARTE—*B. R. Vale.* A variable month. Many snows of small importance A poor month for gathering corn.

DENISON—*J. H. Holmes.* Very severe storm all day of 21st. Snowed and blowed until all business and work was stopped.

FOREST CITY—*J. A. Peters.* About 40 per cent of the corn is yet in the field on account of the heavy snows of the 22d to 29th. It is standing up, however, and consequently will be but very little damaged.

GRUNDY CENTER—*Geo. F. Ellis.* Only half of the corn crop has been gathered.

HUMBOLDT—*H. S. Wells.* The snow caught the farmers with much corn in the field. Where it stands up it is being gathered. Ground was not frozen when snow came.

IOWA FALLS—*J. B. Parmelee.* A cold rain, freezing as it fell, began at 5 A. M. of the 21st, and continued to about 10 A. M., when it gradually changed to sleet and snow, wind changing to northwest By night a genuine blizzard was in progress continuing all night and till noon of the 22d.

LARRABEE—*H. B. Strever.* A blizzard raged on the 21st, from early morn till late at night. Stock suffered generally. Considerable corn yet in the field.

LINN GROVE *J. W. Hubbard.* Sun dogs on 22d and 23d.

MONTICELLO—*C E. Heisey.* This has been a severe month for the farmers. The different snowstorms of November 20th, 27th and 28th, have caught a great many of our farmer friends with all the way from ten to fifty acres of corn to pick.

OSKALOOSA *Jos. Boyd.* The month was disagreeable for gathering corn; about one-half is still in the fields.

SIDNEY—*G. V. Swearingen.* Severe blizzard the 21st. Drop in temperature of 64° in twenty-eight hours; 14 2 inches of very light snow fell. Brilliant display of sun dogs on mornings of 23d and 30th.

TOLEDO—*Chas. Mason.* The fore part of the month was rather mild and favorable for corn husking. The latter part was stormy with considerable snow and good sleighing.

THURMAN—*O. R. Paul.* One of the worst blizzards that ever visited this section of the country at this time of year was on the 21st. Four inches of snow and a very strong wind that drifted snow badly.

WASHTA—*H L. Felter.* Big blizzard on the 21st. Coldest weather 13° below zero on the 25th.

WHITTEN—*F. P. Butler.* Rain, sleet and snow on the 21st; temperature fell 59° in thirty-six hours.

WAPELLO—*G. W. Schofield.* Thunder on the 21st; it has been a very disagreeable month for farmers in keeping them out of the cornfields.

RIDGEWAY—*Arthur Betts.* A good month, though the last nine days were decidedly wintry. A good month for fall work. Ground froze up on the 22d. The night of the 4th was phenomenally warm, mercury not going lower than 50°. We had seven hazy days which farmers call Indian summer. There was constant lightning in the east on the 4th in the evening, after the warm night and two warm days. Corn is nearly out. It goes from 30 to 60 bushels per acre, and averages about 40. Wild flowers up to 21st.

ERRATA FOR OCTOBER.

Mean temperature at Algona should be 45 3°.

Total precipitation at Chariton should be 5.29 inches.

Mean temperature at Cresco should be 44 6°.

Mean maximum temperature at Fairfield should be 58 4°; mean temperature should be 49 8°.

Minimum temperature at Grand Meadow should be 26° on 26th; mean temperature should be 45.6°.

Mean temperature at Logan should be 47.5°.

Minimum temperature at Mt. Pleasant should be 24° on 31st.

Total precipitation at St. Charles should be 3 64 inches.

Maximum temperature at Vinton should be 76° on 4th.

Total precipitation at West Branch should be 3 72 inches.

Total precipitation at Whitten should be 5 88 inches.

ERRATA IN JULY MONTHLY REVIEW.

Total precipitation at Charles City should be 2.98 inches.

Total precipitation at College Springs should be 8 28 inches.

Maximum temperature at Humboldt should be 96° on the 24th.

Minimum temperature at Ovid should be 52° on the 11th.

BELATED REPORTS.

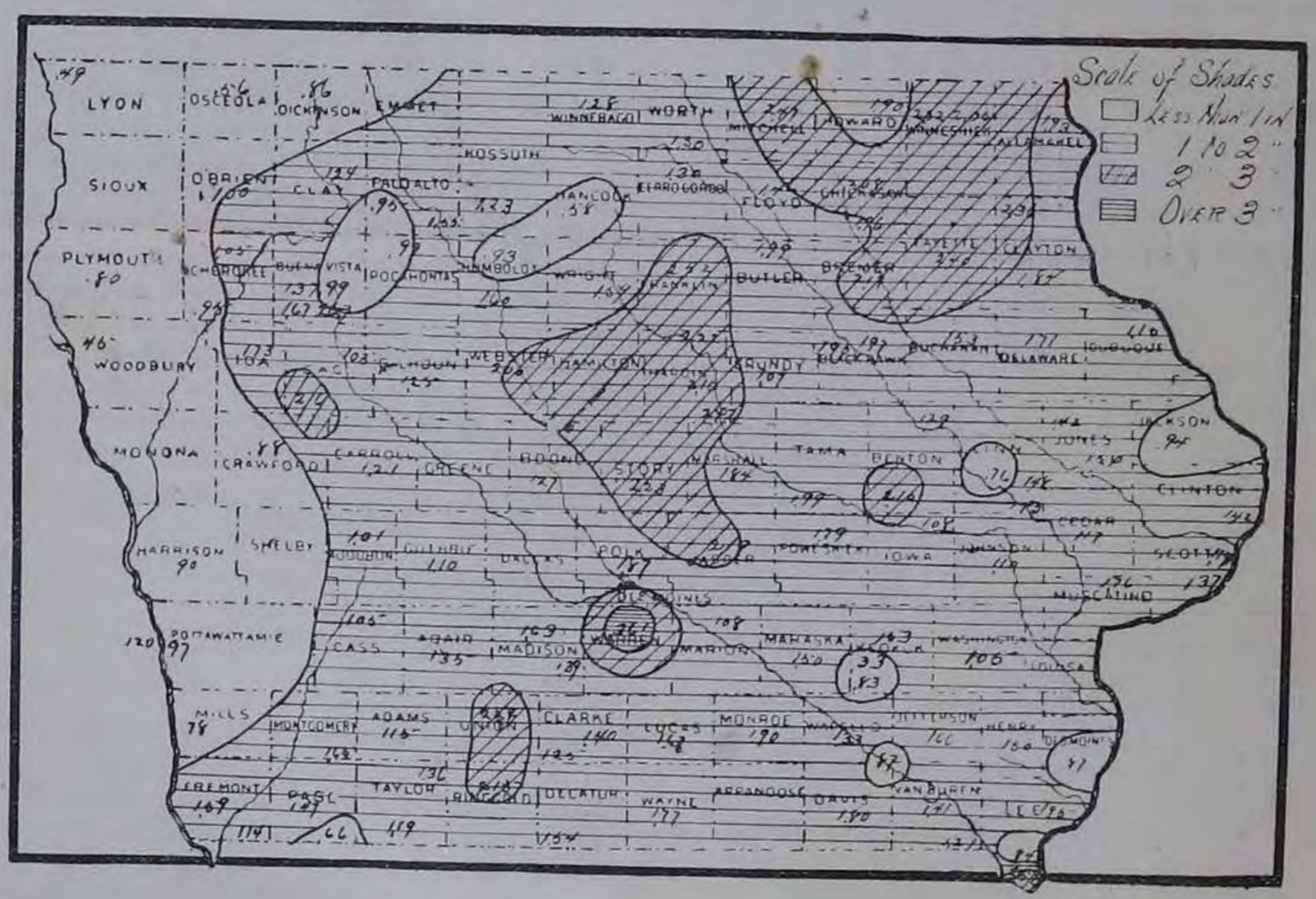
Reports received too late to publish in the October REVIEW:

KNOXVILLE—Mean temperature, 49.8°; mean maximum temperature, 58.9°; mean minimum temperature, 40.7°; highest, 83° on the 4th; lowest, 25° on the 26th. Total precipitation, 4.01 inches; greatest in twenty-four hours, 2 inches on the 17th. Number of clear days, 7; partly cloudy, 8; cloudy, 16; rainy, 8.

FAYETTE—Mean temperature, 44.8°; mean maximum temperature, 52.5°; mean minimum temperature, 37°; highest, 78° on the 4th; lowest, 21° on the 26th. Total precipitation, 3.88 inches; greatest in twenty-four hours, 2 03 inches on the 16th and 17th. Number of clear days, 3; partly cloudy, 6; cloudy, 22; rainy, 11.

WEST UNION—Total precipitation, 7.20 inches; total snowfall, 4 inches; greatest in twenty-four hours, 2.83 inches on the 19th. Number of rainy days, 6.

Precipitation Chart November 98.



DAILY AND MONTHLY PRECIPITATION FOR NOVEMBER, 1898.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total.
Afton										T							90				1.08						.26				2.24
Algona					.03								.20				.16	.09				.45			.15		.15				1 23
Alta (Hadden)					.05			T					.25				.24	.02			.6				.03		.15	.03			1 37
Albia									.30												1 20			.10				.30			1.90
Amana								T	.10	.15			.06				T				.43	.15			.10			.07	.02		1.08
Atlantic																						.80			.07		.10	.07			1 04
Audubon												.11									.70						.20				1.01
Belknap										.40										.60		.20				.20		.40			1 80
Belle Plaine									.30	.20		.10									.90	.30			.10			.25			2 15
Bonaparte								.22		26											.51				.06			.16			1.21
Britt					T				T				17				.04	.04			.23	.10			.08		T	.10			.76
Bedford													02								1.00				T			.17			1.19
Carroll											T		04								85			07		.20	.05				1.21
Cedar Falls													10								1.50							.20		.10	1.90
Cedar Rapids				T	T			T	01			T	03									.52			.02			.15			.76
Charlton								.04	.10	.08			04				.02				1 15				.09		.02	13			1.67
Charles City					.04					T			.05	T			.10	T		.99				.30				.03			1.51
Clarinda												.05										1.10			.05			.27			1.47
Clinton				.03					.24	.57				01			.25	T			.18				.06			03			1.42
Clear Lake													24					.06			.20	.60					.20	T			1.30
College Springs										.10											.50					02		.04			.66
Corning													15				T					80			T			.20			1 15
Council Bluffs												.03									.34			.20			.40				.97
Cresco					.06								10				.04	02			1.49				.11			.08			1.90
Davenport				T	.02			T	.24	.46			.01	T			.16	.01	.01		.16	.12			.03	.04		.11			1 37
Decorah													15								1.30	.43			.17						2.05
Delaware					.03					.15			07				.14				1.07				.18			.07			1.71
Denison													09								.60	.12		T			.03	.04			.88
Des Moines				T	T	T			T	.08			.08	.01			.01	T			1 06	.21			.12		.04	.23	.03		1.87
Dows					.04				T				.30				.10	.10				.75			.15		.10	.05			1.59
Dubuque				T	T				01	T			T	.04			.23	.09			.40	.17			.10			.09	.02		1.15
Eldon								.10	.10				T			T	T				.50	T			.07			.10			.87
Eldora									.20				.40				T	T			.10	80			.40			.20			2 10
Elkader					T				.02				.05				.20	T			1.33				.16			.08			1.84
Estherville													20				T	T			.30	.20			05		.05	.10			.90
Fairfield								.03	22	.20			.03								.68	.10			.20			.20			1 66
Forest City													.18	T								.50			.40			.20			1 28
Fredericksburg						.21											14			1 12	.25							.24			1.96
Ft. Madison				.27				.27	.25			.09	T	09			T				.70	T			.20			.08			1.95
Galva					T								.20				T				1 45									.08	1.73
Glenwood												T								.68					T		T	.10			.78
Grand Meadow					.14				T				08				.16				1.26	1 52			.10			.10	T		2.36
Greene										T			21	.06			T				.95	.52			.20			.05			1.99
Greenfield								T	T			.06	T					.01			.60	.03			.16		25	.24			1 35
Grinnell									.15				.05								1.23				.14			.22			1.79
Grundy Center					T				.10			.10	.10								.52	.10			.10			.05			1 07
Guthrie Center													T					T	T		.70				.20			.20			1.10
Hampton									1.04			.27	.07				.01				1.76			.08	.05		.08	.06			2.52
Hawkeye				.13							.05		03				.32				1.12	.25		.45							2.50
Hedrick								.07	.1				.04								.37	.10			.10			.03			.83
Hopeville		T							.04								.03				1 05	.02			.02		.09				1.25
Humboldt														.20			.06		.01			.42	.18			.01			.02			.93
Independence				.01					.10				T				T				.80	.05			.40		.17				1.53
Indianola					T				.60	.10			.05	T			.02	T				1 00	1 50		.20		.04	.10	T		3 61
Iowa City										.22							T				.70				.04			.14			1.10
Iowa Falls					T				05				.17				06	T			.94	.40			.30		.20	.10			2.22
Keokuk			T		.32			.01	.12	.12			.06				.01				.69	T			.06			.08			2.52
Keosauqua								.08	19								T				.79				.15			.20			1.41
Lamoni									05				T				T				1 00	.28			.10		.01	.10			1.54
Lansing				T	.11								T	.05				.04	T		1 07	.43			.18			.05	T		1.93
Larchwood													.05					.09			.30						.05				.49
Larrabee					.15							.22						T			.55				.08		.03	.02			1.05
Le Claire				.00				.14	.43				.02				.20				.16				.08			.07			1.19
Le Mars									T			.10					T				.60						.10				.80
Lenox			T										.03				T				1.00	.22			.03		.03	.05			1.36
Linn Grove								.01	.22				.08				.07	.05			.69				.18			.18			1.48
Logan																				.60				.20			.10				.90
Maple Valley					.06							.30					.22	.04			.70			05			20	.05		.05	1.67
Maquoketa					.06					.18			.06				.09				.35				.14			.06			.94
Marshalltown									.01	.05			.07	T			T				.82	.60			.15			.14			1.84
Mooar					30			T	T	.10			T				.14								.20			10			.84
Monticello					.03					.14			.07				07				.90							.21			1 42
Mt. Ayr									T				.02				T				1.25	.75			.08		T	.13			2.23
Mt. Pleasant								20		.25							04				.61	T		T				.40			1.50
Mt. Vernon									.10		.38											.95									1.43
New Hampton					.05								.20	.01				.07			1 00	.10			.45		.20				2.08
Newton									.23				T								.95	.75			.10			.16			2 19
Northwood													.20									.60			.20			.30			1.30
Odebolt				T									.11						.01		80	.30			T		.90	.04			2.16
Ogden										.02			.06				T	T			.55	.48			.08			.08			1.27
Olin				T	T			T		.40			T				.16				.46			.12				.10			1.24
Omaha (Neb)									T	T			01								.83	.22			.08		.03	.03			1.20
Osage					.04								.16				T				1 07	80			.20			.20			2.47
Osceola									.10			T	T				T				.80	10			.10		.20	.20			1.50
Oskaloosa								T		.30								T		.75		.20			.05			.20			1.50
Ottumwa							T		T	.28			T								.85				.20						1.33
Ovid								.02	.10	.21			.05				T				.97	.20			.08			.14			1.77
Pella										.20											.67	.17			.03			.20			1 27
Pioneer					T				T				T				T	T				1.10			.20			.30	T		1.60
Plover					.04				T				.20				.15	.04			.30	.10		T	.02		.10	.02		02	.99
Primghar				3									.20						.20		.20									.10	1 00
Ridgeway					.09								.12				.16	.04			1.00	.28			.40			.19	.04		2.32
Rockwell City					T								.31								.41						.53				1.25
Ruthven													20					.20				.30			.15			.10			.95
Sac City												.25	T				.10				40	.10			.01		.15	.02			1.03
Sibley					.12								.12								.10	10			.02		.05	.05			.56
Sidney																					.45	82			.06		.10	.16			1.59
Sigourney					T			T	.15	.22			.09				.07	.05			.47	.27			.12			.21			1.53
Sioux City					T				T			.02	.22				T	T			.11	.01			T		01	.08			.45
St. Charles					T				T	.05			.09	.02			.01				1.00				.06		.07	.09			1.39
Storm Lake					.05				T				.27				.16	01			.35				T		.12	.03			.99
Spencer					.06								.23					.36			.18	36			.05						1.24
Spirit Lake									T				.38				T	.08				.38				T	T	.02			.86
Tara													.50								1 50										3.00
Toledo										.20			07								.93	.33			.20			.26			1 99
Thurman													.06	T							85	T			.04		.15	.04			1 14
Villisca												.15					T				1 40				.10						1.65
Vinton									.30				.05								.69	.10			.20			.30			1.64
Washington									.08	.20											.22							.55			1.05
Washta					T			T	T				T				.35	T			.60						.05	.05			1.05
Waterloo					T				T	.07			.09				.06	T			.96	.53			.16			.10	T		1.97
Waverly										.06			.11	.05			.05	.02			1.21	.39			.18			.08	.02		2.17
West Bend					.10				T			.25	T				.18	.02			.70				.10		.10	.10			1.55
West Branch					T				.40								.05				.56	.03						.10			1.17
Whitten									T	.20			.20				T	T			.92	.50			.50			.10			2.42
Wilton Junction									T	.50							.18				.68	T			.20			.20			1.76
Winterset										.05			1.00	.50				.07			.67	.72				.10		.17			3.28
Wapello					T								T								.38				.10			.25			1.20
What Cheer			T						T				.01					T			.02	.10			10	T		T			

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR NOVEMBER, 1898.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Afton	Max	59	60	69	69	61	52	68	57	36	40	45	49	39	40	49	55	50	51	50	67	58	10	11	28	29	14	28	29	34	31	44.8
	Min	31	30	37	49	42	31	29	27	32	25	18	28	30	32	24	26	31	27	26	38	8	0	-2	-4	-3	-4	-5	14	18	18	21.8
Albia	Max	62	60	68	69	66	55	68	68	40	43	43	45	42	33	42	51	40	50	70	65	31	21	21	..	..	..	31	35	38	33	47.9
	Min	43	30	38	49	43	37	35	28	30	26	18	22	32	22	24	28	30	28	30	35	16	5	-3	..	..	..	10	21	18	14	26.5
Alta	Max	52	62	66	61	53	50	58	29	35	38	44	44	35	36	50	51	43	48	45	60	13	12	12	17	16	12	27	30	29	28	38.6
	Min	36	28	35	49	35	28	33	22	24	16	22	24	32	17	25	28	29	26	25	34	5	-4	-4	-2	10	-8	4	20	16	8	21.0
Amana	Max	58	56	62	68	63	48	66	55	40	36	40	43	41	36	46	47	48	48	44	63	55	27	11	20	30	10	24	33	33	25	42.5
	Min	43	29	37	51	43	32	30	30	32	26	11	17	32	26	21	27	32	33	33	32	27	8	-1	1	10	6	-5	22	23	5	23.4
Atlantic	Max	53	62	68	67	56	55	63	33	35	43	46	43	38	40	52	52	47	52	52	68	21	12	17	22	28	20	26	35	37	36	42.6
	Min	30	21	28	42	39	29	41	29	30	18	14	16	31	29	24	30	32	21	22	28	9	-1	6	-2	-1	-9	1	22	12	6	19.5
Audubon	Max	60	60	65	67	55	58	60	39	35	35	44	44	38	40	48	53	44	50	50	56	20	10	14	20	29	26	25	31	34	30	41.7
	Min	30	28	34	35	35	29	30	25	23	20	19	21	32	20	25	30	31	30	24	31	8	-5	-1	-1	-7	-5	-3	22	19	13	19.6
Belknap	Max	64	65	71	69	57	53	70	45	44	39	45	47	40	38	50	54	53	52	52	66	30	31	28	29	34	16	20	34	40	36	45.7
	Min	26	25	40	45	47	35	36	32	32	28	23	27	30	26	26	29	29	30	32	37	30	9	3	5	6	-1	4	20	20	20	25.1
BellePl'ine	Max	58	59	62	67	48	47	64	68	40	39	40	40	42	39	41	47	48	50	55	60	40	36	16	20	30	15	27	33	32	33	43.2
	Min	40	28	34	40	40	40	34	28	29	27	10	28	21	21	23	20	30	28	32	35	20	20	-8	-3	14	-10	-8	18	15	2	21.6
Bonaparte	Max	64	63	70	70	62	51	70	50	34	39	47	49	44	39	49	54	47	54	51	66	50	16	17	27	34	15	27	32	41	32	45.6
	Min	45	29	40	52	45	34	34	33	32	25	19	25	33	24	22	29	32	29	37	35	15	10	3	15	-2	0	23	26	24	14	25.4
Britt	Max	51	59	65	64	52	47	59	45	38	38	46	45	38	33	48	50	47	41	43	64	42	16	6	19	5	6	23	32	29	25	39.2
	Min	31	22	27	38	33	25	35	26	26	17	15	20	32	19	20	26	30	27	30	32	8	0	-6	-6	-5	-9	-2	20	9	0	18.0
Burlington	Max	50	60	65	70	65	..	..	..	..	40	47	48	44	40	48	53	45	54	48	63	59	32	15	20	35	24	28	32	40	31	44.9
	Min	30	30	45	55	45	..	..	..	..	29	21	25	35	29	27	31	35	29	39	36	30	20	12	8	20	-2	2	24	28	11	26.7
Bedford	Max	58	62	70	72	60	58	72	46	40	46	48	51	42	47	47	58	54	75	56	57	57	14	22	22	33	19	30	35	40	38	47.6
	Min	36	24	35	42	40	28	48	28	31	28	15	18	32	20	22	28	35	20	25	34	7	-1	-7	-5	22	-9	21	22	6	12	21.9
Carroll	Max	54	63	69	64	56	54	62	32	35	44	48	44	35	43	53	52	42	53	49	68	16	12	14	17	23	17	25	35	34	34	41.6
	Min	42	25	47	48	34	28	34	23	25	19	17	22	30	18	25	29	25	25	20	28	4	-5	-12	-5	11	-8	-1	17	18	5	19.5
Cedar Falls	Max	37	60	63	65	65	52	50	52	54	50	45	42	38	45	50	48	51	48	43	62	45	10	10	20	22	10	21	30	31	30	41.6
	Min	22	28	34	55	39	28	25	30	30	20	14	22	33	23	22	30	31	32	34	30	30	4	-5	0	-4	-8	-5	20	15	5	21.1
Cedar Rap	Max	59	60	65	70	65	48	69	48	38	40	42	45	40	36	50	50	48	49	44	64	53	25	13	21	30	9	26	33	32	24	43.2
	Min	41	31	38	53	41	32	31	31	31	25	15	21	32	27	26	30	35	32	30	33	22	7	1	2	5	-5	-5	24	21	8	23.8
Chariton	Max	61	62	69	68	63	55	69	54	38	41	46	47	41	41	51	55	48	54	52	66	58	15	17	22	28	16	28	30	40	35	45.7
	Min	44	31	39	48	42	33	32	28	31	26	22	26	33	24	25	29	32	37	27	35	9	4	-2	-1	14	-4	-1	23	13	5	24.0
Charles Cy	Max	51	57	62	62	56	48	59	45	36	41	45	43	39	35	47	50	50	45	61	60	21	9	16	24	5	..	19	..	..	..	40.2
	Min	42	25	31	52	36	29	30	30	28	26	13	20	32	26	22	28	30	32	28	20	4	-7	-9	4	-8	..	-10	10	15	3	20.1
Clarinda	Max	62	65	72	72	63	60	72	42	42	48	50	51	48	47	54	58	56	57	57	72	28	16	14	32	32	18	25	34	38	35	47.3
	Min	42	33	43	52	47	40	44	32	33	28	21	26	36	29	26	31	40	28	33	32	8	-2	-7	-4	6	-5	10	22	19	18	25.4
Clear Lake	Max	49	57	61	60	53	45	56	47	36	40	45	44	37	34	48	49	49	46	41	63	41	12	8	10	22	7	21	30	29	25	38.8
	Min	43	30	34	49	30	21	32	27	25	20	20	22	32	21	24	30	28	29	29	31	11	-1	-7	-6	1	-9	-2	11	9	4	19.6
Clinton	Max	61	57	65	68	60	46	65	50	37	39	37	41	40	37	46	50	44	44	43	58	56	37	18	24	32	.14	28	35	35	25	43.1
	Min	41	29	32	50	42	29	27	29	33	20	5	13	26	32	22	25	25	37	28	50	29	11	4	4	13	-3	-2	25	21	10	23.6
College Sps	Max	60	61	70	70	61	56	68	50	40	54	47	49	43	43	51	56	54	56	55	69	68	9	16	25	32	17	27	38	39	41	47.5
	Min	39	29	38	53	42	29	40	..	31	23	21	26	32	26	27	29	26	23	26	40	9	-2	-7	-1	15	-6	8	22	12	22	23.5
Corning	Max	59	65	78	70	59	56	69	50	37	44	45	47	41	45	51	56	51	55	52	69	59	14	17	22	30	15	25	32	41	36	46.3
	Min	43	29	38	52	43	32	43	28	32	27	32	25	32	23	30	32	40	35	31	41	9	2	-3	2	16	-2	9	24	19	21	26.2
Co. Bluffs	Max	57	67	74	64	62	64	61	33	35	46	48	44	44	52	57	58	49	57	54	69	30	17	22	24	24	20	25	37	41	39	45.8
	Min	33	30	30	30	40	33	42	30	29	22	23	23	30	28	25	31	32	27	32	22	8	0	-2	4	4	-4	10	17	16	19	22.1
Cresco	Max	51	55	61	62	50	43	59	36	34	39	45	43	36	35	48	50	48	42	38	57	34	14	7	17	24	4	20	27	31	17	37.6
	Min	32	37	31	50	32	27	28	30	27	20	15	22	32	25	22	29	32	34	28	28	20	4	-7	-5	-1	10	-8	19	12	0	19.8
Davenp'rt	Max	60	61	65	68	60	47	68	49	36	38	43	45	40	36	47	49	44	47	43	59	57	22	17	24	33	12	28	31	36	26	43.0
	Min	44	36	42	54	43	33	37	34	32	25	16	22	31	30	28	32	34	34	34	34	22	10	4	7	5	-1	3	27	22	13	26.2
Decorah	Max	53	55	60	62	57	44	62	37	37	42	47	46	38	39	48	42	50	42	39	58	52	24	9	12	27	12	24	30	30	22	40.0
	Min	38	26	32	32	33	28	27	28	27	22	10	22	31	24	22	32	31	33	23	28	23	8	-5	-9	0	-8	-9	17	14	4	19.5
Denison	Max	52	60	67	67	66	53	58	34	35	38	45	45	39	40	52	53	43	53	52	66	14	9	10	22	18	11	25	34	34	35	41.0
	Min	40	23	33	47	37	27	40	24	27	16	19	25	31	21	21	27	31	23	22	30	7	-4	-8	2	2	-7	6	20	19	6	20.2
Des Moines	Max	58	62	68	68	58	54	67	44	38	44	45	45	40	39	51	55	48	54	49	69	36	15	13	19	28	13	25	31	38	31	43.6
	Min	40	32	40	49	42	33	41	31	33	29	21	26	33	24	27	32	33	29	32	36	9	6	1	2	3	-2	0	23	20	14	24.6
Dows	Max	52	60	64	64	52	49	61	49	34	42	46	42	37	32	49	52	49	..	61	66	60	13	2	14	23	6	20	27	29	25	39.3
	Min	42	25	31	41	36	25	34	24	28	26	12	21	31	19	19	28	31	..	26	31	10	0	-6	-6	1	-11	-6	19	13	0	18.1
Dubuque	Max	58	58	63	67	62	46	67	46	35	42	44	45	38	36	48	48	47	46	41	58	55	30	15	24	29	14	25	35	32	26	42.5
	Min	40	32	41	54	38	32	33	34	28	26	19	23	32	28	26	31	34	38	32	31	30	9	2	3	5	-2	0	25	21	9	25.1
Eldon	Max	61	62	70	69	67	50	71	59	39	38	39	46	38	26	38	41	45	41	49	56	53	17	9	20	19	19	25	31	28	23	41.6
	Min	47	28	37	50	41	30	33	32	32	28	9	12	32	26	11	29	33	33	36	31	11	9	2	3	15	-6	-3	20	12	8	22.7
Eldora	Max	52	54	56	58	56	54	49	45	53	48	52	46	50	38	50	54	58	64	55	64	54	15	18	24	28	18	28	32	30	33	44.5
	Min	28	30	34	37	35	24	27	26	24	20	11	19	29	17	20	19	30	22	28	30	12	1	-9	-9	-1	-12	-7	18	20	-1	17.4
Elkader	Max	61	63	66	67	54	50	66	42	35	48	52	48	39	41	54	54	52	44	39	61	52	14	19	27	29	18	26	30	30	32	43.8
	Min	43	25	33	33	30	27	25	31	30	19	12	18	30	24	21	28	30	36	25	30	34	7	-2	-4	2	-8	-7	20	18	5	20.6
Estherv'le	Max	53	61	64	60	52	50	57	48	36	39	46	46	43	34	49	50	42	46	43	58	42	15	13	..	18	14	26	29	25	31	41.0
	Min	41	21	23	45	29	25	32	19	21	10	23	27	29	17	19	22	19	25	27	27	0	-7	-2	..	-2	-11	-1	17	10	2	17.1
Fairfield	Max	64	63	69	71	65	51	70	60	39	39	46	48	42	39	50	51	48	55	62	68	56	22	15	29	34	18	25	31	43	32	46.9
	Min	38	30	39	49	49	31	32	29	32	29	16	24	34	25	21	26	32	28	34	36	22	9	2	3	14	-2	-4	8	19	12	24.0
Forest City	Max	50	59	62	67	63	48	58	46	48	41	44	42	32	32	48	49	47	48	44	63	55	7	3	12	3	3	19	25	14	17	38.3
	Min	42	25	29	42	33	25	32	34	32	27	34	22	29	20	20	29	31	26	28	32	7	-3	-7	-7	0	-10	-3	19	14	2	20.1
Galva	Max	56	62	67	62	59	53	58	46	35	40	45	44	37	39	44	54	44	51	49	63	31	11	12	15	22	16	28	33	33	33	41.4
	Min	40	29	33	45	33	28	39	23	25	15	20	24	35	19	24	28	30	22	38	30	6	-4	-5	1	3	-6	6	21	18	8	20.9
Glenwood	Max	63	66	75	69	62	60	65	55	36	44	47	46	45	47	57	59	49	58	53	72	48	24	15	22	22	16	25	33	40	38	47.0
	Min	44	26	33	53	41	30	42	39	29	21	16	21	32	25	27	34	39	24	27	39	6	0	-8	-3	5	-7	7	22	19	20	23.4
Greene	Max	52	60	64	62	57	48	62	49	35	43	47	43	40	36	50	54	50	48	45	64	59	18	18	18	25	9	23	31	29	27	42.2
	Min	40	26	32	50	37	28	31	29	28	25	14	21	32	25	21	28	30	32	32	30	18	3	-7	-8	7	-10	-7	19	16	0	20.7
Greenfield	Max	59	62	69	70	58	57	66	48	39	43	47	49	41	43	41	52	57	54	51	69	30	11	15	28	30	15	32	38	36	35	44.9
	Min	37	32	38	46	40	29	40	26	27	20	20	20	32	20	19	19	25	32	25	30	7	-1	-6	-3	0	-9	3	22	17	15	30.7
Grinnell	Max	56	57	62	65	62	48	65	49	37	38	42	43	38	35	42	51	46	47	44	64	59	20	11	18	26	8	24	30	34	27	41.6
	Min	44	33	40	52	42	31	35	29	31	28	23	25	33	23	24	29	34	29	34	34	19	8	-1	0	6	-5	0	20	17	10	24.2
Grundy C'r	Max	56	60	64	65	53	48	64	48	35	41	46	45	38	34	50	54	50	48	44	66	52	14	8	20	27	8	24	30	32	26	41.7
	Min	36	28	34	48	35	28	30	27	28	21	15	19	30	20	20	26	31	26	29	29	14	3	-6	-6	-2	-10	-7	19	16	2	19.4
Guthrie C'r	Max	65	67	69	69	69	68	68	42	60	40	41	47	39	50	50	60	65	70	67	67	32	16	13	22	27	18	26	35	36	36	47.8
	Min	39	29	30	29	20	21	21	22	20	20	19	29	23	20	20	30	37	37	33	0	-8	-3	-3	5	-4	10	10	11	11	9	18.0
Hampton	Max	52	60	64	64	51	47	61	35	34	42	45	62	36	30	44	52	47	48	43	65	32	10	8	17	25	6	22	29	28	25	39.5
	Min	36	29	34	48	32	28	34	27	29	25	19	22	32	20	23	30	32	28	31	31	12	1	-5	-5	-10	-9	-4	20	17	4	20.7
Hopeville	Max	57	60	68	69	57	52	59	47	36	41	45	45	39	41	49	55	50	51	50	65	53	11	13	21	27	16	25	31	34	32	43.6
	Min	40	32	39	48	39	30	38	28	31	25	22	23	32	23	24	28	34	27	27	40	7	2	-3	-1	7	-5	3	24	19	18	23.4
Humboldt	Max	53	60	66	65	52	40	59	58	38	38	46	45	40	34	48	52	46	49	44	65	50	14	8	19	23	10	23	30	31	28	41.2
	Min	45	26	30	47	36	28	35	30	28	18	16	25	32	20	24	28	32	27	20	34	8	1	-3	-3	8	-11	1	28	19	4	21.1
Indep'n'ce	Max	56	58	63	66	59	46	64	41	36	41	44	45	38	36	48	50	49	46	44	62	44	27	11	20	26	16	21	28	31	26	41.1
	Min	41	23	33	48	36	28	27	28	30	27	12	19	28	26	19	24	29	32	32	26	25	4	-3	-2	11	-9	-8	18	17	4	20.9
Indianola	Max	57	62	68	68	67	54	69	62	37	46	46	46	40	38	50	55	48	52	48	47	67	61	..	21	27	17	27	31	35	30	47.4
	Min	45	33	46	42	44	34	39	27	31	26	23	25	32	22	26	31	34	30	30	45	36	..	-3	-2	15	-5	1	23	19	16	26.4
Iowa City	Max	61	61	68	70	65	49	69	60	39	38	43	47	40	37	50	53	47	48	45	64	55	32	14	24	33	17	29	32	34	28	45.1
	Min	33	29	35	50	47	33	31	31	33	28	13	18	29	28	22	27	33	30	33	30	30	8	1	2	17	-8	-5	23	20	7	23.7
Iowa Falls	Max	54	58	63	64	53	48	61	41	35	42	44	43	37	34	47	50	49	47	44	65	45	10	6	18	26	7	23	31	28	25	39.6
	Min	35	25	30	46	39	27	34	27	29	19	11	18	32	20	24	29	31	27	30	32	11	2	-6	-6	-1	-11	-8	20	13	2	19.0
Keosauqua	Max	48	66	68	77	67	61	71	43	38	48	49	51	44	41	52	56	48	56	54	67	60	19	20	30	36	16	29	33	42	34	47.5
	Min	41	34	41	51	47	36	36	33	32	24	18	20	34	25	24	29	32	31	33	38	17	10	4	6	15	-1	1	6	24	15	25.4
Keokuk	Max	65	67	71	81	57	51	72	45	37	40	47	50	45	39	51	55	50	51	51	65	58	17	20	28	37	15	28	36	42	32	46.8
	Min	47	38	44	56	49	37	40	39	36	30	25	29	35	30	30	34	34	35	37	39	27	12	6	10	20	0	5	27	31	21	30.0
Lamoni	Max	60	59	69	67	57	52	68	49	36	40	44	46	40	42	48	53	53	52	50	65	53	9	12	21	30	14	28	34	35	33	44.0
	Min	43	29	38	47	41	32	36	29	31	26	19	22	34	23	23	25	34	25	26	38	9	1	-4	-1	15	-4	3	23	19	20	23.4
Lansing	Max	58	59	60	66	62	49	63	53	39	46	50	47	41	38	52	54	50	42	43	58	56	38	15	22	28	17	25	29	32	24	44.0
	Min	44	27	34	40	41	31	27	35	31	30	14	20	31	30	24	34	31	38	36	32	38	12	-1	-4	10	5	-5	18	22	9	24.1
Larrabee	Max	54	67	67	57	53	54	58	37	37	40	48	49	37	40	54	51	41	48	56	47	27	12	12	18	18	13	28	34	28	32	40.6
	Min	38	24	29	44	33	25	36	21	22	12	20	25	31	25	24	25	28	25	22	25	5	-5	-8	-3	-4	-11	3	20	15	4	18.4
Le Mars	Max	53	65	64	62	56	53	58	49	35	36	43	46	40	40	53	50	43	40	46	52	34	10	13	20	16	17	27	32	34	33	40.7
	Min	38	28	36	46	28	23	39	24	25	12	19	28	26	20	28	29	31	32	31	34	5	-5	-5	0	5	-7	-7	22	19	3	20.2

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR NOVEMBER, 1898—CONTINUED.

STATIONS.		DATE.																														Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Lenox	Max	57	60	68	69	62	53	67	52	36	42	44	46	41	40	49	54	49	52	50	65	58	10	11	21	21	16	24	32	34	33	43 9
	Min	43	29	38	49	41	31	38	27	32	22	23	21	32	21	24	28	33	26	24	38	7	-2	-5	-3	15	-8	3	21	15	17	22 8
Linn Grove	Max	59	60	63	68	53	46	66	43	34	39	41	44	39	44	46	46	47	47	42	60	52	12	13	22	32	8	25	32	33	24	41.3
	Min	42	30	31	50	39	29	31	29	30	28	14	21	29	29	24	24	28	34	35	30	20	8	0	1	10	-6	-4	22	21	6	22.8
Logan	Max	58	66	62	68	69	68	69	68	65	40	37	35	40	45	40	43	48	50	54	64	20	10	15	25	22	30	25	39	38	30	44.9
	Min	42	26	42	46	49	46	48	46	42	27	29	20	18	24	28	24	28	30	29	40	5	-2	-9	-4	9	-4	15	25	22	18	25.3
Maquoketa	Max	63	57	64	68	64	49	67	56	42	40	40	43	46	47	43	45	45	47	45	63	58	41	44	50	31	26	28	33	34	38	47.2
	Min	31	29	28	50	41	31	28	31	32	27	7	14	31	28	21	26	30	36	33	30	37	10	5	4	15	-5	-4	26	25	29	24 2
Marsh'll't'n	Max	59	62	66	66	56	52	67	50	36	43	47	45	39	38	52	55	50	48	..	66	49	18	11	19	28	11	25	30	35	29	43.2
	Min	45	29	34	45	40	29	32	29	31	27	15	21	32	21	25	30	27	33	..	32	16	5	-5	-3	7	-8	-7	20	17	5	21.5
Mason City	Max	51	58	62	62	51	46	58	35	38	40	47	45	44	38	47	49	48	48	41	63	28	25	7	11	24	11	29	30	28	32	40.1
	Min	33	24	38	49	34	26	32	28	25	22	15	19	32	23	21	29	27	30	30	32	24	0	-9	-11	13	11	14	15	13	-2	21 2
Monticello	Max	58	60	64	68	63	48	66	56	45	42	44	46	40	38	48	50	47	44	42	55	53	34	25	23	29	25	24	30	35	29	41 4
	Min	30	27	34	50	39	29	26	30	30	26	11	17	28	18	20	24	28	36	31	26	34	7	-1	0	14	-6	-7	21	24	6	21.7
Mooar	Max	64	64	70	69	56	50	71	42	37	42	45	50	37	40	49	54	47	45	41	40	40	41	28	30	34	19	20	33	44	36	44.6
	Min	46	30	35	40	48	32	35	32	33	32	16	21	35	28	19	25	32	30	30	28	25	16	16	6	19	0	-2	10	33	14	25.5
Mt. Ayr	Max	65	61	70	69	60	55	70	52	39	42	46	49	49	42	49	56	51	52	52	67	61	15	14	23	29	15	26	31	37	34	46.0
	Min	45	39	41	49	42	31	38	27	30	24	23	22	33	22	22	26	34	24	26	38	8	0	-4	-2	15	-5	4	21	17	19	23.6
Mt Pleas'nt	Max	64	62	67	71	68	52	70	62	42	42	45	47	44	42	51	51	47	52	49	65	63	42	22	31	41	41	32	23	38	40	48.9
	Min	45	31	38	52	46	34	35	33	32	31	20	27	32	28	24	29	27	28	31	35	31	12	4	4	18	-1	2	3	18	28	25.9
Newton	Max	57	61	64	65	58	50	67	47	36	40	45	45	39	35	48	54	48	48	47	65	54	13	10	18	28	15	25	31	35	28	42 5
	Min	40	31	36	53	41	30	35	28	30	26	18	21	33	21	24	28	35	27	33	35	9	5	-5	-1	5	-8	-3	21	18	8	22.5
NewH'pton	Max	54	57	62	62	51	44	60	60	35	42	45	45	43	41	48	51	49	48	47	60	53	7	6	18	24	17	20	27	33	21	41 0
	Min	33	31	50	48	27	28	29	30	29	26	17	20	31	20	20	26	31	35	28	28	24	4	-2	-4	1	-10	-7	14	15	0	20.7
Northwood	Max	49	57	62	50	61	44	57	39	37	40	46	46	40	33	48	49	50	46	41	61	42	15	7	16	23	10	20	30	31	24	39.5
	Min	34	25	26	30	32	26	28	28	22	21	14	19	31	22	19	25	28	30	29	29	14	1	-7	-7	0	10	-5	15	10	6	18.0
Odebolt	Max	54	61	67	66	54	55	57	50	35	40	45	45	38	38	50	51	45	51	48	60	40	11	13	19	22	12	25	32	33	34	41 6
	Min	44	27	31	46	36	28	37	24	25	15	18	22	32	20	26	29	28	27	21	33	6	-4	-6	-2	9	-7	5	20	22	9	20.7
Ogden	Max	56	62	67	68	58	55	65	50	38	43	47	44	40	38	52	55	45	54	50	68	55	15	14	15	26	13	22	30	37	33	43.8
	Min	33	28	35	51	39	27	38	27	30	24	20	22	31	19	24	29	32	24	25	36	9	1	-6	-2	10	-13	-3	20	11	3	20.8
Olin	Max	50	60	59	64	..	52	46	66	44	35	40	41	44	39	35	47	50	48	47	41	59	54	9	13	22	31	10	27	32	33	41.4
	Min	27	28	30	35	47	30	26	30	31	28	10	13	18	31	23	24	28	32	35	28	38	9	0	1	4	-5	-7	-3	25	5	20.7
Omaha	Max	55	63	76	68	63	58	60	53	35	43	45	42	42	45	56	57	49	57	52	68	22	15	15	23	26	17	25	32	40	37	44.6
	Min	43	34	42	53	43	33	38	28	30	22	27	36	31	29	29	33	29	28	31	22	6	-1	1	3	9	1	13	24	26	24	25.9
Osceola	Max	57	62	69	68	57	52	71	40	35	41	47	45	45	41	51	57	50	53	52	66	33	12	14	22	27	13	25	29	35	32	43 4
	Min	45	33	38	51	43	32	39	28	32	25	19	22	32	34	26	30	32	28	26	32	8	3	-3	-2	14	-5	0	22	20	18	23.9
Oskaloosa	Max	63	64	69	70	62	53	69	46	35	39	46	48	42	38	50	54	51	53	50	68	50	12	15	25	35	11	31	35	39	32	45 2
	Min	40	28	36	51	46	30	34	27	31	21	12	20	31	22	23	27	31	26	34	34	12	6	-2	-1	8	-5	0	24	17	10	22.4
Ottumwa	Max	65	64	61	71	59	71	71	72	68	39	47	48	46	37	53	57	54	53	54	67	57	19	18	24	31	21	28	35	43	34	48 9
	Min	26	31	32	49	44	29	30	33	29	26	18	19	23	22	22	24	30	28	33	36	15	6	0	-1	15	-4	-2	5	5	10	21.1
Ovid	Max	63	65	71	70	58	56	71	46	36	45	47	48	39	44	51	36	56	54	55	66	34	15	21	26	30	20	28	31	40	36	45 9
	Min	40	31	39	50	44	31	39	29	31	28	21	24	33	23	25	31	33	28	26	36	8	2	-5	-1	8	-5	2	25	19	17	23 7
Pella	Max	47	53	63	65	52	48	69	38	31	36	37	41	35	34	42	45	43	48	42	65	17	12	8	9	18	6	25	29	32	23	37.1
	Min	46	30	38	55	44	32	30	28	31	28	18	33	33	24	24	24	32	27	34	34	17	6	-1	1	14	-13	0	21	20	11	23 7
Pioneer	Max	52	60	65	63	52	42	57	31	..	..	..	44	38	34	49	52	45	48	45	65	15	12	14	18	22	..	25	32	33	29	40.1
	Min	38	29	35	45	35	29	39	26	..	..	..	25	28	22	24	29	32	28	30	30	5	2	-2	1	5	-9	..	23	10	7	21.8
Plover	Max	55	63	65	70	50	50	60	30	30	32	48	49	35	32	40	48	40	46	45	65	38	10	15	16	20	10	26	35	25	35	38 4
	Min	32	30	28	35	34	28	30	25	24	20	15	25	30	20	20	30	30	38	30	37	10	-2	-4	-6	15	-8	0	20	22	20	20.9
Primghar	Max	55	55	62	55	54	58	58	45	35	25	48	48	35	30	34	47	55	42	43	50	30	5	5	4	12	20	28	23	31	32	37.5
	Min	42	35	34	34	24	23	36	24	24	12	13	24	30	15	30	28	30	24	25	25	10	-5	-8	4	8	-12	5	20	0	-1	18.4
Ridgeway	Max	53	40	65	63	58	47	61	46	40	48	50	45	58	40	50	54	47	43	59	58	50	24	17	23	25	17	25	29	32	27	43.1
	Min	41	29	33	50	39	27	36	30	26	27	18	20	33	29	21	29	32	36	34	28	24	4	-7	-5	5	-9	-5	18	22	3	22.3
Rockwell C	Max	53	62	66	65	44	50	59	33	35	40	45	43	37	37	49	53	46	49	45	65	26	15	11	19	25	11	26	32	32	30	40 1
	Min	35	30	32	49	35	27	35	25	28	18	20	21	32	19	25	27	31	34	24	30	0	-2	-5	-4	5	-10	1	21	12	6	20.0
Ruthven	Max	52	64	66	58	50	58	58	28	34	38	44	44	45	38	50	48	50	46	47	60	55	12	17	15	20	10	23	26	30	30	40.5
	Min	42	36	30	49	33	36	35	20	24	12	23	27	30	19	22	28	27	28	28	17	4	-3	-6	-4	-3	-10	2	19	11	1	19.2
Sac City	Max	58	59	66	59	55	48	58	35	33	36	43	45	33	37	51	57	40	49	47	64	41	14	12	14	14	12	24	27	31	30	39.7
	Min	27	32	31	41	33	29	36	24	26	32	53	36	31	19	27	30	29	26	19	35	6	-2	-3	-4	0	-7	2	20	16	9	21.1
Sidney	Max	56	62	72	68	59	56	64	36	36	40	46	45	43	44	53	56	50	55	53	68	4	12	12	24	25	16	26	33	39	45	43.3
	Min	49	34	39	44	42	35	43	30	30	25	23	26	29	30	29	30	36	28	32	40	4	-1	0	-1	15	0	6	23	25	24	25.6
Sibley	Max	57	63	64	62	52	52	59	44	35	41	45	47	38	36	53	51	41	46	..	52	31	13	13	14	17	16	25	28	25	29	39.6
	Min	20	20	24	34	34	24	36	21	21	9	11	27	27	18	25	24	26	27	..	30	4	-4	-9	-3	4	-12	5	20	10	-1	16.3
Sigourney	Max	62	64	70	71	67	52	70	64	47	39	47	49	42	41	51	55	53	53	51	66	56	16	15	27	35	16	29	35	39	31	47.1
	Min	40	27	34	46	42	29	30	26	29	25	12	15	29	20	20	23	30	29	29	31	21	5	-3	-3	10	9	-8	20	16	12	20 9
Sioux City	Max	55	65	67	60	57	56	58	34	34	40	46	45	40	44	56	53	41	52	49	51	13	11	12	22	17	15	26	33	38	36	40.9
	Min	48	31	40	52	38	31	41	25	25	17	27	26	28	27	26	29	30	29	26	23	4	-3	-4	7	9	-3	13	22	24	11	23.3
Spencer	Max	56	63	65	60	51	50	58	46	36	..	45	47	36	34	51	49	46	46	45	59	32	12	8	13	19	12	24	29	26	30	39.6
	Min	34	22	24	39	33	25	35	20	11	..	16	27	27	18	23	26	27	27	26	30	0	-3	-7	-5	3	-11	5	3	6	0	16 6
Spirit Lake	Max	50	61	65	56	51	52	56	46	36	42	45	46	42	32	40	50	52	47	56	54	34	24	11	13	18	19	27	24	26	23	39.9
	Min	28	24	28	32	32	26	34	28	23	12	24	31	25	19	25	25	26	28	34	32	2	17	-8	-6	-2	-10	20	11	11	3	18.0
StormLake	Max	53	60	63	64	54	51	52	48	34	38	44	42	35	37	50	50	44	48	45	60	37	12	9	12	22	12	24	25	29	29	39.4
	Min	43	30	36	48	43	28	34	22	25	15	23	26	31	12	27	31	32	28	25	34	5	-3	..	0	7	-9	4	20	12	8	22.2
St. Charles	Max	59	64	69	69	56	56	70	47	36	46	49	47	40	44	52	58	48	54	54	70	53	15	20	24	29	21	32	33	39	39	46.4
	Min	49	47	40	46	34	33	38	28	31	25	23	23	32	24	27	30	33	29	28	36	7	3	-2	-3	7	-5	0	21	20	18	24.1
Stuart	Max	51	57	65	65	60	50	62	34	37	40	45	45	47	38	34	53	45	39	43	62	20	10	0	10	25	10	10	30	30	33	38.3
	Min	30	31	32	50	32	31	40	30	26	23	24	22	32	21	23	25	25	23	22	25	10	0	-4	-4	4	-5	2	20	20	49	21.0
Tara	Max	54	51	55	53	30	48	60	51	45	41	43	44	40	39	43	45	48	47	45	48	10	11	18	20	19	25	35	32	30	31	39.1
	Min	27	29	30	28	29	30	31	28	29	27	25	24	21	20	25	27	22	21	20	21	6	0	10	14	6	15	20	18	15	17	21 2
Toledo	Max	58	56	63	67	54	50	55	53	35	48	42	45	40	39	47	52	48	50	46	65	45	10	10	15	32	10	26	33	34	25	41.8
	Min	43	28	35	56	42	29	31	29	33	27	14	20	33	23	22	27	28	26	34	32	23	5	-4	-2	11	-8	-7	20	16	3	22.3
Thurman	Max	61	62	74	68	61	57	64	54	38	39	43	46	45	44	55	56	49	57	53	71	40	24	13	26	28	15	27	33	39	37	46.0
	Min	40	22	31	48	40	28	38	30	30	23	16	30	28	25	25	32	35	28	27	40	3	1	-11	6	11	-10	10	23	11	15	22.5
Villisca	Max	64	61	68	71	68	55	58	40	40	43	45	49	51	44	51	55	52	54	54	68	20	13	10	24	30	15	30	35	30	35	44.4
	Min	26	24	29	36	32	26	36	26	25	19	11	17	25	20	20	25	30	21	23	35	20	-4	-10	-6	10	-11	5	11	15	15	18.4
Wapello	Max	56	71	65	70	66	57	68	65	43	46	49	51	52	50	56	50	44	51	51	61	60	45	35	37	36	44	34	40	51	31	51.2
	Min	28	31	39	52	45	32	33	33	33	30	15	23	32	26	24	28	31	29	34	33	29	13	5	5	18	-2	-1	25	25	11	25.3
Washingt'n	Max	63	63	68	70	55	51	70	45	35	39	47	48	43	34	40	47	45	51	48	64	54	50	18	24	33	14	25	33	38	30	43.7
	Min	40	29	38	50	32	30	32	28	30	22	14	21	30	22	22	25	32	28	32	32	14	7	0	0	5	-7	-6	22	22	8	21.8
Waterloo	Max	58	60	64	66	50	50	65	55	36	44	47	46	39	36	51	43	51	48	45	65	53	21	10	21	21	9	20	30	32	29	42 3
	Min	36	27	34	50	37	30	30	30	29	24	14	20	31	26	21	27	30	31	31	29	21	5	-4	-2	7	-7	-6	20	18	5	21.5
Waverly	Max	56	59	63	64	58	47	56	48	36	43	45	44	39	35	49	51	50	47	42	64	55	23	9	20	29	7	23	31	32	26	41.7
	Min	43	26	35	52	40	30	30	31	32	28	15	23	33	26	23	30	35	36	33	31	23	5	-4	2	4	-8	-5	21	15	4	22.8
W. Branch	Max	60	57	62	67	65	49	50	65	48	44	36	42	40	38	42	48	46	47	46	58	60	32	20	28	31	21	33	32	34	31	44.4
	Min	42	27	28	50	42	31	32	26	22	24	6	14	26	24	29	22	26	33	30	28	30	10	2	4	-4	-4	24	21	24	14	22.6
Wilton Jc.	Max	62	58	65	67	64	47	67	47	42	38	39	44	40	38	46	48	45	48	42	54	54	34	15	23	33	25	28	34	33	24	43.5
	Min	32	28	40	51	44	31	32	29	34	29	8	17	28	31	22	26	32	34	32	37	34	10	2	3	13	-5	-1	22	14	5	23.8
Winterset	Max	59	63	68	69	56	53	68	39	37	44	47	49	40	42	42	56	47	57	50	69	39	9	15	24	29	13	27	33	36	33	43.8
	Min	49	31	39	51	43	31	38	29	33	25	25	23	38	23	..	32	34	27	25	37	29	3	-3	2	18	0	1	21	20	18	25.6
WhatCheer	Max	62	70	75	70	60	54	62	57	54	50	55	58	45	48	60	60	65	58	67	66	56	35	28	32	33	23	26	33	45	42	51 6
	Min	28	35	41	51	44	32	33	32	29	25	15	28	23	23	21	22	32	28	32	32	22	7	-1	2	14	-6	-4	22	13	10	22.8

METEOROLOGICAL DATA FOR NOVEMBER, 1898.

NORTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.								
	Monthly mean.	EXTREMES.						Monthly range.	Monthly.	Greatest daily.	Total snowfall.	Depth of unmelted snow at end of month.	Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).
		Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.										
Algona *	29.0	.....		62	20	-17	26	79	1.23	.45	9 5	8 0	NW	10	11	9	7
Alta	29.8	38.5	20.4	66	3	- 8	26	74	1.37	.60	10.8	6.0	SE, NW	13	9	8	9
Alta (near)	.....	.....	.....	.....	.....	.....	.....	.....	1.67	.70	13.5	.....	.....	...	...	.....	7
Britt	28 6	39.2	18 0	65	3	- 9	23	74	.76	.23	6 5	4.0	SW, NW	3	24	3	5
Charles City *a*	30.2	40 2	20.1	62	3, 4	-10	27	72	1.51	.99	11.0	.....	SW	..	..	...	5
Clear Lake	29 2	38.8	19 6	63	20	- 9	26	72	1 30	.60	12.0	.....	SE	20	3	7	5
Cresco	28.7	37.6	19.8	62	4	-10	26	72	1.90	1 49	4.9	4.0	NW	8	11	11	7
Decorah	29 8	40 0	19 5	62	4, 7	- 9	24, 27	71	2.05	1.30	7.0	.....	.....	..	....	....	8
Dows	28 7	39.3	18.1	66	20	-11	26	77	1.59	.75	10.0	7 0	NW	15	6	9	7
Eagle Grove †	27 2	...	...	...	.....	.....	...	.....	...	.....	...	...	.....	...	...	...	...
Elkader	32.2	43.8	20 6	67	4	- 7	27	74	1.84	1.33	4.0	2 0	N	15	6	9	6
Estherville ‡ *a*	29.0	41.0	17.1	64	3	-12	23	76	.90	.30	9.0	8.0	N	...	...	...	6
Forest City	29.2	38.3	20.1	67	4	-10	26	77	1.28	.50	14.0	11 0	NW	12	7	11	4
Fredericksburg	...	.....	.....	....	.....	...	.....	.....	1.96	1 12	...	.....	.....	...	...	...	5
Grand Meadow *	30.4		.....	62	4	- 6	26	68	2.36	1.26	4.0	3.0	NW	9	7	14	7
Greene	31.4	42.2	20.7	64	3, 20	-10	26	74	1 99	.95	8.0	6.0	W	8	12	10	6
Hampton	30.1	39.5	20.7	65	20	- 9	26	74	2 52	1.76	14 0	12 0	NW	11	12	7	9
Hawkeye	.....	...	...	...	.....	...	...	...	2 50	1 12	8 5	.....	.....	...	...	...	9
Humboldt	31.2	41.2	21.1	66	3, 20	-11	26	77	.93	.42	6.6	.....	SE	16	6	8	7
Lansing	34.0	44.0	24.1	66	4	- 5	26, 27	71	1 93	1.07	5 0	3 5	.....	10	6	14	7
Larchwood ‡	...	.....	....	.....	.....	...	...	...	.49	.30	4 0	4.0	NW	8	21	1	4
Larrabee	29.5	40.6	18 4	67	2, 3	-11	26	78	1.05	.55	9.2	.....	SW	7	18	5	6
Le Mars	30.4	40.7	20.2	65	2	- 7	26, 27	72	.80	.60	8.0	4.0	.....	20	4	6	3
Mason City	30.6	40 1	21 2	63	20	-11	24	74	...	.....	.....	.....	.....	...	...	...	...
New Hampton	30 8	41 0	20.7	62	3, 4	-10	26	72	2.08	1.00	9 5	6.0	NW	10	13	7	8
Northwood	28.8	39 5	18.0	62	3	-10	26	72	1.30	.60	13.0	.....	NW	22	3	5	4
Osage †	26 5	...	...	...	.....	...	...	...	2.47	1.07	13 0	12.0	S	8	6	16	6
Pioneer *d*	31 0	40.1	21.8	65	3	- 9	26	74	1.60	1 10	16 0	...	S, NW	18	1	11	3
Plover	29.6	38.4	20 9	70	4	- 8	26	78	.99	.30	7 6	5 0	SW	13	3	14	10
Primghar	28 0	37 5	18.4	62	3	-12	26	74	1 00	.30	7.0	.....	S	...	...	...	5
Ridgeway	32 7	43.1	22 3	65	3	- 9	26	74	2.32	1 00	6 5	6.0	S	7	12	11	9
Ruthven	29 8	40.5	19.2	66	3	-10	26	76	.95	.30	9.5	5.0	NW	8	9	13	5
Sibley *a*	28 0	39.6	16 3	64	3	-12	26	76	56	.12	4 4	.....	SW	12	13	5	7
Spencer *a*	28.1	39 6	16 6	65	3	-11	26	76	1 24	.36	.....	.....	NW	...	...	...	6
Spirit Lake ‡	29.0	39.9	18.0	65	3	-17	22	82	.86	.38	6.8	6 0	NW	21	2	7	4
Storm Lake	30 8	39 4	22.2	64	4	- 9	26	73	.99	35	5.5	4 5	W	14	7	9	7
Waverly	32 2	41 7	22.8	64	4, 20	- 8	26	72	2.17	1.21	8.0	6.0	S	12	10	8	10
West Bend *	28.4	.....	.....	64	3	-10	26	74	1 55	.70	13 0	... .	S	11	11	8	8
Washta	.....	.....	.....	.....	.....	.....	.....	...	1.05	.60	7.0	6.0	S	16	10	4	4
Average	29.8	40.2	20 0	64.5	....	-9.2	.....	73 3	1 58	....	8.9	6.1	NW	12	9	9	6

CENTRAL SECTION.

Amana	33 0	42.5	23.4	68	4	- 6	26	74	1.08	.43	4 9	1 0	NW	17	8	5	8
Audubon	30.6	41 7	19 6	67	4	- 7	25	74	1 01	.70	9 0	4.0	SW	8	12	10	3
Belle Plaine ‡	32 4	43.2	21.6	68	8	-10	26	78	2.15	.90	12.5	5.0	W	13	7	10	7
Carroll	30.6	41.6	19.5	69	3	-12	23	81	1 21	.85	11.8	7.0	.....	14	5	11	7
Cedar Falls	31.4	41.6	21 1	65	4, 5	- 8	26	73	1.90	1 50	3 0	...	NW	14	6	10	4
Cedar Rapids	33.5	43.2	23 8	70	4	- 5	26, 27	75	76	.52	7.6	2 0	S	14	4	12	5
Clinton	33.4	43.1	23.6	68	4	- 3	26	71	1 42	.57	8.5	...	W	13	8	9	8
Davenport	34.6	43.0	26 2	68	4	- 1	26	69	1.37	.47	6.5	.7	SW	11	8	11	12
Delaware †	29.4			65	4	- 8	26	73	1 71	1 07	5.3	3.0	S, NW	9	11	10	7
Denison	30 6	40 9	20.2	67	3. 4	- 8	23	75	.88	.60	5 0	3 0	S	18	6	6	5
Des Moines	34.1	43 6	24 6	69	20	- 2	26	71	1.87	1 27	12.3	2.0	NW	16	8	6	10
Dubuque	33 8	42.5	25 1	67	4	- 2	26	69	1.15	.56	2 9	1.3	SE	11	9	10	9
Eldora ‡	31 0	44.5	17.4	64	18, 20	-12	26	76	2.10	.80	20.0	.....	NW	0	25	5	6
Galva	31 2	41 4	20 9	67	3	- 6	26	73	1.73	1.45	... .	.....	NW	10	11	9	3
Grinnell	32 9	41.6	24 2	65	4, 7	- 5	26	70	1.79	1.23	.....	...	NW	16	7	7	5
Grundy Center	30.6	41 7	19 4	66	20	-10	26	76	1.07	.52	5 5	...	NW	10	9	11	7
Guthrie Center	32.9	47.8	18.0	70	18	- 8	21	78	1 10	.70	11.0	6.0	SW	18	6	6	3
Independence	31.0	41.1	20.9	66	4	- 9	26	75	1 53	.80	7 2	.....	SW	13	11	6	6
Iowa City	34 4	45 1	23.7	70	4	- 6	26	76	1 10	.70	7 5	2.0	S, NW	14	10	6	4
Iowa Falls	29.3	39 6	19 0	65	20	-11	26	76	2 22	.94	19.5	.....	NW	14	7	9	8
Le Claire	.....	...	...	.....	.....	.....	.....	...	1.19	.43	...	.....	.....	.....	.....	.....	8
Linn Grove	32.0	41 3	22.8	68	4	- 6	26	74	1.48	.69	7 0	.....	NW	7	13	10	8
Logan	35.1	44 9	25.3	69	5, 7	- 9	23	78	.90	.60	9 0	5.0	S	16	4	10	3
Maquoketa	35.7	47 2	24.2	68	4	- 5	26	73	.94	.35	10 8	1.0	SW	13	4	13	7
Marshalltown	32.4	43.2	21.5	67	7	- 8	26	75	1 84	.82	2.0	.....	NW	..	.....	.....	7
Monticello	33.0	44.4	21.7	68	4	- 7	27	75	1.42	.90	1.2	....	NW	17	5	8	6
Mt. Vernon *	32.7	.....		68	4	- 8	26	76	1 43	.95		.....	.....	.....	.....	.....	6
Newton	32 5	42.5	22 5	67	7	- 8	26	75	2 19	.95	10.0	.....	NW	12	12	6	3
Odebolt	31.2	41.6	20.7	67	3	- 7	26	74	2 16	.90	19.5	13.0	.....	21	1	8	5
Ogden	32.3	43.8	20 8	68	4, 20	-13	26	81	1.27	.55	11.4	8 0	NW	22	0	8	6
Olin	31.0	41.4	20 7		8	- 7	27	....	1 24	.46	6.5	2 0	S	13	8	9	6
Rockwell City	30.0	40.1	20 0	66	3	-10	26	76	1.25	.53	6.0	....	.....	17	4	9	5
Sioux City	32.2	40 9	23 3	67	3	- 4	23	71	.45	.22	8 0	...	NW	14	6	10	2
Sac City	30.4	39 7	21.1	66	3	- 7	26	73	1.03	.50	9.4	6.0	NW	11	10	9	6
Tara	26.6	39 1	21.2	60	7	0	22	60	2.00	1 50	... ...	... ...	SW	...	...	...	7
Toledo	32 0	41 8	22.3	67	4	- 8	26	75	1 19	.93	9.8	....	NW	16	0	14	2
Vinton *	31.8			65	4	- 6	26	71	1.64	69	9 5	....	NW				6
Waterloo	31 9	42.3	21.5	66	4	- 7	26	73	1 97	.96	9 0	.	NW	14	6	10	7
West Branch	33 5	44.4	22 6	67	4	- 4	25, 26	71	1.17	.56	4.5	.5	NW	16	6	8	5
Whitten *	29.6			62	3, 7	- 7	26	69	2.42	.92	15.0	.....	NW	17	6	7	6
Wilton Junction	33.6	43.5	23.8	67	4, 7	- 5	26	72	1.76	.68	8.5	2.0	NW	15	5	10	5
Average	32 0	42.5	22.4	66 8	.....	-6.7	.....	73.5	1.47	.....	8 3	3 7	NW	14	7	9	6

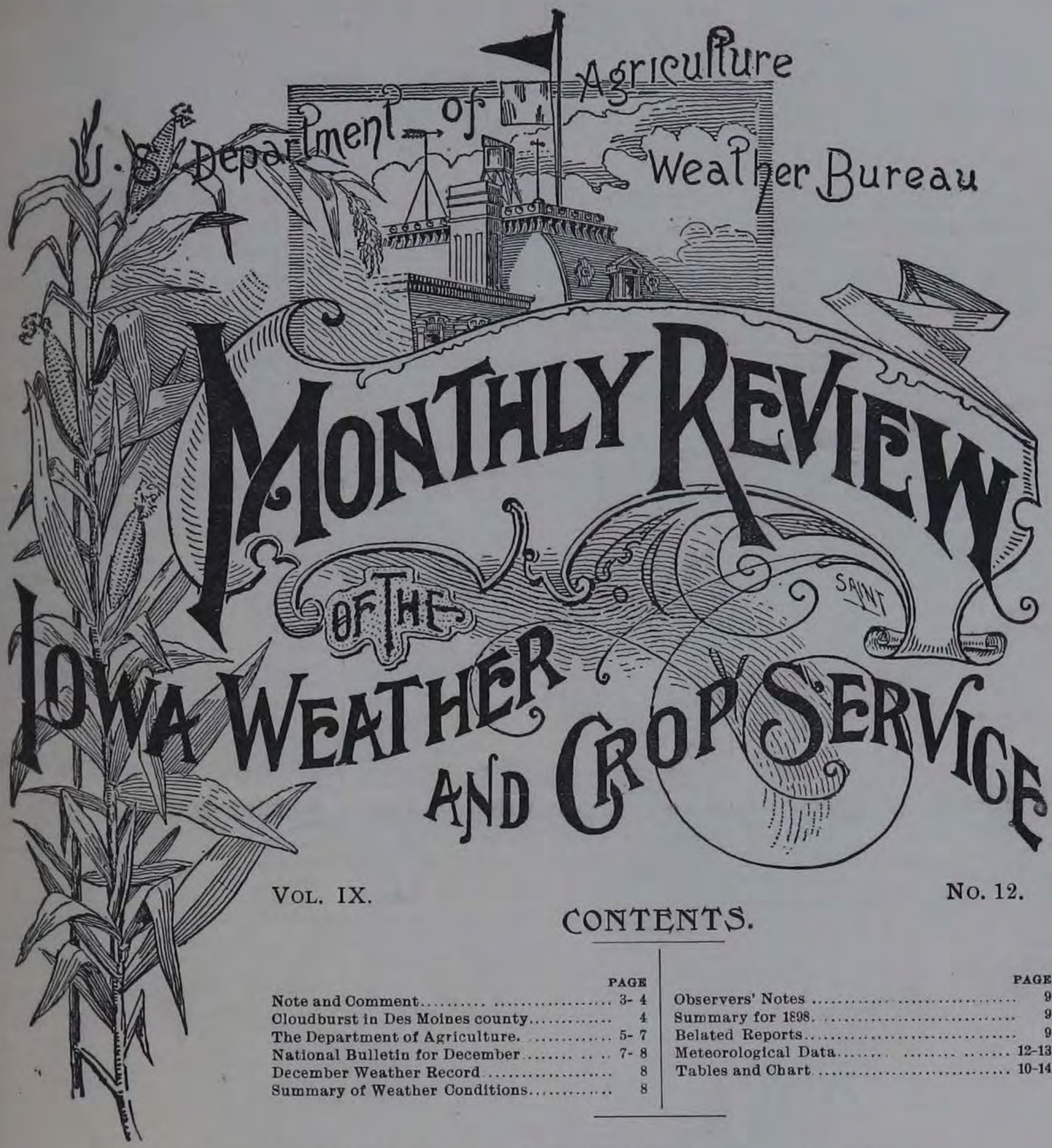
METEOROLOGICAL DATA FOR NOVEMBER, 1898—CONTINUED.

SOUTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.			Depth of unmelted snow at end of month.	Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).
	Monthly mean.	EXTREMES.						Monthly range.	Monthly.	Greatest daily.	Total snowfall.						
		Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.										
Afton	33 3	44.8	21.8	69	3, 4	- 5	27	74	2.24	1.08	3.0	.....	SW	8	15	7	3
Albia *c*	37 2	47 9	26.5	69	4	- 3	23	72	1.90	1.20	7.0	4 0	S W	19	8	3	4
Atlantic	31 0	42.6	19.5	68	3, 20	- 9	26	77	1 05	.80	10 5	6 2	NW	12	7	11	4
Bedford	34.8	47.6	21.9	75	18	- 9	26	84	1.19	1.00	9 0	....	SW	11	12	7	3
Belknap	35.4	45 7	25.1	71	3	- 1	26	72	1 80	.60	12 0	...	NW	19	6	5	5
Bonaparte	35.5	45.6	25.4	70	3, 4, 7	- 2	26	72	1 21	.51	4 5	....	.....	.....	.....	.....	.....
Burlington *d*	35.8	44.9	26.7	70	4	- 2	26	72	...	...	...	.....	NW	18	3	9	....
Charlton	34.8	45 7	21.0	69	3	- 4	26	73	1.67	1.15	1.5	.....	S	14	10	6	9
Clarinda	36.4	47 3	25 4	72	3,4,7,20	- 7	23	79	1 47	1.10	11 5	6 0	NW	15	8	7	4
College Springs	35 5	47.5	23 5	70	3, 4	- 7	22	77	.66	.50	11 0	4 0	SE. NW	20	4	6	4
Corning	36 2	46.3	26.2	78	3	- 3	23	81	1.15	.80	10 0	4.0	SW	20	3	7	3
Council Bluffs	34 0	45.8	22.1	74	3	- 4	26	78	.97	.40	8 0	3.0	S	15	6	9	4
Eldon	32.2	41 6	22.7	70	3	- 6	26	76	87	.50	2 1		E	12	7	11	5
Fairfield‡	35.4	46.9	24.0	71	4	- 4	27	75	1 66	.68	7 0	3.0	.....	12	10	5	8
Ft. Madison*	39 3	.....		68	4	3	26	65	1 95	.70	4 0	...	SW	8	13	9	8
Glenwood	35 2	47 0	23 4	75	3	- 8	23	83	.78	.68	8 0	..	NW	7	15	8	2
Greenfield	32.8	44.8	20 7	70	4	- 9	26	79	1.35	.60	11.9	5.8	S	15	4	11	7
Hedrick*	33 4			72	7	- 6	26	78	.83	.37	8 0	.....	.....	19	6	5	7
Hopeville	33 5	43.6	23 4	69	4	- 5	26	74	1 25	1 05	.	....	S	10	13	7	6
Indianola *a*	36.9	47.4	26.4	69	7	- 5	26	74	3.61	1.50	13.0		SE		.....	...	9
Keokuk	38.4	46.8	30.1	72	7	0	26	72	2 52	.69	2 5	T	SW	12	12	6	10
Keosauqua	36.4	47.5	25 4	77	4	- 1	26	78	1.41	.79	4 0	3.0	..	...	..	....	5
Lamoni	33 7	44.0	23.4	69	3	- 4	23, 26	73	1.54	1 28	5 8		NW	23	2	5	6
Lenox	33.4	43.9	22 8	69	4	- 8	26	77	1.36	1 00	4.1	2 8	S	19	4	7	6
Mooar	35.0	44.6	25 5	71	7	- 2	27	73	.84	.30	3 0		SE, NW	15	4	11	5
Mt. Ayr	34.8	46.0	23 6	70	3, 7	- 5	26	75	2 15	1 25	8.3	6.0	W	10	13	7	4
Mt. Pleasant	37.4	48.9	25.9	71	4	-.1	26	72	1 50	.61	4 0		SW	18	7	5	5
Omaha	35.2	44 6	25.9	76	3	- 1	22	77	1 20	1.05	11 9	3 0	NW	13	10	7	6
Osceola	33 6	43.4	23 9	71	7	- 5	26	76	1 50	80	6 0	2 5	S	11	8	11	5
Ovid	34 8	45 9	23 7	71	3, 7	- 5	23, 26	76	1.77	97	6 2	4.0	NW	18	4	8	8
Osaloosa	33 8	45 2	22 4	70	4	- 5	26	75	1.50	.75	7 5	1.5	NW	17	6	7	5
Ottumwa	35.0	48.9	21.1	72	8	- 4	26	76	1 33	.85	5 0	2.0	NW	13	11	6	3
Pella	30.4	37 1	23.7	69	7	-13	26	82	1.08	.67	6.0		SW	19	5	6	5
Sidney	34.4	43 3	25 6	72	3	- 1	22, 24	73	1.59	.82	17.3	10.0	SW	17	8	5	5
Sigourney	34.0	47 1	20 9	71	4	- 9	26	80	1 53	.47	9 0		SE	19	8	3	7
St. Charles	35 2	46 4	24 1	70	7	- 5	26	75	1.39	1.00	6.5	4.5	NW	19	5	6	8
Stuart	29 6	38 3	21 0	65	3, 4	- 5	26	70	....	..	...	.....	N	.....	...	...	....
Thurman	34.2	46 0	22 5	74	3	-11	23	85	1.14	.85	5 8	...	NW	12	9	9	5
Villisca‡	31 4	44 4	18.4	71	4	-11	23	82	1.65	1.40	9.0	.....	S	17	8	5	3
Wapello	38 2	51 2	25 3	70	4	- 2	26	72	1 20	.38	5.5	2.0	NW	13	12	5	5
What Cheer	37 2	51.6	22 8	75	3	- 6	23	81	.33	.10	3 0	.....	NW	19	5	6	5
Washington	32.8	43 7	21 8	70	4, 7	- 7	26	77	1.05	.55	4.0	...	SW	....	....	.....	4
Winterset	34.7	43.8	25.6	69	4	- 3	23	72	3.28	1.00	26.5	5.0	.....	...	...	.	8
Average	34 7	45 5	23 7	70.9	.....	-4.9	.....	75 8	1.46	.....	9.8	4 2	NW	15	8	7	5
Average for the state	32.2	42 7	22 0	67.4	.....	-6 9	....	74.2	1.50	.....	8.7	4 7	NW	14	8	8	6

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

December, 1898



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Central Station, Des Moines, Iowa.

J. R. SAGE,
DIRECTOR

GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER
1898.

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Le Claire	River Observer.
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West Union	J. M. Lisher.
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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME IX. DECEMBER, 1898. NO. 12.

NOTE AND COMMENT.

Dr. P. B. Allen, of Marne, Cass county, reports the killing of five head of cattle by lightning on the 27th of June, 1897. They were found lying beside a three-wire barbed fence, in close contact with each other, and some part of each animal was lying past the line of the fence. The head of one rested on the middle wire. There were no marks on the animals, and no effect of the electric force on the posts or wire. There were no ground wires used. They were evidently all killed by a single stroke of lightning.

***

An establishment for condensing milk is in operation at Waverly, Iowa, affording employment for seventeen persons, and making a market for a large amount of milk. Thus the factories and farms are brought in closer contact, and the increment is kept nearer home by converting bulky material into compact form for the markets of the world.

***

Lucky were those farmers who cut up their corn in due time to save the fodder in the best condition. No, not lucky; they are wise and prudent, and now they are not blaming themselves for being caught by the wintry storms and sleet, with a large part of their corn crop afield and "unshucked."

***

Secretary Wilson says, in effect, that he wants congress in clothing the Department of Agriculture to make due allowance for its growth. He evidently is an ardent expansionist, at least as applied to the department over which he so ably presides.

***

The imports of American corn at Hamburg and Bremen have increased over 50 per cent in a year. And thus "expansion" is working in various ways.

***

The Illinois Corn Growers' association, which was recently organized at Springfield, Ill., to push the corn food propaganda, has formulated the following as the "standard perfect ear of corn: "A perfect ear of corn should be 10¼ inches in length, 7½ inches in circumference; should yield 90 per cent grain, cylindrical in form, and should carry its size the entire length, except near the point, where it should taper slightly, well filled out at both ends."—*Price Current.*

***

After all the blow, says the *Rockford Register*, the Alaskan gold product is not likely to exceed, yearly, the value of the farm products of three good Iowa counties

The Southern Pacific Railroad company has recently supplied ordinary meteorological instruments to 181 of its stations between Ashland, Ore., Ogden, Utah, and El Paso, Texas. The state of the weather, direction of wind, temperature and rainfall are included in the daily record, and at nine important points pressure readings are made. Daily telegraphic reports are forwarded from each point to San Francisco. Weekly crop reports are also sent from fifty-two important producing centers. The company forwards over its own wires, without charge to the government, warnings of frosts and hot northers. The meteorological observations thus collected are placed at the disposal of the Weather Bureau.—*Science.*

***

Three or four years since, an Indian mound in Arkansas was being excavated, when an earthern jar was found, hermetically sealed, which contained a small quantity of grains of Indian corn. Some of the grains were the next year planted in Missouri, and several bushels raised. On the top of the mound from which the jar was dug out a large tree, four feet in diameter, was growing, and it is thought the corn lay buried about 3,000 years. Squire James L. Neal, one of the most prosperous and progressive farmers, sent and pro ured a small quantity of the corn, paying over 2 cents a grain. This he planted last year, but the yield was small on account of the drouth. He saved enough, however, to get a good patch this year. He has used it for roasting ears, and says it is the best he ever had. The ears are not large, but grow two or three on a single stalk. The one thing peculiar about this corn is its color, or, rather, colors. On the same cob are grains of different colors, and in the row you can find an ear that is white, another blood red, one a salmon color and another perfectly black.—*Harrodsburg (Ky) Sayings.*

***

A meteor fell near Aberdeen, S. D., on the night of December 25th. The largest piece dug from the ground where it fell weighed fifty-five pounds. The metal is very hard and resembles lava.

***

Corn fodder could be improved on many farms by earlier cutting and by putting up in larger shocks, says a bulletin of the Kansas experiment station. The larger the shock the less the loss from weather. It will pay more Kansas dairymen to plant in rows the usual distance apart with stalks eight inches apart in the row, cultivate thoroughly, put up in large shocks and feed without husking. This makes a cheap feed. In our rations we have called corn put up in this way fodder corn, and corn planted in the usual way and husked, corn fodder. Kaffir corn fodder, without the heads, has about the same feeding value as husked corn fodder.

The amount of water precipitated on this globe annually, in form of rain, snow, etc., has been estimated to be 29,000 cubic miles. In other words, it would form a river a mile wide, a mile deep and 29,000 miles long, or long enough to reach around the earth at the equator and have 5,000 miles to spare. It would take a great many Amazons and Mississippis to fill such a vast channel.

THE AUGUST CLOUD-BURST IN DES MOINES COUNTY.

BY MAURICE RICKER.*

It is my purpose to give merely a statement of facts concerning the storm which deluged Des Moines county the morning of August 16, 1898. I believe it was the heaviest rainfall ever noted in the United States for the period of its duration, and while the area covered was not large, it proved to be very destructive. No doubt there have been storms in which the precipitation was as heavy where no one saw fit to chronicle the event. Many great disasters, as the Johnstown flood, with a greater area and less precipitation, have become historic, because of loss of life.

My attention was called to the excessive rainfall that morning at daylight by the little swollen creek which divides South from West Hills in the city of Burlington. Yet this was in the very edge of the storm. The newspapers contained many sensational stories of narrow escape from loss of life, damage to county, city, railroad and farming interests. I read these with no special interest and dismissed their estimates of 16 to 20 inches of rain in Flint valley as exaggerations so commonly found in popular accounts of natural phenomena As soon as the tracks were repaired I had occasion to make many trips by rail through the flooded district. The terrible strength of the water flow then became apparent and noting the limited drainage area of Dry Branch in particular, I began to take more interest in the event, believing at this time that the real precipitation must be about five or six inches. I have since made a thorough canvass of the county and record for those interested in these phenomena only those things which are beyond dispute.

At 10 o'clock on Monday night, August 15th, it began to rain. The precipitation was not extraordinarily heavy, and while it rained steadily no one noticed that there was anything unusual about it. According to good authority the so-called cloudburst began about 2 o'clock A. M and ceased shortly after 4. It rained more or less for an hour later, however. A liberal estimate of time for the heavy rain is three hours. The precipitation outside of these three hours from all accounts could hardly have been more than two inches.

The area of heavy rainfall can be approximately bounded on the south by the divide between Spring creek and Flint river. The former stream was not out of its banks. Keokuk reports a trace only. The county line forms a close boundary on the west, Yarmouth being in the edge of the heavy rain, but suffered only from lightning. Washington reports 1.72; Iowa City, .40. The north boundary of very heavy rain is not far above the county line, Wapello reporting 5.16. On the east, the river was the boundary for excessive rain, although the precipitation was heavy as far east as Biggsville, Ill. This maps out two-thirds of Des Moines county, or approximately two hundred and fifty square miles. The Flint river and its tributaries drain one-half of this area. Dry Branch, Yellow Springs, Dolbee and Swank creeks drain the remainder, save a strip of three miles in width, which drains north into Louisa county. Dry Branch drains only about eleven square miles, yet its waters caused much damage. Yellow Springs creek drains a much larger area and carried perhaps more water proportionately to its bed than Dry Branch.

It is not easy to estimate the rainfall accurately. There was no rain gauge in the county at this time I shall give some of the reports as I obtained them. Great care has been taken to get accurate and truthful accounts in this phase of the investigation.

Mr. J. W. Merrill, editor of the Mediapolis *New Era*, vouches for this story: A large circular windmill tank with nearly straight sides stood removed from buildings upon level ground. It had never been used as a tank and was dry Monday night. It had a semi-circular cover which was open, exposing one-half the tank to the rain. The water in the tank measured twelve inches in depth on Tuesday morning. We will grant that some of the water in the tank ran in from the half which was covered. Yet, had it all run in—and it could not—there would have been a rainfall of twelve inches. If the tank had been perfectly level would more than one-half the water which fell on the cover have entered the tank?

In Dry Branch valley below Latty, six miles south, lives a member of the county drainage board, a man whose judgment can be relied upon. He states that on Monday night an empty, straight-sided tin can, which was used for mixing spray fluids for fruit trees, was left in open ground. The can was about fifteen inches in diameter and sixteen inches high At 5 o'clock the can was full and running over. North of West Burlington lives a truck gardener, who left standing in the garden several sprinkling pots, whose open tops are half covered with tin in the usual manner. These ought to have shed one-half the water, yet daylight found them all with eight or nine inches of rainwater in them.

Other less reliable cases have come to my notice, where the hole of a barrel becomes the outlet for overflow, etc. The instances given suffice to show the character of the information which leads me to firmly believe that over an area of fifty square miles at least sixteen inches of water fell in three hours.

The instances of incredibly rapid rise in streams, even when already in the flood plains, seem to corroborate the estimates given above, while the records at the Mississippi bridge at 6 P. M , August 16th, show a stage of 4 feet 5 inches, a rise of 3 feet 2 inches. When we remember that local rain seldom affects the stage of water noticeably, and take into account the limited area of the storm, we must readily see that something extraordinary must have happened. The rain extended some distance up the river, it is true, Clinton reporting 3 01, Davenport 2.24.

The erosion was well in keeping with the figures given for rainfall. Little idea can be conveyed of the force of the water, which tore up trees twelve inches in diameter and floated rocks weighing hundreds of pounds many feet from their former location. Hay stacks were floated bodily against steel bridges, carrying them many hundred yards down stream. In the city of Burlington whole timber piles floated from the yards and blocked the entrance to the great sewer. Wagons and farm machinery of all kinds went down the Mississippi river, together with many dead animals. The oldest settler had never seen the water so high in these valleys. Many houses, barns, sheds, etc., were flooded, and this in spite of the rapid fall of these streams, which here break through the escarpment to the Mississippi

The upper valleys broaden out with many fertile plats, often planted in truck and garden produce. The lower stream has low banks through the flood plain of the Mississippi. The rush of water necessarily did very great damage to both crops and soil. In many cases acres of ground which had been fall plowed were denuded of soil and left covered with sand and pebbles.

Flint river, which formerly entered into O'Connell slough

* Paper read before the Iowa Academy of Sciences, December 28, 1898.

after paralleling its course for half a mile, cut a new channel directly through cornfields to the slough, tearing out acres of soil with crops and timber. A raft of logs belonging to the J. D. Harmer Manufacturing company went down before it like straws. O'Connell slough, which had been the storage place for logs in summer and steamboats in winter, was piled with the debris, which will cost $15,000 to remove unless the ice and high water next spring can scour it out. Manufacturing establishments situated upon the slough will otherwise be cut off from navigation.

Hawkeye creek, a covered sewer through Burlington, became clogged with floating lumber and caused much damage to lumber yards, a foundry, the pickling works and the Murray Iron works. The stone apron at its mouth went out. The clearing of the sewer and the rebuilding of the apron will cause the city's heaviest bill for damage. The county lost twenty-three bridges, some of which have been replaced at an immediate outlay of $16,000. The Burlington, Cedar Rapids & Northern railway lost nearly two miles of track and five bridges. The bridges which replaced the lost ones are fine steel spans, much better than the old ones, costing $30,000. The loss to land owners is hard to estimate, but must have been very heavy in crops and damage to soil. The loss of live stock drowned would probably have been almost as heavy had it occurred in daylight, owing to the very rapid rise of the streams. The estimate of $100,000 total loss is not far from correct.

There are many other interesting features which should be written up. The weather conditions can be obtained from the Weather Bureau. The map for the date shows a low reaching into Iowa, but would not warrant a forecast of general rain. The energy liberated by so heavy a fall of rain would form an interesting study. I have collected some data concerning similar storms in previous years The heaviest fall that has come to my notice was fifteen inches, at Wilmington, Del., on the 29th of July, 1839.

THE DEPARTMENT OF AGRICULTURE.*

It is a noteworthy fact that three of the most important measures of national legislation, framed distinctively for the benefit of agriculture, were enacted by congress and approved by President Abraham Lincoln in the year 1862, during the darkest period of the civil war, when the government was in extreme peril. The first of these measures was the act establishing a Department or Bureau of Agriculture,—being an enlargement of the division previously established in the patent office for the distribution of valuable seeds, the collection of statistics of production, and the dissemination of useful information relating to agriculture. The second was the homestead bill, designed to encourage the settlement and development of the public lands in the west. And the third was the Agricultural college act, donating 11,000,000 acres of land to the several states for the endowment of agricultural colleges. This bill was first introduced in 1858, by Mr. Morrill, of Vermont, then a member of the lower house of congress; it was passed in that session despite the strenuous opposition of Jefferson Davis and some of his followers, and was defeated by the veto of President James Buchanan. Under the changed conditions in 1862 it was again passed, and was promptly approved by the immortal Lincoln.

Thus in that most eventful era in the history of our country, whilst the nation was in the throes of a mighty struggle for the Union and liberty, industry was regenerated, labor was emancipated from the thralldom of the past ages and measures were adopted to give the hand of toil the guidance of a cultivated brain and the enlightenment of science. It was a great step in advance, marking a new era in the governmental policy of this country. In other words, it gave practical expression and embodiment to the idea of *Paternalism* in our form of government. Despite all counter theories, this element of paternalism inheres in all systems of government framed by the people and for the people. And this is but saying that where the people rule they are good to themselves, and their laws are framed upon a basis of mutual helpfulness. The popular idea of the national sovereignty in our country is expressed in pictorial form, not by a policeman with club and revolver, nor by a soldier with gun or sword, but by a patriarchal figure, of benignant mien and countenance, whom we affectionately call our "Uncle Sam." That quaint, homely, kindly old uncle represents the paternal feature of our government, and thus we personify the best form of political association known on earth,—our national compact framed "to promote the general welfare." That compact implies more than protection from foreign invasion or internal disorder,—it implies organized beneficence and mutual service.

It has been said: "That form of government is best which governs least" This saying may be true as applied to the repressive or coercive function of the government; but that is, or should be, the least of its offices. A better form of statement would be: That government is best which is more swift to serve than to scourge; which partakes more of the character of a parent than a potentate. This has been the higher ideal, toward the attainment of which the American people have made steady progress, moving at times with faltering steps, but most steadily and swiftly during the last third of the Nineteenth century.

The act of 1862, establishing the Department of Agriculture, set forth its object as follows: "To acquire and diffuse among the people of the United States useful information on subjects connected with agriculture, in the most general and comprehensive sense of that word, and to procure, propagate and distribute new and valuable seeds and plants."

At the outset, and for a number of years, it was nothing more than a minor bureau in the Department of the Interior, being poorly housed, meagerly equipped, and inadequately supported. But there was within it the potency and promise of greater achievement, and it steadily grew up into the proportions of a great executive department, headed by a cabinet official, ably officered and manned in every bureau and division, and it is to-day the most practically useful branch of the general government. It has received unqualified praise from the public men of other nations, and this is well expressed in the words of Sir Richard Armstrong, of England, who is quoted as saying that the Department includes in its service "the ablest aggregation of agricultural scientists to be found in the world."

That Department now stands securely upon a solid foundation, supported by ample appropriations, approved by all classes of people, far exceeding in its scope of usefulness all similar departments, boards or ministries of agriculture of the other great nations of the world. And this is fittingly so, inasmuch as American agriculture greatly excels that of any other country.

Unquestionably a great work was done for the benefit of the practical farmers when the oldtime agricultural bureau was transformed into an executive department, placing the Secretary of Agriculture in the cabinet of the President. By that act a just recognition was given to that which is now and always must remain the foremost industry in this country. Agriculture was not only given the honorable place to which it is justly entitled, but the department was also endowed with a larger measure of power to accomplish the beneficent ends for which it was established. With such a man at its head as Secretary James Wilson, who is experienced in statecraft and legislation, as well as in all lines of practical agri-

*Paper read before the State Agricultural Society, January 10, 1899 by J. R. Sage.

culture, there is ample assurance that the great interests committed to his charge will be most efficiently served by the use of all the resources at his command.

Only those who have made a thorough study of the Department of Agriculture, with itsnumerous bureaus, divisions, sections, stations and agencies, can form an adequate idea of its scope and magnitude. As a whole it constitutes a vast university of applied or practical science, the peer of which does not exist in any other country on earth. The ability to comprehend the methods employed, the work performed and the results achieved in the various bureaus and branches of the department, implies a very wide range of intellectual power and culture.

The Hon. Edwin Willetts, who served as assistant secretary during the term of Secretary Rusk, said he regarded the Department of Agriculture as the "most momentous single educational force in the United States." And, in defining the scope of the word "educational," he said: "Every investigation that has for its purpose a better or more economical operation; a better or more perfect understanding of the capacities of soil or climate; a more thorough knowledge of the character and qualities of food, both for plants and animals, and its best adaptation to nutrition; more practical information as to the nature and character of diseases incident to vegetable and animal life, and how to prevent or cure them, and as to noxious insects and how to destroy them; a fuller comprehension of the law of supply and demand, with information as to their ratio up to date; a more extended trial of the adaptability to our soil and climate of new and improved varieties of seeds and plants and animals from foreign shores, or from different localities in our own vast domain, with its many conditions; in short, every study, investigation or experiment that has for its purpose 'the how, the what and the why' of agriculture is, in its essence and its outcome, in its germ and its fruitage, educational."

In another report Mr. Willetts said: "There is hardly a topic of investigation relating to agriculture that is not covered by the work of the Department. Its halls are instinct with science. The chiefs of the divisions and many of their subordinates are eminent in their special lines, and are recognized for their work and ability the world over as the peers of any like body of investigators, seek where you may. One of the gratifying features of this development in scientific research is that the practical character of the work has not one whit abated Much more than one-half of the money appropriated is used for the gathering of facts and statistics, for the purchase and distribution of seeds and plants, for the extirpation of contagious diseases of animals, for the introduction of, and experiments with, forage plants, for the inspection of meats and animals intended for export, and finally, for the dissemination of information. The most abstruse scientific work has for its end the useful and the permanent good of agriculture. Here is exemplified what history again and again shows, that the best and highest scientific work has always been allied with the useful. Men need to be harnessed to facts, theories need to be in touch with realities to produce the best results. At the same time the publications issued by the Department constitute a mass of information the most extensive and varied among the nations of the earth. The annual report of 400,000 copies, constitutes the largest single edition of any book published. In their practical character, in their scientific worth, and in the promptness of their issue, our publications are the admiration of all representatives of foreign governments accredited to the Department to study its workings and efficiency."

This excellent summary of the educational, scientific and practical work of the Department was written nearly nine years ago, and to-day it may be repeated with increased emphasis. Within these latter years notable advancement has been made, especially along scientific and practical lines. The transference of the Weather Bureau, with its splendid equipment for scientific investigation, added materially to the value and efficiency of both the Department and the Bureau. Commercial and agricultural interests have been made recipients of greater benefits by this change.

And here I may remark that the Weather Service affords ample evidence of the practical value of scientific work. In the interest of pure science the systematic study of the weather was begun in this country and investigations were carried on for many years by scientific men to solve the problems relating to the origin, direction of movement and general characteristics of the storms that sweep across our continent. The government extended some assistance through the War Department and the Smithsonian Institution; and by this co-operation of the government and scientific associations much valuable data were collected, resulting in important discoveries and general advancement in meteorological science. And in due time the great mass of material collected served as the basis of the established system of forecasts and warnings of weather changes and the approach of dangerous storms. Thus we see that the so-called visionary studies of scientists brought forth practical results of great value to all classes of people.

This leads to the inquiry: How are the farmers benefited by the Weather Bureau? To this I answer, they receive their full share of benefits, directly and indirectly. Many of them receive the daily forecasts, and the number who make practical use of the forecasts and warnings is constantly increasing. But the forecasts and warnings, though of great value to the general public, really constitute a minor part of the beneficial service rendered by this Bureau. The meteorological records are of inestimable value, affording a basis of study of the climatology of all sections of the country. The Climate and Crop Reports, giving weekly exhibits of the condition and progress of growing crops during the season, are worth a vast amount to producers and consumers; in fact, they are worth more than the entire cost of the Bureau, if no other service was rendered.

And then there is an educational value in this line of public service that is worthy of consideration. The dissemination of scientific truth serves to displace very many harmful errors. There has been a very large amount of traditional nonsense and superstition existing in the minds of the masses of people in relation to the weather, and this medieval stuff is being eliminated by means of the information spread abroad by this Bureau. Farmers do not time their operations by the moon's phases, or the planetary conjunctions, as in ancient days.

At the outset the direct benefits from the weather forecasts and warnings were received by the commercial and shipping interests, and yet all classes of people were benefited thereby. The elimination of a large share of the risks and losses incident to transportation of products by water and land, served in a measure to lessen the cost of transportation; and all classes of commercial men, producers and consumers, shared about equally in the ultimate benefits This affords another illustration of the fact that every step in progress, and every great achievement in scientific discovery, serve to uplift the human race.

Secretary Morton, in his first annual report, gave a very forcible idea of the scope and purpose of his Department when he said: "As organized, the Department of Agriculture offers opulent opportunities for the exercise of the most pronounced paternalism." That was high praise, though the man who wrote it was not an ardent champion of a paternalistic government. But our Uncle Sam was "built that way," and when he became rich enough he gave every man a farm, who was willing to take the land and make a homestead thereon. And now with prodigal liberality he is expending millions annually in teaching the science of farming; in procuring new and valuable

seeds and plants from foreign lands, to be tested and distributed; in extending the range of markets for the farmers' products in foreign lands; in preventing the spread of contagious diseases of farm animals; in observing the elements, and giving timely warnings of destructive storms and floods; and in collecting statistics of farm products, and their disposal and consumption at home and abroad. And thus along scientific and practical lines all possible means are employed in promoting the interests of agriculture.

Now that form of paternalism appears to me to be above criticism. It is not open to the objection that may be urged against some of the many schemes that would enlist government aid in various enterprises that should be carried on by individual or associated efforts and capital. The Department of Agriculture is the agent or servant of the people collectively, and it is employed in lines of work that could not or would not be carried on by other agencies. And it is not open to the charge that it is class legislation, for though primarily established to promote the interests of agriculture, yet in reality all classes and interests are in some measure recipients of its benefits. In fact, the farmers themselves are sometimes heard to complain that their agricultural department, through some of its bureaus, is more helpful to the commercial interests than to those who produce the crops that are bought and sold in the markets of the world. But in truth it is helpful to all interests, because of the fact that the prosperity of agriculture in this country is the prime factor in our national prosperity. We see that fact in a clear light at this time, when the balance of trade is so largely in our favor, and our agricultural products constitute fully 70 per cent of the immense aggregate of exports whereby the golden tide is made to flow to our shores.

Do the farmers appreciate this beneficence of the government? Quite likely there are some who lightly estimate the practical value of the work of the Department; but the number of fault finders is now very small and steadily lessening. Judging by the general tone of the agricultural papers, and their thousands of correspondents, the great body of intelligent farmers in all sections of the country are fully satisfied with the work being done and the results obtained.

And now if there are any farmers who are not consciously receiving some measure of direct benefit from the operations of the Department of Agriculture, it is a result of their fault or misfortune. They are either at fault for not making use of the practical and scientific information given to the public, or they are unfortunately lacking in ability to comprehend the meaning of the matter that has been put forth. The department has no means nor desire to compel the acceptance of its teachings in agricultural science, nor does it possess power to furnish mental ability to those who are lacking in that respect. The benefits resulting from its work are mainly appropriated by the up to-date, progressive farmers who use their brains as well as muscle in their farm operations. And the farmers of that class are rapidly increasing in numbers.

And thus the ultimate measure of good resulting from the work of this great Department depends upon the people themselves, upon their acceptance of valuable instruction given, and their intelligent study of the many object lessons set for their benefit. There must be hearty co-operation of the people with the government to the end that national prosperity shall abound.

In closing this paper I will venture the suggestion that the national government does not hold a monopoly in this line of beneficent work. The Department of Agriculture has no copyright or patent that would preclude the establishment of a Department or Board of Agriculture in Iowa, or any of the other states of the Union. In matter of fact, if we would derive the full measure of benefit from the operations of the Government Department the state, as well as the individual citizen, should co-operate to that end. In our federal system there is provision for such co-working in a common cause. The state may properly take up the work within its own borders at the point where the National Department leaves it. Iowa is the foremost agricultural state in the Union, and the needs of our leading industry have been recognized in state legislation. We have several bureaus and divisions charged with duties relating to the interests of agriculture. To add completeness to this structure they should be brought together in one department, and placed under the general supervision of a Board of Agriculture. That would give a larger measure of coherence and unity to our system, and one magnificent agricultural volume could be issued, combining the numerous minor reports and pamphlets now set forth.

There is an ample field of usefulness for such a Department of Agriculture in Iowa, and it need not add materially to the cost of our present system of "scatteration." And it would place Iowa in line with some of the other progressive states. I hope to see such a department established in this peerless state before the close of this century. Then we may celebrate the incoming of the Twentieth century by issuing a splendid book entitled: "The Iowa Year Book of Agriculture, A. D 1901."

DECEMBER WEATHER IN THE UNITED STATES.

[Extracts from the Climate and Crop Bulletin of the Weather Bureau.]

December, 1898, was colder than usual over much the greater part of the United States, the temperature averaging below the normal from the Appalachian mountain system westward to the Pacific coast, with the exception of limited areas in the upper Missouri valley and on the southern California coast, where the month was slightly milder than usual. Generally throughout the central valleys and Lake region the deficiency in temperature ranged from 3° to 5° per day, and from the west Gulf states northwestward over the Rocky mountain regions from 6° to 11°, being greatest over the northern plateau and southeastern Rocky mountain slope. In the central and northern Pacific coast regions the month averaged from 1° to 4° colder than usual. Throughout the Atlantic coast districts the temperature conditions of the month averaged nearly normal.

COLD WAVES.

Cold waves were numerous during the month, but, with two notable exceptions, were of moderate intensity and unimportant in their effects.

On the morning of the 13th a cold wave of great intensity covered the entire Missouri and the upper Mississippi valleys, southern portion of the western Lake region, Illinois, and western Indiana. Temperature fell from 20° to 30° from North Dakota southeastward over an immense area of territory to the lower Ohio valley, and freezing weather prevailed throughout the United States, except in the south Atlantic and Gulf coast districts At points in Montana and the Dakotas the mercury fell to 18° and 22° below zero, and the zero isotherm extended through the upper Mississippi valley to southern Iowa, embracing within its limits the greater portion of the Missouri valley and northern Rocky mountain region. Moving eastward, the crest of this cold wave reached the Allegheny mountains on the morning of the 14th, causing much colder weather throughout all districts east of the Mississippi river and sending the mercury down to the freezing point at Charleston, Savannah, Mobile, and New Orleans.

The last and most extensive and severe cold wave of the month entered the northern Rocky region during the afternoon and night of the 28th, attended by temperature falls of

from 40° to 46° in Montana and North Dakota. Spreading rapidly northeastward, on the morning of the 30th, it embraced the upper Mississippi valley and extended south to Oklahoma and northern Texas. The zero isotherm extended from the upper lakes southward to central Iowa, and westward across Nebraska to Utah. Readings of from 10° to 20° below zero were recorded at stations in Minnesota, the Dakotas, Nebraska and Wyoming. The great mass of cold air moved more slowly eastward during the night of the 30th, and on the morning of the 31st its eastern border extended from the St. Lawrence valley along the Appalachian mountain range to the central Gulf region. Zero weather prevailed in the western lake region, upper valleys and throughout the central plains and Rocky mountain districts. In the west Gulf states the temperature falls ranged from 20° to 40°, and the freezing line extended south of San Antonio, Texas. During the night of the 31st, the cold wave spread eastward to the Atlantic coast, causing zero weather in the middle Atlantic states and temperature falls of from 24° to 38° from the Gulf coast to New England.

PRECIPITATION.

There was more than the usual amount of precipitation during December, 1898, over an area extending from northern and western Texas northward over Oklahoma, Kansas, eastern Colorado and southeastern Wyoming, including the southern portions of New Mexico and Arizona. Limited areas in the south Atlantic and east Gulf states, and portions of the lower lake region and middle Atlantic states also received more than the usual amount, but over much the greater part of the country the month was drier than usual. Marked deficiencies are shown throughout the central valleys, in New England, over the greater part of the south Atlantic and Gulf states, and throughout the Pacific coast region. From the eastern portions of Washington and Oregon to the upper lake region, the monthly precipitation was considerably less than 1 inch, portions of Montana, the Dakotas, Minnesota, Nebraska and northern Iowa receiving less than one-fourth inch. The very light precipitation on the Pacific coast is an important feature of the month. In southern California less than one-half inch of rain fell, the northern part of the state receiving from 1 to 3 inches, while the coast districts of Oregon and Washington received from 2 to 4 inches, which is from 3 to 11 inches less than the December average.

ANNUAL PRECIPITATION.

The precipitation for the year 1898 exceeded the annual average in Kansas, Oklahoma, and from the lower Missouri and central Mississippi valleys eastward to the lower lake region and upper Ohio valley. More than the annual average also occurred over the greater part of New England and in portions of the middle Atlantic and east Gulf states. Less than the usual amount of precipitation occurred generally throughout the southern states, in the upper Missouri valley, throughout the central and southern Rocky mountain regions and on the Pacific coast. The most important features of the year's precipitation are the decided excess in the central Mississippi and lower Missouri valleys, and the abnormal deficiency on the Pacific coast, especially in California, where less than one-half the annual average occurred, the southern coast districts receiving not more than 33 per cent of the annual fall.

DECEMBER WEATHER RECORD.

The month was colder than usual in all parts of the state. The monthly mean as deduced from reports of 111 stations was 18.1°. The highest monthly mean was 27.1° at Ft. Madison, and the lowest, 9.7° at Estherville. The mean temperature by sections was as follows: Northern section, 15.1°; central section, 18.3°; southern section, 20 8°. The highest temperature reported was 60° at Wapello on the 29th; lowest, 25° below zero at Estherville, Mason City and Ruthven, on the 31st. There were several cold waves during the month; the most severe cold waves occurred on the 13th and the 30th.

The precipitation was generally very light, the average for the state being 48 of an inch. The average for the northern section was 28 of an inch; central section, 42; southern section, .73. The range was a trace at Mason City, and 1.70 inches at Eldora. There were 15 clear days, 8 partly cloudy and 8 cloudy. The highest wind velocity was 44 miles an hour at Sioux City, on the 24th.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30.18 inches; highest observed, 31.07, at Clarinda on the 9th; lowest observed, 29.43, at Dubuque on the 29th; range for the state, 1.64 inches.

Temperature.—Monthly mean, as deduced from 111 reports, was 18 1°; highest monthly mean, 27.1°, at Ft. Madison; lowest monthly mean, 9.7°, at Estherville; the highest temperature reported was 60°, at Wapello on the 29th; the lowest temperature reported was 25° below zero, at Estherville, Mason City and Ruthven on the 31st; the average daily maximum was 27.2°; the average daily minimum was 8.9°; the average monthly maximum was 43.4°; the average monthly minimum was 14.6°; the greatest monthly range was 70°, at Mason City; average monthly range, 58°.

Precipitation.—Average for the state, as determined from the reports of 110 observers, .48 inches; the largest amount reported was 1.70 inches, at Eldora; the least amount was a trace at Mason City; the greatest daily amount reported was 1 inch, at Eldora on the 19th; average number of days on which 01 inch or more of precipitation was reported, 3.

Wind.—Prevailing direction, northwest; highest velocity reported, 44 miles per hour from the northwest, on the 24th at Sioux City.

Weather.—There were 15 clear days, 8 partly cloudy days, and 8 cloudy days.

Fog.—Greenfield, 19th, 20th and 21st; Lenox, 1st, 2d, 17th, 19th, 20th and 21st; Mt. Ayr, 2d, 17th, 20th and 21st; Osceola, 3d, 16th, 17th, 19th, 20th and 21st; Ovid, 17th, 19th, 20th and 21st; Plover, 20th; Ruthven, 2d and 20th; Sidney, 1st; West Branch, 2d; Whitten, 2d.

Solar Halos.—Alta, on the 8th.

Lunar Halos.—Cresco, on the 28th.

Lunar Coronæ.—Cresco, on the 18th.

Sun Dogs.—Cresco, on the 6th and 7th; Lamoni, on the 22d; Waverly, on the 7th.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.12	30.89	9	29.44	29
Des Moines	30.20	30.98	9	29.44	29
Clarinda	30.23	31.07	9	29.51	29
Cresco	.....	30.97	9	29.51	29
Dubuque	30.13	30.89	9	29.43	29
Omaha, Neb	30.20	31.05	9	29.46	29
Keokuk	30.17	30.95	9	29.54	29
Sioux City	30.18	31.06	9	29.47	29
Mean	30.18	31.07	9	29.43	29

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	6,481	27	W	6
Des Moines	5,720	28	SW	14
Dubuque	5,609	36	NW	30
Keokuk	6,997	26	NW	25
La Crosse, Wis	...	...	...	...
Omaha, Neb	5,475	28	NW	24
Sioux City	8.338	44	NW	29

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* Norther in afternoon of 29th, followed by severe cold wave on 30th Temperature fell 44° in eighteen hours.

AMANA—*C. Schadt.* A large part of the corn crop was in the field yet at the beginning of the month, on account of the unseasonable weather in the fall. This month, however, although generally cold, was most favorable for gathering the crop in.

BONAPARTE—*B. R. Vale.* A pleasant winter month, good for all kinds of winter work and stock feeding. No snow in this locality.

CLINTON—*Dr. Luke Roberts* December, 1898, was cold, quite clear and nearly stormless, with less than normal force of wind. Mean temperature, 21.1°; normal being 24 9°. Maximum temperature, 53°; normal, 53.6°. Minimum temperature, 8° below zero; normal, 9 4° below zero Mean temperature of the warmest day, which was the 29th, was 35 3°; normal being 44.1°, or 8.8° warmer than the warmest December day for 1898 The coldest day, the 31st, gave a mean temperature of 1° below zero, while a December normal for the coldest day is 9.9° below zero.

All Decembers for the last twenty years furnished minimum temperature below zero except in 1888, when it lacked 6°; in 1889 it lacked 9.5°; in 1891 it was just zero, and in 1896 it lacked 2° of zero.

In December, 1880, the minimum was 17° below zero; in 1882 it was 16° below zero; in 1883 it was 14° below zero; in 1884 it was 27° below zero; in 1885, 15° below; in 1886, 30° below; in 1887, 20° below; in 1892, 17° below; in 1893, 11° below. The highest December maximum temperature for the last twenty years was 65°, occurring in 1889. The Decembers which furnished lower mean daily temperature than that of 1878 were in 1880, 16.9°; in 1884, 18.8°; in 1886, 15.2°; in 1892, 18.1°.

The movement of the wind was 3,780 miles, or 660 miles below normal. The maximum was 23 miles an hour, occurring on the 6th. The prevailing direction was from the west. There were five days with storm, the total precipitation amounting to only .45 of an inch of water. The total snowfall did not reach 2 inches. From early morning of the 19th to 9 P. M. of the 20th, a misty rain prevailed, aggregating .27 of an inch, the greater part of which was precipitated during the evening of the 19th. It will be noticed that the warmest day of the month and the coldest were only one day separated, the result of a very rapid reduction of temperature.

The zero days were the 8th, 9th, 13th, 14th and 31st The per cent of cloudiness was 44, being less than normal by 13, showing there was less humidity in the atmosphere than is characteristic of December. There having been only 2 inches of rainfall during the last sixty-seven days to the close of December, streams are lower than is usual at the close of December. The roads have been very good throughout December, and farmers and teamsters have been able to move heavy loads at all times without difficulty. The dust of the roads, however, gave some annoyance, both in city and country. Farmers say there is yet plenty of corn to husk.

FOREST CITY—*J. A. Peters.* There has been too much snow and cold weather for the farmers to finish picking corn.

GRAND MEADOW—*F L Williams* The month was cold, culminating in a fall of 46° in sixteen hours on the afternoon of the 29th; mercury rose 1.15 inches in the same time. Good sleighing most of the month. Cholera still killing hogs in some localities; other stock doing well.

HUMBOLDT—*H. S. Wells* Good sleighing all the month. Some have gathered corn, but ground will have to be gone over again; there is much yet in the field and keeping well.

OVID—*H. C. Miller.* At noon on the 29th, thermometer stood at 49°; the next morning, at 7 o'clock, it was at zero.

VILLISCA—*C. E. Matteson.* Total eclipse of moon on 26th; total from 6:15 to 7 P. M.

METEOROLOGICAL SUMMARY FOR 1898.

BAROMETER.—Mean for the year, 30.03 inches; highest observed, 31.07, on December 9th at Clarinda; lowest observed, 29.30, on November 21st at Davenport and Dubuque; range for the state, 1.77 inches.

TEMPERATURE.—Mean for the year, as deduced from 91 voluntary observers, was 47.6°; the highest temperature reported was 103°. at Clarinda and Council Bluffs on August 20th. The lowest temperature was 25° below zero, on December 31st, at Estherville, Mason City and Ruthven; annual range of temperature, 128°.

PRECIPITATION.—Mean for the year, as deduced from 91 voluntary observers, 31.69 inches The greatest daily rainfall was 9.70 inches, on July 6th and 7th, at Thurman. Average number of days on which .01 of an inch or more of rain fell during the year, 82.

WIND.—Prevailing direction, northwest; highest velocity reported 66 miles per hour, from the northwest, at Sioux City on June 24th; average daily wind movement, 109 miles.

WEATHER.—There were 160 clear days during the year, 105 partly cloudy days, and 100 cloudy days.

BELATED REPORTS.

Late reports, received too late to publish in last month's REVIEW:

Ames—November Mean temperature, 36.4°; mean maximum temperature, 51.8°; mean minimum temperature, 21.1°; highest, 70° on the 4th and 21st; lowest, -5° on the 26th and 30th; clear days, 17; partly cloudy, 9; cloudy, 4.

Fayette—November. Mean temperature, 30.2°; mean maximum temperature, 40 5°; mean minimum temperature, 20°; highest, 64° on 4th; lowest, -9° on 27th; total rainfall, 2 29 inches; prevailing wind, northwest; number of clear days, 14; partly cloudy, 8; cloudy, 8; rainy, 8.

Knoxville—November. Mean temperature, 36.6°; mean maximum temperature, 45.3°; mean minimum temperature, 27.9°; highest, 69° on 7th; lowest, -5° on 26th; total rainfall, 2.28 inches; prevailing wind, northwest; number of clear days, 19; partly cloudy, 5; cloudy, 6; rainy, 5.

Webster City—November. Mean temperature, 30.8°; mean maximum temperature, 39 4°; mean minimum temperature, 22°; highest, 63° on 4th; lowest, -6° on 26th; total rainfall, 1.69 inches; prevailing wind, northwest; number of clear days, 10; partly cloudy, 10; cloudy, 10; rainy, 2.

ERROR FOR NOVEMBER, 1898.

West Union—Total precipitation should be 1.52 inches.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR DECEMBER, 1898.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Means.
Afton	Max.	35	32	17	16	30	27	25	11	7	23	29	21	16	23	29	34	36	35	32	32	37	34	31	30	30	38	34	42	40	25	2	27.5
	Min.	17	22	10	2	0	16	7	-5	-6	-4	12	13	-9	-4	2	23	14	20	30	31	23	23	22	12	21	13	17	20	24	-2	-11	11.4
Albia	Max.	38	40	27	25	35	32	21	20	20	25	31	36	18	25	31	46	39	42	35	37	39	50	43	35	33	59	47	46	55	56	13	34.5
	Min.	16	22	12	0	0	10	8	-5	-7	-5	11	12	-9	-5	8	20	17	20	18	20	29	28	23	13	17	-5	-2	-1	-3	-12	-2	7.6
Alta	Max.	31	30	14	14	30	23	12	0	4	26	26	20	4	21	28	30	36	34	34	34	34	32	24	30	28	39	22	40	34	0	-2	23.7
	Min.	22	15	2	-2	4	13	-3	-10	-6	-2	12	6	-15	-2	4	14	18	22	24	25	22	18	13	6	16	11	16	17	7	-10	-18	7.6
Amana	Max.	36	33	23	16	26	26	21	7	11	22	27	22	11	23	28	34	36	36	34	35	35	33	31	30	29	35	34	39	42	28	4	27 5
	Min.	11	25	14	1	-4	15	6	-5	-8	-3	12	10	-8	-7	1	20	14	13	30	32	31	28	20	10	15	7	15	15	2	-2	-10	10.5
Ames	Max.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
	Min.	13	26	10	0	-2	17	5	-7	-4	-2	14	11	-9	-5	-3	19	12	15	21	20	28	21	20	27	17	17	18	20	13	-6	-15	10.3
Atlantic	Max.	37	35	27	19	34	30	17	10	9	27	31	22	9	23	29	33	38	35	33	32	37	35	49	34	30	40	37	42	41	19	3	27.0
	Min.	13	10	14	-11	-8	14	2	-12	-8	-7	3	5	-11	-2	-6	14	9	11	29	31	27	20	21	13	16	14	24	22	10	-4	-12	7.8
Audubon	Max.	35	35	24	16	24	37	17	5	8	23	29	19	21	28	20	31	36	35	32	33	35	34	29	30	34	39	38	39	38	19	6	27.1
	Min.	21	15	5	-2	0	15	0	-6	-6	-3	5	4	3	-10	-3	17	17	17	27	29	23	15	15	15	14	16	23	18	6	-5	-15	8 8
BellePl'ine	Max.	36	37	30	10	26	22	32	7	18	32	28	27	12	23	28	33	33	36	35	36	35	34	30	32	28	35	25	40	42	1	3	27.4
	Min.	28	20	15	0	2	12	4	-10	-10	-12	10	10	-10	-7	2	20	14	15	30	33	28	26	21	9	8	18	15	13	22	-5	-12	10 0
Bonaparte	Max.	36	45	28	21	29	31	22	13	13	31	38	28	13	29	36	35	40	41	37	36	34	38	35	37	21	39	35	47	53	30	10	32.0
	Min.	14	25	17	7	4	18	10	1	-1	0	16	12	-2	-3	9	22	19	19	32	32	30	32	25	17	18	18	24	21	32	4	-7	15.0
Britt	Max	24	29	24	13	25	28	10	8	10	26	30	28	8	18	28	30	32	33	40	37	28	26	18	22	28	32	30	35	23	13	20	24.4
	Min.	4	4	5	-5	-6	10	-8	-12	-8	-6	5	5	-13	-11	5	8	10	13	22	23	14	11	5	-2	13	8	11	13	4	-11	3	3 7
Bedford	Max.	40	40	22	20	34	30	27	5	20	22	31	29	15	22	32	36	40	38	34	34	39	34	33	32	31	42	38	45	34	20	8	29.9
	Min.	11	22	11	-4	6	15	7	-5	-5	-6	5	7	-12	-9	7	18	8	18	32	32	29	23	19	10	19	10	59	24	28	-2	-10	10.9
Carroll	Max	32	33	14	18	34	29	14	5	7	20	32	22	9	22	23	32	42	34	33	42	34	34	27	32	25	33	28	43	36	2	-2	25 4
	Min	11	15	7	-5	0	11	5	-10	-8	-4	12	2	-15	-8	-4	17	18	15	18	21	22	15	15	5	9	11	17	30	0	-8	-19	6.3
Cedar Falls	Max	32	31	29	20	22	25	15	8	12	21	32	35	10	20	32	35	40	37	39	35	35	33	25	28	20	35	18	29	38	4	-2	26.0
	Min	10	20	9	5	-3	10	4	-8	-8	-2	10	12	-10	-5	-2	11	20	11	16	29	29	22	19	20	16	8	13	12	24	-6	-16	8.8
Cedar Rap	Max.	34	31	27	17	27	26	13	8	12	23	29	25	9	26	32	34	38	38	36	35	36	35	31	31	29	35	34	49	44	21	4	27.8
	Min.	10	21	12	1	-4	14	4	-4	-6	-1	15	6	-6	-6	3	22	13	11	31	32	31	28	21	13	9	9	13	13	20	-2	-10	10 1
Charlton	Max	38	41	27	21	32	30	26	11	12	27	35	26	15	25	32	35	41	38	33	33	34	36	35	31	40	37	49	40	47	23	6	30 8
	Min.	18	24	10	0	-2	20	8	-5	-5	-3	12	13	-3	-3	6	24	17	20	31	30	28	26	14	21	18	21	21	20	20	-1	-9	12.4
Charles Cy	Max	24	27	44	15	20	25	20	8	18	33	28	25	10	19	21	32	35	31	32	31	33	31	29	22	24	35	33	35	35	2	-4	24.8
	Min.	5	7	4	-4	-8	10	0	-11	-10	-3	7	8	-13	-12	-7	10	9	7	20	30	27	14	17	1	12	1	11	6	19	-8	-21	4 1
Clarinda	Max.	36	31	20	17	28	29	19	5	7	25	26	20	8	21	28	32	33	36	33	33	38	36	32	34	28	42	38	44	40	7	2	26 6
	Min.	19	18	3	-3	0	16	0	-6	-9	0	10	3	-9	-4	2	16	12	16	31	30	28	21	18	13	16	16	29	27	7	-7	-10	9.8
Clear Lake	Max.	24	24	23	13	32	34	20	4	9	21	28	18	9	18	25	21	36	34	..	34	33	29	26	21	23	36	27	36	36	18	9	23.2
	Min.	14	9	5	0	0	13	1	-10	-5	-2	8	9	-11	-5	1	14	14	17	..	29	24	13	13	1	7	14	11	9	8	-11	-21	5.6
Clinton	Max	36	38	30	31	28	28	22	15	16	27	35	29	17	31	33	34	38	41	35	36	35	38	35	31	30	35	33	38	53	34	18	31 5
	Min.	12	29	17	10	3	16	6	2	-7	-1	11	12	-1	-5	5	15	15	14	30	32	32	31	21	13	10	5	16	10	32	2	-8	12.2
College Sps	Max	39	39	28	20	34	32	18	13	10	30	29	26	17	23	31	37	38	37	36	35	38	36	32	35	36	45	38	43	40	33	6	30 9
	Min	18	19	11	-4	3	15	4	-8	-0	-4	12	12	-10	-5	3	25	12	21	32	30	27	20	22	12	13	13	26	24	25	0	-9	11.3
Corning	Max	40	36	29	26	33	34	28	14	14	30	33	24	17	26	31	38	41	35	35	31	28	24	30	13	21	14	28	23	10	0	-10	12.3
	Min.	22	25	12	-5	0	16	6	-8	-6	-1	10	10	-10	-1	-1	24	27	18	31	30	28	24	30	13	21	14	28	23	10	0	-10	12.3
Co. Bluffs	Max.	39	33	28	12	31	36	20	11	17	35	32	26	14	37	32	38	43	36	34	33	37	39	34	39	31	46	37	49	25	8	6	30.6
	Min	26	21	5	-5	5	12	4	-4	-5	2	11	5	-3	5	4	22	19	20	32	28	29	24	19	14	24	14	23	27	8	-2	-9	12 3
Cresco	Max	24	22	14	11	22	20	6	2	8	24	26	16	4	17	22	33	34	36	32	35	34	28	25	20	18	34	11	33	34	-4	-6	20 8
	Min.	4	3	4	-4	-5	10	-3	-10	-10	-4	6	0	-14	-11	-4	14	11	12	25	29	25	11	8	-2	2	20	6	15	9	-14	-20	3.6
Davenp'rt	Max	36	42	31	21	29	29	23	15	12	28	34	29	13	29	35	34	41	40	35	35	35	42	31	33	29	39	34	40	32	28	10	31.1
	Min.	19	30	19	10	7	18	8	0	-3	3	17	9	-2	1	14	27	22	20	31	33	32	31	23	18	17	16	18	16	28	2	-6	15.4
Decorah	Max.	28	25	28	16	24	32	12	5	10	24	28	7	19	25	33	34	36	36	34	36	36	30	28	21	24	34	29	34	37	15	-4	24 4
	Min.	6	5	6	-2	-5	11	-1	-8	-10	-2	0	-11	-10	-5	-7	12	10	10	22	28	27	17	13	2	8	4	8	8	15	-10	-20	4.0
Denison	Max	34	34	17	15	32	28	12	3	7	25	29	18	8	22	29	32	35	33	33	31	36	34	30	34	26	41	50	42	38	-3	-2	26.0
	Min.	20	21	3	-8	6	12	4	-8	-7	-3	7	8	-14	-4	-5	18	17	9	35	30	25	20	26	8	12	13	32	28	-8	-9	-18	8 7
Des Moines	Max	38	33	20	18	31	22	21	7	12	27	33	24	10	24	30	36	42	36	37	35	38	36	32	32	27	40	38	46	43	8	5	28.9
	Min	21	25	11	0	0	20	4	-2	-3	-1	14	7	-6	-4	3	23	18	18	32	31	29	23	20	15	20	18	21	21	8	-1	-10	12.2
De Soto	Max.	..	..	..	..	..	..	..	..	11	25	30	21	10	24	30	36	39	35	34	31	40	25	32	35	29	39	37	44	40	10	0	29.2
	Min.	..	..	..	..	..	..	..	..	-2	1	15	6	-6	-2	0	22	17	15	30	33	30	26	22	14	22	17	23	23	10	-2	-11	13.2
Dows	Max.	23	26	24	12	21	25	18	2	8	23	27	22	7	17	24	31	36	34	32	32	33	37	25	25	24	34	34	32	37	13	-6	23.5
	Min.	8	5	7	-7	13	11	1	-12	-9	-9	9	6	-12	-11	-7	15	10	8	22	19	27	14	15	1	6	14	11	14	8	-9	-21	4.8
Dubuque	Max	33	28	26	18	24	25	18	11	12	24	31	25	11	24	29	33	36	37	34	35	35	36	31	28	26	34	32	41	46	21	4	27.4
	Min.	16	18	12	6	5	15	4	-1	-4	0	14	7	-3	-3	7	21	16	16	27	33	31	28	19	12	8	6	13	10	21	-2	-10	11 0
Eldon	Max.	35	29	16	12	28	21	10	4	5	22	33	27	11	22	30	28	31	45	33	34	35	32	25	24	25	26	35	35	34	34	4	25.6
	Min	11	23	15	3	1	18	10	-5	-10	-5	7	15	-7	-6	4	24	11	17	32	32	30	30	25	18	12	24	21	30	21	2	-6	12.9
Eldora	Max.	33	32	25	24	25	28	21	7	12	22	30	22	12	21	33	38	42	38	33	33	32	30	30	25	18	32	30	32	33	41	35	10 0	26 9
	Min.	10	20	7	-4	-8	3	-2	-13	-12	-7	5	1	-15	-11	-5	9	12	9	23	28	25	15	9	3	12	9	12	15	14	-8	-20	4.4
Elkader	Max.	45	25	24	24	28	26	16	13	16	31	36	25	17	27	33	33	41	45	35	35	36	38	33	30	32	33	22	40	45	8	8	29.1
	Min.	9	7	4	0	-2	11	0	-10	-10	-1	9	4	-8	-8	-5	8	5	6	17	31	30	22	20	6	3	-1	10	9	20	-8	-15	5 3
Estherv'le	Max.	13	22	21	6	21	26	..	-4	0	25	32	2	-4	12	19	21	28	29	31	30	23	19	15	25	14	29	17	35	30	-10	-10	16.9
	Min.	9	8	0	-4	-5	10	..	-13	-4	-5	5	-1	-13	-10	-5	11	16	11	13	19	13	12	12	-3	10	8	10	13	1	-17	-25	2.5
Fairfield	Max.	36	44	28	19	29	27	17	10	10	29	37	28	14	..	32	35	42	37	34	36	35	41	36	35	32	40	36	47	51	33	..	32 1
	Min.	14	23	16	4	2	17	10	-1	-5	-1	11	14	..	2	13	24	12	17	32	32	30	30	25	15	20	14	22	20	33	2	-7	14.7
Fayette	Max	32	24	18	15	22	24	15	4	10	21	28	20	4	20	24	31	35	40	35	35	35	31	27	23	23	34	30	37	40	15	3	24 4
	Min.	14	8	10	-1	-7	10	-1	-8	10	-3	8	5	-13	-12	16	17	10	8	23	29	28	20	15	3	2	1	10	8	15	-8	-18	5.1
Fonda	Max	12	14	15	13	15	12	7	3	15	20	13	10	13	7	20	17	23	25	36	30	22	25	8	16	22	21	23	35	6	10	20	17.0
	Min.	-2	2	4	1	13	6	3	-4	-4	11	11	-13	-12	0	7	12	14	13	22	21	18	13	5	4	9	7	8	21	-9	-20	-5	4.8
Forest City	Max.	12	22	22	8	20	18	3	-3	0	18	20	11	-5	16	18	31	38	39	24	32	33	30	27	22	22	37	33	37	37	10	-2	21.6
	Min.	9	7	4	0	-4	12	0	-11	-6	-4	5	7	-13	-10	-4	15	11	12	23	29	21	14	15	-1	2	15	10	9	5	-12	-20	4.5
Galva	Max.	33	31	23	16	33	28	21	3	5	27	30	19	8	22	30	33	38	35	33	36	38	33	28	33	29	39	33	41	37	7	-2	26 5
	Min.	21	16	4	-4	4	14	3	-9	-8	-1	17	8	-12	-4	-4	15	17	10	25	25	22	19	15	8	16	11	16	19	7	-8	-18	7.9
Garden G'e	Max.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
	Min.	18	22	21	0	-2	16	6	-6	-8	-3	11	12	-10	-6	4	30	16	18	31	32	29	26	23	13	22	16	31	20	34	-1	-10	13.1
Glenwood	Max	42	36	30	23	34	36	30	16	10	30	34	32	15	25	30	33	41	25	34	33	38	38	46	37	36	46	45	46	44	28	16	32.9
	Min	23	19	10	-7	-3	15	7	-7	-8	-1	8	10	-5	0	-3	26	17	16	31	29	25	21	24	15	17	17	29	25	25	0	-10	11 8
Greene	Max	32	26	24	15	22	24	20	5	10	25	27	22	10	21	28	33	31	35	33	34	35	30	28	24	24	35	30	37	35	19	-8	24 9
	Min	7	9	7	-5	-5	12	2	-10	-11	3	8	8	-12	-8	-5	13	11	9	32	30	27	13	17	2	13	9	10	10	19	-8	-19	5.7
Greenfield	Max.	37	41	30	16	38	26	16	19	10	25	29	23	12	23	31	35	37	37	34	35	38	35	32	32	30	41	36	44	40	16	5	28.8
	Min	19	20	9	-2	10	43	-3	-9	-10	-5	8	9	-12	-5	2	20	17	21	29	31	28	19	17	10	12	11	21	19	10	-6	-14	9 5
Grinnell	Max	35	32	26	11	24	24	23	5	10	32	28	23	9	22	28	34	37	32	32	33	34	33	33	29	32	34	35	40	40	21	1	26.5
	Min	18	22	11	1	1	15	3	-6	-6	-2	13	8	-10	-2	6	22	17	17	28	31	29	24	21	12	16	14	18	17	20	-3	-12	11.4
Grundy C'r	Max	33	29	26	16	25	25	20	3	10	25	28	20	7	22	29	34	38	34	33	35	35	32	28	18	24	25	32	39	39	3	-2	25.3
	Min	10	15	5	0	-5	12	-1	-11	-9	-5	9	2	-11	-8	-5	16	13	11	25	29	27	19	15	6	5	15	12	13	6	-8	-17	6.0
Guthrie C'r	Max.	35	35	15	29	28	28	15	12	-6	25	26	20	10	12	30	33	33	33	15	..	..	.	..	..	..	..	..	48	30	0	0	2235
	Min	15	15	10	15	11	11	-6	-6	-7	0	-3	6	-10	-3	0	13	9	9	9	..	..	..	..	..	..	..	..	24	8	-3	-14	4 2
Hampton	Max.	29	28	18	14	25	21	9	2	9	23	27	18	4	21	27	30	35	34	33	34	34	30	26	27	20	35	19	37	36	-2	-4	22 6
	Min.	10	15	10	0	-2	13	-1	-10	-1	-3	12	4	-11	-4	-1	17	18	12	18	31	27	17	15	5	10	18	12	12	6	-8	19	7.3
Hopeville	Max.	35	32	26	17	30	28	25	7	8	25	28	12	10	24	30	33	36	35	33	33	34	34	30	32	29	38	37	43	42	13	4	27.5
	Min.	20	24	11	1	2	16	5	-7	-7	-2	12	10	-10	-4	6	20	21	23	31	31	28	23	20	14	21	16	24	23	13	-3	-10	11.8
Humboldt	Max.	30	28	25	16	26	26	24	5	20	25	28	24	12	20	24	23	36	35	33	34	33	31	30	28	28	39	34	37	36	12	-2	25.8
	Min	13	20	9	-4	-4	12	-4	-11	-4	-3	11	12	-15	-6	-6	17	14	8	21	28	23	17	20	4	20	31	16	17	10	-10	-21	7.5
Indep'n'ce	Max	31	29	24	15	24	34	13	6	11	22	27	25	12	22	29	32	37	38	33	34	33	32	19	26	25	33	22	34	40	0	-3	2417
	Min	7	11	6	-2	-6	9	-2	-9	-10	-5	7	8	-11	-13	0	18	9	10	25	30	28	21	19	7	15	4	12	14	33	-7	-16	6.8
Indianola	Max.	26	32	27	16	33	29	26	20	9	26	31	26	15	24	31	34	39	35	33	34	36	35	30	33	30	37	36	45	39	21	5	29.1
	Min	18	24	10	-1	0	18	8	-6	-6	-4	12	13	-9	-3	6	25	17	17	29	30	29	24	22	13	20	18	23	22	21	-2	-12	12.1
Iowa City	Max.	36	37	29	17	19	27	22	11	11	26	32	27	15	27	33	34	38	39	35	36	33	35	33	32	32	37	35	43	48	34	7	29.7
	Min	10	27	17	3	2	17	7	-3	-6	-6	14	15	-6	-6	6	18	14	14	30	32	31	29	24	12	12	11	11	15	34	-1	-10	11.8
Iowa Falls	Max.	31	31	25	13	23	24	22	0	10	23	27	19	5	19	26	31	34	32	33	34	35	30	26	27	23	35	31	37	34	7	-5	23.9
	Min.	8	14	7	-3	-8	12	-2	-11	-10	-5	10	4	-12	-7	-7	12	12	8	24	30	27	15	16	4	12	15	13	14	5	-9	-18	5 5
Keosauqua	Max.	38	46	30	20	31	32	26	17	13	31	39	28	24	31	39	35	43	41	37	37	35	41	37	40	32	41	40	48	56	21	10	33 6
	Min.	15	27	16	5	1	19	12	0	-2	0	17	18	-2	-2	12	23	21	19	32	33	31	30	23	18	21	16	26	26	25	5	-5	15.5
Keokuk	Max.	37	47	30	24	35	35	19	14	14	27	38	32	16	33	39	36	41	41	34	37	36	30	32	29	27	34	25	27	33	37	7	18.9
	Min.	24	31	24	10	6	20	15	3	-1	2	14	20	0	2	18	32	28	22	31	33	32	29	27	25	30	39	35	47	49	18	3	29.9
Knoxville	Max.	40	36	25	18	34	30	22	8	11	27	32	24	13	25	31	36	45	35	33	37	37	35	33	35	30	39	35	47	49	18	3	29.9
	Min.	18	22	11	2	2	19	8	-5	-5	-2	14	14	-8	-2	8	23	15	18	30	30	30	26	24	15	18	18	23	21	18	-2	-10	12.7

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR DECEMBER, 1898—CONTINUED.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Lamoni	Max.	37	37	27	17	30	28	26	9	9	27	31	23	13	24	31	35	35	38	35	35	35	35	33	..	..	..	..	..	..	..	..	26.7
	Min.	19	20	12	2	0	16	5	-6	-6	-2	12	13	-7	-5	2	22	17	21	30	31	28	25	24	..	..	..	..	..	..	..	..	10.6
Lansing	Max.	35	26	23	22	25	26	21	14	17	30	35	26	14	23	29	34	40	42	35	35	38	38	30	28	28	35	36	38	44	6	3	28.3
	Min.	7	8	5	2	-1	12	7	-2	-5	2	9	12	-6	-9	-1	10	8	10	19	30	30	20	20	6	8	5	13	8	10	-4	-15	7.0
Larrabee	Max.	32	32	22	16	33	28	11	0	4	30	29	20	8	25	31	32	37	32	33	39	33	33	26	32	30	39	38	43	33	6	0	26.0
	Min.	22	17	0	-7	0	12	-4	-12	-11	-3	10	2	-18	-5	-2	10	17	12	24	19	18	15	14	5	10	13	18	17	2	-12	-22	5.2
Le Mars	Max.	35	31	27	15	27	30	20	3	8	30	31	20	10	20	21	31	38	35	34	33	37	36	30	35	32	41	37	43	39	12	2	27.1
	Min.	20	12		-10	12	15	3	-8	-9	-2	10	10	-15	-4	0	22	19	9	23	27	23	17	20	8	20	17	19	20	8	-8	-15	8.6
Lenox	Max.	35	31	28	16	28	28	27	10	7	24	28	22	15	23	30	33	36	34	33	33	34	33	30	30	31	37	36	42	41	27	2	27.9
	Min	19	21	10	-5	2	15	1	-10	-11	5	8	13	-15	-5	4	23	14	23	31	30	27	21	20	12	21	12	26	21	26	-3	-13	10.7
Linn Grove	Max	34	35	24	17	26	26	13	7	14	23	29	26	8	27	30	33	36	37	33	34	35	35	32	30	25	33	21	38	44	6	8	26 4
	Min.	13	22	8	1	0	14	5	-5	-8	-1	12	11	-8	-4	6	25	15	15	28	32	32	27	20	11	30	10	16	13	19	-1	-10	10.9
Logan	Max	38	35	32	18	13	25	28	18	12	15	28	20	24	32	34	38	39	39	36	36	34	35	36	31	21	36	30	33	33	15	3	28.1
	Min.	20	22	-9	-4	7	15	13	6	4	5	8	-9	-8	4	8	18	12	16	22	28	30	24	21	20	9	14	20	20	15	-5	-14	10 7
Maquoketa	Max	52	49	32	30	27	30	28	30	22	25	34	27	22	27	33	34	26	36	38	39	38	37	34	38	37	35	35	38	49	37	7	33.1
	Min.	29	38	16	8	5	8	6	-4	-6	-2	-3	-4	-6	-5	-2	3	4	6	10	31	34	29	23	24	22	5	7	18	23	2	-10	10-0
Mason City	Max.	22	28	24	10	22	20	5	1	10	22	28	17	4	19	30	30	35	36	35	45	32	30	..	25	23	35	33	36	35	-6	-5	23.0
	Min.	9	8	7	-9	-4	9	0	-12	09	-4	7	10	-15	-6	4	11	14	13	19	29	23	14	..	-1	9	14	10	8	8	-13	-23	403
Monticello	Max	34	33	30	29	24	26	21	9	13	24	31	24	18	25	30	23	38	40	34	35	35	31	31	31	27	30	32	30	45	27	6	28 4
	Min.	8	21	11	2	-3	12	5	-7	-9	-3	10	7	-8	-10	-1	12	7	9	26	32	30	27	20	9	18	1	14	11	25	-2	-11	8.5
Mooar	Max	37	45	28	10	32	33	21	20	19	30	34	35	20	31	38	35	38	38	37	39	35	40	36	38	39	40	38	44	58	17	14	33.2
	Min.	23	20	20	0	3	20	12	3	-1	0	20	19	-3	-4	8	11	18	18	35	33	30	32	28	15	30	31	22	22	39	8	-5	16.0
Mt. Ayr	Max.	36	34	25	17	30	27	29	10	8	25	28	23	13	23	31	33	36	35	34	32	33	33	29	32	30	38	35	44	41	21	3	27 9
	Min.	21	22	10	1	2	15	5	-6	-7	-5	10	13	-9	-6	5	7	13	23	31	30	27	23	21	12	21	13	26	22	23	-2	-10	11.3
Newton	Max.	36	32	26	16	27	27	24	10	12	24	30	24	13	23	29	35	38	35	33	35	35	35	31	30	29	37	35	42	41	13	1	27.7
	Min.	18	19	10	-1	-2	-2	5	-7	-8	-5	13	13	-11	-2	3	20	15	17	30	31	29	23	19	12	17	17	19	18	13	-5	-14	9.8
Neola	Max.	40	42	40	38	35	32	15	18	20	30	32	31	30	30	35	40	38	35	40	35	30	25	20	35	33	30	32	40	42	35	20	32.2
	Min.	18	20	17	18	15	8	-8	-6	-3	-2	-8	-7	-4	-3	8	14	12	10	15	8	4	0	-4	4	8	5	6	10	10	4	2	5.5
NewH'pton	Max.	24	24	31	12	22	23	24	3	8	22	27	19	12	18	22	31	34	37	39	33	33	37	26	20	22	34	30	35	36	11	-4	24.0
	Min.	9	9	6	4	-5	11	-1	-10	-10	5	5	3	-14	-13	6	12	19	15	24	30	27	15	10	0	8	3	7	7	10	-10	-20	4 9
Northwood	Max.	21	24	21	..	..	..	..	24	25	21	23	28	11	19	25	31	38	34	33	38	35	31	27	22	36	27	30	33	35	16	5	26.9
	Min.	10	11	4	..	..	..	..	-8	-10	-5	-1	4	-13	-10	-3	9	11	14	20	28	23	17	15	0	10	20	7	12	4	-14	-20	5 0
Odebolt	Max	22	33	25	16	31	26	25	6	6	25	30	32	10	19	30	32	36	35	33	33	35	24	27	31	26	38	35	38	33	11	-2	26.2
	Min.	22	18	-8	-5	1	15	5	-12	-6	0	12	11	-12	-6	0	17	19	14	21	26	24	14	20	19	16	12	21	18	12	-7	-17	8.7
Ogden	Max.	35	29	27	17	26	28	25	7	13	26	34	20	10	20	29	35	39	34	32	32	34	35	29	28	25	38	23	39	35	15	6	26 6
	Min.	15	13	10	-9	-5	14	5	-10	-10	7	6	8	-17	-7	-2	7	15	12	26	30	23	17	18	16	11	12	20	17	13	-5	-17	7.1
Olin	Max.	35	34	35	24	18	23	25	12	9	12	23	30	26	8	25	30	34	36	37	34	35	34	34	31	31	36	34	43	40	45	8	28.1
	Min	22	24	15	3	-1	13	5	-6	-8	2	2	10	-7	-9	-1	20	10	13	30	32	31	30	23	10	7	6	22	14	18	0	-10	10-3
Omaha	Max.	40	33	28	21	32	33	19	8	10	32	51	25	10	26	20	35	40	34	34	34	38	38	33	39	31	46	40	48	42	8	5	29.6
	Min.	26	24	9	4	10	17	7	-1	5	7	15	8	-3	4	9	24	21	22	31	29	29	25	24	18	20	19	29	28	8	1	-10	14-5
Osceola	Max.	36	35	22	18	29	26	17	9	10	25	31	23	10	25	32	34	39	33	34	34	25	34	30	34	23	39	34	46	42	6	4	27.5
	Min.	19	25	10	1	0	17	6	-5	-6	-2	13	12	-7	-3	7	24	18	22	31	31	28	24	22	9	21	17	22	21	22	-1	-10	12 5
Oskaloosa	Max.	39	39	28	18	32	27	25	8	12	28	33	24	10	24	33	36	40	37	36	38	37	37	34	35	31	39	38	47	48	16	7	30.1
	Min.	16	22	12	1	-5	16	5	-5	-6	-2	14	10	-8	-5	5	23	16	16	31	32	30	28	22	15	11	14	20	20	18	-1	-9	11.5
Ottumwa	Max.	37	45	18	29	28	19	19	19	11	30	32	21	13	29	36	36	44	41	34	38	37	39	34	39	32	41	29	45	50	21	18	31.1
	Min.	14	16	13	3	16	10	8	-1	-4	6	4	5	-4	2	2	5	20	20	23	25	29	27	22	17	17	12	19	22	19	2	-6	11.7
Ovid	Max.	39	45	24	21	33	29	18	12	12	31	37	28	16	28	34	34	46	40	34	32	34	36	34	36	30	31	35	48	43	13	14	31.1
	Min.	18	25	11	0	-1	18	6	-6	-8	-3	13	10	-11	-4	7	21	18	19	32	31	29	27	19	16	21	18	24	23	19	-3	-8	12.2
Pella	Max.	34	25	12	12	26	22	13	3	5	23	21	16	4	21	27	27	37	31	32	32	35	32	24	32	22	35	22	44	30	0	2	22.7
	Min.	22	8	12	0	0	12	7	-7	-6	-3	-3	8	-9	-3	2	24	17	17	29	30	29	27	24	12	18	10	22	22	30	-5	-16	10.6
Plover	Max.	32	33	18	15	16	18	12	5	10	22	25	12	10	12	26	35	37	36	38	36	35	34	23	20	30	40	20	44	34	4	5	23.7
	Min.	28	26	10	-2	-4	15	2	-10	-8	-4	10	10	12	-4	10	12	14	22	24	23	20	28	22	5	22	20	18	20	39	-10	-21	10.4
Primghar	Max.	43	30	20	10	10	20	10	10	10	20	30	38	10	12	30	35	45	40	40	36	35	30	20	28	35	33	38	38	43	22	19	27.4
	Min.	20	20	2	-1	1	10	2	-16	-6	2	3	8	0	-2	-6	10	18	19	25	15	12	5	10	15	12	10	15	18	34	-12	-20	7 2
Ridgeway	Max.	34	26	27	27	27	24	19	12	17	25	34	29	14	23	30	33	39	43	36	36	37	37	31	29	32	34	30	35	39	28	9	28.9
	Min.	11	8	8	2	2	11	2	-7	-9	-2	5	11	-12	-8	0	15	15	19	23	30	28	17	18	2	10	7	10	7	28	-10	-19	7.2
R'ck R'pids	Max.	30	24	20	16	20	30	26	10	6	24	20	0	6	20	28	32	40	30	28	32	34	30	20	24	30	35	40	22	16	10	8	22.7
	Min.	6	10	6	0	0	10	2	-12	-14	0	-10	-14	-22	0	4	6	8	6	4	10	6	16	14	10	14	10	30	15	6	-10	-20	2 9
Rockwell C	Max.	31	33	15	15	30	28	15	5	9	18	28	24	9	23	30	33	38	34	34	35	37	34	29	29	33	39	35	40	42	1	-3	25.9
	Min.	20	10	10	-5	5	13	6	-9	-6	-4	10	4	-15	-5	1	5	24	12	23	27	25	11	18	7	19	11	18	14	7	-10	-20	7.3
Ruthven	Max.	30	30	21	20	32	22	8	2	4	22	23	23	2	18	28	29	31	36	34	33	30	32	30	22	20	37	32	38	39	15	-3	23.9
	Min.	14	17	4	-8	-1	9	0	-16	-14	-6	9	7	-15	-10	-4	11	9	10	22	21	18	20	16	3	7	10	12	10	14	-14	-25	4 2
Sac City	Max.	29	29	21	14	28	24	17	2	4	24	28	18	4	20	29	31	38	35	31	30	32	32	26	29	25	38	30	39	35	5	-5	23 9
	Min.	20	14	4	-1	0	14	-4	-7	-3	-1	10	3	-12	-4	-1	17	20	15	21	25	24	18	15	17	20	20	19	19	5	-8	-19	8.4
Sidney	Max.	39	35	22	21	33	32	17	8	8	28	27	24	11	24	31	35	35	36	35	34	38	37	30	35	28	42	37	44	39	5	3	28.2
	Min.	26	26	11	1	6	18	10	-3	-6	3	13	16	-5	2	7	28	27	23	32	30	27	25	26	18	22	16	32	21	27	-1	-10	15.2
Sibley	Max.	26	28	..	26	26	25	20	4	4	22	28	21	0	22	31	29	40	39	32	33	33	34	29	30	27	..	..	42	38	5	-1	24.8
	Min.	13	19	..	-11	-4	8	4	-12	-12	-3	8	-5	-19	-7	-7	7	15	7	22	27	11	14	17	1	17	..	..	17	5	-13	-11	3.2
Sigourney	Max.	38	39	25	19	28	27	24	13	11	28	33	27	20	27	34	35	42	39	34	35	35	35	33	36	32	39	33	46	49	36	7	31.0
	Min.	11	11	14	-2	-4	13	5	-7	-10	-6	11	10	-10	-7	4	21	13	15	28	29	27	25	20	9	15	10	20	11	32	-3	-12	9.5
Sioux City	Max	33	32	15	20	30	33	13	6	12	35	32	20	13	31	36	37	41	38	35	36	33	40	31	40	28	44	33	52	37	6	-1	28.9
	Min	25	22	8	-4	13	19	4	-7	-8	6	13	9	-8	10	0	19	24	15	29	28	25	24	28	11	11	20	24	24	7	-6	-14	11.9
Spencer	Max.	28	30	20	18	20	24	18	2	8	24	28	20	5	28	30	28	33	33	29	35	39	33	30	28	28	44	..	40	36	15	-3	25 2
	Min	4	0	-2	-8	4	10	-9	-13	-5	-4	8	4	-20	-8	-5	-3	4	8	9	17	19	13	18	-2	18	9	..	18	2	-13	-23	1.7
Spirit Lake	Max.	26	20	22	21	27	26	15	3	6	23	32	23	6	52	28	36	44	44	32	32	32	34	25	28	23	34	37	42	36	5	3	25 7
	Min.	11	20	10	-4	-3	16	-5	-10	-6	-3	10	1	-12	-7	-5	10	15	13	23	24	12	13	10	-3	16	9	15	12	5	-14	-24	5.0
Storm Lake	Max.	28	27	23	15	27	26	24	6	4	25	27	22	9	20	28	31	32	34	31	32	32	31	26	29	28	38	34	39	39	9	-3	24.9
	Min	20	13	7	0	4	14	5	-8	-5	-3	14	9	-14	-3	2	13	19	15	23	22	22	16	13	7	14	10	14	18	9	-10	-19	7 8
Stuart	Max.	35	30	25	15	30	25	20	7	2	20	28	20	8	20	25	32	35	35	33	32	34	34	30	32	23	38	35	40	40	15	0	25.5
	Min.	15	10	10	2	2	7	6	-5	-5	-2	11	7	-10	-2	5	20	15	20	31	30	27	22	12	20	16	12	22	25	15	-4	-13	10.0
Toledo	Max.	33	30	16	7	26	25	14	10	12	23	27	19	4	22	26	35	36	35	34	36	35	31	30	26	28	37	34	40	41	3	0	25.5
	Min.	13	11	13	-1	-5	13	3	-9	-9	-3	12	10	-11	-7	-1	18	12	13	28	32	30	23	21	9	19	9	19	14	30	-3	-14	9.3
Thurman	Max.	39	34	29	20	32	32	15	12	14	29	26	23	19	25	30	34	38	36	36	36	29	38	31	35	30	44	38	44	43	19	8	29 9
	Min.	22	13	12	-10	10	18	12	-11	-5	1	8	6	-2	-1	-2	20	13	18	31	30	27	23	20	17	18	18	22	27	14	1	-7	11.7
Villisca	Max.	39	24	24	24	25	15	24	14	2	26	24	24	9	12	30	45	38	38	33	33	38	36	34	33	29	44	38	46	43	13	10	27.6
	Min.	18	13	20	-9	-3	5	2	-12	-10	-8	4	5	-13	-8	-6	15	10	10	19	28	25	18	24	24	20	8	23	20	28	-3	-14	8 4
Wapello	Max	36	55	46	35	28	30	29	25	17	35	47	38	23	28	46	34	39	52	35	32	35	45	49	47	29	38	30	40	60	38	15	36 6
	Min.	12	23	22	11	6	18	10	1	-2	1	14	15	-1	2	10	25	20	15	31	31	31	31	21	17	15	20	20	23	35	-4	-5	15 2
Washingt'n	Max.	37	40	26	22	28	28	17	12	13	29	33	28	13	31	35	33	42	38	32	35	34	36	34	36	51	38	30	44	51	12	10	29.9
	Min.	11	25	12	3	0	14	4	-4	-7	-3	14	8	-6	-6	6	20	15	15	30	30	58	25	19	12	15	13	15	15	23	-2	-11	10 7
Waterloo	Max.	33	30	23	19	23	15	15	4	13	26	32	24	10	24	29	35	33	42	34	35	36	35	30	25	27	35	25	38	41	32	5	26.9
	Min.	8	5	9	-1	-3	3	3	-8	-10	-2	12	9	-10	-9	-3	14	11	14	23	30	30	24	19	9	12	10	9	11	9	-6	-15	6 8
Waverly	Max.	30	28	25	16	24	15	20	4	12	25	28	21	10	21	25	34	38	36	35	37	37	32	29	27	26	36	32	37	38	18	-2	25 9
	Min.	7	10	7	0	-3	13	3	-8	-8	-3	11	9	-10	-10	-5	15	12	10	29	32	30	19	17	8	11	6	13	10	18	-6	-16	9.1
Webster C.	Max.	19	19	16	29	30	24	12	5	11	26	28	19	8	24	27	30	34	36	34	35	36	31	29	31	28	27	34	37	37	15	-2	21.8
	Min.	8	6	-4	11	18	12	5	-8	-4	0	12	8	-9	-9	-2	10	14	19	22	31	28	20	21	10	8	12	30	18	10	-6	-17	8 5
Wilton Jc.	Max.	47	39	31	32	26	23	22	12	12	24	32	28	16	28	33	34	40	39	33	36	35	38	33	32	30	37	34	39	49	36	7	30.5
	Min.	11	28	17	7	3	9	7	-3	-5	-5	12	21	-5	-5	7	21	12	16	30	33	31	31	24	13	21	9	17	15	34	3	-9	12.9
Winterset	Max.	37	33	21	19	37	27	18	8	9	26	30	23	10	24	31	35	39	36	33	33	36	34	31	34	25	37	30	44	41	5	3	27.5
	Min.	20	23	30	1	1	12	8	-5	-7	2	12	15	-8	2	5	25	20	20	30	32	28	23	24	13	22	16	24	20	36	-2	-10	13.6
WhatCheer	Max.	46	48	46	25	31	32	18	20	10	19	35	28	20	30	28	35	36	35	54	55	32	36	40	36	38	40	33	40	42	15	12	33.2
	Min.	8	8	12	0	-3	0	7	-5	-7	-3	5	-1	-10	-3	0	5	12	10	30	32	13	14	14	12	13	11	13	14	12	-1	-10	6.5

METEOROLOGICAL DATA FOR DECEMBER, 1898

NORTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT)								PRECIPITATION, IN INCHES.								
	Monthly mean.	EXTREMES. Mean maximum.	Mean minimum	Maximum.	Date.	Minimum.	Date.	Monthly range.	Monthly.	Greatest daily.	Total snowfall.	Depth of unmelted snow at end of month.	Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).
Algona *	14.5	....	....	36	26, 28	-23	31	59	.37	.10	3.8	4.0	N W	13	12	6	4
Alta	15.6	23 7	7.6	40	28	-18	31	58	.35	.16	3 7	2.0	W	13	10	8	6
Britt*	14.0	24 4	3 7	40	19	-13	13	53	.41	.20	4.1	5.0	W	11	16	4	4
Charles City	14.4	24 8	4.1	44	3	-21	31	65	03	.02	.5	5.5	N	9	14	8	2
Clear Lake a	14.4	23 2	5.6	36	17,26,28-9	-21	31	57	.20	.10	2 0	....	NW	24	5	2	2
Cresco	12.2	20.8	3.6	36	18	-20	31	56	.38	.20	1.7	3.0	NW	16	8	7	3
Decorah	14.2	24.4	4.0	37	29	-20	31	57	.31	.21							2
Dows	14 2	23.5	4.8	37	29	-21	31	58	.47	.20	2 8	8.0	NW	19	4	8	6
Eagle Grove†	14.4	....	....	....	....	..	..	..	.....	.....	....	....	.....	....	....	..	..
Elkader	17.2	29 1	5.3	45	1,18,29	-15	31	60	.37	.20	2 0	1.0	N	20	6	5	3
Estherville a	9.7	16 9	2.5	35	28	-25	31	60	.25	.20	2.5	6 0	NW	..	....	....	1
Fayette‡	14 8	21.4	5 1	40	18 29	-18	31	58	.25	.14	1 8	1 5	NW	16	10	5	4
Fonda	10 9	17.0	4.8	36	19	-20	30	56	.....	.....	..		.....	12	13	6	..
Forest City	12 6	20 6	4.5	39	18	-20	31	59	.20	.10	2.0	6.0	NW	13	8	10	2
Grand Meadow *	15.7	....		40	29	-16	31	56	.39	.12	1.8	2.0	NW	13	12	6	5
Greene	15.3	24.9	5.7	37	28	-19	31	56	33	.25	.8	2.0	W	14	10	7	2
Hampton	15.0	22.6	7.3	37	28	-18	31	55	.46	.17	3 0	12 0	NW	11	13	7	4
Hawkeye	....	....	....	....	..	....	....	....	.55	.25	3.5	3 0	.....	..	....	..	3
Humboldt	16.6	25.8	7 5	39	26	-22	31	61	.02	.02	.2	6.0	NW	21	2	8	1
Lansing	17.6	28 3	7.0	44	29	-15	31	59	.27	13	.8	....	.....	14	12	5	4
Larchwood	....	....	....	.....	....	.....	....	....	.05	.05	.5		NW	14	12	5	1
Larrabee	15.6	26.0	5.2	43	28	-22	31	65	.24	.16	2.4	7.0	NW	9	16	6	5
Le Mars	17 8	27.1	8.6	43	28	-5	13, 31	58	.20	.20	2.0	....	S	20	5	6	1
Mason City a	13.6	23.0	4.3	45	20	-25	31	70	T	T	T	8 0	.....	..	....	....	..
New Hampton	14 4	24.0	4 9	39	19	-20	31	59	.12	.10	1 0	4 0	NW	13	13	5	2
Northwood d	16 0	26.9	2 0	38	17, 20	-20	31	58	....	.....	....		NW	27	1	3	..
Osage †	11 8	....		....	....	.....			.32	.11	2 0	9 0	NW	9	11	11	4
Plover	17 0	23 7	10 4	44	28	-21	31	65	.22	.15	2.2	4 0	NW	14	5	12	3
Primghar	17.3	27 4	7.2	45	17	-20	31	65	.10	.10			W	15	0	16	1
Ridgeway	18.0	28.9	7 2	43	18	-19	31	62	.40	.15	1.8	4.0	W	13	11	7	8
Rock Rapids ‡	12.8	22 7	2.9	40	17, 27	-22	13	62	.....	.....	....		N, S		....	....	..
Ruthven	14.0	23.9	4.2	39	29	-25	31	64	.40	.20	4 0	3 0	NW	22	1	8	3
Sibley c	14.0	24.8	3.2	42	28	-21	31	63	.15	.13	1.5		NW	....	....	....	2
Spencer a	13.4	25.2	1 7	44	26	-23	31	67	.32	.15		2.5	W	....	....	....	4
Spirit Lake	15 4	25.7	5.0	44	16, 18	-24	31	68	.32	.32	3 2		N, S, W	23	4	4	1
Storm Lake	16 4	24 9	7.8	39	28, 29	-19	31	58	.28	.08	3 2	2 0	W	17	8	6	5
Waverly	16.5	25.9	7.1	38	17, 29	-16	31	54	.38	.15	2 3	3 0	NW	12	13	6	4
West Bend * a	23 7	....	....	37	26, 28	-22	31	57	.40	.10	4 0	....	NW	14	7	10	4
West Union	....	....	....	....	.....	....	.....	....	.30	.15	3.0		N, SW, NW	22	0	9	3
Washta	....	....	....	....	.....	....	.....	....	.46	.20	5.0	6.0	S	18	7	6	3
Average	16 1	21.4	5.6	40 0	....	-20 2	...	60.2	.28	.....	6.9	4.7	NW	16	8	7	3

CENTRAL SECTION.

Amana	19.0	27.5	10.5	42	29	-10	31	52	.44	.30	1.2	....	NW	18	7	6	6
Ames	....	....	....	....	.....	-15	31	.	..	...	....	....	.....	12	12	7	..
Audubon	18 0	27 1	8.8	39	26, 28	-15	31	54	1.10	.60	11.0	2.0	NW	4	17	10	3
Belle Plaine‡	18 7	27 4	10 0	42	29	-12	10, 31	54	.28	.10	1.8	1.5	SW	17	9	5	4
Carroll	15.8	25.4	6.3	42	17,20,28	-19	31	61	.50	.30	5.0	....	.....	20	2	9	3
Cedar Rapids	19 0	27.8	10.1	44	29	-10	31	54	.65	.40	2.6	....	NW	21	1	9	4
Cedar Falls	17.4	26 0	8 8	40	17	-16	31	56	.20	.20	2.0	....	NW	15	9	7	1
Clinton	21.8	31.5	12 2	53	29	-8	31	61	.42	27	1 2	....	W	13	8	10	5
Davenport	23.2	31.1	15.4	52	29	-6	31	58	.59	.31	7		SW	18	4	9	6
Delaware †	14 6	..	.	.	.. ...	...	.....	...	.52	.30	1 8	....	SW	16	8	7	4
Denison	17 4	26 0	8.7	50	27	-18	31	68	.14	.09	2.0	1.0	W	18	11	2	2
De Soto h	21.2	29 2	13 2	44	28	-11	31	55	.32	.31		..	.....	....	....	..	2
Des Moines	20 7	28.9	12.2	46	28	-10	31	56	.57	35	2.2	.2	NW	14	8	9	6
Dubuque	19.2	27 4	11 0	46	29	-10	31	56	.33	.18	1 3		NW	14	11	6	4
Eldora	15.6	26 9	4 4	41	28	-20	31	61	1 70	1.00	7.0	3.0	NW	0	22	9	5
Galva	17.2	26 5	7 9	41	28	-18	31	59	.26	.11	...	....	NW	11	9	11	5
Grinnell	18 9	26 5	11.4	40	29	-12	31	52	.01	.01	.1	....	W	12	11	8	1
Grundy Center	15 6	25.3	6.0	39	28, 29	-17	31	56	.40	.15	1.5	1 0	NW	17	7	7	4
Guthrie Center‡ h	13 4	22 5	4 2	49	28	-14	31	63	.25	.15	1.5	T	NW	..	....	....	2
Independence	15.8	24.7	6 8	40	29	-16	31	56	.42	.16	2 8	T	SW	15	7	9	4
Iowa City	20 8	29.7	11 8	48	29	-10	31	58	.53	.50	3	....	NW	9	18	4	2
Iowa Falls	14.7	23 9	5 5	37	28	-18	31	55	.40	.20	4.0	....	NW	17	5	9	4
Le Claire	..	....	....	....	.. ....	....	....		.29	.11	....	....	.....	....	..	..	5
Linn Grove	18.6	26 4	10.9	44	29	-10	31	54	.30	.22	1.3	.5	W	18	5	8	5
Logan	19.4	28.1	10.7	39	17, 18	-14	31	53	.70	.20	7 0	3.0	N	18	5	8	5
Maquoketa	21.6	33.1	10.0	52	1	-10	31	62	.25	.16	2.5	....	NW	20	1	10	3
Monticello	18 4	28.4	8 5	45	29	-11	31	56	35	.20	1 5	....	NW	22	5	4	2
Mt. Vernon *	18 8		...	46	29	-13	31	59	.....	....	...	....	.....	....	..	....	..
Newton	18 8	27.7	9.8	42	28	-14	31	56	.58	.42	2.7		NW	13	13	5	3
Odebolt	17 4	26 2	8.7	38	26, 28	-17	31	55	.36	.10	3.0	6 0	.....	16	9	6	4
Ogden	16 8	26.6	7.1	39	17, 28	-17	13, 31	56	.33	.17	1 5	6.0	NW	16	0	15	4
Olin	19.2	28.1	10.3	45	30	-10	31	55	.16	.10	1.5	....	NW	14	8	9	3
Reinbeck	....	....	....	.	.....	...	...	...	....	.....	....	....	.....	..	....	....	..
Rockwell City	16 6	25.9	7.3	42	29	-20	31	62	.15	.15	3 0	....	.....	16	1	14	1
Sioux City	20 4	28.9	11.9	52	28	-14	31	66	.06	.02	...	...	NW	13	10	8	4
Sac City	16.2	23 9	8.4	39	28	-19	31	58	.40	.20	4.0	4 0	NW	14	9	8	4
Toledo	17.4	25.5	9.3	41	29	-14	31	55	.50	.40	1.0	..	NW	14	0	17	2
Vinton *	18 6		...	40	28	-10	31	50	.18	.10	2.0	.2	NW	19	5	7	4
Waterloo	16.8	26.9	6.8	42	18	-15	31	57	.33	.24	1 0	....	NW	17	7	7	3
Webster City	16.6	24.8	8.5	37	28, 29	-17	31	54	.04	.04	T	T	NW	10	14	7	1
Whitten d*	15.5	....	....	36	17	-17	31	53	.20	.10	2.0	5.0	NW	15	11	5	2
Wilton Junction	21.7	30.5	12.9	49	29	-9	31	58	.70	.60	1.0	T	NW	22	2	7	2
Average	18.3	27.3	9.5	43.1	....	-13.7	.....	56.8	42	.....	2 3	2.2	NW	15	8	8	3

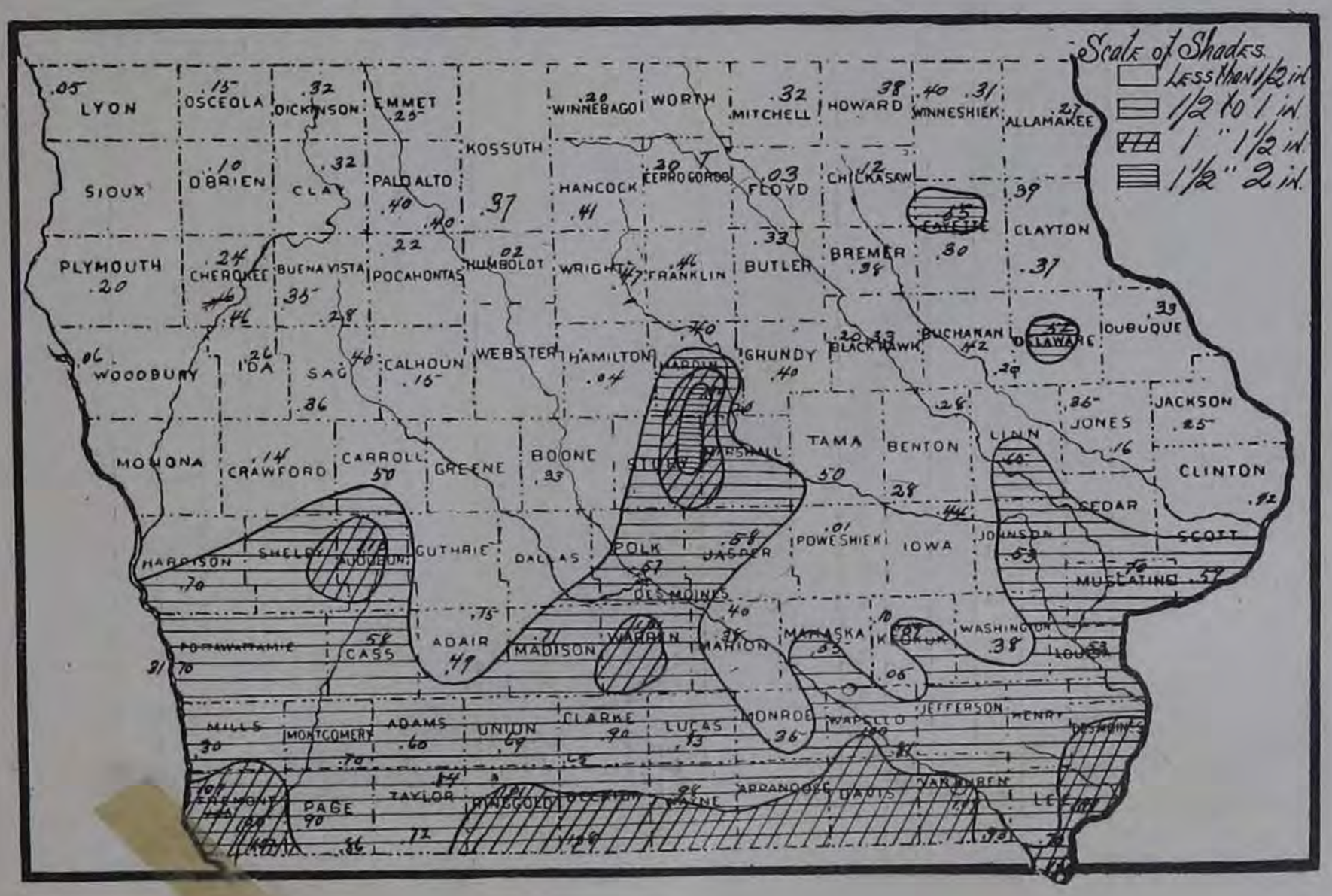
METEOROLOGICAL DATA FOR DECEMBER, 1898—CONTINUED.

SOUTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.			Depth of unmelted snow at end of month.	Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).
	Monthly mean.	EXTREMES						Monthly range.	Monthly.	Greatest daily.	Total snowfall.						
		Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.										
Afton	19.4	27.5	11.4	42	28	-11	31	53	.69	.48	2.0	.....	SW	5	15	11	3
Albia *a*	21.0	34.5	7.6	56	30	-12	30	68	.35	.25	3.5	....	SW, NW	16	8	7	2
Atlantic	17.9	28.0	7.8	42	28	-12	8, 31	54	.58	.38	2.0	....	NW	17	3	11	2
Bedford	20.4	29.9	10.9	45	28	-12	13	57	.72	.38	2.0	2.0	SW	14	12	5	3
Bonaparte	23.5	32.0	15.0	53	29	- 7	31	60	.93	.55	...	.....	.....	....	....	....	2
Charlton	21.6	30.8	12.4	49	27	- 9	31	58	.83	.50	2.1	.....	W	12	13	6	7
Clarinda	18.2	26.6	9.8	44	28	-10	31	54	.90	.55	4.5	2.5	NW	18	8	5	4
College Springs	21.1	30.9	11.3	45	26	- 0	13	55	.86	.58	3.0	T	SW	22	4	5	3
Corning	24.0	35.8	12.3	45	29	-10	13, 31	55	.60	.40	2.0	1.0	SW	16	5	10	2
Council Bluffs	21.4	30.6	12.3	49	28	- 9	31	58	.70	.30	2.0	....	S	19	3	9	3
Eldon	19.2	25.6	12.9	45	18	-10	9	55	.81	.42	T	....	W	23	1	7	3
Fairfield ‡*b*	23.4	32.1	14.7	51	29	- 7	31	58	.75	.47	T	.....	.....	16	9	6	2
Ft. Madison*	27.1	....	....	55	29	- 2	31	57	1.47	.77	T	.....	SW	12	7	12	2
Garden Grove‡	....	....	....	....	....	-10	13, 31	..	....	.....	...	.....	NW	10	8	13	...
Glenwood	22.4	32.9	11.8	46	23,26,28	-10	31	56	.30	.30	3.0	1.0	NW	9	17	5	1
Greenfield	19.2	28.8	9.5	44	28	-14	31	58	.49	.41	1.2	2.2	SW	15	10	6	4
Hedrick*	16.7	....	....	42	28	-12	31	54	.05	.05	.5	.....	NW	....	....	....	1
Hopeville	19.6	27.5	11.8	43	28	-10	13, 31	53	.65	.42	...	.....	NW	12	13	6	3
Indianola	20.6	29.1	12.1	45	28	-12	31	57	1.01	.63	2.5	.....	NW	14	5	12	4
Keokuk	26.0	33.2	18.9	57	29	- 4	31	61	1.38	.94	.9	.....	SW	16	6	9	6
Keosauqua	24.6	33.6	15.5	56	29	- 5	31	61	1.09	.36	1.0	.....	.....	....	....	....	5
Knoxville	21.3	29.9	12.7	49	29	-10	31	59	.38	.20	2.0	.....	NW	18	6	7	2
Lamoni *f*	18.6	26.7	10.6	38	18	- 8	31	46	1.38	.83	3.0	.....	NW	....	....	....	....
Lenox	19.3	27.9	10.7	42	28	-15	13	57	.84	.60	1.2	.2	NW	19	7	5	4
Mooar	24.6	32.2	16.1	58	29	- 5	31	63	.70	.40	...	...	NW	15	4	12	2
Mt. Ayr	19.6	27.9	11.3	38	26	-10	31	48	1.01	.40	3.0	T	SW	9	12	10	5
Neola	18.8	32.2	5.5	42	2, 29	- 8	7	50	....	.....	...	.....	NW	21	3	7	...
Omaha	22.0	29.6	14.5	48	28	-10	31	58	31	.14	2.0	.3	NW	13	10	8	6
Osceola	20.0	27.5	12.5	46	28	-10	31	56	.90	.48	3.0	T	SW	8	13	10	3
Ovid	21.6	31.1	12.2	49	29	-11	13	60	.98	.42	4.0	.....	NW	15	3	13	4
Oskaloosa	20.8	30.1	11.5	48	29	- 9	31	57	.55	.30	3.2	.....	NW	16	4	11	2
Ottumwa	21.4	31.1	11.7	50	29	- 6	31	56	1.00	.48	2.5	....	W, NW	10	9	12	4
Pella	16.6	22.7	10.6	44	28	-16	31	60	.40	.25	1.5		SW	12	14	5	2
Sidney	21.7	28.2	15.2	44	28	-10	31	54	1.35	.71	7.2	2.0	NW	20	7	4	5
Sigourney	20.2	31.0	9.5	49	29	-12	31	61	.59	.47	...	.....	NW	15	10	6	2
Stuart	17.8	25.5	10.0	40	28, 29	-13	31	53	.15	.15	1.5	.....	N	....	....	....	1
Thurman	20.8	29.9	11.7	44	26, 28	-11	8	55	1.07	.60	6.1	....	SW	9	16	6	5
Villisca‡	18.0	27.6	8.4	46	28	-14	31	60	.70	.70	3.0	....	S	23	2	6	1
Wapello	25.9	36.6	15.2	60	29	- 5	31	65	.53	.30	T	.....	SW	19	8	4	2
What Cheer	19.8	33.2	6.5	55	20	-10	13, 31	64	.10	.10	...	....	NW	23	3	5	1
Washington	20.3	29.9	10.7	51	29	-11	31	62	.38	.23	...	.....	SW, NW	....		...	3
Winterset	20.6	27.5	13.6	44	28	-10	31	54	.71	.51	T	.....	.....	....	....	...	3
Average	20.8	29.9	11.7	47.2	.....	-9.9	.....	57.1	.73	.....	2.6	1.4	NW	15	8	8	3
Average for the state	18.1	27.2	8.9	43.4	.....	-14.6	.....	58.0	.48	.....	3.9	2.8	NW	15	8	8	3

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

Precipitation Chart December 1898.



DAILY AND MONTHLY PRECIPITATION FOR DECEMBER, 1898.

STATIONS.	DATE.																														Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	..	..	.13	....	....		....	....	....	....	....	....	....	....	....	....	....	....	.48	....	.08	....	....	....	....	....	....	....	....	....	....	.69
Algona	.10	T	T	....	.10	.07	....	....	....	....	....	....	....	....	....	....	....	....	.10	....	....	T	....	....	T	....	....	....	T	....	....	.37
Alta (Hadden)	.03	....	.02	....	.10	....	....	....	....	....	....	....	....	....	....	....	....	....	.16	....	....	....	T	.01	T	....	....	....	.03	....	....	.35
Albia	..	....	.25	....	....	....	....	..	..	....	..	....	....	....	....	....	.	....	....	....	....	....	....	.10	....	....	....	....	....	....	....	.35
Amana	.02	....	.04	.03	....	T	T	..	....	..	....	..	....	....	....	....	....	....	.30	.02	....	....	....	....	.03	....	....	....	....	....	....	.44
Atlantic	..	....	.20	....	....	..	....	....	....	....	....	....	..	....	....	....	....	..	.38	....	....	..	....	..	....	....	....	....	....	....	....	.58
Audubon	....	..	.60	....	....	....	....	..	..	....	....	....	..	....	....	..	....	..	.20	....	....	....	....	..	....	....	....	....	....	....	..	1.10
Belle Plaine	....	....	....	....	....	....	.04	....	..	..	....	....	..	..	....	....	....	....	.10	T	..	....	....	..	..	....	..	....	..	.30	..	.28
Bonaparte	..	..	....	....	....	....	....	....	..	..	..	....	....	....	....	....	....	....	.38	....	.55	....	....	....	.10	....		....	....	.04	....	.93
Britt	.10	.04	.02	..	T	.20	....	..	....	....	..	..	..	....	....	..	....	....	T	T	....	....	....	....	....	T	....	..	T	....	....	.41
Bedford	....	....	.16	....	....	....	....	....	..	....	..	....	..	..	..	....	....	..	.38	....	T	.18	....	....	....	....	....	....	....	T	....	.72
Carroll	..	..	.30	..	....	.10	....	....	....	....	....	..	....	....	....	....	..	..	T	..	..	....	..	..	T	....	..	....	....	....	T	.50
Cedar Falls	..	.20	..	..	....	....	.	....	....	.	..	.	..	..	..	....	....	.	....	....	..	....	....	..	....	....	..	....	....	....	.10	.20
Cedar Rapids	.05	..	.15	....	T	T	....	....	....	..	....	....	..	..	..	T	..	..	.40	T	..	....	T	.05	....	....	....	....	T	....	....	.65
Charlton	..	..	.20	....	....	....	....	....	T	..	..	....	..	....	....	.	....	....	.50	.02	.07	.01	....	....	.01	....	.02	....	..	....	....	.83
Charles City	T	....	....	..	..	.02	T	....	..	..	....	..	....	..	..	....	....	....	.01	T	..	....	T	T	T	....	....	....	....	....	....	.03
Clarinda	..	....	.25	....	....	....	....	..	....	....	..	....	..	....	..	..	....	..	.55	....	.07	....	....	..	....	....	....	....	.03	....	....	.90
Clinton	.01	..	....	....	..	..	....	..	..	....	....	..	....	..	....	....	....	....	.27	.01	....	.02	....	..	.11	....	..	....	....	....	....	.42
Clear Lake	....	..	....	....	T	....	.10	....	..	....	....	..	....	..	....	....	....	....	....	....	....	..	T	.10	.	....	....	....	....	..	..	.20
College Springs	....	..	.15	....	....	....	....	....	..	....	..	....	..	..	..	..	..	....	.58	..	13	.	....		....	....	..	..	....	....	....	.86
Corning	..	..	.20	....	....	....	....	..	....	..	..	....	..	....	....	..	....	T	.40	..	....	..	....	....	..	..	T	..	T	..	..	.60
Council Bluffs	..		.30	....	....	..	....	....	....	....	....	..	....	....	....		..	..	.20	....	..	..	....	....	..	..	.20	....	....	..	..	.70
Cresco	....	.02	....	....	.03	T	....	....	..	....	..	..	....	....	....	....	..	..	.20	.06	..	..	T	.04	..	.03	..	..	T	....	..	.38
Davenport	.01	..	....	..	....	T	.01	....	..	....	....	..	..	....	....	T	....	..	.28	.10	T	.16	T	..	.03	..	..	T	....	....	..	.59
Decorah	..	....	....	..	....	....	....	..	..	....	....	....	....	....	....	....	..	..	.21	.10	....	....	..	....	....	....	T	T	....	....	....	.31
Delaware	.05	....	..	....	....	....	..	....	....	..	..	..	..	..	....	..	....	..	.30	.04	....	....	..	.13	..	..	..	..	....	..	..	.52
Denison	....	....	.09	....	T	T	..	....	....	....	....	....	....	....	....	....	....	....	T	.05	....	....	....	....	....	....	....	T	....	....	....	.14
Des Moines	....	....	.13	....	....	.02	.01	....	T	..	....	T	T	..	....	..	....	....	.35	T	T	..	T	..	.02	....	T	....	....	.04	..	.57
De Soto	....	....	....	....	....	....	....	....	T	..	....	....	....	....	....	....	....	....	.31	.01	....	....	T	..	T	....	..	....	T	....	....	.32
Dows	.05	T	T	....	....	.10	T	..	T	....	..	....	....	....	....	....	....	....	.20	T	..	..	.02	.05	.05	....	..	....	....	T	..	.47
Dubuque	.05	T	..	..	....	T	T	..	T	..	....	....	....	..	..	T	....	....	18	.02	....	....	T	T	.03	T	....	T	....	T	..	.33
Eldon	..	..	....	T	T	..	....	T	....	..	....	..	....	....	....	....	....	..	.42	.07	T	.32	....	....	....	....	....	....	....	....	..	.81
Eldora	.10	....	.20	....	....	.30	....	....	....	....	....	..	....	....	....	....	....	....	1.00	T	T	..	....	....	.10	....	....	....	....	T	....	1.70
Elkader	....	....	....	....	.09	T	....	....	....	....	..	....	....	....	....	....	....	....	.20	..	..	..	T	.08	....	....	....	....	....	....	....	.37
Estherville	....	....	..	....	....	....	....	....	....	..	....	T	....	..	..	....	....	....	.20	.05	..	....	....	T	....	....	....	....	....	....	....	.25
Fairfield	T	..	..	T	....	....	T	....	T	..	....	..	....	..	..	....	T	..	.47	..	.28	....	....	..	..	....	....	....	....	....	....	.75
Fayette	.02	....	....	....	....	.06	....	....	....	....	....	....	....	....	....	....	..	....	.14	..	.03	....	....	T	..	T	....	....	T	....	....	.25
Forest City	....	T	T	..	....	.10	T	....	....	....	....	....	....	....	....	....	....	....	T	....	....	....	....	..	.10	....	..	....	....	....	....	.20
Ft. Madison	.01	....	.04	..	....	.11	....	..	....	....	....	....	....	....	....	T	....	..	.77	T	.70	....	....	..	T	....	..	....	....	....	....	1.47
Galva	..	..	.30	..	....	..	....	....	....	....	....	..	....	....	....	....	....	....	.08	..	....	....	T	....	T	....	....	....	.02	..	....	.28
Glenwood	....	....	....	..	....	.10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	....	....	.30
Grand Meadow	T	..	..	..	....	....	....	....	....	....	....	....	....	.	....	....	....	....	.12	.08	.02	....	T	.07	..	..	....	..	....	..	....	.39
Greene	..	....	.06	....	..	T	T	....	....	....	....	....	....	....	....	....	..	....	.25	....	....	....	T	.08	....	....	....	....	....	....	....	.53
Greenfield	....	....	.01	....	..	....	..	....	T	..	....	....	.	....	....	..	T	....	.41	.01	T	....	....	....	T	....	T	....	.01	....	..	.49
Grinnell	..	....	T	....	.10	T	....	....	T	..	..	....	..	....	....	..	..	....	T	....	..	....	....	....	T	....	....	....	T	....	....	.01
Grundy Center	T	....	.15	..	..	....	....	....	..	..	....	..	....	....	....	.	....	....	.10	.15	....	....	T	.05	..	....	....	....	T	....	....	.40
Guthrie Center	....	....	..	..	.17	....	..	....	....	....	....	....	....	..	....	....	....	....	.10	....	....	..	....	..	....	....	....	....	T	....	..	.25
Hampton	.08	....	..	..	.10	....	....	....	....	....	....	....	....	....	....	....	....	....	.10	....	....	..	....	.11	..	....	....	....	....	....	....	.46
Hawkeye	T	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.20	....	....	....	....	.25	..	....	....	....	....	....	....	.55
Hedrick	....	.	.05	....	..	..	....	....	....	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	.05
Hopeville	..	....	.12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.42	..	.11	..	..	....	....	....	....	....	....	....	..	.65
Humboldt	..	....	..	..	....	..	....	....	....	....	..	....	..	....	....	..	..	....	.02	T	....	....	....	T	T	....	....	....	T	....	....	.02
Independence	.07	....	....	....	.16	....	....	....	....	....	..	....	....	....	....	....	....	....	.15	T	....	....	....	.04	..	....	....	T	....	....	....	.42
Indianola	....	....	.63	....	....	T	T	....	T	....	..	....	....	....	....	....	....	....	.35	.01	T	..	....	....	..	.02	..	....	....	T	....	1.01
Iowa City	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.50	....	....	....	.03	....	....	....	....	....	....	....	.53
Iowa Falls	.10	....	.05	....	.20	T	....	....	T	....	....	....	....	....	....	....	....	....	T	....	....	....	....	.05	T	..	....	....	....	....	....	.40
Keokuk	T	T	.04	..	..	....	T	..	....	.	....	..	....	....	....	T	....	....	.94	.03	.04	32	....	....	T	....	T	....	.02	....	....	.06
Keosauqua	....	T	....	.09	....	....	T	....	..	..	....	....	....	....	....	..	....	....	.25	21	.18	.36	.	T	....	..	....	....	....	.01	....	.28
Knoxville	..	..	.20	....	..	....	....	..	..	....	....	....	..	....	....	..	....	....	.18	..	....	..	..	T	....	..	....	....	....	....	....	.32
Lamoni	..	....	.30	....	..	....	T	....	....	..	....	....	....	....	....	....	....	....	.83	..	.25	....	..	T	....	..	....	....	....	....	....	.32
Lansing	....	.02	..	....	....	.03	T	....	....	..	..	....	..	..	T	....	....	....	.13	.09	....	....	T	T	T	....	....	....	....	T	....	.15
Larchwood	..	..	....	....	.05	.65	T	....	....	....	..	..	....	..	..	....	....	....	.16	....	....	....	.03	T	....	....	....	....	....	....	....	.40
Larrabee	..	....	.02	..	.02	T	T	....	....	....	..	....	....	....	....	..	....	....	....	....	..	..	....	....	....	....	....	....	....	T	....	.27
Le Claire	.02	....	....	..	..	....	..	....	....	..	....	T	....	..	....	..	....	....	.16	....	....	..	.03	T	....	....	....	....	....	....	....	.05
Le Mars	....	....	....	....	.20	....	....	....	....	..	....	..	....	..	....	..	....	.03	.11	....	..	.07	..	.06	....	..	..	....	.01	....	....	.24
Lenox	....	....	.10		....	..	....	..	....	..	....	..	....	..	....	..	....	....	T	....	....	....	....	....	....	....	....	....	....	T	..	.29
Linn Grove	.01	....	....	....	....	.02	....	....	..	....	....	....	....	....	....	....	....	....	.60	..	.12	..	....	....	T	..	.02	....	....	T	..	.20
Logan	.10	....	.20	.20	....	....	..	....	..	..	....	..	....	..	....	..	..	..	.22	.01	..	....	....	.04	....	..	....	..	....	....	..	.84
Maquoketa	.03	..	....	....	....	....	....	....	..	..	....	..	..	..	....	..	..	....	....	..	..	....	..	....	..	..	....	.10	....	.10	....	.30
Mason City	T	T	....	....	..	T	..	....	....	..	....	....	....	....	....	..	....	T	T	T	..	..	....	.06	..	....	....	....	..	....	..	.70
Mooar	....	....	....	....	....	..	..	..	....	..	....	....	....	....	....	..	....	....	.30	T	T	.40	....	....	....	....	....	....	....	....	....	.25
Monticello	.15	....	....	....	....	..	..	..	....	..	....	....	..	....	....	....	....	....	.20	..	..	..	....	....	....	....	....	....	....	....	....	T
Mt. Ayr	....	..	.27	....	..	....	....	..	....	..	....	....	..	....	..	....	....	....	.40	.01	.26	..	....	..	....	....	.07	....	....	....	....	.70
New Hampton	..	..	....	....	....	.10	....	..	..	....	..	..	....	..	....	....	....	....	.02	....	..	..	....	..	....	....	....	....	....	....	....	.35
Newton	..	..	.14	....	..	....	..	..	....	....	..	..	....	..	....	....	....	....	.42	....	..	..	....	....	....	....	....	....	....	....	....	1.01
Odebolt	T	..	.13	.	..	.05	....	..	....	....	..	..	....	....	....	..	....	....	.08	T	....	....	....	....	.02	....	....	....	....	....	....	.12
Ogden	..	....	.08	....	.	.	.01	..	....	....	..	..	....	....	....	..	....	....	.17	....	..	....	....	....	T	....	T	....	....	.10	....	.58
Olin	.05	..	....	....	..	....	..	....	....	....	..	..	....	....	....	....	....	....	.10	....	....	....	....	.07	....	.	....	....	....	....	....	.36
Omaha (Neb)	T	..	.14	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.10	....	....	..	.01	....	..	..	....	....	....	....	....	.33
Osage	..	T	.	..	.05	....	....	....	....	....	....	.	....	....	....	....	....	....	.10	.01	..	..	T	....	T	.	.03	..	.01	.02	....	.16
Osceola	....	..	.30	....	....	....	....	T	T	....	..	..	....	..	....	....	....	....	.11	.05	..	..	T	.11	....	....	.	....	T	..	..	.31
Oskaloosa	....	..	.30	....	....	..	....	....	....	..	..	..	....	....	....	....	....	....	.48	T	.12	....	T	T	T	..	..	....	....	..	..	.32
Ottumwa	....	..	.20	....	....	....	....	....	..	....	..	..	....	....	....	....	....	....	T	..	..	....	T	T	.25	.	....	....	....	..	..	.90
Ovid	....	..	.40	....	..	..	....	....	..	....	..	..	....	..	....	....	....	....	.48	....	.27	..	..	..	T	....	....	....	....	..	..	.55
Pella	....	....	.15	....	....	....	....	....	..	....	..	..	....	....	....	..	..	.03	.39	....	.16	..	....	....	T	....	....	....	....	....	....	1.00
Plover	.05	....	....	....	15	T	....	....	....	..	....	T	....	....	....	....	....	....	.25	..	..	..	....	....	T	....	....	....	....	....	....	.98
Primghar	.10	..	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	..	..	..	....	....	....	....	....	....	....	....	....	.40
Ridgeway	....	.04	....	....	.04	.03	....	..	T	..	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.02	....	....	.22
Rockwell City	..	....	.15	....	..	..	....	....	....	..	....	....	....	....	....	....	....	....	.15	.05	.03	....	T	.04	....	.02	....	....	T	....	....	.10
Ruthven	.10	....	....	....	..	.20	....	....	....	..	....	....	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	..	....	.40
Sac City	T	....	.05	....	.10	....	....	....	....	..	....	....	....	....	....	....	....	....	T	.10	..	....	T	....	....	....	....	....	....	....	....	.15
Sibley	.13	....	....	....	....	.02	..	..	....	....	....	....	....	....	....	....	....	....	.05	..	....	....	T	....	..	....	..	.20	....	....	.40	.40
Sidney	....	..	.49	....	....	....	....	..	....	..	....	....	..	....	....	....	....	....	....	....	....	....	....	T	..	....	..	....	....	....	....	.15
Sigourney	....	..	T	.12	..	..	..	....	T	..	....	.	..	....	..	....	..	.71	....	.03	.08	....	....	....	....	....	....	.04	..	....	....	1.35
Sioux City	T	....	.01	....	.01	T	....	....	T	..	....	....	....	.	....	....	....	....	.47	....	T	....	T	....	T	....	....	....	.04	..	....	.59
Storm Lake	.05	....	.05	....	T	T	....	....	.	....	..	....	....	.	..	....	....	....	.02	....	....	....	T	....	T	....	T	....	.02	....	....	.06
Spencer	.15	..	....	....	....	....	.05	..	..	..	....	..	....	....	....	....	....	..	.08	....	..	..	T	T	.02	....	..	..	.08	....	....	.28
Spirit Lake	....	..	..	....	T	T	T	....	....	..	....	..	..	..	....	....	....	..	.08	.04	.	T	....	T	T	....	....	....	T	....	....	.32
Stuart	..	....	.15	..	....	....	..	..	....	....	....	..	....	.	....	....	....	..	.32	T	..	..	..	T	..	..	....	....	..	....	....	.32
Toledo	....	..	....	..	....	....	....	....	.10	....	..	....	.	....	....	....	....	....	T	....	..	..	..	....	..	..	....	....	..	....	....	.15
Thurman	....	..	.25	....	....	..	....	....	.	..	....	..		....	....	....	....	....	.40	....	....	..	....	....	....	....	....	....	..	....	....	.50
Villisca	....	..	....	....	....	..	....	....	....	..	....	..	....	....	....	....	....	....	.60	.03	.15	..	T	....	T	..	T	....	T	.04	..	1.07
Vinton	.10	....	.05	..	T	T	....	.	..	..	....	....	..	....	....	..	.	.70	....	....	....	....	....	....	....	....	....	....	....	....	....	.70
Washington	..	....	.	....	....	....	....	....	..	..	....	..	..	....	....	....	....	..	.08	..	....	....	....	.05	..	....	....	....	..	....	....	.28
Washta	..	....	T	..	....	.20	..	..	....	....	....	....	....	....	....	....	....	....	.23	.10	....	.05	....	....	....	....	....	....	....	....	....	.38
Waterloo	.04	....	..	..	..	.05	..	..	....	....	....	....	....	....	....	....	....	..	.20	T	....	....	T	T	....	....	....	....	.06	....	....	.46
Waverly	.06	....	..	....	..	.08	..	.	....	....	....	....	....	....	....	....	....	....	.24	T	..	....	....	....	....	....	....	....	....	....	....	.33
Webster City	T	..	..	..	..	..	T	..	T	....	....	....	..	....	....	....	....	..	.15	.03	....	..	..	T	.06	..	....	....	....	..	....	.38
West Bend	.10	....	..	....	.10	T	....	..	....	....	....	....	....	..	....	....	....	..	.04	..	....	....	....	T	....	....	....	T	....	....	....	.04
West Union	..	....	.	..	....	.15	..	..	..	....	.	..	....	....	....	....	....	....	10	..	..	....	T	T	T	....	....	....	.10	..	..	.40
Whitten	....	..	.10	..	....	.10	....	..	..	..	....	....	....	....	....	....	..	....	....	....	....	..	....	....	.10	..	..	....	.05	..	....	.30
Wilton Junction	..	....	....		....	....	....	....	..	..	....	....	....	....	....	....	..	....	T	....	....	..	....	....	....	....	....	....	....	T	....	.20
Winterset	....	....	....	.18	....	....	T	....	....	....	....	....	....	....	....	....	....	....	....	.60	....	....	....	....	.10	..	....	....	....	....	....	.70
Wapello	....	..	....	....	..	....	....	..	..	..	....	.	....	....	....	..	....	....	.51	.02	....	....	....	....	T	....	T	....	....	T	....	.71
What Cheer	T	....	T	.10	....	....	....	..	....	....	....	....	....	....	....	....	....	..	.30	....	.23	..	....	....	T	....	....	....	....	....	....	.53
																		T	T	..	....	....	....	T	....	....	....	....	....	....	.10

TEMPERATURE AND PRECIPITATION DATA FOR

NORTHERN SECTION.

STATIONS.	JANUARY.					FEBRUARY.					MARCH					APRIL.				
	Mean temperature.	Maximum.	Minimum.	Total precipitation.	Snowfall.	Mean temperature.	Maximum.	Minimum.	Total precipitation.	Snowfall.	Mean temperature.	Maximum.	Minimum.	Total precipitation.	Snowfall.	Mean temperature.	Maximum.	Minimum.	Total precipitation.	Snowfall.
Algona*	21	37	-3	.25	2.5	20	40	-16	1 65	11 0	34	61	6	1 45	11.0	47	76	23	2.42	..
Alta	22	38	-1	.25	2 5	21	42	-12	.93	7.2	34	66	5	1 44	5.1	47	82	20	3.02	....
Britt	19	39	-8	.25	1 8	20	41	-18	1 57	5 7	34	65	7	.93	1.5	45	79	18	2.79	..
Charles City	22	40	-9	1.20	4.0	21	42	-14	2.79	17.5	36	60	11	1.73	2.2	45	78	19	1.72	
Clear Lake	....	..														46	77	21	2 46	T
Cresco	20	38	-10	.55	1.5	20	45	-15	1.02	8.2	34	59	10	1 70	5.5	45	79	18	2.80	T
Decorah	20	41	-7	.82		21	44	-12	1.29	16.5	37	63	8	2 58	6.5	46	80	18	2.81	..
Dows	19	36	-10	85	5.0	20	42	-17	1.65	9.0	35	64	8	1.57	4.0	47	83	20	1.88	....
Eagle Grove	19				3 5	19		-10	.90	9.0	32	..	..	..	....	..	..	..	..	....
Elkader	23	47	-4	88	6.8	23	46	-13	1.09	13.8	37	65	10	2.67	3 0	46	84	17	2.64	..
Estherville	22	43	-6	.15	1.5	20	46	-15	.65	6 5	34	64	3	.48	2.5	45	76	17	1 38	1.0
Fayette	21	43	-6	1.63	4.6	21	46	-16	2 63	16 0	36	58	11	2 42	6.3	45	81	16	3 85	....
Forest City	20	39	-4	.30	3.0	19	45	-14	1.65	9.0	34	65	8	1.33	1.0	45	78	20	2.50	....
Fredericksburg	..	..	..	78		..	..	..	1 42	....	....	....	..	2.37	.	....	....	....	2 05	....
Grand Meadow*	21	38	-4	.90	6.0	21	40	-7	1.95	16.8	35	58	12	2.35	6.8	45	76	18	2.73	....
Greene	21	40	-9	.47	10 0	21	46	-13	1.19	18.0	37	62	10	1.69		47	84	20	1.52	...
Hampton	20	39	-6	1.03	4.5	20	41	-12	1.56	12.1	35	63	10	2.37	5.5	47	83	20	2.29	..
Hawkeye	..	..	...	1.10	1.0	...	..		1 70	17.0	....	.	..	1.34	3.0	...	..	...	2 20	..
Humboldt	21	40	-5	.23	2.0	21	40	-13	1.29	6.0	35	69	4	1.74	10.0	48	82	20	1 58	..
Lansing	23	44	1	.85	2.4	23	45	-9	1.70	16.5	38	60	6	2.37	6 6	47	81	19	3.03	T
Larchwood	...	..	....	.55	5 5	...	..	..	.40	4.0	..	..	....	1.30	2 0	..	..	....	.27	T
Larrabee	21	38	-5	.17	1 7	22	47	-12	.94	4.8	34	66	1	1.09	5.5	46	86	16	1.82	...
Le Mars	22	36	-3	.25	3.0	23	43	-8	.45	5.0	36	66	6	1.26	7.0	49	84	17	1 96	....
Mason City	19	38	-10	T	...	20	41	-15	.95	....	34	62	8	.75	....	46	77	20	1.85	....
New Hampton	25	50	-2	.53	1.5	24	54	-9	1.60	16.0	39	67	11	1 61	6 0	51	87	20	2.04	..
Northwood	20	40	-6	.20	2.0	20	42	-13	1 95	12 0	35	62	9	1 03	3.0	44	78	21	2.49	..
Osage	19	...	..	.37	1.2	19	...	....	1.75	14.5	32	....	....	2.01	6.0	44	....	....	3.02	...
Plover	20	40	0	....	....	21	44	-13	.60	6 0	36	65	5	.92	5.0	48	82	20	1.75	...
Primghar	21	36	-3	.19	1 9	22	41	-11	32	3 2	36	68	5	1.20	5.5	48	82	18	2.19	
Ridgeway	28	51	-3	1.01	4 6	27	51	-10	3.69	24.0	37	60	11	3 12	7.7	46	85	18	3.09	.2
Rock Rapids	22	45	-7	.45	4.5	....			....	....	34	64	2	.99	4.0	46	84	14	1.45	T
Ruthven	22	42	-3	.10	1.0	21	41	-13	.85	8.5	34	63	5	1.50	7.5	47	81	19	3.01	..
Sibley	21	42	-4	.20	2.0	21	46	-12	.57	1.5	33	64	3	.50	4.0	46	86	15	1.44	...
Spencer	20	38	-2	.04	.5	20	42	-13	.67	2.1	33	61	4	.74	4.2	45	74	18	3.12	T
Spirit Lake	22	47	-5	.30	3.0	20	48	-14	.60	6.0	34	65	3	.87	5 0	46	84	18	2.34	1.0
Waverly	22	40	-6	1.00	6.0	22	43	-11	1 30	10.8	38	62	13	1.91	3 2	47	84	21	2 03	...
West Bend*	20	38	-5	.25	2.5	20	40	-12	1.40	9.0	33	63	8	.97	4.5	45	78	21	2.49	....
Washta	....	.	...	.10	1.0	....	..	..	.85	1.8	.	....	...	.53	1.5	....	...	...	1.61	....
Mean	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

STATIONS.	MAY.				JUNE.				JULY.				AUGUST.			
	Mean temperature.	Maximum.	Minimum.	Total precipitation.	Mean temperature.	Maximum.	Minimum.	Total precipitation.	Mean temperature.	Maximum.	Minimum.	Total precipitation.	Mean temperature.	Maximum.	Minimum.	Total precipitation.
Algona*	59	87	40	6.09	72	92	56	4 63	74	93	57	1.40	71	90	55	5.79
Alta	58	89	34	4.86	70	94	48	3.41	73	93	53	2.32	71	96	48	5.49
Britt	58	88	30	4.43	70	92	43	3 96	71	97	48	1.27	69	95	40	4.35
Charles City	58	82	33	4.38	69	92	45	2.63	72	94	48	2 98	69	96	45	1.38
Clear Lake	58	82	34	6.51	69	91	48	3.74	72	92	51	5.14	70	94	46	2.98
Cresco	58	82	34	2.84	68	91	43	2.53	71	93	48	2 91	69	96	46	1.35
Decorah	59	83	36	3.67	69	91	44	2.88	72	94	46	3.04	69	93	46	1.98
Dows	58	84	31	7.22	69	90	47	4.91	71	95	47	1.75	70	96	43	3.16
Eagle Grove	55	77	35		70	....	....	....	....	....	....	....	71	88	55	....
Elkader	60	89	33	3 23	71	94	44	3 36	73	97	45	3 55	71	97	45	1 34
Estherville	57	88	32	2.22	69	97	43	3.48	71	98	45	5.39	69	98	43	4 30
Fayette	57	84	30	3 29	68	92	43	3 53	71	93	45	4 36	69	93	44	2.81
Forest City	58	83	34	4.06	73	90	42	7.20	71	90	51	2 14	69	95	44	5.50
Fredericksburg	..	..	..	2 70	....	....	.	3.30	....	....	..	3.45	..	..	..	1.71
Grand Meadow*	58	84	36	4 76	68	90	50	2.91	70	90	56	4.02	68	95	54	1 57
Greene	60	89	32	5.70	71	94	46	3 25	74	97	48	3.67	72	100	45	1.47
Hampton	59	87	35	4.25	69	92	49	4.95	73	95	50	1.46	70	95	47	5 38
Hawkeye	....	....	..	4.76	....	....	..	3.73	....	....	..	4.00	..	..	..	2.60
Humboldt	60	88	32	5.28	71	92	48	5.67	73	96	52	1.22	71	95	44	5 99
Lansing	61	89	36	2 38	71	91	45	3 00	73	94	46	3.12	70	95	48	2 37
Larchwood	....	..	..	5.38	....	....	..	4.23	....	....	..	3.20	....	....	....	1.39
Larrabee	56	89	31	3.54	70	96	44	5 90	71	98	47	5 06	71	97	45	4.07
Le Mars	58	87	31	3 71	70	94	48	4.72	72	94	53	3.34	72	98	48	2.31
Mason City	58	84	32	5.30	68	92	46	3.03	72	92	50	3.02	69	95	44	2.65
New Hampton	60	82	35	3.41	69	90	47	3 39	72	91	47	3.05	70	95	46	1.33
Northwood	57	83	34	3.95	68	92	43	3 00	71	94	48	1.80	69	94	45	2 81
Osage	57	..	..	3.67	68	....	....	3 15	71	..	..	2.85	66	..	..	2 61
Plover	59	90	35	4.85	71	95	45	4.22	74	97	50	3.30	70	95	44	6 39
Primghar	59	88	35	4.49	73	96	45	5.10	73	95	48	4.52	73	95	48	2.10
Ridgeway	59	84	32	3 30	70	93	50	3 15	73	94	52	3 64	70	95	50	1.99
Rock Rapids	55	86	26	6.05	....			..	70	94	50	1.95	....	....	....	....
Ruthven	57	86	30	4.70	69	94	44	5.41	74	96	50	3 74	69	98	45	6 16
Sibley	56	88	33	5.42	68	94	44	4 99	70	93	47	2.69	68	98	45	3 06
Spencer	57	89	30	5 00	70	93	49	9.17	72	95	50	4 09	70	94	46	3 75
Spirit Lake	57	88	32	3 28	68	93	45	5.31	74	98	51	3 46	70	99	49	5.52
Waverly	60	84	34	5.18	7.	91	50	5 03	73	94	50	2.28	70	96	49	2.69
West Bend*	58	86	39	4.85	69	94	51	6.21	71	96	54	2.93	69	96	54	6.63
Washta	....	...	...	4.29	....	..	....	4 67	....	....	....	3.04	....	....	....	.74
Mean	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

CENTRAL SECTION.

Amana	23	41	-1	2.99	17.2	23	48	-15	1 11	8.1	38	61	15	2.26	.7	48	81	20	3.24	....
Ames	23	42	0	.46	4.7	23	44	-10	....	..	38	67	12	.78	T	49	90	22	1.52	....
Audubon	23	43	-5	1 10	11.0	24	47	-9	1.10	..	37	68	10	1.53	8.0	48	88	21	.83	....
Belle Plaine	20	42	-7	3.32	26 5	22	47	-15	1.30	13.0	34	60	8	2.05	2.5	....	74	....	3.89	....
Carroll	22	42	-4	1.20	12.0	21	45	-10	1 10	10.5	36	67	8	2 01	12 0	49	91	20	1.73	..
Cedar Rapids	22	43	-11	1.02	19.9	23	50	-12	3.65	10.4	39	63	14	1.71	3.5	49	87	21	2.47	....
Cedar Falls	22	40	-5	1.90	8.0	23	45	-11	.70	3 0	38	61	11	1.34	4 0	48	87	20	2.15	..
Clinton	25	45	1	3.60	21 8	25	55	-8	2 37	17.0	40	66	18	4.73	9.0	48	83	23	3.53	..
Davenport	26	45	4	3.68	21.8	27	57	-6	1 86	12.0	41	62	20	4 85	6.0	49	80	24	3.01	T
Delaware	20	43	-1	1.42	9.0	20	45	-10	1.04	11.0	35	59	13	2.12	1.7	45	86	20	2.37	....
Denison	25	50	-4	.60	6.0	....	....	-7	10	1 0	36	68	6	1.35	7.0	47	84	20	3.25	....
Des Moines	26	43	2	1 59	17.6	26	48	-7	.82	3.1	40	67	13	1.35	.4	50	90	25	2.64	. .
De Soto	25	43	1	1 81	15 0	26	52	-10	1.44	4 2	38	70	11	1.59	1 1	49	89	24	1.86	...
Dubuque	24	44	4	2.19	15.1	24	50	-4	2.01	18.4	38	60	13	2.78	5.1	48	82	22	4.06	T
Eldora	23	40	-11	2.30	23.0	22	45	-16	2.10	16.0	35	60	2	1.75	7.5	45	90	18	2.40	..
Galva	22	39	-3	.18	..	23	43	-9	.44	4.4	36	67	6	.82		49	88	20	1.90	..
Grinnell	24	44	-5	3.19	25.1	24	44	-9	.75	4.3	39	61	11	1 17	.2	48	83	18	4.31	....
Grundy Center	21	40	-6	1.80	18.0	21	44	-14	.77	7.0	36	64	11	1.20	2.0	47	88	19	1.94	....
Guthrie Center	24	43	0	1.06	6.8	25	45	-7	.97	1.4	37	71	9	1.31	3 5	49	89	19	.78	....
Independence	20	38	-7	1.76	12.4	21	42	-11	1.34	13.5	37	62	13	1.71	1.5	46	84	16	1.85	..
Iowa City	25	44	-3	4 62	26.0	25	51	-12	1.15	7.0	39	65	17	3 02	4.0	48	82	21	2 89	....
Iowa Falls	...	39	....	1 05	9 5	20	43	-18	2.17	17.8	36	63	10	1.14	3.0	46	86	18	1 84	....
Linn Grove	23	41	-1	2.57	23.0	23	47	-12	1.46	15.1	38	62	15	1.99	3.5	47	83	19	3.02	...
Logan	25	49	4	1.30	13.0	26	50	-6	.80	4 0	37	68	7	1.59	11.0	48	91	20	2.82	...
Maquoketa	23	42	-2	2.01	17.8	24	49	-10	1.52	11.2	39	65	11	2.93	4.0	48	82	23	3.20	...
Marshalltown	23	42	-1	1.02	T	25	46	-10	.62	3.5	39	63	12	.33		48	90	19	1.87	....
Monticello	24	41	-2	2.59	18.0	23	46	-13	.97	12.5	38	60	11	2.43	5.0	47	83	19	2.40	....
Mt. Vernon*	24	42	-4			24	48	-12		....	39	63	16	2.23		49	81	20	2.68	.
Newton	23	42	-4	2.22	13.5	24	46	-10	.85	5.0	39	63	12	1.16	.8	49	87	22	2.23	....
Odebolt	23	39	-2	.41	4.6	23	42	-9	.95	4.2	36	65	6	2.50	11.0	49	90	20	2.15	..
Ogden	23	40	-6	.92	9.5	23	44	-13	1.01	5.2	37	69	9	2.08	4.5	49	91	21	1.46	...
Olin	...	...	...	...	...	..	....	....	....	....	37	60	10	2.88	2.0	46	81	19	2.32	..
Rockwell City	19	40	-4	.46	8.5	21	44	-11	.54	5.0	34	62	6	1.18	7.0	46	82	20	2.23	...
Sioux City	24	40	1	.27	4.3	24	47	-7	.37	5.2	36	67	6	.90	4.8	50	88	19	1.37	....
Sac City	2	36	-4	.41	4.1	22	42	-10	1.12	6 2	35	61	6	1.82	10.5	47	88	20	2.40	..
Tara	20	40	-5	.17	1.7	23	48	-10	1.30	11.0	..	....	....	....	....	48	86	18	1.70	..
Toledo	22	41	-5	1.57	8.0	23	44	-12	.82	7.5	37	63	12	1.30	.5	48	86	17	2.27	....
Tipton*	23	40	-4	2.27	14.0	23	42	-11	1.65	14 5	38	62	15	1.41	T	47	85	22	2.53	
Waterloo	21	43	-1	1.45	6.0	22	42	-10	1.19	10.0	37	63	12	1.89	3.5	47	86	19	2.09	....
Webster City	22	42	-4	1.12	10.8	22	46	-12	1.04	8.5	36	67	10	2.95	10.0	48	82	24	1 21	....
West Branch	24	48	-3	2 29	18.2	23	48	-10	1.47	9.0	38	61	16	2.72	.5	48	82	20	3 08	..
Whitten*	20	39	-7	.82	8.2	21	40	-12	.40	....	35	63	11	....	1.5	46	85	24	1.73	....
Wilton Junction	24	45	0	3.07	20.0	26	50	-12	1.31	8 0	39	65	16	3 58	4.0	48	82	20	3.38	..
Mean	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

STATIONS.	MAY.				JUNE.				JULY.				AUGUST.			
	Mean temperature.	Maximum.	Minimum.	Total precipitation.	Mean temperature.	Maximum.	Minimum.	Total precipitation.	Mean temperature.	Maximum.	Minimum.	Total precipitation.	Mean temperature.	Maximum.	Minimum.	Total precipitation.
Amana	60	86	35	4.14	73	93	52	2.54	74	96	47	2.66	72	94	49	2.61
Ames	60	90	35	3 88	71	92	53	7.10	73	100	42	1.10	72	99	48	3.30
Audubon	58	85	36	4.99	71	93	48	2.74	73	98	48	4.34	72	97	46	1.55
Belle Plaine	57	85	29	5.48	69	99	47	3 80	72	100	45	2.30	69	93	48	7.85
Carroll	58	88	34	4.72	71	93	47	2.99	73	95	48	2.61	72	99	45	2.58
Cedar Rapids	61	85	37	3.41	73	95	53	3 60	75	100	52	1 90	73	95	53	4.38
Cedar Falls	61	86	37	7.15	72	91	49	3.33	74	97	47	2 05	72	96	46	4.42
Clinton	61	86	35	4.53	72	93	51	8 02	75	99	48	1.89	72	93	51	7.87
Davenport	61	84	39	6 73	73	91	54	3 53	76	97	58	1.85	73	93	56	4 96
Delaware	59	....	....	2.69	70	90	50	5.62	72	96	51	1 45	69	95	52	2.50
Denison	57	88	32	4.13	69	91	47	2.79	....	....	....	....	....	....	....	....
Des Moines	61	87	38	4.22	72	92	54	6.85	74	97	54	1.86	74	99	51	1.09
De Soto	61	90	36	5.39	73	91	52	9 35	74	99	52	2.46	75	97	49	2.71
Dubuque	60	83	37	4.47	71	90	52	4.36	74	95	53	2.83	71	92	53	4.37
Eldora	59	90	32	4 11	71	95	45	6.61	75	102	45	2.40	72	98	45	4.76
Galva	59	89	33	5.49	72	95	52	3.34	74	99	52	1.15	....	....	....	....
Grinnell	60	85	34	4.36	72	90	54	4.67	....	....			....	....	....	
Grundy Center	58	85	32	5.59	70	91	50	7.02	70	97	46	1.32	71	95	47	4 75
Guthrie Center	60	90	32	4.96	71	96	51	4.29	73	100	50	3.07	73	100	45	1.28
Independence	58	84	32	4.14	69	90	47	4 65	73	95	47	1 66	70	95	46	2.60
Iowa City	61	89	35	4.80	72	93	53	3.20	75	99	49	2.27	72	97	50	2.85
Iowa Falls	59	88	33	3.40	70	93	46	1.15	74	96	44	1.73	70	94	42	3.62
Linn Grove	59	85	35	4.50	72	92	52	2.87	74	98	52	3.18	71	93	49	3.44
Logan	60	90	35	4.91	73	98	53	3.25	74	99	48	1.50	73	100	47	2.54
Maquoketa	59	84	34	3.64	70	92	45	2.20	73	96	48	2.45	70	93	43	4.34
Marshalltown	60	88	35	4.26	70	92	50	6.48	74	96	49	2.75	72	99	47	3.31
Monticello	60	85	30	3.46	73	93	53		75	98	50	1.71	71	96	48	5.08
Mt. Vernon*	61	87	37	4.43	73	92	59	2.69	76	95	58	3.20	....	....	....	....
Newton	61	89	36	4.04	73	93	53	4.66	75	97	52	1.43	73	97	49	4.13
Odebolt	60	92	32	4.79	72	94	49	1.93	74	100	50	5.05	74	101	50	5.72
Ogden	59	87	33	4.73	71	91	48	5.88	73	99	50	1.69	72	98	46	2.87
Olin	59	83	33	4.70	70	89	46	1.90	73	97	51	1.51	70	92	49	6 47
Rockwell City	59	89	32	5.29	71	94	47	3.22	73	96	50	2.12	70	97	46	3.81
Sioux City	60	86	35	4.69	71	95	51	6.61	73	94	56	2.78	72	101	52	3.10
Sac City	59	85	36	4.63	70	92	47	3.83	71	94	50	1.55	72	96	47	4.20
Tara	59	89	33	5.10	68	90	43	3.50	71	97	47	.90	70	97	43	2.50
Toledo	60	88	32	3.58	72	93	49	4.37	73	96	47	1.36	71	94	46	5.56
Tipton*	60	85	39	3.02	71	90	57	2.76	74	96	56	.85	71	95	50	1.67
Waterloo	59	86	33	4.22	71	91	49	4.31	74	97	46	1.66	71	95	47	3.47
Webster City	60	86	35	4.00	72	93	52	5.28	74	97	52	1.35	72	94	47	1.55
West Branch	57	83	32	3.30	72	91	51	4.37	74	98	44	1.14	72	93	47	3.94
Whitten*	56	87	38	4.40	72	92	58	5.82	74	96	52	1.38	70	95	50	3.33
Wilton Junction	60	85	34	4.51	72	96	52	3.47	75	98	47	2.98	72	94	49	6.19
Mean	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

SOUTHERN SECTION.

Adair	...	....	....	.90	9.0	...	...	...	.65	1.5	....	....	....	.61	4.4	..	....	....	1.35	....
Afton	26	42	1	1.75	12.0	27	47	-6	1.51	3.0	40	70	10	2.07	T	50	86	22	2.38	..
Albia	29	50	-3	2.93	12 0		54	-7	.83	5.0	....	..	....	2 06		....	....	....	....	....
Atlantic	23	43	-8	1.48	14.5	25	48	-8	1.10	2.0	36	66	9	2.02	5.0	47	88	19	2.42	....
Belknap	26	47	1	5.00	38.0	26	50	-7	1 77	17 0	41	65	15	2.65	1.0	50	80	23	2.95	..
Bonaparte	26	47	-2	3 33	22.0	26	56	-11	1.00	5 0	40	64	17	5.08	1.0	49	82	22	3.71	...
Burlington	28	43	4	1.86	11.5	30	58	-7	1 25	...	42	65	19	6.13	....	51	82	23	2.79	...
Centerville	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	50	81	25	2.33	....
Chariton	27	45	3	3 49	22.4	27	49	-5	.84	3.0	41	66	14	1.60	T	50	82	24	2.20	...
Clarinda	28	46	7	1 42	12.2	30	52	-5	2 13	4 2	41	72	11	1.73	1.0	52	86	26	3.70	....
College Springs	27	43	1	1.01	9.5

Vol. X. January, 1899. No. 1.



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Central Station, Des Moines, Iowa.

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DIRECTOR,

GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER
1898.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME X. JANUARY, 1899. NO. 1.

NOTE AND COMMENT.

The Department of Agriculture reports that 1898 produced the largest crop of hay ever harvested in this country. But a large amount of it has been damaged in stack and rendered unmerchantable, and the quantity being fed is unusually large.

***

The total commerce of the United States with foreign countries in 1898 reached the unprecedented aggregate of $1,888,589,803. The balance of trade in our favor was $621,260,535. Our exports of breadstuffs alone amounted to $308,757,363. Exports of corn, 205,394,000 bushels. The value of farm products shipped abroad last year was $850,000,000, which breaks all former records, making a gain of $120,000,000 as compared with the preceding year.

***

An English botanist asserts that plants sometimes suffer from fever, attended by rise in temperature for a short period. The vegetable and animal kingdoms appear to be related, and in some instances it is difficult to draw a line of distinction between them.

***

The Central Meteorological and Magnetic Observatory of Mexico is about to equip thirty stations with the most approved instruments, with the intent to establish a weather service in the Mexican republic. When completed an exchange of reports will be arranged, which will be of much value to both countries.

***

With improved methods in farm dairies and creameries, there is a steady increase in the output of first class butter, and a corresponding increase in the demand for the prime article. The top of the market shows no signs of over-production. People consume butter more largely when its high quality and extra flavor just suit their palates. We are not likely to have too much of an extra good thing.

***

On January 24th, a strong earthquake shock was felt throughout the Pelopenes, the southern part of the kingdom of Greece. Several villages were completely destroyed, and many people were injured. There were numerous slight shocks following the heavy shakeup at the outset of the disturbance.

***

In this section, on the average, the "backbone of winter" is reached sometime between the 20th of January and the middle of February. In other words, the lowest temperature is generally reached about a month after the period when the days begin to len[illegible]

WORKINGS OF VESUVIUS.

In an interview Professor Semmola, director of the observatory of Vesuvius, has some suggestive remarks concerning the workings of the great volcano. With other observers the professor has discarded the idea of the molten interior of the earth. "The belief prevailed for some time," he says, "that the periods of greatest activity of Vesuvius were coincident with those of the moon's greatest attraction. I investigated this question very thoroughly both by observations for two years and an extended comparison of past records of the moon and the volcano. It became fully evident that no variations whatever in activity were to be attributed to the moon's phases. Were there a molten interior, this, of course, could not be so."

"What mechanical power," the professor was asked, "seems to be responsible for the tremendous force of the eruptions?" He answered: "Steam, superheated, under great pressure. Given matter at a high degree of heat, and water by some means reaches it, and you have a sufficient physical force to account for all the work done. That water plays a very important part in the eruptions is clearly evident. In some eruptions of Vesuvius an enormous amount of water has been thrown out. The eccentric action of the sea, and the wells and springs of the surrounding country established an obvious relation. Many unofficial records of past eruptions describe the sinking of the sea, fish stranded on the shores thus laid bare, etc. Palmieri, however, came to the conclusion, based on his investigation of the eruption of 1861, that it was not the sea that sank, but the coast that lifted. He found that in the eruption the coast was lifted for several miles, the highest elevation being at Torre del Greco, where the elevation was four and one-half feet. It slowly sank to its former level, but two years afterward had not quite attained it.

"This explosive and eruptive action of water is shown whenever a lava flood passes over a spring. A miniature volcano forms and spouts. The water turns to steam, and this, superheated and confined, bears the superincumbent weight only as long as it is unable to lift it. When the amount and power of the steam is equal to the demand, it erupts with violence through the lava flood and gives us a small volcano. After an eruption of Vesuvius the lava which has cooled fills all the canals and vents leading from below. The steam and other gases which form below are thus unable to escape, and may go on augmenting in force for a long period. When the force of expansion attains the bursting point, it either blows out the old vents or forces new ones, sometimes in the volcano and sometimes elsewhere, as when the new volcano of Monte Nuovo appeared above Pozzuoli in 1538. The so-called smoke from Vesuvius is almost entirely steam. Steam is absorbed by the lava before eruption, under great pressure, and is given

off for long periods, as has been the case with the lava stream on the mountain for many months passed."

"How deep, then, do you think the center of activity of Vesuvius lies?" "I can only give you my opinion, and an opinion does not call for a demonstration. I think it is a matter of miles, perhaps ten, but probably less."

The mystery of the volcano remains still, therefore, the mystery of the earth itself; and we shall understand the one only when we understand the other.—*From McClure's Magazine.*

FOODS OF THE WORLD.

SOME POPULAR NOTIONS CORRECTED BY THE PRESENTATION OF STATISTICS.

Some interesting facts about the foods of the nations are brought out in an article in the last number of *McClure's Magazine*, entitled "The World's Bill of Fare." It is not easy to believe the author's (G. B. Waldron, Esq) first statement, says the *Indiana Farmer*, that wheat is far from being the most important food crop of the world. He shows that the potato ranks first in the list of food products, the annual crop of this popular tuber averaging more than 4,000,000,000 bushels, while corn, which comes next, averages only 2,000,000,000 bushels, and then comes wheat, 2,500,000,000 bushels, followed by rye, 1,300,000 000, and barley, 750,000,000 bushels. Another surprise is the fact that among the nations, France is the largest customer for wheat, using an average of 300,000,000 bushels a year, which is 467 pounds, or 7¾ bushels to each inhabitant. Canadians consume about 6 bushels; the people of Great Britain, 250 pounds each; and our people come next, using 240 pounds, or 4 bushels each; a total of about 300,000,000 bushels, or the same as that of France.

The Germans use only about 3 bushels each, making up the deficiency with rye and potatoes. Russians are very saving of their wheat, their average being only 1½ bushels, but they use 5 bushels of rye each, and 90 pounds of oats, yearly.

As we had supposed the Irish are the most liberal users of potatoes, their average being 1,467 pounds, or about 25 bushels each; or 4 pounds a day, a pound at each meal, man, woman and child.

Next to the Irishmen came the German as a potato lover, with his 1,300 pounds a year, or a grand total of 1,170,000,000 bushels for the entire population. Uncle Sam requires about 250,000,000 bushels, or some 3½ bushels for each of us. This we know to be about the amount required at our own home.

As to the meats eaten, it will surprise many readers to know that Uncle Sam heads the list. He uses an average of 11,000,000,000 pounds for each 12 months, or nearly 150 pounds for each person, large and small; almost half a pound a day. We undoubtedly do eat too much flesh food, as the doctors have always told us. John Bull, the greatest beef eater, as he has been considered, eats only 100 pounds of meat per capita; but, it must be remembered that the Irish scarcely eat any beef at all, and but very little meat of any kind, and that the laboring classes generally have to limit themselves to very small allowances of flesh food. Not oftener than two or three times in the week do they enjoy a roast of beef or a rasher of bacon. Italy must live almost entirely on fruits and grains, for her meat ration is only one-sixth that of our people; that of Spain is less than half ours.

Our people consume more eggs, proportionately, than any other nation; the grand total for the year being about 10,000,000,000, or 133 eggs to each one of us. No wonder the hen is our most common domestic animal. But all we raise cannot supply our demand, and we have to import millions of dozens of eggs yearly. Canada comes next to us in the use of eggs, with 90 per capita. Next, Denmark, 80; then France, 78, and Germany, 75.

Johnny Bull leads all in sweets. He gives 80 pounds a year to each person, small and large, while Uncle Sam, who stands next him in this extravagance, gives us 73 pounds, a trifle less. Poor Spain, though owning, until recently, many of the best producing islands in the world, gives her people only the pittance of 7 pounds each. What a poverty-stricken nation she must be.

As to stimulants, alcohol, beer, etc., worse than useless drinks, Uncle Sam ranks third with the nations, and England first, Germany coming between. Our drink bill reaches the enormous total of 1,050,000,000 gallons, or 15 gallons to each person. England's total is 1,200,000,000 gallons, or 30 gallons to each. As the children and most of the women and some of the men drink no intoxicants, the drinkers must consume an average of nearly 100 gallons, costing them over $200 a year each. What a fearful waste and loss is involved in this last expenditure. In the use of that useless, harmful narcotic, tobacco, we find our people rank third again. But in this case Belgium stands first as to individual consumption, with 110 ounces, while the Germans, who we had supposed led the world in puffing tobacco smoke, use but 48 ounces. Our people smoke and chew nearly as much, 43 ounces, or leaving out those who eschew the weed in any shape, something like 200 ounces a year, for those who use it.

Several other interesting comparisons are made in the articles referred to; for example, the use of rice, tea, coffee, etc., by the different leading nations. It is hardly necessary to state that Uncle Sam stands at the head of all as a generous liver.

CLIMATOLOGY AS DISTINGUISHED FROM METEOROLOGY.

The term climatology is very frequently treated as synonymous with meteorology. There is an important distinction, however, which should be generally recognized. Climatology is a distinct branch of meteorology, an application which should not be confounded with the broader subject.

Meteorology includes, in the broadest sense, the atmospheric phenomena. The subject may be conveniently divided into two parts: The study of the laws and principles involved in the movements of the wind; the formation of clouds; the formation and precipitation of rain, snow and hail; the absorption and radiation of heat and the like. The second part consists of the statistical records of the extent and frequency of the changes of the various atmospheric phenomena.

Climatology is a function of these phenomena and should be expressed in terms of the developments of organic life. Climatic changes produce, in many ways, more apparent changes in plants than in animals, and they should be taken as the standard in the interpretation of our meteorological data. Many plants are far more sensitive in recording climatic changes than our meteorological instruments. There are localities where the character of the leaf or the peculiar excellence of the fruit produced show peculiarities in the climate which the instruments fail altogether to record, or rather which we have never been able to deduce from the ordinary meteorological records. The development of plant life should, therefore, be taken as the standard with which our instruments should be compared and our methods adjusted in order that the elements of climatology may be worked out from our meteorological records.

Climatology is not a simple summation, but a complicated expression involving the general relation of certain functions of meteorological elements, the values of which we do not as yet understand. The principal elements influencing the economy of plant life are temperature, humidity, wind velocity, water supply and sunshine. Within certain limits the

activities of the plant are dependent upon the relation between these elements. Thus temperature causes evaporation, the relative humidity and the velocity of the wind control evaporation, while the moisture supply in the soil provides the plant with water to replace that lost by evaporation. The influence of all depends upon the total intensity of the sunshine.

The rainfall, although a very important meteorological element and of great economic and commercial importance, is not considered a factor in climatology, as it is not the immediate source of the water supply of plants. Hence the moisture content of a soil is an essential factor in climatology. Furthermore, as the soils in the field may differ greatly in their power to retain water, we may have very different climates over very small areas. With forty inches of annual rainfall the soil may be so open and porous and retain so little moisture that the conditions may be truly arid. We have small areas of truly desert soil in our eastern states. On the other hand, with only eight or nine inches of annual rainfall there are some soils so retentive of moisture that they will produce good crops with careful and thorough cultivation.—*Milton Whitney in Science.*

RECLAIMED SWAMP LAND.

All through the northwest large tracts of land are now being reclaimed, which in early days were worthless swamps and bogs. The soils of these reclaimed tracts are of a peculiar quality, entirely different from any of our prairie or timber soils of the uplands. They may be put into two classes, one, that class of swamps with little or no peat in their make-up where a black, India rubber muck covers a stiff clay subsoil, and the other where the subsoil is covered with from one to six feet of a peat formation. The common prairie slough belongs to the first-class; the wire-grass slough, wherever found, to the second. The soil of the first named class will usually be found to be charged with an excess of alkaline matter, this explained by the fact of the burning of the grass for ages on the water shed of such slough and the deposition of the ash by the rainfall in such basins, where evaporation later incorporated it with other sedimentary deposits. This soil when reclaimed is cranky, and will utterly refuse to nourish some crops. It will usually produce good potatoes and good grass, timothy, particularly, liking this soil condition. The best use to make of such reclaimed tracts is to get them into timothy to tame them. The peat soils are wholly different. In these will be found a great excess of humus, or decomposed vegetable matter. The best thing to do with these in their loose and porous condition, is to pasture them until they become impacted and solidified, when they will become the richest and most productive lands on the farm. These soils may be flaxed to good advantage, as at first they will be found too rich for wheat, barley or oats.—*J. S. Trigg in Rockford Register.*

PROPERTIES OF LIQUID AIR.

At the session of the American Chemical Society in the College of the City of New York, December 28, 1898, Charles E. Tripler gave an interesting demonstration of the manufacture and properties of liquid air. Among those present was Prof. Raoul Pictet, of Geneva, who was one of the first scientists to liquify oxygen. Great interest was manifested by the spectators in the extraordinary experiments made by Mr. Tripler. Several gallons of liquid air were brought into the laboratory and Mr. Tripler sprinkled it over the crowd. The liquid, which is extremely cold to the touch, evaporated in a minute.

The curious effects of the liquid on different metals were shown. Copper immersed in the steaming fluid in a few moments became soft; steel grew brittle as glass and was as easily broken. Mr. Tripler filled a tin cup with the liquid, gave the cup a squeeze and it fell at his feet in fragments.

A piece of steel bicycle tubing, plunged into the liquid and then struck with a hammer, crumbled to pieces. A rubber ball, dipped into liquid air, froze and turned white, and when thrown to the floor cracked like an eggshell. Whisky poured into a glass containing liquid air at 312° Fahrenheit froze in a few moments. Alcohol requires a temperature of 200° below zero to freeze it, but Mr. Tripler formed an icicle out of a glass of alcohol by pouring it into the extraordinary fluid.

To show the paradoxical nature of the liquid Mr. Tripler filled a teakettle with it and placed it on a lighted gas stove. Then he poured a glass of water into a kettle. As the heat of the stove increased the liquid air grew colder, until the water was taken from the kettle in the form of a lump of ice.

"This is the air we breathe, nothing less," said Mr. Tripler. "It is oxygen and nitrogen, and the nitrogen boils off first."

He obtained pure oxygen by pouring the liquid from one glass to another to hasten evaporation. Then, placing some of the liquid in a rock salt cup, he showed that oxygen gas is magnetic, the fluid attaching itself to a magnet overhead.

Prof. R. Ogden Doremus, at the close of the session, performed an interesting experiment by burning a diamond in liquid oxygen. He placed the diamond in a coil of platinum, passed an electric curent through the coil and the diamond became white hot Plunged into the liquid oxygen the little gem burned away with a brilliant glow.

NATIONAL BULLETIN FOR JANUARY.

The month averaged slightly colder than usual over upper Michigan peninsular and the greater part of the gulf states, including portions of the southeastern Rocky mountain slope and the interior of the middle and south Atlantic states. Along the middle Atlantic coast, over northern England, and the greater part of the lake region and Ohio valley the temperature averaged nearly normal, though generally slightly above In the central and upper Mississippi valleys, and thence westward to the Pacific coast, including the plateau regions, the month was milder than usual, the temperature excess ranging from 3° to 9° per day, being greatest over the upper Missouri valley and northern and central Rocky mountain districts.

The monthly precipitation exceeded the average in the Ohio and lower Mississippi valleys, over portions of the middle Atlantic states and southern New England, the greater part of the gulf states, and over portions of the middle and north Pacific coast. The total for the lower Mississippi valley and portions of eastern Texas ranged from six to ten inches, being one to six inches more than the average. A marked excess also occurred on the west Florida coast, in northern California, and on the north Pacific coast.

There was less than the usual amount of precipitation in the Carolinas and adjacent portions of Georgia and Tennessee, over the northern portions of New England and the middle Atlantic states, generally throughout the lake region, in the upper Mississippi and Missouri valleys, and generally throughout the Rocky mountain regions. From Arizona, New Mexico, and western Texas northeastward to South Dakota and southern portions of Minnesota and Wisconsin the total for the month was less than half an inch, extensive areas receiving less than one-fourth inch, and no appreciable amount falling in portions of northern Kansas and southwest Arizona.

CONDITION OF WINTER WHEAT.

Officials in charge of the Climate and Crop Service sections in the principal winter wheat states were called upon to col-

lect information as to the condition of winter wheat at the close of January. Summaries from the states comprising the winter wheat region are given in this issue.

The reports indicate that notwithstanding the fact that comparatively little protection has been afforded by snow, the general condition of the crop at the close of the month was satisfactory, although fears are entertained as to the result of the extreme cold in the latter part of January in the states of the central valleys. The condition of early sown is generally better than that which was sown late.

Iowa —Des Moines, 28th: Early-sown wheat made vigorous growth, fine stand; late sown retarded by drought and not so promising at the beginning of winter; the crop was generally well protected by snow, and did well until the recent period of alternate thawing and freezing; it is now threatened by injury, though extensive damage is not yet apparent; nearly all reports show considerable increase in the area sown.

Kansas.—Topeka, 29th: Wheat somewhat backward; in eastern counties it is healthy with soil moist and in good condition; in central counties is small but well rooted and is in very good condition; in northwestern counties early was killed but the rest is in very good condition; in the southwestern counties it is backward and a poor stand.

Missouri —Columbia 29th: In northwestern counties ground well covered with snow in December, but elsewhere wheat had little or no protection and was injured to some extent by thawing and freezing; in northern sections injury generally slight, but in some central and southern counties late-sown wheat reported badly damaged; greater part of crop, however, standing winter well.

Illinois.—Chicago, 30th: Increased acreage of wheat over eastern and southeastern counties, but little wheat sown north half and little rye in south. Reports conflicting, but outlook is generally considered good, although lack of snow and present severe weather, following mild days most of January, will probably cause some damage; rye generally in good condition; clover shows some damage; corn not keeping well, showing mold and rot; stock in excellent condition with abundance of feed.

A REMARKABLE HAILSTORM.

[FROM CLIMATE AND CROPS: MISSOURI SECTION]

One of the most remarkable and destructive hailstorms in the history of Missouri occurred in the northwestern part of Nodaway county on the afternoon of September 5, 1898. The storm moved in an easterly direction across Lincoln and Atchison townships, ending at One Hundred and Two river, and its path was about three miles in width. Growing crops were broken down and beaten into the ground, trees were stripped of leaves and fruit, windows were broken and roofs damaged, and hundreds of hogs and chickens killed. After the passage of the storm the country in places, presented the appearance of midwinter, so great was the fall of hail and so completely were the trees stripped of foliage.

At Elmo the storm lasted about one hour, and hail is reported to have fallen to a depth of one foot in places In some instances the hail pounded holes in roofs of corrugated iron.

The heaviest fall of hail appears to have occurred about four miles east of Clermont, and to have covered an area of about four square miles. Mr. J. R. Brink, voluntary observer of the Weather Bureau at Maryville, Mo., visited this portion of the track four weeks after the storm, and has furnished photographs showing the terrible destruction wrought. One photograph shows the complete demolition of a corn field, with a solitary stalk held erect, and on this the only ear of corn in the whole field that was not on the ground; the stalk was doubled over, but not entirely broken down. This field would have made at least sixty bushels to the acre, and would have matured by the middle of September. Another photograph shows how completely the trees were stripped of foliage and smaller branches, the bark being entirely pounded off on the northwest side.

Under date of October 7th, Mr. Brink writes regarding the storm as follows:

"The whole path of the storm has the appearance of midwinter. What is left of the fruit trees have leafed out and are in full bloom. The chunks of ice actually went right through the roofs of some of the houses. One house that we examined did not have a whole siding board on the north side, and at another sided with second grade siding, the hail pounded out the knots, leaving the north and west sides full of knot holes. One man gave me the measurements of a piece of ice he picked up which was four inches long by two and a half inches in diameter, being in rather a cylindrical form. The storm was accompanied by a very high wind from the northwest, which, with the deep rumbling noise, made the scene appalling. Where farm houses were provided with caves families took refuge in them, and in many instances were kept there for some time, owing to the ice being piled so thick about the entrance. The storm began at 3 P. M. and ended at 3:35 P. M. One man tells me he had to clean the hail out of his stove flue the following day before he could build a fire. At one place it was impossible to get through a lane for two weeks after the storm on account of so much ice. Our party feasted on ice cream frozen with hailstones taken from a drift which still remained, unprotected by any artificial means; this, understand, four weeks after the storm occurred."

In a subsequent communication, Mr. Brink states that hail remained at the point where the stones were gathered for making ice cream until October 27th—fifty-two days after the storm.

JANUARY WEATHER RECORD.

The month was warmer than usual, with much less than the normal amount of precipitation. The mean temperature for the state, as deduced from records of 118 stations, was 19 8°. The average of the northern section (a belt across the state east and west, three counties in width,) was 15.9°; central section, 19.9°; southern section, 23.5°. The lowest temperature reported was 34° below zero at Mason City on the 31st. The highest was 68° at Council Bluffs on the 21st. Estherville reported the lowest monthly average, 10 8°. Keokuk reported the highest monthly average, 27.8°.

The average precipitation, as reported by 114 observers, was .28 of an inch, which is nearly an inch below the normal for January.

By sections the averages were as follows: Northern section, .30 of an inch; central section, .29 of an inch; southern section, .24 of an inch. The largest amount reported was 1 15 inches at Eldora; several stations reported only a trace.

There were 15 clear days; 6 cloudy and 10 partly cloudy.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30 12 inches; highest observed, 30 81, at Cresco on the 1st; lowest observed, 29 48, at Cresco and Dubuque on the 25th; range for the state, 1.33 inches.

Temperature.—Monthly mean, as deduced from 118 reports, was 19.8°; highest monthly mean, 27.8°, at Keokuk; lowest monthly mean, 10.8°, at Estherville; the highest temperature reported was 68°, at Council Bluffs on the 21st; the lowest temperature reported was -34°, at Mason City on the 31st; the average daily maximum was 29.7°; the average daily minimum

was 9.9°; the average monthly maximum was 46.4°; the average monthly minimum was –19°; the greatest monthly range was 81°, at Council Bluffs; average monthly range, 65 4°.

Precipitation.—Average for the state, as determined from the reports of 114 observers, .28 inch; the largest amount reported was 1.15 inches, at Eldora; the least amount was T, at several stations; the greatest daily amount reported was .55 inch, at Newton on the 23d; average number of days on which .01 inch or more of precipitation was reported, 3.

Wind —Prevailing direction, southwest, northwest; highest velocity reported, 56 miles per hour from the northwest on the 25th at Sioux City.

Weather.—There were 15 clear days, 10 partly cloudy days, and 6 cloudy days.

Dates of Fogs.—Alta, 9th, 10th and 11th; Ames, 9th; Belle Plaine, 12th and 13th; Independence, 12th and 13th; Lansing 12th and 16th; Lenox, 9th, 11th, 12th and 13th; Mt Ayr, 9th, 11th and 12th; Osceola, 11th, 12th and 13th; Ovid, 11th, 12th and 13th; Tara, 10th; Villisca, 9th, 10th, 11th and 12th; Waverly, 12th and 13th; West Bend, 11th and 12th; Whitten 12th and 13th.

Lunar Halos.—Alta, 19th, 21st and 27th; Cresco, 19th; Greenfield, 19th and 23d; Lamoni, 15th and 22d; Ridgeway, 19th; Villisca, 22d; Waterloo, 26th.

Sun Dogs.—Grundy Center, 31st; Lamoni, 26th.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.10	30.77	1	29.52	25
Des Moines	30.14	30.75	1	29.55	25
Clarinda	30.16	30.73	1	29.62	25
Cresco	.....	30.81	1	29.48	25
Dubuque	30.11	30.78	1	29.48	25
Omaha, Neb	30.11	30.65	1	29.62	25
Keokuk	30.13	30.80	1	29.59	25
Sioux City	30.12	30.59	1	29.66	12
Means	30.12	30.81	1	29.48	25

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	6,308	37	SW	26
Des Moines	6,516	27	SW	2
Dubuque	6,076	32	NW	30
Keokuk	6,434	36	W	26
La Crosse, Wis	5,921	36	SW	26
Omaha, Neb	6,398	36	NW	23
Sioux City	9,791	56	NW	25

OBSERVERS' NOTES.

CLINTON—*Dr. Luke Roberts.* January, 1899, was milder than usual, the mean temperature being 3.8° above normal. The month came in with the temperature 5° below zero, but it did not drop so low again until the 27th, and was repeated every day for the balance of the month; the last three days giving a daily mean below zero; on the 29th ½° below, 30th 9.2° below and the 31st 1.5° below. The 5th, 6th, 7th, 8th and 26th gave a mininum but little above zero, leaving the balance of the month quite mild. During the last twenty-one years there were eight Januaries with a higher mean temperature than 1899, the highest of which was 35.8°, occurring in 1880. The lowest temperature reached, during the time mentioned above, was 36° below zero, occuring in 1884, and the 5th day of the month the mean for the day being 30.5° below zero. The warmest day of the month was the 3d; mean temperature, 39 2°; the coldest day was the 30th; mean temperature, 9 2° below zero. The month was nearly stormless, notwithstanding the weather prophet, DeVoe, said, in his forecasts for January, 1899: "January will be one of the greatest storm months of this stormy year." There were only four storm days during the month, and a precipitation of .27 of an inch; the greatest amount of that which fell in any twenty-four hours was .19 of an inch. The precipitation was mostly in rain, there having been only about one-half inch of snow all told; it is less than any former record This was the lightest January rainfall on record. The number of clear days was 14; part cloudy days, 11; cloudy days, 6. Total movement of the wind was 3,720 miles, or 1,275 miles below normal, and the least on record, except one year ago; maximum velocity, 26 miles an hour, occurring on the 26th. Per cent of cloudiness, 49; this was 12 per cent below normal.

ALTA—*David E. Hadden.* Cold wave with high northwest wind on 26th; very cold weather continued until close of month. Unusual fall in temperature after sunrise, January 28th; at 8 A. M. temperature was –7°; after this time it fell rapidly, and at 10 A. M. was –14.5°; it then rose and at 11 A. M. registered –10°, and remained steady nearly all the balance of the day. The sky was clear; wind northwest.

AMANA—*Conrad Schadt.* The weather was generally fair and mild till the 26th, when a cold snap set in, which continued for several days and made the mercury go down to –17° on the morning of the 30th. For farmers who still had some corn in the field, the weather and ground was better for corn harvesting than in the corn harvesting months. The cold snap may have seriously damaged winter wheat, as the ground was entirely bare.

BONAPARTE—*B. R. Vale.* A remarkably fine month; good roads, no snow on the ground, no rain. Good month for feeding stock and for work of all kinds.

FOREST CITY—*J. A. Peters.* Wind on morning of 26th blew car from track; no damage to buildings.

GRAND MEADOW—*F. L. Williams.* On 26th wind blew a gale from the northwest; air filled with fine snow and dust; 29th, 30th and 31st were bitter days; morning of the 30th –22° and blowing a gale.

LARRABEE—*H. B. Strever.* January has been remarkably mild. Sleighing spoiled by the mild weather. The most of the corn snowed under last fall has been gathered.

OLIN—*Nathan Potter.* Very fierce wind on the 26th from the northwest; air full of frost. Thermometer fell from 40° above in the afternoon of the 25th, to –6° on the morning of 26th. Wagon roads almost perfect during the whole month; smooth as a floor and as hard as a rock.

RIDGEWAY—*Arthur Betts.* Very pretty mirage New Year's morning.

WEST BEND—*Phil Dorweiler.* A fine month and hardly any rain or snow; sleighing all gone.

BELATED REPORTS.

Mt. Pleasant—December. Mean temperature, 26.5°; mean maximum temperature, 38 5°; mean minimum temperature, 14.5°; highest, 56°, on the 28th; lowest, –7°, on the 31st; total precipitation, .37 inch; prevailing direction of wind, southwest; number of clear days, 23; partly cloudy, 4; cloudy, 4; rainy, 1.

Burlington—December. Mean temperature, 26.1°; mean maximum temperature, 33 9°; mean minimum temperature, 18.3°; highest, 58°, on the 20th; lowest, –2°, on the 9th and 10th.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JANUARY, 1899.

STATIONS.		DATE.																														Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max.	23	39	45	40	20	20	12	33	29	31	33	40	44	43	45	15	31	22	37	47	49	49	40	34	40	38	18	17	13	15	9	32.3
	Min.	-5	16	16	10	4	6	3	19	10	16	21	30	29	28	27	27	7	7	13	29	30	31	27	17	24	4	-6	-6	-14	-16	-11	12.7
Albia	Max.	23	40	63	66	31	30	23	35	39	35	39	39	48	45	49	39	38	37	40	49	40	50	47	38	44	49	18	22	18	15	11	37.7
	Min.	18	14	28	12	3	2	4	11	8	16	20	25	22	21	29	33	9	15	11	24	30	21	27	13	22	5	10	-5	-16	-15	-16	12 7
Alta	Max.	19	31	36	8	20	17	15	19	27	28	30	39	42	40	39	26	14	24	33	43	47	47	32	34	39	8	23	-6	12	-2	9	25 6
	Min	-12	14	16	2	-6	-2	-10	8	-2	13	25	29	28	25	21	20	-1	2	18	21	27	31	24	17	24	0	-10	-14	-18	-22	-14	8 2
Amana	Max.	16	37	46	44	18	18	17	30	28	28	25	36	38	40	41	43	32	26	37	45	41	41	37	33	41	38	14	17	8	10	8	30.1
	Min	-6	12	25	10	1	5	-1	10	4	12	14	25	33	24	27	22	13	8	13	27	29	23	25	10	17	1	-6	-6	-15	-17	-15	10.5
Ames	Max.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40	38	21	20	13	-3	11	....
	Min	-7	19	21	8	2	-4	-4	10	3	17	20	25	30	22	27	22	3	3	18	22	30	23	26	18	25	2	-6	-10	-14	-18	-9	10.3
Atlantic	Max	23	37	43	34	21	21	26	31	27	30	33	39	46	43	45	40	25	22	36	48	49	48	37	42	41	37	31	19	17	2	10	32.4
	Min	-5	19	26	7	1	4	1	15	5	24	28	32	23	22	28	20	8	1	17	18	29	25	26	17	23	5	-5	-6	-13	-16	-11	11.8
Audubon	Max.	11	33	34	39	19	17	22	25	24	29	32	34	42	40	42	38	39	19	43	44	47	47	36	37	43	23	19	18	11	11	9	29.9
	Min	-6	16	17	1	1	4	-4	14	9	25	27	26	25	28	27	29	4	3	15	17	27	30	25	19	25	4	-7	-8	-14	-17	-10	11.4
Belknap	Max.	20	46	50	29	25	18	25	38	38	38	33	42	42	48	50	50	23	29	42	54	49	49	40	40	48	15	16	20	13	-4	6	33.3
	Min	5	20	24	28	6	11	7	8	16	18	20	24	32	25	29	29	13	13	15	22	31	30	29	18	25	9	-3	16	-14	-11	-11	15 6
BellePl'ine	Max.	30	37	47	18	20	20	18	30	28	30	28	35	38	40	38	42	20	25	37	46	41	42	38	35	49	10	15	8	2	-8	10	27.7
	Min	18	30	23	9	0	8	-3	15	5	12	15	28	23	22	23	22	12	5	15	25	27	25	24	15	24	0	-6	-6	-17	19	-15	11.6
Bonaparte	Max	22	43	51	51	22	20	24	39	34	32	28	39	40	49	50	49	37	32	41	50	50	44	40	41	49	40	20	20	11	13	13	35.8
	Min	-5	13	27	15	5	9	4	16	13	20	19	25	36	26	30	28	17	22	13	33	31	25	30	19	25	10	-4	-3	-15	-11	-14	14.8
Britt	Max	9	32	42	22	23	27	8	32	28	32	32	36	38	34	38	27	21	11	28	42	43	40	33	34	36	8	7	5	10	10	8	25 7
	Min	-15	10	9	0	-12	-2	-12	-2	2	4	21	17	23	18	19	10	0	-1	4	15	20	21	20	19	8	-4	-11	-9	-19	-24	-15	3.7
Burlington	Max.	..	..	..	..	..	..	..	..	..	25	27	28	40	44	42	36	26	32	39	40	41	46	47	40	40	20	14	15	20	8	16	31.1
	Min	..	..	..	..	..	..	..	..	..	24	23	21	30	40	38	27	25	18	18	38	32	36	26	24	25	11	-3	-2	-15	-20	-15	18.2
Bedford	Max.	25	40	45	42	22	23	29	38	33	32	33	43	48	44	48	48	32	23	42	52	52	46	40	43	42	40	22	18	18	18	15	35.3
	Min	-3	18	25	12	4	6	4	16	15	16	29	31	28	22	23	22	12	9	15	22	24	27	24	7	21	4	-4	0	-18	-15	-15	12 3
Carroll	Max.	23	24	24	10	17	18	22	28	30	29	32	40	47	42	45	34	17	23	35	46	49	51	49	47	41	11	21	-4	11	0	16	28.4
	Min	-11	-4	14	3	5	-2	-8	10	1	18	18	28	28	21	22	21	0	-1	13	13	26	27	25	16	28	0	-10	-11	-15	-22	-12	7 9
Cedar Falls	Max	17	35	39	17	20	10	20	26	31	31	26	..	..	..	44	35	25	22	35	41	35	41	35	35	38	5	8	0	10	10	8	25.0
	Min	-9	10	10	9	10	4	-8	4	0	8	14	..	..	..	28	8	8	3	13	20	20	24	22	18	21	1	0	-8	-18	-19	-15	6.4
Cedar Rap	Max.	18	40	49	46	22	21	19	29	33	32	28	39	41	42	44	43	29	28	40	48	41	42	38	33	42	39	16	18	10	12	9	32.0
	Min	-4	15	27	9	4	7	-2	12	6	14	14	26	31	24	28	22	15	8	15	28	28	22	21	8	13	0	-6	-8	-16	-17	-13	10 7
Centerville	Max	..	42	50	48	44	22	28	45	38	32	..	40	43	43	50	53	39	27	39	50	51	..	50	46	46	45	20	19	10	14	15	37.5
	Min	..	12	25	12	22	6	5	21	16	23	..	21	33	23	29	26	12	11	12	32	31	..	28	16	25	8	-3	-1	-16	-13	-13	14.3
Chariton	Max	23	41	47	45	21	21	24	40	33	32	31	41	47	48	48	51	33	27	39	51	50	50	42	43	41	38	19	18	12	13	10	34 8
	Min	-4	16	26	11	4	7	3	19	9	19	22	26	21	22	29	25	9	11	14	28	28	28	25	14	24	5	-4	-6	-16	-14	-15	12 5
Charles Cy	Max	15	29	37	25	14	13	16	18	20	28	23	34	38	35	38	34	25	20	32	40	37	34	31	30	35	35	15	11	10	9	9	25.9
	Min	-15	9	19	6	-6	0	-6	-3	-2	6	11	23	30	18	20	14	4	-2	12	12	21	25	28	13	20	-2	-11	-10	-20	-22	15	5.7
Clarinda	Max.	24	40	45	36	23	24	30	34	30	33	31	40	44	44	47	43	19	24	37	48	51	47	33	40	40	13	22	20	19	-9	12	32 0
	Min	4	22	28	9	8	7	7	22	15	31	31	35	30	30	30	23	10	8	18	26	32	32	23	17	25	2	5	-17	-17	-15	-12	15.1
Clear Lake	Max.	14	19	36	9	11	9	16	10	21	28	23	36	38	31	..	44	22	19	31	35	37	35	32	31	38	36	17	17	9	8	8	24.0
	Min	-14	7	5	3	-9	0	-12	0	-1	8	15	23	12	9	..	8	-8	-8	0	6	12	23	15	5	9	8	-12	-16	-18	-22	-13	1.2
Clinton	Max	17	36	47	45	19	20	17	36	31	32	30	38	40	42	44	46	35	29	37	46	41	41	36	35	43	39	14	16	6	9	9	31.5
	Min	-5	7	24	11	2	6	1	7	10	14	12	29	27	28	24	28	9	11	30	25	19	25	15	16	5	-6	-9	-17	-15	-16	10.8
College Sps	Max.	25	39	45	40	22	22	28	35	31	33	33	43	44	43	46	45	33	27	42	50	53	45	40	45	42	35	27	18	21	20	12	34 8
	Min	-8	20	29	9	5	5	5	20	14	27	29	31	25	25	29	25	9	5	15	25	28	31	24	19	25	6	5	-5	-17	-14	-12	15.2
Corning	Max	34	39	45	42	21	24	32	36	28	31	32	41	48	44	47	45	24	22	36	51	50	49	43	43	41	40	21	21	16	15	12	34.4
	Min	-2	19	25	10	6	6	4	20	12	21	26	29	29	26	31	25	10	8	18	27	28	31	27	18	27	5	-3	-5	-12	-15	-11	14.2
Co. Bluffs	Max.	25	40	46	22	24	28	36	35	39	34	35	52	50	53	48	41	25	31	49	52	68	46	49	44	44	30	28	25	21	6	13	36.7
	Min	0	23	20	7	5	7	6	16	11	29	31	34	28	25	28	19	9	4	20	24	28	35	24	19	24	4	-2	-9	-11	-13	-8	14.1
Oresco	Max.	18	26	36	8	12	9	0	18	16	28	24	35	35	33	36	31	15	22	30	37	33	32	31	25	35	7	14	-4	5	-9	6	20 8
	Min	-17	10	17	0	-9	-3	-15	1	-2	5	12	24	28	19	20	17	5	-4	13	21	23	17	20	12	20	-6	-15	-18	-23	-25	-20	4.1
Davenp'rt	Max.	17	39	48	46	19	19	20	37	35	32	29	42	42	45	47	47	32	31	37	47	42	41	42	36	45	38	15	19	9	11	10	32.9
	Min	-1	17	29	10	6	11	4	20	12	16	14	27	35	28	32	30	23	16	17	34	31	26	28	21	24	2	-3	-8	-14	-13	-10	15.0
Decorah	Max	13	29	39	34	8	14	12	12	22	31	27	35	38	35	40	33	24	25	33	34	36	34	33	36	27	31	14	15	7	-8	8	24.9
	Min	-15	3	19	3	-5	0	-7	-5	-2	5	12	25	28	22	20	15	8	-2	14	16	25	19	22	25	15	2	-13	-16	-21	-24	-21	5.4
Denison	Max	21	33	40	9	21	17	18	22	26	31	33	42	43	41	42	31	16	21	36	45	34	48	32	36	45	10	20	0	18	-5	11	27.0
	Min	-13	13	14	3	-5	-3	-8	0	11	21	29	32	25	23	24	13	2	-3	10	17	15	20	20	16	23	2	-10	-10	-16	-19	-11	7.6
Des Moines	Max	23	40	47	40	22	22	25	32	26	31	31	41	46	46	47	45	25	24	39	51	46	51	40	40	41	37	21	20	15	12	10	33.4
	Min	-4	21	28	9	5	8	4	18	11	19	21	27	30	27	32	25	7	11	17	29	32	30	29	20	26	4	-3	-8	-14	-18	-9	14.1
De Soto	Max.	22	38	46	40	22	22	22	28	28	32	34	41	45	44	45	43	25	25	40	52	47	51	39	38	42	37	20	15	15	14	12	33 0
	Min	0	18	28	10	5	7	3	18	8	22	26	30	29	26	31	22	6	8	16	26	31	27	25	17	25	6	-4	-10	-14	-17	-10	13 4
Dows	Max.	15	32	38	34	14	15	17	20	21	27	24	36	42	38	39	32	26	16	23	42	40	38	38	33	39	39	17	21	11	10	9	27 3
	Min	-15	12	14	5	-8	-1	-11	4	-1	5	17	23	26	22	20	16	0	-3	11	16	25	24	26	15	23	-2	-10	-13	-18	-22	-14	6 0
Dubuque	Max	16	36	45	46	20	17	16	30	27	31	30	38	38	41	42	43	28	29	37	46	39	38	37	30	41	38	13	16	7	7	8	30.0
	Min	-5	13	26	9	3	6	-3	5	5	11	16	28	31	24	29	21	18	10	17	28	30	22	23	14	17	2	-8	-12	-18	-17	-15	10.6
Eldon	Max.	19	33	48	13	20	20	18	28	25	29	28	39	36	37	35	37	37	23	37	41	37	43	42	48	42	16	15	17	11	5	5	27.5
	Min	-4	15	21	13	5	11	7	15	10	16	20	26	35	25	31	25	14	18	14	32	30	23	30	12	26	8	-4	-3	-14	-13	-14	13.5
Eldora	Max.	15	32	30	32	30	12	10	23	30	23	20	32	38	40	41	35	30	31	32	45	42	43	40	35	34	26	6	0	12	0	10	27 7
	Min	-13	10	15	20	-6	-2	-12	6	-3	6	10	20	27	23	20	1	-2	20	16	17	21	20	13	19	13	-3	-13	-20	-22	-17	6.8
Elkader	Max	19	32	42	19	23	13	9	32	29	34	28	35	37	43	48	42	30	32	39	48	36	37	39	36	39	12	18	8	8	4	12	28.2
	Min	-11	10	24	7	0	0	-8	-4	-1	6	12	26	29	22	23	17	14	3	16	22	24	17	15	4	9	0	-10	-13	-20	-20	-22	6.2
Estherv'le	Max.	14	22	26	1	..	11	5	8	8	26	26	35	32	32	33	19	8	..	30	32	32	34	30	31	34	..	23	-13	0	-10	0	18.9
	Min	-17	9	4	-4	..	-8	-17	-1	-5	2	18	22	20	17	18	14	-7	..	11	17	20	19	19	12	18	..	-19	-18	-23	-27	-20	2.6
Fairfield	Max.	23	43	52	47	33	20	21	40	49	30	30	37	40	50	51	63	37	31	42	45	49	43	40	40	50	41	21	17	12	2	24	36.2
	Min	-4	12	27	14	4	12	6	13	10	20	20	25	35	25	30	27	14	19	14	32	29	25	32	17	23	8	-5	-2	-15	-12	-14	14.3
Fayette	Max	14	31	39	39	15	15	14	21	..	..	36	35	37	37	40	38	24	23	33	41	37	36	36	35	37	34	14	12	7	5	10	27.4
	Min	-14	10	19	5	-3	4	-10	6	-1	..	30	31	32	21	21	17	11	2	14	20	26	19	22	15	20	-2	-9	-14	-20	-22	-21	7.6
Forest City	Max.	13	28	35	33	13	9	14	18	25	26	26	35	39	36	38	33	33	19	32	40	38	35	34	30	38	36	16	19	8	8	8	26.0
	Min	-15	10	18	2	-13	-1	-15	1	-1	7	16	22	19	19	20	19	-1	-2	12	14	24	23	26	14	20	-6	-13	-15	-20	-23	-17	4.6
Galva	Max.	22	32	38	27	19	19	17	21	30	30	32	43	45	42	42	35	24	25	34	45	49	49	48	37	43	36	24	22	14	11	12	31.2
	Min	-11	21	20	3	-5	-1	-7	11	2	13	22	32	28	25	24	20	1	2	18	20	26	32	23	11	25	1	-9	-11	-12	-19	-10	9.5
Garden G'e	Max.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
	Min.	5	17	26	17	1	7	3	18	12	20	24	28	29	25	26	24	8	10	12	28	28	28	30	12	20	8	-6	10	-17	-15	-15	13.6
Glenwood	Max.	23	36	46	40	20	24	29	32	32	33	33	43	49	46	49	41	32	28	39	50	57	53	44	46	43	40	24	22	21	20	11	35.8
	Min.	-3	21	29	8	3	6	3	18	18	21	30	32	27	26	30	23	8	2	20	24	29	32	29	18	25	5	-5	-5	-14	-15	-11	14.0
Greene	Max.	17	29	37	10	20	10	5	20	22	27	22	33	40	35	40	30	18	21	32	40	35	35	32	29	36	30	16	17	10	9	11	24.8
	Min	-13	10	18	8	-5	-1	-11	0	-2	-1	15	22	30	21	22	18	4	0	13	16	25	23	29	16	21	-2	-9	-10	-17	-20	-13	6.7
Greenfield	Max.	25	38	45	37	23	23	28	31	30	32	35	40	45	42	43	43	24	22	37	48	46	49	38	39	41	36	22	16	17	14	13	33.0
	Min	-8	15	22	5	1	3	0	15	8	20	26	32	28	26	28	23	5	4	13	24	28	31	23	12	24	3	-9	-12	16	-19	-13	11.0
Grinnell	Max.	19	37	45	39	18	18	16	27	28	27	26	37	37	40	42	41	29	21	37	45	40	40	32	35	38	36	15	12	9	10	7	29.1
	Min	-5	5	14	10	4	6	-1	14	5	13	17	25	29	24	30	27	8	7	14	27	30	28	27	17	21	3	-6	-8	-14	-17	-11	11.1
Grundy C'r	Max.	16	35	40	31	19	16	17	25	29	30	24	36	37	40	42	39	24	20	35	45	40	39	37	34	39	34	17	11	12	7	10	28.4
	Min	-11	11	21	4	-3	1	-10	7	-2	10	15	22	24	22	24	20	4	1	12	21	26	24	25	15	21	-4	-9	-15	-19	-21	-15	7.1
Guthrie C'r	Max.	22	26	33	26	15	15	15	22	22	25	32	40	45	45	37	37	30	30	25	39	42	45	49	39	49	37	20	10	15	14	14	29 5
	Min	0	-3	10	8	0	0	-1	-1	0	10	15	32	34	30	25	25	3	3	14	32	30	29	27	32	14	0	-7	-10	-14	-17	-11	10.0
Hampton	Max.	16	32	38	10	22	13	13	20	22	28	29	36	40	38	39	32	16	19	33	42	38	38	33	32	40	2	17	-2	11	-5	10	24.3
	Min	-14	12	22	3	-6	1	-11	8	-1	9	10	22	29	25	25	22	2	0	12	20	27	23	26	17	23	-1	-10	-15	-18	-21	-12	7.3
Hopeville	Max.	22	40	45	42	21	21	27	35	34	31	34	42	46	43	45	44	26	24	37	48	47	..	49	37	41	37	21	19	14	15	10	32.9
	Min	-3	17	25	9	5	7	5	20	12	19	26	30	30	30	29	26	8	11	16	30	32	..	24	17	26	5	-5	-9	-13	-15	-11	13.4
Humboldt	Max.	20	33	38	34	18	16	17	20	23	28	28	38	41	38	38	34	25	18	34	44	40	41	37	33	43	38	22	19	13	13	11	28 9
	Min	-12	15	18	6	-6	0	10	6	-1	14	20	26	27	27	20	17	-1	-2	14	16	28	25	27	16	25	0	-10	-11	-16	-21	-13	8.5
Indianola	Max.	23	40	46	44	20	20	24	32	28	31	31	37	45	46	47	44	33	25	40	51	46	50	43	39	40	39	19	19	12	13	10	33 1
	Min	-4	17	26	10	4	8	2	20	7	17	21	26	30	28	32	26	6	9	14	28	31	29	30	15	24	4	-5	-6	-15	-17	-12	13.1
Iowa City	Max.	28	42	48	45	21	18	17	33	35	32	27	36	40	44	46	47	35	31	41	48	43	45	42	35	43	42	17	17	10	11	11	33.2
	Min	-7	10	22	12	1	8	0	9	7	14	14	20	29	28	23	16	9	11	28	28	22	28	14	19	6	-6	-5	-18	-17	-15	10 8
Iowa Falls	Max.	16	34	39	32	16	16	10	22	24	29	25	36	38	38	39	33	23	19	31	42	39	39	34	32	39	30	17	18	12	4	8	26.9
	Min	-12	11	20	4	-4	0	-11	5	-2	8	17	23	26	21	18	2	-1	-2	12	17	26	23	26	16	23	-4	-9	-15	-17	-21	-15	6.9
Keosauqua	Max.	23	44	53	51	26	21	27	41	39	33	30	48	49	48	47	50	33	35	42	52	48	44	41	40	49	29	22	21	12	14	16	36.1
	Min	-2	16	28	12	8	10	10	22	16	21	21	27	35	27	25	27	17	18	17	34	32	24	25	20	25	11	-1	-1	-13	-10	-12	15.8
Keokuk	Max.	25	46	54	51	21	18	27	42	34	32	28	41	45	48	53	50	32	34	42	50	51	47	43	42	50	36	22	24	16	11	13	36.4
	Min	0	18	32	18	10	15	13	22	25	29	19	26	38	29	36	32	19	22	30	36	33	30	33	24	30	14	-1	1	-11	-7	-7	19.3

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JANUARY, 1899—CONTINUED.

STATIONS.		DATE.																														Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Knoxville	Max	23	40	48	43	21	20	21	33	33	32	30	41	40	57	43	46	34	26	40	51	53	47	40	36	43	37	18	12	13	10	10	33.6
	Min	-3	17	28	10	5	7	3	17	7	19	20	15	33	24	21	27	8	13	13	30	31	28	28	16	22	5	-5	-7	-14	-15	-11	12.6
Lamont	Max.	22	40	45	43	23	21	28	36	35	32	35	40	44	42	45	48	32	24	37	48	49	48	40	38	42	39	19	19	13	15	9	33.9
	Min	-3	17	25	10	2	7	5	20	16	21	27	30	30	27	25	24	10	11	13	28	27	29	21	16	22	5	-4	-9	-16	-13	-11	13 3
Lansing	Max.	15	32	40	42	20	15	13	30	25	28	27	36	41	41	46	37	36	29	37	40	40	35	39	35	37	38	15	15	5	5	10	29.2
	Min	12	12	18	8	-2	5	-7	-6	3	2	15	26	33	21	20	17	16	1	13	25	30	19	29	15	15	6	-10	-6	-21	-21	-22	7.8
Larrabee	Max.	22	34	38	20	17	21	15	30	26	28	32	38	44	43	41	26	18	25	36	47	47	45	34	36	42	36	25	5	13	-2	12	28.8
	Min	-14	15	14	-2	-12	5	-14	6	0	10	26	30	26	24	19	12	-2	-2	8	17	25	28	22	12	25	-2	-14	-14	-19	-23	-14	6.2
Le Mars	Max	22	24	30	20	18	18	20	22	29	32	34	45	44	45	43	37	24	27	37	46	51	48	36	38	40	36	25	23	15	10	13	31.7
	Min	-8	17	12	3	-5	0	-8	11	3	13	29	32	27	24	27	19	0	3	19	29	26	30	21	24	25	0	-9	-13	-15	-20	-13	9.8
Lenox	Max.	22	38	43	42	21	21	27	33	21	31	31	40	43	41	44	43	32	21	38	47	47	44	41	39	40	39	19	20	16	16	9	32.5
	Min	-4	16	23	8	5	4	3	19	12	17	27	31	28	27	28	26	8	7	13	30	29	31	27	15	26	3	-6	-5	-15	-18	-14	12.9
Logan	Max.	22	36	42	12	20	22	23	28	32	36	36	45	35	38	31	18	24	32	34	36	47	38	35	30	36	27	14	12	-6	12	10	27.4
	Min	-6	16	22	5	-3	5	-2	4	10	14	30	36	24	22	20	6	0	10	15	16	22	20	15	10	22	2	-7	-5	-15	-12	-13	9.2
Maquoketa	Max	37	42	45	24	25	35	22	30	36	33	34	33	38	42	45	47	38	29	40	47	40	43	40	34	43	39	11	18	8	10	11	32.9
	Min	-5	15	23	11	4	18	-8	3	17	5	15	18	24	25	26	23	20	9	15	12	31	26	22	15	27	0	-1	-3	-13	-16	-15	10.9
Mason City	Max.	14	28	36	9	18	17	5	18	19	20	35	..	40	35	36	31	24	21	33	41	45	36	..	..	..	..	25	12	4	8	-4	23.4
	Min	-16	8	14	8	10	-2	-16	-2	-3	5	20	..	22	22	23	11	-1	-4	11	14	24	21	21	..	..	..	-10	-4	-16	-22	-34	3.9
Monticello	Max	17	37	44	44	20	25	17	30	33	32	29	34	37	41	44	44	35	30	37	47	39	38	37	34	40	39	15	16	7	8	2	30.7
	Min	-7	8	21	10	0	3	-1	1	3	11	13	14	34	23	25	20	16	6	10	24	29	19	28	10	12	4	-7	-5	-17	-18	-17	8.7
Mooar	Max	34	42	50	48	33	22	30	38	42	31	28	41	42	46	44	49	25	27	48	48	50	49	42	46	47	22	20	17	3	1	14	34.8
	Min	20	19	32	20	4	15	9	19	20	22	20	25	39	28	22	28	19	20	10	33	33	31	33	19	19	12	-1	4	-14	-12	-8	17.5
Mt. Ayr	Max	24	39	44	42	21	21	29	35	32	31	33	40	47	43	45	45	32	31	35	49	49	48	40	41	40	38	19	18	14	14	9	31.5
	Min	-3	13	25	10	3	6	5	9	15	21	27	30	29	25	27	25	9	9	13	25	27	32	25	15	22	5	-1	-7	-6	-14	-12	13.4
Mt. Ple'sn't	Max.	23	45	52	53	27	28	21	40	38	39	36	41	42	48	50	52	48	31	41	50	50	49	43	40	50	47	16	20	18	13	14	37.6
	Min	-7	14	27	14	4	13	6	13	10	17	15	26	36	28	26	27	18	16	13	31	26	24	31	19	23	10	-1	-1	-15	-10	-14	14.1
Newton	Max.	21	37	45	39	19	19	17	28	29	29	28	39	38	42	44	43	29	21	38	48	43	41	37	38	39	38	17	17	12	12	10	30.9
	Min	-6	14	23	7	3	5	-1	12	4	14	18	25	26	23	23	25	5	6	13	27	29	27	25	13	26	4	-7	-13	-15	-20	-12	10.6
Neola	Max.	35	30	25	20	23	4	20	44	35	33	38	45	45	43	45	41	20	25	22	28	30	20	32	35	30	30	25	25	15	8	12	28.5
	Min	18	21	15	8	3	0	4	10	20	23	32	21	25	26	22	8	2	6	7	8	12	8	15	15	12	8	2	-8	-13	-15	-11	9.8
New H'pton	Max	13	27	36	35	15	15	0	19	23	26	23	35	35	34	37	38	24	22	31	39	34	..	34	27	35	35	14	..	14	7	6	25.3
	Min	-14	10	18	3	-7	-8	-13	-3	0	10	10	23	30	28	22	19	12	3	13	16	25	..	20	15	18	-2	-13	..	-14	-23	-17	6.2
Northwood	Max	15	28	35	26	14	12	14	17	22	28	25	35	40	35	38	30	21	20	33	35	40	35	32	26	27	15	16	16	8	3	9	24.5
	Min	-17	18	13	1	-12	0	-14	-1	-2	6	14	23	25	23	15	20	0	-2	12	14	17	20	17	13	17	-6	-14	-15	-20	-23	-16	4.1
Odebolt	Max	21	31	41	25	15	17	14	23	31	29	32	40	44	39	42	36	27	21	32	44	49	48	42	26	38	10	23	21	15	13	11	29.0
	Min	11	16	20	-4	-5	-1	-8	10	1	16	27	31	30	35	25	21	2	1	17	18	27	29	26	-16	26	1	-9	-10	-13	-19	-10	9.5
Olin	Max.	5	20	37	46	28	20	17	20	31	30	32	30	38	36	42	42	46	25	29	38	47	40	38	36	33	40	9	16	10	8	-6	23.5
	Min	-8	10	20	25	2	10	0	5	6	9	12	25	29	25	25	24	19	9	9	11	26	20	26	11	13	9	-6	10	-17	-17	-18	10.5
Omaha	Max.	24	40	45	24	20	24	29	32	35	34	34	49	50	45	48	40	30	27	39	50	58	46	41	43	44	31	25	23	21	10	10	34.2
	Min	0	23	24	7	8	7	5	19	14	27	31	35	31	29	31	20	9	9	20	30	33	38	28	24	30	5	-3	-8	-9	-15	-5	16.0
Osceola	Max.	23	40	47	17	20	19	27	36	35	31	34	41	48	47	48	47	19	25	38	..	..	..	32	49	40	16	19	19	13	-3	10	29.9
	Min	-4	15	37	10	4	7	3	20	10	18	24	29	32	30	32	28	8	15	15	..	..	..	..	16	24	4	-6	-7	-14	-16	-11	12.0
Oskaloosa	Max.	23	42	48	44	23	18	20	35	34	31	32	40	41	47	48	48	28	28	41	51	49	47	36	38	44	37	17	17	13	13	12	33.7
	Min	-3	10	26	10	4	8	3	17	8	17	19	27	32	24	30	24	9	13	12	30	29	23	20	10	22	4	-4	-9	-14	-15	-14	12.0
Ottumwa	Max.	48	47	50	50	23	23	38	41	42	31	31	40	42	51	54	50	32	28	42	54	49	45	39	40	48	39	21	15	14	13	15	37.3
	Min	17	17	21	10	7	6	8	9	11	17	19	22	25	24	27	26	13	18	15	18	22	25	26	17	20	9	1	-5	-12	-12	-9	13.3
Ovid	Max	24	42	48	20	23	20	26	43	39	32	32	41	43	49	51	51	21	28	39	51	51	50	34	44	43	19	21	16	14	4	14	33.3
	Min	-4	19	28	8	3	8	3	18	12	21	23	28	28	22	28	26	10	15	13	31	31	28	19	15	23	5	-5	-9	-16	-14	-13	13.0
Parnell	Max.	20	30	48	56	22	32	30	30	31	29	28	37	40	42	35	40	43	..	39	47	..	50	34	35	47	17	17	18	12	1	10	31.7
	Min	12	28	30	10	21	7	7	17	23	21	25	36	32	35	31	30	20	..	35	37	..	42	20	25	35	10	15	-5	-4	-16	-13	19.4
Pella	Max.	19	36	44	13	18	15	16	26	28	28	29	37	34	41	40	36	18	20	36	42	38	41	31	34	39	10	0	-3	9	-4	7	24.8
	Min	-4	10	20	12	1	7	4	11	14	16	17	24	30	22	28	21	7	7	8	28	28	26	29	10	18	4	-17	-4	-15	-17	-14	7.5
Plover	Max.	20	30	38	25	20	15	16	15	18	28	32	40	45	37	42	28	15	24	34	45	42	43	36	32	45	12	25	10	12	-5	5	26.6
	Min	15	20	15	5	-10	-4	-11	10	-2	21	22	30	24	22	18	20	-2	-2	12	16	28	25	22	18	28	0	-10	-3	-17	-21	-12	8.9
Primghar	Max	12	20	30	40	20	25	25	38	20	20	45	30	45	30	25	30	30	37	38	39	33	36	39	40	42	20	13	15	4	12	5	27.6
	Min	2	9	15	0	10	-4	-13	0	15	18	25	23	22	10	-2	0	10	20	22	23	23	24	26	14	16	-2	-12	-8	-18	-24	-14	7.4
Red Oak	Max.	24	41	46	37	21	25	31	40	28	33	34	42	50	45	49	42	28	23	38	50	58	46	40	43	41	36	24	20	20	20	13	35.3
	Min	0	19	28	10	6	5	4	4	10	27	30	33	22	28	30	23	10	5	18	26	30	30	26	30	27	4	-2	-4	-12	-13	-12	14.4
Ridgeway	Max.	16	31	37	37	21	15	12	31	20	27	26	37	40	36	42	34	30	29	33	40	36	33	35	36	36	33	15	16	7	5	11	27.6
	Min	-13	8	19	5	-8	4	-13	-3	0	3	12	24	33	20	22	18	8	2	14	23	25	18	23	13	14	2	-15	-14	-23	-25	-19	5.7
R'ck R'pids	Max.	20	10	15	0	10	18	20	28	28	32	34	32	42	40	32	26	28	33	40	42	40	44	42	40	35	28	20	-12	-4	-8	0	24.5
	Min	-10	0	-5	-22	-10	-5	-15	0	5	10	20	30	40	20	14	10	-4	-5	10	4	14	20	28	26	20	-2	-15	-20	-22	-25	-15	3.1
Rockwell C	Max	21	34	40	37	20	20	19	20	27	26	29	40	42	40	41	32	30	21	31	47	44	44	37	38	40	11	20	-3	15	2	11	27.8
	Min	-13	-3	11	4	-4	-2	-9	-2	-3	14	23	28	27	25	24	22	-1	1	20	23	26	29	23	11	25	2	-9	-12	-15	-20	-12	7.5
Ruthven	Max.	15	28	37	33	15	16	16	20	15	25	27	36	38	39	38	37	23	23	37	40	40	38	39	36	37	35	11	19	18	9	7	27.3
	Min	14	11	11	0	-10	-8	-13	2	-2	15	16	22	23	22	22	17	-4	-3	12	20	22	17	21	17	15	-4	-12	-14	-18	-24	-16	5.6
Sac City	Max.	18	31	38	21	16	15	16	19	28	26	28	37	44	47	41	28	15	22	31	43	47	46	34	36	40	23	22	20	12	-7	5	27.1
	Min	-13	16	17	2	-3	0	-8	10	-1	22	25	29	30	30	25	14	0	-1	18	22	31	34	25	16	22	0	-8	-11	-14	-19	-10	9.7
Sidney	Max	24	39	44	15	20	22	20	31	30	32	33	46	43	42	45	40	19	27	39	48	53	44	35	42	41	15	22	8	21	-3	11	30.6
	Min	-3	21	27	9	9	7	7	12	12	26	31	33	31	29	32	30	9	7	19	30	33	35	29	23	29	4	-4	-6	-14	-16	-10	15.5
Sibley	Max.	17	30	39	23	18	17	..	18	..	23	30	40	42	41	45	36	17	26	38	42	46	40	35	35	35	35	20	19	8	4	10	28.4
	Min	-13	14	11	0	-13	-8	..	-14	..	0	26	28	25	21	17	11	-4	-2	17	17	23	25	19	12	20	-5	-13	-17	-18	-24	-18	4.7
Sigourney	Max.	20	42	50	47	23	20	20	35	35	28	30	37	40	47	49	49	37	30	43	51	47	45	40	39	45	42	19	14	13	12	12	31.2
	Min	-9	10	22	10	-2	6	-1	10	6	13	15	22	32	20	24	22	10	14	10	26	23	22	28	10	19	4	-3	-5	-17	-18	-16	9.7
Sioux City	Max	26	35	30	11	20	25	26	24	34	33	37	48	44	48	46	29	17	30	38	51	57	50	33	35	41	10	29	0	18	-1	14	30.4
	Min	-3	21	11	4	-3	4	-4	17	9	27	25	30	31	27	21	18	0	4	20	25	30	39	21	18	28	-1	-8	-12	-9	-19	-8	11.8
Spencer	Max.	18	30	26	14	14	15	16	19	21	28	30	45	41	35	32	28	14	24	41	43	43	35	23	39	..	6	22	20	12	0	11	24.8
	Min	13	13	10	0	-12	-5	8	5	7	8	23	27	25	20	18	10	-1	-3	20	23	24	20	13	8	..	-14	-12	-17	-18	-24	-14	5.7
Spirit Lake	Max.	17	24	32	15	21	12	14	12	22	26	28	26	40	36	34	42	..	24	36	42	..	43	36	43	36	34	20	16	10	4	10	26.1
	Min	-14	15	15	0	-12	-8	-16	6	-1	10	23	16	25	25	22	10	..	-13	15	15	..	23	20	13	22	-8	-14	-17	-21	-25	-17	3.8
StormLake	Max.	19	30	35	27	16	16	..	..	..	27	29	38	43	39	39	33	19	23	32	43	46	45	37	34	39	35	23	22	9	9	9	29.1
	Min	-10	15	16	2	-6	-1	..	..	..	13	23	29	28	24	23	14	-1	2	15	21	27	30	24	16	14	0	-11	-14	-16	-21	-12	8.9
Stuart	Max.	12	35	43	38	17	20	22	26	25	..	30	40	42	40	40	42	28	30	36	30	40	33	37	40	42	37	19	20	17	15	10	30.2
	Min	-8	22	23	7	2	4	7	17	7	..	20	25	25	28	29	25	16	4	20	21	30	27	22	17	25	-2	-4	-5	-15	-18	-10	13.0
Tara	Max.	25	27	32	18	22	18	17	22	24	29	30	40	40	40	33	30	18	20	32	40	40	45	37	39	44	10	22	5	-7	-2	10	25.6
	Min	15	5	22	10	5	4	2	7	5	8	24	30	30	30	22	20	1	5	20	25	27	30	25	25	31	-2	-3	-7	-12	-23	-7	12.3
Thurman	Max.	31	37	44	39	24	24	30	32	32	34	35	47	45	40	45	44	30	26	41	50	55	45	40	44	43	38	22	24	22	21	11	35.3
	Min	10	23	23	9	6	7	5	18	8	26	31	33	26	25	28	12	10	4	20	22	28	29	27	18	25	6	-2	-5	-14	-12	-11	14.0
Villisca	Max	5	39	45	16	20	28	32	31	30	32	38	36	46	43	45	45	20	25	38	50	50	47	47	43	43	12	12	10	18	5	14	31.2
	Min	-5	15	20	8	2	5	8	10	12	20	24	26	42	20	25	23	0	4	10	18	25	30	30	17	23	5	-5	5	-15	-15	-12	12.1
Wapello	Max	25	40	49	49	30	25	37	46	37	36	37	38	40	53	46	54	36	43	40	58	45	43	..	..	..	..	..	..	13	12	22	38.2
	Min	-5	14	29	14	5	10	15	15	11	13	15	24	30	29	29	28	20	15	15	34	29	21	..	..	..	..	..	..	-14	-10	-11	15.0
Washingt'n	Max	19	42	51	34	23	18	20	38	36	31	31	39	38	47	48	49	26	32	41	50	45	44	37	40	47	20	18	11	11	4	14	32.4
	Min	9	14	27	10	1	5	1	12	7	14	13	22	31	23	27	25	13	15	12	30	28	24	22	15	20	-3	-6	-9	-16	-15	-15	10.9
Waterloo	Max	18	36	39	25	18	15	10	25	30	29	26	36	34	41	44	36	17	24	36	47	41	38	36	35	38	33	16	5	12	10	7	27.7
	Min	-8	12	6	9	0	3	-7	4	15	11	14	25	33	22	25	20	10	4	14	20	27	22	22	16	21	-1	-8	-12	-17	-19	-13	8.7
Waverly	Max	17	33	39	37	17	16	10	22	26	30	25	36	38	38	41	35	26	23	35	43	39	38	39	32	38	37	17	17	10	9	11	28.2
	Min	-11	12	23	8	-1	1	-8	5	-1	10	15	25	32	22	25	19	7	3	14	19	28	26	28	18	22	-1	-7	-9	-15	-19	-14	8.9
Webster C.	Max.	15	20	40	30	17	16	19	22	27	28	29	42	41	39	40	32	18	22	32	45	40	41	38	37	30	24	18	18	15	15	11	27.7
	Min	0	10	20	8	-1	-4	-5	-5	4	8	20	20	24	22	24	21	3	7	15	20	27	30	24	18	9	3	-3	-10	-13	-19	-9	8.6
West Br'ch	Max.	18	30	40	47	18	18	18	16	30	32	36	34	38	42	43	45	42	38	42	40	38	34	30	32	36	22	24	16	14	4	22	30.2
	Min	-5	16	18	15	10	12	0	8	10	12	20	22	24	23	22	25	13	14	18	16	20	26	18	20	18	5	-5	-6	-14	-14	-11	11.4
Wilton Jc.	Max.	17	38	49	44	20	18	20	35	32	32	27	40	35	42	43	45	37	27	34	46	40	43	43	35	44	36	14	17	7	10	9	31.6
	Min	-7	10	24	14	1	10	3	22	8	13	11	26	33	26	27	26	20	9	21	27	32	23	30	16	36	7	-6	-3	-17	-15	-15	13.3
Winterset	Max	23	38	40	16	21	18	27	33	27	31	34	40	46	44	46	44	17	23	38	50	46	50	36	41	41	15	19	10	14	-1	12	30.3
	Min	1	20	30	15	4	6	2	22	8	20	23	29	30	29	31	24	6	7	15	26	31	28	29	15	24	4	-5	10	-14	-15	-11	14.3
WhatCheer	Max.	16	35	45	35	25	18	33	36	34	28	36	38	37	40	42	43	28	36	38	40	42	..	..	..	..	..	..	..	16	10	9	16	31.0
	Min	-7	10	22	16	7	2	11	13	13	12	16	20	19	30	34	20	10	10	18	30	20	..	..	..	..	..	..	..	-5	-15	-16	-8	11.3

METEOROLOGICAL DATA FOR JANUARY, 1899

NORTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.								
	Monthly mean.	EXTREMES.						Monthly range.	Monthly.	Greatest daily.	Total snowfall.	Depth of unmelted snow at end of month.	Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).
		Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.										
Algona *	16 4			42	20	-27	30	69	.03	.03	.3	2.0	SE	12	13	6	1
Alta	16.9	25 6	8.2	47	21,22	-22	30	69	.15	.04	1 0	1.0	N W	16	11	4	1
Britt	14 7	25.7	3.7	43	21	-23	30	66	.03	.03	.3		N W	16	10	5	1
Charles City	15.8	25 9	5.7	40	20	-22	30	62	.85	.50	2.5	.1	NW	7	19	5	3
Clear Lake *a*	12.6	24.0	1.2	44	16	-22	30	66	.32	.20	3 0		N W				3
Cresco	12 4	20.8	4.1	37	20	-25	30	62	.43	18	2.5	1 0	NW	17	8	6	3
Decorah	15.2	24.9	5.4	40	15	-24	30	64	.38	.27	3.0		W				3
Dows	16.6	27.3	6.0	42	13,20	-22	30	64	.22	.10	1.5	1.0	SW	21	3	7	3
Elkader	17.2	28.2	6 2	48	15,20	-22	31	70	.44	.16	3 5	1.0	S	18	10	3	4
Estherville *c*	10.8	18.9	2.6	35	12	-27	30	62	02	.02			S W				1
Fayette *b*	17.5	27 4	7.6	41	20	-22	30	63	.41	.19	3.0	.5	SW				4
Forest City	15 3	26.0	4.6	40	20	-23	30	63	.22	.10	2 0	T	S & W	19	4	8	3
Grand Meadow *	15.9			38	15	-22	30	60	.62	.25	4 2	1.0	NW, SW	13	11	7	4
Greene	15 8	24.8	6 7	40	13,15,20	-20	30	60	.32	.20	2.5		S W	9	12	10	2
Hampton	15.8	24.3	7.3	42	20	-21	30	63	.27	.13	1.5	1.0	SW	14	14	3	3
Hawkeye									.80	.20	5 0	3 0					3
Humboldt	18 7	28 9	8.5	44	20	-21	30	65	T	T	T	T	SE	23	3	5	0
Lansing	18.5	29.2	7.8	46	15	-22	31	68	.53	.25	4.5			12	10	9	4
Larchwood									.17	12	1 8	.5	SW	10	18	3	2
Larrabee	17 5	28 8	6.2	47	20,21	-23	30	70	.12	.07	9		S W	15	14	2	3
Le Mars	20.2	30 7	9.8	51	21	-20	30	71	T	T	T		S	17	11	3	0
Mason City *e*	13.6	23 4	3.9	45	21	-31	31	79									
New Hampton *b*	15 8	25 3	6 2	39	20	-23	30	62	.43	.40	4 0	4 0	NW				
Northwood	14 3	24.5	4.1	40	13,21	-23	30	63					N W	26	1	4	2
Osage †	11 8								.41	.16	3 0	6 0	S	7	8	16	4
Plover	17 8	26 6	8.9	45	13,20,25	-21	30	66	.20	.20	T		S W	26	0	5	1
Primghar	17.5	27.6	7.4	45	11	-24	30	69					N W	15	0	16	
Ridgeway	16 6	27 6	5.7	42	15	-25	30	67	1 05	.35	4.2	1.5	W	13	13	5	10
Rock Rapids	13.8	24.5	3.1	44	22	-25	30	69									
Ruthven	16.4	27 3	5.6	40	20,21	-24	30	64	T	T	T		S W	18	7	6	
Sibley *b*	16 6	28.4	4 7	46	21	-24	30	70	.20	.09	.5		S	14	12	5	4
Spencer *a*	15.2	24.8	5.7	45	12	-24	30	69	.06	.03	.2	.5	W				4
Spirit Lake *b*	15.0	26.1	3.8	43	22,24	-25	30	68	T	T	T		N W	20	4	7	0
Storm Lake	19.0	29 1	8.9	46	21	-21	30	67	.13	.02	.6	.5	S W	18	10	3	8
Waverly	18.6	28.2	8.9	43	20	-19	30	62	.46	.20	3.0	3 0	NW	15	12	4	5
West Bend *	15.9			43	20	-22	30	65	T	T	T		S, N W	18	8	5	0
West Union									.15	.10	1.5		N W	19	0	12	2
Washta									.10	.05	1.0	T	S W	18	11	2	2
Average	15.9	26.2	5.9	40.4		-23.1		65.9	.30		1.3	1.4	NW	15	10	6	3

CENTRAL SECTION.

Amana	20.3	30.1	10.5	46	3	-17	30	63	.36	.19	.5		NW	15	8	8	4
Ames			10.3	44	20	-18	30	62	.11	.07	.1			10	15	6	3
Audubon	20.6	29.9	11.4	47	21, 22	-17	30	64					N W	2	13	16	
Belle Plaine	19.6	27.7	11.6	47	3	-19	30	66	.82	.35	5.5		S & W	12	16	3	4
Carroll	18.2	28.4	7.9	51	22	-22	30	73	T	T	T			19	4	8	
Cedar Rapids	21.4	31.9	10.7	49	3	-17	30	66	.62	.25	4.0		S	18	3	10	3
Cedar Falls *c*	15 7	25.0	6.4	44	15	-19	30	63	.50	.40	1.0		N W				2
Clinton	21.2	31 5	10.8	47	3	-17	29	64	.27	.19	.5		S W	14	11	6	4
Davenport	24 0	32.9	15 0	48	3	-14	29	62	.31	.17	.8	.2	S W	12	7	12	7
Denison	17 3	27 0	7.6	48	22	-19	30	67	.05	.05	.5		N W	26	3	2	1
De Soto	23 2	33.0	13.4	52	20	-17	30	69	.10	.06	1.2		S W	13	11	7	3
Des Moines	23.7	33.4	14.1	51	20	-16	30	67	.29	.12	1.7	.3	S W	14	11	6	5
Dubuque	20.3	30.0	10.6	46	4	-18	29	64	.51	.20	3.3	T	N W	16	7	8	7
Eldora	17.2	27.7	6.8	45	20	-22	30	67	1.15	.50	4 0		SW, SE	1	28	2	4
Galva	20.4	31.2	9 5	49	21	-19	30	68	.15	.15	1.5	1.0	SW, SE	19	10	2	1
Grinnell	20 1	29 1	11.1	45	3, 20	-17	30	62	.58	.40	1.2		N W	11	11	9	3
Grundy Center	17.8	28.4	7.1	45	20	-21	30	66	.21	.15	.5	T	S	13	7	11	3
Guthrie Center	19 8	29.5	10.0	49	23, 25	-1	30	66	T	T	T		N W	19	7	5	0
Independence †	16 2			40	20	-21	30	61	.46	.15	3.1		S W	17	10	4	4
Iowa City	22.0	33.2	10 8	48	3, 30	-18	29	66	.59	.25	3.0		N W	12	15	4	3
Iowa Falls	16.8	26.8	6 9	42	20	-21	30	63	10	.10	T		SE, SW				1
Logan	18.3	27 4	9.2	47	21	-15	30	62	10	.10	1.0		S	22	3	6	1
Maquoketa	21.9	32 9	10.9	47	16, 20	-16	29, 30	63	.24	.14	2 8		N W	17	6	8	4
Monticello	19.7	30.7	8.7	47	20	-18	30	65	.47	.19	2.8		SW	22	5	4	3
Mt. Vernon *	20.3			46	3, 20	-20	29, 30	66									
Newton	20.8	30.9	10.6	48	20	-20	30	68	.86	.55	6.2		SE	14	13	4	4
Odebolt	19.2	29.0	9.5	49	21	-19	30	68	.05	.05	.5			21	5	5	1
Olin	19.5	28.5	10.5	47	21	-17	29, 30	64	.39	.17	2.0		S	16	11	4	3
Parnell *b*	25 6	31.7	19 4	56	4	-16	20	72	T	T	T		N W				
Rockwell City	17.6	27.8	7.5	47	20	-20	30	67						24	2	5	
Sioux City	21.1	30.4	11.8	57	21	-19	30	76	.08	.07			S	15	8	8	2
Sac City	18.4	27.1	9.7	47	14, 21	-19	30	66	.04	.02	.5		S W	12	13	6	2
Tara	19.0	25.7	12.3	45	22	-23	30	68	T	T	T		S W	5	23	3	0
Vinton *	20 2			47	20	-16	29	63	.53	.23	3.0	.5	S W	25	1	5	4
Waterloo	18.2	27 7	8.7	47	20	-19	30	66	.27	.10	2.0		N W	14	11	6	4
Webster City	18 2	27.7	8.6	45	20	-19	30	64	T	T	T		S E	9	14	8	0
West Branch	20.8	30.2	11.4	47	4	-14	29, 30	61	.11	.06	.5		S W	12	11	8	2
Whitten *g* *	17.9			42	20	-19	30	61	.02	.02	T		S				1
Wilton Junction	22.4	31.6	13.3	49	3	-17	29	66	T	T	T		W, N W	22	3	6	0
Average	19 9	29.3	10.4	47.3		-18 3		62 9	.29		1.6	.3	SW, NW	15	10	6	3

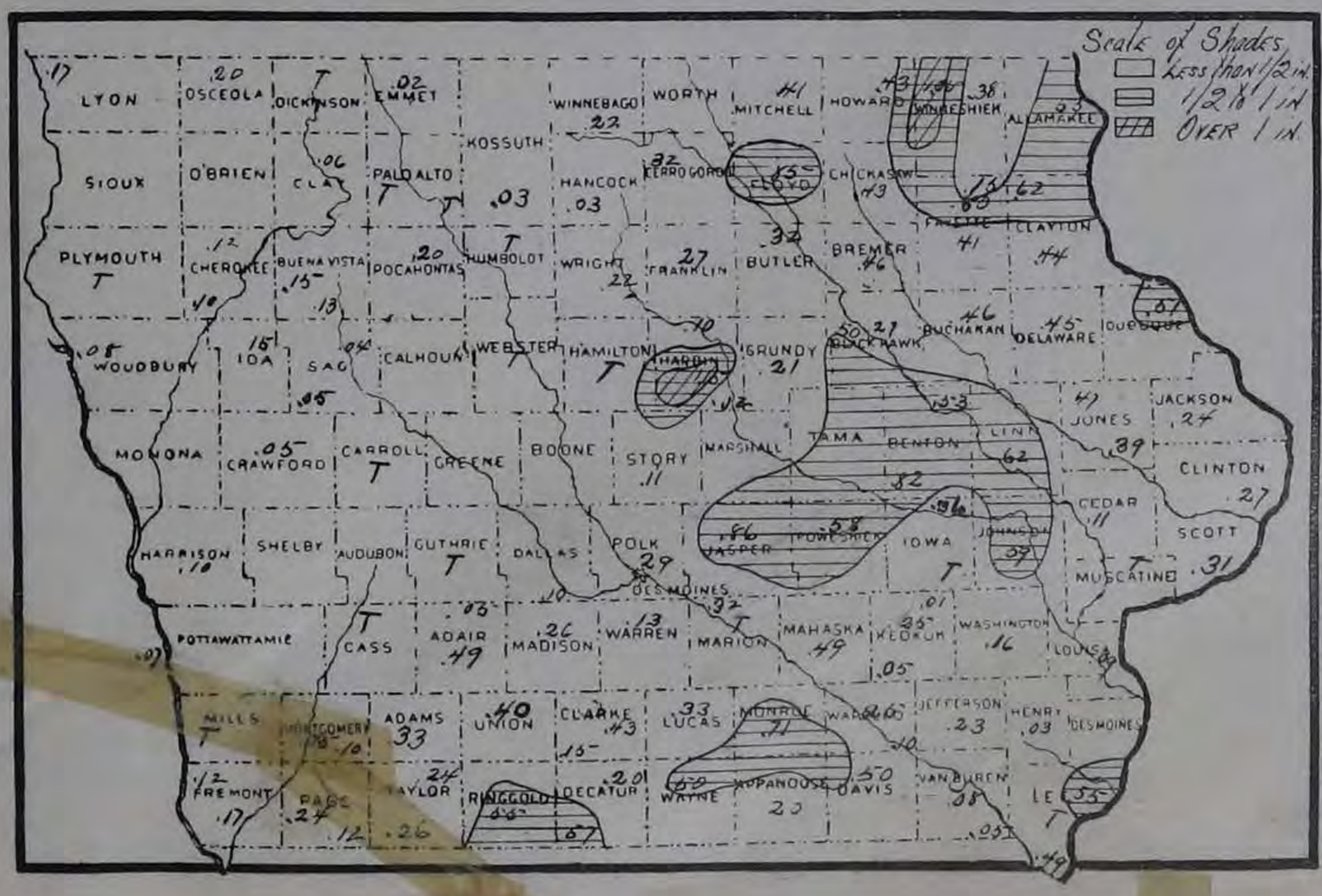
METEOROLOGICAL DATA FOR JANUARY, 1899—CONTINUED.

SOUTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).									PRECIPITATION, IN INCHES.								
	Monthly mean.	EXTREMES						Monthly range.	Monthly.	Greatest daily.	Total snowfall.	Depth of unmelted snow at end of month.	Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).
		Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.										
Afton	22.5	32.3	12 7	49	21, 22	-16	30	65	.40	.20	2 0		SW	4	16	11	2
Albia	25.2	37.7	12.7	66	4	-16	29, 31	82	.71	.25	5.5	0	SW	12	22	7	5
Atlantic	22.1	32 4	11 8	49	21	-16	30	65	T	T	T	....	SW	13	10	8	3
Bedford	23.8	35.3	12.3	52	20, 21	-18	29	72	.26	.11	1.5	.....	SW	8	17	6	4
Belknap	24.4	33 3	15.6	54	20	-14	29	68	.50	.30	2.0	....	NW	....	....	....	4
Bonaparte	25.0	35.3	14.8	51	3, 4	-15	29	66	.05	.05	.5	.....	.....	.....	.....	.....	1
Burlington ‡	24.6	31 1	18.2	47	23	-20	30	67	.....	.....	...	.	.....	...	.....	.....	...
Centerville c	25.9	37.5	14.3	53	16	-16	29	69	.20	.10	.2	.1	N	....	....	....	2
Chariton	23.6	34.8	12.5	51	16, 20	-16	29	67	.33	.15	1.8	...	S W	12	15	4	4
Clarinda	23.4	31.8	15.1	51	21	-17	28, 29	68	.24	.07	2 0	1.2	S	14	12	5	5
College Springs	25.0	34 8	15 2	46	15	-17	29	63	.12	.06	2 0	1 0	S	18	7	6	2
Corning	24.3	34 4	14.2	51	20	-15	30	66	.33	.33	T	T	SW	19	6	6	1
Council Bluffs	25.4	36.7	14.1	68	21	-13	30	81	.....	.....	.....	....	S	23	2	6	..
Eldon	20.5	27.5	13.5	48	3	-14	29, 31	62	.10	.10	T	....	E	22	1	8	1
Fairfield	25.2	36.2	14.3	63	16	-15	29	78	.23	.11	1.0	T	.....	20	2	9	4
Ft. Madison*	27.2	.....		49	16	-10	29	59	.55	.26	1.0	....	SW	5	13	13	2
Garden Grove	....	.....	13.6	....	....	-17	29	.....	.20	.15	.5	.....	S	13	1	17	2
Glenwood	24.9	35.8	14.0	57	21	-15	30	72	T	T	T	.....	SW	7	19	5	0
Greenfield	22.0	33.0	11.0	49	22	-19	30	68	.49	.39	1.1	.2	S	17	6	8	4
Hedrick f*	20 1		.....	45	15,20,25	-14	30	59	.05	.05	.5	.....	S	....	....	....	1
Hopeville a	23.2	32.9	13.4	48	20	-15	30	63	.15	.09	.6	....	NW				2
Indianola	23.1	33 1	13.1	47	15	-17	30	64	.13	.09	2.8	....	SW	13	7	11	2
Keokuk	27 8	36.4	19.3	54	3	-11	29	65	.49	.39	1 0	T	SW	10	15	6	6
Keosauqua	26.0	36.1	15.8	53	3	-13	29	66	.08	.06	1 5	.5	.....	.....	....	.	2
Knoxville	23.1	33.6	12 6	57	14	-15	30	72	T	T	T	....	SW	17	6	8	0
Lamoni	23.6	33.9	13.3	49	21	-16	29	75	.57	.17	4.0	.....	NW	23	2	6	5
Lenox	22 7	32 5	12.7	47	20, 21	-18	30	65	.24	.09	1.5	.6	SW	16	8	7	3
Mooar	26 2	34.8	17.5	50	3, 21	-14	29	64	T	T		....	NW	15	4	12	0
Mt. Ayr	23 4	33.5	13 4	49	20, 21	-16	29	65	.55	.15	4 5	.8	S	4	22	5	5
Mt. Pleasant	25.8	37.6	14 1	53	4	-15	29	68	.03	.02	.3	....	SW	23	2	6	2
Neola	19.2	28 5	9 8	45	12,13,15	-15	30	60	....	....	.....	.....	NW	12	8	11	..
Omaha	25.1	34.2	16.0	58	21	-15	30	73	.07	.03	.6	..	S	17	8	6	5
Osceola d	21.0	29.9	12.0	49	24	-15	30	64	.43	25	3 5	T	SW	....	....	....	3
Ovid	23 2	33 3	13 0	51	15,16,20	-16	29	67	.50	.27	3.0	.5	SW	14	4	13	5
Oskaloosa	22.8	33.7	12.0	51	20	-15	30	66	.49	25	3.8	T	SW	15	4	12	5
Ottumwa	25.3	37.3	13.3	54	15, 20	-12	29, 30	66	.25	.20	.5	....	NW	12	12	7	2
Pella	16.2	24 8	7.5	44	3	-17	27, 30	61	.32	.20	2 0	.....	SW	11	11	9	2
Red Oak	24.8	35.3	14.4	58	21	-13	30	71	.15	.10	T	....	.....	.....	.....	...	2
Sidney	23.0	30.6	15.5	53	21	-16	30	69	.17	.10	1 0	2.0	SW	20	8	3	3
Sigourney	22 0	34.2	9.7	51	20	-18	30	69	.25	.15	2.0	.....	NW	13	14	4	2
Stuart a	21.1	30.2	12.0	43	3	-18	30	61	.05	.05	.5	.....	N	.. ..	.....	.....	1
Thurman	24 6	35 3	14.0	55	21	-14	29	69	.12	.08	2.7	.....	NW	7	14	10	2
Villisca	21.6	31 2	12.1	50	20, 21	-15	29, 30	65	.10	.10	1.0	.....	S	15	11	5	1
Wapello f	26.6	38.2	15.0	58	20	-14	29	72	.09	.09	1.0	.....	NW	.....	.....	.....	1
What Cheer f	21 2	31 0	11 3	45	3	-16	30	71	T	T	.....	.....	NW	.....	.....	.....	...
Washington	21.6	32.4	10.9	51	3	-16	29	67	.16	.12	T	.....	SW	.....	.....	.....	2
Winterset	22.3	30.3	14.3	50	20, 22	-15	30	65	.26	.12	2 6	.... .	.....	.....	.....	.....	3
Average	23.5	33 5	13.4	51.6	.....	-15.5	.....	67 4	.24	.....	1.5	.5	SW	14	9	8	3
Average for the state	19.8	29 7	9.9	46.4	.....	-19.0	....	65.4	.28	.....	1.5	.7	SW, NW	15	10	6	3

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

Precipitation Chart January 1899.



DAILY AND MONTHLY PRECIPITATION FOR JANUARY, 1899.

STATIONS.	DATE.																													Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	..	....	....	..	....	....	..	..	..	....	T	.20	.	....	....	.	....	T	....	....	..	....	.20	....	....	T	....	T	....	....	....	.40
Algona	..	..	..	T	....	.03	..	....	....	....	T	.	..	..	....	....	....	....	....	..	....	T	T	....	....	T	....	T	T	....	....	.03
Alta (Hadden)	....	....	..	....	.01	....	....	....	....	..	....	.04	..	..	....	T	....	..	....	..	....	.02	.03	..	.02	..	....	.02	.01	..	T	.15
Albia	....	....	....	....	....	.15	....	....	....	..	.	.16	..	....	.	..	..	....	....	....	....	..	.25	..	..	..	..	.10	.05	..	....	.71
Amana	..	....	..	....	.05	....	..	..	.	....	..	.19	....	..	....	..	....	..	....	..	....	.	.08	..	....	T	....	.04	....	T	....	.36
Ames	..	..	....	T	.	T	..	....	..	....	....	.07	....	..	..	..	..	....	....	..	....	.03	....	....	T	....	....	.01	....	....	..	.11
Atlantic	....	....	..	..	.	T	.	..	..	..	..	.	.30	....	..	....	..	..	....	..	..	....	.05	..	..	T	....	.05	....	....	....	T
Belknap	...	.	..	..	..	.10	..	..	..	..	..	.15	....	..	....	T	..	..	....	..	..	....	.35	..	..	T	....	.05	....	....	..	.10
Belle Plaine	..	..	..	....	..	.15	....	..	..	....	..	.27	..	.	..	..	T	..	....	..	..	....	....	..	..	T	..	.05	....	....	....	.82
Bonaparte	...	..	..	..	..	.05	..	....	....	....	....	....	....	..	....	..	..	....	..	..	....	..	..	....	....	....	....	....	....	....	....	.05
Britt	..	...	..	T	....	T	....	....	..	.	T	.03	..	..	..	....	.	..	..	....	....	....	..	..	T	T	..	....	T	....	..	.03
Bedford	....	.	..	..	....	...	....	....	....	.	..	.11	..	..	..	..	....	T	....	....	..	..	.06	....	..	T	.	.06	.03	..	....	.26
Carroll	..	....	.	....	..	T	.	..	..	..	..	T	..	....	....	..	..	....	....	..	....	....	.10	....	....	.	..	T	..	..	....	T
Cedar Falls	..	...	..	...	..	..	....	....	..	..	....	.40	..	..	..	..	....	....	....	..	....	....	.10	....	..	..	..	....	..	..	....	.50
Cedar Rapids	.	...	....	....	.06	...	.	....	..	..	T	.22	..	....	....	T	..	....	....	..	....	T	.25	....	T	..	T	..	T	....	..	.53
Centerville	....	...	T	..	....	.	.10	....	..	..	....	T	T	....	....	..	.	....	..	..	..	..	T	....	..	T	..	T	..	....	..	.30
Chariton	..	..	.	T	..	.05	..	.	..	..	..	.10	..	..	..	....	....	....	....	..	..	..	.15	..	..	T	T	.10	....	....	....	.33
Charles City	....	..	..	..	..	.50	..	....	..	..	..	.30	....	....	..	..	T	..	....	..	....	T	T	..	....	T	..	.03	....	T	..	.85
Clarinda	..	.	.	....	....	....	..	..	T	03	.07	....	..	..	..	..	..	T	....	..	..	..	.03	....	T	T	..	.05	....	..	....	.24
Clinton	..	..	..	02	....	.05	..	....	..	....	..	.	.19	....	.	..	..	..	..	..	..	..	T	..	.01	..	....	.05	.	.06	..	.27
Clear Lake	..	..	..	..	.	.10	..	..	....	..	..	..	..	....	..	..	..	....	..	..	..	.02	..	..	T	....	..	..	....	....	.20	.62
College Springs	....	....	..	...	..	..	....	..	..	..	..	..	....	.	..	T	..	T	.	..	.	..	.06	....	..	T	T	..	....	T	.06	.12
Corning	...	..	..	....	....	....	....	.	....	..	.33	..	..	..	T	..	T	.	..	.	T	T	T	..	T	T	..	.07	..	....	..	.33
Cresco	..	..	..	....	.18	....	..	..	....	..	..	.18	....	..	....	..	..	..	..	T	T	T	.04	..	.01	T	T	.03	..	....	..	.43
Davenport	..	..	..	.04	.	.02	....	....	.	.	..	.11	.06	..	....	..	T	..	..	....	T	..	.08	T	..	....	.01	T	.03	....	....	..	.31
Decorah	....	....	.	..	.27	....	..	..	....	....	.	....	....	..	..	..	..	..	..	..	....	.08	T	..	.03	..	.	.	.	T	..	.38
Delaware	..	..	..	..	.	.10	..	..	..	.	..	.22	..	.	..	.	.	....	.	..	....	..	.09	..	....	..	.02	..	.02	....	....	.45
Denison	..	..	..	..	..	.05	.	..	..	....	.	.	.	.	.	.	.	.	.	.	.	..	.	....	T	..	..	T	..	..	..	.05
Des Moines	..	..	....	T	....	03	..	..	....	T	T	.12	.	..	..	T	T	T	..	.	..	..	.08	....	T	T	..	.05	..	.01	..	.29
De Soto	..	..	..	....	..	T	..	....	....	..	T	.03	....	....	....	T	....	T	..	..	..	..	.06	....	T	..	..	.01	..	....	..	.10
Dows	..	..	....	..	.	10	..	..	....	..	T	07	..	....	..	..	..	T	..	....	..	T	T	....	T	T	..	.05	T	....	....	.22
Dubuque	....	....	T	..	.	.11	.	.	.	....	..	.16	.04	....	....	.	T	.	.	.	.01	T	.11	....	T	T	..	.07	.	.01	.	.57
Eldon	..	..	..	..	..	T	.	..	.	..	..	.10	T	..	..	....	T	....	....	..	..	T	T	.	..	T	.	T	.	T	..	.10
Eldora	..	..	..	..	.	.30	....	..	....	..	..	.50	.25	..	..	T	..	..	....	.	.	T	..	....	..	T	..	.10	T	..	....	1.15
Elkader	....	..	..	..	..	.15	..	..	..	..	....	.16	....	.	..	T	.	..	....	T	....	.12	.	....	01	..	.	....	T	..	...	.44
Estherville	...	..	....	.	..	.	.	..	..	....	T	T	...	....	....	.	..	....	....	..	.	.	.	..	.02	.	.	....	..	..	..	.12
Fairfield	..	..	.	T	..	.	....	..	..	..	..	.11	.01	..	....	..	.	....	....	....	....	..	.10	..	01	..	..	....	....	..	..	.23
Fayette	...	.	..	T	....	.19	..	..	....	..	....	.10	....	..	....	.	....	....	..	..	T	T	.08	..	T	T	..	04	T	T	....	.41
Forest City	...	..	..	T	..	....	.	..	..	T	..	.10	..	....	....	.	....	....	..	..	..	..	.	..	.10	T	..	02	T	..	....	.22
Ft. Madison	....	.	..	.26	..	10	..	..	..	....	..	.	.19	..	....	..	..	..	.	T	..	..	T	....	....	T	..	T	.	....	....	.55
Galva	...	.	..	..	....	.15	....	.	....	.	..	.	....	....	.	....	..	....	....	..	..	....	....	....	.	.	....	.	....	.	..	.15
Garden Grove	...	....	..	....	..	....	.	....	....	..	T	.15	..	..	.	T	..	..	....	..	..	....	T	....	....	..	....	.05	..	..	....	.20
Glenwood	....	....	..	..	..	....	....	....	.	..	.	.	..	....	....	..	....	....	....	....	..	....	....	..	..	....	..	....	T	T	..	..
Grand Meadow	..	.	..	..	..	.25	..	....	.	....	..	....	15	..	....	..	.	....	..	..	T	T	....	..	..	..	..	.10	T	..	..	.62
Greene	....	..	.	..	..	.12	....	..	....	....	....	.20	....	..	..	.	....	..	..	.	..	T	..	..	..	..	..	..	T	..	....	T	.32
Greenfield	..	..	..	.	..	..	..	..	..	T	T	.39	T	..	..	T	.	T	..	.	..	..	.04	.	..	T	..	.02	.04	....	..	.49
Grinnell	..	.	..	....	..	.12	..	..	....	....	....	40	....	.	..	..	..	.	..	....	..	..	.06	....	..	.	..	T	..	....	..	.58
Grundy Center	....	..	..	..	T	..	.	..	....	....	....	.15	....	..	..	T	.	T	..	..	.	T	.05	....	.01	....	....	T	T	....	....	.21
Guthrie Center	....	..	.	....	....	T	.	..	....	T	T	....	....	..	....	....	..	..	....	..	.	....	....	..	..	....	..	..	T	..	..	..	T
Hampton	..	..	..	....	.12	....	..	.	....	..	....	.13	..	....	....	.	..	..	....	....	....	....	....	..	....	....	.02	.	..	..	..	.27
Hawkeye	...	.	..	..	.	.30	.	....	..	..	....	..	....	.30	..	....	.	..	..	..	T	T	..	....	....	T	..	.20	....	..	....	.80
Hedrick	..	....	....	.	....	....	..	..	....	..	..	....	....	....	..	....	..	....	..	..	....	..	.05	....	..	.	..	.	....	....	....	.05
Hopeville	..	...	.	..	....	T	..	..	....	..	.	.09	..	....	..	....	..	....	..	..	....	..	.06	..	T	T	..	T	....	T	.	.15
Humboldt	...	...	.	..	..	..	..	..	....	..	T	..	..	....	..	....	..	....	..	.	..	T	..	..	....	T	..	T	..	..	..	T
Independence	..	.	..	..	..	.10	..	....	..	..	....	.15	....	..	..	..	T	....	..	.	..	..	.11	..	....	..	....	.10	..	T	..	.46
Indianola	..	..	..	T	.	....	..	..	....	T	....	.04	..	..	..	....	..	T	....	..	..	..	.09	..	T	....	....	T	T	..	..	.13
Iowa City	.	..	..	..	.22	..	..	....	....	..	..	.25	..	..	....	....	..	..	....	..	..	..	.12	..	....	..	....	T	..	..	....	.59
Iowa Falls	..	..	..	..	..	....	....	....	..	T	.10	....	.	..	.	T	..	....	....	....	....	T	T	..	T	..	T	....	T	..	....	.10
Keokuk	..	.	.39	.	.03	....	T	.03	....	..	T	T	.	....	....	.	T	..	....	.01	..	.	.01	..	....	T	..	.02	..	T	..	.49
Keosauqua	.	..	...	....	....	.06	....	....	..	....	..	....	....	..	....	....	T	....	....	....	..	..	T	..	....	T	..	T	..	....	..	.08
Knoxville	..	.	T	...	T	..	....	....	....	..	T	..	....	..	....	..	..	....	..	..	....	..	....	..	..	....	..	....	..	....	..	....
Lamoni	..	....	..	..	....	....	..	....	....	T	..	.14	....	..	....	....	..	..	....	....	....	..	....	..	..	..	....	..	....	....	....	T
Lansing	..	..	..	....	....	.25	..	....	....	....	T	....	.08	....	....	..	..	....	.05	....	..	T	.16	..	....	..	....	.17	....	.05	..	.57
Larchwood	..	..	..	....	....	.05	..	....	....	....	T	....	....	....	....	..	....	....	.	..	T	.10	..	..	..	....	.10	..	....	....	....	.53
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Vol. X. February, 1899. No. 2.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

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Central Station, Des Moines, Iowa.

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LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

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F. R. CONAWAY, STATE PRINTER
1899.

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Guthrie Center	Oscar Klingman.
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Van Horne	Spencer Smith.
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Wilton	Thos. Boot.
Wiota	I. S. Coomes.

U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME X. FEBRUARY, 1899. NO. 2.

CALENDAR OF DISCONTENT.

SPRING.

Too well I know you, Spring, and so restrain
My foolish muse from all such flatterings vain
As "mild" and "gentle"—lest I be repaid,
Even as Marsyas of old, and flayed,
This time by icy hail and cutting sleet,
Instead—I pray your going may be fleet,
That soon I may forget and drowse away
My weariness beneath dear Summer's sway.

SUMMER.

Insufferable season of the sun,
When will your endless reign of fire be done?
When will your noisy insect court take flight?
Your orchestra that rests not—day or night;
Your armies with unconquerable stings;
When will they flee—what for do they have wings?
How long before brave Autumn, with a shout,
Will succor me and put them all to rout?

AUTUMN.

You dismal mourner, wailing by the bier
Of Summer dead, with lamentations drear,
Driving me frantic ever and anon,
With reminiscences of Summer gone.
Now mimicking her tenderest airs and tones,
Now harrowing me with horrid shrieks and groans.
Were good and jolly Winter only here,
I'd soon forget you and your evil cheer!

WINTER.

Hoary imposter! with mock jovial air,
You took the green earth prisoner unaware
And pinioned the trees that moan and call
To Spring to free them from your icy thrall.
You manacled the stream who tugs in vain
To loose himself from your relentless chain.
And I—my heart is sad, my lyre is dumb,
Mild, gentle Spring—Oh! will you ever come!

—*Oliver Herford in Scribner.*

THE WINTER OF 1898-1899.

The advent of winter was about a week earlier than usual in this section, being ushered in by a general storm and a severe "norther," with considerable snow, on November 21st. A marked type of winter weather prevailed during the last decade in November; and the average of the minimum registered for the month in the state was 6.9° below zero. At the central station the mean temperature of the last decade of that month was 16 4°. At every station in the state zero temperature was recorded during that period, and in the northern section a minimum of 17° below zero was registered. The larger part of the state was covered with a mantle of snow during that decade, and the month as a whole was unusually severe.

The month of December was colder than usual in this section. At the central station (Des Moines) the daily mean temperature for the month was 5° below the normal, and in the state the daily deficiency ranged from 4 to 6°. Two cold waves of great intensity swept over the state during the month; the first on the 13th and 14th, and the last on the 30th and 31st. In the northern section the lowest temperature recorded was 25° below zero, and the mean of the minimum was 20.2° below zero. In the central section the minimum registered was 20° below zero, and the mean of the minimum was 13.7° below zero; in the southern section the lowest registered was 16° below zero, and the mean of the minimum was 14.6° below. Though colder than usual, December was not excessively stormy.

January as a whole was warmer than usual, with less than the normal amount of precipitation. At the close of the month the ground was quite bare of snow. Zero temperatures were recorded at various points during the first week and the last week of the month. There was an average for all the stations of observation of about nine days during the month on which the minimum temperature reached zero or below. At Des Moines the highest temperature recorded was 51°, and the lowest 16° below zero. On the whole it was a fair and moderate midwinter month. The daily mean temperature for the state was 19.8°, which is about 2° above the January normal.

THE COLD SNAP—JANUARY 27TH TO FEBRUARY 13TH.

The prominent feature of the winter was the cold snap, covering a period of eighteen days, beginning January 27th and ending February 13th. This constituted what is termed "the backbone of winter," and it was a remarkably stiff vertebral column. The lowest temperatures of the cold period were registered in February, from the 7th to the 13th. At Des Moines the lowest was 24° below zero on the 11th. On the same day Sioux City reported 31° below, with a mean of -22°. Omaha reported -26° on the 11th, with a mean of -19°. The minimum at Keokuk was -21° on the 9th, and on the same date Dubuque registered -26°, and Davenport -23°. The reports show that it was a record-breaker for duration and severity of cold in the first half of February.

At Des Moines the records show but one equally cold period of about the same number of consecutive days, and that occurred January 7th to 23d, in the year 1888. For comparison we give below the the daily records of these two notably cold periods:

DATE.	TEMP. 1888. Max.	Min.	Mean.	DATE.	TEMP. 1899. Max.	Min.	Mean.
January 7	11	1	6	January 27	21	-3	9
January 8	2	-11	-4	January 28	20	-8	6
January 9	8	-10	-1	January 29	15	-14	0
January 10	12	1	6	January 30	13	-16	-2
January 11	6	-5	6	January 31	10	-9	0
January 12	25	3	14	February 1	17	4	10
January 13	5	-19	-7	February 2	14	-4	5
January 14	-9	-19	-14	February 3	10	-1	4
January 15	-8	-27	-18	February 4	10	-6	2
January 16	1	-20	-10	Ferbuary 5	17	-1	8
January 17	10	-1	4	February 6	13	0	6
January 18	10	-8	1	February 7	5	-10	-2
January 19	11	11	0	February 8	-10	-21	-16
January 20	-10	-17	-14	February 9	-5	-23	-14
January 21	-4	-17	-10	February 10	4	-13	-4
January 22	13	-13	0	February 11	-5	-24	-14
January 23	15	3	9	February 12	8	-17	-4
				February 13	17	-11	3
Means	6	-10	-2 2	Means	9.5	-10	0.2

It will be seen by the records that the cold snap in the winter of 1888 was slightly colder than the cold period of corresponding duration in the past winter, but it occurred in January, which is normally the coldest month in the year in this section, while the climax of the recent cold spell was reached from the 7th to the 12th of February.

The month of February, 1899, will score a new record for low temperature at nearly all stations in Iowa The average for the state was from 7° to 11° below the normal. At the close of the month the soil was frozen to an unusual depth, the average in the northern section being over four feet, and in the southern section about three feet The precipation was unusually light, and there were few severe storms.

On the whole the winter of 1898-99 will be classed as exceptionally severe, and quite unlike the "old-fashioned winters" of the '40's, '50's and '60's, when the pioneers were able to do considerable plowing and breaking between November and March.

NOTE AND COMMENT.

The publication of the weekly CROP BULLETINS will be resumed on the second Tuesday in April (the 11th), and blank cards will be issued to crop reporters in due time. We hope to retain the services of all who have heretofore co-operated in this work, and to add some new names to the list of observers.

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A newspaper item says: "Weather Prophet De Voe predicts severe storms and cold during March, followed by a very hot and dry summer." That's a very safe forecast. In this country March always brings cold and stormy weather somewhere within our broad domain. And every summer is hot in considerable portions of the United States, with large areas of dryness in various sections. These long range prophets always take wide margins of latitude in their predictions, so they hit it somewhere.

***

Observer J. W. Love, of Atlantic, reports a strange phenomenon that appeared on the 18th of February, at about 9:10 P. M. It was a light-gray band, in form of a perfect rainbow, arching the heavens; the sky being clear and the moon shining brightly at the time of its appearance. Though perfect in form, the colors of a rainbow were not visible.

***

The people who have been saying the winters are steadily growing milder, are now inclined to the opinion that the amelioration of climate depends very much on the weather.

A writer in *Knowledge* makes a vivid picture of the great belt of clouds, some 300 miles in breadth, which surrounds the earth a little north of the equator. Within this belt rain almost incessantly falls, sometimes in sheets, and the wind seldom stirs. Before the invention of steamships vessels becalmed in the "cloud belt" sometimes drifted helpless for weeks. Even now the crossing of this belt, where everything is surcharged with moisture, is a disagreeable experience for voyagers going from the north to the south Atlantic ocean or *vice versa*. The belt can be traced across equatorial Africa and across the American isthmus, and the great rivers, Amazon, Orinoco, Niger, Nile and Kongo, arise in these rain soaked regions, which are like exhaustless reservoirs. The cause of the equatorial cloud belt is connected with the trade winds, and in the course of a year it oscillates north and south over a distance equal to about three times its own breadth.—*Ex.*

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A recent associated press dispatch from Los Angeles, Cal., says:

Under the direction of Prof. T. S. C. Lowe, a series of experiments are to be made at artificial rain-making. A committee has been appointed by the chamber of commerce here to raise $8,000, the amount deemed necessary for an apparatus and chemicals for bombarding the skies. Rain is much needed here and the conditions have been favorable many times of late, but no rain has fallen.

That California drouth has been hard on fruit and farm products, but it appears to have brought forth a big crop of fads, fakes and foolishness. It seems marvelous that in this age of general enlightenment the members of a body of intelligent business men, who are competent to manage the commercial interests of a large city, can be induced to pay thousands of dollars to conduct experiments for curing a drouth by the use of explosives and chemical cathartics—a fake theory that was exploded several years ago.

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The Bay of Fundy has the highest tide in the world. It rises twelve feet an hour, and sometimes attains a height of seventy feet.

***

Corn loaned to a hog is cash at a good investment, safe and at a large interest. The hog is a condenser; he will put ten bushels of corn into less space than a bushel measure. He has been styled "a manufacturer of hams, lard, hair brushes, head cheese, tooth brushes, glue, buttons, fertilizer, fats, bacon, knife handles, whistles, soaps, souse, sausage and satisfaction." He converts corn into coin, and can buy what he will.—*Indiana Farmer.*

***

Waterspouts are common on the coast of New South Wales, often occurring in groups of three or four. An unusual display of last May was witnessed by a scientific observer, H. C. Russell, who has lately given a description of the phenomenon. The morning was fine, with a light northwest wind and smooth sea. A dark mass of cloud, lighted by electrical flickerings, appeared in the east, but gave no warning of the disturbances it was bringing. Before noon fourteen waterspouts were seen. Each began with a rotary motion in the water, a large column, with a mist cap 100 to 150 feet deep, then gradually rising for three or four minutes, the clouds at the same time forming an inverted cone, which alternately dipped and rose until it met the cone of water. The column then remained unchanged for several minutes, when getting out of perpendicular, it parted in the middle, the top rising and the bottom falling.—*Ex.*

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The director of the Upsala Observatory has just published the results of his observations on the height of clouds during the last seven years. No less than 3,000 measurements were taken, of which about half were made with photographic apparatus. It appears that the mean height of the clouds varies

greatly during the year. The maximum is reached in June and July, when the mean height of cirrus clouds is 8,176 meters (five miles), and that of cumulus 1,685 meters (a little over a mile).

OLD-TIME WINTERS.

CHANGE IN CONDITIONS AND NOT IN THE CLIMATE.

[FROM INDEPENDENCE BULLETIN-JOURNAL.]

A few of the "oldest inhabitants" of the county enjoy telling their early day winter experiences here, and would have us believe that the cold wave last week was a summer day compared with the cold weather of long ago. One farmer was heard to remark the other day that the cold weather that froze up water pipes six feet under ground, and made the mercury cuddle down 40° below the zero mark, was nothing compared with the cold weather experienced in 1857. That was forty years ago, and there are few here now who can contradict the statement, but considering the difference in conveniences between then and now we can easily see why anyone might remember a cold wave, similar to the one last week, as fatal. Forty years ago houses here were built of native lumber or logs, and the wind blew through the sides of an average building like a sieve. It was not uncommon to get up in the morning and find drifts of snow on the floor. It was the conveniences they lacked that impresses them with the hardships of that time. There was no coal in use here then, and happy the man who had dry wood to burn. Fur overcoats were almost entirely unknown, and not one man in a dozen wore overshoes or felt boots. The houses stood on bleak prairies without groves to break the nor'westers. Very few farmers had barns or anything better than straw sheds for their stock, and not a winter passed that there was not more or less loss of stock from exposure and the severity of the weather. Cotton cloth ranged from 25 to 40 cents per yard, and other cloth in proportion. Common pine lumber was worth from $50 to $70 per thousand, and, considering the money in the country, this was almost prohibitory. Wheat growing was the leading business with our farmers, and, while prices were fair, yet the expense of raising and marketing left them with little profit, and hardly money enough for the necessities of life. There was little stock raising, dairy products were not relied upon, poultry cut no feature in the income, and even hog raising was a side issue. So, about midwinter, after the wheat was sold, until threshing time the next fall, creditors were asked to "wait until after the next harvest" for their money. The closest economy was necessary, while the simplest conveniences were considered luxuries. To-day the poor are better prepared to endure the cold weather than the rich were during "the good old times" we hear about, but which all are not anxious to see again. To-day the majority of farm houses in Buchanan county are fully as comfortable and convenient as any in town. They are built on approved modern plans, the majority heated with coal stoves, while many are supplied with furnaces. The houses are furnished with the best the market affords, while the fireside group is as happy as any on earth, and can snap their fingers at the cold. Warm barns, well filled granaries, good stock shelter and abundant supplies are now the rule and not the exception It is little wonder, looking back on the hardships of those days, that persons who have passed through it all and are now enjoying the fruits of their labor, and the many conveniences that have come with advanced civilization, that we hear that the continued cold thus far in February cannot be compared in severity with the winter of '57. Perhaps fifty years from now our heating system will be such, and improvements so numerous and perfect, that the young people of to-day will be able to refer to the perils of winter as experienced during February, 1899, as a record breaker.

RAIN, SNOW AND HAIL.

FROM THE STORY OF THE ATMOSPHERE BY DOUGLAS ARCHIBALD.

Rain is the final stage of condensation of vapor back into water, of which cloud is a half way stage. The mist which composes a cloud is formed of tiny drops of water about 1-3000 inch in diameter. It used to be a puzzle to explain how these water particles were sustained, and it was at one time supposed that cloud particles were hollow. We know now that this is neither necessary nor true, since very small particles, even of gold, will remain suspended for a long time in air; the finer the particles the longer they take to fall. A slight upward motion of the air is therefore enough to keep them balanced. As condensation proceeds these particles grow larger by fresh coatings of water, and the larger ones fall down against the smaller and mingle with them until large drops from 1-20 to 1-10 inch thick form, which are no longer capable of being suspended and fall to the earth. Snow forms when the temperature at which this further stage of condensation occurs is below freezing point. Every snow crystal is a variety of a six-rayed cluster, and is similar to the crystals of salts which are precipitated from a chemical solution. No one has watched the formation of snow, but it must be very similar to that of crystalization out of a solution which is saturated with a chemical salt.

Hail, unlike the delicate snow crystals, is frozen water-drops. Its frequent association with thunderstorms led to the belief that it was caused in some way by electricity. This is, however, found to be untenable in the search light of modern science, which shows that electricity is mostly an *effect*, not a *cause* of such mechanical disturbances It is believed that in such storms the rain-drops formed in one part of a storm are carried upward by powerful ascending currents (25 miles an hour is enough to sustain large drops) into higher regions of the atmosphere where they are solidified by the excessive cold, and being carried over with the overflow which takes place near the top, fall down until they are redrawn into the interior of the storm and again whirled up aloft. Receiving alternate meltings and freezings, and growing larger with each circuit they make in the atmospheric churn, they are finally thrown out on either side of the storm center. This explains the fact that in a traveling hailstorm there are two bands where hail falls on either side, while, under the center, it is often found that only rain has fallen.

Hailstones have often fallen of enormous sizes. In 1697, Robert Taylor found hailstones in Hertfordshire 14 inches in circumference.

In India, the writer remembers a hailstorm on the great Brahmaputra river when the hailstones cut holes through the tarpaulin cover of the steamer, which were so large that each one had to be mended with a separate patch. Hailstorms are intimately connected with tornadoes, and, like these phenomena, are more frequent over flat plains and in very hot and moist summers and countries.

The destruction dealt by hail on standing crops, vineyards and orchards has lead to means being proposed for its prevention. Under the old idea of its connection with electricity, lightning rods were erected, but without avail. With ironical waywardness it fell in several instances on the rod protected lands and avoided the others.

Planting of trees would be more effective, since this would tend to check the rapid heating up of the lowest stratum of air, which is one of the chief causes of tornado and hailstorm action.

Rainfall, like clouds, is more prevalent in mountainous than over flat countries, and for similar reasons, especially cooling by forced ascent of air

In England the heaviest falls will be observed to occur in the mountains of Cumberland and Wales, and generally along the hilly country of the west and north. In Scotland and Ireland it is the same. The lowest rainfalls under 20 inches all occur on the eastern sides of the country. This difference is partly due to the fact that the prevailing and most rainy winds are southwest and drop a good deal of their moisture before reaching the eastern parts, but even were these barriers absent, the rainfall over the flatter country on the eastern sides would not be very much increased. In India, the rainfall along the western Ghats down the Bombay coast and along the Himalaya shows the influence of the mountains, the heaviest fall occurring near the northeast corner of the Bay of Bengal in the Khasia hills, which offer an abrupt wall 4,000 feet high up which the southerly monsoon winds are forced.

Chirapunji, at the edge of these hills, has the largest rainfall in the world (about 500 inches), half of which falls in June and July. On the western side of the Ghats rain falls heavily up to 250 inches at Mahalleshwar on their summits, while the table land of the Deccan on their eastern lee side has a scanty supply and is one of the areas liable to drought.

The greatest amount of rain in a vertical direction occurs at altitudes where the lowest cloud is thickest, that is, at about 3,000 feet in Europe and 4,000 feet in India above sea level. In the interior of large continents where mountain ranges are absent, especially where they lie like Australia in the zone of perpetual high pressure dividing the tropical from the polar wind systems, the rainfall tails off to a very few inches as we go inland.

FEBRUARY WEATHER IN THE UNITED STATES.

EXTRACTS FROM THE CLIMATE AND CROP BULLETIN OF THE WEATHER BUREAU.

February, 1899, was an exceptionally cold month in the states of the eastern Rocky mountain slope, and in all districts to the eastward, with the exception of northern New England and extreme southern Florida, where the deficiency in temperature was only slight. From the middle Atlantic coast westward to the eastern Rocky mountain slope, and from the Gulf of Mexico northward to the lake region, the average daily temperature deficiency generally ranged from 8° to 14°, reaching 15° in southeastern Wyoming. Over the western portion of the plateau regions and on the north Pacific coast, the deficiency in temperature was slight, and over the interior of central and northern California, the month averaged milder than usual, the temperature excess in the upper Sacramento valley amounting to 3° per day.

The temperature extremes were very exceptional, the maximum ranging from 80° to 86° in California, Arizona, southern Texas, and Florida, and the minimum from 20° to 40° below zero in the upper lake region, upper Mississippi and Missouri valleys, and northeastern Rocky mountain slope.

The minimum records for the second decade of February were broken at nearly every Weather Bureau station east of the Rocky mountains, between the 11th and 14th, during the progress of the severe cold wave of that period. Many of the minimum temperatures occurring on these dates were from 10° to 26° below any previously recorded during the second decade of February.

The maximum temperature at Jacksonville, Fla., on the 5th was 82°, which is 1° higher than the previous maximum record for the first decade of February. On the 18th and 19th, at San Francisco, the temperature reached 80°, which is 5° above the previous maximum record for the second decade of February.

PRECIPITATION.

There was much more than the average February precipitation in the Atlantic coast districts south of New England, where the total amount for the month ranged from four to ten inches, being greatest over eastern Georgia and the western portions of Carolina, where there was more than double the usual amount. There was also more than the usual February precipitation over portions of the central Rocky mountain region, over the greater part of Oregon, along the immediate coast of Washington, and over a few areas of limited extent in the upper Missouri and upper Mississippi valleys

Generally throughout the central valleys, in the Lake region, and from the central Gulf states westward to the Pacific coast there was less than the usual amount of precipitation, the month being exceptionally dry over nearly the whole of California, and from thence eastward to Oklahoma and western Texas, over which districts the total precipitation for the month was less than one-fourth of an inch. An extensive area, including the interior and southern portions of California and western Texas, received no appreciable amount, there being an entire absence of rain throughout the month at Fresno, Cal. Less than one-fourth of an inch fell over portions of the Dakotas, and an extensive area embracing portions of Montana, Wyoming, Nebraska, Colorado, and Nevada received less than one-half inch.

CONDITION OF WINTER WHEAT.

The following summaries, relating principally to the condition of winter wheat at the close of February, are based upon a large number of reports collected by officials in charge of state centers of the Climate and Crop Service of the Weather Bureau. These summaries indicate that over a large part of the principal winter wheat area the crop was exposed to very unfavorable weather conditions. As at the close of January, the reports indicate that the early sown was in better condition at the close of February, than that seeded late. The crop seems to have experienced most unfavorable conditions in Oklahoma, Iowa, Michigan, and New York, the northern portions of Missouri, Illinois, and Indiana, northwestern Ohio, and central and eastern Tennessee. In Texas the crop made but little growth and the damage resulting from the severe freeze will be so great that many fields will be plowed up. In Kansas the early sown has been but little injured and over the southern portions of Missouri, Illinois, Indiana and Ohio the condition of the crop is generally promising, while in West Virginia, Pennsylvania, Maryland and Virginia, owing to ample protection afforded by snow, the reports as to the condition of wheat are encouraging.

STATE REPORTS.

Iowa —Reports received as to the condition of winter wheat are variable, but the majority indicate serious injury as result of extreme cold weather and the absence of snow covering; in some districts early sown fields show evidence of remaining vitality, but the output of the crop will depend largely upon weather conditions during March.

Kansas.—Early sown wheat generally reported but little injured, if at all; late sown considered injured from 10 to 25 per cent, but reports agree that it is yet too early to definitely estimate damage; wheat sown in stubble and cornstalk fields is better than that on plowed ground.

Missouri.—In south-central and southeastern counties wheat was well protected by snow during severe cold weather and but little damaged; in northern and western counties reports very conflicting, but crop generally unprotected and probably considerably injured, especially late sown; some report crop half killed; clover badly frozen out in many counties; peach buds nearly all killed and trees greatly injured; tender varieties of pears, plums, cherries, and other fruits, except apples, damaged to a greater or less extent.

Illinois.—Winter wheat over north half of state is in very poor condition, owing to extreme cold without snow protection; over south half condition improves rapidly and in southern district is generally considered unharmed; much damage possible yet, however; rye is in fair condition; clover much damaged, but too early to estimate; peaches, plums, cherries, blackberries and raspberries apparently much damaged; apples, pears and strawberries promising; stock doing well, feed abundant.

SEASONAL RAINFALL.

DOES NOT DEPEND ON LOCAL PONDS AND LAKES.

[SIOUX CITY JOURNAL, FEBRUARY 26TH.]

"I don't think there is any room for alarm about the scarcity of moisture this season," declares Observer Purssell, of the local weather office. "Simply because there has been a deficiency of precipitation for the past few months is no sign at all that there will not be plenty when the farmers need it. Indeed, a drought during the time the rain or snow is not directly needed for agricultural operations argues that there will be plenty when it is needed. One way or another the average supply each year will come, except in occasional seasons, and nothing that has prevailed affords any indication whatever that we will not have all that we want in due time.

"Many people think our water supply is contingent upon the local lakes and ponds being full, and when this is not the case they get very apprehensive. It is the judgment of the best meteorological and climatological authorities that the amount of local moisture exposed to evaporation has nothing whatever to do with the amount of any season's rainfall Anything worth considering must come from the oceans or the great lakes. The difference between full and empty lakes or ponds scattered around through the country is so small, so far as burdening the atmosphere with humidity is concerned, that practically it amounts to nothing. I know this is contrary to the generally accepted notions of men who think they have observed conditions; but the scientific proof is overwhelming that the influence of local evaporation in supplying material for rain is insignificant. Nearly every investigator has declared this to be the case.

"Therefore, those who fear the coming season is to be inordinately dry because there is not much water surface exposed in this immediate section of the country need not waste any apprehensions. The local dryness at this time affords no criterion from which to conclude anything whatever about the humidity that is to follow, except that it probably increases the chance for plentiful wetness later, in order that the average of about 24 or 25 inches per annum may be maintained."

A COLD FEBRUARY AT CLINTON.

A COMPREHENSIVE REVIEW OF THE MONTH BY OBSERVER LUKE ROBERTS, M. D.

February, 1899, was very cold—but two colder Februaries during the last twenty-one years—1885 and 1895. The former gave a mean of 8.3°, and the latter 14 2°. The mean for February, 1899, was 15.3°, or 6.7° below the mean of twenty-one years.

The first twelve days gave a mean temperature of 1 7° below zero. The mean for the 8th was 16° below zero, and for the 9th, 1.° below zero. From the 4th to the 13th, inclusive, the minimum was below zero, reaching 28° below on the 9th, being the lowest temperature recorded since January 25, 1894, which was the same.

The maximum temperature was 57°, occurring on the 16th, being 4° above normal.

The warmest day was the 16th—mean temperature 41°, which was normal for February warm days. The coldest day was the 9th, with a mean of 17° below zero, or 12.9° below normal. But two Februaries in the last twenty-one years furnished a colder day—1886, 1888. The former was 18° below and the latter 19° below zero.

The temperature throughout the month was very fluctuating, there being several sudden and extreme changes.

During the cold period of the month the wind prevailed from the northwest, and for the next seven days southwest. The prevailing direction of the wind was southwest, and its maximum velocity reached 23 miles an hour on the 8th, and on the 26th it blew 20 miles an hour. The total movement of the wind for the month was 3,540 miles, being 1,240 miles below normal.

Total precipitation was 1.45 inches, and mostly in the form of rain. The first rain fell on the 14th, leaving only .01 of an inch. There were seven storm days, but only one on which was a liberal fall of water. It was on the 25th, and snow commenced falling at 5:30 A. M., and at 10 A. M. changed to rain, which continued till 7:30 P. M., when snow again held the field until 8:30 P. M., when the rain appeared again and held out till 3 A. M. the next morning, leaving a deposit of .92 inches of water. Total snow deposit, 4 inches, about 2 inches of which remained on the ground at the close of the month.

The total precipitation of snow for the winter months, December, January and February, was 7 inches. The winter of 1879-80 gave a precipitation of only 2 inches of snow, so that the winter just closed did not break the record in this particular. The winters of 1881–82 and 1883–84 each furnished 9 inches of snow. The winter furnishing the greatest depth of snow was 1885–86, which has a record of 47 inches, and the winter preceding, 45 inches. The average winter snowfall for the last twenty-one years is 22 inches.

The total precipitation of water (snow being melted) during the late winter was only 2.14 inches, being the least on record. The winter of 1894–95 came the nearest to this by furnishing only 3.19 inches. The winter credited for the greatest precipitation was 1885–86, being 8.79 inches.

The winter having the higest mean temperature was 1889-90, being 31°, while the lowest mean winter temperature, 12 2°, occurred in 1884–85. Three solar and two lunar haloes were observed.

A RECORD BREAKER.

[ESTHERVILLE REPUBLICAN, FEBRUARY 16TH.]

Below is the record of the last cold snap, covering a period of eighteen days, as kept by Councilman M. L. Archer, the only official record in Estherville. It is no doubt the longest extremely cold spell ever experienced in this locality or will be experienced again for many years to come:

DAY OF MONTH.	Maximum	Minimum
January 27	23	—19
January 28	—13	—18
January 29	0	—23
January 30	—10	—27
January 31	0	—20
February 1	—8	—11
February 2	—6	—18
February 3	—9	—17
February 4	—15	—27
February 5	5	—27
February 6	—8	—24
February 7	—15	—24
February 8	—15	—35
February 9	—12	—38
February 10	—10	—30
February 11	—16	—36
February 12	5	—27
February 13	16	—16

The average maximum temperature for the eighteen days was a fraction of a degree more than 8° below zero, and the average minimum was a little more than 24° below zero or a mean average of 16¼° below.

It was a record breaker all over. The government Weather Bureau at Des Moines, have given out that Saturday was 1° colder than was ever known before in that city in February and its report is about the same as made in other places.

THE GRAIN BELT OF IOWA.

[ROCKFORD REGISTER.]

Stretching down across the state of Iowa, commencing at the Minnesota line, lies a belt of counties which in the future may be rightly named the Egypt of Iowa. The territory included in this belt is from 100 to 150 miles in width, and embraces what were known as the slough lands of the state in an early day—a region prolific in tall blue joint grass, frog ponds, small lakes, and possessing a black gumbo soil of unsurpassed fertility and durability. In the pioneer days men starved out in the effort to here grow a crop, the excess of moisture in the soil defeating their best efforts. Ditching, tiling and cultivation have changed this condition and to-day the world does not possess a more productive and fertile region. While the slopes and hills of the valley land bordering our great rivers already show marked evidences of exhaustion, this Egypt of the central black lands is coming to its own, and its marvelous productiveness is just beginning to be appreciated. As between the white farm on the hills and the black farm in the territory referred to, there is an immeasurable difference.

FEBRUARY WEATHER RECORD.

The month of February was notable for its extremes of high barometric pressure and low temperature. The mean pressure was 30.16 inches. The highest observed was 31.08 inches at Sioux City on the 11th.

The monthly mean temperature of the state deduced from records of 119 stations, was 12.2°, which is about 9° less than the normal. The lowest temperature reported was 40° below zero at Sibley on the 11th. Estherville reported the lowest mean for the month, 2.6°.

The mean temperature by sections was as follows: Northern section, 8.3°; central section, 12 8°; southern section, 15.6°.

The average precipitation for the state was .89 of an inch, which is .17 of an inch below the February normal. By sections the averages were as follows: Northern section, 1.17 inches; central section, .73 of an inch; southern section, .78 of an inch. The largest amount reported was 4.32 inches at Ridgeway. There was an average of 11 clear days, 10 partly cloudy and 7 cloudy. The highest wind velocity was 48 miles an hour at Sioux City on the 23d.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for month, 30.16 inches; highest observed, 31.08, at Sioux City on the 11th; lowest observed, 29 37, at Davenport and Dubuque on the 26th; range for the state, 1.71 inches.

Temperature—Monthly mean, as deduced from 119 reports, was 12.2°; highest monthly mean, 24.2°, at Mt. Pleasant; lowest monthly mean, 2.6°, at Estherville; the highest temperature reported was 75°, at Mt. Pleasant on the 20th; the lowest temperature reported was –40°, at Sibley on the 9th; the average daily max mum was 22.5°; the average daily minimum was 2.3°; the average monthly maximum was 54 2°; the average monthly minimum was 27.5°; the greatest monthly range was 97°, at Mt. Pleasant; average monthly range, 83.1°.

Precipitation.—Average for the state, as determined from the reports of 127 observers, .89 inches; the largest amount reported was 4.32 inches, at Ridgeway; the least amount was .12, at Toledo; the greatest daily amount reported was 1.81 inches, at Ridgeway on the 26th; average number of days on which .01 inch or more of precipitation was reported, 5.

Wind—Prevailing direction, northwest; highest velocity reported, 48 miles per hour from the northwest, on the 23d at Sioux City.

Weather.—There were 11 clear days, 10 partly cloudy days, and 7 cloudy days.

Solar Halos.—Amana on the 11th; Alta on the 1st, 3d, 7th, 26th, 27th; Ridgeway on the 13th and 20th; Waterloo on the 8th, 11th and 23d.

Lunar Halos.—Cresco on the 21st; Ridgeway on the 21st.

Sun Dogs.—Grundy Center on the 9th; Lamoni on the 23d; Lenox on the 6th and 22d.

Aurora.—On the 11th, at Alta and Cresco.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.10	30.81	11	29.37	26
Des Moines	30.16	30.95	11	29.54	25
Clarinda	30.21	31.05	11	29.46	25
Cresco	.....	30.92	11	29.47	26
Dubuque	30.11	30.84	11	29.37	26
Omaha, Neb	30.18	31.03	11	29.57	25
Keokuk	30.14	30.85	12	29.48	26
Sioux City	30.19	31.08	11	29.63	21
Means	30.16	31.08	11	29.37	26

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,804	30	NW	26
Des Moines	5,986	29	NW	23
Dubuque	5,483	29	NW	26
Keokuk	6,201	35	NW	8
La Crosse, Wis	4,345	25	N	26
Omaha, Neb	5,608	28	SE	25
Sioux City	8,922	48	NW	23

OBSERVERS' NOTES.

Bonaparte—B. R. VALE. The first two weeks were very cold, but remainder of month remarkably pleasant. Roads dusty and feed lots as dry as in August. Some spring wheat sown on 20th.

Denison—J. H. HOLMES. The first twelve days of the month satisfied even the old settler for cold weather, beating his experience.

Elkader—CHARLES REINECKE. Ice went out of Turker river below the dam on the 20th; above the dam it has not moved yet, although it is broken up.

Forest City—J. A. PETERS. A hard month on the coal bin, corn crib and hay stack.

Grinnell—A. O. PRICE. Frost in ground 4 2-3 feet. Fields bare of snow first of month, with extreme cold and then thawing, has damaged winter sown grain. Miscrosopic examination of plum and cherry buds at the college, reveals no damage by the extreme cold Apples and other fruits are thought to be all right.

Sigourney—MRS. R. F. ASHBAUGH. On the 8th the thermometer registered 19° below zero at 7 A. M., at noon 12° below,

and at 7 P. M. was down to 24° below and had reached 27° below zero before morning of the 9th. The wind blew from the northwest with vengeance, and the "oldest inhabitant" cannot remember such a "cold snap" since 1863.

Wapello—G. W. SCHOFIELD. Ground frozen about 4 feet; no precipitation during January and up to February 20th. Nearly all cellars have been subject to frost and one-half of the potatoes stored in cellars are frozen.

Washta—H L FELTER. According to the memory of the oldest inhabitant, this has been the coldest February in this county.

West Bend—PHIL. DORWEILER. Coldest month on record; thermometer dropped below zero seventeen days, and nine days it stayed below zero all day.

Lenox—J. L HURLEY. During the recent cold weather I made a comparison of records for the local papers, showing the marked difference between the present and preceding winters. I append a copy, covering the years since this station was established, showing the maximum, minimum and mean, for the last five days in January and the first thirteen days in February, since 1893:

	LAST FIVE DAYS OF JANUARY.			FIRST THIRTEEN DAYS OF FEBRUARY.			Average for eighteen days.
	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	
1893	38	-5	11 6	56	-14	13 7	13.1
1894	40	0	19.3	58	4	26 2	24.3
1895	28	-10	11 0	29	-19	5.4	6.9
1896	47	13	34 0	44	14	30.1	31.2
1897	34	-5	17.6	41	-11	29.8	25.3
1898	40	6	20 2	41	-3	26.4	24.5
1899	20	-18	2.2	14	-29	-3.3	-1.8

During the five days from the 8th to 12th, inclusive, the daily mean temperature was 12.1°. The lowest temperature recorded here in previous winters since March 1, 1892, was 20° on January 24, 1894, and 19° on February 8, 1895.

BELATED REPORTS.

Ogden—JANUARY—Mean temperature, 20 5°; mean maximum temperature, 31.1°; mean minimum temperature, 9 9°; total precipitation, .11 inches; total snowfall, 1 inch; greatest amount in twenty-four hours, .04 inches on the 12th; prevailing direction of wind, southwest; number of clear days, 18; partly cloudy, none; cloudy, 13; rainy, 5.

Toledo—JANUARY—Mean temperature, 20°; mean maximum temperature, 27.9°; mean minimum temperature, 12.2°; total precipitation, .13 inches; greatest amount in twenty-four hours, .08 inches on the 12th; prevailing direction of wind, northwest; number of clear days, 18; partly cloudy, none; cloudy, 13; rainy, 3.

Knoxville—FEBRUARY—Mean temperature, 15.4°; mean maximum temperature, 24 1°; mean minimum temperature, 6.7°; total precipitation, .49 inches; greatest amount in twenty-four hours, .24 inches on the 25th; total snowfall, 4.5 inches; number of clear days, 19; partly cloudy, 4; cloudy, 5; rainy, 4.

ERRORS IN DECEMBER REVIEW.

West Bend—Mean temperature should be 13.8°.

Mount Ayr—Maximum temperature should be 44° on the 29th.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR FEBRUARY, 1899.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Means.
Afton	Max	15	10	8	8	13	11	8	-7	-7	7	-12	1	17	42	49	52	45	44	57	57	49	42	24	27	32	31	30	38	24 7
	Min	0	-5	-4	-10	-10	1	-6	-19	-25	-13	-26	-22	-14	9	17	30	28	28	27	27	35	22	-3	3	20	7	-10	10	3 5
Albia	Max	12	13	11	19	21	17	15	18	-3	8	9	9	19	39	47	52	48	45	52	56	53	47	48	27	34	41	33	41	29 7
	Min	0	-3	-2	-10	-3	3	-12	-18	-25	-15	-22	-21	-13	11	18	28	30	23	25	36	32	28	3	1	20	13	3	6	4 9
Alta	Max	10	2	2	2	8	7	-10	-20	-10	-1	-18	2	17	38	47	48	39	38	54	49	41	28	14	26	26	18	20	28	18.1
	Min	-5	-10	-7	-20	-13	-14	-16	-28	-33	-19	-32	-28	10	9	20	33	27	27	27	32	28	13	-6	4	18	4	-14	-2	-0.6
Amana	Max	15	12	9	8	11	7	8	-8	-9	3	-3	5	18	37	47	50	46	41	47	52	44	35	31	23	33	33	24	37	23 4
	Min	0	-3	-1	-8	-4	1	-9	-20	-25	-21	-21	-19	-12	8	16	27	33	25	26	35	29	31	7	-5	20	14	-6	9	4 5
Ames	Max	..	..	..	..	..	..	..	..	..	4	-4	8	19	42	52	49	43	42	56	55	48	39	19	25	31	33	25	37	31.8
	Min	4	-7	-3	-10	-7	-4	-10	-23	-27	-14	-27	-19	-11	12	18	33	30	28	28	35	30	18	1	2	20	7	-9	7	3.6
Atlantic	Max	17	11	7	9	17	14	0	-15	-5	8	-10	4	18	45	50	46	47	44	61	55	50	33	19	25	32	30	31	39	24.4
	Min	-2	-5	-1	-11	-10	-3	-13	-23	-25	-16	-26	-23	-11	12	10	34	29	30	21	30	27	12	-3	2	20	5	-13	10	2.1
Audubon	Max	13	7	4	4	14	10	5	-13	-5	5	-13	3	17	44	48	49	43	42	56	54	47	32	18	25	30	29	29	36	22 6
	Min	1	-7	-7	-13	-9	-5	-13	-22	-27	-15	-28	-23	-11	12	18	32	30	28	29	32	30	13	-4	5	20	7	-9	18	3.0
Belknap	Max	16	15	10	10	10	12	10	-12	-14	-6	-7	4	12	30	50	54	50	44	42	54	58	30	20	32	32	30	32	32	23.2
	Min	0	2	3	-6	0	6	-6	-14	-23	-11	-20	-19	-12	12	22	29	33	26	27	38	35	30	5	5	23	25	-1	31	8 6
Bonaparte	Max	13	15	15	12	15	15	15	-2	-5	4	-4	5	15	38	51	55	53	45	55	58	44	38	29	24	34	37	30	35	26.4
	Min	0	4	4	-6	0	3	8	-18	-23	-14	-18	-21	-15	4	16	25	31	25	27	37	32	29	8	2	20	17	2	18	6.5
Britt	Max	8	9	7	6	5	-5	-10	-22	-10	-2	-15	5	18	38	42	40	39	42	45	48	32	30	5	10	32	15	18	14	15.9
	Min	-6	-11	-7	-20	-15	-14	-21	-29	-33	-25	-30	-23	-11	2	18	28	21	28	29	30	24	10	-2	-3	18	8	-13	6	1.3
Burlington	Max	10	17	15	10	13	15	13	-2	-8	-3	-2	5	12	35	40	55	53	54	56	58	45	43	32	28	36	40	30	38	23 4
	Min	-9	-3	-4	-3	0	5	-4	-21	-24	-18	-16	-21	-11	10	19	28	25	27	28	28	23	28	10	3	29	32	4	18	6.5
Bedford	Max	22	15	10	13	19	13	10	-8	-1	15	-3	-4	20	42	51	52	48	42	61	59	53	48	18	25	35	32	34	34	26 9
	Min	0	-3	-1	-13	-5	3	-12	-20	-25	-15	-24	-24	-17	6	11	33	22	22	23	30	32	30	-5	3	15	7	-13	12	2 8
Carroll	Max	15	9	5	5	8	11	-5	-20	-10	5	-15	5	36	45	50	53	42	44	54	42	31	18	26	38	30	28	30	17	21.0
	Min	2	-10	-8	-17	-12	-8	-16	-25	-31	-20	-31	-25	-12	10	17	24	21	25	25	29	12	2	-5	6	18	-14	-12	0	-2 1
Cedar Falls	Max	15	9	10	11	9	9	7	-9	-9	-4	-10	7	14	37	47	47	47	42	46	52	51	33	10	25	32	21	16	22	21.0
	Min	-5	-10	-5	-13	-5	-4	-11	-21	-27	-22	-24	-20	-4	10	20	31	30	31	34	36	27	16	-5	-6	18	5	-3	12	2.8
Cedar Rap	Max	14	12	9	7	11	7	8	-5	-9	1	-1	6	19	39	51	52	45	40	48	51	43	36	25	23	34	35	29	38	23.9
	Min	3	-3	-1	-8	-4	-3	-9	-21	-25	-18	-20	-19	-7	9	25	30	33	29	30	31	28	24	5	-2	22	10	-5	7	5.0
Centerville	Max	18	15	10	12	25	15	15	5	-5	5	-2	5	15	39	50	55	53	47	56	60	50	37	33	25	33	32	30	39	28.0
	Min	0	0	0	-7	-2	-5	-7	-17	-23	-13	-20	-21	-15	12	28	30	30	25	46	31	40	29	5	5	26	14	-3	7	7.0
Chariton	Max	15	11	10	10	14	11	10	-7	-5	4	4	7	14	41	50	54	51	45	57	58	51	37	18	24	33	30	31	34	25 4
	Min	1	-2	-1	-10	-4	-2	-10	20	-24	-14	23	-22	-12	12	19	27	30	26	25	36	34	25	-2	4	20	9	-7	10	4 5
Charles Cy	Max	13	6	2	-1	7	5	-1	-17	-14	0	-2	1	15	32	43	43	40	36	47	46	45	40	27	17	29	30	13	28	18.8
	Min	0	-11	-8	-18	-18	-11	-26	-28	-31	-31	-28	-23	-18	9	17	32	29	28	29	32	21	27	3	-18	14	13	-13	7	-0.6
Clarinda	Max	17	11	7	10	15	15	5	-8	-3	9	-2	0	19	45	52	54	48	46	62	58	51	36	20	25	32	31	35	39	26 0
	Min	1	-1	-2	-12	-7	-2	-10	-21	-24	-14	-24	-24	-22	6	16	33	28	27	28	35	33	8	-4	5	21	3	-11	11	2.8
Clear Lake	Max	13	-1	2	-1	7	2	0	-1	-15	1	-9	1	16	35	43	45	38	36	48	45	43	34	15	..	18	23	19	22	18 0
	Min	-9	-11	-8	-19	-13	-12	-18	-28	-32	-23	-29	-24	-3	11	20	32	29	28	32	30	28	13	-2	..	-2	17	-10	4	-0.3
Clinton	Max	18	18	15	12	12	13	11	-9	-11	0	0	6	19	32	47	57	49	39	50	52	38	37	31	21	35	36	23	38	24 9
	Min	0	3	2	-6	-6	-4	-14	-18	-28	-20	-12	-20	-11	8	15	26	29	25	26	31	29	29	8	0	26	16	2	13	5.3
College Sps	Max	16	11	10	10	14	14	6	-10	-2	8	-14	2	16	42	30	53	47	42	62	46	51	35	15	25	32	31	37	38	23 8
	Min	-1	-3	-1	-15	-5	0	-9	-19	-26	-13	-26	-27	-16	7	20	32	27	27	28	35	32	13	-5	5	20	6	-9	9	3.1
Co. Bluffs	Max	18	14	9	10	17	18	8	-4	2	9	-10	8	23	44	53	47	49	49	66	55	50	32	22	28	34	24	34	41	26.8
	Min	0	-4	-4	-9	-5	-2	-12	-21	-22	-13	-24	-20	-4	12	7	33	29	29	28	36	28	0	-3	9	23	0	-8	10	3 3
Cresco	Max	13	-2	3	-3	6	8	-8	-21	-17	0	-14	0	14	27	40	39	35	36	45	44	46	31	8	17	28	29	19	19	15.5
	Min	-7	-13	-13	-23	-21	-18	-26	-29	-33	-33	-30	-32	-17	9	15	29	28	22	22	30	24	26	-6	-10	15	7	-13	-2	-3 5
Davenp'rt	Max	14	18	13	11	16	12	10	-3	-8	2	2	6	15	34	48	53	50	42	49	52	40	37	31	24	37	39	31	39	25 3
	Min	2	8	4	-4	-1	-1	-10	-19	-23	-16	-14	-19	-6	9	21	30	32	28	29	38	32	31	6	2	24	11	2	12	7 4
Decorah	Max	15	4	5	-1	8	-1	-4	-18	-16	-1	-10	-1	16	27	43	42	36	37	46	48	46	35	26	23	32	31	26	25	18.5
	Min	-5	-12	-11	-19	-20	-13	-28	-28	-32	-34	-27	-21	-21	1	15	30	31	21	22	32	23	23	-2	-13	10	6	-11	-2	-3 2
Delaware	Max	14	9	8	5	10	6	7	-12	-13	1	-4	4	15	29	45	45	42	39	47	52	41	36	30	21	33	35	21	32	21.4
	Min	-2	-7	-5	-10	-9	-5	-3	-23	-28	-23	-23	-21	-12	6	20	28	32	26	27	33	29	29	1	-11	17	11	-9	4	2 2
Denison	Max	13	8	5	1	9	10	-7	-19	-8	3	-17	2	19	44	48	50	40	40	51	53	44	30	12	28	24	15	26	15	19.4
	Min	0	-7	-7	-17	-13	-8	-15	-25	-30	-20	-31	-26	-5	-10	12	26	26	30	25	33	24	10	-5	2	23	3	-16	5	0.5
Des Moines	Max	17	14	10	10	17	13	5	-10	-5	4	-5	8	17	47	50	47	48	42	58	56	50	37	19	24	34	34	35	40	25.6
	Min	4	-4	-1	-6	-1	0	-10	-21	-23	-13	-24	-17	-11	12	21	34	31	30	30	30	33	11	3	6	22	8	-7	10	5 6
De Soto	Max	16	11	7	10	14	10	1	-10	-5	9	-5	5	21	48	49	50	47	43	57	57	50	37	17	29	32	32	33	37	25.1
	Min	2	-5	-2	-8	-5	-1	-10	-21	-23	-13	-25	-18	-9	13	16	34	28	28	27	38	31	13	1	5	23	6	-6	9	4.6
Dows	Max	12	4	1	0	6	3	-4	-12	-15	0	-8	2	17	36	43	47	39	37	52	50	45	35	19	23	39	21	17	29	19 2
	Min	0	-10	-6	-18	-14	-10	-16	-26	-30	-23	-29	-22	-11	10	17	32	28	27	27	30	25	17	-1	-2	17	11	-13	4	0.4
Dubuque	Max	14	12	9	6	11	6	8	-10	-13	-1	-5	4	16	30	47	51	48	40	48	51	40	35	28	21	34	36	28	35	22.5
	Min	0	-2	-2	-7	-5	-3	-11	-21	-26	-21	-18	-20	-8	8	28	31	34	26	30	34	29	28	4	-2	21	9	-4	7	5.0
Eldon	Max	11	13	15	6	10	10	11	-4	-9	3	-7	0	14	33	41	45	37	34	50	58	48	39	34	26	35	40	32	40	23.6
	Min	0	2	..	-11	-1	2	-11	-20	-24	-15	-21	-20	-12	10	13	21	27	23	23	32	32	28	6	3	23	17	0	19	5.4
Eldora	Max	18	10	5	6	15	7	-3	-20	-8	7	-10	10	15	40	48	45	46	40	55	54	48	33	15	24	32	30	16	28	21 6
	Min	0	-11	-8	-16	-13	-14	-16	-26	-30	-24	-29	-23	-13	8	16	30	27	25	23	29	24	15	0	-4	16	8	-15	-5	-0 9
Elkader	Max	18	18	16	6	17	6	5	-18	-11	4	-6	6	17	27	49	45	42	42	51	52	46	35	21	22	32	27	18	24	21 8
	Min	6	-9	-10	-13	-12	-14	-20	-24	-28	-28	-23	-22	-18	8	12	31	32	23	26	30	25	26	-4	-17	16	9	-9	9	-0 4
Estherv'le	Max	-8	-6	-9	-15	-5	8	-15	-15	12	-10	-16	5	16	31	42	40	34	31	40	41	33	11	4	20	24	24	17	10	11.4
	Min	-11	-18	-17	-27	27	-24	-24	-35	-38	-30	-36	-27	-16	6	18	28	22	25	24	27	24	5	-10	-7	14	5	-19	-6	-6.2
Forest City	Max	10	0	-1	-2	7	1	-2	-11	-15	-1	-7	3	18	33	43	43	39	37	50	49	43	34	19	20	28	30	18	22	18.1
	Min	-5	-12	-7	-22	-19	-15	-24	-30	33	-27	-31	-25	-14	11	19	38	29	27	28	31	27	12	-3	-5	14	4	-13	2	-1 7
Galva	Max	10	10	4	3	11	10	0	-9	-11	0	-3	5	18	41	49	51	42	40	56	52	43	34	14	28	28	25	22	31	21 5
	Min	-3	-7	-6	-15	-10	-9	-13	-25	-30	-18	-30	-22	-8	11	18	34	22	28	27	33	28	12	-5	5	20	4	-11	-1	1.0
Glenwood	Max	16	11	10	4	18	14	10	-4	-2	8	3	4	22	47	52	44	49	47	63	61	49	41	26	25	32	30	30	40	26 8
	Min	0	-5	-1	-13	-10	-1	-6	-18	-25	-9	-25	-23	-10	10	18	37	30	27	29	36	31	11	-4	7	19	7	-11	7	3.9
Greene	Max	14	8	4	2	11	4	-1	-10	8	1	-5	3	17	34	48	45	41	37	49	50	48	40	21	22	30	30	17	22	20.5
	Min	3	-10	-6	-15	-12	-9	-16	-25	-29	-24	-26	-21	-12	10	20	33	30	29	29	32	27	21	4	-12	15	10	-12	7	1.5
Greenfield	Max	17	12	8	15	16	14	-1	-13	-13	12	-5	6	18	45	50	48	45	45	57	56	49	37	17	30	32	30	32	30	24.6
	Min	0	-8	-6	-13	-11	-2	-13	-26	-28	17	-29	-25	-13	9	20	30	28	27	25	36	29	13	-3	3	15	1	-11	8	1.4
Grinnell	Max	12	9	7	7	10	7	4	-1	-9	0	-1	4	17	38	46	47	45	37	50	49	43	35	30	22	32	33	24	36	22.4
	Min	3	-6	-2	-7	-5	1	-9	-21	-25	-17	-23	-19	-11	10	23	30	33	28	28	37	33	29	4	2	20	12	-6	11	5.4
Grundy C'r	Max	13	7	6	5	12	5	-1	-15	-15	1	1	4	18	40	48	46	42	41	53	52	47	34	15	24	32	32	20	33	20.9
	Min	-3	-10	-6	-12	-9	-5	-15	2	-29	-22	-27	-22	-14	8	17	28	28	25	25	31	23	13	2	-3	19	5	-12	-2	0 4
Guthrie C'r	Max	12	10	10	14	10	12	6	-12	-10	7	-2	6	19	45	48	50	45	47	54	56	56	34	19	34	32	32	38	38	25 3
	Min	-2	-6	-2	-11	-9	-11	-10	-18	-25	-14	-25	-21	9	20	19	34	34	32	30	32	36	19	-2	27	29	9	8	20	7.2
Grin'l (nr)	Max	15	10	8	10	11	6	4	-8	-1	0	-1	5	20	39	46	47	45	40	50	50	43	34	30	23	32	33	25	37	23.1
	Min	0	-7	-3	-10	-7	-2	-12	-22	-26	-20	-3	-21	-12	10	22	28	31	28	28	34	31	30	3	0	10	12	-10	13	4 1
Harlan	Max	15	10	4	3	12	10	3	-13	-12	6	-1	2	20	45	49	51	43	41	57	54	46	37	15	26	29	28	23	37	22.8
	Min	1	-7	-4	-16	-13	-4	-13	-24	-28	-18	-29	-25	-16	7	12	33	29	25	24	36	30	15	-5	3	18	4	-12	4	1.0
Hedrick	Max	17	14	9	11	12	11	10	..	-12	5	3	4	20	40	49	53	48	41	53	53	47	42	34	21	34	33	28	39	26 6
	Min	0	-1	0	-7	-2	-3	-12	-19	-23	-14	-20	-18	-12	10	18	24	32	25	25	35	37	28	2	1	22	10	-5	12	5.2
Hampton	Max	13	3	3	1	9	3	-7	-21	-14	0	-13	0	17	36	46	47	37	37	50	50	45	32	8	23	30	20	22	12	17.5
	Min	-5	-10	-6	-13	-11	-10	-15	-26	-30	-19	-28	-22	-11	10	18	33	29	29	29	33	32	13	1	-3	18	8	-11	4	1.3
Hopeville	Max	14	9	8	9	13	11	3	-10	-5	6	1	2	17	41	48	51	46	44	57	54	49	35	17	24	32	32	32	38	24.1
	Min	1	-4	-2	-10	-5	2	-20	-23	-25	-12	-25	-23	-13	11	19	30	31	29	29	39	35	15	-1	4	21	4	-7	12	4.4
Humboldt	Max	13	2	3	0	11	2	4	-10	-12	2	-4	3	20	38	47	49	43	39	54	51	46	36	17	26	28	29	23	27	21.0
	Min	-4	-10	-5	-18	-10	-10	-16	-24	-31	-22	-30	-23	-10	24	17	36	24	28	27	31	24	18	-3	0	20	8	-12	3	1 1
In'pend'ce	Max	13	11	6	5	10	4	3	-17	-12	-1	6	2	16	32	46	47	40	38	47	49	48	40	28	21	31	30	16	14	20.0
	Min	3	-9	-6	-12	-10	-5	-14	-25	-29	-23	-24	-21	-14	8	18	27	28	25	27	39	28	29	6	-8	15	20	-12	10	2.2
Indianola	Max	15	13	9	9	14	13	5	-6	-7	4	1	5	17	46	50	51	46	41	56	55	49	40	29	25	32	32	28	39	25.4
	Min	2	-5	-2	-9	-5	0	-3	-17	-24	-13	-25	-19	-12	12	21	33	32	21	28	39	34	27	-1	5	21	13	-8	12	5.3
Iowa City	Max	15	15	11	10	13	11	10	-13	-8	2	-3	7	18	41	51	54	48	42	48	55	44	37	33	25	35	30	27	27	24.5
	Min	0	-1	1	-7	-4	-5	-13	-18	-26	-22	-20	-19	-12	12	15	23	33	26	27	33	29	28	9	-4	17	16	-6	13	4.5
Iowa Falls	Max	14	5	5	3	10	5	-3	-21	-13	-1	-11	3	17	38	46	47	39	38	51	49	35	33	12	25	29	30	24	28	19 2
	Min	-1	-9	-7	-14	-11	-8	15	-25	-28	-23	-27	-21	-12	10	16	33	27	27	27	31	26	10	2	-1	24	5	-11	-1	-0.8
Keosauqua	Max	16	15	13	12	15	15	15	0	0	6	6	6	17	39	52	57	54	44	55	60	45	38	30	24	34	36	32	37	27.6
	Min	2	5	4	-4	0	1	0	-16	-22	-13	-17	-20	-12	11	15	28	30	25	28	40	32	32	8	4	23	17	3	17	7.9
Keokuk	Max	16	20	18	13	17	17	10	-2	-5	3	2	3	16	38	50	54	56	47	53	60	49	41	34	25	35	42	35	40	28.1
	Min	0	12	10	-2	2	9	-1	-15	-21	-8	-14	-20	-10	12	24	33	38	29	35	40	39	31	9	6	25	21	5	23	11.1

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR FEBRUARY, 1899—CONTINUED.

STATIONS.		DATE.																											Total.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Lamoni	Max.	16	13	9	5	14	11	6	0	-3	11	4	1	17	39	46	51	47	45	56	56	49	35	25	25	32	33	32	38	25.5
	Min	0	-2	0	-9	-10	-1	-8	-18	-24	-11	-23	-24	-14	9	16	29	29	23	26	35	35	28	-1	5	20	9	-6	13	4.6
Lansing	Max.	17	17	13	10	10	7	7	-2	-9	0	0	5	15	25	45	46	45	42	47	51	50	39	30	20	32	32	30	25	23.2
	Min	-7	-7	-8	-14	-15	-15	-25	-24	-29	-31	-22	-23	-18	9	21	34	31	21	27	35	25	29	10	-15	14	19	-6	13	1.1
Larrabee	Max.	10	-5	2	1	12	7	-8	-23	-11	-1	-17	1	18	36	43	52	39	45	56	51	40	29	14	28	27	33	23	28	19.1
	Min	-9	-13	-15	-23	-15	-19	-20	-31	-37	-22	-34	-27	-10	9	15	32	25	28	25	30	26	8	-7	2	18	0	-17	-4	-3 6
Le Mars	Max.	10	1	3	0	8	8	-2	-13	-11	0	-8	5	20	38	48	50	45	43	58	52	44	36	14	26	26	25	22	31	20.7
	Min	-10	-13	-5	-20	-16	-15	-20	-28	-35	-24	-33	-25	-8	12	16	29	26	29	29	31	26	7	-7	6	18	4	-13	-2	-1.5
Lenox	Max.	14	12	9	9	14	13	9	-6	-4	7	2	1	17	40	47	49	44	42	58	54	49	39	24	23	32	31	30	37	24.9
	Min	-2	-6	-4	-14	-9	-1	-9	-22	-29	-14	-29	-28	-17	7	18	30	28	27	28	36	33	22	-6	4	19	8	-13	8	2 3
M.Vernon,2	Max.	19	14	13	8	13	8	6	-13	-3	-1	-5	0	14	33	48	49	50	40	49	51	32	32	20	32	33	30	20	24	22.1
	Min	5	-2	0	-8	-3	-2	-10	-22	-26	-19	-20	-19	-12	6	19	24	32	24	24	31	25	26	10	-3	24	10	-6	5	4 0
Logan	Max.	16	18	6	4	14	12	-6	-9	-17	2	7	3	25	50	51	45	36	33	57	52	47	27	12	22	27	14	12	10	20 4
	Min	-2	-4	-6	-15	-11	-8	-12	-20	-26	-16	-27	-25	14	18	20	36	24	25	26	35	27	20	-4	5	18	-14	4	6	3.1
Maquoketa	Max	..	17	16	13	11	13	11	-5	-8	3	-4	8	18	23	47	23	42	52	48	42	53	43	50	44	42	38	34	32	26.5
	Min	..	-2	2	2	-6	-5	-13	-21	-26	-20	-18	-19	-6	3	10	15	23	28	27	23	35	33	36	34	30	5	3	-2	6 3
Marsh'lt'n.	Max.	..	..	..	..	..	..	-2	-10	-11	5	-5	10	20	42	50	47	45	40	54	53	50	35	36	38	35	34	22	37	28 4
	Min	..	..	..	..	..	..	11	-23	-25	-28	24	-20	-8	2	15	30	30	27	26	32	23	24	3	2	20	6	-10	7	4.7
Mason City	Max.	8	13	0	0	8	3	-4	-12	-14	0	-8	3	15	44	44	..	45	37	40	48	47	37	34	.	34	27	11	21	19.3
	Min	..	-13	-12	-20	-20	-15	-30	-33	-35	-35	-32	-27	-22	21	22	..	29	30	28	32	22	18	0	.	12	7	-12	-5	-3.2
Monticello.	Max.	15	19	10	12	12	10	9	-5	-10	2	-1	7	17	33	48	57	48	42	47	53	44	37	32	21	33	34	19	35	24 1
	Min	-3	-3	-2	-9	-6	-7	-13	-21	-25	-23	-20	-20	-14	7	21	25	31	25	25	32	26	30	9	-13	-15	-15	-6	12	3.1
Mooar	Max.	15	22	8	15	10	22	16	-8	0	3	1	4	11	35	46	52	56	47	47	56	40	40	30	30	32	32	33	40	26.2
	Min	0	9	0	-6	5	5	-11	-12	-21	-17	-15	-21	-15	10	15	29	34	19	28	30	30	27	9	9	28	9	1	28	7 4
Mt. Ayr.	Max.	12	10	7	7	12	11	7	-8	-4	8	3	2	16	39	49	50	48	43	58	55	49	37	22	22	31	31	32	37	24 5
	Min	0	-4	-2	-11	-5	2	-9	-20	-26	-12	-26	-25	-17	6	19	30	26	25	23	36	35	22	-4	5	19	5	-10	11	3.3
Mt. Ple'sn't	Max.	50	35	35	37	36	46	36	30	-8	2	2	4	10	36	50	70	70	59	60	75	63	46	30	40	42	35	40	40	38 3
	Min	10	10	4	0	3	6	-6	-16	-22	-8	-9	-15	-6	10	22	25	30	30	30	50	34	26	10	6	27	10	2	17	10.0
Newton	Max.	14	10	9	10	12	9	3	-10	-8	2	-1	4	16	40	48	47	45	33	52	51	45	34	22	24	32	31	24	37	22 9
	Min	2	-7	-4	-10	-6	-1	-11	-26	-28	-18	-27	-22	-13	10	20	30	31	27	28	37	32	22	1	2	20	6	-10	14	3.5
NewH'pton	Max.	11	6	2	-3	6	1	0	-14	-17	-3	-7	0	13	28	41	41	37	35	45	46	46	41	27	16	29	30	12	22	17.6
	Min	-2	-12	-10	-19	-16	-12	-13	-27	-33	-28	-29	-24	-5	9	16	29	28	25	26	33	27	27	-2	-12	13	10	-14	5	-0.4
Northwood	Max.	15	5	6	0	8	1	-10	-22	-17	0	-10	2	16	34	41	49	37	36	50	47	45	33	19	21	28	26	19	20	17.8
	Min	-6	-12	-10	-18	-21	-15	-21	-34	-31	-29	-30	-22	-17	9	18	32	28	23	27	32	26	19	-1	-4	15	8	-11	4	-1.5
Odebolt	Max.	12	7	4	3	13	12	5	-12	-7	1	-5	5	18	42	50	55	47	41	58	52	43	36	16	28	27	27	22	31	22.5
	Min	0	-7	-6	-15	-9	-7	-11	-24	-29	-19	-29	-23	-9	12	16	36	26	29	30	33	27	16	-4	3	20	5	-11	0	1.8
Ogden	Max.	13	12	8	9	15	14	11	5	-6	-5	2	8	21	47	50	52	44	43	56	55	51	41	20	24	30	31	25	17	23.7
	Min	11	-8	-9	-12	-10	-5	-13	-21	-27	-19	-28	-21	-12	10	17	24	29	26	28	32	28	20	0	2	20	7	-13	7	2 2
Olin	Max.	9	14	14	10	9	10	9	-13	-12	1	-5	5	19	36	46	46	51	41	47	51	39	35	30	24	35	31	36	31	23.2
	Min	-4	0	-1	-10	-5	-6	-14	-21	-26	-24	-20	-21	-14	12	22	26	29	24	25	31	27	29	17	-5	17	31	-4	25	5 0
Omaha	Max.	16	10	6	6	16	14	7	-14	-3	5	-12	3	22	44	52	48	47	46	62	56	46	34	19	25	31	26	40	43	24.8
	Min	0	-6	-2	-12	-4	-1	-14	-21	-23	-12	-26	-22	-9	16	24	38	32	31	34	42	33	2	-5	10	20	1	-5	7	4.6
Osage	Max.	13	1	2	-1	1	0	-3	-7	-12	1	-3	1	16	32	41	42	37	36	46	46	44	37	22	16	28	28	13	23	17.9
	Min	-4	-12	-9	-19	-17	-14	-25	-29	-32	-30	-29	-24	-15	9	21	33	28	26	25	31	26	20	1	-9	14	7	-12	3	-1.2
Osceola	Max.	14	9	6	10	14	11	4	-2	5	4	-12	5	15	42	50	53	48	45	58	56	50	36	19	25	32	24	31	26	21 2
	Min	0	-4	-2	-11	-6	2	-7	-15	-32	-20	-25	-23	-13	9	19	32	31	29	28	40	36	25	0	4	21	7	-8	12	4.6
Oskaloosa.	Max.	13	11	8	10	14	11	9	-13	8	5	-8	-2	21	42	50	54	49	41	53	54	46	39	20	30	35	35	29	29	24.9
	Min	1	-2	-1	-9	-3	1	-10	-21	-25	-15	-21	-19	-11	10	17	29	30	25	27	36	30	20	4	4	23	10	-4	12	4.9
Ottumwa	Max.	15	14	12	10	15	14	11	-9	-5	6	5	5	16	42	52	57	50	44	54	57	42	37	31	25	35	35	33	40	26 5
	Min	2	2	2	-6	0	1	-6	-18	-23	-11	-19	-17	-13	11	17	29	31	26	27	37	32	29	5	4	9	10	-1	15	6 2
Ovid	Max.	18	18	11	15	20	17	13	-7	-5	6	-7	5	14	42	52	54	53	54	57	58	54	37	23	25	36	25	35	30	26.9
	Min	0	-1	0	-10	-3	0	-10	-20	-25	-13	-23	-24	-14	12	18	29	28	28	27	33	30	21	2	5	21	5	-5	12	4.5
Parnell	Max.	16	13	10	18	12	15	11	..	-2	5	4	20	40	50	..	52	50	48	48	55	50	39	32	25	34	34	25	33	27.5
	Min	4	-4	-2	-8	-5	-1	9	0	-25	-20	-21	-20	10	19	..	44	30	23	25	36	32	29	6	-3	21	-9	-3	6	5.0
Pella	Max.	10	9	7	9	10	10	-3	..	-8	3	-11	5	14	40	46	49	44	41	46	50	44	33	18	22	32	14	26	18	21.4
	Min	5	-3	-3	-10	-10	-10	-15	-19	-25	-15	-23	-20	-15	2	18	10	32	19	20	32	31	27	2	-1	19	14	9	16	3.1
Plover	Max.	8	10	5	0	10	12	-5	-18	-18	2	-15	4	5	38	48	49	43	46	54	52	46	39	28	29	23	25	15	..	20.0
	Min	-5	-9	-5	-20	-13	-12	-17	-27	-33	-22	-30	-23	-11	..	18	35	28	27	26	30	28	24	0	22	15	-15	-2	..	0.3
Primghar	Max.	10	20	8	5	2	3	12	12	-20	-10	0	-25	18	15	40	48	52	50	52	45	52	52	21	15	25	23	10	23	19 9
	Min	0	-10	-5	-24	-18	-23	-21	-33	-38	-23	-35	-30	-12	8	18	22	25	24	25	30	26	25	-3	7	20	8	-16	-5	1.5
Red Oak	Max.	23	18	12	16	23	20	5	-8	-6	10	-6	9	22	48	50	47	51	37	64	60	53	36	21	27	35	34	35	38	27 6
	Min	2	-2	3	-9	-6	0	-8	-19	-23	-9	-25	-22	-12	9	15	34	30	29	30	36	30	12	-4	7	20	10	-7	9	4.6
Ridgeway	Max.	20	14	15	7	10	11	7	-13	-4	4	0	7	15	29	42	42	39	41	46	48	51	37	30	18	30	31	16	26	22.1
	Min	-3	-11	-10	-18	-18	12	-21	-28	-32	-30	-28	-24	-15	8	20	30	30	23	23	33	27	30	9	-5	16	10	-9	8	0 1
Rockwell C	Max.	15	8	4	6	12	9	-5	-21	-8	4	-12	7	20	44	49	50	39	47	51	54	57	34	16	27	29	28	14	16	21.3
	Min	-2	-9	-6	-17	-10	-7	-15	-25	-31	-20	-31	-22	-12	8	18	31	26	33	28	32	27	11	-2	2	20	4	-12	2	0.5
Ruthven	Max.	9	-2	-3	-4	5	6	5	12	-17	-5	-5	0	12	33	44	45	48	37	52	51	48	36	16	23	22	22	15	22	18.0
	Min	-3	-16	-10	-26	-17	-21	-23	32	-38	-25	-34	-28	-12	5	17	32	26	24	27	31	24	16	-8	-2	5	9	-17	-5	-3.5
Sac City	Max.	10	3	2	1	13	-1	-4	-12	-10	-2	-15	5	11	43	48	48	40	42	57	50	46	32	13	26	23	12	26	12	18.6
	Min	-6	-7	-9	-15	-10	-11	-12	-24	-29	-19	-29	-21	-10	10	18	34	28	28	27	33	28	7	-3	3	12	3	-13	1	5.0
Sidney	Max.	15	10	6	6	15	12	-1	-13	-4	8	-16	-1	20	43	49	52	32	43	51	63	58	53	41	25	34	53	31	21	25 2
	Min	-3	-6	-3	-12	-7	-2	-6	-20	-26	-10	-28	-25	-12	12	32	36	33	31	31	34	44	12	-7	6	32	51	-7	8	6 7
Sibley	Max.	6	-3	-5	-5	7	1	-10	-16	-14	-6	-16	0	20	31	46	49	38	39	56	53	40	30	13	25	25	23	..	20	16.7
	Min	-9	-17	-14	-26	-28	-30	-29	-32	-40	-22	-36	-30	-14	9	15	31	26	28	28	29	25	7	-9	1	18	3	..	-15	-4 9
Sigourney	Max.	18	12	12	11	11	12	11	-1	-6	3	1	6	19	43	52	55	49	42	53	54	47	40	32	28	34	32	23	39	26-1
	Min	-2	-5	-2	-10	-5	-1	-12	-21	-27	-21	-24	-22	-15	7	15	19	30	22	23	34	30	27	3	-3	19	11	-7	11	2.5
Sioux City	Max.	11	2	2	-1	10	10	-10	22	-8	-1	-14	7	26	41	53	54	44	44	61	52	42	29	13	23	28	12	34	14	20 0
	Min	-2	-10	-5	-17	-12	-11	-14	-27	-29	-12	-31	-22	-1	16	16	34	29	30	38	37	29	4	-7	11	22	2	-12	-1	2 0
Spencer	Max.	12	1	8	-3	8	7	-10	18	-10	-3	-17	2	12	35	45	48	35	40	54	50	40	28	12	27	26	24	10	21	17.4
	Min	-8	-13	-18	-25	-19	-22	-23	-31	-36	-23	-34	-27	-14	10	17	32	23	23	27	28	25	8	-8	2	17	0	-17	-5	-3 8
Spirit Lake	Max.	5	4	2	-2	7	3	-10	-16	-12	-12	-22	1	13	36	42	46	52	42	47	52	38	24	10	25	26	16	18	19	16.2
	Min	-17	-16	-17	-27	-20	-26	-25	-33	-39	-26	-34	-28	-13	10	18	31	25	27	24	30	26	6	-7	-2	13	0	-16	-6	-5.8
StormLake	Max.	9	1	-2	-2	9	7	-2	-13	-12	-2	-10	3	16	38	42	43	40	39	56	51	42	33	14	25	26	25	19	30	18.8
	Min	-4	-8	-10	-17	-11	-12	-14	-26	-30	-19	-30	-24	-9	9	18	34	27	29	28	33	29	11	-5	4	19	3	-13	1	0 5
Stuart	Max.	15	9	7	8	12	12	5	-8	-10	5	-1	5	18	45	48	48	45	48	56	55	50	40	23	27	31	31	28	20	24.0
	Min	2	-8	-2	-12	-8	-2	-10	-20	-26	-15	-27	21	-11	10	20	32	30	33	30	36	33	22	-2	5	8	8	-10	2	3.1
Tara	Max.	12	6	6	12	8	6	-5	-20	-10	6	-10	5	22	48	50	53	50	48	58	56	51	35	15	20	26	26	18	15	21.7
	Min	-2	-12	-6	-12	-8	-10	-15	-25	-28	-12	-31	-20	-6	20	22	35	32	35	37	38	32	25	-2	-1	-3	-3	2	1	3.0
Toledo	Max.	15	16	12	10	13	6	-1	-15	-9	3	-10	3	15	44	42	46	45	47	41	50	51	47	35	11	25	32	25	22	22.1
	Min	0	-7	-5	-10	-9	0	-11	-22	26	-15	-23	-20	-13	12	12	17	30	31	25	26	33	28	28	6	2	23	12	-10	4.1
Thurman	Max.	15	12	..	..	..	14	6	-6	-3	9	0	0	21	45	50	46	48	45	62	55	49	39	17	26	31	32	32	40	27 5
	Min	2	2	..	..	..	-1	-5	-16	-23	-12	-24	-25	-10	11	14	34	27	24	25	32	32	10	-3	9	21	6	16	8	4 1
Villisca	Max.	20	13	20	13	12	18	12	2	-12	14	12	4	21	49	52	52	51	49	52	57	56	35	33	25	23	18	38	25	27.3
	Min	0	-4	-3	-11	-7	-2	-7	-18	-25	-11	-27	-25	-16	2	32	28	26	25	27	29	31	23	-5	3	10	12	11	11	3 1
Wapello	Max.	16	12	14	18	20	18	20	-2	-6	5	4	11	22	35	..	57	64	42	50	56	39	37	34	21	34	37	39	37	27.3
	Min	-2	5	7	4	0	-2	-8	-15	-22	-18	-15	-18	-10	9	..	16	32	24	25	34	27	29	14	-1	23	21	3	14	6.5
Washingt'n	Max.	14	12	12	14	16	15	14	-6	-3	3	0	8	17	41	52	57	51	43	50	54	42	37	20	27	34	30	38	34	25 9
	Min	-2	0	0	-8	-5	0	-11	-22	-26	-19	-20	-21	-13	6	16	25	28	22	22	33	30	25	3	-4	19	10	-5	7	3 2
Waterloo	Max.	7	7	10	7	15	7	6	-13	-10	3	-8	6	16	36	47	45	43	41	50	53	48	36	9	22	32	32	27	26	21 4
	Min	0	-9	-5	-11	-9	-4	-13	-22	-27	-21	-24	-20	-12	10	18	30	30	28	30	30	27	26	5	-6	20	12	-9	2	2.7
Waverly	Max.	15	4	7	3	11	4	-3	-9	-12	1	-9	4	16	34	46	44	30	39	49	51	48	37	23	21	32	33	18	21	21 7
	Min	3	-9	-6	-12	-9	-6	-12	-22	-27	-23	-24	-24	-12	11	18	31	31	28	29	32	28	23	2	-12	18	11	-9	8	2 4
West Br'ch	Max.	12	10	8	12	12	12	4	-12	-8	0	0	10	12	42	48	52	52	50	48	52	50	42	32	30	32	14	36	18	23 9
	Min	6	-6	-4	6	4	4	-11	-18	23	-20	-18	-18	-10	14	12	10	12	16	28	25	38	30	15	1	-1	-2	22	12	4.4
Wilton Jc.	Max.	17	15	12	12	13	12	12	-1	-9	3	-2	5	19	37	47	56	50	46	49	53	44	37	33	23	37	31	25	37	25 5
	Min	0	2	1	-7	-3	-2	-13	-17	-24	-22	-17	-20	-13	7	15	25	23	26	26	33	30	27	11	0	21	23	-1	7	4 9
Winterset	Max.	17	11	8	10	14	14	3	-13	-5	8	-8	5	14	45	50	50	47	44	57	56	50	38	18	27	32	24	38	20	24 1
	Min	2	-5	-1	-10	-5	1	-8	-17	-24	-13	-25	-20	-10	11	19	33	31	27	28	38	33	25	0	5	21	21	10	15	5 8

METEOROLOGICAL DATA FOR FEBRUARY, 1899

NORTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.							
	Monthly mean.	EXTREMES. Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.	Monthly range.	Monthly.	Greatest daily.	Total snowfall.	Depth of unmelted snow at end of month.	Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).
Algona	7.2	.....	.	50	19	-36	9, 11	86	.92	.50	9 2	6 0	N W	12	12	4	5
Alta	8 8	18.1	- .6	54	19	-33	9	87	.68	.62	6 7	6 0	NW	9	16	3	4
Britt	7.3	15.9	-1.3	48	20	-33	9	81	1.15	.30	11.5	2.0	NW	9	17	2	4
Charles City	9 1	18.8	- .6	47	19	-31	9, 10	78	1.72	1.00	16.0	14 0	NW	5	19	4	7
Clear Lake *a*	8 8	18.0	- .3	48	19	-32	9	80	1 40	.40	14 0		NW	.....	.....	.....	.....
Cresco	6.0	15.5	-3.5	46	21	-33	9, 10	79	.98	.28	9.8	4 0	NW	12	7	9	5
Decorah	7.6	18 5	-3.2	48	20	-34	10	82	1 43	.35	18.0		NW	..	..	.	6
Dows	9.8	19.2	- .4	52	19	-30	9	82	.58	.25	4.0	2.5	NW	15	4	9	7
Eagle Grove †	8.3	.....	.....	...	.....	.....	... .	.....	....	.....	.	.	.....	.....	.....	.....	...
Elkader	10 7	21.8	- .4	52	19	-28	9, 10	80	1 25	.65	12.8	6 0	N	20	5	3	3
Estherville	2 6	11.4	-6 2	42	15	-38	9	80	1.26	1 00	10 6	8 0	NW	15	8	5	4
Fonda ‡	9.2	20.4	-2 0	58	16	-30	8, 10	88	....	...	...	...	...	11	12	5	...
Forest City	8 2	18.1	-1.7	50	19	-33	9	83	1 53	.60	14.0	5.0	W	10	6	12	7
Grand Meadow *	9.2	.....	.....	46	20	-30	9	76	1 13	.50	11 2	9.0	NW	13	9	6	6
Greene	11 0	20 5	1 5	50	20	-29	9	79	1.89	1.40	20.0	18.0	W	5	11	12	6
Hampton	9.4	17.5	1 3	50	19, 20	-30	9	80	1.02	.55	10 8	8.0	NW	9	16	3	5
Hawkeye	.....	...	...	..	.....	.....	.....	.....	2.03	1.00	20 2	18.0	.....	9	15	4	5
Humboldt	11 0	21.0	1 1	54	19	-31	9	85	.44	.22	3.4	3.4	NW	19	3	6	4
Lansing	12 2	23.2	1.1	51	20	-31	10	82	1.77	.80	...	...	.....	9	12	7	6
Larchwood	.....	.....	.....	.....	.....	.....	.....	...	1.50	45	15 0	7.0	NW	9	15	4	6
Larrabee	7.8	19.1	-3.6	56	19	-37	9	93	1.13	1.00	11 3	...	NW	9	17	2	3
Le Mars	9 6	20 7	-1.5	58	19	-35	9	93	.70	.50	7.0	..	NW	13	10	5	2
Mason City *b*	8 0	19.3	-3.2	50	19	-35	9, 10	85	.71	.40	7.5	..	....	....	....	....	3
New Hampton	8 6	17.6	- .4	46	20, 21	-33	9	79	1.60	.50	16 0	9.0	NW	9	16	3	7
Northwood	8 2	17 8	-1.5	50	19	-34	8	84	1.27	.60	12 0	10.0	NW	23	1	4	5
Osage	8.4	17 9	-1.2	46	19, 20	-32	9	78	1.66	.70	16.6	1.6	NW	4	6	18	1
Plover *b*	10 2	20 0	.3	54	19	-33	9	87	.35	.30	3 5	3.0	NW	...	...	...	2
Primghar	10 7	19.9	1.5	52	17,19,21,22	-38	9	90	.70	.50	7 0	5.0	NW	16	0	12	2
Ridgeway	11 1	22.1	.1	51	21	-32	9	83	4 32	1.81	22.9	16.3	NW	10	11	7	13
Ruthven	7.2	18 0	-3 5	52	19	-38	9	90	.80	.50	8 0	5.5	NW	15	6	7	4
Sibley *a*	5 9	16 7	-4.9	56	19	-40	9	96	.84	.30	7.5	4 0	NW	10	12	6	6
Spencer	6 8	17 4	-3 8	54	19	-36	9	90	.77	.61	7.7	6.0	S & W	9	10	9	4
Spirit Lake	5.2	16.2	-5 8	52	17, 20	-39	9	91	1.16	.40	11 5	6.8	NW	10	10	8	7
Storm Lake	9 6	18 8	.5	56	19	-30	9, 11	86	.59	.50	5 8	5 0	NW	9	17	2	4
Waverly	11 6	20.7	2.4	51	20	-27	9	78	1.72	1.05	17 2	1.0	NW	9	12	7	6
West Bend *	7.4	....	....	51	19	-35	9	86	.60	.30	6.0	..	NW	11	11	6	4
West Union	.....	.....	....	....	.....	.....	.....	.....	1.00	.60	10.0						2
Washta	.....	...	....	... .	.....	.....	.....	.....	.60	.50	8 8	7 8	NW	11	13	4	2
Average	8 3	18.6	-1.3	50.7	.....	-33.3	.....	84.0	1.17	.....	11.2	7.1	NW	11	10	7	5

CENTRAL SECTION.

Amana	14.0	23.4	4.5	52	20	-25	9	77	.71	.36	5.0	3.8	NW	11	11	6	3
Ames *i*	18 2	32.8	3.6	56	19	-27	9, 11	83	.30	.30	2 5	2.0	....	3	18	7	1
Audubon	12.8	22.6	3 0	56	19	-28	11	84	.40	.30	4.0	....	.....	....	.....	.....	2
Belle Plaine ‡	14 2	24.2	4 3	53	20	-28	9	81	.76	.20	6 6	4.0	NW	7	15	6	7
Carroll	9 4	21 0	-2.1	54	19	-31	9, 11	85	.55	.40	5 5	4.0	.. ..	20	2	6	3
Cedar Rapids	14 4	23.9	5.0	52	16	-25	9	77	.50	.45	2.8	1.5	NW	13	7	8	3
Cedar Falls	11 9	21.0	2.8	52	20	-27	9	79	1.50	.60	15.0	.....	NW	15	7	6	4
Clinton	15.1	24 9	5 3	57	16	-28	9	85	1.45	.92	4 6	....	SW, NW	....	.....	...	....
Davenport	16.4	25.3	7.4	53	16	-23	9	76	1 91	.82	5 3	.4	NW	6	7	15	9
Delaware	11 8	21.4	2.2	52	20	-28	9	80	1.11	.56	10.5	6 0	NW	12	9	7	4
Denison	10 0	19.4	.5	53	20	-31	11	81	.40	.15	4.0	1.0	NW	17	7	4	5
De Soto	14.8	25.1	4.6	57	19, 20	-25	11	82	.44	.27	4 2	2.0	NW	12	10	6	4
Des Moines	15.6	25 6	5.6	58	19	-24	11	82	.57	.45	5.8	2.0	NW	9	13	6	4
Dubuque	13.8	22.5	5.0	51	21	-26	9	77	.67	.55	6.1	1.0	NW	14	8	6	6
Eldora	10.4	21 6	- .9	55	19	-30	9	85	1.00	.60	10 0	.....	NW	0	26	2	5
Galva	11.2	21.5	1.0	56	19	-30	9, 11	86	.80	.70	....	....	NW	11	15	2	2
Grinnell	13.9	22.4	5.4	50	19	-25	9	75	.77	.60	4.2	2 0	NW	11	12	5	2
Grinnell (near)	13 6	23 1	4.1	50	19, 20	-26	9	76	.66	.50	5.0	..	NW	9	13	6	3
Grundy Center	10.6	20.9	.4	53	19	-29	9	82	.30	.30	3 0	3.0	NW	10	10	8	5
Guthrie Center	16.2	25.3	7.2	56	20, 21	-26	11	82	50	.30	5.0	3.0	NW	15	8	5	1
Harlan	11 9	22.8	1 0	57	19	-29	11	86	.42	.20	4.2	T	NW	6	14	8	2
Independence	11.1	20.0	2.2	49	20	-29	9	78	.87	.30	8.8	.....	NW	16	10	2	4
Iowa City	14 5	24 5	4.5	55	20	-26	9	81	1 82	1 26	6.0	4.0	NW	4	19	5	6
Iowa Falls	10 0	19.2	.8	51	19	-28	9	79	.93	.60	8.0	....	NW	15	6	7	4
Mt. Vernon (2)	13.0	22.1	4 0	54	20	-26	9	80	.58	.36	5.7	3.0	NW	18	4	6	5
Logan	11.8	20.4	3.1	57	19	-27	11	84	.70	.60	7.0	6.0	N	22	5	1	5
Maquoketa *a*	16 4	26.5	6 3	53	21	-26	9	79	.78	.25	6.2	3.0	SW, NW	....	....	....	2
Marshalltown *f*	16.6	28.4	4.7	54	19	-28	10	82	.26	.20	2.8	.....	NW	.....	.....	.....	5
Monticello	13 6	24 1	3.1	53	20	-25	9	78	.97	.60	8.5	.....	NW	22	3	3	6
Mt. Vernon *	12.9	.....	.....	54	20	-30	9	84	.....	...	.....	.....	...	.....	.....	...	3
Newton	13.2	22.9	3 5	52	19	-28	9	80	.75	.61	7.1	4 5	NW	8	16	4	3
Odebolt	12.2	22 5	1.8	58	19	-29	9, 11	87	.83	.65	6.8	6 2	.....	19	6	3	3
Ogden	13.0	23.7	2.2	56	19	-28	11	84	.38	.30	3.8	3.0	NW	16	0	12	4
Olin	14.1	23.2	5.0	51	17, 20	-26	9	77	1 47	.90	5.5	2.0	NW	13	12	3	5
Parnell *a*	16 2	27.5	5 0	55	20	-25	9	80	.20	.20	2.0	....	NW	...	.	....	1
Rockwell City	10.9	21.3	.5	57	21	-31	9, 11	88	.30	.22	4.0	.....	....	18	2	8	3
Sioux City	11 0	20.0	2.0	61	19	-31	11	92	.52	.35	....	....	NW	8	12	8	4
Sac City	11.8	18.6	5.0	57	19	-29	9, 11	86	.57	.50	5 8	5.0	NW	11	12	5	3
Tara	12.4	21.7	3.0	58	19	-31	11	89	.40	.40	4.0	.4	NW	1	27	0	1
Toledo	13.1	22.1	4 1	51	21	-26	9	77	.12	.10	T	....	NW	14	0	14	2
Vinton *	13.4	....	...	53	20	-26	9	79	1.00	.50	6.0	4.0	NW	23	1	4	3
Waterloo	12.0	21.4	2.7	53	20	-27	9	80	1.18	.46	10 0	....	NW	12	14	2	8
West Branch	14 2	23.9	4.4	52	16,17,20	-23	9	75	.20	.10	2 0	1.0	NW	16	7	5	2
Whitten * *f*	9.7	.....	.....	50	19, 20	-29	9	79	.80	.60	8.0	8.0	NW	9	16	3	2
Wilton Junction	15.2	25.5	4.9	56	16	-24	9	80	1.71	.85	1.0	2.0	W	14	7	7	5
Average	12.8	23 0	3.3	52.9	.....	-24.5	... .	81.6	.73	.....	5.7	3.1	NW	12	10	6	4

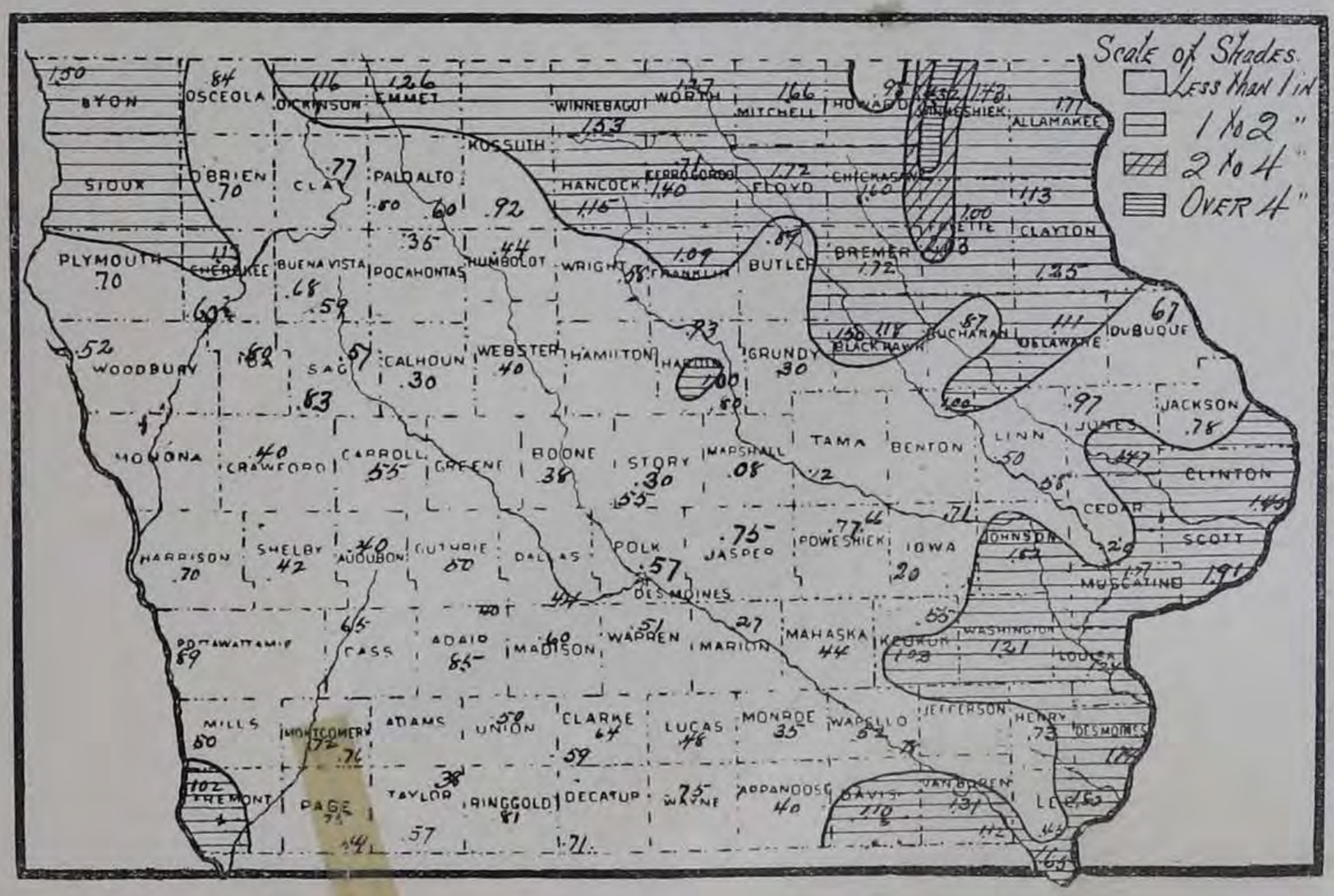
METEOROLOGICAL DATA FOR FEBRUARY, 1899—CONTINUED

SOUTHERN SECTION.

STATIONS.	TEMPERATURE OF THE AIR (IN DEGREES FAHRENHEIT).								PRECIPITATION, IN INCHES.			Depth of unmelted snow at end of month.	Prevailing direction of wind.	Number of clear days.	Number partly cloudy days.	Number cloudy days.	Rainy days (.01 inch or more).
	Monthly mean.	EXTREMES						Monthly range.	Monthly.	Greatest daily.	Total snowfall.						
		Mean maximum.	Mean minimum.	Maximum.	Date.	Minimum.	Date.										
Afton	14.1	24 7	3 5	57	19, 20	-26	11	83	.50	.15	5.0		NW	4	19	5	3
Albia	17 3	29 7	4 9	56	20	-25	9	81	.35	.20	3 5	3 0	NW	12	11	5	3
Atlantic	13 2	24 4	2.1	61	19	-26	11	87	.65	.30	4.0	.....	NW	10	8	10	3
Bedford	14.8	26 9	2 8	61	19	-2[illegible]	9	86	.57	.27	4.5	.....	NW	6	18	4	4
Belknap	15.9	23.2	8.6	58	21	-23	9	81	1.10	.60	6.0	.....	NW	19	6	3	5
Bonaparte	16 4	26 4	6.5	58	20	-24	9	82	1.12	.90	...	.....	.....	..	..	..	3
Burlington	16.4	26 4	6.5	58	20	-24	9	82	1.74	1 11	T	.....	NW	7	15	6	3
Centerville	17 5	28.0	7.0	60	20	-23	9	83	.40	.20	4.0	1.0	N	6	15	7	2
Charlton	15.0	25.4	4.5	58	20	-24	9	82	.61	.33	2.5	.....	NW	7	15	6	6
Clarinda	14.4	26.0	2.8	62	19	-24	9,11,12	86	.75	.55	5 8	4 0	NW	14	9	5	6
College Springs	13.4	23.8	3.1	62	19	-27	12	89	.44	.34	5.8	3.0	NW	20	1	7	4
Council Bluffs	15.0	26.8	3.3	66	19	-24	11	90	.89	.50	7.0	.....	S	9	12	7	4
Eldon *a*	14 2	23.6	4.7	58	20	-24	9	82	.78	.46	1.8	.....	NW	10	6	12	5
Fairfield‡	17.0	28.5	5 6	63	20	-24	9	87	1.08	.95	...	...	.....	13	1	14	2
Ft. Madison*	19.7		.....	58	20	-20	9	78	1 80	1.08	3.0	T	NW	5	10	13	5
Glenwood	15.4	26 8	3.9	63	19	-25	9, 11	88	50	.45	5.0	3 0	NW	3	19	6	2
Greenfield	13 0	24 6	1.4	57	19	-29	11	86	.85	.38	5 9	4.0	N, NW	10	10	8	6
Hedrick *a*	15.9	26.6	5 2	53	16,19,20	-23	9	76	.55	.30	3.5	.....	NW	..	..	..	3
Hopeville	14 2	24.1	4.4	57	19	-25	9, 11	82	.59	.32	.2	.....	NW	3	18	7	4
Indianola	15.3	25 4	5 2	56	19	-25	11	81	.51	.21	5 4	.....	NW	9	6	13	4
Keokuk	19 6	28.1	11.1	60	20	-21	9	81	1.65	1.07	2.2	.....	NW	10	11	7	7
Keosauqua	17.8	27 6	7.9	60	20	-22	9	82	1.33	.85	2.0	.....	.....	..	..	..	4
Lamoni	15.0	25.5	4.6	56	19, 20	-24	9, 12	80	.71	.40	6.8	2.0	NW	19	2	7	7
Lenox	13.6	24.9	2.3	58	19	-29	9, 11	87	.38	.22	3 6	2 0	NW	19	2	7	5
Mooar	16.8	26 2	7.4	56	17, 20	-21	9, 12	77	.45	.30	.5	...	NW	14	8	6	3
Mt. Ayr	13.9	24.5	3.3	58	19	-26	9, 11	84	.81	.48	5.0	4.0	NW	4	18	6	5
Mt. Pleasant	24.2	38.3	10 0	75	20	-22	9	97	.73	.52	...		NW	11	13	4	4
Omaha	14.7	24 8	4.6	62	19	-26	11	88	71	.60	7 1	5.6	NW	9	13	6	6
Osceola	12 9	21.2	4.6	58	19	-32	9	90	.64	.46	5.5	2 5	.....	5	14	9	3
Ovid	15 7	26 9	4 5	58	20	-25	9	83	.75	.56	4 0		NW	12	5	11	11
Osaloosa	14.9	24.9	4.9	54	16, 20	-25	9	79	.44	.23	4 4	2.0	NW	11	6	11	5
Ottumwa	16 4	26.5	6 2	57	16, 20	-23	9	80	.52	.35	1 8	1.5	NW	4	13	11	5
Pacific Junction *f* ‡	13.2	24.4	2.1	62	19	-26	11, 12	88	.40	.40	4.0	.....	.....	..	..	..	1
Pella	12.2	21 4	3.1	50	20	-25	9	75	.27	.10	2.8	.....	NW	10	14	4	4
Red Oak	16.1	27.6	4 6	64	19	-25	11	89	.72	.25	T	.....	N	15	0	13	5
Sidney	16 0	25.2	6.7	63	20	-28	11	91	1.02	.75	6 5	5.0	N	10	14	4	7
Sigourney	14 3	26.1	2.5	55	16	-27	9	82	1.03	57	6.0	.....	NW	10	17	1	5
Stuart	13.6	24.0	3.1	56	19	-27	11	83	.40	.25	4.0	.....	N	..	..	..	3
Thurman *c*	15.8	27.5	4.1	62	19	-25	12	87	1.02	.66	8.0	4 0	NW	..	..	..	7
Villisca	15.2	27.3	3.1	57	20	-27	11	84	.76	.65	7 1	2.0	N	12	7	9	3
Wapello *a*	16 9	27.3	6.5	64	17	-22	9	86	1.24	.57	2.8	1.0	NW	..	..	..	4
Washington	14.6	25 9	3.2	57	16	-26	9	83	1.21	1.03	5.5	...	NW	..	..	..	3
Winterset	15.0	24.1	5 8	57	19	-25	11	82	.60	.55	6.5	.....	.....	..	..	..	2
Average	15.6	25 9	4.9	58.9	.....	-24.8	.....	83.7	.78	.....	4.5	2.9	NW	10	11	7	6
Average for the state	12.2	22.5	2.3	54.2	.....	-27.5	.....	83.1	.89	.....	7.1	4.4	NW	11	10	7	5

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

Precipitation Chart February 1899



DAILY AND MONTHLY PRECIPITATION FOR FEBRUARY, 1899.

STATIONS.	DATE.																												Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Afton	...	....	...	...	..	....	....	..	..	....	-	..	..	..	....	....	T	....	..	..	..	..	.05	..	.15	.30		..	.50
Algona	12	..	.10	....	....	...	..	..	...		..	...	..	..	.10		....	T	T	..	T	.10	....		.	.50	...	..	.93
Alta (Hadden)	T	....	03	....	..	...		..	....	..	..		..	...	....	T	..	..	.01	..	T	.02	...	....	.62	..	..	..	.68
Albia	.05	....	..	..	.	..		..		....	T	..	T		....		..	....	...	..	T	....	..	.10	.20		..	..	.35
Amana	T		..			....	..	..	..	..	T		.	T	..		...	T	..	..	....	..	.09	..	.26	.36	..	...	.71
Ames	T	....	...	.	...		..		....	....	...	..	..	....		....	....	....		..	...	T	.	....	.30		..	T	.30
Atlantic	...	..	...	...	....	...	..	..	..	..	..	....	....	...	...	....	..	.	....	....	..	.10	...	...	.25	.30	....	....	.65
Audubon		..	...	..	..	..	..	....	....	..	..	....	.	..	...	....	..	..	...	..	...	.10	...	...	.30	...	...	....	.40
Belknap	.10	..	T	..	...	..	..	....	..	...	..	...	....	...	...	....	..	..	...	..	.20	....	.10	..	.10	.60	..	...	1.10
Bonaparte	.	..		..	..	..	..		..	..					..	..	..	..	..	..	.20	....	.02	....	.90			..	1 12
Britt	.15	.16	.14	..	.	..	..	...	..		..	..	T	.10	...	..	..	....	..	..	T	.20	..	...	.10	.30	..	....	1 15
Burlington	T	..		..	.	..	....	..	..	T	....	...	..	..		..	..	T	...	T	.53	...	T	..	1.11	.10	..	..	1.74
Bedford	T	..	T	..	...	...	..		..	T	..	T	..		T	..	...	.	T	..	.03	..	.05		.27	.22	...	..	.57
Carroll	10	..	..	..	..	..	.	..	....	T	....	..	..	..	T	..	..		T	..	..	....	.05	..	..		.40	..	.55
Cedar Falls	...		..	..	..	..	.	..	..	..	..	...		T	..	T	..	....	..	..	..	.40	.20	..	.30	.60		..	1 50
Cedar Rapids	T	T	..	.	..	..		.	....		....	...	T		..	....	..	T	..	..	T	T	.02	..	.45	.03	..	...	.53
Centerville	.20	....			...	..	..	.	..	T	T		....			..	T		...	..	T	...	.		.20				.40
Charlton	.03	T	T		.	..	....			.03	T	..	..	.02	....	...		..	....	..	T		.02		.33	.18	..	..	.61
Charles City	.05	..	05	...	..		..	T		T		..	..	.05	...		..	.05	-	T	....	1.00			.10	.42	..		1.72
Clarinda	..	....	.02	..	..		..	..		...	.06	.	....	T	..	.04			..	T		..	.08		.12	.43	..	T	.75
Clinton	..	....		..	..	..	..	..	..			..	..	.01			.11		..	.	.32	04	04		.92	01	..	..	1.45
Clear Lake	.20	..	.20		..		..	..	.				..	.20		..	..	..		..	..	40				.40	..	..	1.40
College Springs	.03	....		..		..	..			.03	..	..			....	T	..		..	....	....	04	..	.34	..				.44
Cresco	.09	....	.03		..					..			T	07	..	T		.15	..	....	....	.25	.04	.	28	....	....	.07	.98
Davenport	.01	T	.01	T	..	..	T	T	T		T		..	01		..	.06	T	T	T	.54	.07	30		54	.37	T	T	1.91
Decorah	.11	.	T	.	..		..	..	...				..	.07		..	..	26			....	.30	.10	..	.08	.35	.16		1.43
Delaware						..	..	....		..	..	..		02	..				..			20	.23	..	.56				1.11
Denison		...	05	....	....	..		T	.05		...	..	...			...				....		T	.05		.10	.15	....		.40
Des Moines	.01	T	T	...	..	..	....	T	...	T	..	..	T	T	T	T		..	T	T	T	T	.10		.15	.31	...	T	.57
De Soto	T		T		...	...	...		T	T	..	..	T		..	T				T	.01	02	...		.14	.27	..		.44
Dows	T	.05	.05	....	..	....	T			T		..	T	T		T		.02	T		.19	...	.01		...	.25	..	.01	.68
Dubuque	.01	..			..			T	T	..	T	....		.01			T	T		..	T	.07	02	.	.25	31	...	T	.67
Eldon	.02	....	T			..	....	..			T	..	..	T	..		T	..	T		.11	..	.04	..	.48	.15	..		.78
Eldora	T	T	..	..	....	....	T	T	...	T	T		..	T	..	T	..	.05	....	..	10	10		..	.15	.6	T	..	1 10
Elkader	T	...				....	....		..	..	....	..		T	...	..		.05				.55				65			1 25
Estherville	.05	..	T	...		....							T	T		..			T		20	T			.01	1 00	T		1 26
Forest City	.40		.10	....		..	..	..	T	T	T	..		14	..	..	.	05	....		....	.60	04	..	T	.20	T	..	1.53
Ft Madison	.10	T	T	....	....	....		..	..	T		..	..		..	..		T	..	T	.37		.20	..	1.08	05		..	1.80
Galva		..	10	..	.			..	..		..	..	T	..	..	..			..			T				30	..	...	.80
Glenwood	T	..	T	. ..	..	..				T	..	..			..	T	.		..	T	..		05		T	.45			.60
Grand Meadow	05	....	...	..	..	..	..	.	..	..	..	..	.	.10	...	T	....	.08	..	..	....	.25	.15	....	.	.50			1 13
Greene	...		..	..	..		..	..		....				10	..			.03			....	40			.05	.31			.89
Greenfield	T	T	T	T	....		...	T		.03	..	....	T			T	..	T		.01	T	.05	04	T	.34	.38	..	T	.85
Grinnell	T	..		..	..	..	..		..	T	..	..	....		..	..	T	T		.09	T	08		..	.60				.77
Grundy Center	T	..		..	..	.	..	..	....	T	..	....	T	..	..	..		..	T		T	T	T			30			30
Guthrie Center		....	...	..	...	....		..	..	T	...				..		..	..			...	T	..		20	30			.50
Harlan	T	....	.02	...	..	..	..	..	....	.03	..	....	..		..		..	..	..	T	....	T	..		.17	.2		T	.42
Hampton		..	..	..	..	....	.	..	..	..			..	06	..		...	..	06		.31	.	..		55			.12	1 09
Hawkeye	.05	....			..						...		..	.10	.	T			08		..	1 00	.			.80			2 03
Hedrick		..	..	..	..	..	..	..	..				..	..			.20	T		T			.05	.	.30				.55
Hopeville	T	..	....		..	..	....		..	.04		..	....	..		T		..	..		T	.02	..	..	.32	.2		..	.59
Humboldt		..	T		..				..			..	....	..			..				.10	0	.10	...	02	.22		..	.44
Independence	.10	....		..	...	..					..	...	...	.05		T	..	.10	..	T	T	.20	.12	..	.30				.87
Indianola	T	...	..	..	..	..	..		....	.02	....	..	T	T	..	T	..	T	T	T	T	T	.10		.18	2	..	....	.51
Iowa City	T	....	....	...	..	....	..	..	..	..		..			....	.21	..	T	T	..	.10	T	25		...	1.26	..	..	1.82
Iowa Falls	T	...	T	.	...	..	..	..	...	.	....	..	....	T	..	T	..	.10	.02	T	.11	T	..	..	.60	.10	..	..	.93
Keokuk	.01	T	T	.	..	..	T	..	....	.01	.07	..		T	....	..	..	..	..	..	.41	..	.08		.94	.15	..	..	1.65
Keosauqua	T	T	T	..	.	..	...	..	..	T	T	T	....	..	..	..	....	..	..	..	.25	.06	..	..	.85	.23	..	T	1.39
Lamoni	.04	..	T	..	..	..	..	....	..	.03	.03	..	..	..	..	..	....	..	..	..	.05	T	.06	..	.40	.10	..	..	.71
Lansing	.16	..	..	...	...	....	..	..	..	.	....	.	...	.04	.	..		05	..	..		55	.17	..	T	.80	T	....	1.77
Larchwood	...	.45		..	...	..	...	..	..		..	....	..	...	..	..	..	..	T	..	.20	05	..	T	.30	.40	..	.10	1.50
Larrabee	T	...	.13	..	..	..		....	..	..			..	..	..	..	..	..	T	..	T	T	..	....	1.00		..	..	1.13
Le Mars	..	..	T	..	..	..	....	..	..	..			..	..	....	..	..	..	..	..	..	....	....	....	.20	50	..	.	.70
Lenox	.	..	.01	.	..	..	....	..	..	.02	..	..	...	..	....	T	..	..	..	..	T	T	03	.	.10	.22			.38
Mt Vernon (2)	...	..	..	..	..	..	..	T	T	T	...	..	..	.05	..	T	....	.02	...	..	T	.10	05	..	.36	..	T	T	.58
Logan	..	...	..	..	...	....	..	....	..	.10	...	..	..		T	...	....	....	..	..	.23	13	..	..	.60	.	..	..	.70
Maquoketa	..	.02	..	..	..		..	..	..		..	....	..		..	....	..	..	..	..	.01	.01	.01	.01	17	.21	..	..	.78
Marshalltown	....		....	....	....	..	..	....	....	T	....	..			..		...	T	T	..	.01	.01	.01	.01	.02	.20		..	.26
Mason City	..	.20	...	..	..	...	..	..	..	..	..	..		..	.11	....	..	.	T	....	...	..	T	..		.40	....	....	.71
Mooar	....		..	..	..	..	..	..	..	....	..			..		..	..		....		.10		.05		.30	T	....	..	.45
Monticello	....	...		....		..	..	.	....	.	..	..	..	.10	....		T		..	T		T	.27		T	.60	....	..	.97
Mt. Ayr	T	T	T	..	..	..	...	....	..	.05	..	..	..	..	...	T	...	..	....	..	.01	T	.05	...	.48	.22		....	.81
Mt. Pleasant	.02	....	..	..	.	..	....	....		....	.	...	T	..	..		..	..		....	..	....	.18	..	.52	.01	..	....	.73
Mt. Vernon	.	..	..	.	....	..	....	..	..	..	..	....	..	....	.	....	....	..	..	..	T	T	.	....	T		....		T
New Hampton	.10	..		..	..	..	..	..	T	..	..		....	.10	..	T	..	.20	..		..	.50	.20	..		.10	40		1.60
Newton	T		.	..	..	....	..	..		....	..	....	.	..	..	T	..	..	..		07	.07		....	.61	....	..	....	.75
Northwood	..	.30	...	....	..	....	..	....	..	T	..	.20	....		..		..	..	..		..	.60	..	..	.10	.07		....	1.27
Odebolt		..	.08			....	..		..	T	..	..	T	....	....	..	..	..	....	T	.	T		..	.10	.65	...	...	.83
Ogden	T	.	...	..	..	..	..	.02	..	.02	....	....	....		..	..	..	....			T	T	.04		....	.30	..	....	.38
Olin	T	..		..	....	....	..	..	...		..			.01	..	..	....	T		T	.03	.20		.30	.20	T	..	....	1.47
Omaha (Neb)	T	...	.02	..	...	..	..	....	...	.05	..	..	T	T	...	..	....			T	T	.02	.02	..	.14	.46	...	...	.71
Osage	.16	..	.08	..	....	....	..	....	....	T	..	....	..	.09	..	..	..	.08	..	T	T	.70	..	..	.05	.50	...	....	1.66
Osceola	T	T	T	..	..	....	.10	..	..	T	..	..	T	.	..	....	T	..	..	T	T	T	.08	..	.46	..	..	..	.64
Oskaloosa	.04	....	T	..	...		..	..	..	..	....	....	.05	..	..	T	..	..	T	T	T	.07	..	.05	.23	..	..	....	.44
Ottumwa	.05		..	..		..	..	..	..	.	....	....	.05		..	..	..	..	....	..	..	..	.05	.02	.35	....	....	....	.52
Ovid	.02	.01	.01	..	..	....	....	....	.01	.02	.01	....	.02	..	....	....	..	....	....	....	.05	.02	..	..	.56	.02	..	....	.75
Parnell	T	..	T	...	..	....	..	..	...	T	..	....	.	....	....	..	....	T	..	..	...	T	.	..	.20	..	..	....	.20
Pella	.05	..	.	..	....	..	..	..	...	T	..	....	....	..	....	..	..	..	..	T	...	..	.02	....	.10	.10	..	..	.27
Plover	.05	....	....	....	..	..	..	..	...	..	....	....	..	..	....	..	..	..	T	..	T	..	..	....	.30	..	....	...	.35
Primghar	..	..	.20	..	....	..	....	....	....	..	....	....	..	..	.	..	..	..	..	..	..	..	....	....	....	.50	.	....	.70
Red Oak	T	..	T	..	..	....	....	....	....	T	..	..	T	....	..	.05	..	..	....	T	.12	.10	..	..	.25	.20	....	....	.72
Ridgeway	37	...	.04	..	..	..	....	..	....	.01	....	..	....	.18	..	.01		.53	T	..	.01	..	1.28	.01	....	1.81	..	.07	4 32
Rockwell City		.	....	.	...		.	..	..	....	....	..	....	..	..	..	....	....	T	..	T	.02	....	....	.06	.22	..	....	.30
Ruthven	.20	..	.	.05	..	..	....	....	..	....	....	..	T	T	....	..	....	....	T	..	T	.05	....	..	....	.50	..	....	.80
Sac City		..	.05	..	..	....	....	..	..	T	....	..	T	....	..	..	....	..	T	..	T	.02	....	..	.50	....	....	....	.57
Sibley	.30	..	05	T	....	..	..	T	....	..	..	..	....	..	..	.03	....	..	T	....	.06	T	....	..	.20	.20	....	..	.84
Sigourney	T	T	....	..	..	....	....	..	..	T	....	....	....	..	T		.09	T	T	.03	T	T	.12	..	.57	.22	..	..	1.03
Sioux City	T	....	.01	....	..	..		..	..	TT	....	.	..		....	....	....	..	T	..	T	.01	T	..	.15	.35	..		.52
Storm Lake	T	....	.07	...	..	.	T	T	..	TT	..		....		...	....	....	..	T	..	.01	.01	..	..	...	.50	..	..	.59
Spencer	.07	.07	..	..	..	..		..	..	T	..	...	....	T	..	....	....	T	T	..	T	T	T	....	.02	61	..	....	.77
Spirit Lake	.40	....	..	..	..	..	....	....	..	....	....	..	..	..	.08	....	....	....	T	..	.15	.07	.01	....	.15	.30	T	...	1 16
Stuart	...	....		..	..	.	....	....	..	....	....	..	..	..	..	..	..	....	..	..	T	T	.10	..	.05	.25	....	....	.40
Tara	T	....	T	....	...	..	....	....	....	T	....	..	..	..	..	..	..	....	..	..	T	....	T	.40	..	....	....	..	.46
Toledo	....	....	...	..	..	....	..	..	.	....	...	..	..	....	....	..	T	T	T	..	T	....	.62	..	.	.10	..	..	.12
Thurman	.02	T		....	....	..	....	....	.04	T		....	..	....	..	T	.	..	..	....	.06	.06	.04	....	.63	.14	..	T	1 02
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Vol. X. March, 1899. No. 3.



U. S. Department of Agriculture
Weather Bureau

MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

STAR ENG. CO.

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Central Station, Des Moines, Iowa.

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DES MOINES:
F. R. CONAWAY, STATE PRINTER
1899.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME X. MARCH, 1899. NO. 3.

NOTE AND COMMENT.

THE DAYS BETWEEN.

These are the days that lie between
The brown of winter in the wane
And springtime's coming glow of green.
The silent trees are gray and bare,
And not a bud is showing, yet
We know the folded leaves are there.

To-day the air is cold and fierce,
And skies are gray; the bitter winds
As keenly as an arrow pierce.
To-morrow comes, the winds are mild,
And all the deep, blue skies are like
The soft eyes of a little child!

—*Washington Star.*

***

This country exported 51,000 horses in 1898. And so it appears that the "passing of the horse" is toward the front instead of the rear, despite the predictions of the pessimists.

***

The electric conductivity of water is found by two German physicists to increase greatly with pressure, showing a rise of 40 per cent at 500 atmospheres. The effect seems to vary much with different solutions.—*Ex*

***

Some one has found out how far a farmer has to walk to put in and attend to forty acres of corn. To plow the ground with a sixteen-inch plow he walks 350 miles; to harrow it thoroughly before planting he walks fifty miles, and to cultivate it afterwards he will have to travel 320 miles, making a grand total of 750 miles besides gathering.—*Rockford Register.*

***

The maple sugar harvest in Vermont, and other eastern sugar districts, is reported to be a failure this year. But that will not affect the supply of pure Vermont maple sugar and syrup in the markets. Nothing but a famine of corn cobs and glucose will cut short that staple product.

***

A note from H. B. Strever brings sorrowful news of the death of H. H. Carnahan, of Larrabee, Cherokee county, which sad event occurred April 1, 1899. Mr. Carnahan was one of the most faithful crop reporters of this service, and was serving his second term as postmaster of his town when he was called to his reward. He had reached the 66th year of his useful and honorable life.

***

Comparing the records for fifty-one years (1841–1891), A. B. MacDowall finds that the temperature of both Greenwich and Chicago was above the average during sixteen winters, and below during fourteen. There were nine seasons in which Greenwich was warmer and Chicago colder than the average; and twelve in which Greenwich was colder and Chicago warmer.—*Ex.*

Some of the stories in circulation, relative to the marvels of liquid air, should be taken with a grain of salt. We are assured by the "inventor" that liquid air can be used as a motive power in the manufacture of liquid air, and that from two gallons of the liquid eight gallons may be produced, and so on indefinitely; that, in fact, its power is illimitable, with the essential qualities of perpetual motion. This is an age of marvelous achievements, but we await absolute proof before we accept the stories that are put forth as to the miracles that may be wrought by this so-called new force.

***

Mr. H. W. Vandike, formerly a voluntary observer at Belle Plaine, Iowa, and now a resident of Los Angeles, Cal., writes as follows relative to a paragraph that appeared in the last issue of the MONTHLY REVIEW:

"In your February issue you quote a press dispatch from this city, stating that the chamber of commerce had appointed a committee to raise $8,000 to enable Professor Lowe to test his rain-making theory. This is an error. Professor Lowe did write a letter to Secretary Wiggins, setting forth his theory; but the chamber of commerce refused to appoint a committee or even consider the subject. The members of that body are among the most intelligent business men of the city, and they have no use for such fake experiments. But the rain came in copious showers, to the amount of two inches during the month of March."

***

"Not many years ago," says a writer in the *Ladies' Home Journal*, "when an ox was slaughtered, 40 per cent of the animal was wasted; at the present time nothing is lost but its dying breath. As but one-third of the weight of the animal consists of products that can be eaten, the question of utilizing the waste is a serious one. The blood is used in refining sugar and in sizing paper, or is manufactured into door knobs and buttons. The hide goes to the tanner; horns and hoofs are transformed into combs and buttons; thigh bones, worth $80 per ton, are cut into handles for clothes brushes; fore leg bones sell for $30 per ton for collar buttons, parasol handles and jewelry; the water in which bones are boiled is reduced to glue; the dust from sawing the bones is food for cattle and poultry; the smallest bones are made into boneblack. Each foot yields a quarter of a pint of neat's foot oil; the tail finds itself "in the soup," while the brush of hair at the end of the tail is sold to the mattress maker. The choicer parts of the fat makes the basis of butterine; the intestines are used for sausage casings or bought by gold beaters. The undigested food in the stomach, which formerly cost the packers of Chicago $30,000 a year to remove and destroy, is now made into paper. These are but a few of the products of abattoirs. Scraps unfit for any other use, find their way to the glue pot, or do missionary work for farmers as fertilizer."

TILE DRAINING.

BY J. R. SAGE.

[Substance of a farmers' institute talk.]

According to the state census for 1895, there had been constructed in Iowa 10,610,000 rods of tile drains, of which a little over 1,000,000 rods were laid in the drouthy season of 1894. Allowing for a corresponding increase since that time, we have to-day about 15,000,000 rods of tiling; which would make an average of about 75 rods for each of our 204,000 farms, or less than half a rod per acre for all our farmed lands. These figures show that we have scarcely begun a systematic and thorough drainage of our naturally wet soils

The census figures show a very unequal distribution of tiling among the various counties of the state. Hamilton county was far in advance, with a total of 2,297,901 rods, or more than one-fifth of the amount in the state. The enterprising farmers of that county had constructed prior to 1895, an average of 1,082 rods for each farm of 155 acres. And now the county of Hamilton presents many striking object lessons as to the practical value of tile draining. About 25 or 30 years ago that county contained a very large percentage of swamp lands, or soil too wet to produce any farm crop; but to-day nearly all of the waste land has been reclaimed, and now Hamilton ranks among the most productive agricultural counties in the state. In fact, the reclaimed wet soils are now the best in the county, as a result of drainage and cultivation.

Among the other counties that have taken the lead in tile draining we note Henry, Des Moines, Washington, Story, Cedar, Jones, Polk, Dallas and Scott, all of which show uniformly good yields of the staple crops. The farmers therein have been imbued with the spirit of progress.

In its original condition, as left by nature and the Indians and buffaloes, Iowa was composed of prairie uplands, dry ridges and divides, with innumerable depressions through which were streams flowing through miry and well nigh impassable bottoms. On many of the divides and uplands were numerous shallow lakes, ponds and extended bogs. These bottoms, lake beds and miasmatic bogs, when drained and reclaimed, are found to contain the deepest and richest deposits of the elements of crop production. By cultivating the ridges, straightening the crooked streams, and draining a portion of the wet bottoms we have materially extended the area of arable lands, and within the last few years our best crops have been produced on soils that twenty-or thirty years ago were excessively wet and wholly worthless for cultivation.

In this line of improvement we have scarcely made a beginning. The need of tile drainage is quite general in this state, though of course there is a marked difference in the condition of soils in different localities. We have in Iowa something over 204,000 farms, and it is certain that fully 95 per cent of these farms contain fields that need more or less drainage. In fact, I have never seen a farm in this state so absolutely perfect in respect to natural drainage that it might not be improved by tiling at least a portion of its soil.

Any soil that is saturated with water during the crop season any considerable time after the heaviest rains should be underdrained to draw off the excessive moisture. Wherever water stands upon the surface for even a full day after a heavy rain, there is need of drainage or subsoiling to facilitate its percolation into the soil. And any soil that shows a marked tendency to bake and crack in a dry period needs corrective treatment in form of tiling or subsoiling. Low bottom lands, and soils in which stiff clay predominates, are generally benefited by tiling. Our farm crops do better in a soil containing from 30 to 60 per cent of the amount of water which it would contain if fully saturated. Where the amount of moisture in the soil is less than 30 per cent of saturation the crops suffer from lack of moisture. When the moisture contents of the soil exceed 60 per cent the crops suffer from lack of air as well as water; so an excess of water hurts the plants by preventing necessary aeration. The lack of air at the roots is indicated by the pale, sickly color of the leaves and blades of corn and other plants standing in wet soil.

It requires no great depth of scientific lore to comprehend the pracical utility of tile draining. Its special purpose is to facilitate the removal of excessive moisture from the surface. This is effected by drawing the surplus water downward through the soil, instead of causing it to flow over the soil in open ditches or streams. It has also been proven by experience that tiling not only removes excessive moisture, but it also helps to maintain an equilibrium of moisture by facilitating the circulation of air in the soil. And more than this, it tends to enrich the soil by the absorption of the elements of plant growth, which are carried therein by the raindrops and the atmosphere. So we have three points in favor of thorough tile drainage: First, it helps to dry and warm the soil in wet seasons; second, it adds to its moisture in extremely dry seasons; and third, it enriches the soil in all seasons.

It is well known that moisture on the surface tends to make the soil cold, especially when there is an evaporating wind. But when the rains of summer are carried through the soil they carry the heat into the earth, where the roots of plants receive the benefit. In that way the soil is warmed to a greater depth by facilitating drainage through the soil, instead of over the surface of the soil.

In extremely dry seasons the beneficial effects of tile drains are observed in every cultivated field where that system is in operation. The warm moist air enters the drains and finds its way into the soil, where it parts with a portion of its moisture by the process of cooling.

In all drouthy seasons the well tiled fields produce the best crops, especially of corn, which requires an abundance of moisture at certain stages of its growth.

The beneficial chemical effects of drainage are also attested. As before stated, the requisite amount of air cannot enter a water-soaked soil. And the free admission of air is necessary to oxidize the decomposing nitrogenous substances in manures and decaying plant and animal structures, converting them first into ammonia compounds and then into nitrates that are so essential in plant growth. It has been found by experiments that a cold, water-soaked soil suffers a loss of large quantities of available nitrogen. This may be mostly saved by thorough tile drainage.

It is a well verified fact that rainwater contains valuable elements of fertilization; and so we find another beneficial effect of draining the rainwater through the soil instead of allowing it to run off over the surface.

Sir J. B. Laws, a noted English scientist, found that land at Rothamstead, England, received annually per acre an average of about 24 pounds of pure common salt. And he also found that a year's rainfall brings down more valuable fertilizing material; viz., about 4½ pounds of nitrogen in form of ammonia and nitric acid, and 18 pounds of sulphuric acid per acre.

Varying quanties of carbonic acid, one of the most powerful solvents of plant food, are brought to the earth by rain in its passage through the atmosphere. This substance serves as a solvent and pulverizer, liberating the lime and potash in the soil, preparing them for use of growing plants. By this agency barnyard manure and commercial fertilizers are made available in the support of vegetable life.

The practical value of tile drainage is no longer in the realm of theory; it has been fully demonstrated by years of experience in all sections of our country.

Col. Geo E. Waring, an eminent authority in scientific agriculture, gave the following excellent summary of the advantages of under-draining:

"1. It greatly lessens the injurious effects of drought.

"2. It admits an increased supply of atmospheric fertilizers.

"3. It warms the lower portions of the soil.

"4 It hastens the decomposition of root and other organic matter.

"5. It accelerates the disintegration of the minerals in the soil.

"6 It causes a more even distribution of nutritious matters among these parts of soil traversed by roots.

"7. It improves the mechanical texture of the soil.

"8. It tends to prevent grasses from 'running out.'

"9. It enables us to deepen the surface soil "

"10. By removing excess of water it renders soils earlier in the spring.

"11. It greatly lessens the throwing out of grain in winter.

"12. It allows us to work sooner after rains.

"13. It keeps off the bad effects of cold weather longer in the fall.

"14 It prevents the formation of acetic and other organic acids, which induce the growth of sorrel and similar weeds.

"15. It hastens the decay of vegetable matter and the finer comminution of the earthly parts of the soil.

"16. It prevents, in a great measure, the evaporation of water and the consequent cooling of the soil.

"17. It admits fresh quantities of water from rains, etc., which are always more or less imbued with the fertilizing gases of the atmosphere, to be deposited among the absorbent parts of soil, and given up to the demands of plants.

"18 It prevents the formation of so hard a crust on the surface of the soil as is customary on heavy lands."

I am fully convinced that there is no more profitable investment for the average farmer than a liberal outlay of labor and cash in tiling his lands that show any measure of excess of moisture during the crop season. It will pay better than bank stock, government bonds or money invested in mortgages. The farmer who possesses a little surplus cash had better expend it in adding to the value of the acres he owns than in purchasing an adjoining quarter section. He had better expand his possessions downward rather than sideward; and tile draining is one of the best forms of expansion.

In England, after many years of experience in this line, it is regarded as an accepted fact that under-drainage will repay the original cost in three years; that is, it will return a profit of 33⅓ per cent, every year of the original investment. I believe that will hold good in this country.

SEVERE WINTERS AND LATE SPRINGS.

The abnormal character of the past winter, in respect to its early advent, extreme low temperature and long duration, has brought forth considerable comment and comparison of notes, records and memoranda. The "oldest inhabitant" has been in evidence in the talk of the street and in the columns of the newspapers. We clip the following from the Marshall *Times-Republican* of April 6th:

Iowa pioneers are recalling some of the severe winters in Iowa, and their recollections of the early days make interesting reading, especially since it has been claimed that the winter just passed has been one of the most rigorous and prolonged in the state's history. Uncle John Montgomery, of Albion, one of the rugged pioneers of this section, says the winter of '56–7 was extremely severe. Snow fell on the 6th of November to a depth of about ten inches so that we went everywhere on runners. Then again, on the 1st of December, snow commenced falling and did not cease for three days till it was over three feet deep on a level in the timber. We had ninety days without a thaw. Stock devoured everything in the way of feed, and hay and straw went up to fabulous prices. It continued very cold through March and April. I was staging then, and I remember that on April 20th the snow was still badly drifted on the prairies. But we need not go back that far to find cold winters. In 1888 snow fell on the night of October 15th; the ground froze and all apples were frozen solid on the trees Frost did not go out until the last of the following April. That was the year (1889) that we had no spring; it simply changed from winter to summer. Thomas Miller, of Bangor township, had a public sale on the last day of April, and there was still considerable snow to be observed in shaded places, and yet we had fair crops that season. How prone we are to forget some things, even of comparatively recent occurrence. Perhaps it is as well, however.

The following is from the Waterloo *Courier* of recent date:

Weather Observer M. L. Newton has a record of the weather since 1883, and he finds in it nothing that begins to equal the month of March just past. The nearest approach was in 1888, when the average normal temperature here was 25° above zero. This year it was 23.4° above. The average March normal temperature for the seventeen years since 1882 was 31.5° or 8.1° above this March. Mr. Newton has no records further back than 1882, but he has the weather reports from Dubuque for twenty-seven years, or from 1872 to date He says the temperature at Waterloo will average about 1° warmer than at Dubuque. Only one oldest inhabitant has been found who has the courage to remember any weather equaling the past month of March. That man is W. H. Brott. He says away back before the war he saw weather just like that which we are experiencing now. He says on the 26th day of April that year the ice was still in the river and that young stock froze to death.

And now comes the Le Mars *Sentinel* with the following relative to belated springs in former days:

Talking about late springs in this locality, Captain Betsworth, who ought to be an authority, as he has lived here for more than thirty-three years, says that this is the latest spring he has ever seen with the exception of one, and that was in 1867. In that winter snow fell on December 28, 1866, and it was winter until late in April. No wheat was sowed until away in the month of May. That same winter the snow was drifted forty feet high in some places on the Floyd bottoms. Captain Betsworth resided at that time where the Le Mars brick yards now stand, and his son, John, resided where the St. James church is now. The water that spring was all over the country from bluff to bluff and his son had to swim a horse to get from one house to the other. The Indians, of whom there were plenty in those days, said it was the highest the water had ever been in these parts. The captain recalled another late spring in 1873, when the spring freshets brought floods, and later in the spring of 1881, after the winter of 1880 and 1881, when there was a tremendous snowfall.

In relation to the character of old time seasons, however, the meteorological records made by reliable observers greatly outweigh the recollections and traditions of the oldest inhabitants. At Muscatine continuous weather records have been kept since 1839, and these records show that the winters of 1855–6, 1856–7, 1874–5, 1882–3 and 1887–8 were colder than the past winter. And in respect to frequency of storms and general inclemency of weather there have been several winters of greater severity than the season just passed And the records also show that in former years we have had some much belated springs that were followed by fairly productive summers. In 1881 there were several snow blockades in the northern section of the state during March, and one heavy snowstorm and blockade as late as the 6th of April; and yet there was a fruitful season. The worst drawback that year was an excess of rainfall.

DATES OF ICEBREAKS IN THE MISSOURI.

[Sioux City Journal, March 24th.]

The dates upon which the ice in the Missouri river broke up are not recorded officially at Sioux City further back than 1890. But Pierre Chouteau, the famous trader for whom Pierre, S. D., was named, kept a record of the yearly breakups at that point, and, although not accurate for Sioux City, it approximates the dates of the event here. His figures, jotted down in a note book, yellowed with age before its memorandum was ever printed, are as follows:

1846	April 20
1847	April 10
1848	April 9
1849	April 1
1850	April 3
1851	March 24
1852	March 22
1853	March 29
1854	April 5
1855	March 30
1856	April 6
1857	March 26
1858	April 12
1859	April 18
1860	March 24
1861	April 5
1862	March 27
1863	March 23
1864	April 15
1865	April 13
1866	April 7
1867	April 4
1868	March 25
1869	March 29
1870	April 8
1871	April 2
1872	March 14
1873	March 11
1874	April 14
1875	March 25
1876	March 30
1877	March 16
1878	March 23
1879	March 31
1880	April 7
1881	March 27
1882	April 4
1883	March 24
1884	March 28
1885	April 3
1886	March 16
1887	March 12
1888	April 1
1889	March 18

The record at Sioux City, beginning with 1890, follows:

1890	March 20
1891	March 21
1892	March 5
1893	March 12
1894	March 4
1895	March 20
1896	February 26
1897	March 20
1898	March 7

HISTORIC COLD WINTERS.

In the year 401 the Black sea was frozen over for twenty days, and men crossed from Asia Minor to the Crimea.

In 764 the Black sea was frozen to a distance of fifty miles from shore. The Hellespont and Dardanelles were frozen and the Sea of Marmora was passable for cavalry.

In 1063 the River Thames was frozen over for thirteen weeks. All the rivers of the continent were frozen, and even south of the Alps the Po and many other streams were blocked with ice.

In 1294 the Cattegat was covered with ice seven feet thick. Batteries of artillery were moved to and fro on the strait.

In 1323 the Baltic sea was frozen over, and during three months travelers passed from the continent to Sweden on the ice. Heavy wagon trains were substituted for the traveling vessels.

In 1433 the Thames and all other rivers of England and Scotland froze over; the Seine, Rhine and Danube were closed to navigation early in December. The Dardanelles and Hellespont froze, as did many bays and inlets of the Mediteranean. Ice formed in Algiers, and the Strait of Gibraltar was almost impassable from drift ice.

In 1460 the Baltic again froze over so as to permit travel on the ice. In Germany deer sought the towns for refuge from wolves. Packs of wolves came into the cities and attacked the people on the streets.

In 1544 the cold was so severe in Holland that wine was cut in blocks and sold by weight.

In 1594 the rivers of North Europe were frozen before Christmas. The Cattegat froze, together with a large part of the Baltic. The Sea of Venice froze so that during three weeks no boats could be used. The Tiber froze at Rome and men crossed it on the ice, a thing never known before or since.

In 1658 the bays and inlets of North Europe froze over early in December. Charles X of Sweden crossed the strait to Denmark with his whole army, including the artillery, baggage and provision trains.

In 1648 the Thames was covered with ice over a foot thick. Booths were erected for a fair, which was held on the river. Coaches plied to and fro on the ice as on dry land. All the French ports were closed for three or four weeks, the harbors being frozen over.

In 1691 the cold was so severe in eastern Europe that packs of starving wolves entered Vienna and attacked men and women in the streets. All the canals of Venice were frozen, and the principal mouth of the Nile was blocked with floating ice for a week.

In 1740 the Thames was frozen for eleven weeks. Forest birds almost all perished, and trees were split by the frost. The harbor of Barcelona froze over, and navigation was suspended in the Greek Archipelago on account of the danger from floating ice.

The winter of 1812–13 was one of the hardest ever known in Europe. The Thames froze from the source to the sea; the Seine, the Rhine, the Danube, the Po and the Gaudalquiver were all covered with ice. The Baltic froze for many miles from land, and the Ikagerack and the Cattegat were both frozen over. The Adriatic at Venice was frozen, so was the Sea of Marmora, while the Hellespont and the Dardanelles were blocked with ice and the archipelago was impassable. The Tiber was lightly coated, and the Straits of Messina were covered with ice. Snow fell all over North Africa and drift ice appeared in the Nile. This was the winter of Napoleon's retreat from Moscow, when 400,000 men perished, mostly of cold and hunger. The men froze to death in battalions, and no horses were left either for the artillery or cavalry. Quicksilver froze this winter.

In 1849 the cold in Sweden, Norway and Russia was so severe that great numbers of persons were frozen to death in all those countries.

In 1863-64 a severe cold wave swept over the whole of North America. The thermometer went to 60 below zero in the northwest. The Mississippi river was blocked with ice in a single night, and in twelve hours froze from St. Paul to Cairo.—*Ex.*

MARCH WEATHER IN THE UNITED STATES.

[Extracts from the Climate and Crop Bulletin of the Weather Bureau.]

The month averaged slightly milder than usual in the southern states and on the Atlantic coast south of New England, including the upper Ohio valley and the eastern portion of the lower lake region. The excess in temperature averaged less than 3° per day, except over central and southern Texas and limited areas in the south Atlantic and east gulf states, where it amounted to from 3° to 4°. Over the southern Rocky Mountain region and in southern California nearly normal temperature prevailed. From the upper lake region and central Mississippi valley westward to the north Pacific coast the month was colder than the average, being decidedly cold from the upper Mississippi valley westward to Idaho, over which region the average daily temperature deficiency ranged from 9° to 21°, being greatest in northern Montana.

The temperature extremes of the month are: 94° at Abilene, Tex., on the 25th, and —26° at Havre, Mont., on the 21st, and Williston, N. Dak., on the 23d.

PRECIPITATION.

Except over the northern portions of Alabama and Georgia, eastern Tennessee, and a limited area on the east gulf coast the month was drier than usual in the southern states, and over portions of central and western Texas there was no appreciable rainfall. There was also less than the average precipitation in Washington and northern Oregon, over portions of the central Missouri and upper Mississippi valleys, over the southern Plateau region and southern California The month was characterized by unusually heavy precipitation in southern Oregon, northern and central California, and from the lower lake region, central Ohio valley, and eastern Tennessee, eastward to the Atlantic coast. Amounts ranging from 2 to 10 inches were reported from southern California, while over the eastern portions of Kentucky, Tennessee, southern Virginia, and along the coast from New Jersey to southern Maine, the monthly rainfall generally ranged from 6 to 9 inches, eastern Tennessee receiving from 11 to 14 inches.

GENERAL REMARKS.

Upon the whole, the season is backward at the close of March, the month having been very unfavorable for farming operations. In the Dakotas, Nebraska, Minnesota, Iowa, and Wisconsin the ground is frozen to an unusual depth, the frost extending to a depth of from 5 to 10 feet in North Dakota and Minnesota. While the average temperature of March was somewhat above the normal in the southern states, the season in that section is reported from two to three weeks late, except in Texas, where it is more nearly normal.

The general condition of wheat is less favorable than at the close of February, and as at the close of that month, the late sown is less promising than that seeded early. On the Pacific coast the outlook is most promising in Oregon, and the crop has been greatly benefited by recent rains in California, but in Washington it has been injured by severe weather and lack of snow protection.

Preparations for cotton planting in Texas are well advanced and some has been planted in the southern part of the state; some has also been planted in portions of Georgia and South Carolina.

Some corn has been planted as far north as Tennessee and Oklahoma, and farther south a large part of the crop has been planted.

Some spring oats have been sown as far north as the lower Missouri and Ohio valleys.

STATE REPORTS.

Iowa.—Des Moines, 29th: Month unusually cold; considerable snow yet remains in the northern section; interior rivers and lakes not yet clear of ice; soil frozen to an unusual depth in all sections; under these conditions field work has been practically impossible, even where the ground is bare; reports indicate material injury to winter wheat and rye, and the less hardy fruit trees.

Nebraska.—Lincoln, 28th: Month exceptionally cold; in most of the state ground has been frozen during entire month; no farm work has been done, neither have grass, fall-sown grain, nor fruit buds started; rye seems to have wintered well; winter wheat has been damaged by severe winter, but to what extent cannot be determined now.

Kansas.—Topeka, 29th: In eastern half of state early-sown wheat is in fair condition and late sown appears much damaged, except on last year's cornfields, the old stalks having held the snow; in western half of state late-sown wheat is in fine condition, but early has been damaged somewhat; no farm work yet, except some oat seeding and plowing in south, and spring wheat seeding in northwest.

Missouri.—Columbia, 30th: Month cold and disagreeable, with frequent rains and snows, and much alternate freezing and thawing, very unfavorable for wheat and clover; in northern sections wheat greatly injured, and present outlook discouraging; in central and southern sections crops generally in better condition, and some looking very well, though considerable late sown will probably be plowed up; no farming done, except in some southern counties where part of oat crop has been sown; ground cold and wet.

Illinois.—Chicago, 30th: March, cold, cloudy, wet; no farming done, except extreme south, where few oats sown; few potatoes planted; little soil turned over; soil still frozen four feet deep in north counties; wheat, north half, in poor condition, improves southward, and in southern district fair to good; late sown suffered most; rye less damaged; clover considerably injured, but timothy good; peaches killed; apples and strawberries unharmed; other fruits more or less damaged; roads very bad; no grain moving; stock wintered well.

Indiana.—Indianapolis, 29th: Unseasonably cold weather with frequent rain and snow; farm work much delayed; in more southerly counties some oats, grass and clover sown, but little or no plowing for corn yet done; ground in most unfavorable condition, being deeply frozen in localities in north portion; no field potatoes have been planted, and but very little gardening done; in Spencer and Switzerland counties a few tobacco beds have been sown; early-sown wheat continues in most promising condition, but much late-sown wheat has been winter killed; barley and rye in fair condition, and grass, young clover and timothy begin to look green.

MARCH WEATHER RECORD.

March was characterized by wintry conditions throughout, with an average temperature for the state of 23°, which is about 10° below the normal. The lowest temperature reported was 16° below zero, at Charles City and Cresco on the 7th, and the highest was 75°, at Mt. Pleasant on the 10th and 11th The mean temperature by sections was as follows: Northern section, 19 6°; central section, 25°; southern section, 24.3°.

The average precipitation for the state was 1 62 inches. Average by sections as follows: Northern section, 1 92 inches; central section, 1.20 inches; southern section, 1.73 inches. There were 7 clear days, 12 partly cloudy, and 12 cloudy.

The general weather conditions were wholly unfavorable for farming operations, and scarcely any field work was attempted during the month. At the central station it was the coldest March since the establishment of the service in Des Moines.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30.04 inches; highest observed, 30.69, at Clarinda on the 6th; lowest observed, 29.24, at Dubuque on the 11th; range for the state, 1.45 inches.

Temperature.—Monthly mean, as deduced from 125 reports, was 23°; highest monthly mean 36.2°, at Mt. Pleasant; lowest monthly mean, 1.30°, at Estherville; the highest temperature reported was 75°, at Mt. Pleasant on the 10th and 11th; the lowest temperature reported was –16°, at Charles City and Cresco on the 7th; the average monthly maximum was 56.1°; the average monthly minimum was –6°; the greatest daily range was 47°, at Osceola; average daily range, 35.3°.

Precipitation.—Average for the state, as determined from the reports of 134 observers, 1.62 inches; the largest amount reported was 5 90 inches, at Ridgeway; the least amount was .37 inches, at Monticello; the greatest daily amount reported was 2.03 inches, at Ridgeway on the 18th; average number of days on which .01 inch or more of precipitation was reported, 6.

Wind.—Prevailing direction, northwest; highest velocity reported, 50 miles per hour from the northwest, on the 12th.

Weather.—There were 7 clear days, 12 partly cloudy days, and 12 cloudy days.

Solar Halos.—Alta on the 23d and 30th; Cresco on the 30th; Ridgeway on the 4th, 26th, 27th and 30th.

Sun Dogs.—Atlantic on the 6th and 30th; Cresco on the 11th; Denison on the 6th; Fayette on the 6th; Guthrie Center on the 30th; Lamoni on the 6th; Lenox on the 6th, 12th and 31st.

Auroras.—Cresco on the 6th.

Thunder.—Was heard quite generally in all sections of the state from the 10th to the 17th.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.99	30.59	7	29.26	11
Des Moines	30.05	30.60	7	29.32	11
Clarinda	30.06	30.69	6	29.46	10
Cresco	.....	30.65	7	29.30	11
Dubuque	30.01	30.59	7	29.24	11
Omaha, Neb	30.05	30.56	6	29.52	10
Keokuk	30.00	30.61	7	29.29	11
Sioux City	30.09	30.48	6	29.62	10
Means	30.04	30.69	6	29.24	11

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	7,556	37	SW	12
Des Moines	7,281	35	NW	12
Dubuque	7,419	32	NW	31
Keokuk	7,597	48	W	11
La Crosse, Wis	5,370	30	NW	12
Omaha, Neb	7,536	30	NW	12
Sioux City	10,892	50	NW	12

OBSERVERS' NOTES.

Amana—CONRAD SCHADT. March was extraordinary cold. On two days only, 10th and 11th, did the temperature not fall below the freezing point, and on those two days it came very close to it. The ground is still frozen as in midwinter and no farming whatever could be done. Winter rye seems to be in good condition yet. Winter wheat, which apparently suffered no damage during February, was injured by the cold weather which followed the mild days of 10th and 11th.

Bonaparte—B. R. VALE. A damp, cold and disagreeable month. Bad for feeding and for all stock not well sheltered. Great fatality to young calves and pigs.

Coon Rapids—DOWNS & CO. No seeding or spring work of any kind done yet.

Grinnell—A. O. PRICE. Continued cold and cold winds marks March, '99, as backward. Plenty of frost in ground. Field work, none of importance. Fruit buds damaged badly and strawberries not covered, dead.

Hopeville—M. T. ASHLEY. A very cold month. Many think winter wheat killed.

Ogden—E. SAYRE. Ground froze three to four feet deep. A little snow in lanes and on north sides of buildings.

Ovid—A cold, disagreeable month, with mist, hail, snow and rain in succession and sometimes all together. A furious snow storm commenced about dark on the 29th, and continued until after 3 P. M. on the 30th, the strong northeast wind causing it to drift badly. Twelve years ago a similar storm commenced on the 29th that blockaded the railroads. More than three feet of frost in the ground at commencement of month and none thawed from the top at the close.

Waverly—H. S. HOOVER. March, 1899, was the coldest March in the twelve years of which I have preserved records. March, 1890, was nearly as cold as this month, being 1° warmer. It has been winter, not spring; freezing every day except the 10th and 11th. On the 7th it was 13° below zero, which is the lowest March reading I have.

Ogden—E. SAYRE. At close of March there were snowdrifts on north sides of fences and buildings; little ponds were frozen solid; the ground was frozen three to four feet; a great many potatoes have been frozen; some corn in fields not yet husked. The total snowfall from November 1st to April 1st has been 24.3 inches. Prices of grain at Ogden April 1st: Wheat, 52 cents; corn, 22 cents; oats, 22 cents.

Clinton—DR. LUKE ROBERTS. March, 1899, was the first I have to record with so limited phenomena. There was no fog, solar or lunar halos, thunder and lightning, hail or aurora. Some one or more of this stands to the credit of former March months. The minimum temperature was 3° below zero, occurring on the 6th, and the average minimum for the month was 20.9°. Normal March minimum is .5° above zero, therefore, March, 1899, gave a minimum of 3-5° below normal. The maximum temperature was 63°, occurring on the 10th and 11th. The mean temperature was 28.7°, or 4.1° below normal. But for March in 1888 and 1890, each of which gave a mean temperature of .1° lower, March, 1899, would have beat the record. It was one of the coldest Marches. The warmest day was the 10th, which gave a mean of 51 5°, or .7° above normal. The coldest day was the 6th; mean, 1.7°, or 10.3° below normal. The number of storm days was 8, giving a precipitation of 1.90 inches. Total depth of snowfall, 7 inches. The greatest precipitation during any 24 consecutive hours was .90 of an inch of water, occurring on the 17th. Most of the storms were mixtures of rain and snow. The number of cloudy days was 20, being in excess of any previous March, and were above normal. Only 4 clear days, being 5 below normal. The per cent of cloudiness was 61, being 9 per cent above normal. The prevailing wind was west; the northwest being nearly the same. Maximum velocity was 26 miles an hour, occurring on the 12th; total movement, 5,340 miles, or 675 miles below normal.

With so little sunshine and warmth and the ground unprotected with snow, the frost, which had penetrated to the depth of 4 to 6 feet, is scarcely less in depth at the close of the month than at its commencement. It will be many days yet before any plowing can be done and several weeks before stock can find grazing.

The steamboat Reindeer was the first boat to pass through the drawbridge for this season on its trip south at 6:30 A. M., on the 27th. The steamboat Artemus Gates passed up at 8:45 the same morning. The packet Verne Swain came up from Davenport at 2 o'clock P. M., the 28th, as her initial trip for the season, but new formed ice prevented her from returning the next morning.

BELATED REPORTS.

Corning—FEBRUARY—Mean temperature, 15.5°; mean maximum temperature, 26.7°; mean minimum temperature, 4.3°; total precipitation, .40 inches; greatest in 24 hours, .40 on the 26th; total snowfall, 4.5 inches; prevailing wind direction, northwest; number of clear days, 15; partly cloudy, 6; cloudy, 6; rainy, 1.

Garden Grove—FEBRUARY—Mean temperature, 15°; mean maximum temperature, 25.2°; mean minimum temperature, 4.7°; total precipitation, .27 inches; greatest in 24 hours, .22 on the 25th; total snowfall, 2.8 inches; number of clear days, 11; partly cloudy, 10; cloudy, 7; rainy, 2; prevailing direction of wind, northwest.

Rock Rapids—FEBRUARY—Mean temperature 3.1°; mean maximum temperature, 12.8°; mean minimum temperature, 6 6°; total precipitation, 35 inches; greatest in 24 hours, .30 on the 25th; total snowfall, 3.5 inches; number of rainy days, 2.

Fayette—FEBRUARY—Mean temperature, 9.2°; mean maximum temperature, 19.3°; mean minimum temperature, .9°; total precipitation, 1 83 inches; total snowfall, 14 7 inches; greatest amount in 24 hours, .78 on the 25th and 26th; number of clear days, 10; partly cloudy, 14; cloudy, 4; rainy, 8; prevailing direction of wind, northwest.

ERROR IN JANUARY REVIEW.

College Springs—Maximum temperature should have been 53° on the 21st.

Observations in Des Moines on April 8, 1899, showed that the temperature of hydrant water was 39°, which is 5° lower than on the corresponding date last year. The water had passed through the mains a distance of two miles from the waterworks, and the temperature was practically that of the ground at the depth of about six feet.

CLIMATOLOGICAL DATA FOR IOWA, MARCH, 1899.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES				SKY.				Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).	Number rainy days.	Number clear days.	Number partly cloudy days.	Number cloudy days.	
Algona*	Kossuth	1,500	7	18 0	-13	38	8,10,24	-11	6	..	2.47	84	1.15	16.0	6	6	16	9	N W
Alta	Buena Vista	1,519	8	19.0	-11	45	8	-9	6	36	1.58	-.31	.60	17.3	11	7	14	10	NW
Alta (near)	Buena Vista	....	..	....	.....	....	.....	....	.....	....	1.88	.....	.60	18 0	9	....	....	....	.....
Britt	Hancock	1,230	....	18.2	...	40	8, 10	-10	6	37	2.06	.....	.60	10.6	10	2	23	6	NW
Bancroft c	Kossuth	.	....	18.4	....	43	11	-11	6, 23	37	....	.....	.30	8.5	6	6	13	12	NW
Charles City	Floyd	1,012	8	20.5	-10	41	11	-16	7	34	1.56	-.02	1.00	5.0	7	4	20	7	N
Clear Lake	Cerro Gordo	984		23.8	.....	58	9	-10	11	40	....	.....	....	....		13	6	12	NW
Cresco	Howard	1,312	27	16.9	-9	41	11	-16	7	37	2 34	1.01	1.20	10.0	11	7	13	11	NW
Decorah	Winneshiek	900	6	19.9	-12	43	11	-15	7	35	3.51	2.03	1.10	15.5	11	...	....	...	NW
Dows	Wright	.....	....	20 4	.....	52	11	-10	6	34	1.48	.....	.40	.....	13	13	6	12	NW
Eagle Grove †	Wright	.....		21.0	....	....	.....	....	.....	....	.....	.....	.....	.....	..	..	..	..	.....
Elkader	Clayton	....	18	23 8	-7	45	13	-13	7	41	1.69	-.09	58	5.0	6	14	10	7	N, NW
Estherville d	Emmet	.....	....	13.0	....	38	29	-14	6	35	2.20	.....	.70	21.0	6	..	....	....	NW
Fayette †	Fayette	1,000	9	21.8	-9	45	10	-15	7	38	2.22	.12	.81	10.8	11	6	17	8	NW
Forest City	Winnebago	1,220	....	18.6	....	47	11	-11	6	33	3.38	.....	1.10	14.0	12	11	5	15	W
Grand Meadow *	Clayton	.....	8	20.6	-10	36	2, 11	-10	6	..	1.80	-.25	.75	8.8	7	6	11	14	NW
Greene	Butler	943	...	22.0	..	42	11	-15	7	36	1.39	.....	.68	4.0	8	3	20	8	W
Hampton	Franklin	1,240	9	20.9	-8	45	11	-8	6	30	2 05	.04	1.05	4.2	6	2	20	9	NW
Hawkeye	Fayette	....	....	....	.....	..	.....	....	.....	....	1.70	.....	.40	11.5	8	...	...	....	.....
Humboldt	Humboldt	1,082	....	21.6	.....	53	10	-7	6, 23	36	.95	.....	.48	8.7	6	11	10	10	NW
Lansing	Allamakee	.....	...	23.7	.....	45	9	-14	7	32	2.68	....	.87	13.6	7	5	15	11	.....
Larchwood	Lyon	....	..	....	.....	....	....	....	....	.....	1.31	.....	.25	11.5	9	8	12	11	NW
Larrabee	Cherokee	.....	8	18 8	-12	48	8	-11	22	36	1 40	-.48	55	14.2	9	8	14	9	NW
Le Mars	Plymouth	1,221	...	20.8	..	49	8	-7	6	34	1.24	....	43	12.0	5	15	6	10	N
Mason City	Cerro Gordo	1,130	5	18.7	-12	42	11	-15	7	33	1 80	.61	.50	....	5	...	....	....	N
New Hampton	Chickasaw	1,166	...	20 8	....	42	11	-13	7	28	1.61	.. ....	1.00	6.0	7	6	15	10	NW
Northwood	Worth	1,210	....	18.9	....	40	11	-10	6	28	2.83	.....	.79	14.0	7	20	3	8	NW
Osage	Mitchell	1,178	8	19.2	-9	44	11	-10	7	31	2.13	.68	.77	7 5	10	2	9	20	NW
Plover	Pocahontas	.....	....	20.6	.....	48	8	-8	6	45	1.35	.....	.50	11 5	6	13	4	14	NW
Primghar	O'Brien	.....	..	16.0	.....	40	5, 25	-10	6	37	2.75	.....	1 00	.....	4	11	0	20	NW
Ridgeway	Winneshiek	.....	....	22.7	....	43	9	-9	6, 7	33	5.90	.....	2.03	20.0	10	4	13	14	NW
Ruthven	Palo Alto	.....	..	16.3	....	39	11	-12	6	32	1.65	.....	.6 0	16 5	5	15	5	11	NW
Sheldon	O'Brien	.....	..	18.0	.....	44	8	-11	23	33	.65	.....	.25	5 6	12	10	5	16	NW
Sibley b	Osceola	1,509	6	17.1	-13	46	8	-13	23	35	1.42	.25	.50	12.5	6	10	9	12	NW
Spencer	Clay	.	....	17.7	.....	46	24	-12	6	39	1.29	.....	.57	9.7	8	5	14	12	N
Storm Lake	Buena Vista	.....	...	18.8	....	43	10, 11	-8	6	30	1.02	.....	.40	10 0	10	7	15	9	NW
Washta	Cherokee	.....	....	...	.....	..	... ..	...	.....	.....	1.55	.....	.75	11.0	4	12	13	6	NE
Waverly	Bremer	942	....	23.6	.....	47	11	-13	7	35	1.76	.....	.95	4.8	9	2	18	11	NW
West Bend *	Palo Alto	.....	6	18.1	-12	42	8	-9	6	.....	1.53	-.17	.50	14.0	6	8	12	11	NW
West Union	Fayette	1,105	....	.....	...	...	.....	....	.....	.....	.85	.....	.30	8.5	5	11	0	20	NW
Average		.....	...	19.6	-10	44.2	.....	-11.2	.....	33.5	1 92	.27	.....	11 2	8	8	11	12	NW

CENTRAL SECTION.

Amana	Iowa	.....	23	27.0	-4	61	10	-8	7	30	.63	-1.35	.28	T	6	6	12	13	N
Ames	Story	936	19	25.0	-7	62	10	-7	6	36	.49	-.90	.40	2.5	4	1	9	21	.....
Audubon	Audubon	....	6	24.6	-9	62	10	-3	6	39	1.20	- 66	.60	12 0	3	0	19	12	NW
Belle Plaine	Benton	840	9	26.7	-5	62	10	-7	7	38	1.42	- 65	1.00	1.8	6	4	21	6	SE, NW
Carroll	Carroll	.....	9	22 4	-9	67	10	-7	6	40	1.89	-.59	1.25	17.0	5	14	6	11	.....
Cedar Falls	Black Hawk	844	8	22.6	-10	48	10	-9	7	39	1.45	.03	1.20	2.5	3	8	11	12	NW
Cedar Rapids	Linn	744	17	26.8	-6	64	10	-5	7	29	.53	-1.73	.28	.8	5	8	5	18	NW
Clinton	Clinton	609	8	29.0	-8	63	10, 11	-3	7	30	1.89	-.66	.90	7.2	7	4	7	20	NE
Coon Rapids c	Carroll	....	....	24.4	....	62	10	-4	6	36	.81	.....	.45	3.8	3	11	13	7	NW
Davenport	Scott	578	27	29.0	-6	64	10	-2	7	30	1.94	-.30	1.04	5.7	10	2	4	25	NW
Delaware	Delaware	1,084	8	23 4	-8	50	11	-11	7	35	1.16	-.65	.48	3.5	6	9	10	12	NW
Denison	Crawford	1,192	6	22.3	-4	64	10	-5	6, 7	36	1 00	-.74	.50	4.5	6	14	8	9	N
Des Moines	Polk	867	21	27.9	-7	65	10	-1	6	36	1.04	-.44	.70	2.8	8	1	21	9	N
De Soto	Dallas	886	....	27.4	....	66	10	0	6, 7	35	.84	.....	.48	3.4	5	8	15	8	NW
Dubuque	Dubuque	614	26	25.8	-7	56	10	-4	7	27	1.52	-.74	.57	6.1	9	7	11	13	NW
Eldora	Hardin	1,153	....	21.4	.....	56	10	-10	7	37	1 45	.....	.50	4.5	6	0	28	3	NW
Galva	Ida	.	6	21.6	-12	57	10	-5	6	33	1.43	.16	1.18	.....	2	16	11	4	NW
Grinnell	Poweshiek	1,011	9	26.0	-7	60	10	-3	6, 7	31	1 23	-.35	.90	.5	4	3	11	17	N
Grinnell (near)	Poweshiek	.....	....	26.0	....	61	10	-5	7	34	1.46	.....	.85	.....	7	6	8	17	NW
Grundy Center	Grundy	966	8	22.6	-9	58	10	-9	7	35	1.31	-.02	.80	1.0	4	2	12	17	N, NW
Guthrie Center	Guthrie	....	....	24.0	.....	55	9	-2	6, 7	40	.72	.....	.60	6.2	3	6	20	5	NW
Harlan	Shelby	.....	....	25 4	....	65	10	-3	6	45	.75	.....	.64	3.9	3	4	17	10	NW
Independance	Buchanan	921	37	22.6	-7	47	11	-12	7	28	1.02	- 72	.65	3 8	5	9	14	8	NW
Iowa City	Johnson	644	9	28.6	-6	65	10	-3	6	30	1.43	-.96	.51	1 5	5	9	14	8	NW
Iowa Falls	Hardin	.....	6	22.4	-10	52	10	-8	7	33	1 50	.24	.70	6.0	6	5	12	14	NW
Le Claire	Scott	....	...	.....	.....	...	.....	.....	.....	.....	1.63	.....	.90	.....	6	...	...	...	.....
Logan	Harrison	928	34	20.7	-13	54	10	-3	6	33	30	-.57	1.10	13.0	2	12	10	9	N
Maquoketa	Jackson	....	6	31.8	-4	60	11	-3	6	33	.65	-1.79	.42	3.0	4	12	8	11	NW
Marshalltown	Marshall	898	7	25.6	-6	62	10	-4	6, 7	38	1.56	.02	.83	2 0	6	8	14	9	NW
Monticello	Jones	800	45	26.4	-5	57	10	-9	7	34	.37	-2.02	.37	T	1	12	15	4	NW
Mt. Vernon*	Linn	858	....	26.6	.....	66	10	-8	7	.....	.50	.....	.30	.....	3	....	....	.....	.....
Mt Vernon (Hubbard)	Linn	.....	....	27.2	.....	61	10	-8	7	30	.97	.....	.35	3 7	6	9	1	21	NW
Newton	Jasper	958	12	26.8	-7	62	10	-3	6, 7	35	.74	-.61	.64	1 5	4	2	22	7	NW
Odebolt	Sac	.....	....	23.6	.....	61	10	-4	7	37	.72	.....	.28	6.0	5	9	14	8	.....
Ogden	Boone	1,109	....	24.4	.....	63	10	-5	7	38	1.36	.....	.50	9.3	5	12	0	19	NW
Olin e	Jones	.....	...	26.5	.....	59	10	-7	7	29	.93	.....	.46	3.2	6	9	16	6	NW
Onawa	Monona	....	....	25.8	.....	63	10	-5	6	42	.91	.....	.29	9.8	9	9	14	8	NW
Parnell d	Iowa	...	....	27.6	....	50	24	-7	6	33	.....	... ...	.....	.....	....	....	....	....	.....
Rockwell City	Calhoun	1,219	....	21 8	...	60	10	-6	6	37	1.62	.....	.70	18.0	9	22	4	5	.....
Sioux City	Woodbury	1,122	10	22.0	-9	53	8	-8	6	36	.55	.....	.27	.....	7	8	10	13	NW
Sac City	Sac	900	20	20.8	-10	57	10	-6	6	31	1.61	.....	.50	14 1	9	7	9	15	NW
Scranton g	Greene	.....	...	26 6	.....	60	10	2	23	38	1.16	.....	.53	5.0	4	....	....	...	N
Tara	Webster	1,159	...	21.4	.....	52	28	-5	5, 6	42	.60	.....	.40	6.0	3	0	31	0	NW
Toledo	Tama	.....	5	26.0	-9	60	10	-10	7	33	1.66	.33	.88	2.0	5	5	0	26	NW
Vinton b*	Benton	800	9	25.9	-6	56	10	-7	7	.....	2.13	.44	1.20	4.2	6	17	3	11	NW
Waterloo	Black Hawk	862	20	23.4	-10	50	10	-9	7	35	2.23	.85	1.25	3.2	11	6	14	11	NW
West Branch	Cedar	708	....	23.1	.....	63	10	-4	8	40	.87	.....	.42	.....	4	6	9	16	NW
Whitten * d	Hardin	....	....	23.6	.....	58	10	-4	6	.....	.81	.....	.81	1.0	1	10	16	5	NW
Wilton Juncton	Muscatine	....	....	30.1	....	66	11	-5	7	31	1.54	.....	.73	5.0	6	3	5	23	NW
Average		.....	...	25 0	-8	59.1	.....	-5.5	.....	34.7	1.20	-.58	....	5 3	5	7	12	12	NW

CLIMATOLOGICAL DATA FOR IOWA, MARCH, 1899—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIPITATION, INCHES.				SKY.				
				Mean.	Departure from the normal.	Greatest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).	Number rainy days	Number clear days.	Number partly cloudy days.	Number cloudy days.	Prevailing direction of wind.
Afton	Union	....	....	28 2	.....	65	10	-1	6, 7	39	1.25	....	.69	2.0	4	2	13	16	NW
Albia	Monroe	945	...	30.6	.....	65	10	-5	7	41	2.02	.....	.72	9 0	7	4	12	15	NW
Atlantic	Cass	....	8	26 4	-7	66	10	-1	6	39	1.24	-.61	.91	7.0	4	....	....	....	NW
Batavia	Jefferson	640	...	....	....	....	.....	.....	.....	.....	.87	.....	.34	1.1	6	....	....	....	.....
Bedford *d*	Taylor	....	...	28 3	.....	68	10	0	6, 7	42	2.68	.....	1.22	4.0	5	4	19	8	NW
Belknap	Davis	857	...	29 6	....	61	10	-1	7	35	3.10	... .	.80	17.5	10	12	11	8	NW
Bonaparte	Van Buren	....	8	30.4	-8	66	10	-2	7	44	3.08	.20	.85	10.0	8	....	....	....	.....
Burlington	Des Moines	526	...	.....	.....	.....	.....	.....	.....	...	3 83	....	.93	14.0	9	2	16	13	W
Centerville	Appanoose	1,013	6	31 8	-9	63	9, 10	-2	7	37	1 05	-.90	.50	6.5	4	4	18	9	NW
Charlton	Lucas	1,030	...	28 2	.....	64	10	-3	7	37	1.42	.....	.57	6.2	7	1	21	9	N
Chillicothe	Wapello	645	...	.....	.....	.....	.....	.....	.....	.....	2.10	.....	1.00	7.0	5	....	....	....	.....
Clarinda	Page	1,069	9	28.6	-6	68	10	1	6	39	2.68	-.97	1 10	10.5	6	8	12	11	NW
Corning	Adams	1,127	7	28.0	-9	66	10	0	6	38	1.77	.05	1.57	11 0	2	10	3	18	NW
College Springs	Page	....	8	28 3	-9	67	10	0	6	39	2.44	.64	1.21	6.0	8	10	14	7	NW
Council Bluffs	Pottawattamie	989	...	27.6	....	68	10	1	6	41	.72	.....	.50	5.5	5	7	15	9	NW
Danville	Des Moines	715	...	.....	.....	.....	.....	.....	.....	.....	2.94	.....	.90	8.0	10	9	8	14	.....
Eldon	Wapello	....	...	31 2	.....	66	10	-1	7	34	1 36	.....	.42	11.8	10	8	7	16	NW
Emerson	Mills	....	...	.....	.....	.....	.....	.....	.....	.....	.50	.....	.40	5.0	2	....	....	....	.....
Fairfield	Jefferson	767	13	30.0	-4	65	10	-3	7	32	1.64	-.48	.45	6.0	6	8	7	16	.....
Ft. Madison*	Lee	516	51	32.2	-6	65	10	3	7	.....	3.47	.70	.95	7.5	10	1	9	21	NE, NW
Garden Grove	Decatur	....	...	28 5	....	67	11	-4	7	34	.98	....	.70	7.0	2	2	15	14	NW
Glenwood	Mills	979	29	27.7	-5	70	10	0	6	42	.66	-.71	.60	6.6	3	2	17	12	NW
Greenfield	Adair	....	8	26 3	-8	66	10	-5	7	34	1.57	-.83	1.00	6.2	5	....	....	....	N
Hedrick *b*	Keokuk	.....	...	29 2	.....	64	10	-3	7	35	1.17	.....	.40	4.6	7	....	....	....	NW
Hopeville	Clarke	.....	8	27.6	-7	63	10	-1	7	38	1.35	-.37	.65	.....	4	2	17	12	NW
Indianola *a*	Warren	....	7	27.8	-9	64	10	-2	7	38	1.06	.13	.68	1.7	5	....	....	....	NW
Keokuk	Lee	618	28	32 7	-5	70	10	0	7	31	2.66	.45	.79	11.3	12	5	11	16	NW
Keosauqua	Van Buren	....	7	31.2	-8	65	10	0	7	34	3.15	.66	1.14	14.1	10	....	....	....	.....
Knoxville	Marion	....	6	28.9	-8	63	10	0	6, 7	36	1.31	.04	.70	3.5	5	6	7	18	NW
Lamoni c	Decatur	....	....	30.0	.....	65	10	0	7	37	2 89	.....	.82	1.4	10	....	....	..	NW
Lenox	Taylor	.....	..	27.4	.....	63	10	-2	6, 7	37	1.28	.....	.52	2.7	6	12	10	9	NW
Lockridge	Jefferson	....	..	.....	.....	.....	.....	.....	.....	.....	1.75	.....	.72	8 0	4	8	2	21	.....
Melrose	Monroe	853	...	.....	.....	.....	.....	.....	.....	.....	.82	.....	.50	7.0	5	1	19	11	SE
Mooar	Lee	....	...	32 0	...	65	10	-1	7	33	3.16	.....	1.00	15.0	10	10	3	18	NW
Mt. Ayr	Ringgold	1,236	6	28.2	-8	64	10	-1	7	38	1 64	- 49	.67	7 2	7	0	20	11	NW
Mt. Pleasant	Henry	725	...	36.2	....	75	10, 11	-1	7	41	1 86	.....	1 05	4.0	5	12	12	7	.....
Omaha (Neb)	Douglass	....	....	26.8	....	68	10	-2	6	38	.64	.. ....	.40	5.4	10	3	12	16	NW
Osceola	Clarke	1,123	...	27 8	....	65	10	-1	6, 7	47	86	.. ....	.38	4.0	5	6	9	16	N
Ovid	Wayne	....	6	28.8	-8	63	10	-2	7	38	2.07	-.12	.56	8.8	12	4	5	22	NW
Oskaloosa	Mahaska	850	16	28 6	-5	64	10	-2	7	36	.71	-1 27	.30	4.2	4	3	4	24	NW
Ottumwa	Wapello	630	5	30.4	-9	64	10	1	6	39	.82	-1 28	.60	7.4	4	3	13	15	NW
Pacific Junction *g*	Mills	960	....	26.7	.....	69	10	7	13	39	.75	... .	.60	7.5	....	....	....	....	NW
Pella	Marion	....	....	25.1	....	60	10	-6	7	42	1 04	.....	.72	1.0	6	6	18	7	NW
Red Oak	Montgomery	1,033	..	29 5	.....	69	10	1	6	41	1 23	.....	.97	.....	4	15	2	14	N
Sigourney	Keokuk	....	..	26.1	.....	66	10	-7	7	38	1.41	.....	.34	6.8	7	4	22	5	NW
Stuart	Guthrie	.....	..	23.8	.....	55	9	-5	6	37	85	.....	.60	6 6	4	....	..	....	N
Thurman	Fremont	....	..	28 6	....	69	10	1	7	37	2 38	.....	1.25	20.6	8	2	7	22	NE, NW
Villisca	Montgomery	1,058	6	29.6	-6	67	10	0	6	45	2 10	-.01	1.50	12 0	3	11	10	10	SE
Washington	Washington	738	8	27.4	-8	65	10	-6	7	32	1.28	-.97	.35	5.0	6	....	....	....	NW
Wapello	Louisa	578	..	30 8	.....	63	11	-3	7	30	2 20	....	.60	8.0	9	6	13	12	NW
Winterset	Madison	....	8	27.4	-6	64	10	-1	7	38	1 62	-.21	1.15	.....	4	....	..	....	.....
Woodburn	Clarke	....	..	....	....	..	.... ..	....	.....	.....	1.53	.....	.76	5.4	6	7	14	10	.....
Average		....	..	24.3	-9	65 1	.....	-1.3	.....	37.7	1 73	-.25	....	7.4	6	6	12	13	NW
Av. for the state		....	....	23 0	-9	56 1	.....	-6 0	.....	35.3	1.62	-.18	.....	8.0	6	7	12	12	NW

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

STATIONS.		DATE.																														Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
fton	Max.	40	44	40	34	31	12	24	51	56	65	60	31	42	31	37	32	33	32	30	36	37	28	37	57	43	32	29	32	38	32	30	37.3
	Min.	12	23	27	11	12	-1	-1	12	33	39	30	17	16	29	24	16	28	21	17	12	23	16	11	27	33	25	15	18	17	17	15	19.1
lbia	Max.	38	51	46	48	43	19	25	49	54	65	62	39	40	45	40	35	35	39	36	54	54	32	34	50	46	47	32	34	39	32	35	41.9
	Min.	8	23	30	19	12	0	-5	12	29	38	33	21	21	29	27	16	25	24	16	13	14	20	11	22	30	27	17	16	18	17	13	19.2
lta	Max.	28	38	24	26	12	5	24	45	36	42	30	27	32	32	25	22	23	22	22	19	30	18	23	42	32	22	24	28	28	26	26	26.9
	Min.	4	19	8	4	5	-9	-2	14	31	30	26	18	8	16	16	4	16	11	6	1	16	0	-4	6	28	17	7	10	13	9	12	11.0
mana	Max.	32	40	36	33	28	10	19	38	45	61	54	40	37	34	35	35	34	33	32	30	36	30	29	43	40	36	32	31	35	31	32	34.9
	Min.	2	15	31	20	10	-1	-8	11	26	35	36	23	14	28	27	19	29	27	18	14	23	21	11	17	30	26	18	18	16	21	18	19.2
mes	Max.	30	35	33	32	25	9	23	48	45	62	55	34	38	34	35	33	32	31	26	29	29	25	26	48	40	31	25	29	29	30	29	33.2
	Min.	5	15	25	15	7	-7	-3	12	33	34	32	21	10	30	20	11	26	18	13	8	20	12	6	20	28	23	14	19	18	18	17	16.7
tlantic	Max.	40	43	35	37	23	9	25	55	58	66	37	30	40	35	35	30	33	30	29	33	34	35	31	48	43	30	29	33	33	31	30	35.5
	Min.	13	21	22	17	10	-1	0	16	24	39	20	11	3	32	19	14	27	18	17	10	23	15	10	23	30	21	17	16	16	18	16	17.3
udubon	Max.	36	40	31	32	19	9	25	54	52	62	52	26	34	36	34	30	31	27	25	28	32	28	28	49	40	30	25	32	30	28	29	33.4
	Min.	13	17	20	14	10	-3	-2	15	30	36	26	16	13	32	15	11	23	15	12	5	20	6	6	20	28	18	13	14	15	17	14	15.8
ancroft	Max.	..	..	..	28	12	6	33	42	41	40	43	25	32	31	25	27	27	21	20	19	26	19	21	42	38	26	31	24	28	26	28	27.6
	Min.	..	..	..	0	4	-11	-7	12	19	30	27	15	4	25	13	7	17	8	3	0	18	2	-11	5	26	12	4	8	7	4	14	9 1
elknap	Max	36	40	38	34	27	6	24	49	58	61	44	32	44	37	32	34	36	33	35	37	40	31	35	48	46	37	32	32	38	27	30	34.5
	Min.	14	31	32	24	18	3	-1	14	32	42	41	23	23	30	30	21	28	27	18	16	18	22	15	25	32	29	20	18	22	20	13	22.6
elle Pl'ne	Max.	34	44	37	33	24	11	25	41	45	62	55	35	33	36	35	38	33	33	30	28	37	30	29	50	40	35	34	32	34	32	28	35.2
	Min.	5	11	29	17	10	-3	-7	10	27	38	35	22	18	28	25	17	25	26	16	11	23	19	10	12	30	26	17	18	15	18	17	18.2
onaparte	Max.	35	48	39	33	31	11	22	43	58	66	62	39	40	35	41	41	37	35	37	33	40	33	35	48	45	39	32	32	38	32	30	38.4
	Min	14	31	33	27	11	3	-2	13	14	40	39	26	23	30	30	24	27	29	21	18	26	23	16	25	31	30	22	18	22	21	12	22 5
ritt	Max	22	32	33	32	10	3	19	40	39	40	32	21	33	33	23	34	29	20	19	20	28	21	30	39	30	22	30	22	25	25	26	26.8
	Min	0	7	10	7	4	-10	-9	10	28	31	30	15	5	24	12	8	17	9	0	2	15	5	-8	8	24	14	3	11	6	5	15	9.6
edford	Max.	34	48	34	38	25	15	24	53	58	68	62	34	44	40	40	33	36	34	39	34	31	..	...	..	..	34	32	38	38	38	37	38.5
	Min.	15	30	28	17	10	0	0	13	28	34	20	16	6	32	22	20	22	20	19	14	18	..	...	..	..	19	16	18	20	18	14	18.1
arroll	Max.	30	44	32	35	12	5	25	54	47	67	61	26	36	32	25	27	29	25	25	27	35	28	34	46	34	28	25	32	30	29	29	32.7
	Min	4	13	14	8	4	-7	-5	14	30	30	26	14	15	20	15	6	3	12	6	0	15	5	-3	28	25	15	10	9	20	14	12	12.0
edar Falls	Max	33	35	37	33	22	6	10	36	38	48	20	20	33	35	36	34	36	36	30	29	30	28	27	41	36	30	30	27	31	32	30	30.6
	Min	-6	9	27	13	8	-6	-9	10	20	20	10	10	20	20	25	15	24	26	13	15	18	16	7	21	25	20	15	19	19	15	18	14.7
edar Rap	Max.	31	38	36	32	26	9	18	40	43	64	57	41	37	35	36	35	34	35	31	27	35	29	27	42	39	35	31	29	35	31	32	34 5
	Min	4	13	30	22	9	-8	-5	13	25	35	37	20	16	28	25	20	29	27	18	13	21	20	12	16	30	23	19	19	19	20	19	19.2
enterville	Max	35	54	52	32	32	22	22	50	63	63	60	40	42	35	42	33	34	33	45	40	42	32	51	56	36	38	38	32	36	34	30	40.5
	Min	13	30	31	21	16	3	-2	13	33	42	34	20	22	30	28	10	28	26	27	15	30	21	26	32	32	30	16	16	20	19	10	23.0
hariton	Max	32	44	34	35	30	11	21	50	55	64	58	33	42	36	39	30	33	34	33	33	36	31	34	50	42	36	31	33	37	31	31	36.7
	Min	10	26	30	19	10	0	-3	13	30	40	32	20	12	29	25	17	27	24	18	12	33	19	12	23	30	25	17	18	19	18	10	19 8
harles Cy	Max.	25	32	31	27	23	10	15	30	35	38	41	35	30	32	34	29	30	29	24	19	26	24	19	36	35	29	24	21	24	26	27	27.7
	Min	-9	22	23	14	6	-13	-16	9	15	33	32	17	10	26	23	13	22	19	10	4	14	12	3	10	28	19	10	16	12	11	17	13.3
larinda	Max.	33	48	33	39	27	11	24	54	60	68	49	31	43	40	39	31	37	33	35	37	37	30	36	47	44	34	29	36	37	34	32	37.7
	Min	15	26	27	18	10	1	3	15	27	43	19	15	9	34	22	20	28	21	17	15	20	17	14	26	31	24	18	16	21	18	16	19 5
lear Lake	Max.	25	31	30	29	30	5	17	37	58	36	40	48	32	30	32	49	36	32	22	18	32	23	26	43	37	36	25	28	24	30	25	36.0
	Min	0	20	14	9	1	-10	12	10	28	30	26	10	12	16	14	9	8	2	10	3	14	9	7	7	23	15	11	12	8	10	15	11 5
linton	Max	31	41	36	32	31	5	20	39	52	63	53	41	36	35	39	32	35	37	35	32	46	32	31	38	45	42	36	41	37	29	35	37.0
	Min	7	29	32	26	13	0	-3	12	23	33	40	20	14	25	31	26	29	28	22	15	21	23	15	15	32	26	22	19	14	22	17	20.9
ollege Sps	Max.	35	48	35	36	29	11	25	52	57	67	59	29	40	38	34	33	36	34	34	35	37	35	37	48	46	32	27	38	38	30	32	37.6
	Min	13	24	27	16	10	0	1	15	27	42	20	15	13	32	22	19	26	21	17	14	23	15	12	25	32	22	16	19	22	17	11	19.0
orning	Max.	35	46	35	38	33	13	23	52	56	66	41	32	42	42	32	30	34	32	35	34	37	30	32	47	46	32	30	36	35	32	32	37.0
	Min	15	23	25	17	12	0	1	14	27	41	21	17	10	32	24	10	18	21	17	12	28	17	12	26	32	25	16	18	22	18	18	19.0
oon Rap	Max	..	..	..	32	22	11	25	51	47	62	57	29	35	34	34	26	32	28	24	28	29	27	25	45	42	30	24	30	28	28	28	32.6
	Min	..	..	..	13	9	-4	-1	15	31	34	27	17	18	30	19	10	23	16	11	5	19	9	3	19	28	21	13	15	16	18	16	16.1
o. Bluffs	Max.	37	45	39	38	24	16	26	58	61	68	33	32	49	40	30	30	33	28	33	34	34	26	34	57	44	30	30	38	35	34	34	37.1
	Min	15	21	20	15	7	1	7	17	30	32	19	15	15	32	17	18	22	18	15	12	18	12	12	27	30	22	18	18	20	20	17	18.1
resco	Max.	23	35	31	26	19	0	16	32	37	34	41	33	27	29	34	32	29	32	25	17	25	26	17	34	30	27	23	18	22	25	25	26.3
	Min	-7	19	17	12	-2	-11	-16	7	20	31	32	10	3	23	18	13	23	11	4	-1	11	6	-4	-3	18	8	2	8	3	-1	7	7.5
avenp'rt	Max.	33	43	38	37	33	9	18	39	54	64	63	33	35	35	41	30	37	36	34	28	45	31	31	42	44	39	34	29	36	27	31	36.4
	Min.	11	30	33	26	9	0	-2	14	29	35	33	22	19	27	29	24	29	29	19	17	25	22	16	20	32	25	22	18	21	21	17	21.7
ecorah	Max.	28	37	36	32	21	0	19	35	39	35	43	34	33	32	36	38	35	36	23	25	28	28	22	29	34	30	28	24	25	30	29	29.8
	Min.	-7	12	23	15	2	-9	-15	8	14	31	33	13	5	22	23	15	22	18	9	2	12	13	2	-1	27	8	6	11	5	2	13	10.8
elaware	Max	29	37	35	31	29	6	17	35	42	44	50	45	31	32	35	34	31	32	29	22	32	29	24	35	35	33	29	26	28	29	31	31.5
	Min.	-6	10	27	18	6	-7	-11	6	21	31	36	18	9	24	25	18	27	22	15	9	15	17	9	10	29	21	15	16	15	14	17	15.4
enison	Max	38	39	39	38	13	5	27	51	45	64	32	25	33	33	25	27	28	21	23	26	30	17	27	47	34	24	25	32	30	28	28	30.8
	Min	14	17	10	8	7	-5	-5	15	25	34	24	15	11	31	15	9	24	9	9	4	18	5	-1	23	28	18	9	16	14	14	14	13.8
es Moines	Max	32	44	34	36	25	8	22	51	53	65	59	29	38	36	36	33	35	32	31	31	35	27	32	50	45	33	30	31	34	34	30	35.8
	Min	10	16	25	19	6	-1	1	15	34	40	24	23	21	32	20	16	29	22	16	14	23	17	12	25	31	22	17	22	20	21	20	19.7
e Soto	Max.	36	47	34	35	22	9	24	51	55	66	57	30	38	36	36	37	33	31	28	30	35	25	34	54	44	33	31	31	35	32	32	36 2
	Min	10	14	28	16	9	0	0	16	28	38	27	20	20	32	20	14	28	20	15	11	23	15	10	23	29	22	16	20	17	20	18	18.7
ows	Max.	27	27	30	29	25	8	17	42	38	51	52	23	31	32	33	17	29	27	24	22	25	23	21	42	31	33	29	24	24	27	27	28.9
	Min	-1	13	18	13	5	-10	-8	10	25	31	30	17	6	27	17	5	23	13	5	3	15	8	15	8	6	13	7	16	14	13	15	12.0
ubuque	Max	29	38	40	32	27	6	14	38	44	56	56	37	32	34	37	35	33	33	31	32	34	28	25	38	38	37	31	26	30	30	32	33.0
	Min	4	20	28	23	6	-4	-4	11	27	34	37	17	13	24	29	24	27	26	18	12	18	19	13	14	31	22	18	17	17	18	19	18.6
ldon	Max.	37	50	39	35	31	17	23	49	59	66	60	42	44	36	42	33	35	36	37	35	44	34	38	50	47	39	34	33	39	34	31	39.7
	Min	14	31	33	24	17	1	-1	15	25	42	36	25	24	31	29	22	28	29	20	17	26	23	16	21	32	30	21	18	21	20	13	22.7
ldora	Max.	32	35	32	30	15	8	22	45	42	56	54	29	34	32	30	40	32	32	30	25	30	25	26	32	32	30	28	25	28	30	28	31.3
	Min	-2	12	6	10	7	-7	-10	8	24	28	30	8	9	25	15	9	25	19	9	5	15	10	1	10	15	20	9	14	12	13	9	11.5
lkader	Max.	33	39	42	35	29	7	19	39	44	42	42	25	45	35	41	39	33	39	33	24	32	34	28	41	38	36	33	27	30	31	34	33.7
	Min	-9	13	22	17	5	-6	-13	8	13	33	35	17	9	24	26	18	24	22	13	7	15	15	6	6	30	17	11	13	11	11	17	13 9
stherv'le	Max.	21	27	15	20	10	3	17	35	34	35	..	14	26	29	13	19	24	16	6	20	19	12	15	36	29	11	21	24	38	25	53	21 2
	Min	-4	17	2	-2	0	-14	-11	9	24	27	..	12	-4	20	8	4	12	6	4	-3	9	-2	-10	-1	22	1	0	2	4	3	10	4.8
airfield	Max.	36	41	35	36	32	16	22	45	58	65	57	40	41	36	34	30	35	34	35	32	43	29	32	35	37	32	31	34	33	31	31	37.7
	Min	10	30	30	24	16	1	-3	13	28	40	37	25	22	29	21	22	27	29	25	18	27	22	15	25	30	29	21	21	18	21	14	22.2
ayette	Max.	28	36	37	32	24	3	15	36	40	45	41	38	32	32	34	35	31	34	24	22	30	29	21	38	34	34	26	24	26	29	29	30.2
	Min	10	19	23	20	4	-8	-15	6	18	32	33	17	9	27	26	16	23	24	15	5	16	10	5	6	28	15	9	13	13	9	12	13.5
orest City	Max.	22	34	31	31	26	7	17	38	38	37	47	37	30	30	31	29	30	26	21	12	19	18	21	38	35	29	22	20	24	26	25	27.5
	Min	-2	20	11	6	2	-11	-7	20	28	31	29	13	6	23	13	9	18	8	1	1	10	1	-5	5	25	13	5	9	6	7	9	9.8
alva	Max.	30	40	32	28	26	7	25	48	43	57	45	27	35	34	32	26	23	22	21	24	27	22	28	45	40	30	24	30	28	26	27	30.7
	Min	7	17	12	5	6	-5	-2	15	28	33	23	14	15	30	16	6	18	12	8	4	16	2	-3	12	25	15	10	12	10	12	12	12.4
arden Gr.	Max.	33	39	50	33	36	25	11	24	51	61	67	50	32	44	42	40	35	35	33	35	35	40	35	40	51	49	37	33	35	40	30	38.7
	Min	10	23	29	19	14	0	-4	12	18	29	33	19	17	29	25	19	24	23	14	12	23	18	10	23	30	26	15	16	15	17	9	18.3
lenwood	Max.	37	46	35	36	30	10	35	57	58	70	55	31	37	40	38	29	35	29	33	33	35	31	31	47	48	32	27	37	35	31	33	37.5
	Min	11	24	25	11	9	0	3	15	25	43	19	14	9	33	21	15	26	18	16	11	24	11	11	26	31	21	15	15	20	19	15	17.9
reene	Max.	30	34	31	29	24	12	21	39	37	38	42	35	34	32	33	35	33	30	25	24	27	25	22	38	35	29	25	22	28	28	28	29.8
	Min	-5	21	23	14	4	-7	-15	10	22	30	32	18	11	26	19	12	23	20	11	6	16	13	4	11	28	20	12	18	14	18	18	14.3
reenfield	Max.	40	45	33	36	25	12	26	52	58	66	55	29	40	32	31	19	8	27	16	13	8	20	18	7	20	29	20	14	14	14	19	15	16.1
	Min	10	16	21	14	5	-3	-5	18	32	36	25	12	12	31	35	35	34	33	32	32	30	28	30	28	28	45	41	33	29	37	34	31	31	33.5
rinnell	Max.	29	36	34	30	25	8	17	42	45	60	55	31	21	20	28	24	17	29	24	17	11	20	18	9	18	30	27	16	18	15	18	16	18 4
	Min	6	15	27	17	7	-3	-3	11	32	33	34	21	20	28	24	17	29	24	17	11	20	18	9	18	30	27	16	18	15	18	16	18 4
rin'l (nr)	Max.	30	36	35	30	26	9	20	45	44	61	55	32	36	34	34	34	31	32	30	28	31	30	28	47	42	32	30	30	35	31	32	33.9
	Min	4	13	26	16	8	-2	-5	11	29	33	33	22	18	28	25	17	27	24	17	12	20	19	9	19	30	27	15	19	13	19	15	18.1
rundy C'r	Max.	33	36	33	30	22	4	20	41	39	58	51	32	35	33	32	32	32	31	24	25	24	26	24	44	35	30	34	26	30	30	32	31.5
	Min	-2	9	14	14	2	-6	-9	10	28	31	31	18	13	26	18	12	26	16	12	7	6	16	5	13	27	18	12	17	12	15	12	13 6
uthrie C'r	Max.	38	42	32	36	28	10	38	45	55	48	32	38	38	32	35	33	30	30	33	30	32	30	32	50	32	33	34	33	32	32	31	34.6
	Min	8	10	15	15	10	-2	-2	30	32	36	7	8	8	6	14	10	8	12	8	8	12	10	8	35	8	22	14	14	10	22	16	13.3
arlan	Max.	40	37	37	32	29	10	25	54	54	65	61	28	38	35	35	35	30	26	27	30	33	27	53	47	41	30	26	33	32	30	30	35.2
	Min	8	18	19	12	10	-3	-1	9	28	37	26	14	9	32	19	12	25	11	12	6	20	9	6	22	30	20	13	15	14	17	15	15.6
ampton	Max.	28	33	30	29	19	5	18	40	35	45	34	24	33	33	30	30	32	28	25	24	28	23	20	42	34	25	27	24	25	28	27	28.3
	Min	-2	20	18	14	2	-8	-7	10	29	31	31	16	10	27	13	9	25	13	9	5	15	10	0	32	26	17	10	18	15	13	17	13.5
edrick	Max	34	44	35	34	27	10	24	47	53	64	55	38	39	38	39	38	38	34	28	16	15	21	14	22	30	25	..	32	32	37	33	33	37.2
	Min	9	29	30	21	10	..	-3	12	30	38	35	23	21	35	26	19	24	28	16	15	21	14	22	30	25	..	19	16	18	18	12	21.1
opeville	Max.	35	45	35	34	26	9	22	51	55	63	57	28	43	39	38	34	31	34	32	31	34	37	27	35	48	44	33	19	32	35	30	29	35.8
	Min	12	26	28	18	9	0	-1	13	34	41	22	19	19	32	22	18	27	21	17	13	23	17	13	24	29	23	16	19	20	17	13	19.5
umboldt	Max.	28	34	32	29	24	7	22	46	43	53	50	30	30	33	33	33	27	30	28	28	23	28	23	23	44	38	30	24	27	27	26	27	30.6
	Min	2	24	12	7	7	-7	-6	14	23	31	30	20	1	17	18	8	17	12	8	3	16	17	-7	8	28	18	8	13	13	12	15	12.6
n'pend'ce	Max.	29	36	35	28	23	2	14	34	36	46	47	23	33	33	34	32	32	33	29	21	30	27	23	39	36	29	28	25	28	29	31	29.8
	Min	0	22	25	14	10	-7	-12	7	20	32

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR MARCH, 1899—CONTINUED.

STATIONS.		DATE.																														Total.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Iowa Falls.	Max.	32	35	30	29	20	5	20	41	37	52	48	32	35	32	32	36	34	28	26	25	28	24	23	44	34	27	25	24	28	29	30	30.5
	Min.	-1	17	19	14	3	-7	-8	10	25	32	31	17	17	28	13	10	26	13	10	5	16	10	2	14	27	17	12	18	15	15	20	14.2
Keosauqua	Max.	38	49	35	35	25	16	24	46	59	65	57	41	44	36	41	34	37	36	35	36	45	32	37	48	48	39	33	34	39	32	29	38.9
	Min.	16	32	33	26	16	4	0	15	25	43	39	26	23	31	27	24	27	27	25	18	27	25	15	26	31	30	23	19	22	21	12	23.5
Keokuk	Max.	37	56	38	35	33	14	22	41	58	70	67	34	41	38	36	34	49	33	40	35	50	38	36	50	49	39	31	31	42	34	29	40.0
	Min.	19	33	35	29	20	5	0	10	32	44	42	29	25	33	33	26	30	31	22	19	32	25	16	28	34	32	23	19	24	23	14	25.4
Knoxville	Max.	35	54	36	34	28	12	23	49	54	63	60	35	40	35	33	36	34	32	32	32	35	28	35	51	44	36	31	33	36	33	31	37.1
	Min.	11	21	29	19	12	0	0	13	32	38	33	23	23	30	25	17	29	25	18	13	22	19	11	23	32	28	17	21	21	19	19	20.7
Lamoni	Max.	31	48	37	35	30	10	22	50	63	65	59	30	43	40	41	33	35	39	35	33	42	29	36	48	47	35	31	38	..	..	..	38.5
	Min.	12	30	29	20	12	1	0	13	35	42	30	19	19	31	29	22	26	25	19	7	26	20	13	26	32	28	18	18	..	..	..	21.5
Lansing	Max.	26	37	42	35	30	11	18	36	45	39	41	40	34	34	41	36	36	40	36	24	28	33	27	35	35	36	35	28	30	34	35	33.5
	Min	-6	15	26	17	8	-5	-14	8	13	33	35	18	6	24	25	20	25	24	14	6	14	17	5	3	29	12	11	15	10	6	17	13.9
Larrabee	Max.	28	40	25	27	18	6	25	48	37	39	36	32	32	32	30	27	21	20	21	19	31	20	25	44	36	27	27	32	28	27	28	28.6
	Min.	3	18	7	-2	3	-10	-6	14	26	31	24	16	14	28	6	4	17	4	3	0	14	-11	-10	8	24	15	3	7	8	8	10	8.9
Le Mars	Max.	29	37	32	35	25	9	25	49	45	41	40	29	35	33	35	25	23	21	22	19	30	22	24	42	40	30	26	30	29	29	28	30.3
	Min.	13	14	9	1	4	-7	1	16	27	32	23	13	14	30	13	17	17	8	7	3	16	-1	-4	13	15	13	8	10	15	12	10	11.4
Lenox	Max.	33	44	35	34	31	15	22	49	55	63	58	25	40	38	38	30	33	32	31	33	36	30	34	47	44	33	27	34	36	30	29	36.1
	Min	10	25	26	16	13	-2	-2	12	31	40	24	16	13	32	23	17	27	21	17	12	22	15	12	25	32	24	15	17	22	16	11	18.8
Logan	Max	38	35	32	32	12	10	24	32	52	54	45	26	36	34	25	24	20	23	27	22	32	24	22	18	20	14	22	24	32	29	33	28.2
	Min.	9	12	15	12	4	-3	1	9	19	24	18	8	14	30	20	16	14	20	23	8	22	9	7	9	12	8	14	15	13	14	13	13.3
Maquoketa	Max	37	40	39	37	38	29	43	45	58	53	60	43	51	34	37	35	37	35	33	33	40	39	38	39	41	41	38	34	35	29	35	39.5
	Min	26	31	28	23	16	-3	38	36	40	34	39	13	18	28	29	25	29	27	18	19	28	23	19	15	30	27	19	16	17	19	18	24.0
Marsh'lt'n.	Max.	42	38	37	35	28	8	28	35	47	62	47	28	41	34	25	32	34	35	28	28	33	28	32	48	45	32	28	32	30	32	28	34.2
	Min.	4	12	22	17	6	-4	-4	14	28	40	34	20	17	28	18	10	28	23	16	10	18	12	8	20	24	24	10	17	15	18	18	16.3
Mason City	Max.	23	29	29	29	22	6	17	36	35	37	42	32	28	31	31	28	30	26	25	26	24	24	21	29	33	29	31	22	25	27	27	27.5
	Min.	-10	20	15	7	0	-10	-15	7	21	30	30	15	7	25	15	8	15	14	8	5	0	12	-5	0	25	15	12	12	12	5	11	9.9
Monticello.	Max	31	37	39	31	29	16	16	37	43	57	54	54	36	36	36	35	34	34	39	25	35	31	27	37	37	37	37	30	33	34	33	35.2
	Min.	-1	16	30	22	13	-5	-9	9	21	34	41	20	25	14	27	20	29	25	16	12	18	19	11	13	30	19	17	16	14	15	16	17.6
Mooar	Max	36	52	38	36	34	7	20	37	62	65	62	39	47	39	37	35	29	25	16	12	18	19	11	13	30	19	17	16	14	15	16	17.6
	Min.	17	20	33	21	20	0	-1	15	32	39	50	19	20	30	31	26	28	33	28	19	31	27	9	21	38	26	23	19	20	24	12	23.5
Mt. Ayr	Max	33	45	36	37	29	10	23	50	56	64	60	28	43	40	40	31	34	32	32	33	39	29	35	50	46	33	28	34	38	30	29	37.9
	Min.	11	28	28	17	11	0	-1	12	34	41	24	18	19	32	22	19	26	22	18	13	23	17	12	23	30	25	16	18	20	16	10	19.5
Mt. Ple'sn't	Max.	48	57	48	45	40	38	40	60	58	75	75	45	55	47	57	52	55	50	42	40	58	42	44	52	55	45	40	40	40	40	35	49.0
	Min.	18	33	32	25	8	2	-1	23	25	40	35	27	25	22	22	22	32	29	22	19	39	20	17	27	32	25	25	20	22	23	20	23.8
Mt. Vern., H	Max.	34	41	45	35	26	10	10	35	53	61	47	26	44	33	35	34	34	34	34	31	40	31	29	44	37	43	36	32	36	33	33	35.5
	Min.	4	20	31	22	7	-4	-8	9	28	31	42	18	15	26	27	21	27	27	17	12	21	20	12	15	28	26	17	17	16	19	17	18.8
Newton	Max.	31	39	34	34	24	17	20	46	49	62	59	34	37	38	35	34	33	32	30	31	34	23	30	49	43	36	30	30	34	32	30	34.8
	Min	6	12	26	17	6	-3	-3	11	31	34	33	22	20	30	25	16	28	24	16	12	21	18	9	20	30	25	11	20	18	29	17	18.7
NewH'pton	Max	23	34	30	31	21	5	14	32	38	37	42	36	31	32	33	33	31	30	24	21	26	23	19	36	33	28	23	19	23	28	26	27.8
	Min	-5	21	25	15	5	-10	-13	10	28	31	33	15	8	24	23	14	23	22	10	8	14	14	2	8	28	17	9	14	11	9	17	13.9
Northwood	Max.	26	37	29	28	18	6	18	36	36	38	40	32	32	32	34	30	37	26	23	21	25	23	20	32	33	26	24	23	26	28	29	28.0
	Min.	-2	20	12	6	3	-10	-6	10	25	30	30	13	9	20	10	9	18	11	5	-1	12	8	-2	10	22	12	6	9	8	3	15	9.8
Odebolt	Max.	31	40	33	31	27	9	24	48	47	61	58	39	37	34	33	30	27	24	26	27	30	23	36	47	43	29	28	32	30	27	28	33.5
	Min	1	11	12	12	7	-3	-4	15	28	33	28	22	17	30	20	6	20	13	10	4	17	3	-1	13	28	18	12	12	11	13	13	13.6
Ogden	Max.	31	34	34	34	30	10	24	50	47	63	35	32	35	33	33	30	32	31	26	26	30	25	27	49	40	30	25	30	30	32	31	32.9
	Min.	5	15	21	15	10	-4	-5	12	27	32	31	31	9	30	22	9	24	17	10	6	19	11	3	20	28	22	12	16	17	17	12	15.2
Olin	Max.	30	40	38	32	27	5	17	38	44	59	55	25	35	34	38	37	34	33	32	27	42	..	..	..	..	..	32	29	33	29	33	33.7
	Min	2	13	30	23	13	-3	-7	10	22	30	43	25	15	26	28	23	25	27	18	13	23	21	12	15	27	27	18	17	16	19	18	19.3
Omaha	Max.	36	42	34	34	26	9	23	57	58	68	36	31	39	40	34	28	33	25	31	32	32	24	32	48	45	30	26	34	31	31	32	34.9
	Min.	15	22	20	15	9	-2	5	19	36	36	19	16	15	34	17	16	24	19	19	10	20	10	14	28	30	21	15	20	23	19	14	18.6
Onawa	Max	35	36	36	38	31	13	28	58	54	63	46	35	41	39	36	33	29	27	28	28	32	28	34	47	46	32	31	37	36	31	31	36.1
	Min.	10	18	16	8	7	-5	2	16	28	37	22	15	13	31	18	13	21	13	14	8	20	4	4	23	30	18	13	17	18	17	13	15.5
Osage	Max.	24	31	31	26	19	5	15	34	36	36	44	34	28	30	34	34	31	28	24	17	25	24	17	36	32	27	24	21	24	25	25	27.1
	Min.	-4	20	18	19	2	-9	-10	9	22	30	32	15	8	24	17	11	20	15	8	1	12	10	-1	5	25	15	7	12	8	2	16	11.3
Osceola	Max.	34	47	32	35	34	11	10	53	56	65	32	32	43	38	30	30	37	32	32	34	37	29	35	50	46	36	30	33	35	30	30	35.7
	Min.	11	23	29	18	15	1	-1	6	30	41	31	20	28	32	25	17	27	24	17	13	23	19	10	24	31	25	16	19	19	17	13	20.0
Oskaloosa	Max.	36	45	34	33	22	8	25	50	55	64	56	32	41	38	36	41	35	33	31	34	36	31	35	51	43	37	31	33	37	30	33	37.0
	Min.	10	26	30	20	8	0	-2	14	27	39	32	24	22	30	25	19	19	24	18	15	24	21	13	24	30	25	17	17	18	18	15	20.1
Ottumwa	Max.	45	46	38	40	35	22	30	49	58	64	58	31	41	41	40	41	37	35	32	35	40	32	35	50	47	37	37	35	38	38	38	40.1
	Min.	17	29	31	27	22	1	5	13	19	25	30	24	22	30	21	24	27	27	22	12	21	7	15	25	29	25	20	17	22	20	15	20.8
Ovid	Max.	35	53	33	38	27	11	22	51	57	63	37	29	44	38	36	36	34	34	39	34	43	34	40	50	45	40	34	35	39	32	31	37.9
	Min	12	29	30	20	10	0	-2	13	30	41	25	21	18	31	24	20	25	23	17	15	24	18	12	25	29	24	17	17	19	18	9	19.8
Pacific Jct.	Max	..	..	..	..	..	..	..	55	58	69	40	32	42	42	28	33	38	28	29	38	33	30	38	49	38	28	27	28	36	32	31	37.6
	Min.	..	..	..	..	..	..	..	16	24	41	20	16	7	34	21	18	26	16	14	11	26	13	11	26	34	22	15	12	20	20	14	15.8
Parnell	Max.	33	43	35	34	30	25	43	..	47	63	57	..	40	35	36	37	..	35	34	30	38	31	35	50	38	..	..	33	38	38	33	36.7
	Min.	3	21	30	20	-3	-7	10	..	30	35	35	..	21	28	28	19	..	26	18	14	22	10	18	30	17	..	..	18	16	26	15	18.5
Pella	Max.	30	37	32	30	16	6	18	47	45	60	35	27	38	36	28	32	34	30	23	29	30	27	30	46	31	29	28	29	32	30	29	31.4
	Min.	12	9	28	15	12	-2	-6	5	28	38	33	22	20	24	26	16	28	24	17	20	22	19	10	22	29	27	16	19	15	18	17	18.8
Plover	Max.	29	37	28	30	15	10	28	48	36	44	42	26	30	38	28	32	28	25	25	20	28	20	22	46	34	28	30	32	28	22	25	29.5
	Min.	2	24	9	-2	5	-8	-7	3	28	30	32	18	5	30	22	5	24	20	10	0	15	7	-5	10	22	15	10	15	7	8	15	11.8
Primghar	Max.	23	25	31	18	40	15	10	12	15	20	35	25	32	30	35	25	24	22	25	18	28	30	15	25	40	30	23	30	25	32	30	25.4
	Min.	3	6	1	1	3	-10	3	5	7	15	17	15	15	16	15	5	4	5	4	0	10	-6	-9	13	18	15	5	5	3	10	10	6.6
Red Oak	Max.	39	50	36	45	23	15	25	56	63	69	43	35	46	41	36	31	31	34	36	40	36	24	40	64	45	37	33	40	38	38	36	39.5
	Min.	15	24	25	18	9	1	4	15	27	40	21	15	12	34	22	18	29	20	18	13	24	16	12	23	33	23	19	17	21	20	17	19.5
Ridgeway	Max.	25	34	40	33	30	11	17	36	43	40	40	35	31	31	38	35	31	39	34	20	38	35	28	33	33	34	35	28	31	37	34	32.5
	Min.	0	20	24	14	7	-9	-9	6	23	31	34	18	6	23	24	15	24	20	9	2	12	15	1	2	28	15	6	13	8	4	15	12.9
Rockwell C	Max	30	36	29	30	15	3	24	49	42	60	34	30	33	33	33	26	29	28	24	25	31	27	25	47	40	30	26	30	31	27	30	30.9
	Min.	6	8	13	8	7	-6	-4	13	29	35	24	21	15	22	11	4	20	15	7	3	17	7	-6	10	29	21	9	11	15	13	15	12.6
Ruthven	Max.	21	29	29	30	22	12	20	37	38	37	39	28	23	27	30	19	20	20	12	12	23	16	17	36	36	28	21	22	24	22	33	25.3
	Min.	1	12	5	0	-10	-12	-8	22	23	28	27	18	5	10	14	4	5	6	4	-2	10	0	-11	4	24	13	3	6	5	7	13	7.3
Sac City	Max.	31	35	25	25	15	3	23	43	41	57	52	28	30	31	31	28	23	23	22	22	27	16	17	41	36	22	23	27	27	24	25	28.2
	Min.	4	14	11	7	4	-6	-3	15	31	32	21	20	16	26	19	20	19	13	9	3	16	5	-2	10	28	19	9	13	15	12	13	13.3
Scranton	Max.	..	..	..	..	..	..	..	53	46	60	56	31	34	34	33	23	32	29	22	27	29	26	24	45	41	29	24	28	28	27	28	33.7
	Min.	..	..	..	..	..	..	..	43	33	40	30	18	18	30	21	10	23	17	10	11	9	2	17	29	22	12	16	17	12	16	19	19.4
Sheldon	Max.	30	36	32	28	22	5	23	44	39	36	35	27	31	36	28	22	20	18	14	13	25	17	22	38	34	28	25	27	27	27	25	26.9
	Min.	9	14	11	-1	2	-10	-5	13	25	31	22	16	16	28	10	5	15	2	0	0	12	-8	-11	10	25	14	3	6	7	10	11	9.1
Sibley	Max.	26	32	33	31	25	7	22	46	40	34	32	26	..	32	28	..	19	22	17	13	24	24	22	38	35	27	24	25	26	26	24	26.9
	Min.	0	0	5	-1	2	-11	-6	14	24	31	21	16	..	14	10	..	6	7	5	-2	11	-2	-13	15	25	13	0	4	4	8	12	7.3
Sigourney	Max.	36	43	35	34	29	14	22	48	57	66	57	41	43	36	38	37	35	34	33	35	40	30	33	49	44	38	32	32	37	32	32	37.8
	Min.	4	20	28	18	12	-2	-7	10	28	34	32	15	18	21	26	17	26	24	14	12	20	19	10	18	28	25	16	15	16	17	13	14.4
Sioux City	Max	30	36	29	34	13	9	26	53	45	46	30	29	39	36	20	25	24	21	23	24	28	17	28	46	33	23	26	33	29	29	27	29.4
	Min	13	21	13	8	3	-6	5	17	34	36	20	12	16	32	14	9	19	8	15	5	18	-1	1	26	28	14	10	14	19	14	13	14.5
Spencer	Max.	27	36	24	26	22	3	22	41	45	37	36	27	31	32	31	27	23	21	18	18	23	19	22	46	37	25	25	27	26	25	26	27.4
	Min.	-2	2	4	-1	0	-12	-9	12	30	30	25	17	8	26	9	5	15	7	0	-1	12	1	-10	7	24	10	5	7	7	8	12	8.0
StormLake	Max.	24	35	31	25	21	5	21	42	42	43	43	27	31	31	27	21	22	21	19	19	25	20	19	39	38	22	21	26	26	24	24	26.9
	Min	4	18	9	2	4	-8	-5	14	30	31	26	17	11	27	14	3	15	10	2	1	14	1	-6	9	22	16	7	11	13	9	12	10.7
Stuart	Max.	34	42	35	34	20	10	39	48	55	38	30	24	35	35	30	30	32	33	32	30	31	30	34	47	35	34	30	31	32	32	31	33.3
	Min.	10	15	12	11	5	-5	10	11	35	32	25	20	15	15	14	12	25	20	7	0	21	14	8	20	8	10	14	16	17	15	15	14.4
Tara	Max.	30	40	27	32	15	17	25	52	38	37	32	31	30	33	35	30	30	27	16	25	29	27	25	45	32	30	28	32	30	28	30	30.3
	Min.	10	0	15	10	-5	-5	-2	10	20	19	12	11	10	19	20	8	15	17	10	6	17	10	2	10	20	20	15	20	17	18	17	11.6
Toledo	Max.	32	42	35	33	15	4	23	42	43	60	38	28	36	34	35	35	34	35	33	30	35	30	40	46	38	36	34	33	35	32	30	34.1
	Min.	12	10	28	15	10	-4	-10	10	25	33	29	23	32	28	27	15	29	15	14	11	20	20	8	16	30	26	15	19	14	19	16	17.9
Thurman	Max.	56	45	35	35	30	15	24	55	57	69	55	30	39	41	38	32	38	32	33	35	38	32	34	48	50	36	29	34	38	31	30	37.9
	Min.	14	21	27	18	10	2	1	18	27	44	19	15	8	33	20	18	27	18	18	12	25	13	14	26	32	23	17	16	26	23	16	19.4
Villisca	Max.	40	53	48	35	38	18	46	52	47	67	39	30	43	39	33	31	38	34	35	38	32	50	45	35	33	32	38	38	35	34	39.3
	Min.	10	23	28	25	16	0	1	18	22	39	33	16	15	34	27	15	20	22	16	15	20	18	25	29	26	25	18	15	18	17	15	20.0
Wapello	Max	34	42	45	36	27	19	18	39	57	35	63	48	48	34	40	33	35	36	40	36	50	34	39	41	48	43	35	32	44	37	37	38.6
	Min.	12	31	33	29	18	3	-3	15	27	17	47	27	19	29	31	26	29	31	23	19	26	25	17	23	30	28	23	19	20	22	15	22.9
Washingt'n	Max.	34	40	35	33	29	7	20	48	53	65	54	30	38	34	37	32	34	34	35	32	44	29	34	46	45	40	33	33	38	32	32	36.3
	Min.	5	27	30	22	6	-2	-6	11	28	35	25	21	18	26	23	20	26	27	18	14	21	20	11	19	28	23	18	15	15	18	12	18.5
Waterloo	Max	29	35	35	32	20	6	17	35	40	50	45	35	33	34	34	32	32	34	30	24	30	29	24	28	25	30	30	28	30	30	32	30.9
	Min.	-6	13	25	15	8	-5	-9	9	20	33	35	18	13	26	18	15	27	20	15	8	18	18	8	14	28	22	15	19	16	15	19	15.8
Waverly	Max.	31	36	34	31	23	5	20	38	38	43	47	38	33	34	35	32	34	33	29	26	30	28	23	40	35	29	27	25	28	29	30	31.1

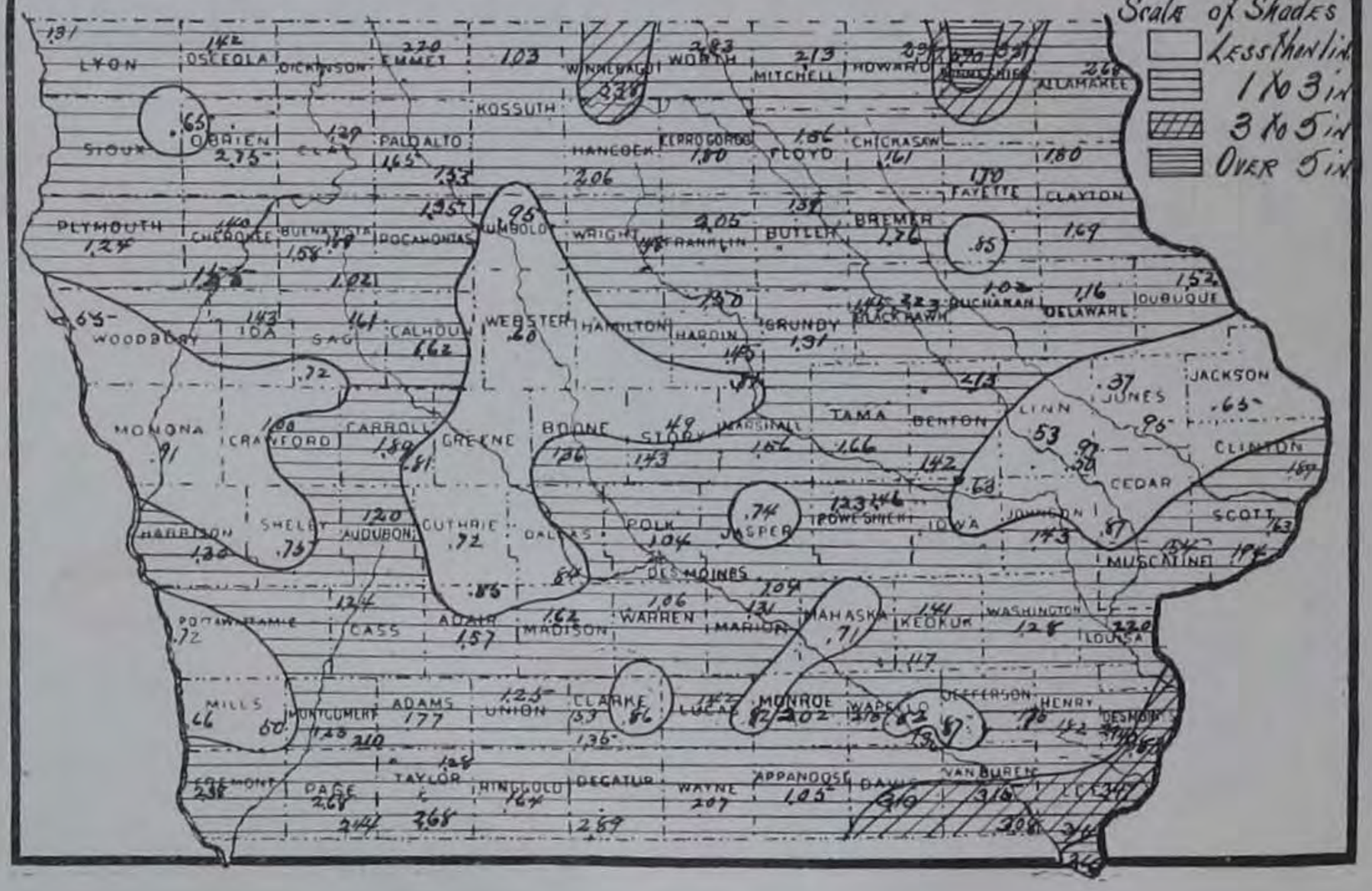
DAILY AND MONTHLY PRECIPITATION FOR MARCH, 1899.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Afton	....	....	..	....	..	...	....	....	....	....	.69	....	...	.16	....	...	.20	..	..	T	T	..	...	T	....	T	...	T	....	....	.20	1 25
Algona	.20	T	....	....	....	..	...	....	....	.30	..	1.15	....	.50	....	....	.30	..	....	T	T	....	....	.02	....	T	...	T	....	....	....	2.47
Alta (Hadden)	.06	....	....	..	.01	..	....	....	....	.03	.60	..	....	.58	..	..	.21	...	...	01	.03	..	....	.02	...	01	....	T	....	....	.02	1 58
Alta (near)	.08	....	..	..	....	...	....	....	....	.10	.60	..	...	.60	....	....	.25	...	..	.05	.10	..	..	.05	....	T	..	...	..	...	.05	1.88
Albia	T	....	....	..	....	...	....	....	....	..	.72	.05	.05	40	..	..	..	.	....	....	....	.05	..	T	....	....	T	.15	....	.60	....	2.02
Amana	..	..	....	....	T	T	....	....	....	..	.28	T	..	.05	.05	...	.11	.13	..	..	.01	....	....	T	....	..	..	T	....	....	T	.63
Ames	..	...	....	....	....	..	....	...	....	....	.04	.40	....	.03	..	....	.02	.	....	T	....	....	....	....	..	..	..	....	....	....	....	.49
Atlantic	..	...	...	....	T	....	....	....	....	....	.91	..	...	.15	...	...	.03	...	...	....	....	....	....	....	..	..	..	....	.10	....	T	1.24
Audubon	...	..	..	....	T	..	T	..	....	....	.60	...	....	.10	..	T	....	....	..	....	....	..	..	....	....	T	..	....	.50	T	T	1.20
Bancroft	..	...	...	..	...	....	....	..	T	..	.27	.10	...	.25	.10	....	30	...	..	T	T	....	....	.01	..	T	...	....	. .	....	....	1.03
Batavia	...	....	....	....	....	..	....	....	..	....	.34	.02	....	....	..	...	.32	.10	..	..	....	..	....	....	T	..	....	.02	....	.07	...	.87
Belknap	...	....	.30	....	....	..	...	....	..	....	.10	.30	....	.40	..	...	.60	.10	....	..	..	.10	..	.	T	..	T	.20	...	.80	.20	3.10
Belle Plaine	..	...	...	...	..	T	...	....	...	...	1.00	.05	....	.03	.25	...	....	...	....	..	.07	...	T	.02	..	..	....	....	....	....	....	1.42
Bedford	.48	..	..	...	..	.	..	....	..	...	1.22	...	..	.40	....	...	.20	....	....	....	T	....	....	..	..	....	T	..	....	.38	..	2.68
Bonaparte	.36	....	.30	...	....	....	....	....	....	....	.25	.	...	..	....	..	.85	.32	....	..	....	.08	..	T	....	.12	..	..	.80	....	....	3.08
Britt	.20	.10	....	..	.01	T	..	...	....	.20	.60	.31	...	.15	.20	....	.18	...	....	...	T	..	....	.11	....	T	..	T	T	...	T	2.06
Burlington	T	.20	.45	....	..	T	..	....	..	...	.45	.21	....	T	..	....	.93	.19	...	..	..	.05	...	..	...	..	T	.35	...	1 00	....	3.83
Carroll	...	...	....	..	..	T	....	....	....	..	..	1.25	...	.31	....	..	.18	..	..	..	..	.12	...	T	...	T	....	..	....	.03	...	1.89
Cedar Falls	....	...	..	....	....	..	..	....	T	..	1.20	....	..	....	....	..	.20	.05	...	..	..	..	..	T	....	..	....	..	....	..	...	1.45
Cedar Rapids	. ..	...	..	....	T	T	..	....	T	..	.28	T	...	.01	..	..	.18	...	...	.05	..	T	T	.01	..	..	T	T	.15	..	.50	T	.53
Centerville	...	...	..	..	T	....	..	...	..	...	.20	..	...	T	....	...	.20	..	....	..	..	T	T	..	..	T	...	..	.05	...	.29	..	1.05
Chariton	....	....	....	....	T	...	..	....	....	..	.57	.10	..	.05	....	....	.30	.03	..	..	....	....	....	T	..	..	..	..	.10	....	.50	....	1.42
Chillicothe	T	...	....	...	T	..	..	...	....	....	1.00	T	...	.10	....	..	.40	T	..	..	....	....	....	..	..	..	..	..	T	....	....	T	2.10
Charles City	....	...	...	...	T	..	..	....	.	.05	1.00	T	..	.05	.15	...	.16	.05	..	..	..	..	....	T	.10	..	..	T	....	.40	....	1.56
Clarinda	.11	..	..	....	T	..	..	....	....	....	..	1.10	...	.31	..	....	.26	..	..	..	..	.50	..	T	....	T	T	T	....	.40	....	2.68
Clinton	....	...	.01	....	T	T	....	....	....	..	.30	....	..	.23	.20	..	.90	.	..	.10	..	.05	....	T	..	..	.	.11	....	....	....	1.89
Clear Lake	....	....	....	....	....	....	....	....	....	....	....	....	..	....	....	..	....	..	..	..	..	....	....	....	....	....	....	....	..	....	..	....
College Springs	.40	.	....	....	.01	....	..	....	....	..	1.21	....	...	.40	..	..	.04	..	..	....	....	....	....	....	....	.02	.06	..	....	.30	....	2.44
Corning	....	....	....	....	T	....	....	....	....	....	1 57	....	....	T	..	..	.	T	....	..	T	....	....	....	....	....	....	....	....	.20	.	1.77
Coon Rapids	..	....	....	....	....	....	....	....	....	..	.45	....	.	.27	T	...	.09	.	..	..	....	....	....	T	..	T	....	....	....	....	....	.81
Council Bluffs	....	....	....	..	.05	....	....	....	....	.02	....	.50	T	.02	..	....	.13	....	....	..	.	T	..	T	T	....	T	....	T	..	....	.72
Cresco	.03	.07	..	...	T	....	....	....	....	.09	1.20	.25	...	.10	.04	....	.31	.03	.	.04	....	..	..	.18	.	....	..	....	....	....	T	2.34
Danville	....	.14	.36	...	T	T	....	....	.	....	.34	T	....	.19	..	....	.90	.18	...	..	....	.10	....	....	.03	....	....	.10	....	.60	....	2.94
Davenport	T	..	T	..	T	T	....	....	....	T	.22	.03	T	.09	.10	...	.57	.47	..	..	.02	.02	...	T	T	..	..	.10	....	.32	T	1.94
Decorah	.03	.04	....	....	....	..	....	....	....	...	1.10	.80	...	.07	.18	....	.36	.10	....	....	.18	.04	...	.61	....	....	....	..	....	....	....	3.51
Delaware	....	....	..	....	....	....	....	....	.03	....	.48	..	....	.15	....	....	.35	.	..	.10	..	..	..	.05	....	....	....	....	....	....	..	1.16
Denison	....	....	....	....	T	....	....	. .	..	...	.50	.20	.08	.08	T	...	.09	.05	...	.	T	....	....	T	....	....	....	....	..	..	..	1.00
Des Moines	T	....	..	....	T	T	..	....	....	T	.53	.17	....	.10	.08	..	.10	.03	..	T	T	T	T	.02	T	....	....	....	T	.01	T	1.04
De Soto	T	T	...	...	T	T	....	....	....	....	.48	.02	...	.30	....	...	.01	....	....	....	....	..	..	....	....	....	..	..	..	.03	T	.84
Dows	.10	T	...	....	T	T	..	....	..	T	.40	.22	..	.30	.	...	.25	....	..	T	....	T	..	.14	....	....	T	....	....	....	T	1.41
Dubuque	T	....	....	...	T	T	....	....	T	02	.53	.07	...	.10	.14	....	.04	.32	..	T	.21	T	..	T	.09	....	....	T	..	..	T	1.52
Eldon	.03	.03	.03	...	T	T	...	....	...	..	.30	T	..	.12	..	..	.42	.11	...	..	....	.03	..	..	T	..	..	.04	T	.23	T	1.36
Eldora	.10	T	....	....	T	T	..	...	....	....	.	.10	.50	.10	...	....	.15	...	....	T	..	T	.50	..	T	T	..	T	....	....	....	1.45
Elkader	....	..	....	....	....	....	....	....	....	.07	.58	....	..	.45	..	..	.23	....	..	.11	....	....	....	.25	....	....	....	....	....	....	....	1.69
Emerson	....	..	....	....	....	....	....	....	.	T	.40	....	T	T	..	....	....	T	.	....	....	....	..	T	....	....	....	..	.10	....	....	.50
Estherville	...	...	....	...	T	....	...	...	.10	...	...	.70	....	.40	.60	..	.30	.10	..	T	T	..	..	T	....	T	....	..	....	....	....	2.20
Fairfield	...	.10	....	....	....	..	....	....	....	..	.30	..	..	....	....	....	.45	.19	....	....	....	..	..	....	....	....	..	..	.20	.40	....	1 64
Forest City	...	T	..	....	.02	T	.05	....	....	.21	.45	.65	...	.35	.40	....	.78	.12	....	T	.	T	..	.18	.15	.02	..	..	....	..	....	3.38
Ft. Madison	.41	...	.50	.06	T	..	....	....	....	...	.44	..	..	.26	....	T	.95	T	....	....	....	.13	.	..	..	....	.08	.10	..	.54	...	3.47
Galva	T	..	..	..	T	..	....	....	....	..	.25	..	...	1.18	..	T	..	....	....	T	....	....	..	T	....	....	....	..	..	..	T	1 43
Glenwood	....	....	....	....	.01	....	....	....	....	T	.60	..	..	T	T	....	T	..	..	..	....	..	..	T	..	....	....	....	....	.05	..	.66
Grand Meadow	....	..	....	....	..	....	....	....	....	.03	..	75	...	.10	.35	...	.15	....	..	.12	....	..	....	.30	..	....	....	....	....	..	....	1.80
Greene	.03	...	....	....	....	....	....	....	....	T	.68	.13	..	.09	.11	..	.13	.08	..	....	....	..	..	.	.14	..	..	....	....	..	....	1.39
Greenfield	T	T	T	...	..	....	....	....	..	..	1.00	.15	..	.31	T	..	.08	..	....	....	....	..	T	T	.	T	..	T	.03	....	T	1.57
Grinnell	....	....	....	....	....	....	..	....	..	..	.90	T	..	T	....	..	.28	....	.	.02	.	....	....	.03	....	....	....	....	....	..	....	1.23
Grinnell (near)	...	....	....	....	..	T	....	..	....	..	.85	.11	....	.03	.10	....	.28	.	..	....	.01	T	....	.08	....	....	....	....	....	..	....	1 46
Grundy Center	....	....	....	....	T	T	....	....	....	....	.80	..	..	.01	....	....	.10	T	..	T	T	..	....	.40	..	....	....	T	T	..	T	1.31
Guthrie Center	....	..	....	....	T	..	....	....	....	..	.60	..	..	.02	..	....	.10	....	....	..	....	..	....	.30	..	..	..	..	..	..	....	.72
Hampton	...	..	...	....	....	....	....	....	.05	..	1.05	....	..	.30	..	.10	25	..	....	....	....	....	....	T	..	T	T	....	T	T	T	2.05
Harlan	....	T	....	....	T	....	....	....	....	....	.64	T	...	.07	T	.	.04	....	....	..	.25	..	....	.15	....	....	....	....	....	....	T	.75
Hawkeye	.10	..	....	....	....	..	....	.15	....	..	.40	.15	....	....	.20	....	.30	....	....	..	T	.05	....	....	....	..	..	.06	....	.40	..	1 70
Hedrick	....	....	....	....	T	..	....	....	..	....	.09	.02	..	.15	....	..	.40	..	..	..	T	....	....	.02	....	..	....	....	....	.37	....	1.17
Hopeville	T	....	....	....	T	....	....	....	....	....	.65	....	..	.09	..	..	.24	....	....	....	....	T	..	T	....	..	T	....	....	....	....	1.35
Humboldt	.01	....	....	....	....	....	....	....	....	..	.48	.25	T	.12	.04	..	..	T	..	..	....	....	....	.05	....	....	..	....	....	....	....	.95
Independence	....	....	....	....	....	....	....	....	....	..	.65	.08	..	.01	....	....	.22	..	..	..	.03	T	....	T	T	....	....	T	....	....	T	1.02
Indianola	....	..	..	....	T	T	....	....	..	..	.68	.04	T	.10	T	T	.14	T	..	T	....	..	....	T	T	....	..	T	T	.10	T	1.06
Iowa City	..	.	...	....	T	....	....	..	....	....	.51	T	..	22	....	..	.34	....	.	.15	....	..	..	.21	....	....	....	T	..	T	..	1.43
Iowa Falls	.10	T	...	...	T	....	..	....	....	T	.70	.10	..	.20	.	....	.25	....	.	T	T	....	..	.15	....	....	....	....	....	....	....	1.50
Keokuk	.10	.12	.42	.04	T	T	..	....	....	....	.41	....	.	.11	T	....	.12	.67	..	..	....	.11	..	....	..	....	.03	.02	.	.51	T	2.66
Keosauqua	.25	T	.48	..	T	T	..	....	....	....	.24	..	.	.48	...	....	.79	.35	..	....	....	.02	..	T	..	....	.01	.07	.	.46	T	3.15
Knoxville	..	....	....	....	T	T	....	....	....	....	.70	06	...	.10	..	....	.25	..	....	..	....	..	....	T	....	....	....	..	T	.20	....	1.31
Lamoni	.60	.09	....	..	T	..	..	..	....	....	.80	.19	....	.19	....	..	.82	.01	...	..	....	.06	...	T	....	T	.02	.08	..	..	..	2.89
Lansing	....	...	T	...	....	..	....	....	....	T	.45	.87	....	T	.28	...	.40	.08	....	....	.20	....	..	....	.40	....	....	....	....	....	....	2.68
Larchwood	.10	....	....	...	T	..	....	....	....	.16	T	T	T	.25	.20	.10	.15	.	T	.05	.25	..	....	T	....	T	T	T	..	.05	T	1.31
Larrabee	.11	....	....	..	.01	....	..	....	.	.01	.55	....	...	.30	..	..	.35	.04	..	.02	.01	....	....	T	....	T	....	T	....	..	T	1.40
Le Claire	T	...	....	..	..	T	T	....	....	....	.25	....	....	....	.19	..	.90	..	..	..	....	.02	T	....	....	....	....	.10	....	.17	....	1.63
Le Mars	....	....	....	..	....	....	....	....	....	..	T	.31	..	.43	..	..	.40	....	..	..	.05	..	..	....	T	....	....	..	....	....	.05	1.24
Lenox	T	...	....	..	....	..	....	.	..	....	.52	.05	..	.40	.12	..	.07	..	..	..	....	....	....	T	....	T	T	..	....	.12	.	1.28
Logan	....	....	....	T	....	....	....	....	....	....	1.10	....	..	.20	.	..	....	....	T	....	....	....	....	....	....	....	....	..	T	....	....	1.30
Lockridge	....	..	....	....	....	....	....	....	....	....	.23	....	....	....	....	....	.72	....	....	....	....	....	....	....	....	....	....	....	....	.70	.10	1.75
Maquoketa	...	....	....	..	T	....	....	....	....	....	.18	....	....	....	....	....	.42	....	....	....	.03	....	....	....	....	....	....	.02	..	....	....	.65
Marshalltown	....	T	....	....	....	....	....	....	....	....	.83	T	...	.02	.34	..	.19	.02	....	....	T	T	....	.16	..	..	....	....	....	....	T	1.56
Mason City	....	....	....	.10	....	....	....	....	....	....	50	.50	....	.40	....	....	30	T	....	....	....	....	....	....	....	....	....	....	....	....	....	1.80
Melrose	T	....	....	....	....	T	....	....	....	....	.08	.10	T	....	....	....	04	....	....	....	....	....	....	....	....	....	T	.10	....	.50	....	.82
Mooar	.06	.20	.80	.10	..	..	....	....	....	....	.30	..	..	.20	..	....	.30	....	..	....	....	..	....	....	....	..	.10	.10	...	1.00	....	3.16
Monticello	....	....	....	....	....	..	..	....	....	....	....	T	....	T	....	....	.37	....	..	..	T	....	....	T	....	....	....	T	....	T	T	.37
Mt. Ayr	.26	.05	....	..	T	T	....	....	....	....	.25	..	..	.17	T	....	.22	T	..	..	T	.02	....	T	....	T	T	T	..	.67	T	1.64
Mt. Pleasant	....	....	....	....	....	..	....	..	....	..	.38	T	....	.08	..	....	....	....	....	.	T	....	....	....	1.05	..	.15	....	....	.20	....	1.86
Mt. Vernon	....	..	....	....	..	....	....	....	..	..	.30	..	....	.05	....	....	.15	....	..	....	....	..	....	....	....	....	....	....	.	....	....	.50
Mt Vernon (h)	..	....	....	..	.01	T	....	....	....	....	.33	T	..	.19	....	.	.35	....	....	.06	....	....	..	T	....	....	....	.03	....	..	T	.97
New Hampton	.10	..	....	....	....	....	....	....	..	.01	1.00	T	....	....	.10	....	.20	.10	..	....	....	....	....	....	.10	....	....	....	....	....	....	1.61
Newton	....	..	.	..	....	....	....	....	....	....	.64	.02	....	.05	....	....	03	..	..	....	....	T	....	T	....	....	....	....	....	....	....	.74
Northwood	.10	....	....	....	....	....	..	....	....	.19	.45	.79	....	....	.40	....	.70	.20	....	....	....	....	....	....	....	....	....	....	....	....	....	2.83
Odebolt	....	....	....	....	T	....	....	..	....	....	.28	.10	..	.17	....	.	.10	....	....	T	.07	..	....	T	..	T	....	....	....	....	T	.72
Ogden	....	....	....	....	....	..	....	....	....	....	.45	.50	....	.21	....	....	.18	....	....	....	T	....	....	.02	....	....	T	....	....	....	....	1.36
Olin	....	....	....	....	T	....	....	..	....	....	.20	T	..	.02	.12	..	.46	....	.10	....	....	....	....	T	....	....	....	.05	....	....	T	.95
Omaha (Neb)	T	....	....	....	.02	....	....	..	....	....	.36	.10	....	.05	.01	T	.04	.01	....	....	....	T	....	T	....	....	T	....	.01	.03	.01	.64
Osage	.10	T	....	....	T	....	....	....	....	T	.77	.18	..	.15	15	....	.43	.06	..	T	.04	....	....	.06	.19	..	....	....	T	..	T	2.13
Osceola	T	T	....	....	....	....	....	....	....	....	.	.10	.10	....	T	..	.20	.08	.	....	....	....	....	T	....	....	T	T	T	.38	T	.86
Onawa	T	....	....	....	.04	....	.	....	....	....	.20	.16	....	.29	.08	...	.03	.01	...	....	.09	....	....	T	....	....	....	....	....	....	.01	.91
Oskaloosa	....	....	....	....	T	T	....	....	....	....	.09	....	....	T	....	....	.05	....	..	....	....	....	....	T	....	....	.07	....	T	.25	....	.71
Ottumwa	....	....	....	....	....	....	....	....	....	....	T	....	....	T	....	....	10	....	....	..	....	.05	....	T	....	....	....	.07	....	.60	....	.82
Ovid	.15	....	....	....	....	....	....	....	....	....	.56	.03	...	.05	....	....	.38	.12	....	....	....	.04	....	....	....	.03	.07	.01	.07	.56	..	2.07
Pacific Junction	....	....	....	....	....	..	....	....	....	..	.60	.10	T	..	....	....	T	....	....	....	....	....	....	T	....	....	....	....	.05	....	....	.75
Parnell	....	....	....	....	....	....	....	....	....	....	T	....	....	T	....	..	....	....	....	....	....	....	T	....	....	....	....	....	....	.05	....	T
Pella	....	....	..	....	....	....	....	....	..	....	.72	.13	....	..	.01	...	.11	.02	..	..	..	..	....	....	....	....	....	....	....	.05	....	1.04
Plover	.05	....	....	....	....	....	....	..	....	15	....	.50	...	.30	..	....	.30	..	....	....	....	....	....	.05	..	....	....	....	....	....	....	1.35
Primghar	.25	..	...	....	....	....	....	....	....	....	....	1.00	..	1.00	...	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.75

DAILY AND MONTHLY PRECIPITATION FOR MARCH, 1899—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Ridgeway	.08	.12	...	....	.01	....	....	....	....	.22	1.21	.26	...	....	.50	....	...	2.03	..	....	.37	....	....	....	1.10	....	....	T	....	...	T	5.90
Red Oak	....	....	....	....	T	....	....	....	....	....	.97	....	....	.14	....	....	.11	....	....	....	....	....	..	....	....	....	....	....	....	.01	....	1.23
Ruthven	.20	....	....	....	....	..	....	....	....	....	.30	....	....	.60	....	....	.50	....	....	.05	....	....	....	T	T	....	....	....	....	T	....	*1.65
Rockwell City	.02	....	....	....	T	....	....	....	....	.08	.30	.70	..	.20	....	....	.08	....	....	....	.12	....	....	.10	....	.02	T	T	....	....	....	1.62
Sac City	.05	....	....	....	T	....	....	....	....	.10	.50	.50	....	.20	...	....	.10	....	....	....	.05	..	....	.10	....	.01	....	....	....	....	....	1.61
Scranton	....	....	....	....	....	....	....	....	....	....	.53	.30	...	.30	..	....	.03	..	....	....	T	....	....	....	....	....	....	....	....	....	....	1.16
Sheldon	.02	.02	....	....	.01	..	....	....	..	.09	.02	.02	....	.25	....	....	.12	T	...	.03	.02	....	....	T	T	.01	....	T	....	....	.04	.65
Sibley	T	....	....	....	T	....	....	....	....	.17	T	.10	T	.50	.10	...	.50	..	..	.05	T	T	....	T	....	T	T	....	..	....	....	1.42
Sigourney	T	T	T	....	T	T	....	....	....	....	.34	.10	..	.16	....	....	.34	.17	....	....	T	T	...	T	T	....	.05	....	....	.25	T	1.41
Sioux City	T	....	....	....	T	....	....	....	....	T	.11	.05	....	.27	.01	....	.08	.01	T	T	.02	T	....	T	....	T	T	....	....	....	T	.55
Storm Lake	.07	....	....	....	.01	....	....	....	....	T	.30	....	....	.40	....	....	.12	.03	..	.02	.03	T	...	.02	....	.02	....	T	....	....	....	1.02
Spencer	.05	.05	...	....	T	...	....	....	....	.10	.29	.28	....	.27	..	...	.21	.04	....	T	T	....	....	T	..	T	....	....	....	....	T	1.20
Stuart	...	....	....	....	....	....	....	....	....	...	.60	....	....	.10	..	....	.05	.10	....	....	....	....	....	....	....	....	....	....	....	T	....	.85
Tara	....	....	....	....	....	....	....	..	..	....	.40	...	....	.10	.10	....	...	....	....	....	T	....	....	....	....	....	....	....	....	....	....	.60
Toledo	....	....	....	....	....	T	....	....	....	T	.88	.14	....	....	.41	....	.13	....	....	....	....	T	T	....	T	....	T	T	.30	.40	....	....	1.64
Thurman	.06	..	..	....	.12	....	..	....	....	....	.06	1.25	....	.15	T	T	.04	..	....	....	....	T	T	....	T	....	T	T	....	T	....	....	2.38
Villisca	....	....	....	....	....	T	....	....	..	....	1.50	....	....	.50	T	....	.10	....	....	....	....	....	T	....	....	....	T	T	...	....	....	....	2.10
Vinton	...	....	....	....	....	....	....	....	....	...	1.20	.05	....	.47	....	....	.25	....	....	.12	....	....	....	.04	....	....	....	....	....	....	....	2.13
Washington	...	....	..	....	....	....	....	....	....	....	....	.30	....	....	.15	....	....	.35	....	....	....	.02	....	T	....	....	....	.06	....	.40	..	1.28
Washta	...	....	....	....	....	....	....	....	....	....	.60	....	....	.75	....	....	.15	....	....	T	.05	....	....	T	....	T	....	T	....	....	T	1.55
Waterloo	.03	....	....	...	T	T	....	....	....	.03	1.25	.15	..	.03	.31	....	.21	.03	T	T	.02	....	....	.11	....	....	....	.06	..	....	T	2.23
Waverly	.01	....	....	....	T	....	....	....	....	....	.95	.16	...	.13	.04	....	.23	T	..	T	.06	....	...	.03	.15	...	....	T	....	...	T	1.76
West Bend	.10	T	....	..	....	....	....	....	....	.03	.50	T	....	.40	....	....	.30	....	.20	T	T	....	....	T	....	T	....	....	..	....	T	1.53
West Branch	T	....	....	....	...	T	...	....	..	....	.22	T	...	.10	....	.13	.42	....	..	....	....	....	....	....	T	....	T	....	...	T	...	.87
West Union	T	....	....	....	....	....	....	....	....	T	....	.15	....	....	.30	....	.10	..	....	....	.10	....	..	....	.20	....	....	....	....	..	..	.85
Whitten	....	....	....	....	T	....	....	....	....	....	.81	T	..	T	T	....	T	....	....	T	....	T	....	T	...	T	T	T	....	....	T	.81
Wilton Junction	....	....	....	..	T	....	....	....	....	....	....	....	..	.35	.15	....	.73	..	....	....	....	....	....	....	....	....	....	15	....	.16	....	1.54
Winterset	....	T	...	....	....	....	....	....	....	....	1.15	....	....	....	.26	....	....	.20	....	....	....	....	....	....	....	..	....	....	....	.01	....	1.62
Wapello	....	....	.43	....	....	....	..	....	....	....	.27	....	....	12	....	....	.60	.23	....	....	.04	.04	T	....	....	....	....	.10	....	.57	..	2.20
Woodburn	T	..	....	..	T	T	..	....	....	....	.69	.07	...	.07	T	....	.27	.03	....	..	....	....	....	T	T	..	T	T	....	.40	....	1.53

Precipitation Chart March 1899.



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Central Station, Des Moines, Iowa.

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1899.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME X. APRIL, 1899. NO. 4.

NOTE AND COMMENT.

Timber from the Oregon forests is being shipped for use in the construction of a Russian railroad in China.

***

On May 1st a severe hailstorm passed near Vandalia, Ind., and reports state that hailstones fell that weighed a pound each.

***

More than 2,000,000 trees have been planted along the line of the Northern Pacific railroad in North Dakota, to serve as protection from snow drifts.

***

Secretary Wilson has obtained for American distribution a lot of muskmelon seeds from Afghanistan, where the melons are said to be the finest in the world.

***

A cable dispatch from Berlin, dated May 2d, states that severe weather prevailed throughout Germany; terrific rains and thunderstorms were followed by snow and freezing temperature.

***

The germs of spring fever are getting in their work, but they are not a very dangerous variety of microbes. Their worst effect is the production of a disease known as inertia, which is seldom deadly.

***

We are pained to learn of the death of H. D Olds, of Cedar Rapids, who served as a voluntary observer at that station until increasing infirmity compelled him to relinquish the work in which he had taken so deep an interest. He was an excellent citizen, a loyal soldier of his country, and a true-hearted friend.

***

The Le Mars *Sentinel* states that a shower of mud fell in that city about 9 o'clock P. M. on Sunday, April 30th. It was supposed to have been caused by the heavy windstorm that occurred south of Le Mars, carrying clouds of dust which were converted into mud by contact with rain clouds.

***

Observer Fred Z. Gosewisch, of Keokuk, writes as follows: "During Sunday, April 23d, frequent showers were falling in the afternoon, the temperature being high and winds light and variable, with a steady barometer. About 2:20 P. M. clouds were moving rapidly from the southwest. A trunk was observed to form below a dense mass of dark cloud, passing about two miles east of the station. The lower extremity appeared about four feet in diameter and extended within 500 feet of the ground. When opposite the station, a distinct whirl from right to left was plainly distinguished. The trunk undulated about ten minutes, and then slowly receded into the cloud mass above it."

We regret to learn of the serious illness of Dr Caleb Brown, of Sac City, who has served as voluntary meteorological observer at that station for the past ten years. He is a man of rare personal qualities, and all who know of his worth and usefulness as a citizen will join us in the wish that he may have a speedy recovery.

***

The department of agriculture is to conduct on a large scale experiments for testing imported seeds. The test will be made on a large tract of land adjacent to Washington, which was set aside by congress for this purpose. Attention will be paid to tests of varieties of seed wheat. In speaking of this feature of the work, Secretary Wilson said: "One of our explorers has just returned from Russia, where he went last year with directions to study the grain situation, ascertaining what varieties winter would not kill, smut, roast or blight, and to bring back for the benefit of the wheat raisers of the United States the best results of his search. These we shall try on our experiment area, and the results will be published.—*Ex.*

***

E. C. Bennett, in *Orange Judd Farmer*, says: "In some of the counties of Illinois half of the hogs often die on account of disease In Iowa severe losses are reported. Indiana, Kansas, Nebraska and Missouri report loss, but to a smaller extent. Kentucky is comparatively free. Wisconsin, Minnesota and the Dakotas are usually light sufferers. It is seen from this that disease is most prevalent where there are the most hogs. The massing of animals together and crowding them with so carbonaceous a food as corn is an invitation to disease to come and reap a heavy harvest. The surroundings become unsanitary, disease germs multiply fast, the system is enfeebled by damp, unwholesome surroundings, and it is not surprising that bad results follow. One of the best germicides known is sunlight. Disease loves darkness and dampness. Dry, sunshiny quarters are absolutely necessary to continued health. All animals must have the sunshine to bask in or they will not thrive, and especially young animals require sunshine. These facts are too well known to call for proof."

***

The Sioux City *Tribune* reported the occurrence of a shower of mud in that place on the afternoon of April 30th. It says:

The windward side of every building in the city received a thorough coating of the sticky mixture. Newly washed windows presented a truly shocking appearance a few minutes after the storm commenced. The faces and garments of pedestrians were plastered and the mud, fairly beaten into the texture of the cloth, proved to be almost impossible to remove. The storm was not of long duration, but while it lasted it attracted much attention. Weather Observer Purssell's explanation is that the precipitation was the result of the dust storms of the preceding few days. The dust was carried high in the air, and, mixing with the water in the clouds, proved more than the atmosphere could hold in solution and fell in the form of mud.

Rockford Register: While nature at times seems spiteful and merciless in her climatic vagaries and manifestations, he who studies her closely will soon discover a beautiful law of compensation permeating all her work. This fact has been very apparent this spring; the season opened later, by three weeks, than usual, yet when fairly open there is such a kindly co-operation of sunshine and warmth and moisture that May 10th finds vegetation as forward as usual and crop prospects of the most encouraging character.

***

Russia in Europe has a forest area of about 500,000,000 acres. One-third of the country, indeed, is forest. It is to be noted, however, that the whole of the forest area of Russia is under careful crown management, and effective measures are taken to prevent waste. One peculiarity of the management of forests in Russia is, that certain forests are recognized as necessary to protect the water supply of rivers, and in these forests the felling of timber is under very strict regulation, the object being to preserve the forest for all time.

LONG-RANGE FORECASTS.

CAN THEY BE MADE WITH SUFFICIENT PRECISION TO BE OF GENERAL UTILITY?

This topic was briefly discussed at the convention of weather bureau officials, held at Omaha, October 13–14, 1898. The subject is of sufficient general interest to justify the reproduction of the brief papers read by Prof. H. A. Hazen, of Washington, D. C., and Patrick Connor, local forecast official at Kansas, City, Mo.

PROFESSOR HAZEN.

I will leave the serious side of this question to those who are to follow me, and will proceed in a lighter vein. Our newspapers are very ready to publish so-called forecasts of the weather a month or even a year in advance, and it is remarkable how much confidence is placed in such pure guesses by respectable people. The explanation, in part, at least, lies in P. T. Barnum's *bon mot* "the American people love to be humbugged." It is a well-known fact that we are very prone to remember coincidences in such cases, but very likely to forget failures. It will be of interest to inquire as to the principles on which such guesses are prepared, for, strange as it may seem, all these men have a supposed cause for all the effects they describe as about to occur in a month, year, or one hundred years just as well. All these men adopt cosmical or extraterrestrial forces as acting upon our weather. It is impossible to see how such cosmic force can act to produce a storm unless it act uniformly over a whole hemisphere. To say that a storm will occur on any day and then claim a verification because a storm occurred at one point is of no account really, for two or three storms are active somewhere in the northern hemisphere every day.

The moon has been the commonest of all extraterrestrial forces to which weather changes have been ascribed. If the moon can raise a tide of 60 feet in the Bay of Fundy, it must produce tremendous tides in the air, and why should not these, in turn, give us our weather changes. The fact that this enormous tide is due to the configuration of the coast, and that the greatest tide in mid-ocean is less than a foot, is lost sight of. One theory asserts that the moon draws the air into a lenticular form, and this air lens concentrates the sun's heat so as to give us severe storms. The moon is known to be inert and dead. Its surface exposed to the sun may have a temperature of boiling water, while at new moon the dark face may have a temperature of 200° below zero, but neither of these conditions affects our atmosphere, and in fact, the most refined methods of observation have shown scarcely the difference of $\frac{1}{1000}$ of a degree as the range of influence from the bright and dark moon.

The planets, however, have yielded the most powerful of all theories for weather changes. It seems most extraordinary that any person, after considering the immensity and power of the sun, could for a moment think that one of its tiny attendants, itself entirely dependent upon the sun for its light and heat, can overpower the effect of the sun, and produce storms of its own in localities. Here is one of these theories:

The planets, comets, etc., go through a reversed change of motion, volume, distance, and density at perihelion and aphelion each orbital revolution, which are affected through reciprocating electric currents or lines that exist and undulate between the planetary bodies. These changes are the cause of our most violent storms and earth disturbances. The perihelion and aphelion passages of the planets, the oppositions and opposite positions of the superior planets, the inferior and superior conjunctions of the inferior planets, and the eclipses of the sun and moon constitute the first grade of meteoric disturbances.

Others claim that the planet has its greatest effect when it is farthest from the line between earth and sun, or at quadrature instead of in conjunction. These opposite theories produce the novel result that the fair days of one are exactly the storm days of the other and *vice versa*. Notwithstanding this plain contradiction, however, each one claims a perfect verification for his own guess.

Of course any rigid system of forecasting for a well-defined locality and a verification by a strictly impartial rule would settle the question of the value of these guesses at once, and it would seem as though these planetarians would eagerly accept such methods. On the contrary, they absolutely refuse to allow anyone to verify a forecast. In one instance one of these men submitted a forecast for each day of a whole month, and also a curve showing the resulting temperature, which he claimed gave a complete verification. After a while the same forecasts were sent back to him and with his curve exactly reversed; that is, the cold points in the first curve were sent back as the warm points in the second and *vice versa*. Notwithstanding this exact reversal in the result, he claimed a perfect verification of the guess.

A thorough acquaintance with the methods of these planetarians will convince anyone of the uselessness of such guesses. We must look to the sun alone for all our weather changes. It is very certain that, with a very few exceptions, no definite forecasts can be made for a period greater than forty-eight or, at the most, seventy-two hours; also, that none of our weather changes are due to lunar or planetary influence. Whether we may ever be able to make a forecast three months or even a month in advance is an interesting question. If the state of the ice in the northern latitudes affects our weather, then by obtaining information from these far north points we may hope to give a general idea of the coming season, but even then it will plainly be impossible to make a definite forecast for an individual day.

MR. CONNOR.

I presume that since the fulfillment of the long-range forecast of heavy rain which floated Noah's ark, and perhaps a thousand years before, there have been a few people, at least, who have considered it within the bounds of knowledge or so-called science to make useful long-range forecasts of the weather, but unfortunately the success and skill of those wise wits of weather, those soothsayers of simoons, those human horoscopes of heaven, can be measured only by the diversity of human eccentricity, superstition, and public credulity. There are those to-day who think that the laws governing long-range weather forecasting are hidden in impenetrable gloom, while there are others to whom they are as an open book.

I understand there are a few in our own country, who, by some special endowment not known to the writer, can harness their chariots to lines of magnetic force and ride on ether vibrations to the most distant planet, whose sensitive souls are so delicately attuned to the symphony of the spheres that they can ascertain with minutest detail the throbbings and pulsations that will take place in the family of worlds for a year or two to come, and can tell what the effect will be on the varied interests of mankind for the same period, while there are others in the same line of research weighted down by ponderous calculations and stern realities, who, living at the bottom of the aerial ocean, think they are doing well if they can tell their neighbors when to carry an unbrella or when is may be safe to ship a carload of fruit.

I have been so situated for some years past that I could not help but feel interested in this intensely interesting subject, for I am bounded on the north by a long-range weather forecaster, Foster, of St. Joseph, Mo., and on the east by another, Hicks, of St. Louis, Mo. What surprises me more than anything else is that, situated as I am, I have not been influenced so far as I know by thought transference or the psychological communications which are supposed to pass between kindred spirits. But to come to the point: Can long-range weather forecasts be made with sufficient precision to be of particular benefit to the public? I have to answer yes and no; at times, yes; at other times, no. I have tried it and met with success; again I have tried it and met with total failure.

I do not think that it lies within the bounds of human knowledge to make definite long-range forecasts under all conditions, but I do think it possible, *at times*, to make a very good general forecast for a week or two with reasonable precision for certain localities. Some sections of the country present less difficulty than others, notably those having well-marked seasons and uniformity of conditions during long periods, such as obtain on the Pacific slope. I have tried to find cycles when weather conditions repeat themselves, but without success for the section of country in which I happen to be located. I have found but little consolation in the sun spot theory, as the years of supposed maximum or minimum frequency afford no index as to what month may be wet or dry, cold or warm. There may possibly be some reason, unknown to me, for the assignment of numerous and destructive tornadoes and electrical storms to the great solar energy assumed to be developed at the time of maximum sun-spot frequency, but it will not hold very well with regard to precipitation. We are now almost at a time of minimum solar energy as measured by sun spot periods, and yet my section of the country has received from 9 to 12 inches of rain in excess of normal. Some of the farmers in eastern Kansas and northwest Missouri had to plant corn three or four times this year on account of washouts.

Struggling to find something else that might be of aid, I entertained myself for a time with thoughts on lunar influence, only to find that I could not swear by the inconstant moon. I found that the weather was just as liable to be one kind as another during any of the moon's phases or perturbations.

The next line in which I directed some attention was Professor Bigelow's solar magnetic theory of weather changes, and I will say candidly that I got more satisfaction than disappointment out of it. I have made several very accurate forecasts based entirely upon my humble interpretation of his suggestions, which I can not possibly attribute to chance, and I have made others which, on account, I suppose, of the inverse conditions which the professor mentions in his writings, were conspicuous failures.

The last long-range forecast I made was for carnival week at Kansas City, from October 3d to 8th. About September 28th I gave out, with slight reservation, that we would be within storm influences which would give threatening weather and some rains from Friday, September 30th, to perhaps Monday evening, October 3d, when they should pass off. Tuesday, Wednesday and Thursday should be fair, followed by a change suggesting rain on Friday. In addition I stated that the week would likely be very much cooler than the two preceding, and that people coming to town should bring their wraps and overcoats. It affords me pleasure to state that all this was verified almost to the letter. But that offers no guarantee that the next forecast will be fulfilled. When I consider the solar schemes as a basis for forecasting, I am confronted by the fact that unchanging atmospheric conditions frequently occur over widespread areas during the whole time necessary for a complete solar rotation, and during which every variation shown in the average magnetic curve must have occurred, so that it seems as if great irregularities ought to have figured in the average daily solar impress, or else there must be very unequal distribution of earth currents to be acted upon by the solar forces. Coming nearer home I will now refer to certain atmospheric conditions, doubtless well known to all of you, which appear at times and which make possible long-range forecasts with reasonable hope of verification. The area of abnormally high pressure which settles over the central plateau region in the winter season, exerts a modifying influence on the temperature of the western states. Its permanence covers at least one week, and usually two weeks, and frequently more. From the first phase of permanency it is safe to predict that no very cold weather may be expected for a week or ten days, south of Nebraska and Iowa. This condition prevailed during the greater portion of last winter and, as a result, no very cold weather was experienced. On our neighboring lakes ice did not reach eight inches in thickness. Again, during the summer months the great south Atlantic high, which extends over the southeast portions of the country, enables a forecaster to predict, with reasonable safety, an absence of rain in the west for nearly a week.

The passage of a series of lows, far to the north, in summer, presages several days in advance dry weather for the west. The series may be anticipated by the very weak high which follows the first low, leaving practically a low belt along the British line to the north Pacific, while pressure above normal obtains over the southern portions of the country. Then, again, circular "lows," the center of which do not dip south of the northern tier of states, although rather formidable, usually produce hot and windy weather in the west and southwest, but no rain. These furnish the greater number of stereotyped conditions when it may be reasonably safe to make long-range forecasts from the maps, and are, perhaps, the most reliable grounds upon which to base them. Regarding the seasons, so far as I know, it is impossible to anticipate their characteristics as to weather details. Should one season show a great excess or deficiency of any element, it would be reasonable to expect reversed conditions the following season, but for definite forecasting it counts for little, and the man who relies very much on it may soon have a "yellow" reputation to carry around with him. Long-range forecasting, except on rare occasions is full of surprises. I would like to grasp the hand of the one who can do it successfully. I think that, some day, within the lives of present aspiring observers, great skill will be acquired in this work, but only when we have fathomed the methods of the great universe builder.

WEATHER FORECASTING.

BY F. J. WALZ, L. F. O., BALTIMORE, MD.

In order to intelligently predict the coming weather for even a small section of the country, it is necessary to know the weather conditions that exist simultaneously over a large part of the country at the same time, especially over the sections to the west of the place for which the prediction is to be

made, as the weather of a place depends upon the atmospheric conditions developed to the west of it.

To guide the forecaster at Baltimore in making predictions, telegraphic reports of weather elements are received at the station twice a day from about 110 stations scattered throughout the United States and Canada. These telegraphic reports are the results of simultaneous observations made at these various stations at 8 A. M. and 8 P. M., respectively. The information they give is: Pressure of the air for each station, reduced to a sea level and a standard temperature of 32°; temperature of the air; wet bulb temperature; the precipitation; wind movement and direction; clouds (the amount and direction); the maximum wind velocity and direction in the past twenty-four hours, and the time of beginning and ending of thunderstorms. These telegrams are all sent in cipher, for which purpose a condensed and comprehensive code has been arranged.

At 7:40 o'clock (75th meridian time) each morning and evening, the observers at different stations begin taking their observations from accurately tested and standardized instruments, noting all the elementary conditions of the air, such as pressure, temperature, wind velocity and direction, rainfall, etc. By 8 o'clock the necessary mathematical corrections have been made, all observations reduced to the cipher and each filed at the local telegraph office. During the next thirty or forty minutes these telegrams, with the right of way over all lines, are hurrying to their destinations, each station contributing its own observations and receiving in return, by systematic telegraphic circuits, such observations from other stations as it may require. As fast as the reports come over the wires, they are quickly delivered and the cipher translated into figures and words of intelligible order.

The weather conditions given are then entered on a geographical map at the different places, respectively. The barometer, temperature and other data, which are represented by figures, are written near the places so reporting; while by the use of symbols, with arrows to show the direction of the wind, the other weather elements, such as clear, cloudy, rain, wind direction, etc., are shown. Blue pencil lines are then drawn through points having the same atmospheric pressure, a separate line being drawn for each one-tenth of an inch of barometer, and are called isobars. Then lines connecting places having the same temperature are drawn in red for each ten degrees of thermometer. These lines are called isotherms. We now have a chart or picture showing the weather conditions throughout the country at the same instant of time.

On every map, after these systems of lines are drawn, we will find an area, as shown by the isobars, where the barometer is lower than anywhere else in the surrounding regions. This area is designated as a "low." Likewise we will find an area or areas where the barometer is higher than anywhere else in the surrounding regions, which area is designated as a "high." In the great ocean of air that surrounds the earth, as in the ocean of water, there are constantly occurring waves and hollows—areas where the air is piled up and others where it is depressed. The hollows are the depressions which we call "lows," the crests of the waves "highs." The "highs" are usually attended by fair and cool or cold weather. The "lows," popularly known as storms, are usually preceded and accompanied by cloudiness, rain or snow, and more or less high winds. The influence of the disturbance often extends a distance of 500 to 600 miles from the center of the storm. The area of the storm disturbance may vary from 500 to 1,500 miles in diameter, and maintains distinctive characteristics throughout its formation and movement. We may divide these areas into four quadrants, each of which shows distinctive features which are maintained as long as the identity of the storm lasts. These quadrants briefly described are as follows: The *northeast quadrant* is distinguished by great humidity, light winds and cloud formation, especially in the southern portion, together with precipitation. The *southeast quadrant* contains the maximum of heat and moisture, and is the origin of all severe local storms, especially the tornado. The *southwest quadrant* is marked by clearing weather, frequently with rain in the eastern portion, falling temperature and diminishing humidity. The *northwest quadrant* has the minimum of heat and moisture, an absence of clouds and brisk, cold winds. From the nature, then, of storm formation precipitation is confined to certain parts of the area of the "lows;" the rain area extends to the south and east from 300 to 500 miles in advance of the storm center. In advance of the "low," the winds are generally easterly or southerly, and bring higher temperature. When the center of a "low" passes to the east of a place, the wind at once shifts to the west or northwest, bringing lower temperature. The "lows" are technically called cyclones on account of the spiral, inward movement of the winds about them in the direction opposite to that in which the hands of a watch move. The "highs" are called anticyclones on account of the wind flowing spirally outward from the center and in the direction the hands of a watch move. The formation, movement and prevalence of these "highs" and "lows" across the United States practically control the current weather conditions and changes; and it is from charting these daily and watching their movement, with a knowledge and study of the laws governing their formation, characteristics and movements, that weather forecasts are made.

The birthplace of nearly all of our storms is either in the Gulf region, off the Pacific coast or in the far northwest, and their final destination the Gulf of St. Lawrence. Their rate of movement varies, the average drift eastward being at the rate of about 600 miles daily, and their periods average about three days each; that is, the time required for the storm condition to move across from the point from which it enters the United States to the point from which it leaves is about three days. "Lows" move faster than "highs."

The high areas enter the United States from only two points. In the winter they usually originate in Alberta to the north of Montana, while in summer the larger number of "highs" enter from the Pacific ocean about the latitude of Oregon The "lows" have some nine places or districts of inception or entrance into the United States. The paths of both are from west to east, and the "lows" all try sooner or later to leave the United States in the neighborhood of New England. The paths of both "highs" and "lows" usually follow well established tracks, and it is this fact, together with the more or less constant characteristics maintained by them, that is the basis of all predictions of future weather and weather changes.

ARE TORNADOES MORE NUMEROUS?

[IOWA STATE REGISTER.]

That question has again become general in consequence of the Kirksville, Mo., tornado; and also the query as to the cause of the increase. All admit that the former question cannot be definitely answered, because the facilities for the transmission and publication of news covered a very little portion of the United States at the formation of the government, and three months to a year were required for the transmission of news from America to Europe, and even in Europe the newspapers of the latter part of the last century did not attempt to publish American news of that nature. Besides, the United States was so sparsely settled during the past century that tornadoes and cyclones could destroy the wild forests for thousands of miles without knowledge of the destruction reaching the settled portions of the nation.

The earliest account of a tornado that we have been able to find occurred at Northford, Conn., June 19, 1794, but the mere date of the tornado is the only detail of the storm that has been handed down to present generations. April 4, 1804, a tornado touched Hancock, Ga., which is chiefly referred to because of the utter darkness that accompanied the storm. September 9, 1821, the towns of Sunapee and Warner, N. H., are reported to have been desolated by a tornado, but no other details are given by the authorities. The first details of tornadoes we have found on records were the two that wrought terrible destruction in Adams county, Miss., on May 7, 1840, and June 16, 1842, which were almost equally destructive of life, as 317 persons were killed in the former, and 500 persons in the latter. Since that time the details of the destruction by tornadoes and other storms have been preserved, and we think that the number of tornadoes has only been apparently increased because the whole of the country has been settled, therefore every tornado and cyclone destroys more or less life and property.

Many think that the railroad tracks banding the nation, and the continually increasing, and large aggregate of metal on the surface throughout the country, aid in creating electrical disturbances in the atmosphere, and they call attention to the manner in which the needle is affected by the pole to sustain their theory; but the contrary opinion is presented by others who assert that the railroad tracks and telegraph lines are useful as lightning rods for the earth. The "scientists" have many theories in regard to this subject, but the fact remains that all countries had windstorms of all degrees before there was a railroad track or telegraph line on the face of the earth, and it is probable that the number has not been increased by the added years. All of the civilized world's disasters are now published within twenty-four hours after occurrence, and that is the reason why there is an apparent large proportional increase in comparison with the days when telegraph and cable lines and daily newspapers were unknown—only 100 years ago.

CLIMATE AND CROP REVIEW.

The winter of 1898-9 began about ten days earlier than the average, and was protracted fully two weeks beyond the usual period for the advent of spring. The ground was frozen to an unusual depth, and the season for farming operations opened at least three weeks later than in 1898, and two weeks later than the average of the past ten years. Seeding of spring wheat and other small grain was begun in the northern and central sections about April 10th; in portions of the southern section field work was delayed by excessive moisture, and as a result the acreage of oats in that section was materially lessened. In all parts of the state the lateness of the season caused more or less reduction of the area of spring wheat, oats and barley, compared with last year. The effect of the low temperature and alternate thawing and freezing during the winter, was very damaging to winter wheat and clover, and this will result in a considerable increase in the acreage planted in corn. The loss of clover in meadows and pastures has been general throughout the state, and this is likely to seriously affect the hay and forage crop. The last half of April was warmer than usual, giving a vigorous start to vegetation, and by the close of the month farm work was well advanced, and the fields showed good stands of spring wheat, oats and barley. Grass was also about as well advanced as usual in meadows and pastures by the close of April.

SEVERE APRIL STORMS.

Very high winds prevailed during the closing week in April, causing dust storms in some localities, and developing tornado activity within a limited area.

On the night of the 26th a small but violent tornado swept through a portion of the Soldier river valley, in Monona county, causing some loss of life and destruction of property. The storm originated early in the evening, in Boone county, Neb., and entered the Soldier valley about 10 P. M. According to newspaper reports, and letters from postmasters and others, the tornado cloud first made its appearance at the farm of Geo. Swenson, about three miles northeast of Moorhead. On that farm the dwelling was spared, but the barn and outbuildings were demolished. There were eight horses in the barn, of which five were crippled and three only slightly injured. The next building demolished was the home of Rev. H. J. Hjorlholm. Mr. Hjorlholm and family had taken refuge in the storm cave when they heard the roaring of the wind, and so escaped death. Not a stick of the house was left standing and the outbuildings were wrenched and smashed. The High Hill schoolhouse, a mile and a half south of Soldier postoffice, was torn from its foundation and turned half way round.

The tornado next visited the farm of Anton Hanson, sweeping away his residence and fatally injuring his father-in-law. Peter Peterson. The home of Arnt Amundson was also wrecked and Mr. Amundson was seriously injured and died from the effects.

The house of George Furne, about three miles southeast of Ute, was destroyed, and one son, aged about 11 years, was instantly killed. Mrs. Furne was very badly injured.

A number of other farms were in the track of the storm, and more or less damage was done to buildings, trees and fences. Newspaper reports state that some fall plowed fields were swept bare of loose soil down to hard pan. The track of the storm was twelve to fifteen miles long, but the tornado cloud did not touch the earth all that distance. Four persons lost their lives as the result of the storm and one or two others may not survive their injuries.

On the 30th, about 3:30 P. M., a severe wind and rainstorm developed near Macedonia, Pottawattamie county, and wrought considerable damage in a narrow pathway, passing near the towns of Oakland, Hancock and Avoca. It was a straight blow, or heavy squall, with some of the characteristics of a tornado at various points along its track. No residences were destroyed and no persons were injured, but several barns were demolished and other buildings unroofed. Along the railway track telegraph poles were blown down and many trees were uprooted or twisted off. The same general disturbance developed a severe hailstorm at various points in the western and northern districts, the most destructive effects being felt at Bode, in Humboldt county, and heavy winds were experienced in all parts of the state.

APRIL WEATHER RECORD.

The month began with wintry conditions. At the central station the mean temperature of the first ten days was 36°, an average daily deficiency of above 10°. The second and third decades were warmer than usual, bringing the mean temperature up to about the normal for April.

For the state the average temperature for the month was 48.9°, which is about the normal for all the stations of record. The month was notable for its great extremes, ranging from severe wintry weather to normal summer temperature. The average monthly maximum was 82.8°, and the average monthly minimum 11.9°.

The mean temperature by sections was as follows: Northern section, 47.2°; central section, 48.9°; southern section, 50°.

The average precipitation for the state was 2.40 inches, as shown by records of 149 stations. This is about .60 of an inch below the normal amount for April. By sections the average was as follows: Northern section, 1.82 inches; central section, 2.65 inches; southern section, 2.73 inches.

The highest wind velocity recorded was 60 miles an hour at

Sioux City on the 28th. There were several days of extremely high winds during the closing week of the month.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30 inches; highest observed, 30.54, at Clarinda on the 4th; lowest observed, 29 31, at Omaha on the 30th; range for the state, 1 23 inches.

Temperature.—Monthly mean, as deduced from 119 reports, was 48.9°; highest monthly mean, 54.3°, at Ft Madison; lowest monthly mean, 44.8° at Eagle Grove; the highest temperature reported was 89°, at Thurman on the 12th; the lowest temperature reported was 1°, at Bedford on the 4th; the average monthly maximum was 82.8°; the average monthly minimum was 11.9°; the greatest daily range was 50°, at Plover, Sheldon and Atlantic; average daily range, 41.7°.

Precipitation.—Average for the state, as determined from the reports of 149 observers, 2.40 inches; the largest amount reported was 5 76 inches, at Belle Plaine; the least amount was .56, at Northwood; the greatest daily amount reported was 3 inches at Lansing on the 28th; average number of days on which .01 inch or more of precipitation was reported, 7.

Wind.—Prevailing direction northwest; highest velocity 60 miles per hour, from the south, on the 28th, at Sioux City.

Weather.—There were 12 clear days, 11 partly cloudy days and 7 cloudy days.

Thunderstorms.—Thunderstorms were general over the state on the 13th, 17th, 19th, 27th, 29th and 30th.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.99	30.42	4	29.44	27
Des Moines	30.01	30.48	4	29.44	27
Clarinda	30.01	30.54	4	29.42	27
Oresco	.....	30.49	4	29.41	27
Dubuque	29.99	30.43	4	29.43	27
Omaha, Neb	29.98	30.47	4	29.31	30
Keokuk	30.00	30.44	4	29.44	27
Sioux City	30.02	30.43	4	29.44	27
Means	30.00	30.54	4	29.31	30

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	6,080	29	SW	28
Des Moines	6,878	42	SW	30
Dubuque	5,781	33	NW	28
Keokuk	5,901	36	SW	27
La Crosse, Wis	5,270	28	W	13
Omaha, Neb	6,828	36	S	28
Sioux City	10,640	60	S	28

OBSERVERS' NOTES.

Albia—R. MOORE. But little done yet in the way of farming; too much moisture in the vicinity for farm work.

Bancroft—E. G. BAILEY. First wheat sown on 11th. A very fine month every way; farmers mostly through seeding, and some commencing to prepare ground for corn.

Bonaparte—B. R. VALE. The first two weeks were cold and severe on all young stock, causing great fatality. The last of month has been above normal and very growing weather, but such frequent rains and showers as to prevent the usual amount of seeding and other farm work. Farm work two to three weeks late

Clinton—LUKE ROBERTS. Farm and garden work progressing nicely; vegetation making rapid strides. Some fruit trees in full bloom.

Coon Rapids—DOWNS & Co. Seeding all done; some small grain up. Farmers plowing for corn. No corn planted yet. The ground is in first class condition to work; grass coming good, but nearly all clover winter killed.

Forest City—J. A. PETERS. Farmers commenced seeding about the 15th. Season is about two weeks late. Small grain about all in at close of month and some plowing for corn.

Grand Meadow—F. L. WILLIAMS. First plowing, 12th; first seeding, 13th; farm work backward. Hardly grass enough for stock at end of month. Ground works fairly well.

Grinnell—A. O. PRICE. First seeding, 7th and until 27th; generally favorable for field work, with ground in fine condition. Hail on 29th at 3 P. M., size of buckshot to size of marbles. The storm of the 30th was a big downpour for an hour, washing out culverts and doing other damage; some stock killed by lightning.

Logan—M. B. STERN. The month has been remarkable for cold and cloudiness, but vegetation is progressing slowly; fruit trees are coming into bloom, but many things have suffered from our long cold winter.

Storm Lake—M. L. FULLER. Sleighing continued up to the 4th, but spring came quickly after it started. Sunday, the 2d, was more like New Year's day than like Easter. Light snow fell most of the day; overcoats and sleigh-bells had not been laid aside. Four weeks later the leaves had begun to unfold on the trees, and grass was large enough for pasturage in many fields.

Tara—W. E. HUMPHREY. Season about two weeks late; small grain nearly all in; trees are leafing out; pastures look green, feed in ten days. Farmers are commencing to get corn ground ready, will be some planting done in ten days to two weeks.

BELATED REPORTS.

Received too late to be included in means:

Corning—APRIL—Mean temperature, 49.7°; highest, 81°, on the 28th; lowest, 9°, on the 4th. Total precipitation, 2 93 inches; greatest in 24 hours, .95 inch, on the 30th Total snowfall, 2.5 inches. Prevailing direction of wind, northeast. Number of clear days, 13; partly cloudy, 5; cloudy, 12; rainy, 6.

Northboro—APRIL—Total precipitation, 2.09 inches. Total snowfall, 5 inches. Number of rainy days, 8.

ERRATA IN FEBRUARY REVIEW.

Indianola.—Mean temperature should have been 15.5°; mean minimum temperature should have been of 5.6°.

Mt Pleasant.—The maximum temperature readings for the month of February were about 10° too high on account of defective exposure.

CLIMATOLOGICAL DATA FOR IOWA, APRIL, 1899.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Algona*	Kossuth	1,500	7	47 8	0	78	25, 28	13	1	...	1.95	-1.99	1.00	2.0	4	2	23	5	NW
Alta	Buena Vista	1,519	8	46.6	0	84	25	11	1	40	1.17	-2.87	.45	3.0	7	12	13	5	SE, NW
Alta (near)	Buena Vista										1.34		.36	2 0	6				
Britt	Hancock	1,230		46 5		83	25	10	1	42	1.63		.86	.9	7	4	24	2	W, NW
Bancroft†	Kossuth			46.6		81	25	11	1	40	1.07		.45	1.0	5	12	10	8	NW
Charles City	Floyd	1,012	8	47.4	0	82	25	14	1	43	1.61	-1.77	.92	.5	8	9	15	6	SE
Clear Lake	Cerro Gordo	984		47 8		84	25	10	1	42	2 00		.76	2 0	4	16	7	7	SE
Cresco	Howard	1,312	27	45 8	+2	82	25	7	2	37	1.55	-1.04	.91	.5	6				NW
Decorah	Winneshiek	900	6	47.8	-1	83	25	12	1, 2	41	3 46	+.14	1.20	1.0	8				NW
Dows	Wright			47.5		81	25, 28	13	1	41	2 51		.69	1 2	9	14	8	8	SW
Eagle Grove†	Wright			44.8							2.46		1.10		5	10	18	2	N
Elkader	Clayton			49.1		85	28	14	2	48	1.18		.53		6	12	5	13	W
Forest City	Winnebago	1,220		46 4		80	25, 28	10	2	38	4 18	+.60	2.30	.2	8	6	18	6	SW, NW
Grand Meadow*	Clayton		8	47.1	0	78	25, 26	15	2		1.47		.82	T	5	6	18	6	W
Greene	Butler	943		48 5		85	25	12	2	45	2.14	-1.99	.88	2.5	10	6	17	7	NW
Hampton	Franklin	1,240	9	48.0	+1	83	25	15	1, 2	41	3 31		1.96	.8	8				
Hawkeye	Fayette										1 26		.42		7	20	5	5	NW
Humboldt	Humboldt	1,082		48 6		84	25	8	4	44	4 12		3.00		4	9	13	8	
Lansing	Allamakee			50.2		83	28	14	2	42	2.11		.84	2.5	5	15	6	9	S
Larchwood	Lyon										1,4		.30	2.0	4	15	10	5	N, S
Le Mars	Plymouth	1,221		48 4		84	25	12	1, 4	46	.98		.60		6				S
Mason City *b*	Cerro Gordo	1,130		45 5		82	24, 27	11	2	48	1 81		1.12		6				SE
New Hampton *b*	Chickasaw	1,166		48 6		83	25	13	1	33	2.89		.32		3	21	2	7	S
Northwood	Worth	1,210		46.6		82	25	9	2	39	56		.61	.9	9	2	14	14	NW
Osage	Mitchell	1,178	8	46 8	+2	80	25	11	1	40	1.93	-.97	.40		4	18	3	9	SW
Plover	Pocahontas			47.4		85	25	6	4	50	.82		1.00		2	18	0	12	S
Primghar	O'Brien			47.0		85	25, 27	10	1	46	1 50		1 24	.7	13	11	14	5	W, NW
Ridgeway	Winneshiek			48 6		84	25	12	2	37	2.40		.37	3.0	3	14	9	7	NW
Ruthven	Palo Alto			46.1		81	25, 28	8	2	38	.78		.88	2 6	9	15	10	5	SE, S
Sheldon	O'Brien	1,406		47.4		86	25, 28	7	3, 4	50	1 55		.58	2.0	6	11	15	4	SW
Sibley	Osceola	1,509	6	45 9	-2	85	25, 28	10	1, 4	47	1 30	-2.18	78	2.0	4	9	17	4	E
Spencer *b*	Clay			45.1		83	25	5	4	46	1.09		.55	T	2	14	10	6	S
Spirit Lake	Dickinson		5	47.3	-2	88	25	11	1, 2	40	.65	-2.65	.98	1.5	8	14	12	4	S
Storm Lake	Buena Vista			45.6		79	25, 28	6	4	40	1.70		.88	1.0	6	15	10	5	S
Washta	Cherokee										1 28		.90	1.1	7	5	19	6	NW
Waverly	Bremer	942		49.6		83	25	17	1	48	2 14		.66	T	6	9	15	6	S, NW
West Bend*	Palo Alto		6	46.1	0	84	25	10	4		1 50	-1.92	1.00		4	21	0	9	W
West Union	Fayette	1,105									2.11								
Average				47.2	+0	82 8		10.8		42.4	1.82	-1.55		1.5	6	12	12	6	NW

CENTRAL SECTION.

Amana	Iowa		23	50.2	2	82	25	12	2	43	3 04	.10	1.03	.4	11	11	10	9	SE
Ames	Story	936	19	48.6	0	85	25	16	1, 2	46	2.01	-.84	.77		6	6	13	11	
Audubon	Audubon		6	48.4	-2	82	25	12	1	42	1.75	-2.19	.61	2.2	6	6	11	13	S
Baxter‡	Jasper					83	25				1.90		71	4.0	9	4	18	8	NW
Belle Plaine	Benton	840	9	48.6	-1	80	13, 27	13	1	38	5.76	2.26	1.86	1.5	10	5	18	7	S
Carroll	Carroll		9	47.3	-2	82	25	12	1, 4	48	2.28	-1.59	.80	1.8	8	16	3	11	
Cedar Falls *d*	Black Hawk	844	8	47.8	-2	83	25	15	1, 2	44	2.15	-1.34	1 00	.5	4				NW
Cedar Rapids	Linn	744	17	51.0	+7	84	28	15	2	44	2.89	-.27	1.25		8	12	10	8	NW
Clinton	Clinton	609	8	51.8	1	85	26	14	2	42	2.25	-.94	1.22		8	11	10	9	SE
Coon Rapids	Carroll			48 2		80	25, 28	14	4	42	1 59		.66	5	6	13	12	5	S
Davenport	Scott	615	27	52 3	2	82	28	17	2	32	2 94	.10	1.70	.3	10	6	11	13	SW
Delaware	Delaware	1,084	8	47.0	0	80	25	14	2	33	3.00	-.38	1.03		7	9	18	3	SW
Denison	Crawford	1,192	6	47.2	-2	84	25	11	4	44	2 63	-2 54	.66	.5	6	12	11	7	S
Des Moines	Polk	867	21	49.8	-2	82	28	13	4	40	2.22	-.82	.80	3 0	9	9	10	11	SW
De Soto	Dallas	886		49.4		85	25	10	4	45	2.03		.98	1.9	8	8	15	7	NW
Dubuque	Dubuque	665	26	50.6	2	81	28	17	2	37	4.24	1.18	2.44	T	7	11	13	6	NW
Galva	Ida		6	47.2	-2	83	28	12	1, 4	43	1.09	-2 51	.50		3	16	11	3	NW
Gilman	Marshall	1,035									2.81		1 30	T	6	15	7	8	S
Gladbrook	Tama										2.44		1.20		5				
Grinnell	Poweshiek	1,011		49.2		80	28	15	1, 2	33	5 05		2.29		7	7	12	11	N
Grinnell (near)	Poweshiek			49 0		82	28	13	2	40	5.22		2.10	4 0	10	12	9	9	SE
Grundy Center	Grundy	966	8	48.4	-1	84	28	17	2, 3	40	1.76	-2 24	1.04	T	7	17	9	4	SE
Guthrie Center	Guthrie	1,269		48.6		83	28	12	4	43	1.25		.64	.5	8	4	18	8	SE, SW
Harlan	Shelby			48.8		83	25	11	4	45	4.21		1.37	2.0	7	10	12	8	S
Independence	Buchanan	921	37	48.0	1	81	28	13	2	42	3 45	1.01	2.02	T	5	16	11	3	NW
Iowa City	Johnson	644	9	51.4	0	84	28	13	2	47	3 23	05	1.56	1.0	10	8	18	4	SW
Iowa Falls	Hardin		6	47.2	0	83	25	14	2	44	1.74	-2.48	.78	2.0	7				NW
Le Claire	Scott										2 64		1.70		6				
Logan	Harrison	928	34	50.2	-2	85	11	14	1	49	2.08	-.90	.50		8	14	8	8	S
Maquoketa	Jackson		6	50.1	2	83	26, 28	16	1, 2	43	1.36	-1 86	.33		7	17	9	4	SE, SW
Marshalltown	Marshall	898	7	49.1	0	82	28	15	2	46	2.12	-1.51	60		11	11	14	5	S
Monticello	Jones	800	45	49.4	1	82	25	14	3	40	3.81	1.13	1.48		5	15	10	5	NW
Mt. Vernon*	Linn	858		51 2		84	13	14	1		3.39		.97		8				
Mt Vernon (Hubbard)	Linn			51.5		82	28	15	1	41	3 40		1.05	.7	10	10	5	15	S
Newton	Jasper	958	12	48.6	0	81	28	15	1	38	4.52	1 02	1.75	5.2	10	10	14	6	NW
Odebolt	Sac			48.8		84	25	13	1	43	2.35		1.00		4	20	3	7	
Ogden	Boone	1,109		48.2		83	25	12	4	41	1 62		.55	.6	8	15	0	15	SE
Olin	Jones			49.4		81	28	11	1	49	2.83		.97	.2	8	16	10	4	S
Onawa	Monona			49.7		85	28	14	1, 4	44	1.09		.47	.5	7	12	12	6	NW
Rockwell City	Calhoun	1,219		47.9		84	25	10	4	41	1.90		.63	1 4	6	17	1	12	
Scranton	Greene			49 0		82	25	15	1, 4	46	1.49		.70	T	4	14	13	3	S, SW
Sioux City	Woodbury	1,122	10	49.4	-2	85	12	15	1	40	.96	-2.30	.31		7	13	8	9	NW
Tara	Webster	1,159		53 6		85	25,27,28	17	1	27	1.85		1.00	1.0	5	0	29	1	SE
Toledo	Tama		5	48.6	-2	83	28	1	2	45	3 18	-.24	1.43	2.0	8	14	0	16	SE
Vinton*	Benton	800	9	49.2	0	82	28	18	1		2.96	-.19	1.05	.5	5	20	6	4	NW
Waterloo	Black Hawk	862	20	48 3	-2	82	28	15	2	41	2 38	-.10	1.24	.8	9	13	13	4	NW
West Branch	Cedar	708		47.3		80	28	14	1	32	2 47		.60	5	6	12	12	6	SW
Whitten*	Hardin			47 2		84	25	18	1		1.97		1.04	1.5	3	13	10	7	SW
Wilton Juncton	Muscatine			51.2		82	29	14	1	41	3.45		1.44		5	12	7	11	SW
Average				48.9	-1	82.7		13 9		41 5	2 65	-.65		1 4	7	12	10	8	NW

CLIMATOLOGICAL DATA FOR IOWA, APRIL, 1899—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIPITATION, INCHES.				Number rainy days	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Afton	Union	....	....	45.6	.....	....	.....	14	1, 3, 4	.....	2 25	.....	.50	6.0	9	10	10	10	SW
Albia	Monroe	945	....	49 9	.....	82	28	8	1	39	4.30	.....	1.18	5.0	11	12	7	11	SE
Atlantic	Cass	.....	8	48.3	-1	85	25	4	4	50	1.69	-1.84	60	3 0	6	13	7	10	NW
Batavia	Jefferson	640	...	.....	.....	....	.....	.....	.....	.....	1.74	.....	1.00	.2	5	...	...	...	.....
Bedford	Taylor	.....	...	49.8	.....	85	25, 29	1	4	45	2 91	.....	.95	4.0	8	7	18	5	SE
Belknap	Davis	857	....	50.2	.....	83	25, 28	13	1	41	2 90	.....	.60	10.0	10	15	5	10	NW
Blockton	Taylor	.....	....	50.0	.....	81	28	11	4	41	2.69	.....	.92	3.0	8	10	15	5	NW
Bonaparte	Van Buren	.....	8	51.0	-1	83	28	10	1	42	2 44	-1.36	.68	3.0	8	.....	...	...	.....
Burlington *a*	Des Moines	526	....	53.7	.....	85	28	17	4	38	3.45	.....	1.24	2 0	12	..	..	....	.....
Bussey	Marion	.....	...	.....	.....	....	.....	.....	.....	....	2.78	.....	.94	3.5	11	...	.....	.....	.....
Carson	Pottawattamie	.....	...	.....	.....	...	.....	.....	.....	...	2 36	..	.62	2 0	7	..	...	.....	.....
Centerville	Appanoose	1,013	6	50.8	-2	83	28	9	1	39	3 12	-1 36	1.61	1.0	8	11	14	5	SE
Chariton	Lucas	1,030	....	48 6	.....	82	28	10	1	39	2.79	.....	.60	3.2	14	9	14	7	NE, SE
Chillicothe	Wapello	645	...	.....	.....	...	.....	.....	.....	....	3 33	..	.70	4 5	9	....	...	...	.....
Clarinda	Page	1,069	9	49.8	-2	84	25	7	4	44	4.30	+1 06	1.20	5.5	9	18	5	7	NW
College Springs	Page	.....	8	49 2	-4	82	25, 28	11	1	36	3.62	-.44	1.74	....	7	19	3	8	SW
Council Bluffs	Pottawattamie	989	..	50.8	.....	85	12	14	4	39	1.27	.....	.52	.7	8	18	1	11	S
Cumberland	Cass	.....	...	.....	.....	....	.....	.....	.....	.....	1.22	.....	.55	2 4	7	11	14	5	N, SW
Danville	Des Moines	715	...	.....	.....	....	.....	.....	.....	.....	2.63	.....	1.05	3	8	10	16	4	.....
Eldon	Wapello	.....	...	51.8	.....	82	12, 26	9	1	48	2.11	.....	.48	3 2	11	16	4	10	S
Emerson	Mills	.....	...	.....	.....	....	.....	.....	.....	.....	1.00	.....	50	2.5	3	...	.....	...	SE
Fairfield‡	Jefferson	767	13	52 7	+3	86	12	12	1	48	3 19	+.14	1.10	4.0	11	10	13	7	.....
Ft. Madison*	Lee	516	51	54.3	2	82	29	12	1	....	3 95	.73	1 12	4.0	9	7	10	13	S, SW
Glenwood	Mills	979	29	50 9	2	87	12	10	4	42	3 51	.98	1.03	2.2	6	5	18	7	SE
Greenfield	Adair	.....	8	48 4	-3	83	25	12	4	48	2.38	-1.22	.87	3.2	9	15	7	8	N
Griswold	Cass	.....	....	....	.....	....	.....	.....	.....	.....	1 56	.....	.45	3.5	6	3	14	13	S
Hamburg	Fremont	912	...	.....	.....	...	.....	.....	.....	.....	5.07	.....	1.75	1.0	6	12	9	9	NW
Hedrick	Keokuk	.....	...	48.0	.. ..	82	28	10	1	88	2.70	... ..	.62	3.0	9	....	..	..	S, SW
Hopeville	Clarke	.....	8	48.8	-3	80	28	11	1	38	4.08	21	.96		10	8	12	10	S
Indianola	Warren	...	7	50.0	-2	82	28	14	4	37	3.70	-.11	1.01	1.2	13	9	10	11	NW
Keokuk	Lee	618	28	53.3	1	83	28, 29	14	1	32	3 28	.09	2.09	3.0	11	14	6	10	SW
Keosauqua	Van Buren	.....	7	51.6	1	82	25,28,29	10	1	43	3.26	-1.26	.89	6.0	7	..	..	..	.....
Knoxville	Marion	....	6	50.6	-2	82	25, 28	15	1	40	3 57	-.53	1 20	5.0	10	9	8	13	NW
Lacona	Warren	.....	...	.....	.....	...	.....	.....	.....	.....	1.97	.....	.98	.5	9	12	9	9	.....
Lamoni *d*	Decatur	.....	....	52.8	....	80	26, 28	27	7	39	2.60	.....	.73	.....	8	....	..	..	NW
Lenox	Taylor	.....	...	49 0	....	81	25	10	4	38	2 22	.....	.67	2.5	9	15	5	10	SE
Lockridge‡	Jefferson	...	...	....	.....	..	.....	.....	.....	....	2.88	.....	.89	3 0	9	9	12	9	.....
Melrose	Monroe	853	...	.....	.....	..	.....	.....	.....	.....	.77	.....	.40	6.0	7	5	24	1	SE
Mooar	Lee	...	...	50.8	.....	83	28, 29	9	1	47	3.08	.....	.72	3.0	11	10	7	13	SE
Mt. Ayr	Ringgold	1,236	6	49.0	-3	82	25	7	1	38	3.11	-.65	.88	6.0	9	8	14	8	NE
Mt. Pleasant	Henry	725	...	51.8	.....	83	27, 28	12	2	42	2.27	.....	1.00	.....	6	14	11	5	SE
Murray	Clarke	1,183	...	.....	.....	....	.....	.....	.....	....	2.97	.....	.78	T	7	9	20	1	.....
Omaha (Neb)	Douglass	1,113	...	50.6	.....	84	12	17	1	34	1.73	.....	.82	1.3	8	8	11	11	NW
Osceola	Clarke	1,123	...	48 8	...	82	28	12	1	39	3.61	.....	.80	3.0	11	....	....	....	NE, SW
Ovid	Wayne	...	6	49 3	-4	82	28	8	1	39	3.21	-43	1.03	4.5	10	14	5	11	NW
Oskaloosa	Mahaska	850	16	50.3	0	84	28	12	1, 4	41	2.76	+ 02	1.25	3.5	10	13	4	13	NW
Ottumwa	Wapello	630	5	50.2	-4	83	28	12	1	41	2.19	-1.69	.67	.2	7	10	9	11	NW
Pacific Junction	Mills	960	..	49 2	.....	82	12,25,26	10	4	49	2.92	.....	.91	4 8	7	16	9	5	E, S
Pella	Marion	..	...	47.5	....	80	28	14	4	37	3.62	.....	1.36	2.0	11	13	9	8	SE
Red Oak	Montgomery	1,033	...	51.6	.....	83	12,24.28	9	4	41	2.39	.....	.66	.....	6	17	0	13	S
Sigourney	Keokuk	.....	...	49.6	....	85	28	9	1	47	2.76	.....	.50	3.2	10	11	15	4	SE
Stuart	Guthrie	.....	...	48 4	....	82	25	10	1	48	1 37	.....	1.10	.8	5	13	9	8	N
Thurman	Fremont	....	.	51.5	...	89	12	13	4	37	3 37	.....	.92	6.8	7	6	12	12	SW
Villisca	Montgomery	1,058	6	49 0	-3	84	24, 25	4	4	47	3.38	-.56	1.10	.....	7	17	10	3	S
Wapello	Louisa	578	....	52.4	.....	85	25	11	1	41	1.64	.....	1.00	.....	6	15	9	6	SE
Washington	Washington	738	8	49.8	-2	81	13,25,26	7	1	43	2.81	.10	.66	..	8	....	...	....	S, SW
Winterset	Madison	.....	8	48 2	-3	83	28	13	4	43	2 40	-2.03	.75	T	8			...	.....
Woodburn	Clarke	.....	...	....	....	....	.....	.....	.....	.....	2 58	.....	.75	3.6	12	11	10	9	.....
Average		.....	...	50.0	-2	82.8	.....	10.9	.....	41.1	2.73	-51	.....	3.2	7	12	10	8	SE
Av. for the state		.....	.	48.7	-1	82 8	.....	11.9	.....	41 7	2 40	-90	.....	2.0	7	12	11	7	NW

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Afton	Max	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
	Min	14	22	14	14	22	33	29	28	29	34	39	39	58	38	39	30	33	35	33	39	34	41	50	52	50	57	55	46	43	48	36.6
Albia	Max	32	33	32	40	45	46	42	50	56	66	69	79	77	62	62	63	75	69	71	63	55	61	65	73	80	80	81	82	76	72	61.9
	Min	8	17	23	13	25	33	30	25	27	35	43	40	56	38	37	28	44	48	34	44	37	42	50	50	48	55	64	47	47	50	37.9
Alta(H'd'n)	Max	28	25	32	39	46	36	40	46	59	66	67	79	72	53	50	68	70	50	70	44	56	62	68	74	84	77	76	82	62	62	58.1
	Min	11	14	18	14	28	30	25	26	37	34	36	44	55	32	34	28	48	34	31	36	31	33	33	49	50	57	67	45	37	41	35.0
Amana	Max	32	34	40	47	48	46	45	50	58	65	71	76	80	66	53	64	75	66	69	66	55	68	72	72	82	79	77	81	72	67	62.4
	Min	15	12	24	20	26	32	33	28	27	34	41	33	55	40	37	27	42	42	29	47	40	41	51	54	48	52	63	50	50	50	38.1
Ames	Max	30	28	37	44	45	37	43	48	61	65	71	80	75	58	53	66	70	58	72	65	54	67	71	78	85	80	76	82	71	71	61.4
	Min	16	16	21	18	28	32	36	29	33	33	38	34	53	37	36	28	46	35	27	40	35	36	50	45	45	53	46	45	42	45	35.9
Atlantic	Max	38	29	31	41	46	37	47	51	60	66	74	81	72	62	57	68	73	57	75	56	56	60	74	79	85	80	80	83	70	72	62.0
	Min	16	23	18	4	29	30	25	24	22	35	32	31	50	36	32	33	49	36	31	36	34	33	50	41	43	60	57	39	41	48	34.6
Audubon	Max	34	28	31	40	46	47	43	48	58	64	68	80	74	57	54	67	72	57	74	54	57	59	73	75	82	77	78	80	72	70	60.6
	Min	12	21	22	22	23	25	27	27	27	35	37	38	40	32	37	27	49	39	34	27	37	35	53	46	55	57	55	44	45	55	36.1
Bancroft	Max	31	29	35	39	45	37	41	46	37	62	67	77	74	52	48	67	72	48	67	60	54	64	74	77	81	80	79	80	72	68	58.6
	Min	11	14	18	13	30	31	27	28	29	34	35	37	36	33	32	30	42	37	29	41	35	33	49	44	49	56	60	43	40	39	34.5
Belknap	Max	35	30	33	41	40	44	43	48	56	66	72	79	76	75	56	64	74	63	76	62	56	65	67	75	83	80	75	83	67	73	61.9
	Min	13	19	19	17	27	33	32	31	30	35	38	38	39	42	39	30	45	43	38	40	40	40	45	52	53	56	63	50	53	52	38.4
Belle Pl'ne	Max	29	35	40	45	48	46	44	50	58	66	70	77	80	55	53	51	72	68	58	63	57	60	73	73	70	72	80	76	75	65	60.3
	Min	13	14	22	20	25	36	31	26	32	35	39	35	52	37	36	26	38	30	45	35	39	35	44	46	48	60	60	55	45	45	36.8
Bedford	Max	40	34	34	38	39	38	48	50	60	69	74	83	78	65	62	68	72	60	75	72	59	65	75	82	85	81	78	83	85	73	64.2
	Min	8	15	24	1	31	31	28	25	28	31	32	38	55	38	36	23	45	44	33	45	33	42	45	42	45	59	48	40	45	48	35 3
Blockton	Max	40	32	35	42	44	39	44	48	57	67	70	80	77	62	51	65	73	69	76	66	55	57	70	75	80	80	74	81	78	73	62.2
	Min	15	24	25	11	29	33	30	28	29	37	55	39	57	40	41	29	40	37	37	40	35	42	51	31	49	58	57	43	45	50	37.9
Bonaparte	Max	30	27	33	39	40	44	43	50	56	67	73	79	80	70	57	64	75	61	72	64	58	65	64	70	80	79	80	83	75	79	61.9
	Min	10	15	25	17	25	34	33	28	29	34	47	37	56	42	39	29	42	45	37	50	42	50	52	53	51	54	63	49	58	58	40.1
Britt	Max	24	32	36	39	44	37	42	46	54	62	66	76	78	52	48	66	73	52	68	58	54	65	75	80	83	79	79	79	68	65	59.3
	Min	10	22	19	12	28	31	29	29	25	33	35	35	50	32	28	25	42	35	26	40	34	30	47	45	43	53	53	41	37	42	33.7
Burlington	Max	31	33	33	40	45	46	47	54	59	69	79	75	80	68	57	67	75	66	73	71	72	68	70	70	81	81	77	85	83	84	64.6
	Min	..	18	25	17	25	32	32	29	30	37	49	38	59	44	41	30	44	50	35	48	44	48	53	55	56	51	63	58	66	63	42.8
Carroll	Max	32	26	33	43	48	37	46	51	61	63	72	81	73	59	54	74	69	56	73	47	55	64	67	77	82	79	76	81	61	65	60.2
	Min	12	18	20	12	28	28	25	26	26	33	32	38	56	28	36	26	46	34	28	35	30	33	47	48	49	52	65	40	38	42	34.4
Cedar Falls	Max	32	36	35	47	40	39	45	50	59	63	73	77	78	56	56	66	73	53	72	68	72	70	68	73	83	..	..	80	..	..	60 2
	Min	15	15	25	29	30	32	32	31	31	34	33	33	55	37	32	35	39	35	28	45	52	45	35	40	47	..	..	57	..	..	35.5
Cedar Rap	Max	30	36	40	48	50	45	44	50	57	67	71	80	81	58	52	65	76	56	70	69	55	66	73	74	81	80	75	84	71	72	62.5
	Min	16	15	24	22	27	33	33	29	31	37	43	36	57	41	39	31	45	43	33	45	41	41	51	51	52	53	63	53	52	50	39 6
Centerville	Max	33	32	29	43	42	42	42	50	56	67	72	81	76	69	58	62	76	67	73	65	54	61	70	72	80	81	78	83	64	70	61.6
	Min	9	20	24	14	25	33	30	32	30	36	45	42	56	40	38	30	48	40	43	43	40	44	55	51	51	58	61	59	50	54	40 0
Chariton	Max	36	27	28	38	41	39	41	48	51	65	71	79	75	60	55	63	72	58	72	65	56	59	65	72	72	80	78	82	74	72	59.8
	Min	10	20	24	11	25	32	30	27	30	37	42	43	55	39	39	27	35	37	33	43	37	42	51	51	49	57	55	48	45	51	37.5
Charles Cy	Max	25	27	34	42	45	40	42	47	54	60	65	75	76	57	48	64	72	59	65	60	54	64	75	76	82	76	76	79	73	64	59.2
	Min	14	15	22	20	28	31	32	29	29	30	34	32	50	35	29	30	41	38	28	45	37	31	49	47	44	50	63	49	48	45	35 7
Clarinda	Max	39	32	31	40	42	36	49	51	60	70	74	83	78	65	59	68	74	63	77	59	58	58	72	79	84	81	77	83	71	74	62.9
	Min	16	25	17	7	30	31	28	28	26	34	39	39	51	39	37	27	49	36	36	33	35	45	50	43	48	57	54	43	43	50	36.8
Clear Lake	Max	32	36	42	49	62	60	43	48	62	65	78	70	58	45	64	60	42	72	60	60	66	72	78	80	84	81	80	82	74	72	62.6
	Min	10	12	20	13	29	32	29	32	32	40	36	32	22	30	28	32	30	30	32	28	40	46	46	42	46	41	50	52	38	40	33.0
Clinton	Max	32	38	43	49	50	47	45	51	60	65	74	77	83	69	57	63	72	61	71	73	62	67	73	71	81	85	82	81	84	82	64.9
	Min	17	14	25	19	22	33	34	28	25	27	45	35	55	41	36	27	42	43	31	51	44	44	50	49	51	48	61	53	53	54	38.7
College Sps	Max	36	33	31	38	41	36	45	49	59	70	71	81	78	64	58	64	72	63	72	60	57	58	68	78	82	81	79	82	70	77	61.8
	Min	11	23	23	12	28	29	26	27	29	35	49	45	50	38	41	29	41	35	38	36	32	35	51	46	51	57	50	47	42	45	36.7
Coon Rap	Max	31	27	32	41	46	40	42	47	56	64	66	76	70	58	52	64	68	60	72	65	53	60	65	73	80	77	77	80	72	69	59.4
	Min	15	20	23	14	29	31	29	29	30	36	37	41	58	35	39	29	49	37	30	38	34	33	50	45	53	58	57	46	41	46	37.1
Co. Bluffs	Max	42	33	33	43	44	37	50	52	62	69	72	85	74	62	57	71	72	61	73	58	59	59	73	79	82	84	80	81	66	68	62.9
	Min	17	27	19	14	30	25	26	33	30	40	42	46	59	40	36	33	41	38	38	37	37	40	50	53	51	60	60	46	42	48	38.7
Cresco	Max	25	27	35	40	43	36	41	46	51	58	65	71	76	51	50	63	72	43	64	53	53	62	73	77	82	81	77	79	62	63	57.3
	Min	10	7	13	13	25	31	31	27	31	32	36	35	48	33	30	27	41	38	29	43	37	31	46	46	45	50	60	49	42	44	34.3
Davenp'rt	Max	32	32	38	45	45	43	45	49	54	63	74	76	78	58	54	62	72	60	69	70	59	66	71	68	80	78	77	82	80	81	62.0
	Min	17	17	26	28	29	35	35	30	32	40	51	44	57	44	38	34	46	45	40	48	44	46	51	52	57	56	62	56	63	56	42.6
Decorah	Max	25	34	42	43	47	37	43	48	52	61	63	74	79	60	48	74	70	45	68	62	53	67	74	78	83	80	74	82	62	63	59.7
	Min	12	12	17	16	26	32	32	27	30	28	30	33	53	37	30	42	33	40	29	42	29	30	47	47	65	49	62	52	46	45	35 9
Delaware	Max	27	33	38	45	46	45	45	48	45	62	69	75	79	58	52	64	73	62	64	65	55	64	68	71	80	78	75	79	70	66	60.0
	Min	15	14	22	22	25	32	32	28	29	29	40	38	55	37	32	27	42	42	29	46	40	36	47	45	51	51	61	50	54	47	33.9
Denison	Max	31	27	31	43	51	34	40	50	60	67	70	70	75	58	58	70	73	54	75	48	53	62	72	75	84	78	75	81	69	69	60.1
	Min	13	19	19	11	29	80	23	26	26	35	32	38	51	30	25	26	47	35	33	36	31	30	46	45	48	60	59	43	39	45	34.3
Des Moines	Max	34	28	36	40	44	39	45	49	58	65	71	80	74	58	54	64	70	57	71	63	53	59	65	73	79	78	77	82	71	71	60.3
	Min	17	20	26	13	31	33	32	32	33	39	44	40	50	41	38	32	50	39	36	40	37	41	52	50	50	58	58	50	45	49	39.2
De Soto	Max	34	32	34	44	49	39	45	50	59	67	70	80	78	57	55	65	73	58	73	61	54	58	68	76	85	81	80	82	72	71	61.7
	Min	16	18	24	10	30	32	30	27	28	37	40	35	52	39	38	29	50	38	30	43	35	35	51	50	46	58	57	45	44	49	37.2
Dows	Max	24	27	34	44	37	39	41	48	54	64	67	73	74	58	51	65	70	65	68	59	56	64	72	74	81	78	76	81	76	76	59 9
	Min	13	16	21	14	16	31	26	25	28	34	34	35	53	33	31	28	43	53	27	40	35	32	48	48	46	52	59	45	39	49	35.1
Dubuque	Max	27	36	39	46	48	44	44	48	55	61	73	74	79	56	53	64	72	55	66	68	58	65	68	73	81	80	75	81	74	70	61.1
	Min	17	17	25	23	26	34	34	29	31	33	48	37	56	42	37	32	45	43	36	46	42	41	50	48	53	54	62	55	59	49	40.1
Eldon	Max	33	30	35	43	46	44	45	51	59	69	75	82	80	71	59	66	77	71	79	62	60	62	69	75	81	82	77	81	72	77	63.8
	Min	9	17	26	12	27	33	33	30	28	35	42	34	57	42	39	37	41	44	37	47	42	46	53	52	47	54	68	50	54	56	39.7
Elkader	Max	35	35	40	50	51	44	46	53	57	63	74	78	82	57	51	67	76	46	70	67	56	70	71	80	84	80	77	85	69	67	62.7
	Min	15	14	22	20	24	33	32	25	25	26	35	30	54	39	28	27	45	42	29	45	39	33	48	43	44	45	60	51	45	48	35.5
Fairfield	Max	32	35	37	55	44	44	47	58	65	69	75	86	78	69	55	62	72	67	71	62	58	68	63	71	79	80	75	81	69	76	63.4
	Min	12	16	27	26	30	36	35	31	41	38	48	38	56	44	43	32	46	48	38	49	43	47	51	50	55	53	63	51	57	56	42.0
Forest City	Max	23	26	35	39	44	38	42	47	54	61	66	76	74	53	49	65	70	65	67	60	54	65	73	74	80	76	76	80	66	64	58.7
	Min	11	10	19	16	16	31	30	28	29	34	38	38	49	33	31	28	38	34	30	40	35	33	47	48	48	53	49	44	38	42	34.0
Galva	Max	28	26	30	42	46	43	42	46	63	70	69	82	76	55	52	75	72	53	73	52	55	66	65	78	80	77	79	83	73	67	60.6
	Min	12	15	20	12	30	22	26	26	28	34	32	39	52	32	26	32	46	25	34	34	32	30	54	45	45	52	61	43	32	43	33.8
Glenwood	Max	40	36	30	41	46	40	48	52	61	71	73	87	77	62	60	72	74	66	74	61	54	59	74	79	84	82	79	83	80	79	64.1
	Min	15	25	25	10	30	29	24	27	29	36	38	45	59	38	42	30	52	36	38	35	36	39	49	48	51	57	56	45	41	47	37.7
Greene	Max	25	32	36	48	49	39	42	49	57	64	69	79	77	69	49	65	71	57	70	60	56	68	76	80	85	76	79	70	67	66	61.0
	Min	15	12	23	21	28	32	31	28	29	33	36	34	52	34	32	30	42	37	29	44	37	31	47	46	46	50	63	43	46	48	36.0
Greenfield	Max	35	32	32	41	45	37	43	48	57	68	70	80	76	58	55	65	72	57	78	57	55	66	72	77	83	80	78	82	69	73	61.4
	Min	13	20	16	12	27	31	26	23	27	35	38	43	50	36	38	28	43	34	30	33	32	38	48	47	52	57	53	45	41	47	35.4
Grinnell	Max	30	28	35	41	43	40	41	49	55	63	69	76	77	58	50	53	72	59	68	66	53	57	66	70	76	77	75	80	75	70	59.4
	Min	15	15	22	19	29	33	31	27	43	35	41	45	58	39	39	30	44	39	35	47	38	38	49	51	55	57	57	50	45	48	39.1
Grin'l (nr)	Max	23	29	35	43	45	41	42	49	58	66	70	79	77	67	52	66	74	66	71	64	53	56	70	71	80	80	76	82	76	68	61.3
	Min	14	13	23	16	27	31	30	26	30	32	38	39	50	36	37	27	42	36	32	44	38	37	49	50	50	50	63	48	44	48	36.7
Grundy C'r	Max	29	38	39	42	48	37	44	50	54	65	70	79	80	55	51	67	75	55	71	56	56	67	75	77	83	79	75	84	75	70	61.5
	Min	18	17	17	19	25	30	27	27	32	30	37	42	47	35	34	27	41	35	35	43	36	32	46	45	48	50	53	47	43	41	35.3
Guthrie C'r	Max	33	30	32	49	45	39	45	48	59	67	71	79	75	63	54	65	71	57	74	67	54	57	64	77	82	77	78	83	79	72	61.5
	Min	16	19	23	12	27	27	28	27	27	35	38	40	58	34	38	27	44	36	31	37	32	35	48	45	53	52	55	40	40	44	35.6
Hampton	Max	25	31	37	44	47	36	47	49	56	62	66	78	77	53	49	66	73	49	70	55	54	67	75	77	83	77	77	82	64	66	59.7
	Min	15	15	22	20	29	32	30	29	30	35	38	40	49	35	32	32	45	35	29	44	36	32	48	47	51	52	55	48	41	45	36.4
Harlan	Max	34	29	33	41	48	40	45	50	60	66	72	81	76	63	54	70	71	63	76	63	52	60	73	77	83	79	77	80	77	72	62.2
	Min	13	22	23	11	29	29	25	26	24	34	35	37	56	35	41	25	46	37	34	36	33	35	50	45	47	52	58	42	40	46	35.5
Hedrick	Max	32	32	35	40	45	45	44	50	56	66	72	78	..	..	..	..	..	..	..	..	..	..	..	..	77	80	..	79	82	70	73	58.7
	Min	10	16	25	17	27	34	28	27	29	29	41	40	53	37	..	32	40	48	..	34	39	42	50	49	52	..	62	47	50	52	37.4
Hopeville	Max	36	27	28	40	41	36	42	47	57	65	69	80	76	60	54	64	70	56	73	54	53	58	68	74	79	77	74	80	67	70	59.2
	Min	11	21	23	12	27	32	29	28	31	38	42	43	56	41	40	33	45	35	35	40	34	42	51	53	53	57	55	49	45	50	38.4
Humboldt	Max	26	30	34	40	45	40	44	47	57	63	67	78	77	59	52	68	73	61	72	64	66	66	73	78	84	81	78	83	79	61	61.6
	Min	14	18	20	8	30	30	29	27	29	33	31	37	57	33	32	27	48	37	28	40	36	36	49	46	48	55	62	42	39	43	35.5
In'pend'ce	Max	27	34	40	46	47	44	46	51	56	63	71	76	80	56	49	64	75	58	67	61	53	66	73	74	79	77	73	81	70	67	60.8
	Min	14	13	21	22	23	31	30	27	28	30	36	34	47	35	31	27	40	41	25	47	38	34	47	46	44	49	61	47	45	47	35.3
Indianola	Max	34	28	31	40	42	39	43	50	58	64	73	80	75	69	54	64	71	66	72	68	54	58	65	73	80	78	77	82	78	75	61.4
	Min	16	20	24	14	28	33	30	28	32	38	40	44	60	39	40	31	48	37	35	42	36	40	52	50	51	56	55	48	44	50	38.7
Iowa City	Max	33	33	41	48	50	48	45	50	51	68	74	81	82	68	54	64	77	67	72	71	60	67	76	77	88	82	81	84	74	72	64.4
	Min	16	13	25	21	25	33	33	28	27	33	39	34	53	41	39	28	39	45	31	48	41	43	49	52	48	51	62	51	53	52	38.4
Iowa Falls	Max	27	32	38	43	45	37	43	49	57	63	68	76	76	54	51	64	70	52	69	58	54	67	74	74	83	79	78	79	68	68	59.9
	Min	15	14	22	15	28	31	28	26	29	32	35	32	48	34	31	27	44	33	25	42	36	30	48	46	43	52	55	46	41	45	34.4
Keosauqua	Max	34	32	33	44	44	44	43	48	57	68	72	79	79	63	58	72	76	63	72	70	57	64	66	71	82	79	78	82	82	77	63.0
	Min	10	18	26	16	25	32	33	28	29	36	38	36	58	43	36	40	45	45	35	49	43	47	54	53	50	55	58	51	60	58	40.2
Keokuk	Max	31	30	32	40	43	44	42	50	56	68	74	78	80	61	56	64	74	60	73	70	56	65	67	68	79	79	78	83	83	81	62.1
	Min	14	20

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR APRIL, 1899—CONTINUED.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Means.
Knoxville..	Max....	34	30	34	44	44	53	44	51	59	66	72	80	77	75	55	65	74	62	73	66	56	60	67	74	82	80	78	82	74	71	62.7
	Min	15	19	19	17	28	32	31	28	32	37	43	40	43	40	41	31	47	38	34	43	37	41	51	51	53	57	56	51	45	51	38.4
Lamoni....	Max....	..	..	..	..	43	43	42	49	55	66	70	78	75	60	55	61	70	55	74	61	56	58	70	73	78	80	73	80	69	71	64.0
	Min	..	..	..	..	35	32	27	28	28	35	43	40	56	39	39	29	45	37	35	49	35	43	57	52	49	58	55	45	46	52	41.8
Lansing....	Max.....	29	36	45	48	49	46	47	53	58	62	74	76	80	71	52	65	76	71	66	66	56	69	74	78	82	82	78	83	77	65	63.7
	Min	15	14	17	18	23	34	33	25	26	28	36	34	60	41	30	29	49	43	32	32	40	31	50	43	46	48	62	55	55	49	36.6
Le Mars....	Max.....	30	28	32	38	48	37	43	51	63	70	78	83	78	55	53	74	68	55	53	55	62	64	72	78	84	81	80	83	80	68	64.5
	Min	12	20	19	12	29	25	25	29	30	35	34	37	55	33	27	29	53	35	36	29	28	35	49	55	46	60	60	38	36	40	38.2
Lenox.....	Max.....	36	32	28	38	39	36	44	47	56	65	69	79	75	63	55	64	72	62	73	67	54	58	69	74	81	79	75	80	74	71	65.6
	Min	11	22	23	10	28	31	29	27	29	35	41	43	57	38	40	31	45	35	35	38	34	42	51	50	51	57	55	47	43	48	37.5
Logan.....	Max.....	37	32	30	39	45	40	48	52	60	72	85	72	68	65	72	75	70	75	58	65	72	70	77	80	84	84	82	71	76	70	64.2
	Min	14	24	18	22	29	30	23	27	32	22	36	48	42	33	35	40	38	34	38	32	35	36	50	52	50	55	50	51	45	40	36.1
Maquoketa	Max	31	38	43	47	50	46	44	48	46	63	72	76	81	70	56	64	73	61	69	70	61	66	71	74	82	83	72	83	76	76	63.1
	Min	16	16	25	21	23	26	32	28	28	28	38	33	53	43	35	27	39	44	28	51	42	40	49	44	53	47	45	52	55	51	37.1
Marsh'lt'n.	Max.....	29	30	38	43	45	39	44	50	58	63	71	79	77	55	55	65	73	55	70	58	54	66	72	75	80	80	75	82	63	73	60.8
	Min	16	15	24	20	31	33	32	26	30	44	36	53	65	39	37	29	45	37	29	55	38	35	40	47	40	52	60	50	46	45	37.6
Mason City	Max.....	23	27	35	42	47	39	45	50	55	63	..	78	78	56	50	56	72	49	63	62	55	64	75	82	74	74	82	..	64	64	58.2
	Min	12	11	20	15	28	31	25	25	28	29	..	30	34	34	32	29	44	35	26	40	33	29	44	44	48	61	47	..	40	43	32.9
Monticello.	Max	31	35	35	48	48	45	45	50	57	64	76	75	80	70	54	60	71	69	68	70	59	67	69	77	82	80	79	81	80	75	65.4
	Min	15	16	14	16	15	31	32	25	26	28	41	40	51	40	32	26	42	44	28	50	41	39	40	44	47	45	49	47	48	51	35.4
Mooar	Max.....	34	35	34	45	45	47	45	54	52	68	80	79	79	66	56	59	73	63	73	61	59	67	69	72	79	80	72	83	81	70	62.7
	Min	9	18	17	16	20	30	31	30	29	28	33	34	59	45	37	33	35	50	35	52	42	49	50	50	58	50	64	55	53	53	39.0
Mt. Ayr .	Max.....	35	27	26	41	42	36	41	47	56	67	69	81	75	64	56	65	72	59	74	65	52	56	70	77	82	80	71	81	71	71	60.4
	Min	7	21	24	15	22	32	28	27	28	35	44	43	56	39	40	29	46	35	36	39	34	42	52	52	51	56	55	46	44	49	37.6
Mt. Ple'sn't	Max.....	36	38	40	42	48	47	46	51	57	68	73	76	81	71	60	63	75	67	74	72	61	68	67	73	81	82	83	83	82	82	64.9
	Min	23	12	24	20	25	31	31	27	28	34	45	34	54	40	39	25	41	45	33	47	39	44	49	50	51	53	62	46	55	57	38.8
Mt. Vern., H	Max.....	39	42	41	53	49	44	48	48	50	68	81	78	79	63	64	66	75	59	74	69	63	71	78	79	80	81	77	82	72	71	64.8
	Min	15	17	26	23	25	33	32	24	31	40	42	43	52	40	39	32	41	40	33	46	41	39	38	50	49	48	51	50	55	50	38.2
Newton ...	Max.....	31	28	35	41	44	38	43	50	57	64	70	78	76	58	54	63	72	55	70	60	54	58	68	74	80	78	73	81	68	70	59.7
	Min	15	16	23	17	29	32	31	26	31	34	39	40	56	40	40	29	46	37	32	44	38	38	50	50	50	52	53	48	44	48	37.4
NewH'pton	Max.....	23	29	..	36	42	45	42	48	54	60	65	75	76	56	48	64	61	66	66	55	54	66	73	76	83	78	73	78	69	69	59.7
	Min	13	18	..	19	20	29	32	21	30	32	38	42	53	38	30	28	38	..	38	45	38	32	47	63	49	48	62	48	53	44	37.6
Northwood	Max.....	26	29	30	40	45	36	41	46	54	68	70	73	76	51	60	65	73	52	67	58	54	65	76	78	82	75	77	79	60	63	59.9
	Min	10	9	15	18	26	32	29	29	30	34	38	34	40	36	34	30	41	36	28	43	35	30	45	44	45	47	55	56	40	44	34.8
Odebolt	Max.....	32	29	31	54	57	40	43	49	62	68	71	82	77	63	53	70	71	65	74	56	56	65	69	78	84	79	73	81	77	76	63.8
	Min	13	19	21	22	28	30	24	28	28	34	34	41	52	31	34	29	48	35	31	32	31	33	36	45	51	59	60	39	39	41	34.9
Ogden.....	Max.....	31	27	35	43	45	38	45	51	60	65	72	80	74	58	54	65	71	58	71	53	55	64	69	75	83	80	77	82	63	70	65.4
	Min	14	22	23	12	29	31	28	26	26	35	32	40	38	32	36	37	47	35	30	40	31	36	50	47	48	55	65	44	40	46	35.9
Olin.....	Max.....	30	38	42	46	47	45	45	49	55	63	71	76	80	57	51	63	73	57	78	72	59	67	72	73	80	80	76	81	70	70	63.4
	Min	11	14	20	21	24	32	33	26	27	29	39	32	42	39	35	26	35	45	29	51	41	41	45	49	48	49	58	51	54	50	36.4
Omaha....	Max....	37	31	31	39	43	35	47	51	60	70	70	84	72	60	56	70	70	60	70	54	56	58	70	75	80	82	74	82	60	76	60.6
	Min ..	17	26	26	18	31	30	28	33	34	38	40	50	52	41	45	37	53	38	41	37	36	41	51	53	56	58	59	51	43	49	40.4
Onawa....	Max...	38	32	36	46	47	40	48	54	63	68	74	84	74	60	59	72	70	64	71	54	63	68	75	80	84	82	81	85	79	73	64.2
	Min	14	24	22	14	31	28	21	28	25	32	34	36	51	30	37	28	50	36	35	34	29	32	47	44	41	58	61	41	39	47	35.8
Osage.....	Max. .	24	26	35	40	44	38	44	47	52	60	66	75	76	54	48	64	71	56	65	56	52	62	73	75	80	79	75	78	70	65	58.3
	Min	11	16	17	19	27	32	31	28	30	32	36	35	51	34	31	30	41	37	30	45	36	31	46	45	46	49	61	48	42	43	35.3
Osceola ...	Max.....	36	26	28	40	41	37	42	49	56	66	70	80	75	61	56	64	71	58	72	52	54	58	66	72	79	79	76	82	61	72	59.8
	Min	12	20	24	14	27	32	29	28	32	39	42	41	58	40	40	30	47	37	33	41	35	42	50	52	53	56	55	48	45	50	38.4
Oskaloosa..	Max.....	34	32	34	44	45	44	43	49	59	67	72	81	80	60	56	66	77	59	75	62	55	61	68	74	83	81	81	84	69	73	62.2
	Min	12	19	25	12	28	33	31	28	29	37	42	45	57	38	38	27	47	40	34	43	39	41	50	52	50	54	58	50	46	50	38.8
Ottumwa...	Max.....	35	32	34	40	44	43	44	49	58	66	72	79	79	60	57	65	70	59	72	64	55	61	65	70	80	80	71	83	70	75	64.4
	Min	12	13	19	16	27	33	32	29	30	31	45	38	57	42	41	31	41	42	37	45	41	45	52	50	50	58	59	51	51	54	39.1
Ovid	Max.....	36	26	30	42	41	42	42	51	60	65	78	80	73	65	62	64	73	61	74	49	59	58	71	73	79	79	76	82	63	71	64.8
	Min	8	20	24	12	25	32	30	27	29	36	42	42	53	37	38	31	45	38	35	40	37	43	51	52	51	56	55	48	47	51	35.9
Pacific Jct.	Max	38	38	32	40	46	42	44	51	60	70	70	82	74	61	54	74	72	61	74	54	56	57	73	79	82	82	76	74	60	74	61.7
	Min	14	26	21	10	30	29	22	27	24	38	34	36	56	39	41	25	48	38	37	35	36	37	50	47	47	60	58	42	42	58	36.9
Pella.....	Max.....	32	25	34	40	38	40	43	48	50	63	77	72	74	58	50	61	69	55	70	51	53	58	65	69	78	74	68	80	63	69	57.4
	Min	15	17	23	14	20	23	30	30	..	..	..	..	..	39	41	28	43	38	33	45	38	41	51	53	50	55	64	48	46	51	37.6
Plover.....	Max.....	24	28	30	45	50	35	40	45	58	66	70	78	76	55	50	76	74	55	74	50	55	58	76	78	85	82	78	84	60	70	60.2
	Min	12	20	22	6	28	28	25	25	29	40	35	40	55	32	35	26	40	35	42	40	35	30	50	45	48	44	65	42	35	33	34.7
Primghar ..	Max.....	25	30	25	25	40	43	33	45	52	60	70	80	73	72	45	70	68	50	66	50	58	60	72	80	85	75	85	80	75	75	59.9
	Min	10	16	15	12	18	33	21	35	43	45	24	45	38	34	26	44	35	35	33	37	32	32	50	65	52	60	42	43	35	40	35.0
Red Oak...	Max.....	45	36	33	42	44	36	54	55	61	69	78	83	73	78	65	69	73	67	75	60	62	64	75	83	81	80	78	83	67	76	64.8
	Min	16	27	19	9	30	30	26	28	28	38	39	42	58	43	38	30	39	37	40	35	42	43	51	45	53	60	59	49	45	54	38.4
Ridgeway..	Max.....	30	38	42	45	47	40	45	54	53	60	71	75	77	57	49	65	72	58	68	57	57	64	72	79	84	80	73	80	70	64	60.9
	Min	13	12	17	19	27	33	31	28	30	33	40	38	53	35	32	29	41	38	31	46	37	31	45	47	51	53	62	50	45	45	36.4
Rockwell C	Max.....	30	28	33	42	47	41	43	49	60	70	71	79	74	56	53	67	73	57	71	65	53	65	70	76	84	81	79	81	62	69	60.9
	Min	13	18	21	10	29	31	29	33	29	32	33	39	50	31	33	31	40	35	30	39	32	33	49	44	49	53	53	45	40	44	34.2
Ruthven...	Max. ..	22	22	30	35	41	38	38	44	56	59	64	75	74	62	48	67	69	74	68	62	48	69	64	72	81	81	79	81	80	62	58.7
	Min	10	8	15	18	21	25	22	24	28	32	34	38	58	30	30	39	39	42	30	36	32	34	47	44	52	55	42	43	34	41	33.4
Scranton ..	Max.....	29	28	32	40	46	41	42	47	58	63	79	78	72	63	52	65	69	64	72	67	52	63	66	74	82	78	77	80	70	65	60.5
	Min	15	20	24	15	29	30	29	29	30	31	37	32	59	34	40	31	49	31	62	38	32	35	50	50	51	51	45	59	40	46	37.5
Sheldon ..	Max.....	27	24	30	40	45	37	43	67	69	70	74	84	74	56	54	78	70	56	69	59	55	67	74	82	83	84	83	86	65	59	62.2
	Min	10	16	7	7	28	27	23	26	34	35	34	34	49	27	24	28	49	34	29	36	31	28	46	41	45	56	62	35	35	15	32.7
Sibley	Max. ..	25	21	30	38	42	36	42	50	61	68	68	82	69	51	52	74	67	47	68	43	57	66	74	79	85	83	82	85	61	55	58.7
	Min	10	15	18	10	28	27	23	26	25	34	34	35	55	29	25	25	49	31	27	36	31	29	47	41	45	55	63	42	34	44	33.1
Sigourney..	Max.....	34	36	39	45	44	44	45	52	58	68	75	80	81	63	54	66	76	69	74	74	59	65	70	70	83	81	76	85	71	74	63.7
	Min . ..	9	13	22	14	21	30	29	25	26	39	40	35	34	37	38	26	41	40	31	31	38	40	47	50	50	51	60	48	47	50	32.4
Sioux City..	Max.....	31	29	32	45	48	38	48	52	64	70	71	85	70	55	54	74	68	57	65	46	57	62	70	78	82	77	81	84	66	71	60.9
	Min	15	24	21	18	32	26	24	28	30	38	42	48	57	34	35	34	55	35	40	38	31	32	53	45	55	55	59	47	39	48	37.9
Spencer ...	Max.....	26	27	31	41	45	34	41	47	57	65	69	78	75	56	69	69	47	66	..	..	62	65	73	79	83	81	65	82	72	62	59.5
	Min	9	15	19	5	27	27	22	25	29	32	33	37	50	28	26	45	30	25	..	..	24	26	54	42	46	43	28	36	35	42	30.7
Spirit Lake	Max.....	32	27	35	39	43	39	40	47	64	63	68	78	72	53	50	68	72	54	70	54	54	69	78	82	88	82	80	87	63	60	60.4
	Min	11	11	18	18	27	24	23	28	32	34	39	38	45	30	28	36	48	34	39	37	31	32	38	45	48	52	61	40	35	45	34.2
StormLake	Max.....	26	24	27	37	43	36	40	46	59	61	67	73	69	54	51	65	69	50	68	55	53	62	66	72	79	74	72	79	74	65	57.2
	Min ...	11	17	19	6	29	30	26	26	30	31	36	39	49	32	31	25	42	35	33	36	31	30	49	46	52	58	59	33	37	43	34.0
Stuart	Max.....	34	33	33	41	45	35	45	48	55	65	70	80	77	55	55	64	70	61	73	70	53	58	67	74	82	79	79	81	70	60	60.4
	Min	10	20	24	15	28	25	28	27	30	35	40	50	57	32	28	30	46	35	25	39	33	38	48	47	52	57	57	48	47	45	36.5
Tara.....	Max...	27	30	35	48	50	40	45	48	62	65	70	78	77	64	63	68	70	52	72	60	57	65	70	75	85	81	85	85	60	60	60.4
	Min	17	19	22	30	35	30	34	38	45	50	45	65	68	48	58	58	55	42	45	48	40	45	50	55	68	65	70	70	45	47	48.9
Thurman..	Max.....	37	38	31	40	43	38	47	40	46	68	70	80	72	56	61	70	71	64	76	57	57	60	70	74	79	79	78	82	60	75	60.9
	Min	17	30	26	13	33	34	29	33	29	28	44	52	52	45	42	43	52	42	65	41	41	48	52	48	48	59	58	45	46	58	42.1
Toledo.....	Max.....	32	33	37	46	47	44	44	53	42	66	71	77	80	58	55	65	74	53	69	59	57	62	73	75	80	78	75	83	65	70	60.9
	Min	14	13	23	16	25	33	31	24	27	35	35	32	55	37	35	28	42	50	29	50	40	35	48	48	44	51	61	48	45	42	36.5
Villisca....	Max.....	33	32	33	40	45	45	48	52	56	68	70	82	77	62	59	68	72	75	76	56	57	60	73	84	84	81	81	82	69	74	63.4
	Min	14	18	25	4	28	30	27	34	26	28	36	35	43	35	39	26	35	43	35	37	32	38	48	45	47	58	59	44	43	49	33.0
Wapello ...	Max.....	31	30	36	49	42	44	45	47	59	61	76	78	81	69	57	70	75	67	71	72	61	65	74	70	85	77	79	82	81	80	65.8
	Min	11	13	25	23	28	33	34	31	27	36	48	37	58	43	41	30	44	49	34	51	43	45	51	51	55	56	64	51	62	58	41.1
Washingt'n	Max.....	33	29	36	42	43	43	46	51	56	67	74	79	81	60	56	65	76	60	70	66	59	64	69	72	81	81	75	83	72	73	62.1
	Min	7	12	22	18	26	32	31	27	28	33	44	38	42	39	35	26	42	41	31	43	38	42	48	48	60	53	56	50	56	52	37.3
Waterloo...	Max.....	29	34	40	44	47	40	42	50	57	64	71	74	79	57	51	62	74	54	64	57	53	69	74	75	81	77	76	82	66	70	60.4
	Min	16	15	24	21	26	32	31	26	30	31	33	33	52	31	31	29	41	39	29	45	39	35	49	49	46	49	62	50	44	47	36.2
Waverly...	Max.....	27	31	38	47	49	39	45	50	57	63	69	77	78	55	50	67	74	60	78	57	53	69	75	76	83	77	75	81	75	71	61.5
	Min	17	18	25	22	29	33	33	29	31	35	36	34	55	37	32	30	43	40	30	48	38	34	49	49	46	53	64	51	45	46	37.7
West Br'ch	Max. ..	24	32	38	38	38	48	46	50	64	66	68	72	76	56	58	56	54	48	50	56	62	52	61	58	74	78	76	80	62	70	57.0
	Min	14	16	22	26	24	32	36	28	40	48	50	52	54	34	35	34	32	29	31	26	41	38	45	36	54	61	52	48	38	52	37.6
Wilton Jc.	Max.....	32	36	40	47	47	46	44	50	58	65	73	76	79	58	55	63	72	60	70	73	60	67	74	74	81	80	79	81	82	74	63.3
	Min	14	24	25	22	27	33	31	29	26	33	43	35	45	37	39	27	42	47	32	51	41	43	48	50	51	55	63	50	53	56	39.2
Winterset.	Max.....	35	30	32	41	44	35	45	50	37	65	70	80	70	60	56	65	69	57	74	53	56	58	66	76	82	78	70	83	62	71	59.0
	Min	15	20	21	13	28	32	28	27	30	37	40	42	58	37	40	29	48	35	33	40	33	40	56	47	50	58	57	40	43	47	37.5

DAILY AND MONTHLY PRECIPITATION FOR APRIL, 1899.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	7.
'ton	...	.40	.10	..		.10	..	...	...	...	..	..		....	....	....	.11	..	..	.28	..	.12		...		.50	.25	...	....	.39	2.25
gona	....	.20	..	..	T	....	..	..	...	..	..	..	T		....	...	....	....	....	T	....	..	T	....	..	T	.70	..	.05	1 00	1.95
ta (Hadden)	...	.27	01	..	.08	....	...	....	..	..	..	..		T	..	...			.19	..	..	....	..	...	....	.13	.04	....	..	.45	1.17
ta (near)	...	.20	...	....	....	15	..	....	....	..	..	....		..	..	..		....	.29	....	....			...	...	.28	.06	...	..	.36	1.34
bia	..	25	25	..	..	T	..	...	...	...	..		.94		..	..	.11	....	1.18	.04	....	12	T	.15	..	T	1.12	....	.05	.03	4.30
mana	..	T	.04	..	....		...	....	....	..	....	....		.14	.06		..	.20		.48	T	T	.04	.28		T	.10	.65	.02	1.03	3.04
mes	..	.05	.10	..	..	.31	..	...	..	..			T	..	..	..	....	....	.01	..	....	T	....	..		T	.77	...	.74	..	2.01
tlantic	..	.30	T	..		.17	..	...	...		..	....	....	..	...	...	..		.07		..		..	..	.	.15	.60	..	..	.40	1.69
udubon		.15	T	..	T	.07	..	..	....	....	....	..		..	..	..	..	..	.18		....	T	....	..		.18	.61	..	..	.56	1 75
ancroft	T	.10			....	T	....	...	..	..	....	....	T	..	..	..		.	.05	T	....	..	..	..	..	....	.45	.07	..	.40	1.07
tavia	....	.02	T		....	..	..	...			..		.16	....		..	..		..	1.00	....	.18				..	.38		..	..	1.74
lknap	....	20	.60	.10	..	.10	..	....	..			..	..	..	T	...	...	.50	..	.50	T	.10	.20	T	....	..	T	.80	..	.10	2.90
lle Plaine	...	.05	.10	....	....	..	....		....	....	..	....	..	.20	....	..			1.25	..	....		.04	.10	..	..	.30	1 46	.40	1 86	5.76
dford	....	.15	.05		..	.19	..	..	..	....	.	..	....	....	..	..	.09	..	..	.69	....	.06	....	..	T	..	.95	..	..	.73	2.91
ockton	..	20	.10	..	..		..	..	..	....	..	..	..	....	..				..	.92	....	.18	.03	..	..	.28	.38	..	..	.60	2.69
naparte	...	30	....	..	..	....		..	..	..	..	....	...	.68	(2			29	..	.12	.06	..	.37				.60	..	..	..	2.44
itt		.05		....	....	.06		..	..	..		..		..		..	..		18	.16	....			T	..		.86	.13	..	.19	1.63
rlington	...	.20	.05	..	....	T	T	..	..	..		..		.42	.51	...	...	.40		.13	.05	.04	.37	..	...	..	1.24	...	....	.04	3.45
ussey	....	.30	.05	..		T	..	..	..	..	..	..	.08	.02	..	..	.09	....	.94	....	..	25	.12			.03	.56	..	.34		2.78
rroll	....	....	.13	..	..	.05	.	..			...	..	.01	..	..	....	..	..	.46	..	....			02	..		.06	.75		.80	2.28
rson	....	.20	T	..		.14		..	....	..	..	..						..	.33	.27	...	T	T			.21	.62	...		.59	2.36
dar Falls	....		.05				....	..	..	..	....	..	.10		..		T	...			....	..		..	..	..	1.00	..	1 00		2 15
dar Rapids	T	.02	T		T	T				..	..		.11	T		..	.31	....	.30	T	T	T	.07	..	..	T	.43	..	1.25	.40	2.89
nterville	..	.10	T	..	..	T	T	T	T	..		....		.26	T			19	..	.68	.02	T	.24		..	T	1 61	..		02	3.12
nariton	....	.18	.11	..		.02	..	..	....				.32		..	..	03	07		.00	....	.12	.13	01	....	.02	.50	.10	T	.55	2 79
hillicothe	...	.30	.15	..	....		..		....	..	....	..	.52	T	..	..	.20		.44	T	.45	.22	....	....	..		.70	.35	T	T	3.33
harles City	T	....		....	..	.05	....		....	..	....	..	.13	..	..	..	.01		....	.10	....	..	..	..		.07	.02	.92		.31	1 61
arinda	..	.40	.05		.	.30	..	T	...	....	..	.	..			..		..	1.03	..	....	06	.			.60	.66	..	1.05	.15	4.30
linton	....	....	..		.	.01	.	..			....		.31	..	..	..			.47	..	...	...	.18	.02	..		1.22	..	.02	.02	2.25
lear Lake	.20				....	..	..	..	..			..	....		..	....	..	.60		..	..	..	..	....	.	..	.76		.44	..	2 00
ollege Springs	...	.30	.10		.	..	..	..		..	..			..	..	....	.		1 74	..	..	08	..	..	...	.13		.40	.87	..	3 62
oon Rapids	...	.05	T	...		.06	..	..	..		.	.	..		..	..	..	..	T	.11	...	T	..	..	..	.16	55	..		.66	1.59
ouncil Bluffs		.05	T	...	T	.10		..	..	..	..	..	....	T	..	..			T	.23	...	..	.01	..	.19	.13	.01		T	.52	1 27
resco	T	..		..	...	05				...		..	.09	....	.	...	T	T	.08	.	..			..	..	.07	.91	..	..	.35	1.55
umberland	..	.12	T		..	.12	..		..		..		.03		..	..	..		T	01	...	T	T	..		.10	.29	..		.55	1 22
anville	....	..	.03				....	..	..			.		.38	.16	...		....	..	.	36	T	.20	..		..	1.05	.25	T	.20	2.63
avenport	T		.03	...	..	T	T		....		..	..		.42	T		.	.01		.24	.08	T	.43	.02	T		1.47	.23	..	.01	2.94
ecorah	T		..	..	..	..	.11	....			..	..	.60		..	..			..	.48	..		..		..	04	.54	1.20	.02	47	3.46
elaware	..		..			.01	..	..	..		..		.09	...	...	....	38	....		.47	....	..	..		..	....	52	.	.47	1.06	3.00
enison		T	T		....	.10	..		...		...	..		..	....		T	..	30	.44	....	..	..	....	.	55	.58	..		.66	2 63
es Moines	..	.15	14	..		08		T		....	..	.	T	T	....		T	..	.20	.14	....	1.04	T	T	..	.20	53	.27	T	.67	2.22
e Soto	T	.10	03		..	.09	..	....	...		..	..	T	T		..	T	T	.18	T	....	..	.01	....	....	..	.10	.52	.	.98	T	2.03
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ubuque	T	T			..	T	T		..		..	..	..	T	T	..			..	67	T	.03	T			T	57	.39	.15	2 29	4 24
ldon	....	. 2	.13	.	..	T	..			..		..	....	.25	T	.	...	32	..	.48	.03	.20	.28	.02		..	.16	.12		T	2.11
lkader				..	..				..	..		..		21	..	....	..	08	..	.52	....	..	..	....	..	T	1 10	..		.55	2.46
merson	.25	T	..	T		....	..		..	..		..	....			...	..		.25	..	..					50			T	T	1 00
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orest City	T	T	.03	..	..	.05	..		..	....			..	..	..	..		T		.36	..	..	..	..	..		.46	.07		.21	1.18
t. Madison	T		.25	....		T	T	....	..	....	..		.51	..	.25	..	.14	....	..	.28	.90	..	.35	..	..	....	1.12		..	.12	3.95
alva	....	T	T	..	T	....	..	....						....	..		..	..	....	.29	T	....		..	.50	....	....	....	..	.30	1.09
ladbrook		..		..	.07		....	..						..		..	..	....		.10	....		..	.07		..		1 20	1.00	..	2.44
lenwood	....	.20	T	....	.13	....		....	....		..				....			....	.90			T		..		52	1 03		..	.73	3.51
liman	....	T	T	..	..	T		..	..	..	..	..	.04	..		....	.20	....		.32	....		.06	..	..	T	1 30	T		.89	2 81
rand Meadow	....			....	....	.03	....	..	..		..	..	04	....	..	..	.68	..	..	.44	..	..	..	....		.08	..	2.30	.05	.56	4 18
reene	..	T	..	..	....	.06			..	....			.3			....				.11	..			....		T	....	.82	....	.35	1 47
reenfield	..	21	.04	..	..	.12	T	T	....	..	..	..	53	T	....			T	.13	....	..	T	.03	....	....	.12	.33	..		87	2.38
rinnell	..	25		..	..	....	..	..	..	..	..	..	T	..	..		.15		.84		..	.06	.25	..		..	1 21		2.29		5.05
rinnell (near)	..	.25		..	..	T	..	..	..	..	....	..	T	..	.	..	..	.18	..	.82		.08	.29	.15	..	....	.05	1.30	.35	1.75	5.22
riswold	..	.12	T	...	..	.11	.	....	..	..	..	..	..	..	..	..	..	....	....	.27	..	T		....	..	.17	.44	....	....	.45	1.56
rundy Center	..		....	..	..	T		..	....	....	..	....	T	..	...		.01	..	01	T	....	....	.02	..	....	01	1 04	T	....	.67	1.76
uthrie Center	..	.05	..	.	..	.10	...	..	..	..		..	.01		.02			..	....	.05	..	..	T	..		.10	.28	....		.64	1.25
amburg	..	.20		.	..		....		..	..	....	..		..	..	..		..	.68	.68	..		....	..	.22		1.54	..	1.75	..	5 07
ampton	..	.11	..	..	.08	.05	...	....	..		....	..	.35	..	..		T	..	.10		..	.02	.01	..	..	.09	.88			.45	2.14
arlan	...	.10	.05	..	..	.08	.	..	...	....	....	..	..	...	..			..		1.37	...	T	...	..	..	36	1 12	..	T	1.13	4.21
awkeye	..	..		..	....	.08	..		..	..	....	..	.14	....	..		.12	..		.15	..	..	.02	..	....	.16		1.96	..	.68	3.31
edrick	..	20	.10	...		....	....		..	....	..	....	.18	..		..	.30	....		....	..	.62	.34	..	..		.36	.34		.06	2 70
lopeville	...	.16	07	...	T	.09	..	T	....	....	....		T	..	..		.01	....	61	....	..	.47	.07		..	.67	.96	..	..	.91	4.08
umboldt	..	.04	.01	...	...	.02	...	....	..		....	..	....	..	..	..	..	..	....	.30	..	..	..	..	....		.12	.42	..	.35	1.26
ndependence	....		..	..	...	T	T	..		....	....	..	T	..	..	..	.01		....	1.00	..					T	2.02		.02	.40	3.45
ndianola	...	.07	.05	..	....	.05	....		..		....	....	.84	....	....	....	.58			.30	..	T	.03	.01	...	.16	.53	.06	.01	1.01	3 70
owa City	....	.04	..	..	..		..	.07	..	.	....	....	..	.19	....	..	.62	..	T	.19	.02	.09	.22	..	..	T	1 56		....	.23	3.23
owa Falls	...	.10	....	..	..	.10	..	....	..	..	....	....	.10	....	....	..		..		..	....	....	.17	..	..	.03	78	..	..	.46	1.74
eokuk	....	20	.04	..	..	T	T		..	..	..	....		06	.10	....	..	.16	..	.05	.09	T	.40	T	..	..	1.16	.93	....	09	3.28
eosauqua	....	.22	.10	..	...		T		..		..	....	T	89	T	..	....	.45	..		....	.65	.06	..	...	..	.89	.	..		3 26
noxville	....	.30	.20			T	..	T			..	....		.32	..	..	T	.10	..	.68	..	.20	.08	..	..	.13	....	1.20	..	.36	3 57
acona	....	.02	..	....	.03	....	..		....	....	..	....	T	..	.02	....	T	....	....	.34	....	.04	T	T	....	.12	.98	.12	..	.30	1.97
amoni	....	....	..		....	.06	..	T	..	..	....	....	.41	....	T	....	..	..	..	..	..	.40	.37	.01	..	.02	.73			.60	2.60
ansing	....	..	..	....		T	....	....	....	..	..	..	....	....	..	....	..	.38	....	.24	....	..	..	..	....	..	1	3 00	T	.50	4.12
archwood	....	.25	..	....	.04	....	..	..	....		..	..	..	..	..		.26	.	....	..	..	..	....	....	....	.84	....	....	..	.72	2 11
e Claire	....	..	.01	..	....	....	T	T	..	..	....	..	.48	.	..	T	..	..	..	34	..	02	.09	..	T		1.70	..	T		2.64
e Mars	....	.20	..	..	....	..	..	..	..	....	....	..	..	.	..	.	.	.24		....	....	....	..	..	..	.30	....	..		.24	.98
enox	....	.15	..	..	..	.35	..	....	..	....	....	..	....	....	..	....	T	.	..	.10	..	11	03	.	..	.28	.67	..	.01	52	2.22
ockridge	.30	..	..	..	..		..	....	....	....	..	....	29	..	T	.	.50	....	.16	T	.02	.22	.35	T	....	..	89	.	.15	T	2 88
ogan	..	.25	....	..	....	.50	..	.25	....	....	....	..	..		.08	....		....	....	.34	....	..	..	..	.14	.17	....	....	....	.35	2.08
aquoketa	....	....			..	T	....	....	..	....	..	..		.26	....	....	..	.03	....	.33	.04		..	T	..	..	.27	.31	..	.12	1.36
arshalltown	....	.04	.07	....	....	.10	....	..	....	.	..	..	T	..	.03	..			T	.07	.	T	.08	T	.03	T	45	.55	.10	.60	2 12
ason City	T	....	....	..	..	T		..	..	..	..		.30	....	....	....	..	....	....	.20	....	..	..	.30	..	.	.60	....	.40	.01	1.81
elrose	....	.40	.20	....		T	..	..	....	..	....	....	.01		....	....	..	....	T	.01	T	.02	T	....	..	....	.09		..	.04	.77
looar	....	.20	.10	..	....	....	..	..		....	..	....		.20	.20	....	..	.25	..	.20	.12	.	.35	....			.72	.70	..	.04	3.08
onticello	..			....	....		....		....	....	..	....		..	....	....	....	.85	..	.42	....	..	.06	T	....	T	T	1.00	....	1 48	3.81
t. Ayr	..	.25	.20	..	..	.16	..	T	.	....	....	....	T		T		T	..	T	.88	..	.27	.05	..	....	.26	.30	....	.74	T	3.11
t. Pleasant		T		..	..	T	....	..	..	....	....	....	.23	....	.16	.30	....	....	..	T	..		.54	....	....		1.00	....	..	.04	2.27
t. Vernon	....		.06	....	....		....		..	..	..	..	.10	..	....	..	.90	....	..	.30	T	.05	.16	..	..	T	.97	....		.85	3.39
t Vernon (h)	..	.06	..	..	..	T	....	....	..	....	....	....	.16	.	..	.	1.05	....	.01	.30	T	.10	.17	....	.	.02	.73	....	T	80	3.40
urray	..	T	....	....	....	T	....	.	..	..	..	..	T	....	....	.	.13			36	....	.05	.42	....	..	.58	.65	....	.78	.	2.97
ew Hampton	....		..	....	..		..	....	..	..	..	..	1.12	....	..	..	02	....	.	....	....	....	....	..	..	.10	30	.95	....	.40	2.89
ewton	....	.58	T	..	....	.06	..	....		..	..	....	T	..	....	....	.32		.15	....	....	.04	.17	..	..	.06	1.41	....	.35	1.40	4.52
orthwood	....	....	..	....	....	T	..	....	..	..	....	..	....	....	..	....	..	..	..	.17	....	....	.	....	....	T	.75		.45	1.00	2.35
debolt	..	....	....	..		....	..	....	..	....	....	..	.	....	....	.	....	....	.15	....	....	....	....	....	....	..	.16	.40	..	.55	1.62
gden	....	.03	.11	..	..	.10	....	....	....	..	..	..	.22	.	..	....	..	..	....	.05	.	....	T	....	....	..	.97		..	.34	2.83
lin	..		.02	.	....	T	..	....	..	..	....	..	.28	....	..	..	.58	..	....	.28	.04	....	.32	..	....	....	.31	..	..	.82	1.73
maha (Neb)	..	12	T	...	.01	.13	..	..		..	..	..	..	..	T	....	..	..	.06	.06	..	T	T	....	..	.22	....	..	..	.47	1.09
nawa	....	02	.02	....	.10	.16	....	..	....		..	....	....	....	..	..		....	.12	....	....	..	....	....	....	.20	..	....	....	.40	1.93
sage	T		.04	..	....	.06	..	....	....	....	..	..	.34	....	....	....	.02	....	....	.08	..			....	....	.03	.35	.61	....	.80	3.61
sceola	..	.22	.13	..	..	.05	..	....	..	....	..	....	.05	....	....	....	T	..	..	68	..	.06	.24	....	....	.72	.58	.08	T	.80	3.61
skaloosa	.20	.15	....	....	....		....	....	....	....	....	....	.06	....	....	...	.08	..	.25	T	....	.20	.18	....	....	.03	1.25	....	.36	....	2.76
ttumwa	....	.02	T	...	....	T	....	....	....	....	....	....	18	....	T	....	.36	....	....	.44	....	.45	.67	....	....	....	.07	....	....	....	2.19

DAILY AND MONTHLY PRECIPITATION FOR APRIL, 1899—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total.
Ovid	....	.30	.14	...	....	.01	....	....	....	....	....	....	.70	....	....	....	.03	....	.05	.98	....	.19	....	....	....	....	.58	....	....	.23	3.21
Pacific Junction	....	.28	.02	....	T	.20	....	....	....	....	....	....	....	....	....	....	....	....	T	.05	....	....	T	....	....	.64	.91	....	....	.82	3.92
Pella	....	.10	.10	....	....	....	....	....	....	....	....	....	....	.33	....	....	....	....	....	.71	....	.29	.05	.04	....	.08	.14	1.36	....	.42	3.02
Plover	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.15	....	....	....	....	....	....	.01	.40	....	....	.23	.83
Primghar	....	.50	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.00	1.50
Red Oak	....	.39	....	....	....	.25	....	....	....	....	....	....	....	....	....	....	....	....	.16	....	....	T	....	....	....	.42	.51	....	....	.66	2.39
Ridgeway	.01	.01	....	....	....	.17	....	.01	....	....	....	....	.32	....	....	....	.01	.01	.10	.01	....	.01	....	....	....	.14	1.24	....	....	.36	2.41
Rockwell City	....	.12	.01	....	....	....	....	....	....	....	....	....	T	....	....	....	....	....	T	.50	....	....	.07	....	....	....	.63	....	....	.57	1.70
Ruthven	....	....	.30	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.11	....	....	....	....	....	....	....	....	....	....	.37	.79
Scranton	....	....	T	....	T	.09	....	....	....	....	....	....	T	....	....	....	....	....	.07	....	....	....	....	....	....	....	.63	....	....	.70	1.49
Sheldon	....	.09	.08	....	.14	.02	....	....	....	....	....	....	T	....	....	....	....	.01	.10	.16	....	....	T	....	....	T	.07	....	....	.88	1.55
Sibley	....	.20	....	....	T	....	....	....	....	....	....	....	T	....	....	....	....	.06	.08	.15	....	....	T	....	....	....	.23	....	....	.58	1.30
Sigourney	....	.12	.16	....	....	....	....	....	T	....	....	....	.33	....	T	....	....	.28	....	.33	.06	T	.50	.05	....	T	.46	.47	T	T	2.76
Sioux City	....	.05	.06	..	.06	.01	....	....	....	....	....	....	....	....	T	....	....	....	.30	....	....	....	....	....	....	....	.17	T	....	....	.31	.90
Spencer	..	.15	....	....	T	.03	....	....	....	....	....	....	T	..	....	....	....	.13	....	....	....	....	....	....	T	....	....	....	....	.78	1.09
Spirit Lake	....	T	....	....	....	....	....	....	....	....	....	....	T	....	....	....	....	....	T	.10	....	....	....	....	....	....	....	....	....	.55	.65
Storm Lake	T	.18	.08	....	.01	....	....	....	....	....	....	....	T	....	....	....	....	....	.12	.11	....	....	....	....	....	.12	.07	....	....	.98	1.70
Stuart	....	.02	T	....	....	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	.10	....	....	T	....	....	....	.10	....	T	1.10	1.37
Tara	....	.10	....	....	....	T	....	....	....	....	....	....	....	....	....	....	....	....	.40	....	....	....	....	....	....	....	1.00	....	....	.35	1.85
Thurman	....	.40	.10	....	..	.50	....	....	....	....	....	....	....	....	....	....	....	....	.80	....	....	T	....	....	....	....	.45	....	.92	.20	3.37
Toledo	....	....	.10	....	....	.03	....	.10	....	....	....	....	.17	....	....	....	.25	....	....	.47	....	....	....	....	....	....	....	1 43	....	.63	3.18
Villisca	....	.50	T	....	..	.25	....	..	....	....	....	....	T	....	....	....	....	....	30	....	..	T	T	....	....	.53	.50	....	1.10	.20	3.88
Vinton	....	....	.05	....	....	T	..	....	....	....	....	....	T	....	....	....	.18	....	....	.70	....	..	T	....	....	T	.98	....	....	1.05	2.96
Wapello	....	....	....	....	T	....	....	....	....	....	....	....	....	.04	....	....	....	.14	....	.22	.04	.20	....	....	....	1 00	....	....	....	....	1.64
Washington	....	.05	....	....	....	....	....	....	....	....	....	....	....	.20	....	....	....	.45	....	.45	....	.25	....	.40	....	....	.66	.35	....	....	2.81
Washta	....	T	.10	....	.10	T	..	....	....	....	....	....	....	....	....	....	....	....	....	.06	....	....	....	....	....	.08	.06	....	....	.88	1.28
Waterloo	T	....	.04	..	....	.09	....	....	....	....	....	....	.10	....	....	....	.13	....	....	.18	....	....	T	T	..	.01	.05	1.19	T	.59	2.38
Waverly	T	....	.01	....	....	.11	....	....	....	....	....	....	T	....	....	....	T	....	....	.07	....	....	T	....	....	.05	.40	.90	....	.60	2.14
West Bend	T	....	T	....	.04	....	....	....	....	....	....	....	....	....	....	....	....	....	.24	....	....	T	....	..	....	.04	.52	....	.05	.61	1.50
West Branch	.	....	.10	....	....	....	....	....	....	....	....	....	....	.55	T	....	....	....	.56	.24	T	....	.60	....	....	..	.42	....	T	..	2.47
West Union	....	....	....	....	....	....	....	....	....	....	....	....	T	....	....	....	....	....	....	T	....	....	....	....	....	.15	1.00	....	.86	.10	2.11
Whitten	....	T	.10	....	....	.05	....	....	....	....	....	....	T	....	....	....	....	....	T	....	....	T	T	T	....	T	T	1.04	....	.78	1.97
Wilton Junction	....	....	....	....	....	....	....	....	....	....	....	....	.80	T	....	....	.21	....	....	.58	....	....	.42	....	....	....	1.44	....	....	T	3.45
Winterset	....	T	.35	....	....	T	.10	..	....	....	....	....	....	.26	T	....	....	....	....	.25	....	....	.10	....	....	....	....	.59	....	.75	2.40
Woodburn	....	.13	.20	....	..	.04	T	....	....	....	....	....	.12	....	....	....	.02	....	..	.40	....	.08	.23	T	....	.01	.75	.05	....	.65	2.58

Precipitation Chart April 1899.



Vol. X. May, 1899. No. 5.



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Central Station, Des Moines, Iowa.

J. R. SAGE,
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LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

ALLIED PRINTING TRADES UNION LABEL COUNCIL DES MOINES, IA.

DES MOINES:
F. R. CONAWAY, STATE PRINTER
1899.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME X. MAY, 1899. No. 5.

IOWA CROP REPORT, JUNE 1.

Summary of reports by crop correspondents on the acreage and condition of state crops June 1st:

WINTER WHEAT.—The average condition of winter wheat, as shown by reports of correspondents in the counties where it has been planted in recent years, is only 28 per cent. This estimate expresses the judgment of correspondents as to the possible output of the crop compared with 1898. An effort will be made next month to obtain some reliable figures as to the number of acres that were left for the harvest, after deducting loss of acreage by winter-killing and abandonment.

SPRING WHEAT.—The acreage shows an average decrease of 4 per cent for the state. The average condition June 1st was 96 per cent.

CORN.—The lateness of the season and the fact that a considerable area of ground prepared for corn had not been planted when these reports were mailed, will render it necessary to defer until July a final estimate of the number of acres of this crop. The reports received indicate an increase of about 4 per cent in acreage compared with 1898. The average condition of the crop is rated at 76 per cent.

OATS.—Acreage decreased 1 per cent; average condition June 1st, 99 per cent.

RYE.—Acreage decreased 11 per cent; average condition, 79 per cent.

BARLEY.—Acreage seeded compared with last year decreased 2 per cent; average condition, 98 per cent.

TIMOTHY.—New seeding, 1 per cent increase; condition, 99 per cent.

CLOVER.—New seeding of clover, 2 per cent decrease; condition, 96 per cent.

MILLET.—Increase of acreage, 11 per cent; condition, 97 per cent.

FLAX.—Decrease in acreage, 12 per cent; condition, 96 per cent.

BROOM CORN.—Decreased acreage, 9 per cent; condition, 88 per cent.

POTATOES.—Decrease in acreage, 2 per cent; condition, 95 per cent.

SWEET POTATOES.—Decrease, 6 per cent; condition, 95 per cent.

SORGHUM.—Decrease, 6 per cent; condition, 88 per cent.

MEADOWS.—Condition, 87 per cent.

PASTURES.—Condition, 96 per cent.

CONDITION OF FRUIT.—Apples, 74 per cent; pears, 55; peaches, 10; blackberries, 40; grapes, 46; raspberries, 62; strawberries, 88; currants, 88; cherries, 76.

LIVE STOCK.—Condition, cattle, 98 per cent; horses, 97; sheep, 96; hogs, 96; spring pig crop, 73 per cent; foals, 95 per cent.

Correspondents were asked to give a careful estimate of the percentage of last year's corn crop held in farmers' hands June 1st. The reports show an average of 21 per cent, or about one-fifth of the product of 1898. This would indicate that farmers' present holdings amount to about 58,000,000 bushels.

CLIMATE AND CROP REVIEW FOR MAY.

The temperature of the air in May was quite variable, but the average for the month was about normal. The temperature of the soil, however, was unseasonably low, in consequence of the deep freezing during the latter part of winter, the lateness of the spring, the excessive precipitation and prevalence of cloudy weather. The number of stormy days was unusually large, and the amount of rainfall was much above the normal in all sections of the state.

Under these conditions plowing and planting operations were greatly retarded, especially in the southern and central sections where the soil was almost continuously saturated. A fair beginning was made in corn planting in the central and northern districts, during the first half of the month, but the cool, wet and cloudy weather that followed rendered germination unusually difficult, and much more than the usual amount of replanting was made necessary.

The heavy showers caused much damage in corn fields by washing of slopes and flooding the undrained low lands and bottoms. All these drawbacks caused a material lessening of the corn acreage, compared with the area that would have been planted under more favorable conditions. At the close of the month there remained much planting to be done, especially in the southern section. The stand secured in the area planted was very uneven, ranging from fair to poor.

Grass, spring wheat, oats, barley and garden truck made remarkable growth during the month. The condition of small grain at the close of the month was very good, the chief drawback being a tendency to rank growth on rich moist soils.

WET AND DRY WEATHER IN MAY.

The weatherwise people who predicted that May would be a very dry month hit the mark exactly. Those who predicted that it would be a very wet month were also true prophets. This country is big enough and the weather is sufficiently variable to verify all sorts of predictions for most any month. During the larger part of May, while this state was being drenched by copious showers, very large areas in the Gulf states and along the Atlantic coast were suffering greatly from drouth, and nearly all crops were materially injured thereby.

The air was heavily laden with vapor from gulf and ocean, but conditions were not favorable for its cooling and precipitation until it was borne far inland by the cyclonic winds that swept across the continent. There is one blessed provision for which we should be duly thankful, and that is the providential system that precludes the possibility of a drouth of sufficient extent to cover the entire area of crop production in the same year. Our drouths and famines have always been of a local character and not general. And the records of the past furnish a strong basis of confidence in the future.

NOTE AND COMMENT.

The *Iowa State Register* of May 14th, in an editorial relating to the crop condition and prospects in Iowa, said:

"The soil is in unexcelled tilth, as proved by the fact that the gophers, moles and worms are working it more generally than they have been for years. In consequence of the soft and porous conditions of the soil, the rains are being absorbed by the earth instead of flooding the sloughs, creeks and rivers; and the farmers report that the moisture has gone deeper in the earth than at any time during the past decade."

This is sound, both in fact and philosophy. When the soil is in good tilth or in a porous condition, the rains are absorbed by the earth instead of flooding the sloughs, creeks and rivers. That porous and absorbent condition of the soil is a result of thorough cultivation, subsoiling, tiling and the action of frost. Nearly one-half the farmed area of the state is in cultivated crops, and over three-fourths of the surface has been broken and cultivated; and this has changed the orig'nal physical condition of the soil, making it more receptive and retentive of moisture, thereby lessening the flowage of streams and tending to dry up sloughs and ponds. In other words, the rainwater percolates the soil and subsoil instead of flowing over an impervious surface into sloughs and streams.

***

The Keokuk *Gate City* says: "This country is becoming so thickly settled that a windstorm now hits somewhere every time." Yes, that's true; and, moreover, there is generally some scribe nearby where it hits to write it up as a terrible "cyclone." And so it happens that the belief is so prevalent that "cyclones" are more numerous than they were in former days.

***

Professor Bonney, of London, author of the latest book on volcanoes, frankly declares that it is left for the coming century to explain the causes and significance of volcanic action. This indicates that, in his opinion, there is some measure of uncertainty in regard to the hypothesis that the earth's interior is molten with an intense heat, and that volcanoes are caused by the tremendous forces generated therein.

***

In England, as well as in portions of America, the spring was unseasonably cold and seeding operations were belated. But there, as well as here, the outlook for crops is not discouraging.

***

A paragraph in the Boone *Republican* states that a heavy local cloudburst occurred on the evening of May 9th at a point on the main line of the Chicago & Northwestern railway between Dunlap and Dow City. The storm was short in duration, yet the rainfall was sufficient to wash out a considerable extent of railway track, causing a delay of five hours in the passing of trains. Little or no rain fell on either side of the vicinity where the washout occurred. Such purely local downpours illustrate the need of many more stations equipped with rain gauges.

A severe local storm near Pittsburg, Pa., of sufficient force to demolish light structures, was described by the press of that section as a plain "windstorm." The newspaper reporters of the east are not very enterprising. Such a storm out west is heralded as "A Terrific Cyclone," with a dozen startling headlines of the biggest type in the shop We grow nothing but the biggest of everything out west.

***

The relative meat-eating capacity of the nations is about thus: The United States, 147 pounds; England, 100 pounds; Norway, 80 pounds; France, 77; Spain, 70; Germany, 64; Switzerland, 62; Belgium, 61; Austro-Hungary, 60; Russia, Portugal and the Netherlands, 50 pounds each; Italy, 24 pounds.—*Ex.*

***

The United States uses the most eggs of any land, ten billion being required during the year, or 133 to each inhabitant. Canada comes next, with 90 to each inhabitant; Denmark, 80; France, 78; Germany, 75; Great Britain 39, and Italy, 47.

***

Alfalfa did not suffer much by the severe winter that proved so destructive to other varieties of the legume family. It is a very hardy plant when it takes root in congenial soil.

***

During the month of May the fields presented many object lessons as to the need of tile drainage. And again we are reminded of the fact that this state has suffered vastly greater damage from excessive rains, floods and washouts than from its most severe and protracted drouths The way to lessen the destructive effects of extremes of wet or dry is by thorough tiling and subsoiling.

***

The Davenport *Democrat* remarked that hailstones this spring are larger than usual and the supply thus far has been in excess of the demand. The Clinton *Age* proposes an amendment to the effect that the hailstones are about the regulation size, but the stories are larger than ever before.

***

The west does not have very many more severe windstorms than the east, but western newspaper boys exploit all the storms that sweep this region for all they are worth—and some more. We do all things in the superlative degree.

***

Mr. C. Beeman, of Waukon, Iowa, writing to the Rockford *Register*, says the exact cost of cutting and shredding corn fodder on his farm last fall was $2 46 per ton. He saved thirty tons of fodder from twenty acres of corn, and every ton was worth more than double the cost of cutting and shredding. It pays to cut corn and save the fodder.

***

Land that is tile-drained is wetter in a dry time and drier in a wet time than land not so drained.—*Rockford Register.*

That is a fact that should be told and retold until every farmer accepts it and applies it in practice.

***

Dr. Caleb Brown, of Sac City, passed away June 4th, after a severe illness of several weeks' duration He was a most useful and much beloved citizen, whose life in its prime was sacrificed in the service of the people to whom he ministered as a faithful and skillful physician. He served many years as a voluntary weather observer, and in his death this Bureau suffers an irreparable loss.

AN ASTRAL WEATHER SERVICE.

J. S. TRIGG IN ROCKFORD REGISTER.

We take no stock in an astral weather service, in other words, forecasts of the weather and seasons, based on planetary movements and conjunctions. Such service is too closely allied to the monkey-business of the city astrologer and the wandering gypsy hag, either of whom for a dollar will read and tell your fortune from the stars.

A steady guesser as to coming and unknown things, such as the weather, will, of course, guess right part of the time; but then it is all a guess, and as a prediction upon which to rely, such forecasts are absolutely worthless Still there is so much latent superstition in the make-up of even civilized Americans, that charlatans of this breed find plenty of victims, and line their pockets while they laugh up their sleeves at the credulity of mankind.

A weather service based upon science, so far as it can be utilized, which forecasts weather changes based upon existing barometrical and thermometrical conditions, is of value and is worth studying and heeding; but the foretelling of coming floods, droughts, frosts, cyclones and the like a year ahead, from star movements and conjunctions, is a monumental humbug and fraud.

SKETCH OF THE GEOLOGY OF IOWA.*

The Iowa Geological Survey is engaged in preparing a geological map of Iowa, upon a scale of half an inch to the mile. That is, a half inch on the map represents a mile on the surface of the ground. This map is issued in a series of sheets, each covering a county. The sheets are printed as fast as they are prepared. Each is accompanied by a text forming a report upon the area represented by the map, describing its surface features, its geological structure, and its mineral resources. The sheets and accompanying descriptive texts issued in any one year are bound together to form, for that year, the annual report of the Survey. A few hundred copies of each county report are, however, bound separately and issued as pamphlets. Necessarily the text accompanying any one map is concerned with the geology of the particular area to which the map refers, and to that alone.

For the benefit of readers unfamiliar with geology, who may not receive the full set of publications of the Survey, it has been thought desirable to furnish, with each separate county report, a brief resume of the geology of the state as a whole.

Geologists deal almost exclusively with rocks, but rock, in the wide, scientific use of the term, includes all classes of earthy or stony material, whether consolidated or not. Soft chalk, softer clay, or the loose bed of sand or gravel—if produced by natural, physical agents, such as currents of air or water—is to the geologist as much rock as the hard granite bowlder occasionally found on our prairies. In accordance, however, with the somewhat prevalent notion, the rocks of Iowa may be divided into hard and soft, into indurated and non-indurated rocks, into the regularly-bedded deposits that are recognized as rocks by even the non-geological observer, and the loose, superficial materials that almost everywhere conceal the beds of the indurated series. The hard or indurated rocks of Iowa are made up mainly of limestones, sandstones, and the various form of shales, all of which, however, differ among themselves very greatly in the matter of hardness. The indurated series of the state does not include any volcanic rocks, for nowhere, except at a few points now buried beneath some hundreds of feet of later beds, is there any evidence that Iowa ever included volcanic centers.

The hard, regularly-bedded rocks of Iowa were formed almost exclusively under water. They were originally loose, soft sediments spread out where they now lie, in regular sheets or layers, on the bottom of ancient seas. The present sandstones were originally submarine sand banks, the shales were beds of mud, the limestones were the product of coral reefs or marine shells of various kinds, broken and ground into fragments, and the coal seams were first masses of vegetable matter accumulated in swamps or marshes, something as similar matter accumulates in modern peat bogs. The areas in which coal accumulated differed from modern peat bogs, however, in the fact that they were almost exclusively salt water marshes, limited to what was, at the time of coal formation, the continental borders. That the rocks of the indurated series in Iowa are mainly of marine origin is clearly indicated by a number of lines of evidence; but it may be sufficient to note that the shells, corals and other organic remains so generally found imbedded in the various strata are all of marine types. They are skeletons of creatures that lived in the waters while the rocks were forming, and they are of such types as could live nowhere but in the sea. They tell not only of the presence of an ocean over certain parts of Iowa at the time the sediments in which they are imbedded were laid down, but they reveal the character, condition and stage of development of the marine life of the globe during the successive far-away periods that collectively make up geologic history. The rocks in question, therefore, so far as relates to Iowa, are nothing more than the consolidated sands and muds of old sea bottoms, preserving for our inspection samples of the life that occupied the seas at the time each successive bed was in process of accumulation. Iowa has passed more time under the ocean than as dry land.

Over the hard or indurated rocks that constitute the foundations of the state there is spread a covering of unconsolidated materials, varying from a few inches to more than 500 feet in thickness, and forming the soils and subsoils which are so important an element among the many causes of Iowa's prosperity. This non-indurated rock series includes several sorts of material. There is (*a*) the fine sediment—clays, sands and gravelly loams—laid down by rivers on their bottom lands and called alluvium; (*b*) the red, sticky clay, sometimes mixed with fragments of flint or chert, resulting from the slow decay of limestones where rocks of this kind have been long exposed at the surface. This clay is called residual clay because it is what is left after certain parts of the limestone have been carried away in solution; in some of the publications of the Survey, following the suggestion of a recognized authority on the subject of superficial deposits, it is called *geest*. There is also (*c*) the fine clay, ranging from yellow to buff in color, free from all pebbles, but containing little balls of lime and occasionally shells of land snails, with very rarely a few shells of fresh water species. This fine, pebbleless clay is called *loess*. The origin of the loess is at present somewhat obscure. Lastly, there is (*d*) the blue, black, yellow or buff bowlder clay, with associated gravels and sands, and not infrequently containing masses of granite or other rock species not native to the state These materials, constituting by far the greater portion of the non-indurated or soft rock series of the state, were laid down by great glaciers or ice sheets, which, several times in succession, crept down over all or parts of Iowa from the north. The bowlder clays of glacial origin are spoken of in the literature of geology as *drift* or *till*.

*The following sketch has been prepared by the collaboration of the various members of the Geological Survey, and is being used as an introduction to the various county reports. It is printed here for the benefit of those to whom these reports may not be available.—H. F. BAIN.

The superficial materials, including the drift, loess, geest and alluvium, are the newest or youngest of the rock series of the state. It must be kept in mind that the rocks naturally exposed within the limits of Iowa were not formed simultaneously. Some, as already noted, originated as sediments which were slowly and progressively piled up on the bottom of ancient seas; some were transported and spread out by glaciers; some originated in other ways; but whatever may have been the genetic process, in such a region as Iowa, the order of age among the different beds coincides with the order of superposition.

The very oldest rock in the state is that popularly known as Sioux Falls granite, or Sioux Falls jasper. It happens, however, that the rock is neither granite nor jasper, but is a quartzite. Geologists call it the *Sioux Quartzite*. It was originally a loose bed of sand; but in the lapse of time it has been changed, by a very perfect process of cementation, into one of the hardest and most durable of rocks. The Sioux quartzite outcrops at the surface in the northwestern corner of Lyon county, but elsewhere in the state it is concealed by newer strata. It is sometimes encountered in wells, and the depths at which it may be reached vary with the location of the well. The same formation appears again at the surface in central Wisconsin, where it is known as the *Baraboo Quartzite*.

The rock next in age to the Sioux quartzite, so far as relates to Iowa, is found along the Mississippi river, between McGregor and the northeastern corner of the state. This formation is largely sandstone. In the geology of Minnesota and in the reports of the present Iowa Survey it has been called Saint Croix; but in much of the literature relating to the geology of the region, it is known as the Potsdam sandstone. Wells bored in this sandstone at Lansing, Iowa, reached the underlying quartzite at a depth of 700 feet below the water level of the Mississippi river. The same sandstone rises in the bluffs up to a height of 300 feet above the river, thus giving the formation, at Lansing, a total thickness of about 1,000 feet. The Lansing bluffs are capped with 100 feet of Oneota limestone, a formation younger than the Saint Croix; and the road ascending to the highlands, six or seven miles west of the river, leads over the outcropping edges of the upper part of the Oneota, the whole of the Saint Peter and the basal portion of the Trenton. The order of superposition, and consequently the order of age, is here definitely determined for the five formations named. By studies pursued in other portions of the state, the relations of all the remaining formations, one to the other, may be ascertained with equal accuracy.



FIG. 1. Geological section from Baraboo, Wis., to Des Moines, Iowa, showing the general stratigraphy of the Iowa artesian area and of the Wisconsin gathering ground. The chief aquifers are the Saint Peter, the Jordan and the Basal sandstone. The line of juncture of the Basal sandstone and the Algonkian is hypothetical. *a* Des Moines; *b* Mississippi; *c* Kinderhook; *d* Devonian; *e* Silurian; *f* Hudson River; *g* Galena-Trenton; *i* Oneota; *j* Saint Croix; including the Jordan, St. Lawrence and Basal sandstone.

During the progress of deposition of the sedimentary, or indurated, rocks of Iowa that are younger than the Saint Croix sandstone, the northeastern corner of the state, together with a large adjacent area, was gradually elevated or tilted up, hence the shoreline of the sea in which the strata were successively laid down retreated step by step towards the southwest. Accordingly, the successively younger rocks are found at the surface in crescentic belts as one travels from the northeast to the southwest. Each formation dips to the southwest, and so passes under the next younger, as shown in the accompanying diagram, except that in the figure the inclination of the beds is necessarily very much exaggerated. By drilling a well at Des Moines, for example, the sandstone that crops out in the hills near Lansing is found at a depth of 2,000 feet beneath the surface; and at Des Moines we can pump out water which has filtered through the porous layers of the formation all the way from outcrops of the sandstone in Wisconsin and northeastern Iowa.

Rocks have their individual charactaristics. Those laid down during any one period of geological history have certain peculiarities whereby they may usually be distinguished from the rocks of any other period. The rocks which represent a single period of geological time constitute a system. Systems are assembled into groups, and each system may be divided and subdivided into series and stages. All divisions of whatever rank, from groups to stages, and even to substages, are severally known to geologists by definite names. The table on the opposite page, in which the rocks of Iowa are represented diagrammatically in the order of age or superposition, shows (1) the manner in which the indurated rocks are subdivided, (2) the relations of the several members of the geological column, one to the other, and (3) the names used to designate the several geological units, or natural groups of units, as they are recognized in the publications of the Survey. The table shows the strata that would be penetrated in boring a well, provided it were possible to locate a well so that it would pass through each formation, and pass through it at its maximum thickness. In this table, and in all the other figures published by the Survey, sandstone is represented by dotted patterns, shale by lines, limestone by blocks, and drift by lines broken by small circles. Irregular lines between two formations indicate unconformity. For illustration, there is an unconformity between the Saint Louis limestone of the Lower Carboniferous series and the Des Moines stage of the Upper Carboniferous. This means that at the close of the Saint Louis stage the sea bottom, on which the sediments making up this formation had accumulated, was elevated and became dry land. Streams and atmospheric agents

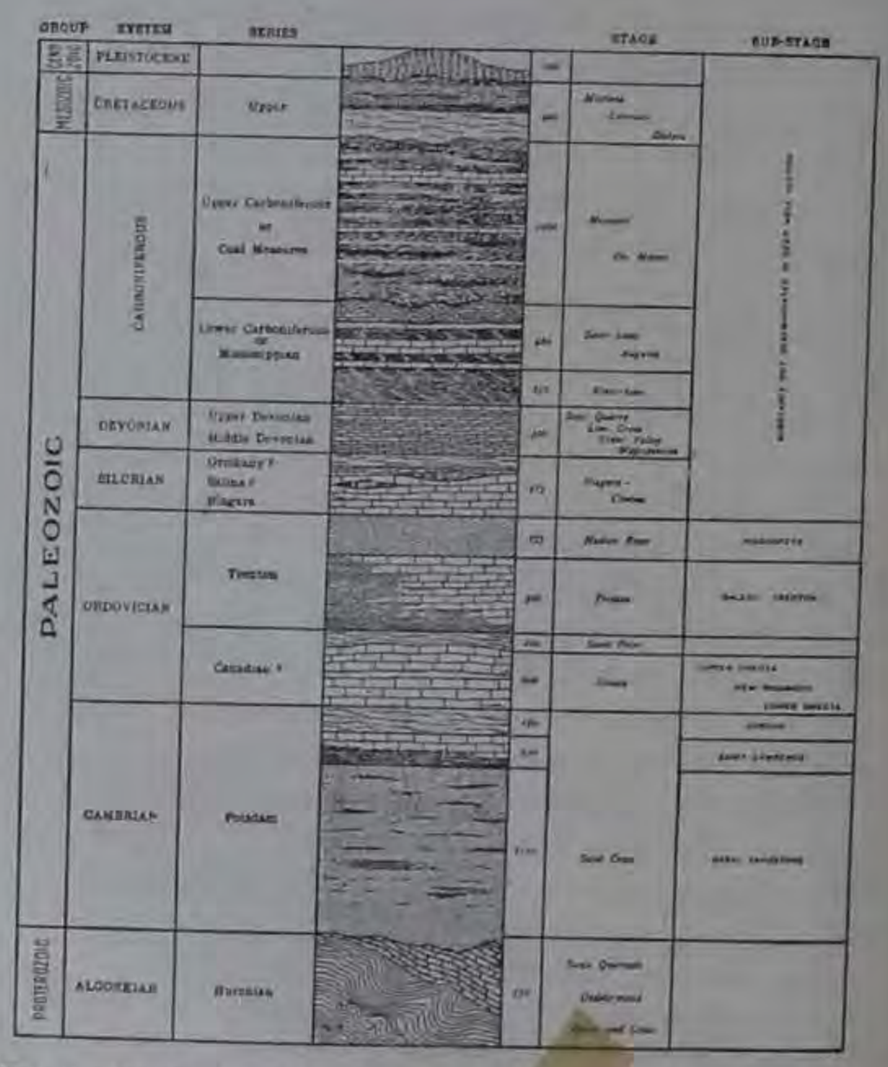


FIG. 2.—General section of rocks of Iowa, by W. H. Norton.

carved this land surface into hills and valleys, producing such irregularities as these same agents have wrought over the present surface of southern Iowa. Eventually, however, the region subsided, and what had been dry land became covered with sea. New sediments—those making up our Iowa coal measures—were spread out unconformably, the geologist would say, over the carved and uneven surface. Unconformity quite generally records, for the region in which it is seen, the following succession of events: (1) Elevation of sea bottom above sea level, (2) erosion and trenching of the exposed surface, (3) subsidence and encroachment of the sea, (4) deposition of new sediments over the carved and irregular surface. There is a marked unconformity between the Cretaceous and the Upper Carboniferous, and there is another, equally as marked, between the Pleistocene deposits and nearly the whole series of indurated rocks. While the drift and other superficial materials were not laid down in the sea, they yet rest on an eroded and irregularly carved surface.

Rocks, like our sandstones, shales and limestones, that originate as sediments accumulated on a sea bottom, are, as a rule, spread out in even, regular, continuous, and practically horizontal sheets. Various causes tend to interfere with the regularity of the original deposition. By reason of strains in the earth's crust the beds may be folded or tilted, or the continuity may be interfered with by fractures and displacements. Marked departures from the original continuity and horizontal position of the beds are known as *deformations*.

It will be noted that many of the formations bear geographic names. These names are derived from localities where the beds are well exposed or typically developed. Thus the Des Moines stage is named from the river along which the beds of this age are found as surface rocks; the Saint Louis from the city where the formation was first studied; the other geographic names have similar reasons for their application.

Iowa lies within the Mississippi valley and forms a part of the great prairie plain of the interior. In general its surface shows but slight relief, the local variations in elevation being comparatively insignificant. The northeastern corner of the state embraces a portion of the famous driftless area, a region which glaciers did not invade. Accordingly the surface here has not been modified by the deposition of drift. The hills, in places, rise abruptly 300 feet above the bottom of the river valleys, and the country, back from the rivers, slopes up to divides that are 300 feet higher than the marginal bluffs. Fringing this area on the west, and covering almost the whole of southern Iowa, is the region of what is known as the Kansan drift. While the surface here is quite uneven, the hills are rounded and less abrupt than in the driftless area, and the valleys, though wide, are comparatively shallow. As in the driftless area, however, the surface irregularities are due to the fact that streams have cut trenches in a once continuous plain. In an area in northeastern Iowa, having Bremer and Buchanan counties as its center, the valleys are broad sags in the surface; they have not been produced by erosion; the streams wander and miss among irregular hills; and there are gravel knolls and erratic land forms not due to stream cutting, but to the heaping up of material by glaciers. In north central Iowa, west of Cerro Gordo, Franklin and Hardin counties, there is an area of still younger drift, an area from which the glaciers retreated so recently—perhaps 6,000 to 10,000 years ago—that the majority of the streams have not yet established definite channels. There are numerous undrained areas—sloughs, ponds, kettle holes and lakes. This is the lake region of Iowa, the characteristics of which become more pronounced in its northward extension into Minnesota. The drift covering the region is called the Wisconsin; that of the area represented by Bremer and Buchanan counties is the Iowan, and a drift occupying a small area in southeastern Iowa is called the Illinoian. In nearly all the area not occupied by Iowan and Wisconsin drift, the surface material is the loess already referred to. With the exception of the driftless area in the northeast, and the small Illinoian area in the southeast, the loess, in general, rests on Kansan drift. The incursion and retreat of the ice sheets that spread out the various drifts mentioned, coming as they did at widely separated times, have had much to do with the rivers of Iowa. The streams have been pushed around, blotted out, made to reverse their courses, and changed so many times that the present stream channels often bear little relation to preglacial, or even interglacial lines of drainage. Some of our main river valleys are a patchwork of bits of a number of old, independent valleys pieced together.

SEVERE STORMS IN MAY.

The latter half of the month brought more than the usual number of destructive windstorms, though happily they traversed short distances and did not strike towns or densely populated districts.

The most notable storm of the month occurred on the evening of the 16th, in the northeastern part of Delaware county, traversing a track about thirty rods wide and ten miles in length. Reports from observers and local papers indicate that it was a tornado of sufficient force to destroy nearly all forms of movable property in its pathway. Mr. William Ball, of Delaware, writes that the day had been sultry and oppressive, the wind blowing from the southwest. About 4 P. M., heavy thunder clouds appeared in the northwest, and from that time to 10 P. M., there was the appearance of a thunderstorm a few miles north and northwest of the station at Delaware, with a light sprinkle at that place about 8.15, and very little wind.

The *Delaware County News*, of May 18th, contained a well written story of the storm, giving interesting details of its inception, appearance and destructive effects. Concerning the atmospheric conditions preceding the development of the tornado, the *News* said:

> The oppressive condition of the atmosphere during Tuesday afternoon presaged a severe storm and timid hearts trembled under the premonitory influences which depressed them, and hoped the unseen danger which they were impotent to avert might be passed around them. The conditions were ripe for a tornado. The air was both cool and sweltering; it was extremely oppressive. Those who were in the vicinity of the starting point of the tornado watched the gathering clouds with extreme apprehension. There was a foreboding appearance to the sky that sent fear into every breast. Suddenly the great masses of vapor converged together in an inky blackness that is indescribable, the whirling mass dropped its funnel to the earth and went bounding on its mission of ruin. It spared nothing that happened to be in its deadly path.

According to the *News* report the whirlwind formed and began its effective work at about 8.30 P. M., on the farm of A. L. Schneider, three miles northwest of Greeley, Delaware county. From this place the tornado moved on a nearly direct line north of east, passing within a mile of the little town of Colesburg. As the storm increased in force its track was narrowed to about fifteen rods in width, and for the distance of two or three miles it swept everything in its pathway. Its force diminished after passing a short distance into Clayton county. The *News* states that four persons were killed, named as follows: J. B. Jacobs, George Lang, Walter Sheppard and Charles Sheppard. Eight persons were injured, more or less severely. The damage to property has not been carefully estimated, but it evidently amounted to many thousand dollars on the score of farms swept by the tornado. The *News* report contains the following tragic incident:

C. Miersen, J. B. Jacobs and George Lang were returning to Colesburg from Elkport, where the two former had been to transact business. They were caught directly in the path of the storm. Jacobs and Lang jumped from the wagon and endeavored to save themselves by seeking shelter by the roadside, but without avail. The wind caught them up into the air and dropped their mangled bodies to the ground with life extinct, and bruised almost beyond recognition. When the body of Jacobs was found the only clothing left upon him was one boot and a part of one pants leg Instead of jumping from the wagon as did the other two men, Mr. Miersen whipped the team to a run and forced them to the outer edge of the storm, when they became unmanageable and he jumped to the ground, escaping with slight injuries. The frightened horses wheeled about and entered the storm once more and both were found dead.

The freaks of the storm are set forth in the following:

At the Sheppard farm a rail was driven into a large basswood tree, piercing it clear through like a needle, and leaving both points exposed. When Mr. Sheppard was picked up the barrel of a shotgun, with the stock missing, was found driven through one of his pants legs without injury to the flesh.

At one place a lath torn from a wrecked house was found sticking through the sides of an iron kettle.

Chickens with the feathers stripped from their bodies were running about. At one place the featherless mother hen was found brooding her flock, which had escaped without a scratch; and in another, a hen was found calmly sitting upon her nest of eggs, which had been safely carried several rods from its former resting place.

At the Sheppard farm a watch was found several rods from the house, the works intact in one place and the open case in another.

In the Klaus cemetery but one tombstone is left erect. Parts of the monuments were found scattered over the ground for a distance of two miles.

A DISTINCTIVE STORM PERIOD.

The last 5 days of May—27th to 31st inclusive—formed a notable storm period in respect to the number of local disturbances of a minor character that traversed portions of this state. A low pressure area that hovered almost continuously over the Missouri valley to the westward and northwestward of Iowa, hatched a brood of squalls, hailstorms and windstorms of limited extent that displayed some of the characteristics of tornadoes.

On the evening of Saturday, the 27th, severe hail and windstorms swept across the state from Buena Vista to Butler county, causing considerable damage in numerous localities along the line of disturbance. Prof. David E. Hadden, voluntary observer at Alta, wrote a detailed report of the storm at that place, from which we glean the following items; The day was warm and very humid; storm clouds were first observed in southwest and west about 2 30 P. M.; rain began falling gently at 4.10 P. M.; hail began at 4.20 and fell one and one-half hours, the stones ranging from the size of peas to one and one-half inches in diameter; rain continued to 6.30 P. M., and the total amount of rain and melted hail was 4.85 inches, of which amount 3.85 inches fell in 1 hour and 50 minutes. Much damage was done to fruit and shade trees, gardens and field crops; storm was more severe in Maple Valley township, south of Alta, where hailstones measured 8 to 9 inches in circumference. Every bridge and culvert in that township was washed out. It was the hardest rainstorm since the Cherokee flood of June, 1891. There was much electric disturbance.

This storm was extremely severe at Fonda, in which place and vicinity the hail caused great damage.

At Dows, Wright county, the storm developed severe electrical and wind disturbances and but little hail. Observer R. E. Fuller writes that the path of the storm was fifteen miles wide. He says: "In Vernon and Blaine townships twenty-one large barns were wrecked, fifty-four windmills blown down and two dwellings destroyed. Three persons were injured; two probably fatal. The lowest estimate I would place on the damage to property would be $30,000." The storm caused considerable damage in Clarion, Wright county, at New Hartford, Butler county, and other intermediate points.

Sunday, the 28th, was partly cloudy, and conditions of pressure, humidity and temperature favored the development of local storms. During the afternoon two minor tornadoes were observed moving in the same general direction though over fifty miles apart; and their characteristic effects were wrought within the short distances of their contact with the earth. One of the storms made its appearance in Adams township, Keokuk county, passing within a half mile of the village of Keswick, and moving in a northeasterly direction. It reached the western part of Johnson county before its force was exhausted, but it was not in close contact with the surface throughout the entire distance covered by the funnel cloud.

The *Keokuk County News*, of June 1st, gave a detailed account of its appearance and effects in that county. The property loss was considerable, but happily no persons were seriously hurt, though some remarkably narrow escapes were made. Numerous characteristic freaks of the storm were noted.

Another tornado originated somewhere in the vicinity of Bondurant, Polk county, Sunday afternoon, and traveled northeasterly, passing near the little town of Mingo, Jasper county. The small cloud, in an almost clear sky, with its pendent "twister" reaching the earth, was plainly seen by people in Altoona, Newton and other points. The *Newton Journal* describes it as a small "cloud-with-a-tail-to-it." It says: "The cloud from which the tail protruded was a common, ordinary, dark summer cloud, with nothing startling or alarming about it, but the long, far reaching, ever destructive tail was so plain that all who saw it realized that the powers of the air were being turned loose on the earth. As it touched the ground a great dust and smoke arose, resembling the burning of a large straw stack." Ample warning was given to the people in the track of the storm, and no one was hurt, though several looked out from their caves or other places of retreat and saw their movable effects whirled to destruction. The roar of the storm was heard eighteen miles distant. It was short-lived, but very vigorous while at work. In its wake a severe hailstorm passed into the edge of Marshall county."

Numerous local windstorms occurred on the afternoon and night of May 30th, and reports indicate that in two localities the storms were probably tornadic in character. A newspaper special states that a tornado in the northwestern part of Mills county, on the night of the 30th, destroyed the house and farm buildings of John Rohrburg, killed his 11 year old daughter, injured the other members of the family and did considerable damage elsewhere.

This same storm, at a later hour, after passing over Montgomery county and the southeastern part of Cass county, again developed the tornado funnel and wrought heavy damage in Eureka and Prussia townships, Adair county. Observer J. G. Culver, of Greenfield, visited the locality over which the storm passed, and sent a detailed report from the columns of the *Adair County Democrat* of June 1st. Six people were injured in those townships, and two brothers, John and Philip Herr, were probably fatally injured. The storm reached that locality after 10 P. M. The tornado was from twenty to forty rods in width. No rain accompanied it or followed in its wake. A brisk shower had fallen a short time previous, and there was a strong wind from the south. Then came a calm, and those who were awake heard the roar of the coming tornado. The loss of property was quite heavy.

Another tornado was reported to have passed about three miles west of Kingsley, Plymouth county, on the same night, but happily no loss of life resulted. In numerous localities high winds caused more or less damage to buildings, trees and

crops, and hail fell at many places. Thus closed the stormiest May that has been known in Iowa within the past twenty years.



Tornado cloud, near Kingsley, May 30.

MAY WEATHER RECORD.

The month was seasonably warm, and abnormally wet and cloudy. The average temperature was 60.2°, which is about the May normal for the state. The averages by sections were as follows: Northern section, 58.3°; Central section, 60 4°; Southern section, 62°. The lowest temperature recorded during the month was 27°, at Larrabee and Spencer, on the 13th, which was the date of the latest frost observed during the season.

The average amount of rainfall for the state, as determined from records at 146 stations, was 6.23 inches, which amount is 2.26 inches in excess of the normal. By sections the rainfall averages were as follows: Northern section, 5.31 inches; Central section, 6.83 inches; Southern section, 6.55 inches. The largest amount reported was 11.47 inches at Keokuk. One notable feature was the fact that rain fell in measurable amounts at one or more stations in the state on every day during the month. The amount of sunshine at the central station was only 44 per cent of the possible amount for the month. It was a phenomenally stormy May, with an excessive amount of wind movement and electrical energy.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 29.94 inches; highest observed, 30.36, at Cresco on the 23d; lowest observed, 29.48, at Omaha, Neb., on the 30th; range for the state, .88 inch.

Temperature.—Monthly mean, as deduced from 125 reports, was 60.2°; highest monthly mean, 64.9°, at Tara; lowest monthly mean, 56.1°, at Sibley; the highest temperature reported was 90°, at De Soto on the 26th; the lowest temperature reported was 27°, at Larrabee and Spencer on the 13th; the average monthly maximum was 84.6°; the average monthly minimum was 35.7°; the greatest daily range was 46°, at Odebolt; average daily range, 37.6°.

Precipitation.—Average for the state, as determined from the reports of 146 observers, 6.23 inches; the largest amount reported was 11.47 inches, at Keokuk; the least amount was 3.09 inches, at Ridgeway; the greatest daily amount reported was 6.35 inches, at Fonda on the 27th; average number of days on which .01 inch or more of precipitation was reported, 13.

Wind.—Prevailing direction, southeast; highest velocity reported, 47 miles per hour from the northwest, on the 28th, at Sioux City.

Weather.—There were 9 clear days, 12 partly cloudy days and 10 cloudy days.

Auroras.—Cresco on the 1st and 3d; Ridgeway on the 3d.

Solar Halos.—Ridgeway on the 20th.

Thunderstorms.—General throughout the state the greater part of the month.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.96	30.31	23	29.66	28
Des Moines	29.95	30.31	23	29.63	27
Clarinda	29.94	30.32	13	29.58	30
Cresco	.....	30.36	23	29.60	1
Dubuque	29.97	30.34	23	29.62	31
Omaha, Neb	29.89	30 28	13	29.48	30
Keokuk	29.96	30.29	23	29.69	28
Sioux City	29.92	30.29	13	29.55	2
Means	29.94	30.36	23	29.48	30

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	6,710	36	NE	14
Des Moines	7,557	37	SW	1
Dubuque	6,410	34	NW	10
Keokuk	6,405	36	SW	3
La Crosse, Wis	5,779	38	SW	25
Omaha, Neb	7,191	32	SW	26
Sioux City	11,474	47	NW	28

OBSERVERS' NOTES.

Amana—CONRAD SCHADT. A tornado, happily of small dimensions passed through that part of South Amana which forms the station of the Chicago, Milwaukee & St. Paul railway, at 12:30 A. M., May 31st. After having wrecked corn cribs, it tore off one side of the four-sided roof of the station, the roof of the elevator and engine buildings. The roof of the hotel was lifted and let down again in its original place, a barn was badly wrecked, trees were broken off, and a long timber 8x8 inches square was driven into the ground several feet. The tin roof of the engine house was carried a mile away. It made its way in a northeasterly direction, striking Mr. Rummer's farm and taking off the upper half story of his brick building, leaving the lower intact; overturned the frame addition in which his father slept, but luckily he was thrown through the window and escaped with some bruises. At Price creek the storm struck a small timber, through which it cut a path 200 feet wide. The general agreement is that it lasted from one-half to a full minute in passing a house. It is learned that it demolished a barn and corn crib at Mr. Jacob's place, over a mile southeast of Amana.

Belknap—A. W. RANKIN. A very cold backward month; very little corn planted yet and soon will be too late; too wet even, for grass.

Bonaparte—B. R. VALE. Absolutely no farm work done since the 13th; it will take a week of dry weather to get to work; but little plowing done for corn, and still less planted.

Clinton—DR. LUKE ROBERTS. May, 1899, exceeded normal in temperature by 1.5°, and 3.77 inches in precipitation. The total precipitation was 8.38 inches and was exceeded but once during the last twenty-one Mays. In 1892 the May ra n-fall was 8.41 inches. That month, however, furnished two more rain days and one more cloudy day, and 15 per cent more cloudiness, besides a deficiency of 6° daily in temperature.

Except for the inconvenience to farmers in getting seed in the ground at a seasonable date, the excess of rainfall for May, 1899, was of inestimable value in replenishing the earth with needed moisture. It is several years since the earth has been normally moist, as evidenced by the fact that old wells have been dug deeper and deeper from year to year in order to obtain a needed supply of water for stock and other purposes.

The maximum temperature was 85°, occurring on the 17th, and 26th, and was 2.3° below normal, while the minimum temperature was 41°, or 7.3° above normal, occurring on the 13th and 21st, thus giving a more uniform temperature at a higher degree than was experienced in May, 1892.

The warmest day was the 16th—mean temperature 74.2°, or one-half a degree above normal. The coldest day was the 14th, mean temperature 47.8° or 2.8° above normal.

The movement of the wind was light, being only 2,700 miles, while normal is 4,173 miles. The prevailing direction was south and the maximum velocity was twenty-seven miles per hour, occurring on the 27th.

Electrical storms occurred on nine different days, and were notably severe on the 27th and 28th, with hail accompaniment.

On the morning of the 27th a small tornado passed over the southern portion of the county, going somewhat southeasterly, doing some damage in its course. About one mile south of Low Moor, it demolished a barn and sheds and fencing for Thomas Tate. The tornado was only about two rods wide, and no dwellings in its path. Some damage was done by lightning —buildings burned, trees broken and a few people stunned.

On Saturday night, the 27th, the downpour of rain was very great, inundating the western portion of the city, not only to the discomfort of the dwellers of the flooded district, but much damage to gardens and other property resulted The total precipitation on that night and Sunday morning was 3.06 inches. Add to this what fell on the morning of the 27th and evening of the 28th, we have a total of 3.46 inches, an amount unusual in this locality to be precipitated in so few hours.

Forest City—J. A. PETERS. Water froze on morning of 13th, but no damage to vegetation; corn about ten days to two weeks late; the season thus far has been very favorable for farm work.

Galva—MISS IDA ACKERT. The frost on the 12th and 13th frosted barley on low ground.

Grinnell—A. O. PRICE. May records severe storms, washing out bridges and hillsides, and damage by lightning. Barn with six horses and six cows burned on 15th; three fat steers in feed yard and thirteen yearlings in field, all near barbed wire fence, killed. Some stock killed by hail, storm of 28th, hail size of duck eggs, destroying fruit.

Humboldt—H. S. WELLS. Moisture has been too great the last week of the month; corn is in better condition than was reported; fruit scarce; some damage by lightning, wind and hail. Grass is growing rapidly.

Lamoni—T. J. FITZPATRICK. The frequent rains delayed farm work three weeks; high winds and local storms did considerable damage to orchards and buildings.

Larrabee—H. B. STREVER. Fruit blossoms damaged by frost on 13th; cold wet weather during the second decade of month retarded germination of corn; about one-third of corn replanted in consequence.

Sioux Center—J. DE RUYTER Corn planting commenced May 5th; frost of 13th nipped barley; heavy hail of 15th damaged grain to some extent; small grain is doing well; corn nearly half replanted.

West Bend—PHIL DORWEILER. Month cool and wet; much corn had to be replanted; small grain and pastures look well; roads are bad.

BELATED REPORTS.

Fayette—APRIL—Mean temperature, 47.2°; highest, 82°, on the 25th; lowest, 11°, on the 2d; total precipitation, 3 87 inches; greatest daily 2.10 inches, on the 27th; total snowfall, .7 of an inch; prevailing direction, northwest; number of clear days, 13; partly cloudy, 15; cloudy, 2; rainy, 8.

Garden Grove—APRIL—Mean temperature, 47°; highest, 83°, on the 25th, 26th and 27th; lowest, 4°, on the 1st; total precipitation, 3.67 inches; greatest daily, 1 inch, on the 30th; total snowfall, 9 inches; prevailing direction, south; number of clear days, 7; partly cloudy, 13; cloudy, 10; rainy, 7.

Eldora—APRIL—Mean temperature, 47 4°; highest, 83°, on the 28th; lowest, 12°, on the 1st; total precipitation, 1.50 inches; total snowfall, 1 inch; greatest daily, 1.10 inches, on the 28th; prevailing direction, northwest; number of clear days, 1; partly cloudy, 26; cloudy, 3; rainy, 3.

Larrabee—APRIL—Mean temperature, 46.2°; highest, 86°, on the 25th; lowest, 6°, on the 4th; total precipitation, 1 39 inches; greatest daily, .52, on the 30th; total snowfall, 4 inches; prevailing direction, southwest; number of clear days, 8; partly cloudy, 18; cloudy, 4; rainy, 4.

ERRATA IN MARCH REVIEW.

Decorah.—Mean temperature should have been 20. 3°.

Eldon.—Total precipitation should have been 2.21 inches.

Whitten.—Total precipitation should have been .91 inch.

Wilton Junction—Total precipitation should have been 1 59 inches.

CLIMATOLOGICAL DATA FOR IOWA, MAY, 1899.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIPITATION, INCHES.				Number rainy days	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Algona*	Kossuth	1,500	7	59.0	+1	84	26	41	1, 13		3.31	+.29	.90	.....	10	5	20	6	SE
Alta	Buena Vista	1,519	8	58.8	+1	85	26	32	4	40	7.75	+3.53	4.85	.....	18	5	20	6	SE
Alta (near)	Buena Vista	.....	.....	. .	.....	...	.....	.....	.....	.....	7.29	.....	4.43	....	15	...	...	...	.....
Britt	Hancock	1,230	....	60.0	.....	83	25, 26	28	13	42	4.77	... ...	1.09	.....	12	1	28	2	S, SE
Bancroft †	Kossuth	.....	....	58 2	.....	84	26	32	13	35	5.62	.....	1.05	.....	15	6	12	13	SE
Charles City	Floyd	1,012	8	59.0	+2	81	16	32	13	37	4.71	+.94	1.32	....	13	5	21	5	SE
Clear Lake	Cerro Gordo	984	..	59.4	.....	86	26	32	3	40	11.43	...	1 98	.....	9	15	3	13	SE
Cresco	Howard	1,312	27	57 4	+1	83	25	31	13	40	3 86	+.29	1 27	.....	10	7	12	12	SW
Decorah	Winneshiek	900	6	58 9	+1	83	25	34	4	40	3.33	+.13	1 04	.....	11	....	....	....	SW
Dows	Wright	....	....	58.4	.....	88	26	29	13	45	5 84	.....	1.77	.....	16	13	9	9	SW
Eagle Grove †	Wright	.....	....	58.5	.....	...	.....	.....	.....	....	.....	.....	....	.....	...	....	...	...	.....
Elkader	Clayton	....	19	60.0	-1	86	25	35	4,13,18	43	5.13	+1.42	1 55	.....	16	9	16	6	E
Estherville *b*	Emmet	....	....	57.1	.....	89	26	28	13	43	5 03	.....	1.30	.....	12	....	..	....	SE
Fonda	Pocahontas	....	....	.....	.....	..	.....	32	3	30	9.12	.....	6.35	.....	16	6	14	11	.....
Forest City	Winnebago	1,220	..	57.9	.....	81	26,11.27	31	13	36	3.79	.....	1.49	.....	13	12	6	13	S
Grand Meadow *	Clayton	....	8	57.6	0	78	12	40	18	....	4 72	+.51	.87	.....	14	8	11	12	SE
Greene	Butler	943	....	59.7	.....	84	25, 26	31	13	36	6.85	.....	1.60	.....	14	7	14	10	W
Hampton	Franklin	1,240	....	58.9	.....	83	26, 27	33	13	36	8.48	.....	2.81	.. .	14	6	16	9	SE
Hawkeye	Fayette	.....	...	.....	.....	....	.....	.....	....	.....	5 57	.....	1 05	.....	12	....	....	...	.....
Humboldt	Humboldt	1,082	....	59.8	.....	86	26, 27	33	13	36	6.27	.....	3.30	.....	14	18	4	9	SE
Lansing	Allamakee	.....	....	60 3	.....	85	25	36	4	38	3.87	.....	.94	....	10	6	12	13	.....
Larrabee	Cherokee	....	8	57 2	-1	86	11	27	13	38	4.33	+.46	1.62	.....	14	3	21	7	SW
Le Mars	Plymouth	1,221	...	59 0	.....	87	11	29	13	39	4 72	.....	.78	....	14	5	14	12	S
Mason City *g*	Cerro Gordo	1,130	.	61.0	.....	82	25	32	13	39	3 29	.....	1.25	.....	9	...	....	....	SE
New Hampton *b*	Chickasaw	1,166	...	58.4	.....	80	16, 25	30	13	35	4.37	.....	.75	. ..	13	6	19	6	NW
Northwood	Worth	1,210	....	56.8	.....	83	27	30	4	38	3 59	.....	.86	....	7	18	1	12	S
Osage	Mitchell	1,178	8	57.5	+2	81	16, 25	32	13	37	3.71	-.38	.77	.....	13	3	7	21	S, SE
Plover	Pocahontas	.....	....	59.6	.....	87	26	31	4, 13	40	5.55	.....	1 34	.....	13	15	5	11	SE
Primghar	O'Brien	....	....	57 8	.....	87	11	32	4	38	3.95	.....	1.15	.....	11	14	0	17	W
Ridgeway	Winneshiek	....	....	58.8	.....	85	11	34	13	42	3.09	.....	.77	.....	12	6	15	10	E
Ruthven	Palo Alto	....	....	58.9	....	84	12, 26	28	13	34	3 30	.....	.70	.....	7	7	7	17	SE
Sheldon	O'Brien	1,406	....	56 6	.....	87	11	28	13	40	4.49	.....	.72	....	21	7	11	13	S
Sibley	Osceola	1,509	6	56.1	.. ..	87	11	28	13	39	5 80	... .	.95	.....	17	2	24	5	SE, SW
Sioux Center	Sioux	....	....	58.2	.....	85	26	31	13	37	5.02	.....	.76	.....	17	8	12	11	SE
Spencer *b*	Clay	....	....	58.1	.....	85	26	27	13	40	5.28	.....	1.43	.....	11	1	19	11	E
Spirit Lake ‡	Dickinson	.. .	5	58.4	.....	87	27	30	13	37	3.04	.. ....	.61	.....	10	6	16	9	SE
Storm Lake	Buena Vista	.....	....	57.4	.....	81	26	31	13	35	7.37	.....	4.15	.....	16	7	13	11	E, SE
Washta	Cherokee	.....	...	.....	.....	....	.....	.....	.....	.....	5.22	.....	1.30	.....	14	5	20	6	NE, NW
Waverly	Bremer	942	....	60 2	.....	83	16, 25	37	13	36	4.68	.....	1.23	.....	14	6	20	5	SE
West Bend (J)*	Palo Alto	....	6	56.4	-2	83	26	40	13	.....	4.04	+1.23	1.70	.....	11	4	11	16	SE
West Union	Fayette	1,105	....	.....	.....	....	....	.....	.....	.....	8.53	.....	3 00	.....	11	...	....	....	.....
Average		....	....	58.3	+4	83.9	.....	31.9	.....	38.2	5.31	+.84	.....	.....	13	8	13	10	SE

CENTRAL SECTION.

Amana	Iowa	.....	23	61.4	+1	83	16	37	4	35	7 92	+3.72	2 37	.....	15	9	11	11	E, S
Ames	Story	936	19	60.5	+1	89	25	36	13	37	7.23	+3.39	2 45	.....	12	5	13	13	.....
Audubon	Audubon	.....	6	59.3	-1	83	27	37	4, 13	37	8 14	+4.48	1.95	.....	11	2	13	16	S
Baxter	Jasper	.....	...	60.5	.....	82	16, 26	35	13	38	8 96	.....	4 45	.....	13	5	17	9	SE
Belle Plaine *d*	Benton	840	9	58 8	+1	84	16	38	13	35	8.60	+4 56	2.90	.....	12	10	13	8	E
Carroll	Carroll	.....	9	58.3	0	85	26, 27	32	13	40	9.04	+4.71	2.70	.....	13	8	7	16	.....
Cedar Rapids	Linn	744	17	63.4	+4	85	12,16,25	41	13, 18	34	9.21	+4.73	2.47	.....	16	13	4	14	SW
Clinton	Clinton	609	8	61 4	0	85	16, 25	39	4, 18	42	8.38	+4.24	3.06	.....	15	9	7	15	NE, S
Coon Rapids	Carroll	.....	....	59.5	.....	82	26	36	13	36	6.26	.....	.94	.....	15	8	15	8	SE
Davenport	Scott	615	27	62 5	+1	83	16	42	13	29	7.35	+3.04	2.29	.....	14	8	8	15	NE
Delaware	Delaware	1,084	8	59 3	+1	86	12	36	13	33	7 44	+3.62	1 85	.....	16	4	20	7	SW
Denison	Crawford	1,192	6	59 3	-1	84	26	34	4, 13	38	4.82	+.58	.83	.....	12	....	..	...	S
Des Moines	Polk	867	21	60.9	0	84	15	41	4	38	6.71	+2.06	1.38	.....	16	7	11	13	SE
De Soto	Dallas	886	...	61.3	.....	90	26	36	4	39	6 60	.....	1.11	.....	12	8	16	7	SE
Dubuque	Dubuque	665	26	60.8	+1	82	12	42	13	30	5 75	+1.64	1.13	.....	16	8	14	9	S
Eldora ‡	Hardin	1,153	....	59.6	.....	87	27	28	13	41	7.95	.. ....	2.00	.....	11	1	25	5	SE
Galva	Ida	.....	6	59.2	-1	86	26	32	12, 13	40	4 78	+1.23	1.63	....	9	18	10	3	SE
Gilman	Marshall	1,035	....	.....	.....	....	.....	.....	.....	.....	6.70	.....	1.91	.....	16	10	16	5	S
Gladbrook	Tama	.....	...	....	.....	...	.....	.....	.....	.....	5 32	.....	2.15	....	8	...	....	....	.....
Grinnell	Poweshiek	1,011	....	60.6	.....	81	16	38	13	33	6.68	.....	2.85	.....	11	5	17	9	SW
Grinnell (near)	Poweshiek	.....	....	60.4	.....	84	16	37	13	35	7.18	.....	2.92	....	15	9	11	11	SE
Grundy Center	Grundy	966	8	58.4	0	83	16, 25	33	13	37	9.15	+4.74	2.40	.....	12	11	10	10	SE
Guthrie Center	Guthrie	1,269	....	59.2	.....	82	15,26,27	34	13	40	6.52	.....	1.63	.....	14	3	19	9	SE
Harlan	Shelby	.....	....	60.4	.....	85	15,26,27	34	4	40	4.49	.....	1.08	.....	15	5	12	14	S, SE
Independence	Buchanan	921	37	58.8	0	82	25	35	13	38	5.80	+1.79	2.20	.....	13	11	14	6	S, SE
Iowa City	Johnson	644	9	62.0	+2	86	16	38	4	37	9.49	+5.34	4.10	.....	16	10	14	7	S
Iowa Falls	Hardin	.....	6	58.4	-1	84	26, 27	32	13	36	3.65	-.03	1.28	.....	12	9	10	12	SE
Le Claire	Scott	.....	....	.....	.....	....	.....	.....	.....	.....	6 57	.....	1.95	...	16	....	....	....	.....
Logan	Harrison	928	34	61 4	0	88	27	40	3, 17	33	3.62	-.77	.87	.....	10	17	10	4	S
Maquoketa	Jackson	.....	6	60.4	-1	84	16	38	4	42	6.74	+2 79	1.32	.....	14	17	5	9	SW
Marshalltown	Marshall	898	7	64.4	+5	82	16, 26	33	7	40	7.70	+3.25	2.20	.....	14	12	6	13	S
Monticello	Jones	800	45	60.1	+1	84	12	36	3	40	6.19	+2.32	1.98	....	10	7	16	8	NW
Mt. Vernon*	Linn	858	....	61.4	.....	86	25	49	13	.....	9.28	.....	2.94	.....	14	....	....	....	.....
Mt. Vernon (Hubbard)	Linn	.....	....	61 8	.....	87	12	38	13	38	11.15	.....	3.40	.....	16	10	5	16	S
Newton	Jasper	958	12	60.8	+1	84	16, 26	37	13	36	6.61	+2.11	2 24	.....	14	10	17	4	SE
Odebolt	Sac	.....	...	59.8	....	88	26	29	13	46	5.48	.....	1.46	.....	12	13	7	11	.....
Ogden	Boone	1,109	....	59.6	.....	87	26	31	13	41	7.80	.....	3.15	.....	12	15	4	12	SE
Olin	Jones	.....	....	59.9	.....	83	16	39	13	33	7.58	.....	2.14	.....	15	13	12	6	S, NW
Onawa	Monona	.....	....	62.1	.....	86	11,15,26	34	4, 13	40	3.62	.....	.51	... .	18	12	12	7	SE
Rockwell City	Calhoun	1,219	....	59.0	.....	83	27	31	13	45	4.71	.....	1.90	.....	12	20	4	7	.....
Scranton	Greene	.....	...	59.4	.....	84	26	35	13	36	5.31	.....	1.16	.....	12	13	7	11	SE
Sioux City	Woodbury	1,122	10	59.4	0	88	11	34	13	43	6.18	+2.53	1.43	.....	16	5	9	17	E
Tara	Webster	1,159	...	64.9	.....	88	26	45	17	28	7.50	.....	2.00	.....	8	....	...	...	SW, NW
Toledo	Tama	.....	5	60.0	-2	85	16	35	4	35	7 30	+4.16	1.57	.....	14	7	0	24	SE
Vinton *a*	Benton	800	9	60.3	+1	80	12,16,25	43	13	.....	5.11	+1.39	1.65	.....	9	17	7	7	SE
Waterloo	Black Hawk	862	20	59.8	-4	84	25	36	13	32	6.08	+2.48	2.27	.....	15	6	18	7	E
West Branch	Cedar	708	....	60 6	.....	81	31	36	4	42	8.62	.... ..	2.80	.....	12	10	10	11	NW
Whitten *	Hardin	.....	....	60.8	.....	83	25,26,27	40	14,20,21	.....	4.12	.....	1.30	.....	10	11	14	6	SW
Wilton Junction *o*	Muscatine	.....	....	59.4	.....	85	16	37	4	33	8.62	.....	2.25	.....	8	....	....	....	.....
Average		.....	....	60.4	+.5	84.4	.....	36.6	.....	37.1	6.83	+2.85	.....	....	13	10	11	10	SE

MONTHLY REVIEW OF THE

CLIMATOLOGICAL DATA FOR IOWA, MAY, 1899—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days	Number partly cloudy days.	Number cloudy days.	
Afton	Union	....	....	61.7	.....	87	27	36	13	37	6 76	.....	1.57	.....	12	6	18	7	SW
Albia	Monroe	945	....	62.0	.....	87	16	38	4	40	5 94	.....	1.86	.....	15	9	16	6	SE
Atlantic	Cass	....	8	60.1	+2	86	26	30	4	43	6 08	+1.76	1.30	.....	11	6	11	14	S
Batavia	Jefferson	640	...	...	....	...	.....	....	.....	..	5.95	.....	1.81	.....	9	....	....	.....	.....
Belknap	Davis	857	...	63.2	.....	83	27	42	4.13,14	37	7.45	.....	2.90	.....	15	14	11	6	E
Blockton	Taylor	....	....	62.0	.....	85	15, 16	41	13, 18	32	7.81	.....	2.38	.....	13	14	13	4	SE
Bonaparte	Van Buren	....	8	62.4	0	84	16	40	4	38	8.35	+4.30	1.80	.....	13	...	...	....	.....
Burlington *b*	Des Moines	526	....	63.7	...	87	16	41	4, 18	39	6.16	.....	.99	.....	16	12	5	14	S
Bussey	Marion	....	....	....	....	....	.....	.....	.. ..	.....	6.30	.....	1 23	.....	12	...	...	...	.....
Carson	Pottawattamie	...	...	....	.....	....	.....	.....	.....	.....	5 99	.....	1.38	.....	11	...	...	...	.....
Centerville	Appanoose	1,013	6	62.2	0	84	15, 16	40	14	37	6.70	+3.27	1.48	..	13	11	13	7	SE
Chariton	Lucas	1,030	....	61 1	.....	84	16	38	13	36	6.95	.....	1.77	.....	16	9	8	14	SE
Chillicothe	Wapello	645	...	.....	.....	...	.....	.....	.....	.....	6 43	.....	1.23	.....	11	...	...	...	.....
Clarinda	Page	1,069	9	62.2	+1	88	27	36	4	40	7.09	+2 50	3.60	.....	10	13	10	8	SE
Corning *a*	Adams	1,127	7	60.9	0	84	15	37	4, 10	35	5 56	+.91	1.64	.....	8	...	...	...	SE
College Springs	Page	.....	8	63.4	+2	89	27	41	4	35	8.13	+3.58	4 12	.....	11	17	8	6	SW
Council Bluffs	Pottawattamie	989	..	62 9	...	87	15	41	1	34	4.42	.....	1 36	.....	11	17	3	11	S
Cumberland	Cass	.....	...	....	.....	....	.....	.....	.....	.....	5.01	.....	1.16	.....	12	10	9	12	E
Danville	Des Moines	715	...	.....	.....	.....	.....	...	.....	...	5.81	.....	1.00	.....	14	14	11	6	.....
Diagonal	Ringgold	.....	...	61 0	.....	86	16	35	4	35	7.60	.....	2.20	.....	11	9	19	3	SE
Eldon	Wapello	.....	...	63 0	.....	86	12, 27	37	4	41	8.69	.....	3 01	.....	12	18	4	9	E
Emerson	Mills	.....	...	.....	.....	.....	.. ..	.....	..	.....	5 60	.....	1.40	.....	11	8	14	9	.....
Fairfield ‡	Jefferson	767	13	61.9	+2	82	15, 16	41	4, 13	36	6.43	+.41	1 22	.....	16	6	19	6	.....
Ft. Madison *	Lee	516	51	64.4	+1	82	16	45	20	.....	11.24	+6 85	2.83	.....	14	3	14	14	SW
Glenwood	Mills	979	29	62.0	+2	87	15	36	4	42	5 76	+.57	1.70	.....	13	2	18	11	NW
Greenfield	Adair	....	8	60.0	0	86	26	38	4	40	6.69	+2.26	1.99	.....	14	...	...	...	SE
Griswold	Cass	.....	...	.....	.....	....	.. ..	....	.....	....	5.13	.....	1 02	.....	11	5	1	25	S
Hamburg	Fremont	912	...	.....	....	...	.....	.....	.....	.....	6.12	.....	2.36	.....	8	....	....	...	S, SE
Hedrick	Keokuk	.....	...	62.4	.....	85	16	39	13	38	5.92	.....	1.02	.....	14	...	...	...	.....
Hopeville *a*	Clarke	.....	8	60.8	+1	84	15	40	13	35	5.89	+1.85	1 60	.....	12	...	...	....	SE
Indianola	Warren	...	7	61.7	+2	83	16, 27	38	13	36	6.58	+1.84	1.16	.....	13	..	....	...	SE, SW
Keokuk	Lee	618	28	64.0	+1	86	16	43	20, 21	37	11.47	+7.47	2.52	.....	16	8	13	10	SW
Keosauqua	Van Buren	.....	7	63 9	+2	86	16	41	4	37	7.42	+2 69	2.76	.....	11	...	...	....	.....
Knoxville *a* ‡	Marion	....	6	61 6	.....	85	16	39	13	37	5.61	... ...	1.03	.....	11	...	...	....	SE
Lacona	Warren	.....	...	.....	.....	...	.....	.....	.....	.....	7.20	.....	1.24	.....	14	...	...	...	.....
Lamoni *d*	Decatur	.....	....	61.6	.....	86	16	37	4	36	7.43	.....	2 42	.....	13	18	3	10	S
Lenox	Taylor	.....	...	61.3	.....	83	15	39	13	34	5.86	.....	2.05	.....	12	11	12	8	S
Lockridge	Jefferson	.....	...	.....	.....	...	.....	.....	.....	.....	4.98	.....	1.20	....	9	6	17	8	SE
Mooar	Lee	.....	....	62.8	....	85	15, 16	41	11	39	10.34	.....	1.84	.....	14	5	4	22	SE
Mt. Ayr	Ringgold	1,236	6	61.4	-1	85	15, 16	40	13	34	7.55	+1.78	2.17	.....	13	8	15	8	E
Mt. Pleasant	Henry	725	....	62.8	.....	88	16	36	4	42	7.30	... ...	1.66	.....	11	14	10	7	SW
Murray	Clarke	1,183	...	....	.....	....	.....	.....	.....	.....	6.88	.....	2.90	.....	11	7	23	1	.....
Northboro	Page	....	...	.....	.....	....	.....	.....	.....	.....	3.94	.....	.96	.....	9	...	...	...	.....
Omaha (Neb.)	Douglass	1,113	....	62.3	.....	87	15	44	14	39	4.45	.....	1.33	.....	14	4	15	12	SE
Osceola	Clarke	1,123	...	60.6	.....	85	15	37	13	37	7.85	.....	1 97	.....	13	4	17	10	SW
Ovid	Wayne	...	6	61.2	0	84	16	38	13	36	7.03	+3.61	1.96	....	14	8	4	19	SE
Oskaloosa	Mahaska	850	16	62.1	+2	88	25	38	4, 13	39	5.58	+1.87	.85	.....	15	12	2	17	E
Ottumwa	Wapello	630	5	62.2	-1	86	16	40	14,18,24	38	7 95	+3.08	1.28	.....	12	7	12	12	E
Pacific Junction	Mills	960	...	61.0	.....	85	15	34	4	36	4.63	.....	1.20	.....	13	7	13	11	E
Pella	Marion	...	...	59 4	.....	82	16	39	13	36	4.83	.....	1.05	.....	15	13	12	6	SW
Red Oak	Montgomery	....	....	63.2	.....	87	15	40	4	36	6.13	.....	1.55	.....	12	9	2	20	S
Sigourney	Keokuk	1,033	....	62.1	.....	88	16	36	4, 13	44	7.79	.....	1.96	.....	14	9	20	2	E,SW,NW
Stuart	Guthrie	.....	...	60.4	.....	85	26	32	14	40	6.55	.....	1.65	.....	13	10	9	12	S
Thurman	Fremont	.....	...	62.8	.	88	15	39	5	36	7 05	... ...	2.89	.....	15	6	10	15	SE
Villisca	Montgomery	....	.....	61.8	+1	86	27	35	4	40	6.45	+2.57	2.05	.....	10	9	15	7	S
Wapello	Louisa	1,058	6	61.8	+1	86	27	35	4	40	6.45	+2.57	2.05	.....	10	9	15	7	S
Washington	Washington	578	....	63.8	....	87	12	41	18	38	4.64	.....	1.16	.....	15	10	19	2	SE
Winterset	Madison	738	8	60.7	0	83	16	38	4,13,18	38	5 27	+1 74	80	.....	13	...	...	..	SW
Woodburn	Clarke	.....	8	60 8	+1	86	26, 27	36	13	38	6.77	+2.21	2.17	.....	13	...	...	...	.....
Average		.....	...	.....	...	....	.....	.....	.....	.....	7.81	.. ....	3.00	.....	13	12	10	9	.....
Av. for the state		.....	...	62 0	+.9	85 5	.....	38 5	.....	37.6	6.55	+2.72	.....	.....	13	9	12	10	SE
		.....	...	60.2	+.6	84.6	....	35.7	....	37.6	6.23	+2.14	.....	.....	13	9	12	10	SE

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

STATIONS.		DATE.																														Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max.	61	71	70	69	72	74	73	72	75	69	79	73	65	55	85	85	64	76	64	57	57	62	70	78	84	85	87	84	80	80	81	72.8
	Min.	44	59	58	37	37	52	54	56	57	55	45	51	36	44	48	61	44	41	50	45	43	42	40	55	56	64	69	56	53	55	62	50.6
Albia	Max.	73	80	78	71	74	75	72	75	78	80	78	80	65	57	85	87	75	70	70	53	61	64	70	76	82	84	85	85	80	81	85	75.1
	Min.	47	53	53	38	46	51	50	53	50	53	43	52	37	43	45	61	45	40	48	42	42	46	42	45	55	62	58	57	53	53	57	49.0
Alta(H'd'n)	Max.	58	72	54	68	72	72	61	73	78	68	84	66	58	46	82	69	64	70	56	51	50	59	66	77	78	85	81	74	75	79	75	68.4
	Min	44	41	46	32	48	46	53	54	51	51	48	57	32	40	42	46	41	43	47	44	40	46	42	51	58	61	53	54	50	54	54	49.3
Amana	Max	69	73	77	71	73	75	68	74	77	73	78	82	64	55	72	83	77	69	63	56	61	64	70	74	82	81	79	79	75	77	80	72.6
	Min	49	50	57	37	46	54	58	54	48	57	43	51	38	45	43	63	47	40	46	47	44	46	42	44	53	63	62	59	55	53	62	50.2
Ames	Max.	68	71	70	73	71	71	65	73	75	68	82	72	62	49	82	81	62	71	66	55	55	63	68	74	89	85	81	80	78	78	79	71.5
	Min.	48	48	55	48	45	48	57	52	50	54	47	48	36	43	45	59	44	40	50	45	42	45	42	45	54	63	60	56	54	53	60	49.5
Atlantic	Max.	69	79	69	73	72	66	60	70	77	66	80	72	59	53	85	79	65	76	60	52	55	62	68	76	80	86	85	76	77	80	80	71.2
	Min.	45	52	49	30	49	46	54	55	51	53	49	52	36	42	46	50	34	38	52	47	43	41	46	47	60	66	59	57	51	57	55	49.0
Audubon	Max.	64	75	68	70	72	67	64	69	75	65	78	69	57	48	82	78	62	82	62	51	52	60	63	73	78	82	83	73	70	77	76	69 2
	Min.	46	48	44	37	48	49	55	55	55	50	48	50	37	40	45	48	43	53	50	45	43	48	46	48	58	65	60	57	52	53	56	47.4
Bancroft	Max.	55	69	65	66	74	75	66	73	76	66	83	65	57	52	65	75	59	64	63	63	55	64	69	72	77	84	81	76	75	80	74	69.0
	Min.	45	41	50	33	45	45	55	52	51	52	48	54	32	39	43	45	41	40	45	41	43	41	44	50	53	65	59	58	52	53	55	47.4
Belknap	Max.	78	80	77	75	70	74	73	72	72	74	79	80	75	70	82	80	80	72	65	55	59	62	68	74	80	80	83	82	76	77	80	74.3
	Min.	50	52	62	42	52	53	58	55	55	54	46	50	42	42	45	66	48	44	52	47	44	46	45	46	55	63	63	59	58	59	58	52.0
Belle Pl'ne	Max.	65	68	70	68	72	75	70	75	76	73	72	81	64	60	73	84	58	69	60	55	58	63	..	..	..	..	80	78	75	77	80	70 3
	Min.	45	45	39	45	48	50	46	48	50	58	44	46	38	43	44	62	45	39	40	41	42	42	44	..	..	..	57	54	55	56	60	47.4
Baxter	Max.	69	69	75	72	72	69	66	73	75	68	79	78	64	54	81	82	71	71	67	54	55	60	66	73	81	82	80	80	76	76	80	71.5
	Min.	46	47	58	40	48	51	55	53	51	54	44	51	35	42	43	64	44	42	48	44	40	45	43	46	56	62	60	56	54	52	60	49.5
Blockton	Max.	73	78	73	70	69	70	74	71	73	69	77	74	62	57	85	85	65	73	67	53	62	63	70	76	74	83	84	83	80	81	80	72.7
	Min.	44	57	58	42	49	52	56	53	53	52	54	61	41	43	53	63	45	41	50	42	42	52	49	49	50	53	60	57	53	59	61	51.4
Bonaparte	Max.	78	79	78	74	70	71	70	72	72	75	78	82	66	57	83	84	77	73	65	54	58	62	66	73	81	78	83	80	77	78	79	73.3
	Min	55	56	61	40	46	56	55	54	51	58	44	48	41	45	45	63	50	43	50	43	43	48	44	47	53	63	64	60	58	56	59	51.6
Britt	Max.	65	73	71	69	78	76	71	76	77	66	81	71	58	52	69	80	59	65	65	60	54	66	71	75	83	83	82	76	75	79	74	74.2
	Min.	44	37	46	30	38	47	54	54	48	48	39	50	28	40	42	47	41	35	45	46	43	45	42	45	53	61	57	56	50	51	54	45.7
Burlington	Max.	81	80	82	74	74	71	73	75	73	77	78	82	66	66	85	87	78	73	61	55	60	65	70	75	82	82	84	82	78	80	80	75.1
	Min.	57	58	61	41	46	54	51	..	60	59	44	58	.	47	46	67	50	41	49	45	44	45	45	46	50	60	61	66	60	54	61	52.2
Carroll	Max.	65	72	58	70	72	68	61	71	76	75	81	71	58	47	82	73	65	76	53	50	52	58	62	77	78	85	85	76	77	78	78	69 4
	Min.	45	44	56	34	47	45	46	54	49	52	42	52	32	40	42	62	40	37	48	45	40	45	40	40	56	60	65	52	49	51	53	47.2
Cedar Rap	Max.	73	75	81	74	79	80	67	77	77	72	80	85	69	51	72	85	77	72	65	66	62	74	77	76	85	79	80	80	79	81	81	75 2
	Min.	53	51	56	42	48	56	56	55	56	54	46	55	41	45	44	60	48	41	46	47	45	47	44	48	56	62	61	59	58	55	62	51.5
Centerville	Max.	75	80	74	73	69	71	70	71	72	71	77	81	72	61	84	84	60	74	64	50	59	59	69	74	80	83	82	83	79	79	82	72 4
	Min.	50	59	58	44	50	50	55	54	57	56	46	56	41	40	53	63	48	43	50	43	43	46	46	54	54	64	60	60	58	56	56	52.0
Charlton	Max.	71	77	72	71	69	69	62	69	73	73	77	79	64	55	83	84	66	73	66	51	57	59	61	72	77	80	83	82	76	78	81	71.3
	Min.	46	55	55	40	49	53	55	54	52	56	46	54	38	43	47	66	45	43	50	44	43	47	45	46	56	64	59	56	54	56	60	50.9
Charles Cy	Max.	67	61	75	70	76	75	70	70	76	69	80	76	60	54	59	81	72	65	62	58	59	67	69	71	81	81	81	77	75	78	75	70.6
	Min.	48	40	53	36	40	46	55	51	48	58	43	51	32	43	42	58	44	35	42	45	42	44	39	44	53	60	61	59	53	52	57	47 5
Clarinda	Max.	74	82	70	76	74	73	71	72	72	69	82	75	59	56	87	84	69	77	62	53	52	67	70	79	80	85	88	81	83	84	86	73.9
	Min.	44	58	45	36	47	50	56	53	51	50	46	50	41	46	52	50	45	41	49	46	48	50	50	49	59	65	59	58	52	60	59	50 5
Clear Lake	Max.	68	77	60	64	76	72	74	77	76	74	80	62	52	80	80	58	67	72	57	60	70	72	70	80	86	82	80	78	84	72	80	72.3
	Min.	42	55	32	36	46	50	48	45	48	54	48	50	40	52	50	40	41	42	43	46	46	42	46	50	52	52	40	46	56	60	48	46 6
Clinton	Max.	74	72	83	70	76	76	61	75	78	77	78	82	65	55	67	85	73	69	62	62	63	67	73	75	85	74	81	82	82	80	82	73 7
	Min.	56	53	53	39	42	42	54	54	51	54	42	51	41	45	42	60	50	39	43	44	41	45	43	42	43	60	60	60	60	51	60	49.0
College Sps	Max.	73	82	69	74	72	76	72	78	81	68	80	74	60	58	88	85	65	75	64	53	65	68	70	79	79	84	89	81	83	84	85	74 7
	Min.	60	60	55	41	48	52	52	50	53	54	46	47	43	44	53	55	44	45	51	45	48	52	50	50	59	67	69	53	51	61	59	52 2
Coon Rap	Max	67	71	68	70	72	66	61	70	76	67	79	70	59	52	80	78	62	71	67	53	52	58	66	75	75	82	81	76	75	78	76	69.5
	Min	47	47	48	39	50	46	54	55	53	54	49	57	36	41	44	52	43	42	50	45	42	47	43	48	59	63	59	56	55	54	57	49.5
Corning	Max.	71	77	71	71	68	68	66	68	74	70	77	73	67	56	84	81	64	71	66	62	59	63	67	73	77	82	82	80	75	79	..	71.4
	Min.	44	55	57	37	50	52	57	55	55	37	49	56	39	44	49	58	44	43	52	46	45	49	48	51	51	66	59	58	53	59	..	50.4
Co. Bluffs	Max.	69	81	69	72	80	70	69	74	76	73	84	69	57	55	87	73	67	77	57	53	59	63	65	74	80	85	85	80	78	85	81	72.6
	Min.	41	59	44	42	53	55	58	56	54	53	50	53	44	45	59	48	46	53	51	47	47	52	52	52	63	68	65	60	58	59	63	53.2
Cresco	Max.	53	60	76	68	76	75	69	73	77	68	80	78	61	49	56	82	55	64	60	60	62	66	71	75	83	76	80	76	73	76	76	69.5
	Min.	40	39	44	33	42	48	51	50	46	46	40	48	31	42	39	51	43	34	42	43	43	42	40	44	53	58	60	58	53	49	56	45 4
Davenp'rt	Max.	75	69	81	70	73	72	65	74	73	74	78	82	66	54	71	83	73	68	62	57	59	64	67	73	80	71	80	82	76	78	80	71 9
	Min.	59	58	56	46	54	57	55	54	55	53	49	57	42	45	42	71	49	44	48	47	44	44	44	49	58	62	62	58	62	59	63	53.1
Decorah	Max.	65	62	78	72	78	78	67	73	78	67	82	80	60	52	56	81	64	64	63	62	67	68	73	75	83	77	80	79	75	78	77	71.4
	Min.	48	36	48	34	38	44	51	50	44	49	42	50	35	45	40	54	45	37	38	42	41	42	38	52	55	59	61	58	55	48	58	46.4
Delaware	Max	65	65	76	69	73	73	63	71	73	72	79	86	62	56	61	80	74	64	60	56	62	64	67	74	81	72	76	75	75	74	78	70 2
	Min.	48	45	50	39	47	50	52	51	51	52	43	53	36	41	40	62	46	39	43	43	43	42	39	46	54	59	60	58	55	53	59	48.4
Denison	Max.	64	74	66	70	71	66	62	71	75	68	83	67	58	47	82	68	64	74	70	51	52	60	66	76	80	84	80	82	77	80	79	69.9
	Min.	46	44	46	34	47	48	54	55	55	52	49	49	34	41	44	48	46	48	50	45	42	48	46	48	58	60	58	55	51	56	53	48 7
Des Moines	Max.	69	72	69	71	70	68	63	68	76	66	79	75	59	50	84	83	64	72	61	52	56	60	67	72	76	83	82	81	76	77	81	70.4
	Min.	47	52	52	41	52	55	57	54	53	56	49	55	42	43	46	52	45	44	50	45	43	47	47	50	58	66	61	58	56	57	63	51.5
De Soto	Max.	71	76	71	75	76	70	63	74	79	65	80	75	62	50	85	86	64	73	60	51	55	60	72	78	84	90	87	84	82	81	83	73.0
	Min.	47	52	47	26	51	48	57	55	50	49	48	54	38	44	47	55	45	40	51	46	44	48	45	47	48	57	62	58	54	54	60	49 6
Dows	Max.	68	68	71	70	74	72	68	69	75	78	79	72	58	61	78	81	60	66	61	56	55	52	66	73	79	88	81	77	75	82	77	70.6
	Min.	46	43	51	35	45	46	43	43	49	52	45	52	29	40	43	43	41	36	46	45	40	45	41	48	46	43	58	61	56	63	54	48.1
Dubuque	Max	69	63	79	69	73	74	60	76	74	72	79	82	61	50	61	82	64	66	62	58	63	66	69	72	80	72	76	79	76	75	79	70.4
	Min.	51	49	50	44	52	55	54	52	53	54	49	54	42	44	42	61	49	41	47	45	44	46	44	48	57	60	62	50	58	57	58	51 1
Diagonal	Max.	70	79	72	71	68	68	71	70	74	71	76	73	61	55	85	86	63	72	65	52	60	65	67	75	80	83	84	82	76	78	79	72 3
	Min.	43	55	43	35	41	52	56	53	51	55	43	51	38	43	50	62	44	40	48	45	45	49	47	47	56	65	58	56	51	56	60	49.6
Eldon	Max.	78	83	79	76	74	74	74	75	75	72	82	86	70	62	82	83	81	76	69	55	53	64	72	75	84	83	86	85	81	80	83	75 9
	Min	59	57	64	37	45	57	56	55	48	59	41	55	42	45	46	63	48	41	51	45	44	48	44	43	53	64	65	59	59	55	60	51 9
Elkader	Max.	65	66	81	72	79	77	65	80	78	74	83	85	65	54	56	85	58	70	68	61	67	71	75	76	86	77	85	81	79	79	80	73.5
	Min.	46	41	50	35	39	46	52	50	48	48	40	52	35	44	40	54	45	35	39	43	44	44	37	42	52	58	61	59	55	49	56	43.4
Eldora	Max.	76	78	75	75	76	78	65	75	78	75	80	78	65	56	75	78	70	75	70	61	65	68	72	75	85	85	87	83	78	80	78	74.7
	Min	39	42	48	34	46	44	54	49	50	45	52	48	28	38	40	40	41	34	38	43	38	42	37	42	44	58	56	54	50	52	59	44 4
Estherville	Max.	62	75	63	68	78	76	60	76	79	70	88	76	59	47	59	65	..	69	65	70	54	61	68	77	77	89	85	68	80	84	..	70.6
	Min.	42	35	46	30	41	36	51	49	47	47	45	50	28	33	40	40	..	34	43	41	39	43	37	48	50	58	57	54	50	50	..	43.6
Fairfield	Max.	75	80	77	72	70	71	70	72	73	72	77	81	69	59	82	82	55	70	64	54	58	62	67	73	79	79	81	79	75	76	79	72.0
	Min.	52	56	60	41	47	56	56	54	52	58	46	55	41	46	48	66	49	43	50	45	42	47	45	45	53	57	62	60	60	56	60	51.8
Fonda	Max.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
	Min.	44	47	32	45	45	54	54	49	53	48	52	42	42	41	43	42	40	49	45	41	44	42	42	54	60	58	45	51	54	52	60	47 4
Forest City	Max.	66	66	70	68	76	76	67	71	75	65	81	67	56	52	60	77	58	65	67	57	55	61	68	72	78	81	81	72	75	78	74	68 9
	Min.	45	41	49	33	43	60	53	56	50	54	45	39	31	37	42	47	41	39	44	42	42	45	42	42	54	61	59	57	52	53	55	46.9
Galva	Max.	74	65	71	72	73	63	77	78	72	82	70	60	57	49	84	76	66	73	66	54	52	62	67	77	80	86	83	76	76	79	78	70 9
	Min.	43	44	33	46	48	56	54	50	50	47	53	32	32	39	44	46	42	39	59	46	42	46	44	50	57	61	57	55	50	59	52	47.6
Glenwood	Max.	73	80	72	72	71	69	68	70	77	71	82	75	62	58	87	81	66	73	70	54	60	64	61	76	78	84	85	82	77	85	83	73.0
	Min.	43	56	46	36	48	55	57	53	55	55	51	55	40	42	45	54	44	44	52	46	46	52	50	52	63	64	60	51	51	61	57	51.1
Greene	Max.	66	66	75	70	77	79	69	75	78	66	81	75	61	54	62	83	59	68	65	59	57	70	75	74	83	84	84	78	77	82	77	71.9
	Min.	48	41	54	35	42	48	55	51	49	54	45	50	31	43	43	59	43	37	43	45	42	41	39	44	53	61	60	59	53	51	55	47.5
Greenfield	Max.	73	80	67	72	72	67	62	72	76	69	78	73	60	50	84	83	66	72	60	53	55	65	71	75	82	86	85	79	82	78	80	71.8
	Min.	43	52	45	38	47	48	54	54	52	45	45	53	36	41	44	49	42	42	48	42	41	43	44	47	58	65	63	55	52	48	58	48.2
Grinnell	Max.	67	70	74	69	70	69	66	68	72	69	77	77	65	49	77	81	72	68	58	53	56	60	66	71	79	80	79	79	75	74	78	69 9
	Min.	48	49	58	44	49	54	57	52	54	54	47	55	38	44	44	65	45	44	48	46	42	46	44	48	56	63	62	59	57	56	62	51.3
Grin'l (nr.)	Max.	68	70	75	72	71	70	65	70	73	67	80	78	61	54	78	84	72	69	74	54	55	60	65	75	80	81	79	79	75	73	79	71.2
	Min.	47	48	54	39	46	54	56	53	50	55	45	52	37	43	43	64	45	39	48	45	41	45	42	47	54	61	60	58	55	54	61	49.7
Grundy C'r	Max.	67	65	75	72	75	72	62	74	77	66	80	79	60	61	73	83	59	68	57	59	57	63	71	73	83	81	82	80	77	78	80	71.3
	Min.	45	44	47	35	40	42	51	50	44	48	43	47	33	43	42	51	41	36	44	41	41	43	39	43	52	60	58	55	53	51	51	45.6
Guthrie C'r	Max.	67	73	71	71	71	65	61	70	76	67	80	74	61	55	82	77	62	75	69	50	51	60	67	74	76	82	82	79	75	77	78	70 3
	Min.	35	45	53	36	49	40	54	53	50	53	46	54	34	40	42	54	42	42	49	44	42	46	44	46	58	63	58	55	51	53	56	48 0
Hampton	Max.	61	65	76	71	77	76	66	72	77	64	81	75	59	50	68	82	59	67	60	59	55	64	70	73	81	83	83	83	79	76	79	70.4
	Min	47	43	47	35	45	45	53	50	49	51	46	52	33	41	43	54	43	40	45	45	41	44	40	47	58	61	56	56	52	54	55	47.4
Harlan	Max.	68	80	73	71	74	69	64	73	76	72	81	76	61	51	85	78	64	74	71	53	53	63	71	76	82	85	85	82	77	81	79	72 5
	Min.	46	50	37	34	44	50	54	53	49	53	44	52	37	41	45	51	42	40	51	46	43	49	47	49	57	63	59	56	49	56	53	48.4
Hedrick	Max	72	80	78	75	74	74	69	74	78	77	79	84	64	55	82	85	76	70	68	54	58	63	70	74	82	82	83	80	76	79	82	74.1
	Min.	50	53	53	54	45	53	53	53	50	52	45	52	39	44	44	63	45	41	48	45	42	45	44	45	53	62	72	58	57	55	59	50.8
Hopeville	Max.	73	77	69	..	68	66	65	67	74	68	77	74	69	54	84	83	62	71	60	51	56	62	68	72	75	81	83	80	75	76	79	70.6
	Min.	45	56	50	43	48	53	57	54	53	54	49	54	40	44	49	55	45	45	49	45	44	48	47	48	57	65	60	57	53	57	61	51.1
Humboldt	Max.	67	78	66	72	76	75	65	73	78	68	82	72	59	54	80	82	63	67	67	56	56	62	70	74	71	86	86	77	77	80	77	71.5

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR MAY, 1899—CONTINUED.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Iowa City..	Max.	72	77	80	72	74	78	67	75	77	77	80	82	68	57	74	86	70	69	67	57	61	68	72	76	83	80	83	82	75	81	80	74.2
	Min.	52	53	56	38	43	53	56	53	49	57	43	51	39	45	44	63	47	40	46	47	43	45	43	46	52	61	60	58	57	51	55	49.9
Iowa Falls.	Max.	65	66	72	71	74	75	67	72	76	64	80	75	61	47	74	62	60	68	56	57	55	65	71	74	83	84	84	73	74	78	78	69.7
	Min.	47	43	44	34	43	43	56	50	46	47	44	50	32	42	42	47	42	34	45	47	41	45	38	44	55	62	65	62	58	50	59	47.0
Keosauqua	Max.	80	82	79	77	72	76	73	75	73	74	79	83	64	56	84	86	78	75	68	56	58	63	70	74	82	80	84	82	80	79	82	75.0
	Min.	55	58	57	41	46	57	57	55	53	54	45	58	43	47	47	69	50	43	50	45	45	45	46	44	54	64	67	61	62	58	61	52.4
Keokuk....	Max.	80	80	79	70	70	71	74	72	70	75	76	79	64	59	85	86	70	71	65	52	59	62	66	72	80	77	82	82	76	79	79	73.0
	Min.	61	59	61	47	52	56	58	55	54	60	50	60	45	47	48	62	50	46	54	43	43	50	47	51	56	61	70	63	62	60	65	55.0
Knoxville..	Max.	73	70	73	73	73	71	66	74	72	76	80	81	65	57	83	85	62	73	68	52	56	62	70	75	82	83	84	83	79	74	..	72.8
	Min.	46	53	50	42	48	54	57	53	54	55	46	52	39	44	46	66	45	43	52	45	43	43	45	45	57	63	60	58	56	60	..	50.7
Lamoni....	Max.	74	78	71	72	68	68	77	70	74	71	77	75	65	58	85	86	64	76	62	52	61	63	70	75	80	82	84	84	80	78	82	73.0
	Min.	44	57	50	37	46	54	58	52	51	55	43	53	41	44	52	55	45	40	50	44	45	50	47	47	55	61	59	57	53	57	58	50.3
Lansing....	Max.	68	63	80	70	78	76	70	78	78	71	81	83	66	60	54	76	66	69	65	65	65	72	74	75	85	75	80	78	76	78	78	72.7
	Min.	50	39	50	36	40	46	48	50	48	57	43	53	38	46	42	52	48	37	39	43	45	45	40	45	53	59	62	62	58	50	60	47.9
Larrabee..	Max.	57	68	63	67	74	68	67	67	82	67	86	67	57	45	85	63	66	67	57	54	49	64	67	76	81	82	81	75	75	80	72	68.6
	Min.	38	38	40	30	44	44	54	51	50	51	48	45	27	37	47	44	39	37	47	44	40	46	42	52	57	60	56	55	50	55	50	45.7
Le Mars....	Max.	66	76	57	69	73	73	63	73	79	71	87	68	53	47	79	59	67	74	69	54	51	63	65	78	80	85	82	80	78	81	81	70.4
	Min.	44	44	41	33	48	48	58	50	52	50	49	51	29	40	40	41	43	38	52	47	41	47	45	48	60	63	58	56	52	56	53	47.8
Lenox	Max.	71	78	72	72	67	69	65	69	74	67	77	73	60	54	83	82	63	72	65	52	58	63	68	73	77	81	82	78	78	79	81	71.1
	Min	44	55	56	40	47	52	57	51	54	57	48	54	39	45	49	60	44	45	50	45	45	49	48	49	58	65	59	57	53	58	60	51.5
Logan.....	Max	68	80	72	66	78	74	72	74	82	78	80	74	64	62	84	58	65	58	55	47	56	65	58	74	78	86	88	77	80	86	86	71.8
	Min.	45	50	40	60	45	48	46	50	58	52	55	52	50	44	52	49	40	42	50	42	44	51	49	52	60	68	61	57	54	57	55	50.9
Maquoketa	Max	71	68	81	71	74	76	76	75	76	75	78	83	64	63	64	84	76	68	62	56	63	67	71	74	81	75	76	80	75	77	81	72.0
	Min	54	49	51	38	41	45	53	52	49	50	42	41	40	43	41	60	48	41	41	40	42	46	40	43	48	59	62	58	58	55	58	47.0
Marsh'lt'n.	Max.	66	70	75	73	72	72	65	70	74	65	81	77	61	48	80	82	62	70	58	55	57	63	68	73	80	82	80	78	78	80	79	70.8
	Min.	47	47	50	37	47	50	33	54	48	55	41	51	36	40	41	56	45	39	48	48	42	46	40	45	57	56	61	59	56	55	59	48.0
Mason City	Max.	65	60	72	68	75	72	72	..	76	70	81	70	60	52	81	66	62	58	56	..	..	64	68	80	82	80	74	..	..	..	..	69.3
	Min.	46	37	50	34	49	40	51	..	45	54	46	54	32	39	42	33	41	42	41	..	..	36	35	55	60	53	52	..	..	..	..	52.8
Monticello.	Max	70	68	70	73	74	75	70	75	75	72	80	84	78	72	60	83	73	68	68	58	60	65	70	74	82	76	78	80	78	80	83	73.2
	Min.	63	47	36	39	44	54	54	52	49	49	40	45	38	40	41	56	46	39	40	39	39	39	40	45	50	60	60	56	56	50	52	47.6
Mooar.....	Max	79	80	70	75	72	73	73	73	72	78	77	79	68	69	85	85	65	75	66	53	55	66	68	73	79	77	82	72	77	79	79	73.4
	Min.	57	59	65	50	50	56	55	47	47	51	41	54	44	45	48	57	55	48	49	44	44	44	45	43	54	62	68	61	65	51	60	52.2
Mt. Ayr....	Max	74	77	70	73	67	66	73	69	74	68	73	73	58	53	85	85	62	73	63	52	59	62	71	76	79	83	84	80	78	77	80	71.7
	Min.	43	57	54	41	48	53	56	53	52	55	44	53	40	43	51	61	44	45	49	45	46	49	47	48	56	64	59	56	53	57	59	51.0
Mt. Ple'sn't	Max.	79	67	83	74	77	76	73	77	77	79	79	80	72	61	85	88	80	73	68	55	52	65	72	78	83	83	86	84	80	81	83	76.0
	Min.	40	52	57	36	42	54	51	52	47	57	39	55	44	44	43	65	46	58	45	42	38	38	39	43	52	59	70	56	58	53	58	49.5
Mt. Vern., H	Max.	71	80	78	77	79	81	61	81	76	73	79	87	71	49	73	83	60	76	62	59	62	69	77	78	85	77	83	72	83	73	79	74.0
	Min.	49	48	52	39	45	53	54	54	52	56	46	51	38	44	43	61	45	42	44	41	42	44	46	54	60	60	55	56	56	58	49.5
Newton....	Max.	69	71	73	72	71	71	64	72	75	68	79	79	64	50	80	84	62	71	59	54	55	64	70	75	80	84	82	80	77	75	82	71.4
	Min.	47	50	54	41	48	53	53	53	51	54	47	52	37	43	44	61	44	43	49	45	42	46	44	46	56	62	60	57	55	53	62	50.2
NewH'pton	Max	66	61	74	70	74	75	70	71	76	63	79	76	60	53	57	80	70	65	62	60	62	66	69	70	80	78	79	77	77	77	74	70.1
	Min.	47	45	50	38	38	48	48	48	49	54	44	44	30	45	41	56	43	35	42	44	41	43	40	40	52	63	60	58	56	50	52	46.6
Northwood	Max.	64	61	73	69	76	77	68	72	76	65	81	74	58	49	58	82	58	63	64	60	60	69	72	73	81	82	83	75	75	79	75	70.1
	Min.	40	37	40	30	36	43	52	48	44	46	43	46	32	39	40	45	40	38	39	41	42	40	38	43	51	52	59	54	52	47	54	44.6
Odebolt	Max	67	75	69	71	72	70	62	74	77	70	84	69	62	51	83	79	67	83	75	53	51	61	69	77	80	88	84	71	79	80	79	72.0
	Min	45	44	46	35	46	41	54	54	51	52	50	47	29	41	44	48	42	37	50	45	42	46	42	47	68	60	57	55	51	53	54	47.3
Ogden.....	Max.	70	66	70	75	74	68	62	71	77	65	80	73	58	47	83	82	63	73	66	52	53	60	69	74	77	87	79	77	77	77	80	70.5
	Min.	46	46	49	36	46	50	55	53	51	55	44	52	31	44	42	53	43	41	50	49	40	45	45	49	55	61	58	55	51	55	58	48.6
Olin	Max.	70	71	79	69	69	74	59	73	75	73	73	82	64	48	55	83	58	68	60	58	60	66	69	73	81	75	79	79	75	76	79	70.1
	Min	51	49	53	48	43	54	54	53	49	58	41	49	39	44	43	60	50	40	43	45	44	43	41	44	50	60	61	59	56	52	61	49.7
Omaha. ...	Max.	66	79	63	71	70	68	66	70	75	68	82	68	56	53	87	74	68	74	64	54	58	63	66	76	77	84	84	77	77	84	82	71.1
	Min.	45	56	45	45	53	54	58	55	58	59	54	53	45	44	48	51	46	51	53	48	47	54	52	55	63	67	61	60	54	64	60	53.5
Onawa....	Max	69	82	74	74	75	74	67	77	81	73	86	81	64	54	88	79	70	74	73	55	54	64	69	79	81	86	84	82	79	84	81	74.5
	Min.	45	46	44	34	45	48	55	53	53	53	50	57	34	42	46	53	44	43	51	47	44	50	49	53	61	62	60	52	51	58	57	49.7
Osage.....	Max.	65	62	75	65	75	73	65	68	76	63	80	74	58	51	52	81	65	64	62	59	60	66	68	71	81	80	80	74	74	78	75	69.1
	Min.	47	38	51	34	40	44	52	48	47	56	43	50	32	41	39	51	41	37	41	42	41	44	38	43	52	60	59	57	51	48	56	45.9
Osceola ...	Max.	71	78	68	71	69	66	63	69	75	66	69	76	59	52	85	84	63	72	59	49	53	60	68	76	78	82	83	81	77	78	81	70.5
	Min.	46	54	52	40	46	56	56	54	52	56	49	49	37	42	48	66	45	42	49	45	44	47	45	46	58	65	60	57	54	55	61	50.8
Oskaloosa..	Max.	73	79	78	74	74	71	67	73	77	78	79	82	61	46	83	86	68	72	64	54	57	62	70	74	88	82	83	82	78	76	82	73.7
	Min.	49	53	52	38	47	55	53	54	49	53	45	52	38	48	44	61	46	45	50	45	42	46	45	44	55	62	60	58	56	55	61	50.5
Ottumwa...	Max.	75	76	78	73	72	71	70	71	74	75	80	83	64	58	84	86	77	75	72	54	57	61	68	74	81	80	83	82	78	78	83	74.0
	Min.	52	55	53	41	40	57	57	55	52	55	41	52	41	40	46	67	42	40	42	44	43	47	45	40	56	63	63	58	59	58	60	50.5
Ovid	Max	73	78	72	73	68	69	67	68	73	71	76	81	64	54	83	84	62	76	58	47	57	69	68	72	76	79	82	83	78	78	82	71.0
	Min	51	54	49	40	49	54	56	54	51	51	46	53	38	45	47	58	45	43	50	45	43	45	45	47	55	65	59	57	56	57	60	50.7
Pacific Jct.	Max	74	79	66	70	71	70	65	76	76	65	81	67	56	54	85	74	64	72	59	53	60	61	66	74	78	83	84	76	74	83	80	70.9
	Min.	43	57	47	34	48	51	56	54	52	55	50	55	39	43	49	53	44	41	51	47	47	53	51	55	62	64	58	58	51	60	56	51.1
Pella.....	Max.	70	75	64	71	66	69	59	68	70	61	77	71	59	49	81	82	62	69	51	50	55	60	64	72	75	78	80	80	75	77	78	68.3
	Min.	46	52	61	40	48	54	56	54	51	55	45	51	39	43	45	65	45	41	50	43	42	46	44	46	55	63	60	58	55	54	62	50.6
Plover.....	Max.	60	72	74	72	74	74	66	80	78	72	82	71	68	60	80	60	70	67	60	52	50	60	68	77	84	87	84	78	77	80	77	71.4
	Min.	35	40	60	31	45	42	55	54	55	53	56	50	31	45	40	55	42	40	45	46	42	44	51	54	50	59	50	56	50	54	55	47.2
Primghar..	Max.	52	64	65	65	76	73	65	78	78	77	87	72	50	55	71	58	65	75	60	54	50	60	65	75	75	83	81	66	68	70	75	68.9
	Min.	41	40	42	32	45	50	55	52	66	46	49	50	30	35	53	45	42	41	46	45	40	40	48	52	55	65	57	49	51	58	53	47.5
Red Oak...	Max.	73	81	71	73	71	71	73	75	78	71	81	77	73	58	87	80	72	78	72	54	67	62	70	75	80	80	86	84	83	83	85	75.0
	Min.	45	57	41	40	49	51	55	52	57	57	50	50	43	45	51	50	46	45	51	45	45	43	45	53	62	63	61	65	54	64	59	71.4
Ridgeway..	Max.	64	60	76	71	77	75	67	75	77	65	85	77	62	53	58	80	73	71	62	61	66	65	70	72	80	77	80	75	75	76	77	71.0
	Min.	45	37	49	35	43	49	50	48	49	49	43	51	34	44	38	54	44	37	40	42	42	40	42	47	54	58	61	58	54	52	58	46.7
Rockwell C	Max	65	72	77	77	76	75	63	71	79	73	81	72	62	52	82	82	63	72	60	54	52	60	71	75	79	82	83	75	77	78	77	71.5
	Min.	47	44	50	32	44	46	53	51	50	53	47	54	31	41	44	48	42	37	50	45	42	46	42	47	68	60	57	55	51	53	54	47.3
Ruthven...	Max.	64	71	59	66	70	73	65	69	72	74	82	84	58	54	74	74	74	68	66	64	68	70	72	74	82	84	80	82	76	80	78	71.8
	Min.	43	40	46	44	44	42	52	50	44	50	48	57	28	44	42	44	42	40	38	36	34	48	44	50	54	62	56	54	50	48	52	46.0
Sioux C'ntr	Max.	64	73	56	69	76	69	62	74	79	71	82	83	58	49	72	53	65	70	66	55	52	58	63	76	79	85	83	73	78	79	77	69.3
	Min.	44	40	40	32	47	46	53	52	53	52	50	53	31	37	36	43	41	42	50	43	40	45	43	53	60	62	58	56	51	55	53	47.2
Scranton ..	Max	69	72	60	71	72	68	62	71	76	68	80	77	64	55	60	64	79	70	71	55	52	58	62	75	77	84	79	79	75	79	77	69.7
	Min	47	50	48	37	48	48	54	54	51	55	46	57	35	42	43	44	43	43	50	45	42	46	44	56	56	64	59	54	52	54	56	49.1
Sheldon ..	Max.	62	75	70	69	72	75	75	75	81	67	87	77	56	49	67	60	64	67	63	55	53	65	70	73	78	83	80	72	75	75	75	69.8
	Min	42	37	30	30	41	40	51	50	40	51	49	40	28	30	40	45	38	36	50	31	30	46	45	42	56	62	56	56	51	50	50	43.3
Sibley	Max.	50	75	50	65	64	75	67	77	81	69	87	64	57	45	63	48	66	68	60	54	47	60	69	74	77	85	83	73	76	81	75	67.3
	Min.	42	38	41	31	43	41	51	51	47	50	48	50	28	36	42	43	40	37	37	47	40	41	42	49	54	60	57	55	50	50	52	44.9
Sigourney..	Max.	74	81	81	74	76	77	68	78	78	77	81	85	68	58	86	88	76	73	70	55	61	68	75	77	86	79	85	84	82	81	85	76.4
	Min.	48	51	55	36	45	49	55	57	48	37	42	50	36	43	42	63	44	38	45	42	40	44	39	41	52	60	58	56	55	51	59	47.8
Sioux City..	Max	61	78	54	70	72	71	65	73	79	71	88	61	57	49	84	54	68	73	58	52	52	62	64	80	81	83	81	76	77	83	77	69.5
	Min	45	44	41	38	45	52	53	53	54	55	54	56	34	42	41	46	44	43	48	48	44	44	50	51	56	62	59	58	53	57	58	49.8
Spencer ...	Max	62	74	64	68	74	73	61	83	78	69	84	75	60	51	75	71	75	71	58	58	52	64	68	78	..	85	82	77	81	80	..	70.7
	Min.	42	37	38	28	43	39	53	62	48	48	47	47	27	38	49	43	41	36	46	46	40	46	42	48	..	69	55	54	56	51	..	45.6
Spirit Lake	Max.	62	78	60	66	76	81	60	83	78	68	84	67	61	45	63	62	62	66	56	58	50	63	70	76	77	84	87	76	76	83	84	69.7
	Min.	45	45	39	32	47	46	53	47	50	50	50	44	50	36	43	45	40	41	49	45	40	45	45	51	57	60	58	57	51	52	65	47.0
StormLake	Max.	65	70	63	67	69	69	60	69	74	63	80	70	56	46	78	73	63	67	62	57	50	57	64	71	74	81	79	72	73	76	76	67.5
	Min	42	42	43	38	49	44	54	53	53	50	51	54	31	42	43	43	41	44	44	42	40	46	44	51	56	61	55	56	51	57	50	47.4
Stuart.....	Max.	68	65	68	70	72	67	65	70	77	72	78	78	69	55	83	81	67	70	67	59	55	60	68	75	80	85	81	82	82	82	82	72.0
	Min.	47	45	38	40	47	50	55	52	52	52	48	49	36	32	43	58	45	47	50	41	40	47	44	46	57	63	62	62	52	54	58	48.0
Tara.....	Max.	60	72	65	75	75	78	75	72	78	65	82	75	59	65	78	82	60	70	57	58	58	62	68	75	83	88	85	75	78	75	80	71.9
	Min.	50	51	55	60	60	68	68	57	70	58	62	68	49	50	50	67	45	55	51	49	48	50	52	55	63	65	65	60	58	65	70	57.9
Thurman..	Max.	70	69	80	73	72	72	71	76	78	68	81	71	62	57	88	79	66	74	65	55	64	65	66	79	79	86	86	82	79	85	81	73.5
	Min.	52	45	58	52	39	53	53	55	60	60	48	54	40	44	52	53	45	40	53	47	48	53	51	51	62	64	60	60	51	62	54	52.2
Toledo	Max.	67	70	77	70	75	74	60	74	76	70	80	81	65	49	79	85	55	74	58	54	57	63	65	70	85	84	83	80	80	80	83	71.7
	Min.	42	47	50	35	49	50	56	53	47	55	45	52	36	42	44	53	45	38	47	46	43	46	40	51	52	50	55	55	55	55	62	48.9
Villisca ...	Max.	69	81	67	68	70	72	73	72	78	79	80	71	62	78	85	66	67	74	60	53	65	67	72	79	81	85	86	81	80	82	83	73.7
	Min.	43	49	64	35	45	50	53	56	51	55	44	51	39	44	45	46	47	40	52	50	45	44	50	50	57	62	57	58	51	57	56	49.9
Wapello ...	Max	82	74	83	76	70	71	61	75	71	73	83	87	69	62	77	86	75	74	76	63	60	63	68	72	84	75	82	79	80	75	81	74.4
	Min.	57	58	59	48	50	62	57	54	52	56	45	56	43	47	45	69	49	41	49	46	44	47	45	47	55	62	64	60	60	56	62	53.1
Washingt'n	Max	74	80	78	72	74	73	64	72	73	75	79	82	76	53	80	83	62	70	64	55	60	63	68	72	81	77	71	79	76	76	81	72.4
	Min	50	52	52	38	45	54	52	51	49	48	42	52	38	44	42	66	45	38	46	43	40	43	41	45	52	60	60	57	57	54	62	49.0
Waterloo...	Max	63	68	76	72

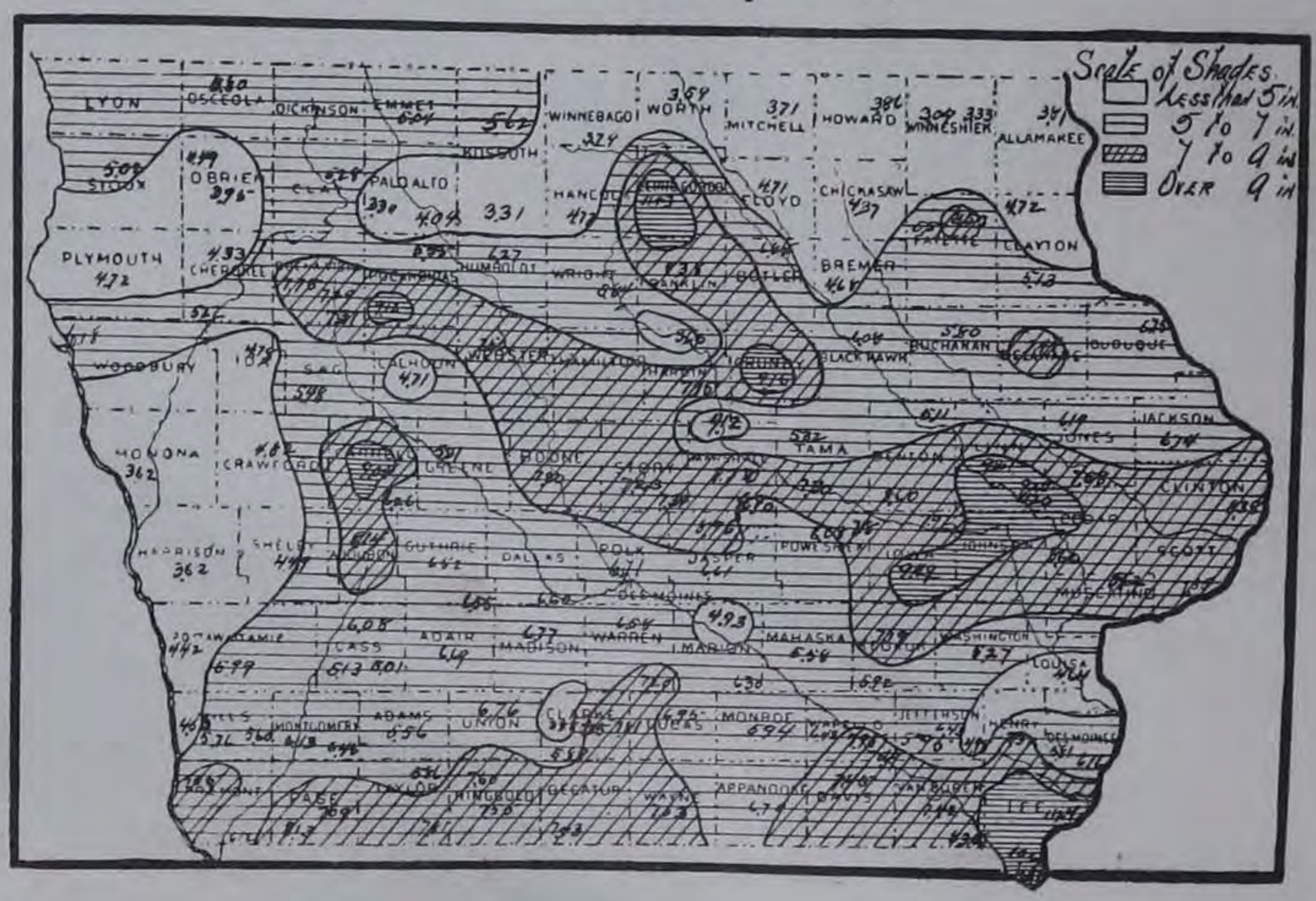
DAILY AND MONTHLY PRECIPITATION FOR MAY, 1899.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Afton	..	.14	...	..	...	...	.75		..	.44	...	..	....	.55	..	..	.56	..	1.31	1 57	.13	....	....	..	...		.26	.72	....	.22	.11	6.76
Algona	..	.05	....	...	..	..	...	.60	T		...	...	..	.25	.50	.15	..	...	..	....	.27	....	...		.05	.02	.52	..	....	.90	...	3 31
Alta (Hadden)	....	...	.13	...	....	.04	.12	..	.12	.02	....	T	.02	.42	.32	T	02	..	.44	.10	.39	...	....	T	.10	...	4.20	1.10	...	.21	...	7.75
Alta (near)	...	.06	..	....	..	T	25	..	.18	.03	....	..	T	.38	.55	.02	....	...	.44	.11	.25	....	....	..	.05	.31	4.43	.14	...	.09		7.29
Albia		.17	...	...	..	T	.95	.08	....	.19	..	...	....	.85		...	.23	...	1 86	.28	.24	.02	....	....	....	.11	.03	.45	..	.26	.22	5.94
Amana	.	10	.08	..	..	...	.20	T	..	.30	..	....	T	1 28	.62	.16	.28	.	T	T	.16	....	....	....	....	1.74	.13	2 37	.14	.02	.34	7.92
Ames	..	.15	..		..	....	1.16	...	.55	.05	..	....	....	1.70	..	....	.42		.20	.20	.35	....	....	..	...	.	.58	1 87	T	...	...	7 23
Atlantic	..	....	...	...	..	.05	1.10	..	..	.11	..	....		1.00	..	...	.30	...	1 30	.62	.15	....	....	..	...	...	.71	.40	...	.34	....	6 08
Audubon	..	..	..	..	....	..	.45	..	...	.30	....	....	...	1.95	.15	..	.32	..	1.14	1 11	.51	....	....	...	....	...	1 58	.40	....	.23	....	8.14
Bancroft	..	.02		....	..	..	.66	.04	T	T	..	..	..	.20	.43	.52	.03	....	T		.25	.16	....	T	.33	.43	91	.41	.18	T	1.05	5.62
Batavia	...	.17	....	...		....	1.81	.	...	...	....	..	..	.38	...	...		...	45	.95	.94	..	...	...	....	.21	T	.70	...	.34	....	5.95
Baxter	..	.32		...	...	..	1.39	.04	T	.30	....	..	T	1.00	3.45	..	.55	....	.19	.09	.21	..	...		....	T	.25	1 15	...	T	.11	8.96
Belknap	...	..	..	...	...	.	.10	.50		.15	..	....	....	1.70	.10	..	.40	..	.10	2 90	.40	.40	...	..	....	.10	.05	.05	..	.25	.25	7.45
Belle Plaine	.50		...	..	...	..	.50	....	...	.40	..	...	....	1.25	.75	02	.25	....	.02	....	.20	...	..	..	....	1.75	....	2.90	...	T	.06	8.60
Blockton	..	.15	.06	.	..	..	.67	...	....	.75	..	....	....	.79	...	..	.33	...	.64	2 38	.44	...	..	....	....	..	.10	.35	...	.55	.60	7.81
Bonaparte	....	.20	....	..	....	....	1.12	..	....	.40	....	..		1.80	.	....	.24	...	.34	1 30	.76	..	....	..	....	.26	..	.42	.76	.55	.20	8.35
Britt	...	..	..	...	....	T	.05	.07	...	.04	....	....	T	.24	.64	....	T	..	T	.	.09	.39	...	T	T	1.03	.23	1.09	.14		.76	4.77
Burlington	...	.35	.13	..	...	..	.70	T	...	.20	....	..	..	.90	..	..	.21	...	.11	.37	.99	.04	...	..	..	.88	.23	.27	.42	.30	.06	6.16
Bussey	...	.17	..	....	...	..	1.03	...	.10	....	....	....	..	1.04		...	50		.67	1.23	.48	....	....	....	.25	.04	.33	...	.46	..	....	6.30
Carroll	..	..			...	..	1 06	..	..	.18	..	....	..	...	1.15	....	.17	.05	...	1.13	.85	....	....	....	..	.04	1 66	2.70	.02	1.03	...	9.04
Carson	..	..	T	...	...	..	1 38	....	.06	....	....	..	..	.51	.36	....	....	.41	1.06	.90	.50	....	....	....	...	T	.50	....	.09	..	.22	5.99
Cedar Rapids	....	.22	.17	..	..	..	.75	..	.22	.21	....	....	.05	1 53	.50	....	.24	....	..	.03	.02	....	....	..	1.42	.24	2 47	.74	...	.40	...	9 21
Centerville	....	.02	..	..	..	T	.78	..	...	.43	....	....	T	.40	..	..	.25		1 48	1 40	.25	....	....	....	....	.30	.39	.35	..	.10	.55	6 70
Charlton		.23	.	.02	....	T	.96	04	.03	.30	....	..	T	.60	....	..	.27		.86	1 77	18	..	....	....	....	.03	13	.50	...	.59	.44	6.95
Chillicothe	T	....	..	..	..	....	1.01	.10	..	T	....	....		.81			.30		.50	1.23	T	..	....	....	....	.08	70	1.00	...	.40	.30	6.43
Charles City	....	....	....	..	....	....	.25	.02		.16	..	..	T	.14	43	.28	T	..	..	....	.08	.26	....	....	.09	.87	.26	1 32	...		.55	4 71
Clarinda	....	....	....	..	....		.46		1 25	.06	..	..	T	.46	..	..	.85	.	....	2 85	.75	T	....	....	....	....	.06	.28	..	.07	....	7.09
Clinton	..	.15	.13	..	....	..	1.22	.02		.19	....	..	....	1 09	.31	.03	.17	..	....	..	.07	.20	....	....	....	.84	2.22	1.51	..		.23	8.38
Clear Lake	...	....	..	..	....	..	.22	...	T	1.61	....	..	....	..	1.12	.35	..	....	..	..	1.12	....	....	1 73	...	1.42	1.88	....	....	1.98	...	11.43
College Springs	....	....	....	....	....	....	.06	...	.70	.30	....	..	.	.76	..	..	.45	....	.57	4 12	.50	..	....	....	.08	..	.05	....		.54	...	8 13
Coon Rapids	...	....	..	..		T	.49	....	T	.18	..	..	...	86	.31	..	.33	..	.80	.71	.33	.02	....		...	.04	.94	.56	.30	.06	.30	6 26
Corning	....	..	....	..	..	....	1.61	...	.10	....	....	..	..	.34	.	..	.42	.	.95	1 54	....	....	....	....	....	....	.35	.22	..	..	....	5 56
Council Bluffs	..	.30		..	..	....	.86	..	T	.10	....	....	.	.40			.28	..	1.36	.45	T	....	....	.06	.01	T	49	.11	....	....	....	4 42
Cresco	....	.	T	....	....	....	.06			.39	....	.	....	.05	.34	.21	T	....	..	....	.20	..	....	....	T	.43	1 27	.59	..	.32	....	3.86
Cumberland	....	..	....	..	..	..	1.16	T	T	.10	..	....	..	.42	.C8	..	.37	....	.80	.87	.09	....	....	..	T	..	.33	.38	.16	T	.25	5 01
Danville	....	T	...	.06	....	..	1.00	....	..	.20	....	..	..	1.00	..	..	.25	....	.15	.41	.77	.02	..	....	....	1.00	.27	.28	.27	.13	T	5 81
Davenport	....	.40	.06	....	..	....	18	..	....	.02	....	..	....	.92	1.37	T	.17	...	T	....	.09	.37	..	....	....	1.15	.30	1.73	.40		.19	7 35
Decorah	...	.02	20	..	...	....	T	..	....	.23	..	....	....	.04	....	.36	....	..	....	..		.37	....	....	.04	.76	.11	1 04	T	..	.16	3.33
Delaware	....	.21	.70	..	..	....	.18	.04	....	.03	..	..	.25	.95	.33	.18	16	....	..	..	33	....	....	....	.05	.77	.75	1.85			.66	7 44
Denison	....	....	.83	.	..	T	.70		T	.23	.	..	..	.63	.04	....	....	..	.75	.10	.20	....				T	.62	.52	.10	.10	...	4.82
Des Moines	....	.13	T	....	...	.02	.93	.27	T	.32	..	..	T	1 00	.38	...	.60	..	.90	.56	.20	T	..	.	T	T	.27	.65	.05	.07	.35	6 71
De Soto	....	.05		..	....	..	.71	...	T	45	..	..	...	1.02	...	..	.45	.	.76	.85	.06	...	....	..	...	.2	1.11	.14	..	.76		6.60
Diagonal	..	.20	...	..	..	...	.70		..	.80	..	..		.50	...		60	...	.80	2 20	20	...	....	....	....	...	.20	.50		....	.90	7.60
Dows	.01	.28	..	..	..	....	.12	T	.04	.46	..	..	T	.41	.61	.43	.06	...	.18	...	.38	.02	....	...	T	.18	.48	1.77	....	.41	....	5.84
Dubuque	.0	.49	.07	...	.	..	.40	.02	T	T	..	..	T	.62	.69	.19	.15	...	....		T	.07	....	..	.01	.77	.31	1.13	.06	....	.76	5.75
Eldon	....	.23	...	.	...		1.13	..	....	.05	..	....		3 01	..	...	.71	...	.50	1.43	.76	T	...	..		.10	T	.17		.25	.35	8.69
Eldora	T	.75	..	..	...	T	..	T	.	.75	..		T	.90	1.10		.10	...	.25	T	.40	....	....	..	T	.50	1.10	2.00	...	.10	...	7.95
Elkader	....	12	.02	...	..	..	.05	..		.22	..		.12	11	.45	.38	..	....	..	....	.06	25	...	.02	.28	.65	.15	70	....	T	1.55	5.13
Emerson	....	..	.20	....	..	....	1.40	....	.10	.10	..		.50	T	..	....	T	70	.60	1.00	.10	..	..	..	..	.50	.40		..	T	....	5.60
Estherville	....		.05	..	..	T	1 30	....	....	.20			T	.23		1 05	....	....	T	T	35	.10	..	T	T	.20	.40	.25	.10	.70	....	5.03
Fairfield	..	.10	..	.	..	T	1.10	.01	..	.11	....	..	T	.96	.01	..	.33	...	.34	.79	1 22	.09	..	..	...	.43	.10	.33	...	.20	.31	6.43
Fonda	....	.03	..	....	....	....	.58	....	.20	.08	...	.36	.17	.15	.05	..	..	.13	20	.25	.03	....	....	....		.45	6.35	.03	...	.06	...	9.12
Forest City	....	....	....	..	..	..	.11	13	...	06	....		..	.23	.70	.05	..	..	....	....	20	.25	....	.	T	.36	.82	.65	.03	..	.20	3.79
Ft. Madison	..	.27	.45	...	...	1.02	.23	...	...	.36	1 65	....	.	....	....	...	.30	..	...	1.85	2.83	....	..	....	....	1.61	.47	.70	....	.15	.35	11.24
Galva	..	....	..	....	...	.51		.36	..	..	..	..	T	.37	.39	..	..	...	.60	...	.13	..	..	..	T	.24	1.63	....	...	55	...	4.78
Gladbrook	....	.40	..		..	....	.03			....	..	..	..	2.15		..	.03		....		.11	..	..	..		.30	1.90	....	.40	....	....	5.32
Glenwood	....	.15	..	...	....	..	1.70	T	..	.07	....	..	T	21	.23	..	.30	...	.90	.98	.42	....	....	T	T	T	.40	22	...	.07	.08	5.76
Gilman	....	.29	...	.	....	.	.25	..	...	.34	..	..	T	1.24	.92	.06	.34		.07	.03	.25	....	....	.	....	.51	.19	1.91	.03	.02	.25	6.70
Grand Meadow	....	.06	.07	..	....	...	.03	..	..	.19		.	.13	.15	.60	.73	..	...			T	.24	....			.63	.20	.80	...	.02	.87	4.72
Greene	..	.13	..	..	.	.	.07			.27	..	.	...	26	.44	.25	Γ	..	..	..	.12	.26	.	.17	.08	1.60	.25	1.53	....	1.41		6 85
Greenfield	....	T	....	..	..	.04	1.68	T	T	.48	..	.	T	.42	.07	...	.48	.	1.99	.21	..	.35	....	..	..	..	.30	.32	.04	.18	.13	6.69
Grinnell	....	....	....	..	..	T	90	..	..	.20	...	..	T	2.85	..	.33	....	...	....	.22	.22	....	..	..	.62		.10	.97	.07	.20	...	6.68
Grinnell (near)	..	.42	..	..	..	..	.47	T		.28	..	..	T	1.02	1.90	....	.35	..	.20	.10	.25	....	..	..	T	.81	.10	.88	.15	.15	.10	7 18
Griswold	....	....	.03	..	....	..	.84	..	..	..	..	..		.42	40	..	.32	..	1 02	.96	.14	....	....	....	....		..	.32	.22	.12	.34	5.13
Grundy Center	..	.32	T	..	..	..	T	T	.	1 00	....	..	.	.82	2.40	.20	....	..	.10	.30	T	....	....	....	.03	.85	.75	2.22	..	....	.16	9.15
Guthrie Center	...	..		..	....	.07	22	..	T	07	....	....	...	1.63	.65	..	.39	.	.74	.47	17	....	....	..		.	.85	1.07	.04	.05	10	6.52
Hamburg	..	..	....	....	..		.93	.	..	1.4	.	....	....	.28	....	..	.37		.37	2.35	.25	....	....	..	....	..	..	..	....	..	.12	6.12
Hampton	....	33		..	..	.11	.24	...	.29	.26	....	....	.17	.72	.66	...	.02	....	....		.33	....	....	..	.72	.37	2 81	....	..	1 37	..	8 40
Harlan	....	....	.07	..	..	....	.58	.02	T	.02	..	..	T	1 08	.08	..	.25	..	.76	.53	.28	T	..	.10	T	....	.58	.12	.01	.01	....	4.49
Hawkeye		.05	.10	...	...	...	T	...	.16	.25	....	.			1.05	...	.40		..	....	.32	..		16	.76	....	.35	....	.97	....	1.00	5.57
Hedrick	...	....	....	....	....	....	1.00		..	.11	..		T	.57	.07	..	.45	...	.40	.47	.59	....	....	..	....	.24	1 02	.42	.02	.28	28	5.92
Hopeville	...	.20	..	.	....		.77	....	..	.62	..	....	....	.42	....	....	.30	..	.76	1.60	.17	....		....	....	T	.24	.40	..	.11	.30	5.89
Humboldt	..	....	..	....	.01	...	.68	.05		.20	....	..	....	.36	20	.03	....		.16	.07	.34	....	.26	.06	....	....	....	3.30	.	..	.55	6.27
Independence	....	.17	....	..	....		.03	....	.02	02	....	..	T	.33	1.04	.10	.10	..	T	....	T	.02	....	..	.15	1.50	....	2.20	..	..	.12	5.80
Indianola	....	.21		....	..	T	.80	T	....	T	....	..	T	9	.36	..	43		.79	1.11	.10	T	....	....	T	....	.19	1.16	....	.20	.30	6.58
Iowa City	....	.36	.10	....	....		.54	..	..	.25	..	..	....	1.16	2.94	.33	.60	....	.04	.27	..	..	....	..	....	1.50	.25	.74	.06	T	.35	9.49
Iowa Falls	....	.24	....	....	....	....	.08	....	..	.24	..	....	.05	.41	.80	.05	.07	....	.12	..	T	..	....	....	T	.28		1 28	....	....	.03	3.65
Keokuk	...	.61	.77	....	....	.05	2.52	....	.	25	....	....	..	.34	..	....	.25	....	.15	1.82	1.93	.05	....	....	....	1.37	T	.25	.24	.10	.77	11.47
Keosauqua	....	....	..	..	....	..	1.00		..	40	....	....	..	1.10	....	....	....	....	.85	1 91	.65	.	....	....	....	.23	T	.40	.13	.52	.23	7.42
Knoxville	..	....	..	..	....	....	.95	.05	..	.13	....	..	T	.93	.50	....	.47	.	.70	1.03	....	..	....	....	....	....	.12	.66	....	.07	..	5 61
Lacona	....	.74	....	....	....	....	.22	.06		.27		....	....	.90	.70	....	.46	....	.77	1.24	.20	T	....	....	....	....	.02	.42	..	.20	1.00	7.20
Lamoni	....	.25	....	..	....	.03	1 18	....	...	69	....	....	..	.37	....	....	..	..	.45	2.42	.18	....	....	....	....	.27	.04	28	..	.37	.90	7.43
Lansing	....	T	T	..	..	..	T	.17	....	.07	....	....	....	T	.34	.49	.08	....	....	....	....	T	....	....	.63	.94	.15	.80	T	....	.20	3.87
Larrabee	....	.12	....	....	..	.10	.27	T	.15	T	....	T	.10	.25	.17	....	....	..	.32	.19	.20	....	....	....	.01	....	1.62	.12		.71	..	4.33
Le Claire	.02	....	.41	.19	....	....	....	.11	....	.01	.01	....	....	....	1.95	T	.04	07	....	T	.05	.09	..	....		.42	.51	1.81	44	....	.41	6 57
Le Mars	..	.16	...	....	....	....	.34	....	.04	....	....	..		47	.54	.01	..	....	.44	.12	.30	....	....	.06	.34		.77	.78	.	..	.35	4 72
Lenox	....	T	.03	....	....	....	1 25	....	..	.40	..	....	T	.38	....	....	.41	....	.81	2.05	.10	....	....	....		....	.10	.20	....	06	.07	5.86
Lockridge	....	..	....	....	.05	..	1.20	.	....	....	..	....	....	1.13	..	....	..	....		1.10	.36	.10	.35	..		....	.59	T	T	.10	....	4.98
Logan	....	..	....	....	....	..	.87	....	..	.	....	....	.61	.20	.	....	..	....	.61	.35	.17	....	....	.07	....	....	.57	.10	.07	..	....	3 63
Maquoketa	....	.15	.09	....	..	..	1.10	....	....	.09	..	..	..	.64	.90	.13	.19	..	..	....	.10	....	....	....		.82	.23	1.32	.48	....	.50	6 74
Mason City	..	....	.	....	....		.01	.03	..	.20	....	....	....	.80	.20	....	....	....	T	....	....	.20	....	....	.35	.25	1 25	....	....	....	....	3.29
Mooar	....	.28	.32	.	....	T	1.84	....	....	22	....	....	....	.62	..	....	.20	....	....	1.70	1.65	.21	....	....	....	1.50	T	.30	.58	.14	.78	10 34
Monticello	.03	....	....	..	....	....	.40	....	T	..	....	....	....	....	....	1.98	.22	....	....	....	.17	.	....	....		.60	.20	1 64	.45	..	.50	6.19
Mt. Ayr	....	.15	....	....	..	T	.54	..	....	.57	....	..	....	.77	..	....	.43	....	1.05	2 17	.30	.01	....	..	T	....	.25	.25	....	.40	.66	7 55
Mt. Pleasant	....	....	T	....	..	1.45	T	....	.	.10	....	..	..	1.17		....	.42	....	..	....	1.66	....	....	..	..	.72	.07	.50	.87	.21	.13	7.30
Mt. Vernon	....	.35	.05	....	....	....	.85	....	....	.15	....	....	....	1.25	1.03	.32	.15	..	....	.	.05	.10	..	..	....	1.00	2 94	.82	....	T	.22	9.28
Mt Vernon (h)	....	.27	.08	..	....	....	.87	....	T	.16	....	..	T	1.35	.85	.41	.23	...	T	....	.09	.09	....	..	.10	1.08	3.40	1 95	..	.01	.26	11.20
Murray	..	.27	....	....	....	....	.76	....	.42	.12	....	....	..	.63	..	....	.52	....	.	2 90	..	....	....	....	....	.	.40	.44	....	.42	....	6.88
New Hampton	....	.75	....	..	....	....	.02	....	....	.20	....	....	....	.01	.60	.42	....	....	....	..	.05	.22	....	.06	....	.62	.22	.54	....	....	.66	4.37
Newton	....	.42	....	....	..	T	1.28	T	T	.05	..	...	T	1.21	1.03	..	.33	....	.35	.08	.30	....	....	..	T	.05	.14	1.19		.10	.08	6 61
Northboro	....	..	....	....	..	....	....	..	.96	....	.01	....	.	.73	....	....	....	.21	.59	.03	.32	....	....	....	....	....	....	....	.32	.77	....	3.94
Northwood	....	....	....	....	....	....	.42	....	....	....	....	....	.	T	.70	..	....	....	....	....	T	.22	....	.	.33	....	.38	.68	..	..	.86	3.59
Odebolt	....	..	....	....	....	T	.72	....	..	.30	....	..	T	.80	.10	.04	....	....	.31	.35	.25	.04	....	....	.	T	.37	1.46	....	....	.74	5 48
Ogden	T	T		....	..	.12	.86	..	....	.35	....	....	....	.63	.60	....	.30	....		.23	.62	....	....	..	T	.91	.14	2.74	....	T	.30	7.58
Olin	....	.15	.07	....	..	....	.16	....	T	.08	....	..	.04	.85	1.24	.60	.14	....	T	....	.16	..	....	.14	.03	T	.52	.12		T	..	4.45
Omaha (Neb)	....	....	.24	....	....	....	1.33	.02	T	.10	....	....	T	.19	.28	....	.26	....	.78	.41	.03	....	....	....	....	.17	.30	51	.05	....		3 62
Onawa	....	....	.07	....	....	.01	.37	....	.01	.25	....	....	....	.44	.26		.08	....	.38	.21	.37	.03	....	.05	.06	.17	.30	.51	.05	....	.24	3.71
Osage	....	.02	....	....	....	....	.58	.02	....	.18	....	....	....	.10	.65	.15	T	....	....	....	.10	.16	....	....	T	.34	.40	.77	.	....		

DAILY AND MONTHLY PRECIPITATION FOR MAY, 1899—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Osceola	...	.20	.03	...	...	T	1.39	...	...	.27	...	...	T	.72	...	...	.35	...	1.21	1.97	.40	T	...	....	....	...	.24	.55	....	.08	.46	7.85
Oskaloosa	...	.03	...	...	...	T	.75	...	01	09	...	...	...	.75	.85	...	.40	...	.47	.51	.60	...	...	...	....	...	.28	.14	.31	...	.32	.05	5.09
Ottumwa	....	..	..	....	...	....	1.20	....	...	.80	...	...	...	.90	...	...	.20	....	.77	.28	.52	...	...	...	....	....	.40	.22	.46	...	.46	.74	7.95
Ovid	....	.38	...	...	....	.04	1.23	..	..	...	...	...	.02	1.11	...	....	.15	...	.97	1.96	.20	...	..	..	...	.01	.23	.16	...	.15	.42	7.08
Pacific Junction	...	...	.23	...	....	...	.28	T	...	.05	...	...	...	.34	.14	....	.31	..	1.20	.95	.20	T	...	....	.01	...	.33	.31	....	.28	...	4.63
Pella	...	.13	...	..	..	....	1.05	06	.	.15	...	...	...	1.05	.29	...	.42	...	3?	.26	.19	...	...	.	...	.06	.13	.30	...	.03	.33	4.83
Plover	...	...		...	T	...	.65	.15	....	.10	..	...	.10	.12	.5?	.33	...	....	.05	.04	60	...	...	...	...	...	...	1.84	.50	..	...	1.05	5.55
Primghar	...	...	...	....	...	...	...	...	...	...	.10	...	...	.15	.50	.25	...	.	..	.10	.75	.15	...	....	.15	...	.50	1.15	...	.15	....	3.95
Red Oak	...	....	.05	....	1.55	..	..	....	...	.15	....	...	T	.29	...	...	.31	....	.92	1.55	30	....	....	....	T	...	33	45	...	.14	.06	6.13
Ridgeway	...	01	..	...	...	....	...	...	...	.29	...	...	....	.06	.38	.31	.01	...	....	....	.22	....	. .	...	.02	.61	12	.77	...	..	.23	3.09
Rockwell City	....	....	...	...	....	.05	.43	....	T	.15	...	....	...	.44	.16	....	.05	...	.32	.10	.55	....	..	...	.02	.61	12	.77	...	..	.23	3.09
Ruthven	...	....	.10	....	...	....	..	.50	...	....	...	...	....	....	.70	...	....	....	...	...	...	...	...	...	...	T	.45	1.90	...	...	.11	4.71
Scranton	...	...	...	...	..	.09	.66	...	....	.12	...	...	...	...	1.00	.26	...	....	.70	.28	.01	...	...	...	...	...	60	.40	.70	.30	...	3.30
Sheldon	...	.15	.01	....	...	...	.01	..	.03	.20	.21	.01	...	T	.22	.50	.61	.02	T	.02	02	.66	.03	.01	....	.08	.07	.40	.51	...	...	.72	4.49
Sibley	....	.49	...	.05	..	....	.01	...	.06	.28	.80	....	...	T	.28	.65	.47	...	...	...	T	.95	.06	...	...	.15	.04	.33	.60	...	.08	.50	5.80
Sigourney	..	.35	...	....	...	...	1.55	.08	...	.27	...	....	...	.58	1.38	T	.52	...	...	42	.57	...	...	...	...	.80	.18	.75	...	.30	.09	7.79
Sioux Center	...	...	.25	...	...	T	.41	.02	.07	.56	...	....	.02	.21	.56	.52	. .	...	.08	.05	76	.03	...	...	.18	...	.38	.61	...	..	.18	5.03
Sioux City	.01	T	.04	....	...	.01	.72	...	.02	.57	...	T	T	18	.22	...	...	...	.58	.24	.10	T	...	.03	.02	1.43	61	1.38	...	T	....	6.18
Spencer	...	...	...	...	...	.06	1.37	T	...	.03	...	....	....	.18	.40	.65	...	...	.02	.02	.30	...	...	...	....	...	...	1.43	.80	...	....	....	5.29
Spirit Lake	...	...	...	...	...	...	.55	...	...	.35	...	....	T	.31	.61	28	....	...	...	...	.45	...	...	...	T	.10	.25	.43	...	.61	...	3.94
Storm Lake	...	...	.09	...	....	05	.29	...	T	.10	....	T	.01	.34	11	.27	.02	...	.34	11	.28	...	....	T	.11	...	4 15	.98	...	....	.12	7.37
Stuart	...	...	...	...	...	....	.30	06	...	30	...	...	...	.94	.15	...	.60	..	.75	1.65	T	...	...	...	...	...	.30	1.00	.30	10	.40	6.85
Tara	..	...	...	...	...	...	1.00	...	.50	1.00	...	...	...	1.00	...	...	...	...	.50	.50	...	...	...	...	...	...	2.00	...	..	1.00	..	7.50
Thurman	..	.30	...	...	...	...	.85	...	.30	.06	...	....	T	.36	T	...	32	...	.87	2 89	.27	...	...	...	.01	.03	.30	.32	...	.08	.08	7.06
Villisca	....	....	T	....	...	...	1.62	....	.10	T	....	...	T	.52	.45	...	.40	..	.	.05	.52	...	...	...	1.57	.21	.22	1.54	...	....	.20	7.37
Vinton	...	.13	...	....	...	...	.35	..	..	.17	...	...	T	.91	1.30	.17	.28	...	.	T	...	...	...	...	T	T	.30	.40	.30	.02	...	6.45
Wapello	..	.23	.01	..	...	...	.59	....	...	.12	...	....	..	.59	.11	...	36	...	...	.17	.37	.09	....	..	...	1.16	.08	.38	.30	.08	...	4.64
Washington	...	.15	...	...	...	...	.64	..	...	.15	...	....	...	.72	.50	...	.52	...	....	.22	.57	...	...	...	...	.80	.16	.60	...	.12	.12	5.27
Washta	....	..	.12	...	...	...	.11	T	..	.14	...	T	T	.89	.08	.12	T	..	.67	.08	.28	..	T	T	.10	.62	1 30	.30	...	.43	..	5.23
Waterloo	....	.20	T	...	....	...	.05	...	..	.15	...	...	.05	.55	.64	.17	.15	...	.03	...	.13	.02	...	....	T	1.12	.40	2 27	T	T	.13	6.09
Waverly	...	.14	.02	...	...	...	.04	...	.	.27	...	...	...	.37	.37	.21	.04	...	....	....	.11	.07	...	...	...	.94	.22	1.23	....	...	.65	4.68
West Bend	...	T	...	...	...	.01	.47	.07	..	.03	....	...	....	.21	52	.15	...	...	.03	...	.55	...	...	T	...	...	.30	1 70	....	....	...	4.04
West Branch	....	.42	T	..	...	....	.23	...	...	.48	. .	...	...	...	2.80	.46	.56	T	T	...	.16	...	...	...	1.10	.40	.60	.40	T	1.00	...	8.62
West Union	....	T	.26	..	...	...	....	.	T	.18	....	...	...	.	1 00	.45	.05	..	..	...	30	...	...	....	.14	.59	.31	...	3 00	....	...	2.25	8.51
Whitten	...	.42	....	...	...	...	.05	T	...	.20	....	...	T	.78	1.30	.30	..	...	T	.23	...	...	....	....	.51	T	....	.30	....	T	T	4.12
Wilton Junction	...	...	T	..	...	...	1 13	...	..	...	...	...	...	1.10	2.25	...	58	...	...	...	...	...	...	...	...	85	.53	....	1 98	...	.23	8.63
Winterset	..	T	.21	...	...	.	25	.67	...	.02	T	...	...	T	99	...	.57	...	..	2.17	.47	.01	...	...	...	T	.33	.71	.03	..	.35	6.77
Woodburn	....	.28	T	...	.		.93	.03	.	.86	...	...	...	.44	T	...	39	...	19	..	14	T	....	....	....	....	18	.39	...	.15	.83	7.81

Precipitation Chart May 1899.



Vol. X. June, 1899. No. 6.

U. S. Department of Agriculture

Weather Bureau



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

STAR ENG. CO

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Central Station, Des Moines, Iowa.

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DES MOINES:
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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW
OF THE
Iowa Weather and Crop Service.

VOLUME X. JUNE, 1899. No. 6.

JULY CROP REPORT.

Following is a summary of the regular July 1st report of the county and township correspondents on the condition of the staple crops:

Corn is unusually variable in condition in all districts, in respect to stand, height of plants, and the amount of cultivation received. It is reported to have been on July 1st in varying stages, from an inch above ground to vigorous plants nearly waist high. The average for the state appears to be 83 per cent. Condition of spring wheat is estimated at 93 per cent, and other crops as follows: Oats, 96 per cent; rye, 80; barley, 97; flax, 94; hay crop, 82; pastures, 98; millet, 97; potatoes, 100; sweet potatoes, 96; broom corn, 85; sorghum, 87; apples, 60; plums, 65; grapes, 43.

On the corresponding date, in 1898, the same correspondents estimated the condition of crops as follows: Winter wheat, 97 per cent; spring wheat, 99; corn, 102; oats, 98; rye, 97; barley, 100; millet, 98; flax, 98; broom corn, 93; potatoes, 102; sweet potatoes, 97; sorghum, 99; meadows, 108; pastures, 105; apples, 79; plums, 70; grapes, 99.

☞The next number of the MONTHLY REVIEW will contain a tabulated report of the number of acres planted this season, by counties, based on the acreage returns of township assessors.

CLIMATE AND CROP REVIEW FOR JUNE

The month of June as a whole was seasonably warm, with a little more than the normal amount of rainfall, though quite unequally distributed. The first week was warmer than usual and showery, with excessive rainfall in considerable portions of the northern and central sections, causing considerable delay in corn planting and necessitating much replanting in early-planted fields. The conditions were favorable for the rapid growth of grass, small grain, potatoes, garden vegetables, and new seeding of timothy and clover. The second week was warm, with normal sunshine, and weather conditions more favorable for drying up the excessive moisture, and for corn planting and other farm operations. Fair progress was made in cultivating early planted fields, and at the close of the week the corn crop presented a cleaner and more promising appearance. Spring grain crops were generally benefited by the weather conditions of the week. The third week brought very heavy showers with floods and washouts in many localities in the northern section and the west half of the central section, causing material damage to crops and delaying needed work in the cornfields The southern section and portions of the central section were favored by very fair weather, and it was well improved in field work. The balance of the month—from the 20th to the 30th—was generally favorable for farm operations and for the healthful advancement of all crops, though some damage resulted from phenomenally heavy rainfall within a small area in the central and west central districts. At the close of the month corn was reported to be in all stages of advancement, ranging from an inch to about two feet in height. And very fair progress has been made in cultivation, though under great disadvantages. Small grain was mostly headed out and was filling fairly well. Oats became quite rank, and there was some apprehension of possible damage by lodging and rust. On the whole, June was more favorable than May, and crop prospects were correspondingly improved.

LOSSES BY LIGHTNING IN MAY.

Reports received from observers and agents of insurance companies show that the month of May, 1899, was notable for an unusual number of thunderstorms of wide extent and great destructive force. There have been received at the central station 128 reports of losses by lightning in this state during that month; and of that number 23 occurred on the 14th in 12 different counties; 13 on the 15th in 9 counties; and 21 on the 27th in 14 different counties. The electric energy appears to have been widely diffused as well as intense and destructive in its effects

As usual the losses of live stock on the farms greatly exceeded the damage to other classes of property. The reports for May record the loss of 179 head of cattle and horses. Of that number 131 were in close contact with wire fences. That is to say, 73 per cent, or about three-fourths of the fatal strokes, occurred while the animals were in contact with the wires; and in all these cases the reports show that ground wires were not used. These are astounding figures, and comment thereon appears to be unnecessary.

In one case reported from Grinnell, by Observer A. O. Price, 13 head of young cattle were killed by a single stroke, the stock being near a wire fence. In another case, reported from Jackson county, Mr J. C. Murray lost 13 head of Red Polled cows from the effects of a single shock of electric force. The report states that "the cattle were huddled together against a wire fence." And in still another case, reported from Buchanan county, 19 head of young cattle, belonging to W. Hickey, were electrocuted by a stroke conveyed over the barbed wires. And so the same story is repeated, and will be continued year after year, until stock growers employ simple means to protect their herds from the combination of lightning and barbed wire fences.

We have reports of 28 barns and 13 houses struck by lightning during May. Of the barns, 8 were burned with their contents, inflicting a total loss of $7,585. The aggregate of loss was small in the 20 cases where the barns were not burned. Of the houses reported struck only one was consumed, and the loss was $1,075.

It appears that barns and live stock are the favorite targets of the thunderbolts. It will be understood, of course, that the reports received at this office do not cover more than a fraction of the losses due to the effects of lightning in the whole state; but the cases reported are sufficient in number to afford a basis for study of the conditions under which these destructive strokes occur.

CYCLONES, HURRICANES, AND TORNADOES.

BY F. H. BIGELOW, PROFESSOR OF METEOROLOGY,
WEATHER BUREAU.

ORIGIN AND CHARACTERISTICS OF THE THREE CLASSES OF STORMS.

Storms are divided into three classes, cyclones, hurricanes, and tornadoes, depending upon certain characteristics which will be discussed briefly in this paper. The ordinary storms that move over the United States are cyclones, and they come from the northwest or from the southwest, but in either case they usually pass off toward the Gulf of St Lawrence. Cyclones occur at all seasons of the year, and they are much more vigorous in the winter than in the summer. The hurricanes never come from the northwest, rarely from the southwest, but they usually enter the United States from the south or southeast. They originate in the eastern parts of the Caribbean sea, travel by a curved track northwestward at first, gradually changing more to the northward and northeastward in the gulf and Atlantic states, till they, too, join the great path in New England by which storms leave this country. Hurricanes occur in the late summer or early autumn, from July to October in this part of the world, and they are very violent, the wind reaching sixty to eighty miles an hour in the central portions of them, so that they are usually destructive to the cities and towns visited by them. Tornadoes are much smaller in size, and even more dangerous than the hurricanes. Cyclones may be 1,000 miles in diameter, hurricanes somewhat less, say 600 or 800 miles, while a tornado is only a mile or so broad at the top and very much less at the bottom. The tornadoes of the United States occur most frequently in the Mississippi and the Ohio valleys, though there are few states east of the Rocky mountains which do not receive occasional visits from them They form in all parts of the temperate zones under different aspects, being known at sea as waterspouts, in deserts as sandstorms. Small tornadoes are called fair-weather whirlwinds when they happen in fair weather on the lakes or on land under suitable conditions; white squalls in a dry atmosphere, only a small white cloud high up being visible. Bull's-eye squalls, which occur near the west coast of Africa, are quite similar in origin to the white squalls. A family of tornadoes may be produced at the same time, coming down from the same cloud, as many as fifteen tubes having been observed at once. Spouts are sometimes noted in clear and calm weather, when they are apt to be very small. Generally in this country tornadoes are formed in the southeastern quadrant of a cyclone, and they move forward with about the same speed as the larger storm It may be noted here that there are many minor whirls in the cloud region which have a gyratory motion, and that these are perhaps the first stages of the developments likely to grow into movements of large dimensions.

APPEARANCE OF THE DIFFERENT TYPES OF STORMS.

The appearances of the different types of storms are such as to clearly distinguish them from one another. The weather map, issued daily by the United States Weather Bureau, has sets of lines which enclose different kinds of areas of barometric pressure. The encircling lines are about parallel to one another, though many irregularities distort them and make them different in shape from circles. Some of these lines inclose areas of high pressure, as indicated by the barometer readings, and others low-pressure areas The former are called anti-cyclones, because the wind blows out of them and circulates in the direction of the motion of the hands of a watch, thus making an outwardly directed spiral path The latter are called cyclones, and the wind blows toward and around the center in the opposite direction to the motion of the hands of a watch, producing inward spirals. Evidently the air coming from the anti-cyclone must have a downward motion toward the ground to supply the place of that which flows away on all sides, while that entering the cyclone must have an upward movement to carry off the air entering the inclosing curves or isobars, as the lines of equal pressure are called.

MOVEMENT OF THE AIR AND APPEARANCE OF THE SKY.

The downward and upward movement of the air over the high and low areas, respectively, has very much to do with the appearance of the sky, for it is known from physical laws that air which moves downward grows warmer by compression, and that therefore any cloudy masses in the higher strata would disappear in the lower, because as air is heated it requires more aqueous vapor to saturate it. If the air rises, it cools by expansion, and can contain less vapor in the saturated state, so that the result is to form clouds and rain in the low-pressure areas. The reason cyclones are popularly spoken of as storms is because the precipitation usually occurs in them, while at the same time the wind is stronger than in the anti-cyclones.

A survey of the upper currents in the atmosphere, which can be made by studying carefully the movements of the clouds, shows that, while the structure of the circulation of the air is not very simple, yet it can properly be divided into two principal layers. The upper layer, embracing the strata from three miles above the ground to six or seven miles high, includes several types of clouds peculiar to it, the alto stratus, alto cumulus, the cirro stratus, cirro cumulus, and the cirrus. The lower three miles contain the stratus, cumulus, and the strato-cumulus cloud forms. All stratus clouds have a continuous, sheet-like appearance and all the cumulus a rounded shape, like the backs of a flock of sheep huddled together; hence, it is easy to distinguish the currents of air in the upper and the lower region. It has been shown by the cloud observations that the strata of the upper and the lower layers of the air have very different kinds of motions over the United States. The upper levels move almost directly to the eastward at a great rate of speed, like a steady river flowing onward with but little to disturb its majestic current. The rate of motion increases upward with the height to eighty or ninety miles per hour in the cirrus level, that is, six miles high, each layer going faster than the one just beneath it Hence, it can be readily inferred that there is a strong force acting to brush eastward any masses of air which are thrust upward into this region, and, therefore, all rising heated air, or the vapors which are driven up by whirling motions, are soon thrown toward the east like a column of smoke rising up into a strong current of wind. The consequence of this operation is to cause the clouds to overhang the eastern side of a cyclone rather than the western; thus, the observer many miles to the east of a storm sees the premonitory flying cirrus clouds before the storm proper arrives, and in this way the clouds may be utilized as harbingers to forecast the coming of a cyclone. A further study of these upper cloud masses shows that the forerunners succeed each other in quite a definite order. The cirrus and cirro stratus come first, the cirro cumulus next, and these are lower down by a mile, more or less; after these the alto cumulus and alto stratus, the clouds now becoming much more dense and continuous in their formation. They now form still lower, and the rain types set in—cumulus, cumulo nimbus, and nimbus—which are within a mile or two of the surface, and cover the central portions of the storm. Thus, it can be seen that the clouds, taken as a whole, form a shape much like a saucer looked at from beneath, the edges being higher than the central portions. In the rifts occurring within the thick masses of clouds near the center it is sometimes possible to make out two or three layers over each other at the proper elevations. On the western side of the cyclone the cloud banks end much more abruptly than on the eastern, the upper currents serving to sweep them toward the middle on the west side, and away from it on the east side.

The upper currents are slightly deflected from the true eastward drift, flowing in gently sinuous lines, southward from a high area to a low area, and northward from a low area to a high area. These curvatures increase gradually in depth, from the cirrus to the alto cumulus, and in the strato cumulus, two miles high, they are very pronounced, the rotating tendency here beginning to control the circulation. From the cumulus to the ground the anti-cyclonic and the cyclonic gyrations are fully developed, and in the lower two miles the air moves about centers, producing the high and the low pressures at the surface It is interesting to note that from the ground upward to two miles the air moves in great circulating streams, having greater velocities as the height increases The steady eastward movement in the upper levels is replaced by a confused set of currents squirming about among themselves, cold streams from the north, warm streams from the south, seeking to reduce their differing temperatures to the mean temperature of equilibrium. These streams are thousands of miles in length, say from the north Pacific coast to the lakes, and from the Gulf of Mexico to the same region, where they produce a whirling or cyclonic action by their meeting together in a counterflow. At the same time this gyration takes on the laws of vortex motion and discharges the accumulating air upward into the great eastward drift. This addition of a circulating rotation to the straight eastward current causes the deflection alluded to, which is observed as a sinuous movement diminishing with the altitude till in the cirrus it is of but little importance. This counterflow of adjacent currents, alternately from the southwest and northwest, causes the formation of successive high and low areas of pressure by the operation of a deflect-

ing force, due to the motion of the air over the surface of the rotating earth, so that a current moving north crowds eastward, and a current moving south bends westward. It will be easily perceived that alternate currents from opposite directions thus heap up together on one side and pull apart on the other, forming in the first case a high area and in the second a low area. Around these the anti-cyclonic and the cyclonic movements take place, respectively, drawing down the upper air and thrusting it toward the ground, accompanied by a clear sky in the first case, but upward with cloudiness in the second case.

SOURCE OF ENERGY OF STORMS.

It has commonly been supposed by meteorologists, and the theory has been widely received, that the heated air of the tropics rises near the equator, flows in the upper strata toward the poles, and then descends in the arctic regions to complete its circuit near the ground toward the equator Now, while there is some truth in this view, yet the cloud observations give almost no evidence in support of this overflow poleward in the upper strata, a fact which is in striking contrast to the requirements of the theory. On the other hand the interchange of polar and tropic air, cold and heated masses, seems to be almost exclusively confined to the lower three miles of the atmosphere, and it certainly does not involve the upper layers to any important extent. The solar radiation expends most of its energy in these lower three miles, because there the air has greater density, and also the vapor contents are to a large percentage contained in this stratum. The consequence is that there exists a somewhat lawless interchange of warm and cold air in the lower stratum, with long currents of air having their bases in the tropics and the polar zones, respectively, which meets in the middle latitudes of the United States, and by their conflict and the laws of disturbed equilibrium generate the very confused and stormy circulation so characteristic of this country. It is not easy to distinguish clearly the dividing line between the general circulation of the air and these local cyclones, since both go on simultaneously and gradually merge into one another; but it is plain enough that the real source of the power expended in storms comes chiefly from this source, namely, the unequal heating of the lower atmosphere by the sun shining on the tropics Hence, a current of air from the tropics may be impelled onward by its general gradients for days at a time, and another from the northwest may be sustained by its independent gradients. These must meet each other, form a cyclone with true vortex motion and an uplifting current in the center, which raises the moisture-bearing air to the point of cold suitable for saturation, when the rainfall occurs. This may continue for days, as long as the distant supply continues to flow onward. At the same time the upward thrust of this air into the eastward-drifting upper strata, entangles the storm with it, and this produces the onward motion of the storms across the United States.

FEATURES OF CYCLONES.

Cyclones do not have any local source of heat that will account for their vast ranges of operations; they are often very cold on one side and warm on the other side; they do not derive much of their energy from condensation of vapor into rain, because many dry cyclones, fully formed and deep, are seen to pass from the Pacific to the Atlantic coasts with almost no precipitation; there is much rain with a cyclone in the gulf states, because the tropical streams of air are there highly charged with moisture, the rain being very largely a product and not a cause; also, heavy and widely extended rains occur under other conditions without any important cyclonic action. The proper study for the meteorologist is, therefore, the behavior of these extensive independent streams of warm and cold air in their counterflow Also, it should be remembered that the closed isobars, circular or roughly elliptical at the surface, lose their closed character within two miles of the ground, pass into sinuous curves, and finally straighten out into lines quite nearly coinciding with the parallels of latitude. There is no special source of energy above a storm, within these two miles, to be discovered by special observations, and the movements of the air in this lower layer are the same in direction above as below, though somewhat more rapid and rounded in their curvatures above than at the ground. A complete knowledge of conditions observed at the surface or visible from it, comprises all the information that will be available in the practical discussion and forecasts of storms, except for the more strictly scientific problems involved in the subject.

FEATURES OF HURRICANES.

As already mentioned hurricanes occur in the southeastern parts of the United States and adjacent waters during the season of the year when the cooling of the northern hemisphere takes place, as the sun retreats toward the southern hemisphere At this season the calm belt of the tropics and the heated, moist condition of the air in the region known as the doldrums are at their farthest northern limit. The South Atlantic permanent anti-cyclone, which lies over the subtropical ocean, is in its fullest vigor. Now, superposed upon these states of the lower atmosphere, the colder temperatures of the upper atmosphere, caused by the approaching autumn, on account of the more rapid circulation higher up, overspread the tropic strata near the surface As the polar air cools first, it flows gradually above the warmer air at the south of it near the ground and covers it with a circulating sheet of temperature cool or low for the time of year The effect of all this is to make the atmosphere unstable, that is to say, too warm at the bottom compared with that above it to be able to maintain the usual equilibrium. The tendency is, therefore, for the lower air to rise vigorously, and burst its way upward by convection, in order that the normal equilibrium may be restored. Of course, this action is favorable to the formation of cyclonic gyrations and the development of severe storms. Hurricanes seem to generate in some such way as this, though our observations are as yet inconclusive on that point, since there is always observed to be a stagnant, warm condition over the ocean at the time the incipient cyclonic action begins. It is to be especially considered that the isotherms in hurricanes do not show any very decided differences in temperature on opposite sides of the center, such as always prevails in the cyclones of the north. There are no counter-flowing currents here, and no source is known from which these can rise in the equatorial region to produce the marked temperature gradients found in cyclones. Furthermore, hurricanes are much more circular in shape, and conform more exactly to the pure theory of cyclones, as derived from mathematical analysis.

There is another feature of great interest to be considered. It was stated that in the case of common cyclones, even those having very great strength, the deflection or distortion of the eastward drift at the three-mile level is only moderate. In the case of hurricanes, which are centered in the east gulf states so that the wind directions can be observed on all sides, it is proven that the circulation is not only more rounded, but also that it penetrates the upper strata very much farther, and twists even the cirrus level entirely out of its ordinary shape. The circular components are, therefore, very strong up to six miles in hurricanes, while they are equally pronounced in cyclones only to a height of three miles This is a very marked characteristic, and indicates that hurricanes depend largely upon vertical convection for their power, while cyclones depend almost exclusively upon horizontal convection, that is, upon the counterflow of very long branches of horizontally moving atmosphere, having their bases several thousand miles apart. As hurricanes move northward, out of the tropics, they gradually assume the nature of true cyclones, since vertical convection is finally superseded by horizontal convection in the North Atlantic districts.

The physical features of hurricanes are well understood. The approach of a hurricane is usually indicated by a long swell on the ocean propagated to great distances, and forewarning the observer by two or three days. A faint rise in the barometer occurs before the gradual fall, which becomes very pronounced at the center; fine wisps of cirrus clouds are first seen, which surround the center to a distance of 200 mile ; the air is calm and sultry, but this is gradually supplanted by a gentle breeze, and later the wind increases to a gale, the clouds become matted, the sea rough, rain falls, and the winds are gusty and dangerous as the vortex core comes on. Here is the indescribable tempest, dealing destruction, impressing the imagination with its wild exhibition of the forces of nature, the flashes of lightning, the torrents of rain, the cooler air, all the elements in an uproar, which indicate the close approach of the center. In the midst of this turmoil there is a sudden pause, the winds almost cease, the sky clears the waves, however, rage in great turbulence. This is the eye of the storm, the core of the vortex, and it is, perhaps, twenty miles in diameter, or one-thirtieth of the whole hurricane. The respite is brief, and is soon followed by the abrupt renewal of the violent wind and rain, but now coming from the opposite direction, and the storm passes off with the several features following each other in the reverse order.

By the laws of vortex motion the winds approach the center in spirals, the circular and the centrifugal movements increasing every moment. At the core, within the walls of the columnar vortex, the air circulates about the calm central part, gradually rising to the cloud stratum, just above the inflowing disk Here the air flows out suddenly on all sides, the circular motion decreasing, the air cooling by expansion, causing a great, thin sheet of rain 200 to 300 miles from the

center. At this distance the vortex sheet turns up suddenly (not down, as usually stated) and discharges the expended matter into the high upper currents of the atmosphere. The feeding wind lines are more nearly parallel to the ground than the upper discharge lines, but they all form a columnar vortex of unusual configuration. There is probably no feature of nature more interesting to study than a hurricane, though the feelings of the observer may sometimes be diverted by thoughts of personal safety.

FEATURES OF TORNADOES.

The formation of tornadoes is attended by the two features which have been described, namely, the counterflow of two horizontal currents of air, and the vertical convection, which is of local origin. They are of small dimensions, but particularly vicious and destructive. They occur during the summer, when the warm weather is at its maximum. The interior of the country is heated; the ocean districts are comparatively cool. The great Atlantic high area, produced by the general circulation, protrudes upon the southeastern districts; in the same way the Pacific "high" overlays the northwestern districts of the plateau. Hence, between these, in the Mississippi and Missouri valleys, there is a region of encounter for the southern winds produced by the Atlantic "high," and for the northern winds maintained by the Pacific "high." The southern winds are warm, and charged with aqueous vapor; the northern winds are cool and comparatively dry. The meeting of these two types of winds in the central valleys, the same conditions extending along the Ohio valley to the lower lakes, is attended by two or three typical local effects. In the first place, there are calms at intervals, local pools of stagnant atmosphere, into which these opposing currents have not penetrated; in the second place, the intense radiation of the sun superheats the strata of air near the ground and causes relatively unstable equilibrium, with its tendency to overturn the strata in a vertical direction; in the third place, the cool currents from the north, borne aloft in the general eastward drift, tend at times to overlay this stagnant atmosphere in the ground stratum and to increase the unstable equilibrium.

CONDITIONS PRODUCING STORMS.

The above are the conditions that always favor the formation of local storms, tornadoes, thunderstorms and showers, in which precipitation generally occurs during the summer Masses of air of different temperatures in the great north and south currents may thus approach a stagnant and calm region, such as the later hours of the afternoon develop, the increase of cloudiness being merely a symptom of the existence of rising and cooling currents, which portend a storm, and finally set the entire mass into a mixed congested state. The cool air comes down and the warm air rises, but they both resist mixing intimately. Rather they tend to be drawn out into long bands or ribbons before such mixing is accomplished, and these are the conditions for local showers. When the condensation is rapid in the strata a mile high the formation of thunderstorms and electric discharges is caused. In certain peculiar formations of the circulation a tornado tube is projected downward. This is a simple vortex, and obeys the laws of the movements of fluids in gyratory circulation. If a mass of air 6,000 feet in diameter is rotating at the half-mile level and it runs into a vortex so that the tube is 100 feet in diameter, and supposing the outer edge of the upper part of the vortex makes seven miles per hour, then at the rim near the bottom of the vortex we should have a velocity of 200 miles per hour. This causes an enormous centrifugal force in the lower tube, a partial vacuum of low temperature. It is accompanied by a forward movement of the entire vortex system. The vacuum tube causes the explosive and disastrous effects upon the objects in its path, as noticed in the tornado accidents; the wind at great velocities prostrates every obstacle; the cold generates the sheath of vapor that makes the tube visible; the same sudden condensation causes electric discharges, just as in thunderstorms on a large scale. There is no real mystery about the formation of tornadoes, or respecting their terrible destructive power. It all goes back to the same principle that discharges a gun, in which case there is a sudden formation and expansion of gas; but in the tornado it is the reverse process, namely, the sudden production of a vacuum into which outside air discharges itself, that is into the hollow vortex tube, and with the further result of quickly cooling the heated air drawn into the vortex.

NO PRACTICAL PREVENTIVE OF TORNADOES.

There is no practical way of warding off tornadoes when conditions are favorable for their development. The tubes resist an explosive discharge in the air outside, these having often been fired upon by cannon at sea. They sweep readily through a forest or a city. There seems to be no annual increase in the number of them. Some have sought to connect their recurrence with the frequency of sun spots, and it is possible that there is some indirect connection, just as in all the other elements of the weather, but only through the general circulation.

WHERE AND WHEN TORNADOES OCCUR.

There are some portions of the United States which are free from tornadoes, such as the Rocky mountain plateau and and slope. In the central valleys they are of annual occurrence, and they are likely to visit almost any of the states east of the Mississippi river. In the winter months tornadoes occur only in the gulf states, but as the weather grows warmer they extend northward, and in the summer they are of the greatest frequency in Nebraska, South Dakota, Iowa and Minnesota. This variation is evidently to be referred to the average probability of cool currents of air from the north encountering warm, moist currents from the south, in the intermixture which is always going on throughout the lower strata, farther north in summer than in winter. More tornadoes occur in the months of May and June than in the other parts of the year, and this is due to the same principle of contrast in temperatures, which is greater locally in the spring than in the summer, when heat prevails generally, or in the winter, when cold is widely distributed.

The annual average number of tornadoes which are well defined and destructive is about twenty-five, and their frequency is quite uniform from year to year Of this number the destructive tornadoes of great violence have been twenty-four in eight years, that is, three each year. The record shows that from 1889 to 1896 property to the value of $31,000,000 was wrecked. As much as $23,000,000 of this must be attributed to three tornadoes, or tornadic hurricanes, which passed through the regions of dense population, namely, that which visited Louisville, March 27, 1890, destroying property to the value of $3,000,000; that which visited St. Louis, May 27, 1896, from which the loss was $13,000,000, and that which traveled from Cedar Keys to Washington, D. C., September 29, 1896, from which the damage was $7,000,000. The latter was more strictly a hurricane, but many of its features were very close to a large tornado in type. Previous to 1889 the record shows that there were three destructive local storms annually for each of the preceding eighteen years.

WIND VELOCITIES OF TORNADOES.

It has not been easy to secure exact data for the computation of the wind velocities which accompany tornado vortices, but the great waterspout of August 19, 1896, which developed in Vineyard Sound, about seven and one-half miles northeast of Cottage City, and of which very good photographs were taken, to some extent supplies this defect. The bearings of the spout were noted from several places, so that its place can be plotted accurately on the map and its dimensions computed. It was found that the tube extended from the cloud to the surface of the sea, 4,200 feet, was 3,400 feet in diameter at the top, 170 feet at the narrowest part, which was 1,500 feet above the sea, and about 250 feet at the sea. This expansion near the surface was due to the retardation caused by contact with the water and the suction of air into the tube from below. The radial velocity was outward from the top to the narrowest part, ranging from seven to three-tenths miles per hour, and very feebly inward in the lower third; the rotation velocity at the cloud was fourteen, and near the sea 350 miles per hour, this being the velocity of a body falling freely from the height of the cloud to the sea; the vertical velocity was one-tenth at the cloud, and thirty-five miles per hour at the sea.

The effect of these motions is to strike a very severe blow laterally upon any object upon which the tube impinges, and to lift vertically at the same time. The air just outside the tube is undisturbed, and the sudden contact with the tube is like a stroke from a heavy hammer. The formula shows that this is equivalent to a sudden pressure of 330 pounds to the square foot at the maximum. The destructive effects at St. Louis upon the bridge and upon heavy buildings indicates a pressure of sixty to ninety pounds per square foot as that which must have been exerted to produce the observed effects. This would imply a rotatory velocity of about 175 miles in the St. Louis tornado. It is evident that the Vineyard waterspout was one of the largest of its class. Contrary to common experience, it occurred on a day when the humidity of the air was low, instead of high, as usually supposed. This shows that the origin was chiefly dynamic, rather than due to heat processes wherein aqueous vapor is turned into water. The inference regarding the structural strength of buildings is that they ought to be able to resist at least forty pounds per square foot applied laterally, for extraordinary storms, such as hurricanes, but that nothing which can be built is likely to withstand the vortex of a tornado when it operates in full power.—*From Year Book, Department of Agriculture.*

INJURY TO NURSERY STOCK LAST WINTER, AND HOW IT HAPPENED.

BY HON. C. L. WATROUS, OF DES MOINES.

(Paper read before the American Association of Nurserymen at Chicago June 14, 1893.)

The winter of 1898–9 left a greater destruction of orchards, vineyards, small fruit, ornamental plantations and nursery stock than any previous one since the settlement of the prairies by white men. It is but natural to ask the cause or causes.

The first and commonly accepted explanation was that of severe dry freezing in February. This appears to have been generally accepted as sufficient, and is the only one yet published, so far as I have seen. It appears that in February the thermometer went, at the United States Weather Station in Des Moines, as low as 24° below zero (though only for one day) and that the average for the whole month was only 16°, being 7° below the average for the past twenty-one years. It is also pointed out that during this time there was little or no snow in the region of the greatest damage. Here, the advocate of the dry freezing theory rests his case and asks judgment.

But there are difficulties It is observed that the serious injury is entirely below the earth line and this without much regard to varieties, whether of the so-called hardy or of the tender. At least this was true at Des Moines, which is near the center of the storm belt. The tops of Rogers Hybrid grapes in vineyard were as sound as those of Concord, but the roots were all seriously damaged, if not killed. The tops of Prairie Queen roses were only moderately injured, but the roots were quite dead and black. In nursery, on certain soils and exposures, all trees were damaged in the roots. Crabs and Russian apples fared no better than Ben Davis and the ordinary commercial and family varieties. The branches and trunks of all varieties of apples, cherry, plum and pear were in as good condition in April as the average of the past thirty years, during which I have personally observed them, the damage being wholly below ground.

The region of damage is, approximately, 150 miles wide and extends from Nebraska to Ohio, at least, and, as I am informed, into the Canadian fruit belt, as well. Every nurseryman in that region has known many winters when cold and dry freezing injured many varieties of trees and plants in the tips of their branches, the injury extending downward according to its severity; but did any man ever observe a case where dry freezing alone killed roots encased in soil, while it left branches and trunks of the same trees in good condition? It never did. Does not every nurseryman, when compelled to ship rooted plants in winter, take care to pack the roots tightly, but in material not too wet, because experience has shown that freezing of roots packed in rather dry material causes less harm than if the packing be very wet. Weather records show many winters as severe during the past quarter century, with the earth as dry and with more or less injury to branches and bodies of trees, but with no damage below the earth line. These are a few of the difficulties in the way of the advocates of the dry freezing theory.

These observations led me to reject this theory as unsatisfactory and to seek another explanation, which might, if possible, account for the facts, which are entirely inexplicable upon the theory of dry freezing alone. I recalled the weather during the autumn of 1898 and asked assistance from the chief of the Iowa Weather Service at Des Moines. The records for September and October show nothing unusual. The rainfall for October was only about one and one-quarter inches above the average for twenty-one years. There was nothing abnormal in the temperature. November, up to the 21st, was drier than usual, less than one-fifth of an inch of water having fallen, but on the 21st there was a precipitation of 1.06 inches, nearly all rain. Towards nightfall the rain turned to sleet and to snow, and before midnight the temperature sunk to 9° above zero. On the 22d the minimum temperature was 6° above zero; and, for the next six days the minimum hovered about the zero mark. The temperature for the remainder of the month was higher, but yet freezing. December was continuously cold, with several inches of snow. January was warmer again, but the soil continued locked in frost till in April, except a few inches of the surface, in January. The storm of November 21st, at Des Moines, commenced on the 20th, in Nebraska, and, as the records show, extended across Iowa, Illinois, Indiana and Ohio, within the following three days. There was along the whole line, which entirely coincides with the line of greatest damage to the roots of trees and plants, the same succession of phenomena, a drenching rainfall followed by a sudden and heavy fall of temperature sufficient to freeze the roots of everything in and near the surface of the water-soaked soil North of this damage zone, the precipitation was largely in the form of snow, which was a protection. South of this zone the freeze of November 20th–24th was neither so sudden nor so severe, and the damage shades off southward into nothingness. The lack of rain and frost in November, before the 21st, left the foliage upon trees and plants of all kinds, so that their roots were thirsty. The drenching rain of the 21st enabled them to gorge their cells with water. The soil to the average depth of 8 to 10 inches was thoroughly water-soaked also, and was suddenly frozen in that condition. The greatest damage to the roots was done to the plastic part between the wood and the bark, known as the cambium layer. The cells there are large and full of life. Of course they filled themselves completely and when the sudden freeze came their walls were ruptured as the shells of eggs are, under similar circumstances. The freeze came too suddenly for the roots to distribute their surplus of water. It was so severe and so long continued that the cell walls were thoroughly ruptured, so much so that when thaws finally came, the tissues were dead and turned black. I examined some cherry trees on Mazzard stocks in early April, and found the roots black, as if they had been dead for a long time. They were not dry but wet, and the soil about them was wet. When the temperature fell, on November 21st, the wind changed into the northwest, blowing the snow partly from north slopes and high lands into the valleys, and in nurseries and orchards to the southern slopes, where it settled among the trees. These circumstances caused a more sudden and severe freezing of roots on high lands and on north slopes, and there is where the most root killing is invariably found. Yet the snow was more thawed from the south slopes in February, than from the northern ones, and the ground must have frozen to about the same depth. I have not found any phases of the injury which cannot be fully accounted for upon the supposition that the damage was caused by sudden and long continued freezing of water-soaked roots, in water-soaked soil. Below 10 inches, on my grounds, the roots were sound and healthy, and at the earth line and all above, they were equally so.

Cherry trees transplanted in the spring of 1898 suffered less than the same stock remaining in nursery. Grapevines planted in the spring of 1898, and blackberries in the fall of same year, mostly escaped killing, while old vineyards and plantations of the same fruits were generally injured and ruined. In these cases trees and plants having the best established root systems suffered most, as we should expect, if the absorption of too much water and the sudden freezing caused the harm, but not as would be the case if dry cold had been the destroyer.

Again, budded stocks sharply ridged up to with the plow, so that much of the water was turned away from the roots, suffered far less than the same stock one year older and not

ridged up to. No theory of dry freezing seems adequate to explain these phenomena, hence I am forced to the explanation herein offered.

Have we been taught any useful lessons by this misfortune? Not many that I can see. One swallow does not make a summer, nor does an accident establish a principle. Such a blizzard once came on October 27th and lasted a week, but was followed by some weeks of mild weather and no harm followed. If our November freeze had happened two weeks earlier we should have probably escaped serious damage because there would have been a mild spell immediately after, which would have enabled the roots to distribute their surplus water.

One result we may well ponder. Things native to the prairies survived where natives of different climates failed. A set of Munson's hybrid grapes, with a dash of native stock, showed better than the best out of a vineyard of twenty-five sorts, of eastern sea coast ancestry. A few vines of Iowa natives had suffered not the slightest disturbance. Trees and plants bred from the natives of any region are hardiest there.

THE TORNADO NEAR KINGSLEY, MAY 30.

By the courtesy of the *Sioux City Journal* we were enabled to reproduce in the May issue of the MONTHLY REVIEW a photogravure of the tornado cloud that passed near Kingsley, Iowa, May 30th. It was a very clear and well defined reproduction of a "snap-shot" photograph taken by an amateur artist named Harry H. Knowles, residing in Kingsley. The young man chanced to have a camera ready; and he also possessed sufficient nerve to tarry at the door of a cave long enough to take several views of the awe-inspiring phenomenon. The funnel was two to two and one-half miles distant from the artist's point of view, passing across the western horizon in a northeasterly direction. Mr. Knowles reports that the cloud was seen about 8:15 P. M., but Mr. J. E. Cathcart, who was with him at the time, writes that it first appeared at 7:45 P. M., and the *Kingsley News* states that the time was 7:30 P. M. It was sufficiently light to secure very good photographs of the cloud, as the sky was nearly clear in the west, giving a distinct outline to the swaying and writhing funnel that reached the earth.

In response to a letter of inquiry Mr. Knowles wrote a brief description of the storm, in substance as follows:

The tornado cloud formed three-fourths of a mile northwest of Moville, a town nine miles southwest of Kingsley. It was funnel-shaped, but gradually lengthened to a long, irregular, vertical tube, appearing to be about 800 feet long. I am told that the cloud appeared very bright to those who viewed it from the west side. Considerable rain and hail preceded it about fifteen minutes; but immediately before it appeared it was unusually calm. Thunder and lightning in abundance; in fact, terrific. There was a roaring sound after it passed. The tornado traveled slightly east of north, with a whirling motion opposite the direction of the hands of a watch Its track was 250 feet wide and ten miles long, though it sometimes skipped, or left the ground altogether, for short distances. It at last became thinner, and lighter colored, and then disappeared. Every person in its track secured shelter of some kind, and only one was injured. The property loss was probably $11,000.

Mr. Knowles adds that he has never had much experience taking "cyclones," and could probably improve with practice, but he hopes never to see another.

Mr J. E. Cathcart, who was with Mr. Knowles, sent a brief report, differing only as to the exact time, and some minor points of observation.

Another "snap-shot" view of the same tornado was taken by a commercial traveler named P. C. Merrillat, who chanced to be on the porch of the hotel when the storm cloud appeared.

SEVERE STORMS IN JUNE.

The month of June in this section usually brings the maximum of rainfall and storm energy, but this year May scored a higher record. The amount of rainfall and meteorological disturbance, however, was somewhat in excess of the June average.

On the evening of Sunday, June 4th, wind and severe electric storms swept over a belt of the state extending from Ringgold county on a diagonal line to Winneshiek, and reaching from that line eastward to the Mississippi river. It was a straight blow, though at numerous points the velocity of the wind attained nearly the force of a hurricane, being sufficient to uproot trees, break telegraph wires, unroof buildings, and demolish numerous windmills Happily no lives were lost, but the aggregate damage to property was quite heavy.

TORNADO AT SALIX, JUNE 11.

The most notable storm of the month was the tornado that passed near the town of Salix on Sunday, June 11th, at about 5:30 P. M. Though the track was narrow and short in extent, yet in that small area five people were killed, and five residences were destroyed, with their surrounding outbuildings.



No. 1. Remains of foundation of Malloy's house.

U. G. Pursell, official in charge of the Sioux City Weather Bureau office, writes that the tornado started west of Homer, Neb., crossing the Missouri river and bottoms southwest of Salix, and expending its force before reaching the town of Luton, about three miles northeast of Salix. The storm moved forward slowly across the bottoms about as fast as a man can run, and was seen by the Salix people a long time before it struck the houses south of town, so that most of the people had time to reach their cellars. All of the occupants of the demolished houses escaped injury, except five members of the family of John Malloy. The members of this unfortunate family went into their cellar when warned of the approaching storm cloud; but after remaining there several minutes, came up, thinking the storm had passed in some other direction, when they were caught in the destruction of their fine, new residence. Five of the family were instantly killed, or fatally injured, viz: John Malloy, Kate Malloy (his wife), and three of their children, named Bessie, Harry and Thomas.

The storm, as described by several observers, was a true tornado in form and general characteristics, being funnel-shaped and rotating swiftly from right to left The width of



No. 2. Fragments of Malloy's house, blown northeast.

the track, according to Mr. Purssell, was about forty rods. There was a considerable fall of rain and hail before the tornado appeared and some rain after it passed.

Mr. M. D. Leavitt, deputy postmaster at Salix, writes that the tornado seemed to form from a cloud that resembled a common shower. It did not touch the earth through its entire course, but dropped downward at intervals, and traveled slowly when close to the ground. Numerous observers state that a loud roaring sound was heard and there was a strong smell like burning sulphur in the air. This was probably ozone, resulting from electric action upon the oxygen of the air.

On the day following the storm Mr. U. G. Purssell, of Sioux City, visited the scene of desolation near Salix, and made a number of photographs of the wreckage left in the wake of the tornado. By his courtesy we are enabled to give reproductions of the ruins of the Malloy and Hassell residences, which were near the center of the storm's path. The Malloy residence was a large new building and the largest portion remaining is shown in the second picture. The Hassell house was lifted high in the air and the floor and part of the foundation fell, as shown in engraving No. 3.



No. 3. Floor and foundation of the Hassell house.

SOME OTHER SEVERE STORMS.

A number of other storms of considerable severity occurred during the month.

A newspaper special from Swea City, Kossuth county, gave some details of a severe storm that passed over that township on the 13th, and the report of damage indicates that it was a squall, or straight blow, of sufficient force to destroy buildings and uproot trees in its pathway. One schoolhouse, a dwelling-house and numerous barns and windmills were demolished or badly wrecked, but fortunately no person was injured.

On the evening of Saturday, June 17th, wind-squalls and hailstorms of much severity swept over the eastern part of Calhoun county and through Webster, inflicting great damage in localities from the effects of hail and wind. Near Manson, Calhoun county, the force of the wind was great enough to demolish four or five residences and a half dozen barns Hail was the principal agent of destruction to crops, and the damage was heavy over a wide belt of country. The city of Fort Dodge suffered severely.

On the evening of the 21st, Waterloo and vicinity, and a wide belt of country east of that city, suffered considerable damage from the effects of a wind-squall of wide extent and great force. In the farming districts the storm was very destructive to light outbuildings, barns and windmills.

On the afternoon of the 22d, Cedar Rapids was visited by a squall of considerable force, with the usual story of damaging effects.

JUNE WEATHER RECORD

Seasonable temperature prevailed during the month, on the average; the monthly mean of 122 stations being 70.7°, or about .7° above the normal for June. There was less than the usual amount of very hot weather; the highest tempera ture reported was 100° at Clarinda and Stuart on the 18th. By sections the averages were as follows: Northern section, 68.9°; central section, 70.9°; southern section; 72.4°.

The average rainfall for the state, as shown by reports from 141 stations, was 5.04 inches, which is .78 of an inch above the June normal. As usual there was considerable inequality in the distribution of moisture. The average rainfall of the northern section was 6.7 inches; the central section received 5.1 inches; and the southern section 3 33 inches. The largest amount reported was 11.99 inches, at Logan, Harrison county. The greatest amount that fell on any one day was 7.74 inches, at Sac City, on the 26th, and of that amount about 6.50 inches fell in less than two hours. Rain fell in measurable quantities in some portion of the state on all days of the month, except the 29th and 30th.

SUMMARY OF WEATHER CONDITIONS.

Barometer. — Mean pressure for the month, 29 97 inches; highest observed, 30 38, at Clarinda on the 15th; lowest observed, 29.50, at Omaha, Neb , on the 12th; range for the state, .88 inc'

Temperature — Monthly mean, as deduced from 122 reports, was 70 7°; highest monthly mean, 76 4°, at Tara; lowest monthly mean 65.9°, at West Bend; the highest temperature reported was 100°, at Clarinda and Stuart on the 18th; the lowest temperature reported was 42°, at Decorah, Maquoketa, West Branch and Ruthven on the 16th, 17th, 12th and 15th; the average monthly maximum was 92°; the average monthly minimum

was 48.5°; the greatest daily range was 44°, at West Branch; average daily range, 32.3°.

Precipitation.—Average for the state, as determined from the reports of 141 observers, 5 04 inches; the largest amount reported was 11.99 inches, at Logan; the least amount was 1.10, at Lockridge; the greatest daily amount reported was 7 74 inches, at Sac City on the 26th; average number of days on which .01 inch or more of precipitation was reported, 10.

Wind. — Prevailing direction, south; highest velocity reported, 57 miles per hour from the south, on the 3d, at Sioux City.

Weather. — There were 12 clear days; 13 partly cloudy days, and 5 cloudy days.

Dates of Auroras.—Alta on the 28th and 29th, Cresco on the 28th; Elkader on the 29th; Mason City on 28th, 29th and 30th.

Thunderstorms.—With the exception of four or five days, thunderstorms prevailed over some section of the state the whole of June.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.99	30.34	16	29.71	12
Des Moines	29.98	30.36	16	29.59	12
Clarinda	29.97	30.38	15	29.59	12
Cresco	.....	30.36	29	29.59	12
Dubuque	29 98	30.36	16	29.63	12
Omaha, Neb	29.92	30.28	16	29.50	12
Keokuk	30.00	30.35	16	29.74	12
Sioux City	29.95	30.29	16	29.51	12
Means	29.97	30.38	15	29.50	12

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,576	36	NW	2
Des Moines	6,701	40	SW	4
Dubuque	5,558	32	NE	2
Keokuk	5,672	30	W	22
La Crosse, Wis	5,039	42	W	12
Omaha, Neb	6,236	36	SW	2
Sioux City	9,515	57	S	3

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* Thunderstorms occurred at this station on the 2d, 3d, 6th, 11th, 12th, 13th, 16th, 18th, 20th, 2d, 25th, and 26th. The total rainfall at station was 8.66 inches. The amount of electric force for the month was greater than usual.

ALBIA—*R. Moore.* The crop prospects are much more encouraging than they were last month; the rainfall has been light during the month of June, which gave the farmers a chance to cultivate their corn, which is in fair condition, considering the season; meadows and pastures good; the oat crop is quite promising on rolling land.

COON RAPIDS—*Downs & Co.* Considerable improvement in prospects of corn crop since last report; small grain, grass and potatoes fine.

LAMONI—*T. J. Fitzpatrick.* The month generally favorable for farm work, but the season is fully three weeks behind

LARRABEE—*H. B. Streever.* Abundant rainfall and otherwise seasonable weather have given vegetation a remarkable growth during the month; corn has made up largely for retarded growth in May, while small grain has nearly reached the danger line of excessive growth.

LOGAN—*Mrs. M. B. Stern.* The month has been remarkable for some heavy rains, doing much damage by high water washing away bridges and drowning stock; cornfields and meadows on low ground are all covered with mud, doing much damage.

RIDGEWAY—*Arthur Betts.* Quite a rainy month; vegetation growing fine, though corn is a little backward.

SIOUX CENTER—*J. De Ruyter.* Small grain doing well; corn cultivated for the second time and much behind in growth with other years.

TOLEDO—*Charles Mason.* The heavy rains of May and June have saturated the low lands to such a degree that much rich land will not produce any crops this year; hail has damaged and destroyed crops and fruit in many localities; otherwise crops look promising.

BELATED REPORTS.

BEDFORD—*May.* Mean temperature, 62.8°; highest, 88°, on the 26th; lowest, 38°, on the 18th; greatest daily range, 40°, on the 18th; total precipitation, 5.73 inches; greatest amount in twenty-four hours, 2.50 inches, on the 20th. Number of clear days, 4; partly cloudy, 21; cloudy, 6; rainy, 12.

ERRATA IN MAY REVIEW.

MARSHALLTOWN—*May.* Total precipitation should have been 7.36 inches.

OSCEOLA—*May.* Total precipitation should have been 7.95 inches.

CLIMATOLOGICAL DATA FOR IOWA, JUNE, 1899.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT. Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	PRECIPITATION, INCHES. Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).	Number rainy days	SKY. Number clear days.	Number partly cloudy days.	Number cloudy days.	Prevailing direction of wind.
Algona*	Kossuth	1,500	7	69.8	0	91	19	58	9	.....	5.56	+1.98	2.15	...	10	12	16	2	SE
Alta	Buena Vista	1,519	8	69.0	0	92	18	50	9	30	8.66	+3.30	2.91	.....	14	13	12	5	S
Alta (near)	Buena Vista	...	....	..	.....	....	.....	.....	.....	.....	11.32	.....	5.21	.....	11	...	..	...	.....
Britt	Hancock	1,230	....	68.9	.....	94	18	47	8	34	7.31	.....	2.35	.....	15	1	29	0	SW
Bancroft *b*	Kossuth	.....	..	69.0	....	87	12, 18	51	1	29	3.84	..	2.76	...	10	...	...	...	SE
Charles City	Floyd	1,012	8	69.4	0	90	19	47	16	29	5.46	+.57	1.64	.....	11	8	15	7	SE
Clear Lake	Cerro Gordo	984		69.8		88	19	52	8, 9	32	6.07	.....	2.90	....	6	17	9	4	SE
Cresco	Howard	1,312	27	67.4	+1	89	19	43	16	31	6.06	+.93	1.77	.....	13	11	9	10	NW
Decorah	Winneshiek	900	6	68.3	0	90	4, 19	42	16	37	5.51	+1.16	1.64	.....	12	..	..	..	SW
Dows	Wright	.. .	....	69.1	.....	90	19	49	8	28	7.77	.....	2.42	.. ..	13	19	3	8	SW
Eagle Grove †	Wright	.....	...	69.0	.....	....	.....	.....	.....	.....	.....	.....	.....	...	....	..	..	..	.....
Elkader	Clayton	....	19	70.6	+1	97	19	45	16	35	5.92	+2.03	1.94	.....	9	9	21	0	S
Fonda	Pocahontas	.	..	71.8	...	95	13, 18	54	8, 30	35	2.90	.....	.86	....	6	6	24	0	.....
Forest City	Winnebago	1,220	..	68.4		88	18, 19	51	9, 16	32	7.15	.....	2.60	....	13	14	5	11	S
Grand Meadow *	Clayton	.	8	67.4	0	86	19	54	2	..	6.43	+1.19	1.68	.....	12	7	18	5	SE, SW
Greene	Butler	943	....	70.7	....	95	19	47	16	33	5.78	.....	3.00	.....	8	11	16	3	SW, W
Hampton	Franklin	1,240	..	69.4	....	92	19	50	10, 16	31	6.76	.. ..	3.50	.....	16	5	22	3	SW
Hawkeye	Fayette	.....	...	.....	.....	.....	.....	...	.....	.....	7.02	.....	2.40	...	8	...	...	...	.....
Humboldt	Humboldt	1,082	...	70.6	.....	91	18	49	1	34	7.56	.....	2.32	.....	16	19	7	4	SE
Lansing	Allamakee	....	..	69.5	.....	93	19	45	16	32	6.01	.....	.85	....	13	11	8	11	.....
Larrabee	Cherokee	...	8	68.6	-1	91	19	46	9	35	5.72	-44	1.90	....	12	7	23	0	SW
Le Mars	Plymouth	1,221		69.7	.....	92	18, 19	46	9	34	6.26	.....	1.75	.....	10	16	10	4	S
Mason City *f*	Cerro Gordo	1,130	.	68.0	.....	90	19	49	3	32	11.05	.....	5.20	.....	9	...	...	...	SW
New Hampton	Chickasaw	1,166		69.3	.....	90	19, 20	46	16	38	4.10	.....	1.24	.....	11	16	12	2	NW
Northwood	Worth	1,210		67.6		89	19	47	16	38	5.89	.....	2.90	....	10	20	4	6	S
Osage	Mitchell	1,178	8	67.8	+2	89	19	47	16	31	8.01	+3.79	2.54	....	12	5	11	14	S
Plover	Pocahontas	.....	....	70.2	.....	93	12	48	9	37	4.43	.....	2.15	.....	6	19	8	3	S
Primghar	O'Brien	...	....	69.8	.....	95	18	45	8	30	7.76	.. ..	1.50	.....	11	18	0	12	SW
Ridgeway	Winneshiek	....	....	69.1	.....	92	19	48	16	30	6.66	.....	1.58	.....	14	9	18	3	S
Ruthven	Palo Alto	.	....	66.0	.....	90	20	42	2, 15	40	8.50	.....	2.90	.....	5	11	10	9	SW
Sheldon	O'Brien	1,406	....	66.2	.....	91	18	45	1, 9	33	6.47	.....	1.96	....	15	14	6	10	W
Sibley	Osceola	1,509	....	66.9	.....	91	18	45	9	35	7.39	.....	2.05	....	15	8	19	3	SW
Sioux Center (*G*)	Sioux	....	....	70.4	.....	94	18	49	9	33	5.78	.....	1.67	....	11	14	8	8	NE, SE
Spencer *f*	Clay	....	....	68.7	.....	92	18	45	2	33	5.77	.....	2.35	....	8	..	..	....	S
Spirit Lake	Dickinson	. .	....	68.4	.....	96	18	48	9	28	10.39	.....	3.93	.....	11	8	9	13	SW
Storm Lake	Buena Vista	.....	....	68.6	....	89	18	51	9	25	7.98	.....	2.69	... ..	10	9	18	3	S
Washta	Cherokee	.....	...	...	.....	...	.....	.....	.....	....	7.84	.....	2.71	....	12	15	14	1	S, SE
Waverly	Bremer	942	....	70.2	....	89	19	50	16	28	6.51	.....	2.95	....	10	9	6	15	S, NW
West Bend * *a*	Palo Alto	.	6	65.9	-2	89	12	56	7	.....	4.92	-.94	1.29	...	13	9	12	9	S
West Union	Fayette	1,105	....	....	.....	...	.....	.....	.....	.....	6.14	.....	1.86	....	10	15	0	15	SW
Average		....	....	68.9	+1	91.1	.....	48.2	... .	32.6	6.70	+3.57	.....	.....	11	12	12	6	S, SW

CENTRAL SECTION.

Amana	Iowa	.....	23	71.6	+2	92	19	47	16	32	3.56	-.91	1.64	.....	12	11	18	1	S
Ames *a*	Story	936	19	70.7	+1	94	18, 19	49	16	32	6.45	+2.01	3.71	.....	7	11	14	5	.....
Audubon	Audubon	.....	6	69.2	-1	89	19	46	10	30	6.27	+3.01	2.55	....	8	3	21	6	SW
Baxter	Jasper	.....	...	71.0	.....	93	19	48	16	33	3.56	...	1.23	.....	11	6	19	5	SW
Belle Plaine	Benton	840	9	71.0	+1	92	19	48	17	30	6.02	+2.46	2.00	....	11	3	25	2	SE
Carroll	Carroll	.....	9	69.7	0	94	18	49	1, 15	32	7.25	+3.07	2.54	.....	11	16	6	8	.....
Cedar Rapids	Linn	744	17	73.2	+2	95	19	50	16	31	3.46	-.36	.74	.....	7	10	10	10	S
Clinton	Clinton	609	8	71.5	0	92	4,6,13,19	45	16	32	3.01	-1.77	.84	....	10	9	16	5	S
Coon Rapids	Carroll	....	...	70.4	.....	91	19	53	15	26	4.86	.... ..	1.85	.....	11	14	15	1	S
Davenport	Scott	615	27	72.4	+1	91	19	52	16	28	4.02	-.15	1.36	.....	9	10	14	6	SW
Delaware	Delaware	1,084	8	71.0	+2	89	16	46	16	23	5.03	+.75	1.21	.....	11	2	27	1	SW
Denison	Crawford	1,192	6	70.3	+1	94	19	48	16	40	6.29	+3.34	3.10	.....	12	17	12	1	S
Des Moines	Polk	867	21	72.0	+1	90	19	54	10	26	3.53	-1.66	1.42	.....	10	6	18	6	SW
De Soto	Dallas	886	...	73.6	.....	97	19	49	10	37	2.79	.....	.93	.....	8	17	12	1	SE, SW
Dubuque	Dubuque	665	26	70.6	+1	91	19	49	16	26	4.03	-.89	.95	.. .	9	12	15	3	SE
Eldora ‡	Hardin	1,153	....	70.1	.....	94	19	47	9	34	7.00	.....	1.75	.....	11	0	30	0	SW
Galva	Ida	.....	6	69.2	0	92	18	48	1	33	7.45	+3.77	2.20	.....	8	15	13	2	SE
Gilman	Marshall	1,035	....	.....	.....	....	.....	.....	.....	.....	5.49	.....	1.75	.....	11	18	9	3	S
Gladbrook	Tama	....	...	.....	.....	...	.....	.....	.....	.....	2.50	.....	1.00	.....	5	...	....	....	.....
Grinnell (near)	Poweshiek	.....	....	70.1	.....	89	19	50	16	30	5.44	....	1.10	.....	11	13	14	3	SW
Grundy Center	Grundy	966	8	69.2	-1	91	19	47	16	33	5.27	+1.25	1.20	.....	12	12	11	7	SW
Guthrie Center ‡	Guthrie	1,269	....	69.6	.....	92	18	51	2	33	3.85	.....	1.19	.....	8	2	28	0	SE
Harlan	Shelby	.....	....	71.2	.....	94	19	47	10	35	7.53	.....	2.71	.....	15	7	13	10	S
Independence	Buchanan	921	37	68.8	+2	89	19	47	16	28	4.35	-.45	1.80	.....	12	16	13	1	S
Iowa City	Johnson	644	9	72.0	+1	92	6, 19	48	16	34	4.50	+.82	1.62	.....	11	16	11	3	S
Iowa Falls	Hardin	.....	6	69.8	+1	93	19	48	8, 16	35	4.85	+1.23	1.12	.....	14	13	9	8	SW
Le Claire	Scott	.....	....	....	.....	...	.....	.....	.....	.....	4.11	.....	1.05	.....	10	....	....	....	.....
Logan	Harrison	928	34	71.0	-1	95	19	45	10	38	11.99	+6.48	6.33	.....	12	15	5	10	S
Maquoketa	Jackson	.....	6	70.4	-1	92	19	42	17	37	5.82	-.52	1.66	.....	10	23	5	2	SW
Marshalltown	Marshall	898	7	70.0	+1	91	5,13 19	47	1	38	4.05	+.14	.76	.....	16	6	22	2	S
Monticello	Jones	800	45	69.6	+1	92	19	45	16	35	4.24	-.22	1.27	.....	10	12	16	2	SW
Mt. Vernon*	Linn	858	....	72.3	.....	91	13	50	16	.... ..	4.18	.....	1.33	.....	8	....	....	....	.....
Mt Vernon (Hubbard)	Linn	.....	....	72.8	.....	97	19	49	16	33	4.25	.....	1.25	.....	9	13	13	4	S
Newton	Jasper	958	12	71.6	+1	92	18, 19	50	16	31	2.00	-2.06	.45	.....	9	11	19	0	SE
Odebolt	Sac	.....	....	71.2	.....	98	19	49	1, 9	33	5.40	.....	1.62	.....	13	19	7	4	.....
Ogden	Boone	1,109	....	70.0	.....	90	12,18,19	51	15	29	7.21	.....	2.34	.....	13	23	1	6	SE
Olin	Jones	....	....	70.5	.....	89	4, 19	47	16	31	4.87	.....	1.60	.....	7	...	...	...	S
Onawa	Monona	.....	....	71.4	....	93	19	50	1	34	6.36	.....	1.88	...	14	20	8	2	SE
Rockwell City	Calhoun	1,219	...	70.2	....	92	18	51	15	30	5.42	.....	1.50	.....	11	22	6	2	.....
Sac City *n*	Sac	900	....	70.6	.....	92	18	51	15	26	.....	.....	7.74	.....	.....	...	...	...	.....
Scranton	Greene	.....	...	71.4	....	94	18	53	11, 15	31	4.68	.....	2.33	.....	8	13	17	0	S
Sioux City	Woodbury	1,122	10	70.4	0	91	19	50	9	31	4.76	+1.01	1.12	.....	14	11	10	9	S
Tara	Webster	1,159	...	76.4	.....	95	19	60	16	25	7.25	... ..	3.50	.....	8	1	29	0	SW
Toledo	Tama	.....	5	71.6	+2	92	19	47	16	33	4.58	+2.10	1.20	.....	13	16	0	14	SE SW
Vinton *d**	Benton	800	9	70.4	0	90	19	55	16	.....	4.51	+.97	1.14	.....	12	26	3	1	SW
Waterloo	Black Hawk	862	20	70.4	-3	91	19	47	16	29	6.94	+3.34	3.67	.....	14	11	16	3	SE, W, NW
West Branch	Cedar	708	....	69.4	.....	92	19	42	1	41	5.29	.....	1.32	.....	8	18	10	2	SW
Whitten*	Hardin	.....	....	69.3	.....	94	18	57	16	.....	5.14	.....	1.18	.....	8	....	....	....	SW
Wilton Juncton †	Muscatine	....	....	72.6	.....	92	6, 19	45	16	33	4.19	.....	1.27	....	6	..	....	....	S
Average		.	....	70.9	+.5	92.3	.....	46.6	.....	32.1	5.10	+1.01	.....	.....	10	13	13	4	S, SW

MONTHLY REVIEW OF THE

CLIMATOLOGICAL DATA FOR IOWA, JUNE, 1899—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES.				SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).	Number rainy days.	Number clear days	Number partly cloudy days.	Number cloudy days	
Afton	Union	....	....	73.2	.....	97	18	51	17	37	4.73	.....	1.92	.....	8	6	21	3	SW
Albia	Monroe	945	..	72 0	.	92	21	48	16	32	2.54	.....	1.12	.....	8	19	11	0	SE
Atlantic	Cass	....	8	71.0	+1	96	19	46	10, 30	37	5.70	-.15	2.17	..	8	8	17	10	S
Batavia	Jefferson	640	...	....	.....	....	.....	.	....	...	2 66	.....	1.70	....	8	....	....	....	.....
Belknap	Davis	857	....	72.6	.....	89	6, 7, 19	54	16, 30	28	3.45	.....	2 50	....	7	17	12	1	S
Blockton *a*	Taylor	....	....	72.4	.....	93	19, 21	47	30	36	1.47	.....	.50	....	6	...	....	....	SE, NW
Bonaparte	Van Buren	....	8	72.2	-1	90	18	51	10, 16	30	1 65	-2.63	1.10	....	5	...	....	....	.....
Bussey	Marion	....	....	....	.....	92	19	53	11	30	1 71	.....	.45	....	8	....	....	..	S
Carson	Pottawattamie	....	....	....	.....	.	.....	..	.....	.....	2.25	.....	.53	...	7	....	....	....	.....
Centerville	Appanoose	1,013	6	72 9	+1	90	18, 19	54	10, 16,17	29	7.99	.....	2 71	....	9	7	13	10	SW
Chariton	Lucas	1,030	....	71.1	.....	89	18, 21	52	10	27	2 43	-1.41	1.00	.....	8	12	18	0	SW
Chillicothe	Wapello	645	...	....	.....	...	.....	....	....	.....	2.52	.....	.83	.....	14	10	14	6	S
Clarinda	Page	1,069	9	73.4	+1	100	18	48	30	40	2 47	.....	1.41	.....	5	...	....	....	.....
Corning ‡	Adams	1,127	7	71.2	+1	92	18	48	30	32	1.54	-3.51	50	.....	10	13	16	1	S
College Springs	Page	....	8	73.4	+2	98	19	52	15	35	3 29	-1 07	1.15	.....	7	12	12	6	SW
Council Bluffs	Pottawattamie	989	..	73.4	.....	98	18	53	15	29	1.31	-3.07	.33	.....	8	18	10	2	SW
Cumberland	Cass	....	...	.....	....	.. .	.....	....	.....	.....	3.76	.....	.93	....	10	20	6	4	S
Danville	Des Moines	715	...	....	.....	...	....	....	.....	.....	4.61	.....	1.61	....	7	17	10	3	S
Diagonal	Ringgold	....	...	71.3	....	93	19	47	29	32	2 40	.....	1.00	.....	7	17	10	3	.....
Eldon	Wapello	....	....	74.0	.....	94	18	50	16	34	3.30	.. ....	.90	....	9	5	25	0	SE
Emerson	Mills	....	....	....	.....	....	.....	.....	.....	.....	2 85	.....	1 53	.....	11	20	4	6	S
Fairfield ‡	Jefferson	767	13	71.5	+2	88	18	52	16, 17	24	6.29	.....	2.25	.....	8	...	...	...	SE
Ft. Madison *	Lee	516	51	74.4	+1	89	11	58	16	....	1.94	-2 45	1.10	.....	9	11	19	0	.....
Glenwood	Mills	979	29	72.0	+2	94	18	52	10, 15	28	3 59	-.69	1.25	.....	9	4	18	8	SW
Greenfield	Adair	....	8	71.2	0	94	18	51	15	38	5.97	+1.50	1.55	.....	10	3	24	3	SW
Griswold	Cass	....	....	...	....	...	.....	.....	.....	.....	4 08	-1.18	1 69	.....	9	15	12	3	S
Hamburg	Fremont	912	...	...	.....	...	.....	.....	.....	.....	5.54	.....	2.10	....	6	14	1	15	S
Hedrick	Keokuk	....	....	71.9	.....	91	6	46	15	30	1 69	.....	.45	.....	7	6	10	14	SE
Hopeville	Clarke	....	8	70.8	+1	90	18, 19	54	9, 10	28	2.35	.....	.84	.....	9	20	8	2	S
Indianola	Warren	....	7	71 8	+1	92	18	53	10	35	3.77	-.43	1 26	.....	13	4	22	4	S
Keokuk	Lee	618	28	74.0	+2	90	6	55	16	26	3.79	-.49	1.90	.....	8	14	11	5	SW
Keosauqua	Van Buren	....	7	73.8	+1	92	18, 19	52	10, 30	33	2 78	-1.70	1.22	.....	7	15	11	4	S
Knoxville ‡	Marion	....	6	72.2	0	91	18, 19	53	16,17, 30	30	2.39	-1.55	1.47	....	8	....	....	....	.....
Lacona	Warren	....	....	....	.....	....	.....	.....	.....	.....	2.50	- 95	.94	.....	7	9	19	2	SE
Lamoni	Decatur	....	....	72 3	.....	94	19	50	10	32	3.21	..... .	1.02	.....	8	...	....	....	.....
Lenox	Taylor	....	...	71.4	.....	91	18, 21	53	10,15, 30	29	2.93	.....	.78	.....	10	24	4	2	SW
Lockridge	Jefferson	....	....	....	.....	....	.....	.....	.....	.....	1.77	.....	.60	....	9	19	7	4	S
Melrose	Monroe	850	....	.....	.....	.....	.....	.....	.....	.....	1.10	.....	.30	....	6	12	17	1	NW
Mooar	Lee	...	....	70.4	.....	88	6, 22	46	9, 10	35	1.51	.....	1.03	.....	9	8	21	1	SW
Mt. Ayr	Ringgold	1,236	6	71 5	+1	93	18, 19	53	17	28	2 95	.....	1.00	.....	6	9	5	16	SW
Mt. Pleasant	Henry	725	....	74.1	.....	95	13	48	16, 30	31	3.13	-1.47	1.13	...	12	6	21	3	E
Murray	Clarke	1,183	...	.....	.....	....	.....	.....	.....	.....	2.02	.....	1.09	....	6	21	8	1	SW
Northboro	Page	....	...	....	.....	....	.....	.....	.....	.....	2.86	... .	1.50	.....	10	8	22	0	.....
Omaha (Neb.)	Douglass	1,113	....	72.1	.....	96	18	56	9	30	5.77	..... .	2.06	.....	9	...	...	...	.....
Osceola	Clarke	1,123	....	71.3	....	91	18	52	30	30	2 91	.....	1 52	.....	9	4	20	6	S, SW
Ovid	Wayne	...	6	71 2	0	89	18, 19	52	10	28	3.67	-.16	.91	.....	12	10	10	10	S, SE
Oskaloosa	Mahaska	850	16	72.2	+2	91	22	51	10, 16	32	1.55	-2.45	.59	...	7	16	8	6	SW
Ottumwa	Wapello	630	5	73.0	0	91	18, 19	52	10, 16	30	3.01	-.39	1.96	.....	10	5	16	9	S
Pacific Junction	Mills	960	...	70 8	..	93	18	49	10	29	6 83	.....	1.96	.....	11	6	21	3	E. S
Pella	Marion	....	...	69.0	.....	88	17	51	18, 30	29	2.67	.....	.75	.....	11	11	19	0	SE
Red Oak	Montgomery	1,033	....	74.0	....	95	18	51	9	36	5 33	.....	2.00	.....	8	10	3	17	S
Sigourney	Keokuk	....	...	73 8	.....	97	18, 19	45	16	43	1.99	.....	1 17	.. ..	7	17	13	0	SW
Stuart	Guthrie	....	....	73 2	.....	100	18	50	29	37	3.35	.....	1.00	.....	8	19	8	3	S
Thurman	Fremont	....	....	73.0	.. .	96	19	50	10	33	5 08	.....	.80	.....	10	7	11	12	SW
Villisca	Montgomery	1,058	6	72 6	+2	94	18	49	30	36	4.13	-.76	1.30	.....	7	15	15	0	S
Wapello	Louisa	578	....	72.8	.....	93	19	52	16, 17	29	1.51	.....	.42	....	9	13	16	1	SW
Washington	Washington	738	8	70.6	+3	90	18, 19	47	16	33	2 00	-1.12	.68	.....	7	...	...	....	S
Winterset	Madison	....	8	71.8	+2	91	19	50	30	33	3 69	-2.48	1.44	....	7	...	...	....	.....
Woodburn	Clarke	....	...	...	....	....	.....	.....	.....	.....	4 39	.....	1 62	.....	10	10	19	1	.....
Average		....	...	72.4	+1 2	92 6	.. ....	50.8	.....	32.2	3.33	-1.27	.....	.....	9	12	13	5	S
Av. for the state		...		70 7	+ .6	92.0	.....	48.5	.. ....	32.3	5 04	+1.10	....	.....	10	12	13	5	S

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Afton	Max	84	89	85	89	86	88	80	76	81	81	86	91	88	84	79	79	84	97	96	84	93	83	83	80	84	89	89	86	80	87	85.7
	Min	56	67	64	67	62	68	60	62	53	53	56	60	62	61	54	55	51	60	64	66	63	63	64	60	62	65	66	61	60	52	60.6
Albia	Max	81	88	86	90	86	90	76	74	76	82	85	88	87	85	77	75	83	90	90	84	92	88	85	86	85	85	87	81	78	80	84.0
	Min	58	59	63	63	64	69	65	56	55	51	54	63	60	62	61	48	51	63	65	68	62	65	60	62	57	63	65	62	55	50	60 0
Alta(H'd'n)	Max	81	84	80	84	82	82	73	76	76	78	81	90	70	72	73	74	83	92	91	79	86	76	80	73	77	79	79	80	76	80	79.5
	Min	51	62	63	62	62	66	51	53	50	52	60	64	60	59	51	53	55	62	64	59	64	64	54	60	56	62	64	56	55	54	58.6
Amana	Max	79	85	87	90	86	90	72	75	75	80	82	88	86	84	74	75	81	89	92	86	87	88	81	80	83	83	86	80	76	83	82 8
	Min	57	57	65	67	66	72	67	53	57	51	53	67	63	66	55	47	51	63	68	56	60	67	62	58	58	62	68	67	58	51	60 4
Ames	Max	81	81	84	89	85	87	77	78	76	81	83	89	84	80	73	75	83	94	94	74	89	76	81	76	81	78	86	80	78	82	81.8
	Min	53	60	62	71	65	70	58	52	55	50	56	65	62	65	65	49	52	63	65	54	62	..	60	59	57	60	65	64	59	50	59 6
Audubon	Max	80	83	79	83	80	82	72	71	74	76	78	87	81	76	76	74	79	87	89	76	85	76	79	79	80	85	83	80	75	79	79 5
	Min	58	65	63	68	64	60	51	49	50	46	54	64	61	59	51	62	53	61	65	64	65	62	59	60	63	65	67	60	50	49	58.9
Atlantic	Max	85	85	81	85	82	83	77	74	76	79	83	92	82	78	80	74	82	94	96	79	89	79	84	84	83	86	85	84	77	83	82.7
	Min	50	66	62	68	64	69	56	53	53	46	59	68	61	60	48	58	53	62	60	65	65	62	60	59	56	67	67	59	54	46	59.2
Bancroft	Max	76	68	81	84	80	83	73	73	73	78	80	87	82	73	68	77	84	87	86	76	83	76	78	78	80	78	81	72	..	..	78.4
	Min	51	54	61	67	64	65	54	59	55	60	61	60	61	61	53	53	55	60	67	60	68	66	54	60	57	61	66	57	..	..	59,6
Baxter	Max	83	84	83	89	82	88	77	74	78	80	82	88	82	80	76	74	80	90	93	90	89	84	81	74	84	75	85	80	73	81	82.0
	Min	57	60	65	66	64	72	61	56	55	53	57	68	61	64	52	48	53	62	68	57	58	56	62	61	68	62	67	62	57	52	60.1
Belknap	Max	79	86	84	87	84	89	89	75	72	79	80	86	87	82	74	79	79	88	89	84	88	86	79	80	84	84	87	81	75	82	82.6
	Min	59	62	68	72	66	70	62	64	56	55	57	63	65	65	58	54	55	60	68	69	64	68	63	64	60	65	67	67	59	54	62.6
Belle Pl'ne	Max	78	84	88	90	86	89	62	70	75	83	82	89	86	80	77	75	80	88	92	75	87	89	83	85	81	77	88	80	76	83	82.3
	Min	55	58	60	60	64	70	65	63	53	51	55	61	52	65	54	52	48	68	67	65	53	65	60	58	59	60	66	64	56	54	59.6
Blockton	Max	80	84	83	85	83	85	75	73	76	85	83	88	82	80	77	80	90	88	93	85	93	88	85	82	82	88	86	..	80	83	83.5
	Min	60	65	62	63	65	70	63	61	56	50	57	67	63	62	54	54	56	52	67	59	64	70	65	65	61	68	64	..	69	47	61.3
Bonaparte	Max	81	84	86	87	83	89	77	69	73	79	81	85	86	81	75	71	78	90	89	84	89	88	82	79	82	85	87	84	77	82	82.1
	Min	60	60	69	74	67	69	66	57	58	51	55	67	66	67	57	51	52	63	70	69	64	68	63	64	61	63	66	67	58	52	62.4
Britt	Max	78	72	82	85	84	85	73	74	75	78	81	89	79	74	70	77	81	94	87	79	84	80	84	81	83	79	82	78	80	83	80.4
	Min	48	58	61	67	62	67	55	47	49	51	56	59	61	60	51	50	53	60	66	58	63	60	53	58	54	62	66	58	57	52	57.4
Burlington	Max	83	88	89	89	85	91	80	73	75	81	82	87	87	85	78	75	79	90	92	86	90	..	83	84	85	88	88	84	80	85	84 2
	Min	63	60	70	75	69	69	68	65	61	61	53	68	70	68	68	69	70	62	70	69	69	..	64	64	63	63	63	68	60	55	65.4
Carroll	Max	81	85	82	85	83	81	77	80	76	79	82	91	82	71	72	75	82	94	93	77	88	79	85	79	80	85	83	80	78	82	81.5
	Min	49	60	60	68	64	68	54	50	51	50	57	66	59	60	49	52	52	64	63	60	62	59	55	60	55	62	65	55	56	52	57.9
Cedar Rap	Max	85	85	88	91	86	92	80	82	78	83	83	91	89	82	77	78	83	92	95	83	91	80	85	83	86	85	87	83	82	86	85.0
	Min	59	59	65	64	66	69	63	55	60	54	58	68	65	62	57	50	55	64	70	61	62	66	63	62	62	62	68	67	55	55	61.5
Centerville	Max	80	87	84	86	83	87	82	74	73	78	82	87	86	84	77	74	79	90	90	86	89	86	80	80	83	86	87	86	78	83	82.9
	Min	60	63	68	67	69	70	67	57	58	54	58	68	65	64	63	54	54	63	67	68	64	64	63	64	64	65	68	65	58	54	62.9
Chariton	Max	78	85	83	86	83	86	78	70	73	76	80	86	84	81	81	72	79	89	88	84	89	83	81	78	82	83	85	82	75	80	81 3
	Min	59	61	66	59	64	70	64	57	54	52	58	67	61	64	56	53	54	62	66	66	64	65	62	61	59	64	67	62	58	54	60 9
Charles Cy	Max	76	72	82	87	82	83	74	75	75	79	80	87	84	78	71	74	81	86	90	81	84	81	78	75	80	78	82	78	76	81	79 7
	Min	54	55	63	72	64	69	59	51	53	50	55	65	63	62	53	47	53	62	65	58	61	64	57	57	55	63	66	66	55	52	59 0
Clarinda	Max	87	87	83	88	86	87	80	77	79	82	85	92	86	79	82	79	87	100	99	87	96	80	82	85	89	87	92	90	84	88	86 2
	Min	57	65	61	65	63	68	57	58	56	50	57	67	64	63	51	56	51	62	66	67	67	66	64	59	30	68	67	60	56	48	60.6
Clear Lake	Max	86	62	80	84	81	82	86	78	72	78	81	86	84	72	80	72	80	86	88	86	86	80	82	76	84	78	82	77	72	76	79.9
	Min	54	58	62	62	64	64	62	52	52	60	57	62	62	64	62	55	56	54	56	60	62	66	58	62	64	63	63	61	58	60	59.8
Clinton	Max	80	85	90	92	86	92	80	75	75	79	85	90	92	87	75	74	80	87	92	83	90	90	81	79	85	88	82	81	76	84	83 8
	Min	58	53	62	68	66	70	64	51	53	50	53	65	69	65	58	45	48	62	65	62	59	64	60	60	58	57	68	62	54	48	59.2
College Sps	Max	85	85	83	87	86	88	79	80	79	82	85	92	87	87	80	82	85	97	98	89	74	86	84	84	90	89	91	88	81	86	85.6
	Min	59	65	61	68	62	70	57	57	55	54	58	67	64	64	52	58	53	62	64	63	67	67	64	62	60	68	66	60	59	53	61.3
Coon Rap	Max	79	82	78	83	80	82	73	75	73	77	82	88	81	77	73	71	80	90	91	78	86	74	78	75	80	82	83	80	75	80	79.5
	Min	62	62	64	70	66	69	57	54	54	54	60	68	61	64	53	57	57	64	65	63	64	63	60	61	58	65	68	61	58	54	61.2
Corning	Max	81	83	80	85	85	85	74	73	73	75	80	88	83	81	75	73	79	92	90	86	89	78	88	77	82	83	85	83	79	80	81.5
	Min	57	55	63	69	65	65	59	58	54	52	58	67	62	64	53	67	54	63	66	67	65	65	64	59	57	67	69	50	59	48	61.0
Co. Bluffs	Max	87	84	80	80	84	79	74	72	78	78	84	92	82	73	64	56	58	58	62	69	74	69	69	64	63	62	65	63	67	70	66	57	63.7
	Min	63	68	63	65	67	62	58	58	57	59	67	73	64	56	53	58	62	69	74	69	69	64	63	62	65	63	67	70	66	57	63.7
Cresco	Max	77	65	82	85	80	84	72	76	72	78	77	84	74	77	66	74	79	85	89	76	79	77	75	78	83	78	80	78	76	79	77.8
	Min	51	56	61	64	62	68	56	49	53	48	55	62	62	58	48	43	55	58	66	58	58	61	55	52	54	62	65	64	51	51	56.9
Davenp'rt	Max	80	84	88	88	84	90	77	72	75	77	80	86	87	82	74	72	78	88	91	81	88	87	80	76	82	85	84	80	76	83	81.8
	Min	65	56	68	67	71	72	62	58	59	57	59	70	71	65	59	52	57	65	71	62	62	66	64	65	63	62	70	63	56	55	63.1
Decorah	Max	78	68	84	90	82	87	73	87	73	79	78	85	78	79	65	72	80	85	90	74	81	77	78	82	83	78	80	78	77	80	79 2
	Min	53	52	62	70	65	68	58	50	56	48	55	62	63	60	50	42	52	59	62	60	58	62	56	52	53	62	63	64	54	50	57.4
Delaware	Max	75	77	83	87	82	85	72	73	70	76	79	85	84	81	68	72	77	82	89	74	84	88	78	76	80	82	81	76	73	79	82.3
	Min	56	55	61	64	64	70	61	50	55	52	56	67	64	64	52	46	53	59	66	61	59	64	58	55	56	60	67	66	51	51	59.0
Denison	Max	83	84	80	84	82	80	76	78	78	79	82	90	81	72	77	72	84	92	94	89	92	79	83	75	81	85	86	59	55	52	58.6
	Min	49	64	61	70	64	66	54	52	52	49	60	68	61	60	51	48	54	52	64	60	64	63	55	62	59	65	66	59	55	52	58.6
Des Moines	Max	81	84	83	89	82	87	77	72	75	77	82	88	84	76	77	70	80	90	90	78	88	81	81	76	82	78	85	83	74	81	81 0
	Min	60	64	68	68	66	70	61	58	59	54	60	69	63	66	56	57	56	66	71	66	65	62	64	64	62	65	69	65	61	55	63.0
De Soto	Max	83	90	87	92	88	93	81	80	82	86	88	93	89	78	78	78	85	95	97	80	93	80	83	77	84	84	88	81	79	86	85.3
	Min	54	64	64	69	65	71	60	54	56	49	59	69	64	65	54	55	53	65	68	67	65	68	63	59	58	67	68	64	62	59	61.9
Diagonal	Max	80	86	83	88	84	86	77	75	73	79	83	88	85	80	76	79	79	92	93	88	92	83	80	78	84	85	80	82	75	81	82.5
	Min	57	65	62	65	62	70	60	56	54	48	56	65	61	63	51	54	51	60	62	66	65	65	62	61	57	65	66	61	47	66	60.1
Dows	Max	78	82	80	88	82	84	72	75	72	79	81	88	81	78	69	80	75	89	90	79	85	74	76	74	80	75	81	76	73	79	79.2
	Min	57	58	61	79	63	69	53	49	53	51	57	63	61	62	52	55	50	62	65	61	62	63	56	56	55	60	65	59	56	52	59.0
Dubuque	Max	80	79	86	88	84	89	75	77	72	76	79	86	88	81	69	72	78	84	91	78	86	84	80	78	81	83	78	76	74	80	80.4
	Min	59	55	62	67	68	68	64	55	58	54	57	69	68	64	56	49	55	63	68	64	60	63	60	58	59	63	68	60	54	56	60.8
Eldon	Max	84	90	88	91	81	92	77	72	78	82	84	90	88	84	79	75	81	94	93	91	92	92	84	84	86	83	89	86	81	85	85.2
	Min	60	60	71	67	62	72	66	61	61	51	55	66	65	66	58	50	52	67	68	70	65	70	64	65	60	65	67	67	58	51	62 7
Eldora	Max	78	80	83	73	78	82	88	80	81	80	78	80	85	77	85	84	87	93	94	90	90	80	82	90	85	84	85	80	82	83	83.2
	Min	53	54	50	50	56	55	54	49	47	50	48	67	63	60	58	54	59	62	60	66	57	58	60	56	60	63	62	56	63	60	57.0
Elkader	Max	82	80	88	92	86	91	79	83	78	83	83	91	90	80	72	77	83	89	97	83	84	85	82	84	86	85	83	83	81	87	84 2
	Min	53	53	59	64	64	72	56	48	64	49	53.	63	64	62	50	45	49	65	63	58	59	61	54	51	53	60	65	67	49	49	57 1
Fairfield	Max	78	84	84	86	80	87	75	70	2	77	79	84	84	77	74	71	77	88	87	83	86	86	79	77	81	80	84	81	76	77	80 1
	Min	60	60	69	69	66	70	66	58	58	56	56	67	64	66	58	52	52	64	68	70	64	69	64	65	66	64	66	66	60	53	62.9
Fonda	Max	83	82	81	78	82	85	83	78	85	78	81	83	95	74	82	78	83	95	93	91	83	77	89	86	82	80	83	79	76	81	82.9
	Min	59	62	58	61	62	67	62	54	60	56	62	57	60	50	60	59	59	62	67	68	63	71	56	61	64	65	67	57	60	54	60 8
Forest City	Max	77	66	80	83	79	82	72	72	72	76	80	86	79	71	69	73	81	88	88	77	82	74	76	77	79	76	80	77	74	79	77.4
	Min	52	59	62	69	64	67	56	54	51	53	57	72	61	63	53	51	55	56	67	60	62	62	55	64	55	61	65	60	57	55	59 3
Galva	Max	81	84	81	84	82	81	79	77	79	78	70	90	80	70	74	77	83	92	91	79	82	79	83	75	79	83	80	79	78	80	80 3
	Min	48	62	62	61	62	65	53	52	50	5	59	69	61	62	51	49	55	62	65	60	62	64	53	54	57	63	65	56	56	57	58.2
Glenwood	Max	83	82	80	84	82	80	76	75	74	78	82	91	86	83	77	78	83	94	92	91	90	77	76	80	83	85	86	86	81	82	82.6
	Min	55	62	61	69	65	69	56	58	54	52	61	70	62	62	52	53	58	66	67	66	68	61	63	62	60	69	65	60	58	55	61.3
Greene	Max	80	72	85	86	84	85	76	79	78	84	83	91	81	76	72	80	83	94	95	83	89	79	82	83	85	85	85	81	83	88	82.9
	Min	52	55	62	70	63	69	59	51	53	50	55	64	63	62	51	47	53	63	64	59	61	63	57	55	54	62	65	64	57	51	58 5
Greenfield	Max	83	85	84	87	85	88	73	76	80	69	85	89	84	77	75	77	82	94	93	77	89	79	83	80	86	88	85	83	78	81	82.5
	Min	56	63	61	66	65	66	59	56	54	55	55	67	64	60	51	58	53	56	67	65	63	62	61	58	57	66	67	54	58	54	59.9
Grin'l (nr)	Max	77	83	83	88	84	87	79	71	74	79	81	88	83	80	73	71	83	37	89	84	87	74	78	75	79	73	83	79	75	81	80.3
	Min	56	59	65	65	64	71	62	54	51	53	56	68	63	65	55	50	53	64	69	57	61	61	61	62	59	59	60	63	57	54	59.9
Grundy C'r	Max	77	81	84	89	83	88	74	86	76	80	82	89	84	77	72	74	81	89	91	77	85	77	78	72	81	79	85	78	75	83	80 9
	Min	52	55	68	63	63	69	58	55	52	49	53	67	60	61	51	47	50	63	65	60	60	60	57	55	55	58	63	60	53	50	57.6
Guthrie C'r	Max	81	83	80	79	81	84	75	75	76	81	88	82	79	75	74	79	91	92	89	87	75	81	75	81	81	84	81	80	80	81	81 0
	Min	52	51	61	55	62	70	56	54	54	54	62	59	62	52	56	54	64	65	62	54	62	59	59	58	64	66	54	57	59	52	58.3
Hampton	Max	78	80	83	88	82	86	74	77	74	81	81	88	80	72	70	74	83	88	92	79	85	74	77	76	82	77	82	77	75	81	79.9
	Min	52	57	62	66	64	70	58	53	54	50	56	62	62	63	53	50	54	62	65	61	62	63	59	57	55	62	65	62	56	53	58.9
Harlan	Max	84	86	81	84	83	83	75	78	76	82	84	90	84	79	77	76	82	92	94	91	88	80	82	80	83	87	84	85	34	81	83.2
	Min	51	64	61	68	63	67	55	53	53	47	59	67	61	61	51	58	52	59	62	63	63	60	58	61	59	67	67	61	57	50	59.3
Hedrick	Max	80	87	85	89	85	91	75	74	74	80	83	89	86	79	77	78	80	90	90	83	89	88	84	89	84	80	88	84	77	82	83.2
	Min	58	60	66	65	64	69	63	56	55	68	54	64	62	64	46	51	52	63	66	65	64	67	60	62	60	59	64	64	56	52	60 6
Hopeville	Max	80	83	82	85	82	84	75	70	72	75	80	86	83	77	75	71	78	90	90	79	88	77	77	76	82	83	83	80			
	Min	59	64	66	65	64	68	62	58	54	54	58	67	63	64	55	55	55	62	68	68	65	68	62	62	59	67	66	62			
Humboldt	Max	79	83	82	86	85	83	76	77	76	80	83	90	84	77	73	77	85	91	90	82	87	78	80	80	81	82	85	78			
	Min	49	59	68	70	65	65	56	52	51	52	62	64	62	63	53	53	57	60	56	60	63	64	57	62	55	64	67				
In'pend'ce	Max	77	80	83	87	81	86	73	76	74	76	79	86	82	79	73	71	78	85	89	84	85	82	77	76	79	81	82				
	Min	54	55	62	68	62	66	62	50	53	51	53	66	61	62	53	47	50	60	65	61	59	60	58	54	57	60	65				
Indianola	Max	89	85	83	87	82	86	78	71	76	77	81	87	84	82	75	80	80	90	92	91	86	89	81	82	75	81	79	8			
	Min	67	62	65	65	64	71	60	60	55	53	57	68	62	63	55	55	57	57	68	66	64	64	64	63	60	63	1				
Iowa City	Max	81	87	88	91	87	92	76	74	77	82	83	90	91	83	75	78	83	94	92	91	90	77	76	80	83	85	86	86	81	82	82.6
	Min	58	57	64	67	62	71	68	54	55	51	53	66	63	64	55	48	49	62	68	57	60	68	62	62	58	61					
Iowa Falls	Max	80	84	84	87	84	87	73	80	75	82	83	89	83	76	72	77	82	91	93	79	87	75	83	77	84	7					
	Min	50	57	62	65	65	68	56	48	53	47	57	64	62	59	51	48	53	61	65	61	63	65	56	55

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JUNE, 1899—CONTINUED.

STATIONS.		DATE.																												Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Keosauqua	Max	85	87	87	88	84	87	77	71	74	80	81	87	87	81	77	71	80	92	92	88	90	90	82	80	85	87	88	86	80	85	83.6
	Min	61	62	61	63	70	71	66	58	58	52	58	69	69	68	59	55	55	67	72	71	67	71	67	66	64	67	69	68	60	52	63.9
Keokuk	Max	82	86	88	89	88	90	78	68	71	78	81	86	86	81	76	73	77	88	89	88	89	89	82	80	83	84	86	83	77	82	82.6
	Min	61	63	70	77	75	72	68	58	60	56	60	70	71	65	61	55	57	66	71	72	65	71	64	68	65	64	68	68	60	56	65.3
Knoxville	Max	82	87	84	89	86	88	78	73	77	81	83	87	87	80	78	75	82	91	91	88	90	87	83	79	84	78	88	87	77	82	83.4
	Min	57	60	65	65	65	70	62	57	55	55	57	57	60	62	56	53	53	63	67	67	63	67	67	65	59	64	65	63	59	53	61.0
Lamoni	Max	81	84	83	87	84	86	78	74	75	77	83	87	86	83	78	76	80	92	94	88	90	85	83	80	88	86	86	82	77	83	83.2
	Min	59	64	66	63	63	65	64	56	56	50	70	66	64	63	55	53	51	60	63	62	65	63	64	59	68	67	67	61	58	51	61.4
Lansing	Max	81	74	86	89	82	86	76	80	76	79	80	87	80	77	70	75	80	86	93	82	80	83	81	83	84	82	80	77	78	82	81.0
	Min	55	54	62	65	65	70	62	50	54	47	56	65	66	63	50	45	52	60	63	60	52	66	57	53	56	62	60	67	52	52	58.0
Larrabee	Max	82	83	81	83	82	80	74	78	80	74	84	88	68	68	73	79	84	88	91	80	88	78	86	81	82	84	83	83	81	81	80 9
	Min	47	60	61	57	58	58	50	50	46	49	60	62	60	58	49	53	56	60	64	55	54	58	60	59	56	61	63	56	54	53	56 2
Le Mars	Max	81	83	81	82	83	81	76	74	78	79	84	89	78	73	76	76	88	92	92	80	84	79	82	77	78	83	79	84	84	81	81.2
	Min	47	64	54	58	56	68	51	56	46	56	62	68	62	59	51	55	56	62	66	60	62	66	58	60	58	61	62	57	59	56	58 3
Lenox	Max	80	83	80	80	81	84	79	72	72	77	80	88	82	79	75	75	79	91	90	87	91	79	76	76	83	84	87	83	76	82	81.0
	Min	57	65	62	67	63	70	60	57	54	53	58	67	61	63	53	57	54	62	66	67	67	67	63	61	58	66	68	76	59	53	61.8
Logan	Max	78	88	80	78	80	82	75	74	79	74	82	85	80	78	89	74	88	92	95	86	84	79	88	84	82	85	88	86	79	76	82.3
	Min	51	65	61	60	65	64	58	50	50	45	60	64	69	65	51	56	53	68	72	67	60	59	55	60	61	66	64	62	56	54	59.7
Maquoketa	Max	79	83	87	90	84	90	83	76	74	80	81	87	89	84	78	74	79	86	92	87	87	88	80	77	82	86	83	78	78	77	82.6
	Min	58	53	63	73	65	67	68	52	55	51	53	66	64	60	45	45	42	61	58	63	59	64	59	56	56	52	68	67	52	48	58.1
Mason City	Max	..	..	81	85	82	82	..	77	75	78	78	86	86	75	69	72	81	85	90	..	..	..	83	76	78	76	80	77	74	79	79.4
	Min	..	..	49	56	69	69	..	52	50	50	55	60	60	62	51	46	54	62	64	..	..	..	54	54	51	62	63	61	52	52	56.6
Marsh'lt'n	Max	79	81	85	85	91	87	89	83	87	80	89	89	91	83	76	71	81	89	91	81	88	80	79	80	82	76	85	79	74	82	83.1
	Min	47	58	65	65	65	72	61	57	55	56	49	70	72	62	53	54	49	51	60	57	52	54	57	57	55	54	57	61	57	52	57.8
Monticello	Max	80	83	90	85	90	88	78	76	84	78	80	87	86	87	73	74	78	87	92	75	87	88	87	82	81	83	82	85	75	85	82.5
	Min	50	55	64	68	67	62	60	50	54	50	55	52	58	57	55	45	48	58	57	57	56	60	58	56	57	55	58	68	65	56	56.8
Mooar	Max	83	85	84	84	84	88	78	72	74	78	77	85	86	79	76	72	76	76	86	86	87	88	84	83	78	79	81	82	80	83	81.2
	Min	62	60	68	67	68	75	66	54	46	46	47	50	56	56	59	52	47	63	64	66	65	64	59	62	62	62	67	65	59	53	59.7
Mt. Ayr	Max	79	84	83	85	82	85	75	74	71	78	82	88	85	76	77	76	80	93	93	82	89	81	77	76	85	86	86	82	74	83	81.6
	Min	59	64	63	65	62	69	61	57	55	55	57	65	63	61	55	56	53	61	65	67	66	66	64	63	69	66	67	62	57	55	61.4
Mt. Ple'sn't	Max	83	87	88	90	88	84	84	77	75	86	85	92	95	88	78	78	84	90	90	89	93	90	87	89	87	91	92	85	78	85	86.2
	Min	59	58	65	70	69	67	71	54	57	52	55	67	64	66	60	48	59	65	69	66	64	65	60	69	59	67	66	64	56	48	62.0
Mt. Vern., H	Max	87	88	88	90	86	89	80	82	82	87	87	88	88	83	78	80	86	93	97	79	87	87	84	80	85	87	83	84	82	86	85.4
	Min	57	56	64	63	66	68	67	55	57	54	62	66	63	63	56	49	52	63	70	56	56	63	61	60	60	60	66	66	52	53	60.1
Newton	Max	81	85	84	90	85	88	76	74	77	80	83	89	84	79	77	74	82	92	92	80	91	85	81	79	84	75	86	81	79	83	82.5
	Min	57	61	66	64	65	72	60	56	55	51	57	69	62	64	53	50	54	64	68	60	63	62	63	59	60	67	68	63	59	52	60.8
NewH'pton	Max	77	72	81	85	80	84	72	88	73	76	78	85	79	76	67	72	78	84	90	90	83	80	76	77	79	78	80	80	74	79	79.1
	Min	63	59	61	70	63	68	57	50	52	50	52	67	62	60	50	46	50	60	74	58	63	65	65	55	65	63	71	65	51	52	59.5
Northwood	Max	75	65	82	85	82	85	72	74	74	75	80	86	77	73	68	78	82	88	89	76	83	80	79	82	83	78	83	77	78	80	79.0
	Min	52	53	60	68	63	66	55	52	50	50	50	62	61	62	50	47	50	50	61	58	58	62	54	53	55	62	63	58	54	49	56.3
Odebolt	Max	86	85	82	86	87	85	80	80	80	82	86	92	86	79	79	78	89	97	98	85	90	84	83	78	83	88	84	82	83	85	84.9
	Min	49	61	62	66	65	67	60	50	49	52	59	67	61	61	50	55	55	54	64	54	55	53	54	62	51	63	65	56	55	52	57.6
Ogden	Max	80	81	83	87	82	85	75	75	76	79	82	90	82	76	76	73	81	90	90	72	87	77	80	73	79	79	84	80	74	81	80.3
	Min	52	63	63	70	63	70	57	54	54	53	66	67	61	63	51	52	54	61	61	53	62	62	59	61	59	64	67	60	57	54	59.8
Olin	Max	78	83	..	89	84	88	74	74	73	79	80	86	87	82	74	74	72	78	89	88	88	87	78	75	81	83	84	78	73	80	80 6
	Min	57	58	62	74	65	66	68	53	55	52	53	65	64	64	56	47	51	64	74	75	64	68	60	56	58	60	68	66	52	51	60.4
Omaha	Max	84	82	79	81	82	78	75	72	76	76	82	92	83	72	78	72	84	96	92	81	88	75	78	80	84	83	86	84	78	81	81.1
	Min	60	63	62	70	67	64	58	61	56	57	64	62	62	62	58	59	60	68	71	67	64	62	64	65	63	68	66	65	63	61	63.1
Onawa	Max	84	85	82	82	84	84	76	76	76	78	84	91	86	73	78	72	84	91	93	86	86	81	80	79	81	85	84	84	83	81	82 3
	Min	50	67	62	62	62	66	56	54	52	52	62	69	62	61	52	58	56	65	67	60	62	65	58	65	61	69	66	58	57	57	60.4
Osage	Max	76	66	81	85	81	84	72	76	73	78	78	87	80	74	68	74	81	84	89	78	82	78	76	79	80	76	83	78	74	80	78.4
	Min	52	59	61	68	62	67	57	51	51	49	55	62	62	62	51	47	52	60	64	52	58	65	55	54	55	62	63	64	53	51	57.3
Osceola	Max	80	85	83	86	82	86	75	70	72	77	82	88	85	78	77	71	79	91	90	76	90	82	79	78	84	85	85	83	74	82	81.1
	Min	57	63	65	65	64	72	63	57	54	55	57	67	62	63	55	54	55	63	68	68	64	66	64	61	58	66	67	62	57	52	61.5
Oskaloosa	Max	81	86	85	89	85	89	75	71	74	82	83	89	84	82	77	75	83	89	90	78	90	91	82	79	84	82	88	83	77	85	82.9
	Min	57	62	66	63	65	71	62	55	56	61	57	68	64	65	56	51	54	64	69	64	64	67	62	62	62	65	66	65	57	53	61.4
Ottumwa	Max	80	83	85	89	85	90	75	70	73	80	80	88	85	79	76	71	80	91	91	90	90	90	89	81	88	80	83	84	75	82	82.8
	Min	60	63	73	68	67	71	67	57	57	52	60	58	61	65	57	52	55	66	70	74	68	69	60	65	61	65	68	66	60	54	63.1
Ovid	Max	80	85	83	86	83	85	77	70	74	76	79	85	83	82	78	73	78	89	89	83	87	84	79	79	84	85	85	84	78	81	81.5
	Min	59	63	66	62	64	70	63	56	55	52	55	67	62	63	53	52	53	61	66	64	64	66	65	63	57	65	67	62	56	53	60 8
Pacific Jct.	Max	84	74	80	82	82	79	74	72	72	76	82	91	83	72	76	75	82	93	92	80	86	75	75	80	83	88	85	84	78	81	80 5
	Min	54	65	61	69	65	66	57	57	58	49	59	68	62	63	50	58	58	65	65	67	68	62	61	62	67	65	57	60	52	52	61.0
Pella	Max	76	68	80	73	81	81	73	68	71	76	78	85	82	75	74	69	88	87	87	83	87	87	84	81	86	84	85	84	80	84	83.4
	Min	56	58	65	67	64	70	68	56	55	54	56	66	62	65	56	51	52	51	67	61	65	61	64	60	59	65	63	63	56	51	60.2
Plover	Max	82	80	82	86	87	85	76	77	76	84	84	93	77	75	74	82	85	93	90	85	88	81	85	81	86	84	85	84	86	88	86.8
	Min	50	55	60	65	63	68	53	50	48	50	55	60	61	60	50	54	49	58	65	60	58	64	60	58	59	62	60	54	55	50	57.1
Primghar	Max	80	65	75	80	80	78	75	75	80	77	86	88	78	70	77	80	85	95	90	79	80	76	83	75	70	77	75	80	78	82	79 0
	Min	50	61	68	65	55	65	50	45	65	53	61	65	62	60	61	53	65	72	73	60	60	60	50	60	56	60	65	68	65	69	60.7
Red Oak	Max	88	79	82	87	93	84	86	84	83	88	83	89	88	89	83	75	84	95	94	90	91	85	85	83	85	83	90	87	86	83	86.1
	Min	58	68	64	67	65	53	58	58	51	52	59	69	70	65	54	60	54	64	69	72	70	65	65	62	61	67	67	62	53	53	61.9
Ridgeway	Max	80	69	80	85	84	85	74	77	75	80	77	85	80	76	74	75	80	81	92	80	80	79	82	79	78	80	79	78	77	84	79.5
	Min	53	56	61	70	64	70	59	53	56	52	56	63	63	59	51	48	54	59	65	59	57	62	58	57	58	62	64	65	54	54	58.7
Rockwell C	Max	80	85	83	87	83	85	75	79	76	82	83	91	81	75	75	78	88	92	91	78	88	79	80	72	80	81	84	80	79	82	81 6
	Min	52	60	63	69	63	64	55	54	53	53	58	63	61	62	51	54	55	63	62	60	61	62	56	61	56	64	66	57	55	52	58.8
Ruthven	Max	76	78	80	78	68	82	84	82	84	80	78	88	80	84	80	78	84	88	88	90	86	82	84	86	78	80	84	82	80	82	81.8
	Min	44	42	48	46	52	54	50	48	46	50	54	58	48	44	42	44	50	50	56	58	50	50	54	56	52	50	48	56	50	54	50.1
Sac City	Max	..	..	..	..	..	..	..	..	..	..	..	..	..	..	72	72	83	92	91	80	86	79	80	74	78	81	82	80	79	80	....
	Min	..	..	..	..	..	..	..	..	..	..	..	..	..	..	51	54	66	68	75	60	62	64	54	62	56	62	66	58	57	54	....
Scranton	Max	80	85	82	84	83	84	77	77	74	79	79	91	86	81	75	75	81	94	92	84	87	75	81	77	83	83	86	84	80	85	82.1
	Min	55	61	63	70	65	70	56	57	60	54	53	68	61	64	53	55	55	64	67	63	64	63	59	61	58	66	63	60	60	54	60.7
Sheldon	Max	78	67	80	80	80	74	72	70	76	75	80	85	72	70	73	75	87	91	88	76	79	75	80	71	72	79	77	80	77	80	77.3
	Min	45	52	50	51	56	56	49	50	45	47	60	60	56	58	46	55	55	58	66	58	61	57	48	60	58	62	63	55	57	55	55.0
Sibley	Max	80	65	80	82	83	76	74	70	77	80	82	86	69	73	75	78	90	91	87	77	78	77	80	73	72	80	78	81	80	82	78.5
	Min	46	58	60	56	56	63	48	50	45	47	57	59	60	58	48	48	55	58	67	58	60	56	47	60	53	61	64	55	53	54	55.3
Sigourney	Max	88	89	89	92	88	93	79	80	84	85	85	90	90	82	78	80	84	97	97	96	94	91	91	88	93	85	92	83	89	91	88.1
	Min	55	55	61	62	62	69	63	53	52	50	50	65	75	63	62	45	60	64	65	62	61	67	59	58	56	57	63	63	55	48	59.4
Sioux City	Max	83	84	81	81	84	78	77	73	78	78	83	90	69	73	78	74	89	92	94	80	82	77	83	76	80	84	83	85	80	81	81.0
	Min	54	60	66	63	56	56	54	54	50	55	60	65	63	59	56	58	58	65	67	62	63	65	57	59	61	63	65	62	60	60	59.9
Sioux C'ntr	Max	82	76	79	82	85	81	78	75	80	81	82	87	76	72	77	78	90	94	92	85	82	79	85	.	..	.	..	..	..	..	81.7
	Min	53	61	63	57	55	65	50	52	49	54	62	63	62	58	63	55	57	68	68	70	63	62	55	.	..	.	..	..	..	..	59.1
Spencer	Max	75	81	80	83	82	79	..	..	83	..	79	89	..	81	78	79	86	92	..	81	78	80	83	78	78	81	80	82	81	84	81.3
	Min	57	45	50	58	65	62	..	49	..	..	..	59	..	60	54	52	56	59	..	57	56	58	60	58	55	53	63	54	56	51	56.1
Spirit Lake	Max	86	73	81	79	78	78	73	72	75	73	78	85	72	72	70	78	85	96	90	80	82	76	81	80	77	75	73	74	82	81	78.5
	Min	59	56	56	61	53	50	50	54	48	54	60	60	61	60	52	54	57	74	68	58	61	60	61	61	57	56	65	68	57	57	58.3
StormLake	Max	77	80	79	81	78	79	72	72	73	74	79	86	80	70	71	72	81	89	88	76	83	75	78	71	76	77	79	78	74	77	77.5
	Min	55	62	63	64	62	64	52	53	51	55	60	65	61	60	52	54	56	64	65	60	62	64	54	61	67	63	67	59	60	56	59.7
Stuart	Max	80	85	85	87	86	85	87	76	78	80	82	90	90	82	75	77	82	100	95	76	90	80	84	86	89	92	90	92	87	84	85.1
	Min	56	62	64	75	65	70	58	60	58	55	64	68	57	59	57	57	54	63	66	57	66	62	62	60	67	69	60	65	50	54	61.3
Tara	Max	80	82	85	84	85	86	78	85	80	85	86	92	82	75	75	76	84	92	95	80	89	80	85	75	80	88	90	80	78	85	83.2
	Min	68	68	68	70	71	72	68	60	70	78	78	72	65	70	62	60	62	75	80	65	73	68	68	65	70	70	75	70	68	75	69.5
Thurman	Max	84	84	81	83	82	83	76	74	75	79	83	91	85	82	81	79	83	94	96	84	89	76	83	83	86	87	88	87	85	85	83 6
	Min	60	62	62	69	65	70	57	59	55	50	63	68	63	64	52	58	57	64	68	67	69	62	64	61	79	69	65	60	58	52	62.4
Toledo	Max	84	85	85	90	87	90	78	77	78	80	78	90	85	80	87	75	85	90	92	80	90	83	81	76	81	73	86	81	77	83	82 9
	Min	55	55	65	72	64	71	64	52	56	50	56	69	63	66	54	47	55	65	66	63	65	66	60	57	54	62	63	64	56	50	60.2
Villisca	Max	84	87	85	87	84	88	77	78	76	80	83	91	85	76	80	80	83	94	93	84	92	80	79	83	85	87	89	85	80	85	84.0
	Min	55	57	63	65	63	69	56	59	55	54	58	67	62	63	62	58	53	60	65	67	68	67	63	60	68	69	68	59	55	49	61.2
Wapello	Max	83	84	87	88	86	83	77	78	74	80	80	85	86	81	75	73	81	91	93	80	89	88	80	75	82	85	85	83	81	83	82.5
	Min	62	58	68	74	68	70	68	62	58	53	56	67	67	66	58	52	52	63	68	64	62	69	63	65	62	64	69	67	57	59	63.0
	Max	78	86	86	88	84	89	76	70	73	79	81	86	86	80	76	72	80	90	90	83	88	89	81	77	84	85	85	82	77	83	82.1
	Min	58	58	65	65	65	70	60	53	54	50	53	66	66	54	50	47	50	60	68	62	60	64	60	62	58	60	64	64	55	50	59.0
	x	79	82	84	90	83	87	76	78	77	79	82	88	83	87	73	74	81	88	91	80	86	81	80	77	82	81	83	80	76	81	81.6
	...	55	56	63	65	64	71	61	51	54	50	56	68	61	60	54	47	53	70	66	62	60	61	59	55	56	61	67	65	52	52	59.2
	..	77	77	83	88	82	88	74	76	74	79	80	87	82	79	70	73	80	85	89	80	80	80	68	75	80	80	84	78	76	81	79 6
	..	54	59	64	72	65	71	61	53	55	51	58	70	65	64	54	50	55	66	67	62	62	66	59	55	57	64	67	67	55	54	60.8
		86	85	84	86	91	90	85	86	85	84	89	88	89	84	70	72	79	90	92	82	86	86	86	84	80	82	84	86	82	82	84.5
		42	50	52	60	62	65	54	47	46	44	46	48	50	64	50	48	45	62	63	54	60	66	60	56	54	55	60	66	54	50	54.4
		80	87	88	90	85	92	79	78	74	82	84	88	88	85	77	75	80	89	92	87	..	..	..	..	..	..	..	..	83	..	84.0
		65	63	74	72	66	68	67	58	51	59	60	64	63	65	60	45	47

DAILY AND MONTHLY PRECIPITATION FOR JUNE, 1899.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total.
Afton	....	....	.12	....	....	....	....	.10	....	....	....	....	.39	1.92	....	.90	..	.26	....	....	..	....	....	.81	.	.23	....	....	....	....	4.73
Algona	....	.70	....	....	.02	.60	....	....	.02	....	.25	....	....	2 15	....	....	.85	....	....	..	T	.25	....	T	..	.62	.10	....	....	....	5.56
Alta (Hadden)	....	.26	T	....	..	1.83	05	.01	....	.	T	....	2.62	.19	....	.34	..	.17	..	.10	T	.07	....	.11	T	2 91	T	....	..	....	8 66
Alta (near)	....	.30	.02	....	....	2.10	....	.04	....	....	....	....	2.74	.25	....	.41	....	....	....	....	....	.08	....	.14	....	5.21	.03	....	....	....	11.32
Albia	.01	T	....	.44	....	....	.11	.25	....	....	....	....	.24	1.12	....	T	.04	....	....	....	....	....	....	T	....	.33	....	....	....	....	2.54
Amana	....	.18	....	.30	....	.65	.04	T	..	....	....	....	.04	.29	....	....	....	.02	....	1.64	....	.05	....	....	....	.06	.20	.09	....	..	3 56
Ames	....	.10	....	..	....	.53	....	....	....	....	....	....	1.81	.85	..	T	.20	....	....	3.71	T	T	T	T	....	.45	....	....	....	..	6.45
Atlantic	....	.09	.25	....	....	.19	.35	....	....	....	....	.56	2.17	.44	....	....	....	....	....	....	.	1 65	....	..	..	T	....	....	....	....	5.70
Audubon	....	....	.16	....	....		.53	..	....	....	....	....	2 55	1.15	....	.55	..	....	....	....	25	.90	....	..	..	....	.18	....	....	....	6.27
Bancroft		.90	.10	....	T	T	1.37	.02	....	...	T	25	2.76	.20	..	T	.15	....	....	....	T	.01	....	.08	....	....	....	....	..	....	5.84
Batavia	.10	.04	....	....	....	.20	.10	....	....	....	....	....	.08	1 70	....	....	....	....	....	....	....	23	....	....	..	.21	....	....	..	....	2 66
Baxter	....	.12	....	.07	....	.02	21	....	....	....	....	....	.33	.40	..	....	....	T	T	1.23	.07	1.00	....	....	..	.07	.04	....	..	....	3.56
Belknap	.30	T	....	..	.05	....	T	.40	....	....	....	....	....	2.50	....	....	....	.05	....	....	....	....	.05	....	....	.10	....	....	..	..	3.45
Belle Plaine	....	.12	....	.20	..	....	.65	....	....	....	....	....	.35	.65	....	....	....	.30	....	2.00	....	.70	....	.25	....	.50	.30	....	....	....	6.02
Blockton	....	.32	.20	.10	....	....	....	.50	....	....	....	....	.25	..	T	T	....	....	....	....	....	T	.10	....	..	T	....	....	....	....	1.47
Bonaparte	.02			....	....	....	....	.33	....	....	....	....		1.10	....	....	....	....	....	....	....	....	.15	....	....	.05	....	....	....	....	1.65
Britt	..	1.35	.05	....	.08	.25	.61	....	T	....	....	.20	2.35	.28	....	.07	1.82	....	....	.03	T	.29	....	.11	T	.13	.19	....	....	....	7.31
Burlington	....	.36			.07	.28	.25	.45	T	....	....	....		.13	....	....	....	....	....	....	....	....	....	....	.43	....	....	....	....	....	1.71
Bussey	....	.22	....	.45	....	.24	....	.11	....	..	....	.27	.53	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.25
Carroll		T	.05	..	10	.50	....	.22	....	....	.02	2 54		1.20	....	.30	.20	....	T	T		1.27	....	....	....	.85	....	....	....	....	7.25
Carson	....	.08	.22		T	....	.80	....	....	....	....	....	2.71	1.20	....	.61	....	....	....	....	.08	2.10	.	....	..	....	.19	....	.	....	7 99
Cedar Rapids	..	.72		.42	....	.63		....	....	....	....	T	.74	.	....	....	T	T	....	.22	....	.21	..	T	..	T	.52	....	....	....	3.46
Centerville	.23	.03	.04	T	....	....	T	.55	....	....	....	....	.	1 00	T	.05	....	T	....	....	....	....	.38	.15	....	T	T	....	....	....	2.43
Charlton	.04	17	.02	.40	....	....	.16	.25	....	....	....	....	.11	.83	..	.02		.31	.04	....	....	....	.01	....	....	.02	.14	....	....	....	2.52
Chillicothe	....	T		.30	....	....	....	.35	..	....	....	....	.11	1.41	..	....	T	T	..	....	....	....	T	....	....	.30	....	....	....	....	2.47
Charles City	....	.50	.39	..	.08	.14	23	....	....	....	....	.08	1.00	1 64	....	..	.72	....	..	....	....	.24	....	....	....	....	.44	....	....	....	5 46
Clarinda	....	.18	.25	....	....	.13	....	.16	....	....	..	....	.13	....	....	.07	....	T	....	....	....	.07	.02	.50	....	....	.03	....	....	....	1.54
Clinton	....	.84	....	.22	....	.03	.01	T	....	....	....	....	....	.58	....	....	.25	..	....	.45	....	.27	....	....	....	.83	03	..	....	....	3 01
Clear Lake	....	.23	1.14	..	....	2.90	....	....	....	....	....	.66	.94	..	..	..	.20	....	....	..	....	....	....	....	....	....	....	....	....	....	6.07
College Springs	....	.18	.33	T	....	12	....	.33	....	....	....	....	.10	....	....	.12	....	T	....	....	....	.05	.08	..	....	....	T	....	....	....	1.31
Coon Rapids	....	.02	.06	..	....	.12	43	....	.15	....	....	....	1.85	.82	..	.10	....	..	....	....	.10	.84	..	....	..	.37	..	....	....	....	4.86
Corning	....	.25	.12	T	T	.32	....	.37	..	....	....	....	.98	1.15	....	.10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3.29
Council Bluffs	....	.16	.80	..	.07	.14	T	....	....	..	.59	....	.16	.20	T	....	....	T	....	....	.49	.93	....	....	.22	....	....	....	....	....	3.76
Cresco	....	1.77	.22	.04	.15	.22	.41	....	....	....	T	.13	1.11	1 02	....	....	.69	..	....	T	.06	.11	....	....	....	....	.13	....	..	....	6.06
Cumberland		.20	.18		T	52	T	....	....	....	....	....	1.64	1 22	..	.05	..	....	T	..	....	.80	....	....	..	....	T	....	....	....	4.61
Danville	T	.15		T	T	.10	.30	.20	..	....	....	....		1.00	....	....	....	T	....	....	....	T	....	....	..	.49	.16	....	T	....	2.40
Davenport		T	.65	.36	T		.31	T	....	....	....	....	T	1.07	T	....	....	.20	T	1.36	T	.02	T	....	....	....	.13	.02	....	....	4.02
Decorah	....	1.64	.03	....	.16	.02	35	T	....	....	T	.73	.32	1.06	....	....	.35	....	....	....	....	....	....	....	....	....	.48	.08	....	....	5 51
Delaware	....	1 21		.28	.16	.45	.16	....	....	....	....	....	.20	1.16	....	....	....	.88	....	.12	....	.08	....	....	....	....	.33	....	....	....	5.03
Denison	.14		.12	....	.20	50	.06	.12	....	....	T	T	3 10	.55	T	.08	....	....	T	....	....	.80	....	....	....	.50	.12	....	....	....	6.29
Des Moines	....	.02	T	.02	T	T4	.02	T	....	....	....	....	.70	.52	....	.10	....	T	.01	....	....	.71	T	.01	....	1.42	T	....	....	....	3.53
De Soto	....	T	T	T	....	.1	....	....	....	....	....	.51	.93	..	....	.11	.33	..	....	....	....	.55	..	.04	....	.18	....	....	....	....	2.79
Diagonal	....	.20	.20	.10	....	....	....	.10	....	....	....	....	20	.90	....	.70	....	....	....	....	....	....	....	.80	..	.10	....	....	....	....	3 30
Dows	..	15	.20	....	....	.04	..	....	10	..	....	T	1.45	2 42	....	....	.83	.33	T	T	.03	.72	....	T	....	.19	99	....	....	....	7.77
Dubuque	..	T	..	.10	.02	....	....	T	....	....	....	....	T	95	....	....	T	....	....	T	....	.08	....	T	....	....	.92	.03	....	....	4 08
Eldon	.10			.17	....	.04	.31	.28	....	....	....	....	....	1.53	..	T	....	.04	..	....	....	....	.19	T	....	03	.02	.14	....	....	2.85
Eldora		.50	T		....	T	.50	.	.50		....	....	1.75	.75	....		T	.50	....	....	....	....		.50	T	.25	1.00		....	....	7.00
Elkader	....	1 75		.10	....	.31	.20	..	....		....	....	1.94		....	....	.62	....	....	....	....	....	..	....	....	T	.52	....	....	....	5 92
Emerson		.20	.30		....	....	.45	..	....	....	....	....	2.25	1 15	....	.90	....	....	.92	....	.12	....	....	....	....		.02	....	....	....	6.29
Fairfield	.04	T	....	.08	....	.18	18	.14	..	....	..	....	.08	1.10	....	....	....	....	....	....	....	....	.12	....	....	....	....	....	....	....	1.94
Fonda	.20	.05	....	....	....	....	.86	..	....	....	....	.31	.58	....	....	....	....	....	....	....	T	.41	....	.19	..	.06	.24	....	....	....	2.90
Forest City	....	1.65	.21	....	.02	35	.51	....	.06	....	....	....	2.60	....	....	....	.19	....	....	.08	....	.28	....	.03	....	.61	.56	....	....	....	7.15
Ft. Madison	....	.05	....	T	....	.40	.32	.35	....	....	....	....	....	1.25	..	....	....	T	..	....	....	T	.27	....	....	.44	.45	.06	....	....	3.59
Galva	....	.23	T	..	....	2.04	....	T	....	....	..	T	2.20	1.09	....	.55	.16	....	....	....	....	T	....	....	.28	.90	....	....	....	....	7.25
Gladbrook	....		....	....	.40	....	....	....	T	....	....	1.00	....	....	....	....	.40	....	....	....	....	....	.40	....	....	.30	....	....	..	..	2.50
Glenwood	....	.08	.70	....	....	..	.34	T	....	....	....	....	1.55	.49	....	.70	....	....	....	....	....	1.52	.12	....	..	.18	.29	....	..	..	5.97
Gilman	....	.49	....	.95	....	....	.27	....	....	....	....	....	.37	.43	....	T	..	.14	T	1.75	.16	.64	....	.11	....	.18	T	..	..	....	5.49
Grand Meadow	....	1.68	....	.65	....	.34	.99	....	.04	....	....	.08	.38	1 08	....	....	.23	....	....	....	.10	.88	..	....	..	....	.48	....	....	....	6.43
Greene	....	1.20	.42	....	....	....	.15	....	.05	....	....	.03	.70	3.00	....	..	T	....	....	..	....	.23	..	....	..	....	T	....	....	....	5.78
Greenfield	....	.05	.10	....	....	.14	....	.02	....	....	....	....	1.18	1.69	....	.20	....	T	....	....	T	.66	....	.04	T	T	T	....	....	....	4.08
Grinnell (near)	....	1.04		.30	....	.39	.26	....	....	....	....	....	.20	.82	....	....	....	.18	....	1.10	....	.43	....	.05	....	.67	T	....	....	....	5.44
Griswold	....	.54	.22		....	....	.48	....	....	....	....	....	2 10	1.56	....	....	....	....	....	....	....	.70	....	....	....	....	....	....	....	....	5.54
Grundy Center	....	.48		.03	....	.01	.20	.50	T	....	..	....	1.20	.75	....	....	....	.20	....	.35	....	.43	....	....	....	.23	.89	....	....	....	5 27
Guthrie Center	....	.09	.26	....	....	....	.30	....	.02	....	....	1.19	.77	....	.16	....	....	....	....	....	1.06	..	....	....	....	..	....	....	....	....	3.85
Hamburg	....	....	.45		....	....	....	.24	....	..	....	....	.25	.15	....	.15	....	....	....	....	....	.10	....	....	....	....	.35	....	....	....	1.69
Hampton	....	.14	.22	.09	....	.84	....	.13	....	....	....	.11	3.50	....	..	.19	.06	....	....	.03	.20	.42	....	.02	..	.31	1 09	....	....	....	6.76
Harlan	....	.10	.20	....	.05	.55	.09	T	....	....	....	.08	1.97	2 71	....	.06	....	.03	....	.35	1 07	....	.01	..	.02	.24	....	....	....	....	7 53
Hawkeye	....	2.40	....	....	.19	....	.90	.09	....	....	....	....		1.93	.	....	.66	..	....	....	....	30	....	....	....	....	.55	....	....	....	7.02
Hedrick	....	.12	..	.04	....	....	.08	.23	....	....	....	....	.17	.76	....	..	....	.05	....	....	....	T	....	....	....	.84	....	.06	....	....	2.35
Hopeville	.03	.24	.19	.11	....	.05	.05	.25	....	....	....	....	.38	1.26	....	.15	....	....	....	....	....	.02	..	.32	....	.72	....	....	....	....	3.77
Humboldt	....	.24	.19	....	.04	.63	.13	....	.01	..	.01	.03	1.61	2 32	....	.07	....	1.46	....	.05	....	.39	..	....	....	T	.18	.20	....	....	7 56
Independence	....	.50	.02	.05	....	.30	.15	....	T	....	....	T	.40	1.80	....	....	.30	....	.30	T	.10	.05	....	T	....	....	.38	..	....	....	4.35
Indianola	....	.38	....	.13	....	....	.11	T	....	....	....	....	....	.17	.90	....	....	T	....	....	..	.03	..	.17	....	1.90	....	....	....	....	3.79
Iowa City	..	1.03	....	.09	....	....	.07	T	....	....	....	....	T	.37	....	....	T	.05	.02	1.62	....	T	.03	.04	....	.43	.75	....	....	..	4.50
Iowa Falls	....	.12	18	T	....	.25	.25	T	.10	....	....	....	1.12	1.03	....	....	.13	....	.21	.05	.05	.48	..	T	..	.43	.45	....	....	....	4 85
Keokuk	.02	T	....	T	T	.88	.06	.42	....	....	....	....	....	1.22	....	....	....	....	....	....	....	....	.18	..	....	.50	....	....	T	....	2.78
Keosauqua	.15	.06	....	T	.08	T	.11	.26	....	....	....	....	....	1.47	....	T	....	....	....	....	....	....	.14	....	....	.12	....	....	T	....	2.39
Knoxville	....	.19	....	.18	....	T	.29	03	....	....	....	....	.18	.94	....	T	....	....	....	....	....	T	....	....	....	.69	....	....	....	....	2.50
Lacona	....	.15	....	.15	....	....	.25	.06	....	....	....	....	.10	1.02	T	....	....	.48	....	....	....	....	....	....	....	1.00	....	..	....	....	3.21
Lamoni	....	.50	....	.82		....	.32	.58	..	....	....	....	....	.78	....	.09	....	....	....	....	....	.04	.12	....	....	.09	.09	....	....	....	2.93
Lansing	....	.55	.25	.38	.24	.12	.60	....	....	....	....	.70	.15	.85		....	.55	....	..	..	....	.45	....	..	....	T	.76	.41	....	....	6.01
Larrabee	.20	.02	....	....	..	1.90	....	.02	....	....	.02	....	1.02	....	....	.36	....	....	....	.03	T	T	....	.20	1.60	.20	.15	....	....	....	5.72
Le Claire	....	....	.84	....	.94	....	.03	T	....	....	....	....	....	1.05	.05	....	....	.15	..	....	.57	....	.24	....	.05	....	....	.19	T	....	4.11
Le Mars	....	.63	....	....	....	.45	.49		....	....	....	....	.71	.03	....	.61	....	....	....	T	....	.55	....	.64	....	1.75	.40	..	....	....	6.26
Lenox	....	.20	.10	.05	....	....	.18	.12	....	....	....	....	.17	.60	....	.19	..	....	....	....	....	....	T	.16	..	T	....	.20	T	....	1 77
Lockridge	.20		.10	.30	T	.10	.20	....	....	....	....	....	....	....	T	T	....	....	....	T	....	....	....	....	....	....	....	....	....	....	1.10
Logan	....	.17	.69	.14	....	1.29	....	....	....	....	....	....	2.77	3.56	.07	.15	....	....	....	....	.98	1.00	....	....	....	1.03	.14	....	....	....	11.99
Maquoketa	....	....	.44	.02	.61	....	.94	....	....	....	....	....	....	.83	....	....	....	.24	....	.11	....	.93	....	....	....	....	1.66	.04	....	....	5.82
Marshalltown	....	....	.14	.14	.02	.18	.05	.08	....	....	....	....	.28	.87	....	....	....	.49	.02	....	.76	.58	..	.10	....	.60	.15	....	....	....	4.05
Mason City	..	....	.90	....	....	.80	1.25	T	....	....	T	.10	1 00	5.20	....	....	....	....	....	....	....	.40	..	....	....	....	.90	....	....	....	11.05
Melrose	....	.03	....	.08	.07	....	....	.09	....	....	....	.02	.07	....	....	....	....	.05	.07	....	....	....	....	....	....	1.03	....	....	T	....	1 51
Mooar	....	....	....	T	....	.14	.20	.30	....	....	....	....	....	.90	....	....	....	....	....	....	....	....	1.00	....	....	.42	T	.11	....	....	2.96
Monticello	....	.32	.70	....	.08	.22	....	....	....	....	....	....	.13	1.27	....	....	....	.83	T	.12	....	.46	....	T	....	....	T	....	....	....	4.24
Mt. Ayr	....	.30	.15	.25	....	....	.03	.50	....	....	....	....	.01	.44	....	.23	....	....	.02	....	....	.01	.06	1.13	....	T	....	..	....	..	3.13
Mt. Pleasant	....	.55	....	.10	....	....	.09	....	....	....	....	....	....	1.09	....	....	....	....	....	....	....	.14	....	..	....	.05	....	..	....	....	2.02
Mt. Vernon	....	.30	....	.50	....	....	.05	....	....	....	....	..	..	.90	....	..	.10	....	....	.60	..	.40	..	..	....	..	1.33	....	....	....	4.18
Mt Vernon(Hubbard)	....	.17	....	.60	T	T	....	....	....	....	....	....	T	.86	....	..	.14	....	.01	.70	....	.52	T	T	....	T	1.24	.01	....	....	4.25
Murray	....	.14	....	.24	....	.08	....	.10	....	....	....	.23	....	1.50	....	.13	.04	....	....	....	....	T	....	05	....	.35	..	....	....	....	2.86
New Hampton	....	.48	.15		.11	.55	.48	..	....	....	....	....	.57	1 24	....	..	.17	.04	....	....	....	T	..	.05	....	..	.26	....	..	....	4.10
Newton	....	.29	....	.10	....	.11	....	T	....	....	....	....	.45	.28	....	....	....	....	....	.02	T	.45	....	.04	....	.26	....	....	....	....	2.00
Northboro	....	.30	.52	....	....	..	.10	.27	....	....	....	....	.10	.10	....	.93	....	....	....	....	....	....	.10	....	....	..	.07	....	....	....	2.49
Northwood	....	1.18	.22	....	....	.20	.22	....	....	....	.05	.12	2 90	.70	..	....	..	....	....	....	....	.18	....	..	..	.12	..	....	....	....	5 89
Odebolt	....	.13	.03	....	....	.32	.68	....	.10	....	..	.10	1 62	.40	....	....	....	....	....	.48	T	.36	.07	....	....	.95	.16	..	..	....	5.40
Ogden	....	.10	.02	..	....	....	.20	....	....	.06	....	....	1.05	.50	..	.25	..	.45	.37	2.38	.72	.71	..	T	....	....	.40	....	....	....	7.21
Olin	....	....	.37	.34	....	.14	T	T	....	....	....	....	....	1.00	....	....	....	....	....	1.60	....	.71	..	T	....	....	.71	T	....	..	4.87
Omaha (Neb.)	....	.22	.76	....	..	.28	T	T	....	....	....	....	1.56	.50	....	.18	....	....	T	....	.35	1.13	T	....	....	.40	.44	....	....	....	5.77
Onawa	....	.30	.38	....	....	1.88	.10	T	....	....	.05	.20	1.75	.48	.12	.08	....	....	....	.20	T	.60	..	.02	....	..	.20	....	..	....	6.36

DAILY AND MONTHLY PRECIPITATION FOR JUNE, 1899—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total.
Osage	....	1.89	25	....	.21	.23	.41		.02	....	T	.03	1 24	2.54	....	....	.20		..	T	T	.26	...	....	....	....	....	.73	...	..	8.01
Osceola	....	.38	..	.08	..	..	.07	.18	....	....	....	....	.11	1.52	....	T	...	.25	....	....	..	T	T	....	....	.02	.20	....	....	....	2.91
Oskaloosa	.	1	....	.39	....	....	.08	.06	....	....	....	....	.18	.59	.	T	.10	..	....	....	T	T	.	....	....	.15	T		....	....	1 55
Ottumwa	.07	.02	T	.10	....	..	.06	.41	....	....	..	....	.13	1 98	...	T	..	.04	..	. .		....	.10	....	....	.12	.	...	....	....	2.01
Ovid	....	.17		.97	..		.73	.54	....	....	....	....	.05	.45	...	.05	..	.15	.02	....	....	..	.03	.03	...	.48		..	.	..	3 67
Pacific Junction	....	.24	.65		..	.22	.35	T	....	....	....	....	1.23	.27	....	.80		....	....	..	....	1 96	.38		....	.51	.22	..	..	..	6 83
Pella	....	.49	..	18	....	.14	.42	.03	....	....	....	....	.35	.75	..	.03	.02	..		...	...		..	....	....	.18	.08	..	..	....	2 67
Plover	....	.10	..	....	..	....	.95	....	....	....	....	....	2 15		...	22	..		T	T	T	.21	...	..	....	.80	..	..	..	...	4.43
Primghar	....	.70	..	...	.	1 40		....	....	....	.15	1 40	.65	.10	...	.31	....	....	..			..	..	.40	.85	1 50	30	..	..	...	7.76
Red Oak	. ..	43	.29	....		....	.32	T	..	....			2.00	1 17	...	..		.04			T	1.00	....		....	..	.08	..	..	...	5 83
Ridgeway	....		1.40	...	.12		1 58	.0		..	.01	.26	.93	1.09	..	..	.48			.02	T	.16	....		....	..	.58	..	....	...	6.66
Rockwell City	....	.25		...	.05	.36	.10		....	...	T	....	1 50	.35	...	30	....		1.25	...	.02	.61	....	.33	..	T		....	....	..	5.42
Ruthven	....	2 90	..		..	..	2 30	...	....	....	..	...	1.50	...	....	1.20	...	..	..	..	..		...	60	..		...		..	...	8.50
Sac City	....	...		...	....	....		..	....	..	....	....				..	....	....	....	14		51	....	22	..	7.74		...	..	...	.....
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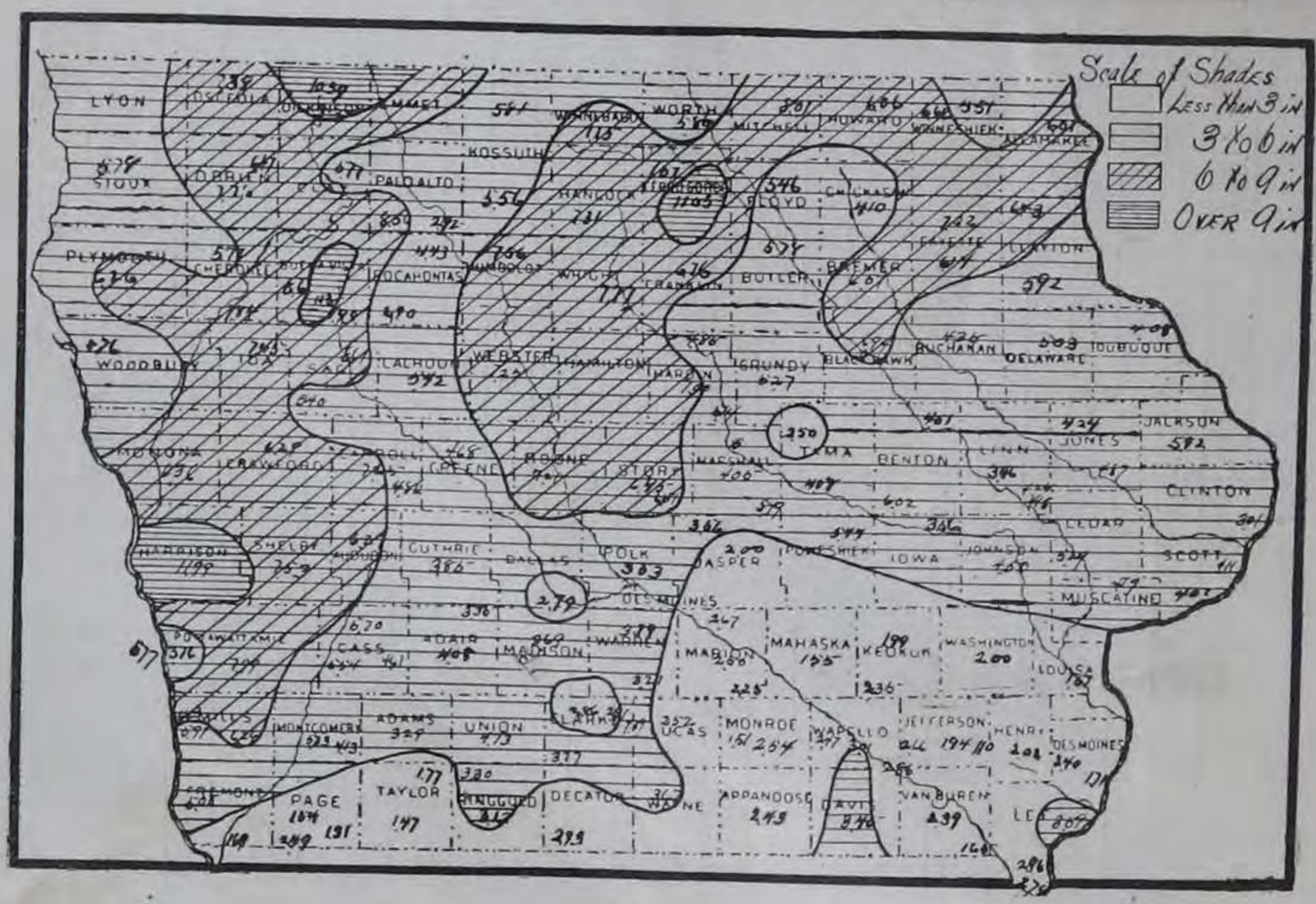
Sheldon	....	1 96	02	T	..	.14	.84	T	..		.58	.06	1.04	.01	.	.46	...	..	...	07	0		....	.17	17	.29	65	..	T	..	6.47
Sibley	....	2 05	..		T	13	.75	03	T	.02	1 58	81	.77			.16	....	....		0	09		....	.05	.04	.65	.25	..	....	.	7.39
Sigourney	....	.08	...	.10	...	T	.08	.10	.	..			.07	.39		....	T	..	....	T	....	T	T			1.17	....	....	....	.	1.99
Sioux Center	....	1.13	T		.12	.61		T	....		.38	T	.68	..		.71	....			07	T	.		.16	1.67	02	.23		....	.	5 78
Sioux City	....	.27	T	...	....	.60	.25	.02	T	..	.54		.61	.15	.06	T	...		..	.25	.01	01	....	.35	..	1 12	.52	..	..	...	4.76
Spencer	.60	2.35	.05		...	.23	...	T		...	....	1 00			..	.24	..	..		.					.45	.84	..	..	..	5.77
Storm Lake	....	.10	.01	..	...	.12	1.85	T	...	....	...		2 69	.95		..		...	.42	....	T	.06	.07		T	1 71	T	...			7 98
Spirit Lake	....	3.93	.25	....	..	1.53	....	T	.20	.	1 86	65	1 30	....				...			T			T	.30	.01	.20			...	10 39
Stuart	.10	.30	....	T	.	.15	...	..	....	....			.60	1 00	....	50		....	..	.13	T	...		T						....	3.35
Tara	....	..	.25	..	..	.50			..		..	.	1 50	.75	...	....	3.50	..		..	..	.20	50	..	..	..	....	..		....	7.25
Thurman	..	.60	45	...	T	T	.80	.04			...		.80	.50		.68		..		..	...	25	....	.25	..	.25	..			....	5.08
Toledo	....	.80		.19	....	.36		..	...	...	..	08	.34	.54		...	04		..		35	.30	80	.06	T	..	T	35	..	...		4.58
Villisca	...	.44	07	T	.	...	.29	..	T	...	....	....	.40	1 38	1.08	....		T		35	.30	1.20	....	.0	....	21	.11	..	..	...	4.13
Vinton		30		.13	..	.35	.31	....				....	.30	.83	..		T	07	....	14	04	.75	....	....	.5	....		....	..		4.51
Wapello	.08			.02	....	.04	.32	.05	....		....	....	..	.42	.	.	..	.02	T	.41	..	..	.15	..	....	....	.15	1 14		..	..	1 54
Washington	....	.33	....	.12	...		.15	0	...	..	..	..		.48	..	..	..	..	..	.18				..	....	....		..	...	...	2.10
Washta	...	.28	.12		...	1.40		16	..		T	.07	1.45		....	.95	..	..	..	15	T	10	....	.20	....	2.71	.25	...		..	7.84
Waterloo	....	46	.18	.06	..	.24	.22	....					.91	2 76	..	....	.51	..	.32	.05	.69	.25	....	T	...	04	.24	..			6 94
Waverly	..	97	.06		..	03	.82		.08	..	..		.58	2 9.	..	....	.60	..	...			.27					.15				6.51
West Bend		..	.62	...	.02	.84		01	....		..	.07	1.29	1 26		.06	.20	..	..	02	T	21	..	..	....	.10	.22	...	..	....	4 92
West Branch	1 00	1.05		....	....		.24	..		T	..	....	T	.60			....	T	T	1 32		15	..	....	....	38	.59	..	..		5.29
West Union	.		.83	...	.55	.30	.90	..			..	....	.29	43	..		1 86			..	.18	.53		....	..	..	27	..			6 14
Whitten	....	T	...	.	.	T	.41		.15		....	....	.74	.74	..				...		.78	.42	..	..		1 18	.72	...			5 14
Wilton Junction	...	.76		...		....	.15			..	....	..	15	.88		...	.98			1 27					....						4 19
Winterset	...		22	...	.04		.01		....	..	.	..	.37	1 44				1 31				..					T				3 49
Woodburn	...	1.00	T	.18	....	T	25	.28				...	T	1 62		02		T	02			T	.08			82	12				4 39

Precipitation Chart June 1899.



Vol. X. July, 1899. No. 7.



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Central Station, Des Moines, Iowa.

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DIRECTOR,

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LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

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DES MOINES:
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1899.

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MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME X JULY, 1899. No. 7.

IOWA CROP REPORT, AUGUST 1ST.

Following is a summary of the reports of county and township correspondents showing the average condition of unripened crops August 1st.

Corn has made marked advancement, and the average condition of the crop is rated at 90 per cent, as against 83 per cent on July 1st. The condition of other crops is estimated as follows:

Millet, 94 per cent; flax, 95; buckwheat, 90; broom corn, 88; sorghum, 91; apples, 59; grapes, 48; potatoes, 100; pastures, 94.

On August 1, 1898, the same correspondents reported the conditions as follows:

Corn, 94; millet, 90; flax, 95; broom corn, 90; potatoes, 78; apples, 63; grapes, 95, pastures, 86.

ACREAGE OF IOWA CROPS, 1899.

We present herewith a carefully prepared table showing the acreage of crops by counties for the current season. It is based on the census of crop acreage for the preceding season, made by the township assessors under the direction of the secretary of state, as provided by the statute. The acreage for this season is figured from the reports of county and township correspondents estimating the increase or decrease as compared with the year 1898. The figures are believed to be approximately correct. The following summary of the figures for the whole state will be of general interest:

Corn.—The total number of acres planted of this leading crop appears to be 8,460,521. Last year, according to assessors' returns, the total was 8,374,530 acres, showing an increased planting this year of 85,991 acres. There was a considerable increase noted in many counties, but this was in part offset by a decrease in others, so that the net gain in acreage was small.

Winter Wheat.—The area of winter wheat sown in the fall of 1898, as returned by the assessors, amounted to 154,177 acres. The larger part of the crop was lost by winter-killing, and according to careful estimates of crop correspondents the total number of acres left for the harvest was only 27,427 acres, or about 18 per cent of the area planted. It is quite probable the destruction was more nearly complete than those figures indicate.

Spring Wheat.—Acreage sown this year, 1,539,391 acres, a decrease of 87,735 acres, compared with last year.

Oats.—Number of acres sown this year, 4,069,557. Last year's acreage, 4,076,669; decrease, 7,112 acres.

Barley.—Number of acres harvested this season, 557,598. Last year, 575,815 acres; decrease, 18,217 acres.

Rye.—Acreage this year, 28,236 acres.

Flax.—Area sown this year, 142,175 acres. Area last year, according to assessors, 189,882 acres, showing a decrease of 47,707 acres.

Potatoes.—Area planted, 154,243 acres. Area planted in 1898, 155,131 acres.

Tame Hay.—Present acreage of timothy and clover meadows, 2,544,343 acres. Last year the aggregate was 235,286 greater.

Prairie Hay.—Acreage of wild hay reported by assessors last year was 1,198,332 acres.

Pasturage.—Acreage reported by assessors, 7,460,922 acres.

CLIMATE AND CROP REVIEW FOR JULY.

The average temperature of July for the state was about normal, with less than the usual number of oppressively hot days. The weather conditions were generally favorable for the rapid growth of vegetation, and also for the comfort of those who were engaged in farm operations.

The average amount of rainfall was less than normal, and there was considerable inequality in its distribution, the western half of the southern section receiving the largest quantity. The local stations in their records show a range from less than an inch to nearly nine inches of rainfall for the month. The greater portion of the state, however, received an ample supply of moisture, and there was but a small area wherein there was injury to crops from effects of dry weather.

The greater portion of the rain fell in the first half of the month. From the 3d to the 15th the weather was murky, cloudy and showery over a large part of the state, causing much delay in haying, cultivation of late corn, and cutting early grain; and there was considerable damage to hay that was cut and put up during that period. The heavy local showers and wet weather in the early part of the month also caused some damage to oats, spring wheat and barley, from the effects of lodging and rust. But the moisture was very beneficial to corn, potatoes, pastures, new seeding of timothy and clover, millet, flax and garden vegetables.

The last half of July was generally dry and warm, affording ideal weather conditions for securing the balance of the hay crop in prime order, and for harvesting the cereal crops. The time was well improved, and by the close of the month nearly all of the small grain was in shock or stack, and threshing operations were well under way. The month as a whole was very favorable for the rapid advancement of corn, which had made a late start and needed forcing conditions to bring it to maturity in advance of frost. According to reports of crop correspondents corn gained about eight points in condition in July. Other unripened crops were also well advanced.

IOWA CROPS, 1899—NUMBER OF ACRES BY COUNTIES.

COUNTIES.	Winter wheat, acres.	Spring wheat, acres.	Corn, acres.	Oats, acres.	Barley, acres.	Rye, acres.	Flax, acres.	Potatoes, acres.	Tame hay, acres.	Wild hay, acres.	Pasturage, acres.
Adair	.....	11,770	99,557	46,254	550	410	.....	1,863	27,120	6,560	72,915
Adams	107	7,840	71,608	23,480	170	150	.....	880	23,105	2,270	58,254
Allamakee	3,108	4,870	52,406	44,188	5,775	490	7,366	2,253	34,880	1,740	78,017
Appanoose	380	160	42,760	8,725	....	340	.....	488	44,161	1,174	88,223
Audubon	.....	19,920	90,540	37,360	3,816	515	.....	1,182	14,350	6,890	55,735
Benton	.....	3,530	120,740	74,510	15,770	1,360	.....	2,053	35,650	9,646	99,803
Black Hawk	.....	708	92,150	57,302	6,751	3,261	.....	1,670	34,045	12,880	80,418
Boone	.....	8,264	105,490	50,650	896	1,220	160	1,395	15,720	23,340	69,606
Bremer	.....	830	60,150	52,645	2,750	880	2,057	1,608	21,130	22,451	69,354
Buchanan	.....	614	85,510	52,410	3,072	1,040	158	1,512	38,160	17,422	91,199
Buena Vista	.....	18,230	109,972	58,516	7,630	635	1,490	2,051	14,810	27,104	62,087
Butler	.....	5,160	98,170	70,995	4,790	3,553	946	1,456	19,450	15,558	78,206
Calhoun	.....	16,130	102,550	51,738	3,920	1,265	1,198	1,290	11,135	25,318	53,510
Carroll	.....	28,357	120,960	54,750	4,415	970	260	2,303	15,910	21,775	67,000
Cass	180	26,520	114,515	39,804	827	260	.....	3,657	22,080	5,423	63,905
Cedar	.....	1,425	99,658	43,212	6,459	1,240	.....	1,264	46,128	1,070	85,182
Cerro Gordo	.....	6,583	87,350	73,887	8,270	1,767	5,662	1,650	26,410	15,865	79,850
Cherokee	.....	39,370	107,017	50,460	9,860	240	445	1,603	16,350	16,821	63,745
Chickasaw	.....	2,445	56,620	61,428	5,140	682	6,860	1,602	29,780	15,663	75,847
Clarke	185	76	55,568	19,890	.....	1,030	.....	883	36,550	763	73,238
Clay	.....	16,490	76,617	43,630	19,194	1,615	2,580	1,243	13,970	21,853	49,040
Clayton	2,160	5,860	74,570	59,590	5,403	4,580	110	2,140	38,120	457	114,939
Clinton	550	1,805	117,207	56,330	2,015	3,440	.....	1,517	47,614	4,577	103,920
Crawford	....	55,147	123,761	43,414	5 309	512	150	2,113	23,140	24,808	85,380
Dallas	280	6,847	90,238	32,265	705	650	.....	1,091	20,107	10,798	67,900
Davis	624	168	56,375	16,120	....	755	.....	478	45,950	104	112,491
Decatur	960	240	63,130	16,625	70	610	.....	753	40,670	1,180	114,568
Delaware	.....	922	88,513	47,465	5,370	1,407	.....	1,460	40,915	11,091	106,534
Des Moines	.....	280	52,143	31,357	...	980	...	887	19,890	598	51,108
Dickinson	.....	22,102	27,536	23,660	16,817	1,454	7,450	601	5,965	22,117	28,209
Dubuque	95	194	63,197	54,054	1,780	4,040	....	2,358	39,262	3,710	111,858
Emmet	....	30,332	37,820	23,660	10,850	540	6,028	430	6,560	20,122	27,301
Fayette	150	3,043	89,220	63,630	7,123	2,103	2,240	1,920	52,535	15,691	105,001
Floyd	.....	3,960	79,840	68,740	5,312	1,980	4,305	3,142	22,740	9,243	58,049
Franklin	.....	9,270	99,242	76,610	3,680	1,330	3,390	1,320	19,114	16,602	65,274
Fremont	3,508	10,690	108,250	11,824	720	270	....	680	11,640	4,568	46,682
Greene	.....	6,760	103,455	54,030	2,860	875	530	1,306	15,071	26,328	67,242
Grundy	....	10,389	96,370	70,690	13,730	960	402	2,148	22,590	16,987	66,144
Guthrie	.....	13,660	95,530	46,612	1,560	750	.....	1,510	25,680	9,696	75,245
Hamilton	.....	9,440	102,083	58,970	1,809	280	774	1,280	18,182	37,247	74,102
Hancock	.....	20,078	71,730	63,960	9,836	1,780	8,594	1,120	15,390	31,764	44,952
Hardin	....	11,560	94,036	58,662	2,991	480	651	1,280	20,790	18,762	72,255
Harrison	.....	41,330	102,650	15,802	850	1,025	.....	1,502	8,630	17,086	78,274
Henry	420	163	67,730	27,850	.....	990	.....	712	29,804	24	87,000
Howard	.....	3,394	50,490	52,362	6,742	250	6,365	1,099	35,521	14,260	53,075
Humboldt	.....	24,504	61,283	33,746	2,658	247	2,068	872	11,665	23,055	42,824
Ida	.....	25,356	98,014	39,890	4,393	190	.....	1,188	18,026	5,182	48,691
Iowa	.....	1,730	88,352	40,714	3,270	2,410	.....	1,257	37,750	4,057	87,905
Jackson	414	1,297	76,863	41,570	1,613	7,018	.....	1,645	39,810	1,938	127,801
Jasper	156	15,610	116,535	46,920	1,352	740	.....	6,760	35,910	3,048	108,961
Jefferson	1,420	220	54,907	21,167	.....	1,537	.....	510	35,210	43	92,071
Johnson	109	1,617	98,560	48,780	1 770	3,820	.....	1,635	43,082	2,332	106,933
Jones	.....	796	80,970	31,390	1,378	2,610	.....	1,070	42,031	1,566	110,864
Keokuk	.....	940	95,450	42,216	820	1,720	..	1,415	41,880	693	91,559
Kossuth	.....	50,810	114,560	78,407	15,620	530	9,886	2,930	15,260	68,467	75,302
Lee	587	170	46,187	13,590	....	1,245	.....	1,170	34,890	288	73,684
Linn	79	1,390	104,970	50,435	1,900	3,375	.....	2,310	47,310	7,532	111,964
Louisa	316	655	56,260	25,171	.....	1,530	.....	550	18,895	1,333	56,885
Lucas	503	290	47,063	17,580	56	1,120	...	460	40,808	415	72,243
Lyon	.....	95,287	55,540	35,630	53,230	610	919	1,569	5,647	15,537	32,688
Madison	314	8,049	82,980	26,450	846	1,230	.....	1,235	35,470	3,424	99,118
Mahaska	299	2,780	85,610	33,714	1,146	1,126	.....	1,778	29,432	1,228	93,787
Marion	48	8,352	89,572	31,213	798	1,627	.....	1,476	24,190	2,130	74,718
Marshall	.....	17,733	96,950	48,320	1,980	437	.....	1,838	30,430	3,102	71,877
Mills	315	19,304	96,318	14,518	340	204	.....	1,096	15,450	6,633	62,343
Mitchell	.....	5,839	53,837	51,310	15,260	1,014	12,020	2,027	33,810	4,328	44,654
Monona	48	32,945	119,320	14,780	4,580	960	.....	1,130	7,560	29,760	74,718
Monroe	240	138	42,410	10,763	.....	772	.....	470	30,918	465	97,771
Montgomery	293	25,160	95,870	16,880	....	278	.....	1,014	16,360	2,373	62,896
Muscatine	840	1,840	64,508	25,380	3,835	2,270	...	1,865	23,409	4,280	65,973
O'Brien	.....	42,129	91,101	45,343	36,895	260	1,956	1,350	12,340	15,743	55,116
Osceola	....	41,746	39,740	28,120	27,690	358	4,324	894	7,931	11,619	18,902
Page	2,680	13,370	123,558	22,511	741	905	.....	1,320	28,207	4,243	83,872
Palo Alto	.....	13,842	68,507	49,690	7,074	808	5,316	990	6,259	39,253	49,399
Plymouth	.....	113 560	130,131	45,840	9,219	540	370	2,228	10,156	31,405	68,102
Pocahontas	....	17,095	90,173	53,270	7,220	910	5,210	2,046	8,940	41,695	61,723
Polk	112	14,949	99,878	34,260	210	540	.....	3,836	21,357	14,574	67,231
Pottawattamie	.....	63,058	213,176	38,265	960	935	.....	4,110	27,090	19,433	121,320
Poweshiek	185	3,390	105,198	48,920	3,490	730	- - ..	1,380	39,380	2,085	104,791
Ringgold	318	270	87,016	25,578	210	590	.....	920	40,620	1,517	105,147
Sac	....	18,875	119,550	50,152	6,802	730	620	1,270	20,170	19,344	66,378
Scott	3,048	7,540	73,905	25,450	24,476	2,020	.....	5,402	25,627	5,512	60,173
Shelby	.....	46,540	125,220	33,826	5,690	513	... .	2,083	23,652	9,868	66,377
Sioux	.....	119,573	107,020	58,480	27,524	517	495	1,504	6,127	24,102	48,025
Story	.....	6,148	102,693	50,270	962	1,140	.... ..	1,152	21,643	19,542	64,892
Tama	133	13,150	114,240	53,073	27,488	809	.....	1,680	32,114	7,098	102,759
Taylor	1,194	597	86,340	23,707	506	719	.....	2,146	36,481	1,862	86,178
Union	56	576	60,714	26,037	250	610	.....	926	34,810	1,132	74,212
Van Buren	189	.....	32,952	15,386	.....	1,035	.....	387	41,240	118	103,532
Wapello	.....	540	53,273	19,843	.....	1,008	.... ..	901	33,260	254	80,606
Warren	201	7,929	84,395	29,610	350	1,146	.....	1,880	34,070	2,329	96,280
Washington	249	397	85,742	40,986	460	2,113	.....	946	40,260	253	84,094
Wayne	134	2,173	41,260	13,540	.....	380	...	857	49,903	306	67,315
Webster	.....	14,438	114,918	70,958	4,920	1,350	1,870	1,353	12,239	42,284	85,860
Winnebago	.....	28,320	40,058	37,560	3,957	180	4,190	958	9,858	24,282	31,649
Winneshiek	240	10,550	72,430	65,310	10,717	10,178	8,850	1,445	42,170	8,184	81,509
Woodbury	.....	82,198	144,565	28,280	5,165	728	450	1,890	8,052	22,434	75,243
Worth	....	7,750	37,259	50,520	7,150	270	9,620	1,130	16,560	15,556	44,574
Wright	.....	16,890	87,609	61,132	5,100	480	3,870	1,220	13,750	29,623	55,479
Totals for state	27,427	1,539,391	8,460,521	4,069,557	557,598	126,236	142,175	154,243	2,..4,343	1,198,312	7,460,922

WHAT GLACIERS HAVE DONE FOR IOWA.

BY PROF. SAMUEL CALVIN, STATE GEOLOGIST.

Everybody knows in a general way that Iowa was once the abode of glaciers and presented an aspect as dreary and uninviting as the central portions of northern Greenland or the ice-locked continent of the Antarctic It may not, however, be so generally known that severe glacial conditions have recurred in Iowa more than once, and that in some cases at least, the interglacial intervals were characterized by a mild climate and, in point of duration, were more than equal to all postglacial time. A consideration of Greenland and Antarctica, in their present condition of frigid deso'ation, would scarcely suggest that the action of glaciers could be, in any way, beneficent; but it needs only a comparison of preglacial, with postglacial Iowa to demonstrate the fact that glaciers and glacial action have contributed in a very large degree to the making of our magnificent state. What Iowa would have been, had it never suffered from the effects of the ponderous ice sheets that successively overflowed its surface, is illustrated, but not perfectly, in the driftless area. Here we have an area that was not invaded by glaciers. This area lies mostly in Wisconsin, but its edges overlap southeastern Minnesota, northeastern Iowa and northwestern Illinois. In our own state, Allamakee county and parts of Winneshiek, Fayette, Clayton, Dubuque and Jackson, belong to the driftless area. Furthermore, the southern limits of glacial action are fairly well defined, coinciding in a general way with a line drawn from Jefferson City to St. Louis, and along the Ohio river from near its mouth to Pittsburg. East of Pittsburg the glacial boundary curves to the north and east, and at last conforms very nearly to the southern edge of Long Island. South of the line described there are further opportunities for comparing preglacial Iowa—or rather what Iowa would have been without the modifications wrought by glaciers—with the Iowa we know to-day. There is yet one other way of learning something about the surface of preglacial Iowa. During the last two decades numerous deep wells have been bored through the loose surface deposits and down into the underlying indurated rocks. The records of these wells show that the rock surface is very uneven. Before the glacial drift, which now mantles nearly the whole of Iowa, was deposited, the surface had been carved into an intricate system of hills and valleys. There were narrow gorges hundreds of feet in depth, and there were rugged rocky cliffs and isolated buttes corresponding in height to the depth of the valleys.

If the eroded rock surface had not been covered up and protected by the mantle of glacial detritus, the angular, jagged topography indicated by well records as characterizing preglacial Iowa, would have been toned and softened, to some extent, by erosion and atmospheric waste. So far, therefore, as topography is concerned, the driftless area and other nonglaciated portions of the country give a more correct notion of what Iowa would have been if the great ice sheets had not worked their beneficent effects upon its surface.

The driftless area differs from the drift-covered portions of Iowa in a number of important particulars. For present purposes, however, these differences may conveniently be reduced to two classes: First, differences in topography, and, second, differences in the superficial materials or soils.

To a person passing from the drift-covered, to the driftless part of the state, the topography presents a series of surprises. The gentle undulations of the drift give place to sharp contours and high reliefs. The topography is of the most pronounced erosional type. The principal drainage streams flow in valleys that, measured from the summits of the divides, are 600 feet or more in depth. The Oneota or Upper Iowa river, in Allamakee county, for example, flows between picturesque cliffs that rise almost vertically to a height of from 300 to 400 feet, while from the summit of the cliffs the land rises gradually to the crest of the divides, three, four, or five miles back from the stream. Tributary streams cut the lateral slopes and canyon walls at intervals These again have tributaries of the second order. Each affluent indeed branches and re-branches until the whole surface of the drainage slopes is occupied by a palmate system of sharp erosion channels separated by rounded ridges. In such a region a quarter section of level land would be in the nature of a curiosity. The straight section-line roads that divide the drift-covered parts of the state into squares as regular as a checker board, are altogether unknown; for highways must, perforce, go where they can, and in the driftless area they wind along the summits of ridges or pursue an even more tortuous course along the stream valleys. In passing from valley to divide, the grades are steep and long; and always, no matter what the direction or purpose of the traveler, the way is sinuous, and the journey is much longer than would be necessary if it were possible to follow straight lines.

Railroad building in such a country is almost out of the question. At all events it is attended with difficulties that would scarcely be appreciated by the residents of the drift-covered portions of the state. For example, the short piece of road between Waukon Junction and Waukon, pursues a tortuous journey of 33 miles, and yet the two points, measured on an air line, are only about 16 miles apart. In the 33 miles of distance the grade rises nearly 600 feet, while curves, numerous and sharp, offer further obstacles to successful operation. The road in question follows the valley of Paint creek, and the trains winding back and forth on the sinuous track grind around the sharp curves with creakings and groanings unutterable. This is a fair example of railroading in the driftless area, a fair example of conditions that would have been met throughout the whole state of Iowa, had it not been for the leveling effects of glaciers Compare this picture with that presented by railways in the counties west of Howard, Chickasaw, and Fayette, where the lines are laid out on straightaway courses, across valley and watershed, with scarce perceptible grade, for scores of miles at a stretch. For the matchless facilities with which the highways of transportation, between different portions of our state and neighboring states, are established and maintained, we are indebted, to an extent difficult to appreciate, to the beneficent action of glaciers.

In the matter of soils, our debt to glacial action is even greater than in the matter of topography. In a non-glaciated Iowa we might have moved about from point to point, though as compared with present conditions it would have involved great expense, great loss of time, and much inconvenience. But a non-glaciated Iowa could never have taken rank as a great agricultural state In an area that has received no glacial tribute the soils are, in general, the result of decay of rocks in places. If, as in the case of Iowa, the area has but recently been elevated from 300 to 600, or 800 feet above base level, the drainage streams flow in deep valleys. The sides of the valleys rise at a high angle. As fast as the soil is formed it is washed from the steep slopes. Over a large percentage of the surface the rocks are bare, while areas that are not completely denuded have soils too thin for purposes of successful agriculture. Furthermore, even where such residual soils as are possible to driftless regions accumulate to a moderate depth, they are found to vary with the nature of the underlying rocks from which they are derived; they are completely oxidized and thoroughly leached of all soluble constituents; they are difficult of cultivation, and crops can only be produced at the expense of much labor and by the liberal use of fertilizers. Exceptions to this general statement are found in narrow belts of rich alluvial soils along the stream valleys; but soils of uniform excellence, spreading between the two great rivers, and from northern to southern boundary, would have been impossible in a non-glacial Iowa.

The conversion of a deeply trenched and eroded surface into a gently undulating plain, upon which wagon roads and railways, facilitating social and commercial intercourse, may be constructed with a minimum of labor and expense, is a service of immeasurable value; and yet this is one of the least of the beneficent effects of glacial action in Iowa. The soils of Iowa have a value equal to all the gold and silver mines of the world combined. In fact it is difficult to find sources of wealth with which our soils may properly be compared. And for all this rich heritage of soils we are indebted to great rivers of ice that overflowed Iowa from the north and northwest. The glaciers, in their long journey, ground up the rocks over which they moved and mingled the fresh rock flour, derived from granites and other crystalline rocks of British America and northern Minnesota with pulverized limestones and shales of more southern regions, and used these rich materials in covering up the bald rocks and leveling the irregular surface of preglacial Iowa. The materials are, in places, hundreds of feet in depth. They are not oxidized or leached, but retain the carbonates and other soluble constituents that contribute so largely to the growth of plants. The physical condition of the materials is ideal, rendering the soil porous, facilitating the distribution of moisture, and offering unmatched opportunities for the employment of improved machinery in all the processes connected with cultivation. Even the driftless area received great benefit from the action of glaciers, for, although the area was not invaded by ice, it was yet to a large extent covered by a peculiar deposit called loess, which is genetically connected with one of the later sheets of drift. The loess is a porous clay rich in carbonate of lime. Throughout the driftless area it has covered up many spots that would otherwise have been bare rocks. It covered the stiff, intractable residual clays that would otherwise have been the only soils of the regions. In itself it constitutes a soil of great fertility. Every part of Iowa is debtor in some way or other to the great ice sheets of the glacial period.

NOTE AND COMMENT.

The cry of drouth, and the promulgation of theories about timber-cutting and tile-drainage drying up the earth, are no longer heard in the land. They have been laid aside for use in the next dry spell.—*Charles City Citizen.*

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Mr. W. E. Donaldson, one of the assistant observers at the U. S. Weather Bureau station in Des Moines, has received a well-merited promotion, and has been assigned to duty as assistant at Ithaca, N. Y., the central station of the climate and crop section of that state. While greatly regretting his departure, we are pleased that his faithful work has brought official recognition and deserved advancement.

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A recent news special from Berlin, Germany, states that during a thunderstorm forty people were prostrated and three of the number killed by a stroke of lightning. They were standing against a wire fence, or railing, witnessing the closing heat of a horse race when the fatal discharge occurred. This serves as another object lesson as to the danger of contact with metallic conductors when electric storms are raging.

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At a recent meeting of the Institute of Mining Engineers in London, Major-General Schaw suggested a new idea in the way of blasting cartridges. His plan is to fill a metal cartridge with water, insert it in the drill hole, and then turn on an electric current which will produce a high pressure of steam in the cartridge, and explode it with a force of 150 pounds to the square inch, within a minute after the current is turned on. This plan, if it is found to be effective, possesses the merit of cheapness and safety.

The sections that complained most loudly of excessive moisture in May were the first to call for rain about the 1st of July. The soil had formed a habit of being soaked, and cried for more water when the supply was suddenly cut off.

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On the morning of August 1st Miss Anna Richart, residing near Madrid, in Boone county, was killed by lightning while engaged in hanging clothes upon a wire line. The bolt struck the wire and the young lady's body served as a conductor from the metal to the moist earth. Wire clothes lines, as well as wire fences, are dangerous, unless they are electrically connected with the earth by ground wires.

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The Burlington (Iowa) *Saturday Post* says: "In Corea the natives are attributing the drouth to the evil influences of the new electric cars which were recently introduced into Chemulpo from Japan. But even that is more rational than the superstition of some of the natives of Iowa who were led not many years since by "Prof." Foster to believe that the weather in the Mississippi valley was regulated by the conjunction of planets many millions of miles away. The Corean simpleton is to be borne with. There are others."

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Mr. Orris W. Roberts, late of the U. S. Weather Bureau office at Washington, D C, has been assigned to duty as an observer in the Des Moines office, to fill the vacancy caused by the transfer of W. E Donaldson to Ithaca, N. Y. Mr. Roberts is a native of Dunlap, Iowa, and completed his educational work at school by a two years' course in electrical engineering at the Iowa Agricultural College. He served three years in engineering at the World's fair in Chicago, and received an appointment as observer in the Weather Bureau in July, 1898. He possesses the requisite qualities and has received an excellent training for a successful career in this branch of the public service.

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The Des Moines Leader: "Of course the invention of a 'cyclone annihilator' has been announced, and, of course, again, the discoverer is a Chicago man. The 'annihilator' is a cannon, equipped with a weather vane and air trigger. The weather vane is to aim the cannon, which rests on a vertical pivot. When a cyclone approaches the back yard or the front stoop the vane will turn the cannon's muzzle full in the teeth of the monster. When the wind reaches sixty-five miles an hour it will spring the trigger, and 'bang!' the projectile fired into the revolving cloud will dissipate it, converting it into a gentle and tractable zephyr. In making this cannon it is suspected that the inventor melts down and recasts old rainmaking machinery."

***

A resident of Sioux City, according to the *Journal* of that place, claims to possess the power of healing diseases by laying on hands and invoking the aid of the planets. The moon is the chief factor in the healing business, though the other bodies of the solar system lend a helping hand now and then. The man who serves as the medium through which the healing power is transmitted says the lunar influence is effective only three or four days immediately following the new moon. During its period of getting full and recovering from the effects of its fullness the moon's healing power is in a state of suspension, as it were. When it comes up new and fresh, regal in its crescent form, it is ready again to take up its beneficent work of healing human maladies. Now all this may seem ridiculous to certain skeptical people, but we can assure them this newly developed lunaopathy is not a whit more absurd than the traditional notions of those who closely follow the moon's phases in their farming operations; nor is it more ridiculous than some of the claims and pretensions of the planetary school of long range weather prognosticators.

Applicants for government appointments will be interested n the following summary of requirements for a subordinate position in the Weather Bureau, prepared by an official of many years' experience: "A Weather Bureau man serving on station, whether he ranks as local forecast official, section director, observer, or revels in the three combined, to be a credit to the service must be a man of education and training, and in addition to being, like Benjamin Franklin, a 'philosopher, philanthropist, and printer,' should be a statistician, a geologist, and a farmer; he must be able to prophesy of weather events to come and keep an accurate and comprehensive record of those past. He should be an electrician, too; and an astronomer, unaided by any star-gazing paraphernalia with which to sweep the heavens for lost comets."—*Chicago Tribune.*

JULY WEATHER RECORD.

The month was about normal in temperature, the average for the state being 73.1°, with a range of about 6° from the lowest to the highest mean. The average of the northern section was 71.8°; central section, 73.4°; southern section, 74°,

The extremes for the month were recorded as follows: 101° at De Soto, on the 23d, and 38° at Mason City, on the 30th. The hottest weather of the month was from the 23d to the 26th, inclusive.

The average rainfall for the month was 3.07 inches, which is about half an inch below the July normal for the state. The extremes were 8 66 inches at Lenox, and .42 of an inch at Whitten. By sections the averages were as follows: northern section, 2.53 inches; central section, 2 30; southern section, 4 37 inches. There were 16 clear days, 5 cloudy, and 10 partly cloudy.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 29.96 inches; highest observed, 30.35, at Clarinda on the 17th; lowest observed, 29.64, at Omaha, Neb., on the 31st; range for the state, .71 of an inch.

Temperature.—Monthly mean, as deduced from 121 reports, was 73.1°; highest monthly mean, 76.1°, at Keosauqua; lowest monthly mean, 69.8°, at Sibley; the highest temperature reported was 101°, at De Soto on the 23d; the lowest temperature reported was 38°, at Mason City on the 30th; the average monthly maximum was 93.6°; the average monthly minimum was 48 6°; the greatest daily range was 47°, at Mason City; average daily range, 34.9°.

Precipitation.—Average for the state, as determined from the reports of 139 observers, 3.07 inches; the largest amount reported was 8.66 inches, at Lenox; the least amount was .42, at Whitten; the greatest daily amount reported was 3 60 inches, at Amana and Bedford on the 3d; the average number of days on which .01 inch or more of precipitation was reported, 7.

Wind.—Prevailing direction, southwest; highest velocity reported, 39 miles per hour from the south, on the 5th, at Sioux City.

Weather.—There were 16 clear days; 10 partly cloudy days, and 5 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES. Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.96	30.21	9	29.75	15
Des Moines	29.99	30.28	8	29.79	20
Clarinda	31.00	30.35	17	29.82	15,20
Cresco	.....	30.27	8	29.81	15
Dubuque	29 95	30.23	8	29.74	20
Omaha, Neb	29.91	30.24	8	29.64	31
Keokuk	29.97	30.24	9	29.80	14
Sioux City	29.97	30.28	8	29.79	21
Means	29.96	30.35	17	29.64	31

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	4,020	35	W	7
Des Moines	4,063	36	SW	6
Dubuque	4,199	25	NW	26
Keokuk	3,937	20	SE	31
La Crosse, Wis	.....	.....	.....	.....
Omaha, Neb	4,756	27	N	29
Sioux City	6,966	39	S	5

OBSERVERS' NOTES

BONAPARTE—*B. R Vale.* A royal month for corn culture' hay making and grain harvest generally; June and July corn is late but in good tilth.

COON RAPIDS—*Downs & Co* Harvesting of all small grains well under way, and had most favorable weather for haying and harvesting; corn has gained, and is as far advanced as usual for this time of year, if not better.

GREENFIELD—*J. G. Culver.* There has been very little wind during the month; oats and corn mostly stand well.

GRINNELL—*A. O. Price.* Seldom better harvest weather, and seldom grain standing better to harvest

WEST BEND—*Phil. Dorweiler.* A fine month and harvesting pretty well along, promising a fair yield.

ERRATA IN MAY REVIEW.

ESTHERVILLE—Total precipitation should have been 4.93 inches.

FT. MADISON—Total precipitation should have been 12.24 inches.

TOLEDO—Total precipitation should have been 8 56 inches.

BELATED REPORTS.

FAYETTE—*May.* Mean temperature, 58.7°; maximum temperature, 82°, on the 25th; minimum temperature, 33°, on the 13th; total precipitation, 6 69 inches; greatest amount in twenty-four hours, 2.04 inches, on the 28th; prevailing direction, southeast. Number of clear days, 7; partly cloudy, 18; cloudy, 6; rainy, 17.

FAYETTE—*June.* Mean temperature, 68.8°; maximum temperature, 91°, on the 19th; minimum temperature, 43°, on the 16th; total precipitation, 5.54 inches; greatest amount in twenty-four hours, 1 93 inches, on the 13th and 14th; prevailing direction, northwest. Number of clear days, 12; partly cloudy, 14; cloudy, 4; rainy, 11.

CLIMATOLOGICAL DATA FOR IOWA, JULY, 1899.

NORTHERN SECTION.

STATIONS	COUNTIES.	Elevation, feet.	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIPITATION, INCHES.				Number rainy days	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Algona*	Kossuth	1,500	7	68.6	-5	94	21	55	30	...	2 12	- 11	.80		6	15	15	1	NW
Alta	Buena Vista	1,519	8	71.4	-1	90	20,21,23	48	29	30	2.89	-.71	1 51	.....	8	16	12	3	S
Alta (near)	Buena Vista	....	....	....	....	..	....	..	....	.....	2.15	.. ..	.94	.....	9	....	....	....	.....
Britt	Hancock	1,230	....	70.8	....	93	23	43	30	32	2 58	.....	96	....	8	5	26	0	SW
Charles City	Floyd	1,012	8	71 6	-1	93	21	39	30	36	1.82	- 91	.62	.....	5	15	14	2	SE
Clear Lake	Cerro Gordo	984		75.0	....	98	25,28,30	54	2	38	1.42	.....	.54	....	4	25	6	0	SE
Cresco	Howard	1,312	27	70.1	-1	90	21	41	30	30	3.47	-.43	1.00	....	11	21	3	7	SW
Decorah	Winneshiek	900	6	70 7	+1	98	22	42	30	36	1 57	-.82	.55	...	10	....	....	..	SW,NW
Dows	Wright	.. .	..	71.2	.....	91	22	47	30	34	1.44	.. ...	.54	....	6	21	5	5	SW
Eagle Grove †	Wright	.....	..	71.9	....	....	... ...	...	.....	....	.....	.....	....	.....	...	...	...	...	.....
Elkader	Clayton	....	19	73.2	-1	98	21	42	30	44	2 02	-2.09	1.50	.....	5	17	12	2	N, W
Emmetsburg (G)	Palo Alto	.. .	....	.....	.....	....	.....	.....	....	....	1.97	... .	.82	....	4	...	..	...	.....
Fonda	Pocahontas	.....	....	72 4	....	93	23	46	30	35	3 02	.. ...	1.37	.....	5	14	12	5	S
Forest City‡	Winnebago	1,220	.	71.3	.....	91	23	47	30	31	2.20	...	.65	...	7	19	3	9	SW
Grand Meadow *	Clayton	. ...	8	69.9	0	88	21	54	30	.....	2.24	-1.40	1.48		5	...	...	...	SW
Greene	Butler	943	..	73.4	.....	98	22	40	30	45	72	.....	.36	...	4	21	7	3	W
Hampton	Franklin	1,240	...	72.7	.....	95	22	49	30	36	2.79	.....	.86	...	7	12	17	2	SW
Hawkeye	Fayette	.....	...	....	....	....	.....	....	.....	.....	4.38	.....	2.50	.....	6	....	...	....	.....
Humboldt	Humboldt	1,082	..	72.2	.....	92	12,21,22	46	30	35	2.02	.....	1.00	....	7	24	5	2	SE
Lansing	Allamakee	....		73.2	...	94	21,22,23	43	30	38	1.11	....	.37	...	5	23	4	4	.....
Larrabee‡	Cherokee	....	8	71.8	0	91	21	48	29, 30	35	2.71	-1 23	.92	...	7	8	23	0	SW
Le Mars	Plymouth	1,221		71 6	.....	91	11, 20	49	8	33	3 22	... ...	.90	.....	6	19	9	3	S
Mason City (d)	Cerro Gordo	1,130	..	70.8	.....	92	25	38	30	47	2.25	.... ..	.65	....	6	..	..	....	.....
New Hampton (b)	Chickasaw	1,166	...	71.2	.....	91	21	46	30	31	3.32	.....	2.45	.. ..	5	..		....	NW
Northwood	Worth	1,210	.	71.0	.. ..	93	21	43	30	39	3 18	.....	1.40	.. ..	5	24	3	4	S
Osage	Mitchell	1,178	..	70 8	.....	92	21	42	30	36	2 06	.....	.87	.....	7	6	15	10	S,SW
Plover	Pocahontas	.....	...	72.6	.....	96	12	45	30	43	1 82	.....	.60	.....	9	24	6	1	SW
Primghar	O'Brien	...	....	75 4	.....	95	10, 20	47	29	33	2 85	.....	1 20	....	6	23	0	8	S
Ridgeway	Winneshiek	...	...	72.7	.....	93	22	50	30	33	2.82	.....	.74	.....	10	23	6	2	S
Ruthven	Palo Alto	.	....	72.8	.....	94	20, 22	46	2, 7	40	3 88	.....	1.58	.....	6	18	10	3	SW
Sheldon	O'Brien	1,406	..	70.3	... ..	92	20	45	29, 30	35	3.20	.....	.85	...	8	14	11	6	SW
Sibley	Osceola	1,509	..	69 8	.....	93	20, 21	45	30, 31	36	4.20	.....	1.34		9	13	16	2	S
Sioux Center (h)	Sioux	....	....	75.9	....	97	20	51	29	33	2.20	.....	.80	...	7	17	11	3	SE
Spencer (e)	Clay	....	..	70.6	....	93	10	45	30	34	2 28	.....	1 29	... .	5	....		..	S
Spirit Lake	Dickinson	..	....	70.9	.....	95	11	49	31	32	6 91	.....	2.37	.....	7	16	13	2	S
Storm Lake	Buena Vista	....	....	71.1	....	88	25	51	8, 29	25	.62	.....	.28	..	7	19	12	0	S
Washta	Cherokee	.....	...		....	....	.. ....		.....	....	1.69	.....	.60	....	8	.	....	...	SE
Waverly	Bremer	942	....	72.3	...	91	22	45	30	33	1.35	.....	.54	...	7	16	3	12	S
West Bend * (b)	Palo Alto	.	6	71.5	0	92	23	55	29	....	3.02	+ 06	.86	.....	8	16	11	4	S
West Union	Fayette	1,105	...	...	.....	..	....	....	....	....	2.93	.....	2.00	.....	3	..	....	....	SW
Average		....	....	71.8	-1.0	93.1	.....	46.3	....	35.6	2.53	- 80	.....	....	7	18	10	3	S

CENTRAL SECTION.

Amana	Iowa	....	23	73.9	0	92	12	48	30	36	5.78	+1 67	3.60	.....	8	18	10	3	SW
Ames	Story	936	19	73.2	-2	92	12,22,25	51	30	35	1.60	-2.85	.50	...	4	18	12	1	.....
Audubon	Audubon	.....	6	72 2	-1	91	23	50	30	35	2 64	-.69	1.35	...	4	11	15	5	S
Baxter	Jasper	...		74 2	....	98	25	50	30	37	1.77	....	.86	.....	7	2	24	5	NW
Belle Plaine	Benton	840	9	73.0	0	94	12	48	30	33	2.87	- 32	1.80	..	7	11	18	2	SE
Carroll	Carroll	.....	9	71.4	-2	93	10	45	30	37	1.40	-1 82	.73	...	7	25	3	3	.....
Cedar Rapids	Linn	744	17	76.0	+1	98	22, 25	50	30	34	3.20	-.55	1.13	....	8	19	5	7	SW, W
Clinton	Clinton	609	8	73.3	-1	94	24	46	30	35	3.54	.....	1 40	..	5	13	14	4	SW
Coon Rapids	Carroll	...	..	72 5	....	90	10,22,23	50	30	34	2.30	.. ..	.70	....	8	16	9	6	S
Davenport	Scott	615	27	75 2	0	94	26	54	30	27	2.84	- 50	.86	....	7	16	8	7	SW
Delaware	Delaware	1,084	8	71.9	0	91	26	47	30	30	2.12	-1.18	1.02		7	16	11	4	S
Denison	Crawford	1,192	6	72.6	0	95	10	48	30	36	1.95	-1.79	.81	...	6	..	..	....	S
Des Moines	Polk	867	21	73.5	-1	91	11	52	30	30	2 20	-.18	1.18	....	9	12	15	3	SW
De Soto c	Dallas	886		74.9	.....	101	23	50	30	39	4.48	...	1.50	.....	7			....	SW
Dubuque	Dubuque	665	26	74.0	0	92	21	51	30	26	4.12	-.15	1 57	.....	9	16	12	3	NW
Galva	Ida	.....	6	71.6	-2	93	23	49	8	38	1 39	-2.03	.51	.....	6	19	11	1	SW
Gilman	Marshall	1,035	...	....	....	..	.....	...	.....	....	2.30	.....	1.55	..	5	19	7	5	S
Gladbrook	Tama	....	...	....	....	..	.....	.....	.....	....	1 90	.....	1.25	....	3	....	..	....	.....
Grinnell (near)	Poweshiek	....	...	73.0	.....	90	21, 25	54	30	29	2.84	...	1.84	....	8	18	7	6	SW
Grundy Center	Grundy	966	8	71.0	-1	93	22	43	30	33	1.69	-2.04	52	..	5	19	6	6	N
Guthrie Center	Guthrie	1,269	...	71.9	.....	93	23	41	30	40	2 80	.....	1.07	.....	11	5	24	2	SW
Harlan	Shelby	.....		72.6	....	94	12	50	30	37	2.31	.. ....	.83	....	7	13	7	11	S
Independence	Buchanan	921	37	71.1	0	91	21, 22	46	30	32	1.16	-3.13	.65	....	6	22	6	3	SW
Iowa City	Johnson	644	9	73.6	0	93	21,22,25	48	30	34	3.78	-.35	2.09	....	9	18	8	5	SW
Iowa Falls	Hardin	....	6	72.4	0	95	22, 23	41	30	44	1.43	-1.39	.67	.....	6	20	7	4	SW
Le Claire	Scott	....	....	..	.....		.....	..	.....	.....	3.06	.....	1 31	....	8			....	.....
Logan	Harrison	928	34	73.6	-1	95	23	47	17	32	1.83	-3.03	83	....	5	19	12	0	S
Maquoketa	Jackson	....	6	72.3	-4	96	21	45	30	36	2.77	-.42	1.71	.....	7	20	9	2	SW
Marshalltown	Marshall	898	7	73.6	+2	95	22	46	30	36	1.00	-3.34	.26	....	6	19	10	2	S
Monticello	Jones	800	45	72.9	0	93	21, 23	48	31	41	2.48	-1 66	1 77	....	7	19	6	6	SW
Mt. Vernon*	Linn	858	.	75.0	.....	94	22, 24	.....	.....	...	5.49	.....	2 60	...	5			....	.....
Mt Vernon (Hubbard)	Linn	...	...	75.2	.....	95	21	50	30	35	5.51	.....	2.45	.....	10	20	6	5	S
Newton	Jasper	958	12	73.6	-1	93	22	50	30	36	2.30	-.89	1 60	....	6	17	11	3	S
Odebolt	Sac	.....	..	73.7	...	97	11	48	8	40	1.11	.....	.31	....	7	23	7	1	.....
Ogden	Boone	1,109	....	72.0	...	92	23	51	30	32	2 17	.....	1.05	...	7	19	7	5	NW
Olin a	Jones	.....	...	72.4	....	91	24	46	30	32	3.34	.....	2.00	....	6	21	7	3	W
Onawa	Monona	...	..	73.8	.....	92	25	53	8	28	1.29	.....	.53	....	6	22	6	3	S
Rockwell City	Calhoun	1,219	..	73.7	.....	93	23	52	8	34	2 32	.....	.95	....	6	24	6	1	.....
Sac City	Sac	900	...		.....	91	10,23,25	51	8	32	1.27	.....	.39	....	7	20	8	3	S
Scranton	Greene	.....		7[illegible]	...	93	21, 22	54	7, 30	33	1 58	.....	.51	....	7	19	11	1	SW
Sioux City‡	Woodbury	1,122	10	73.5	0	94	20	54	8, 29	32	1.00	-2.16	.45	....	5	16	5	10	S
Tara	Webster	1,159	.		.....	99	23	65	7	20	2 00	.. . ...	1.50	....	2	0	31	0	SE
Toledo	Tama	..	5	73 2	1	95	24	43	30	39	2.37	-.71	1 30	....	6	22	0	9	SW
Vinton*	Benton	800	9	72.0	0	90	21,22,25	53	30	....	1.94	-.65	1.10	...	4	25	4	2	SW
Waterloo	Black Hawk	862	20	72.8	-5	94	22	45	30	36	1.61	-2.37	.61	....	7	16	12	3	W
West Branch	Cedar	708	..	72.0		91	24, 25	45	30	38	3.75	.....	2.05	....	6	25	3	3	SW
Whitten *	Hardin	.....	..	72.8	..	96	22	56	31	..	.42	... .	.23	.....	3	14	16	1	SW
Wilton Juncton	Muscatine	....	..	74.4	....	94	12	46	30	34	3.24	.....	2.07	.....	7	20	7	4	SW
Average		....	....	73.4	-0.7	93 6	...	49.0	.....	34.1	2.30	-1.27	...	.....	6	15	8	8	SW

CLIMATOLOGICAL DATA FOR IOWA, JULY, 1899—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT						PRECIPITATION, INCHES				Number rainy days.	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Afton	Union	...	...	74.5	....	95	12	52	9, 30	38	6.33	.....	1.69	.....	10	12	13	6	SW
Albia	Monroe	945	...	72 8	..	92	12, 22	47	30	32	5.29	.....	1.67	....	5	22	7	2	S
Atlantic	Cass	...	8	72.4	-1	94	11,23,25	48	17,18,30	45	4.71	+1.14	2.00	.....	8	10	16	5	S
Batavia	Jefferson	640	...	...	.....	....	.....	.....	.....	.....	3 33	.....	.92	.....	5	...	....	..	.....
Bedford	Taylor	...	...	74.8	...	96	11,22.23	48	30	42	8.60	.....	3.60	.....	12	11	20	0	SW
Belknap	Davis	857	....	74.0	.....	94	26	52	30	29	5.25	.....	1 75	.....	8	17	10	4	W
Blockton *a*	Taylor	....	....	74.8	...	93	23	52	9	36	5.93	....	1 90	...	10	....	....	..	SE, SW
Bonaparte	Van Buren	...	8	75 4	-1	98	26	51	9	37	2.28	-1.46	.65	....	6	..	..	..	.....
Burlington	Des Moines	526	....	76.0	.....	97	26	48	30	36	2.69	.....	.68	....	10	23	0	8	.....
Bussey	Marion	.....	....	....	...	...	.....	....	.....	.....	7.42	.....	2 10	.. .	7	...	..	.	.....
Carson	Pottawattamie	....	...	...	...	...	.....	....	.....	.....	2 22	.....	1.11	....	6	...	...	...	.....
Centerville	Appanoose	1,013	6	75.4	-1	96	26	54	30	33	3 36	-2.15	1.40	.....	6	23	6	2	SE
Chariton	Lucas	1,030	....	72.7	....	91	11,24,26	48	30	30	7 20	.....	2.61	....	12	14	13	4	N
Chillicothe	Wapello	645	...	...	...	...	.....	...	.....	.....	4.13	....	1 10	...	7	....	....	..	.....
Clarinda	Page	1,069	9	74 9	-1	96	22, 28	51	30	39	5.39	+1.06	1.87	....	10	14	13	4	NE, SE
College Springs	Page	.....	8	75.3	+1	95	1	54	8	38	5 93	+ 49	1.82	...	9	20	8	3	S
Council Bluffs	Pottawattamie	989	..	75 2	....	95	10, 25	54	3	35	2 21	.....	.57	.....	7	24	3	4	S
Cumberland	Cass	...	...	...	....	..	.....	..	.....	.....	4.90	.....	2.00	....	5	27	4	0	N, SW
Danville	Des Moines	715	...	...	.....	...	.....	....	.....	.....	2 34	.....	.41	....	6	..	..	...	.....
Diagonal	Ringgold	....	...	72.0	..	91	23	48	30	37	6.40	.....	2.30	....	11	8	21	2	SE
Eldon	Wapello	....	...	75.8	.....	100	26	52	9, 30	40	3 62	....	1.53	...	9	20	5	6	S
Emerson	Mills	...	...	...	.....	...	.....	...	.....	.....	2 40	...	1.00	....	3	20	8	3	SW
Fairfield	Jefferson	767	13	73.4	-2	93	26	54	30	31	2.22	-1 06	1 09	.....	9	15	12	4	.....
Ft. Madison*	Lee	516	51	75.5	2	91	12, 26	58	30	.....	3.68	-.22	1.22	....	7	5	17	9	SW
Glenwood	Mills	979	29	73.6	0	93	25	52	30	40	2.95	-.79	1 07	. .	5	5	25	1	SE, NW
Greenfield	Adair	...	8	73 2	-1	93	9, 22	52	7	30	4.73	+.29	1 35	....	9	18	9	4	S
Griswold	Cass	.....	....	....	..	..	.....	..	.....	....	5.23	.....	1.93	...	7	19	0	12	S
Hamburg	Fremont	912	...	.....	....	..	.....	.....	.....		3.77	.....	1.50	....	5	13	9	9	SE
Hedrick	Keokuk	.....	..	73.4	....	93	12	50	30	33	3.03	.....	1 34	...	8	20	6	5	.....
Hopeville	Clarke	.....	8	72 8	-1	90	22, 26	54	30	30	4 37	+.11	1 40	...	8	8	21	2	S
Indianola	Warren	...	7	73 7	0	91	11	52	30	30	7 34	+4 15	2.05	....	9	12	15	4	SW
Keokuk	Lee	618	28	76 0	-1	95	26	56	30	28	5.39	+ .88	2.34	.....	8	16	8	7	SW
Keosauqua	Van Buren	....	7	76.1	0	94	11	54	30	34	4.53	+ 71	1.00	..	11	....	..	..	.....
Knoxville ‡	Marion	....	6	74.2	-2	91	11,22,26	52	30	33	5.81	+1.96	3 37	.. .	6	18	8	5	SW
Lacona	Warren	....	..	....	....	....	.....	....	....	..	4 51	.. ...	2 34	.....	8	..	....	....	.....
Lamoni *a*	Decatur	....	...	73.2	....	93	1,11,23	50	30	39	5 03	.....	2.40	.....	11	24	3	4	SW
Lenox	Taylor	....	.	72.6	...	91	1	55	8, 9, 30	31	8.66	.....	2.04	....	13	21	7	3	N, S
Mooar	Lee	...	...	72.8	...	96	26	50	1, 31	36	4 23	.....	1.60		6	14	12	5	SW
Mt. Ayr	Ringgold	1,236	6	72.6	-2	91	22	55	8, 30	33	6.25	+1 52	2.15	. ....	12	9	18	4	SW
Mt. Pleasant	Henry	725	...	75.6	..	97	26	50	9	38	1 07	.....	.56	...	6	19	9	3	SW
Murray	Clarke	1,183	..	....	....	...	.....	.....	.....	.....	4.71	.....	2.23	...	8	19	11	1	.....
Northboro	Page	...	..	....	.....	...	.....	...	.....	.....	5.33	.....	1.56	..	8				.....
Omaha (Neb.)	Douglass	1,113	..	75 0	....	92	10	58	8	25	1.73	.....	.48	.....	7	9	10	12	SE
Osceola	Clarke	1,123	....	73 0	...	91	26	52	30	30		.....		.....	.	5	19	7	SW
Ovid	Wayne	...	6	73.6	-1	93	26	50	30	33	4.72	+1.19	2.02	....	9	13	6	12	N, W
Oskaloosa	Mahaska	850	16	73.6	-1	93	22, 26	47	30	34	3.03	-.66	1 95	.....	7	20	6	5	.....
Ottumwa	Wapello	630	5	75.0	-1	96	26	52	30	32	4.73	+.48	2.32	...	9	16	9	6	W
Pacific Junction	Mills	960	..	72 4	....	02	11, 22	50	30	37	3.16	.....	1 30	.....	9	11	20	0	S
Pella	Marion		..	71.0	....	89	11	49	30	31	7.18	.... ..	3 58	.....	9	17	10	4	SW
Red Oak	Montgomery	1,033	..	75.4	....	95	26	54	8	37	4.01	.....	.82	.....	11	7	11	13	S
Sigourney	Keokuk	....	..	75.1	.. .	99	11	45	30	42	2 70	.....	1 28	.....	7	16	15	0	W
Stuart	Guthrie	....	..	75 9	....	97	11	54	31	35	3.75	.....	1.20	.....	7	3	24	4	NE
Thurman	Fremont	....	.	73.7	....	93	22	51	25	41	2 72	..	.87	.....	7	11	9	11	NE
Villisca	Montgomery	1,058	6	74.1	0	96	23	52	31	40	3.18	-1.37	1 09		7	18	12	1	S, SE
Wapello	Louisa	578	....	75 0		100	26	50	30	38	1.78	...	.73	...	6	18	13	0	SW
Washington	Washington	738	8	71 6	-4	93	22, 26	48	30	33	2 82	-1.92	.85	.....	10	.	..	...	SW
Winterset	Madison	...	8	73.2	0	92	10,11,23	51	30	36	6.12	+.81	1.69	...	10	.	..	..	.....
Average		....	...	74.0	-1.0	94 0	.....	51.5	.....	35.0	4.37	+.20	.....	.....	8	15	11	5	SW
Av. for the state		...		73.1	-.9	93.6	.....	48.9	.....	34.9	3.07	-.62	.....	.....	7	16	10	5	SW

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JULY, 1899.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max.	93	89	79	82	91	89	77	81	81	93	94	95	82	89	91	86	86	83	89	93	91	93	92	88	93	90	78	92	83	73	82	87.6
	Min.	55	60	65	64	62	63	62	54	52	60	62	67	68	69	68	63	68	58	58	62	59	64	68	68	58	62	61	61	54	52	59	61.0
Albia	Max.	88	89	80	82	90	89	80	78	82	86	90	92	82	89	87	85	83	85	87	90	88	92	91	91	79	91	80	89	80	79	80	85.9
	Min.	55	62	65	65	60	61	62	50	52	58	62	67	68	68	67	64	52	58	59	62	59	64	65	67	58	62	58	60	51	47	55	60.1
Alta(H'd'n)	Max.	85	78	77	82	80	80	72	78	81	90	90	87	80	82	84	80	82	89	86	90	90	90	90	84	88	77	82	87	73	80	85	83.1
	Min.	57	59	57	58	59	58	58	54	56	64	64	68	66	65	63	61	55	56	57	61	65	62	67	61	59	64	61	58	48	50	62	59.7
Amana	Max.	90	86	79	81	86	89	81	78	83	84	89	92	81	86	84	84	84	86	87	89	90	90	90	90	89	89	77	88	81	79	79	85.2
	Min.	54	64	66	67	63	69	66	55	54	61	62	62	69	68	77	65	61	59	59	60	64	67	67	69	62	63	64	63	60	48	55	62.7
Ames	Max.	90	82	76	82	86	86	77	81	83	86	91	92	82	82	87	82	86	90	87	91	91	92	91	88	92	89	77	90	81	83	88	85.8
	Min.	55	60	64	63	59	69	63	54	50	61	62	61	70	69	66	65	58	64	55	60	65	64	65	58	58	65	65	58	57	51	57	60.7
Audubon	Max.	86	80	75	79	89	85	75	75	73	89	89	88	83	83	86	80	80	86	85	87	87	90	91	87	89	84	73	85	75	78	80	83.1
	Min.	58	60	62	64	60	63	61	55	53	63	65	68	68	67	63	64	56	52	57	62	63	65	66	68	57	65	61	68	57	50	60	61.3
Atlantic	Max.	89	84	79	82	84	90	80	79	80	93	94	88	84	89	91	85	87	89	84	91	91	93	94	90	94	89	73	87	78	80	84	86.3
	Min.	60	58	62	63	57	63	60	49	50	64	57	66	69	69	60	63	48	48	54	58	60	57	63	63	49	59	59	61	57	48	61	58.6
Baxter	Max.	90	83	75	83	89	91	81	79	82	89	94	93	88	84	89	85	90	96	92	94	97	98	97	90	98	89	72	87	78	75	86	87.2
	Min.	58	61	64	63	61	62	62	53	53	61	61	66	68	67	66	64	58	56	59	61	62	64	67	67	61	65	62	58	58	50	55	61.1
Bedford	Max	95	90	85	85	92	92	87	84	85	92	96	92	90	91	92	86	89	90	89	92	95	96	96	90	91	94	76	92	83	84	86	89.7
	Min.	55	63	69	67	67	67	53	52	59	59	60	65	65	67	65	63	53	53	53	59	54	60	63	65	54	67	61	61	56	48	60	59.8
Belknap	Max	88	86	79	80	85	88	75	75	75	85	90	90	81	84	85	85	86	85	86	90	90	90	86	90	90	94	81	86	75	79	70	84.2
	Min.	60	65	66	67	64	65	68	56	56	60	64	65	70	71	70	66	60	62	63	64	63	65	68	70	63	65	61	63	62	52	60	63.7
Belle Pl'ne	Max.	87	82	76	88	89	88	78	80	86	78	88	94	87	89	87	86	85	86	88	90	90	92	91	83	88	89	79	86	77	78	79	85.3
	Min.	54	52	53	65	60	65	63	53	54	60	63	62	63	65	69	64	59	58	58	60	63	67	67	69	61	65	63	61	58	48	57	60.6
Blockton	Max	92	84	76	88	90	92	80	88	80	90	92	91	88	89	88	..	82	83	85	89	90	91	93	88	90	90	78	88	75	80	82	86.6
	Min.	56	62	65	56	60	56	53	56	52	60	62	63	62	71	68	..	62	57	62	65	68	62	65	60	62	61	62	63	57	59	62	62.9
Bonaparte	Max.	89	88	84	80	87	88	83	79	82	85	93	95	85	86	86	87	87	88	89	92	90	93	88	92	93	93	86	91	91	84	76	87.6
	Min	55	63	67	67	64	65	67	56	51	58	64	64	71	71	70	66	59	57	58	65	61	75	70	68	66	61	66	65	64	52	57	63.3
Britt	Max	85	76	81	85	87	82	70	83	83	92	92	94	83	82	83	79	83	86	85	88	90	91	93	83	88	78	85	85	71	81	87	84.2
	Min	54	58	58	55	56	59	56	50	50	61	60	61	67	66	65	62	54	52	54	59	61	63	66	64	54	59	58	56	50	43	48	57.4
Burlington	Max.	89	92	85	79	89	87	83	80	83	85	93	94	87	86	87	87	86	90	89	92	93	95	91	94	93	97	86	90	77	83	78	87.7
	Min.	59	71	69	68	65	67	66	57	53	57	77	57	71	68	68	68	60	64	70	62	64	66	68	67	69	61	69	64	63	48	60	64.4
Carroll	Max.	87	80	75	83	84	86	75	79	82	93	92	90	80	85	84	82	85	88	86	91	91	91	90	89	90	82	72	87	70	79	86	84.3
	Min.	59	60	60	58	58	50	57	52	55	63	60	64	66	65	61	59	51	52	58	62	64	60	63	64	53	62	60	59	52	45	58	58.4
Cedar Rap	Max.	91	91	77	84	89	90	77	85	84	91	92	93	83	88	87	88	89	90	91	93	95	98	96	97	98	93	77	89	81	83	81	88.1
	Min.	57	67	66	67	65	69	64	56	57	62	63	64	69	69	70	65	62	62	62	63	68	67	70	71	64	67	65	65	61	50	56	64.0
Centerville	Max	89	89	83	84	87	89	80	78	82	88	93	90	82	86	89	87	87	89	87	89	92	93	90	94	94	96	82	90	87	83	80	87.4
	Min	59	64	67	67	67	65	68	57	55	60	65	68	69	70	69	66	60	58	61	65	60	64	62	69	63	65	63	63	60	54	58	63.3
Chariton	Max	87	85	76	81	87	89	81	76	78	85	91	88	80	85	86	84	84	85	83	87	88	89	87	91	87	91	76	86	81	77	80	84.2
	Min.	58	62	65	64	61	64	65	54	54	61	61	65	68	67	67	64	58	60	60	64	60	64	61	66	57	62	59	61	57	48	59	61.2
Charles Cy	Max	88	78	76	82	84	86	79	79	86	84	87	87	75	79	81	80	82	87	84	90	93	91	90	87	91	84	86	86	80	80	80	84.1
	Min.	55	60	59	59	56	63	60	49	50	62	61	58	66	68	68	61	54	52	57	61	67	65	68	66	54	65	62	59	53	39	56	59.0
Clarinda	Max.	95	92	80	86	89	93	83	83	84	93	94	91	87	87	89	87	88	90	86	93	93	96	95	93	92	96	72	93	80	82	88	88.7
	Min.	56	61	65	66	60	65	61	54	54	61	59	68	69	70	67	64	55	54	57	60	60	62	66	69	54	59	65	62	57	51	62	61.1
Clear Lake	Max.	82	86	82	88	84	88	80	84	80	88	88	88	87	90	86	86	80	86	90	96	92	92	90	92	98	86	90	98	84	98	90	88.0
	Min.	58	54	54	58	54	55	59	54	56	64	68	64	66	58	62	66	65	58	63	64	68	70	68	66	68	60	62	60	62	85	54	62.0
Clinton	Max	87	82	80	81	81	90	80	79	84	82	90	91	81	84	85	85	83	85	87	90	93	93	93	94	89	92	79	86	79	80	80	85.3
	Min.	52	65	65	61	63	67	66	56	52	56	61	62	65	67	70	63	59	59	58	59	65	61	68	65	65	62	64	61	61	46	51	61.3
College Sps	Max.	95	90	80	85	89	89	84	83	84	92	94	90	87	88	92	86	84	92	88	92	93	93	94	90	93	94	74	93	78	80	85	88.1
	Min.	57	67	65	63	63	65	64	54	57	62	62	69	69	69	66	64	55	58	58	68	62	67	68	71	58	60	62	62	56	55	62	62.5
Coon Rap	Max	87	81	74	80	81	83	77	76	80	90	88	87	81	81	84	79	87	85	84	88	88	90	91	93	85	89	82	75	85	77	80	84	83.0
	Min	61	60	61	62	60	62	62	55	55	66	64	67	71	68	64	65	57	56	67	65	67	64	65	67	55	68	62	63	57	50	62	62.1
Corning	Max	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	91	92	86	90	88	75	87	83	79	81	....
	Min	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	60	63	66	52	62	62	62	57	51	61	....
Co. Bluffs	Max.	91	84	78	82	88	88	81	82	84	95	94	91	82	84	82	84	86	85	85	90	90	93	90	93	95	88	80	88	78	86	87	86.6
	Min.	58	62	54	64	66	68	56	60	64	64	70	70	68	65	68	59	59	64	66	68	66	72	71	58	65	64	64	60	56	64	67	63.9
Cresco	Max.	85	80	77	82	84	86	70	79	81	81	86	88	75	75	80	81	82	84	84	86	90	88	88	84	89	80	82	83	77	77	79	82.0
	Min.	55	57	59	56	54	63	57	50	49	60	59	58	65	67	65	61	56	53	60	58	64	66	66	67	54	64	59	57	50	41	53	58.2
Davenp'rt	Max.	87	88	81	81	86	88	78	79	81	79	90	91	79	84	85	85	82	86	87	90	90	91	90	90	89	91	77	87	77	80	76	84.7
	Min.	62	68	68	69	66	71	64	57	60	64	67	68	69	66	72	67	62	64	65	68	70	64	70	70	68	68	66	67	61	54	60	65.6
Decorah	Max.	87	80	75	82	85	88	72	80	81	83	87	83	74	74	79	81	86	88	89	90	92	93	92	84	90	80	82	84	74	76	81	83.0
	Min.	57	61	59	57	53	62	59	52	50	59	60	58	65	68	67	66	52	59	60	65	67	66	65	67	57	67	64	59	51	42	54	58.4
Delaware	Max	86	81	70	77	84	85	79	76	80	79	85	88	77	77	79	81	80	85	86	88	90	88	89	88	89	91	80	83	76	77	78	82.3
	Min.	59	64	61	64	61	67	62	52	55	61	61	63	65	67	69	63	58	57	59	62	65	64	67	68	61	68	64	61	58	47	54	61.5
Denison	Max	88	79	75	82	83	85	75	82	82	95	94	90	80	87	86	80	84	88	85	90	90	92	93	87	91	81	79	85	74	80	85	84.7
	Min.	58	55	61	58	59	61	57	58	56	63	60	70	68	65	60	60	56	60	60	64	62	62	67	71	55	65	61	59	56	48	63	60.6
Des Moines	Max	90	83	74	81	82	88	76	76	78	85	91	87	79	84	85	84	84	85	84	88	87	91	88	88	89	88	73	85	76	77	84	83.5
	Min.	61	66	65	66	63	64	62	58	56	64	63	66	71	70	68	66	61	60	60	63	65	67	69	70	59	68	60	64	60	52	60	63.5
De Soto	Max.	93	..	..	..	90	91	77	81	85	95	95	96	88	87	89	83	87	90	92	93	93	94	101	88	92	87	74	90	76	82	87	88.4
	Min.	59	..	..	..	60	63	69	55	51	64	64	74	72	71	67	64	59	56	56	63	63	62	64	54	56	64	62	64	59	50	58	61.4
Diagonal	Max.	92	90	78	80	85	89	77	75	79	90	89	88	87	88	82	79	82	85	85	87	85	89	91	87	86	90	71	86	83	78	74	84.1
	Min.	55	60	66	58	65	62	64	53	51	59	59	67	67	67	63	55	55	56	55	60	57	85	66	65	56	58	60	61	55	48	54	60.0
Dows	Max	87	80	87	80	82	84	74	77	79	86	87	89	76	81	80	79	82	87	86	88	90	91	89	86	89	80	83	85	77	79	68	82.5
	Min.	57	56	58	56	56	61	59	49	64	61	62	60	67	66	65	62	63	62	54	54	63	60	67	66	67	62	60	56	52	47	56	59.6
Dubuque	Max.	86	85	71	80	87	86	77	79	81	80	90	87	79	78	81	84	82	86	86	88	92	90	91	89	90	90	79	83	76	79	77	83.3
	Min.	62	69	64	66	64	71	65	57	57	62	65	66	67	67	70	66	61	61	65	64	69	65	71	70	64	69	57	63	62	51	59	64.5
Eldon	Max.	91	91	83	85	89	90	88	82	84	88	93	94	89	82	88	89	88	88	90	93	94	97	96	96	97	100	84	91	88	84	81	89.5
	Min.	54	63	66	68	64	65	68	56	52	57	62	64	70	71	72	61	60	57	56	60	60	64	68	67	65	60	62	63	61	52	57	62.1
Elkader	Max.	91	86	74	87	81	92	74	86	86	86	94	91	81	77	85	87	87	91	92	92	98	96	96	94	98	88	88	87	80	85	84	87.8
	Min	53	63	60	61	67	65	62	48	49	56	60	59	64	67	68	61	54	53	57	56	54	61	64	66	55	61	61	59	51	42	51	58.5
Fairfield	Max.	85	85	79	80	83	84	79	78	78	80	88	88	80	81	83	84	81	82	83	87	87	90	85	90	88	93	78	85	80	78	77	83.2
	Min.	56	63	66	67	65	65	67	56	55	59	64	67	70	68	71	67	61	60	60	63	62	67	68	70	65	62	65	64	61	54	56	63.4
Fonda	Max.	87	79	76	86	81	87	71	78	83	91	90	90	85	83	85	80	82	87	84	90	91	89	93	88	90	86	87	90	79	80	90	85.1
	Min.	57	56	58	60	58	60	55	50	55	65	64	68	67	66	64	62	54	56	57	60	65	68	69	65	63	57	65	60	48	46	55	59.8
Forest City	Max.	85	75	77	82	82	81	69	78	79	90	88	88	76	80	81	79	81	85	85	89	90	90	91	85	88	78	83	83	71	78	83	82.2
	Min.	57	61	60	59	67	60	57	57	53	62	64	62	66	66	67	65	57	55	58	62	65	65	68	63	60	62	58	59	53	47	58	60.4
Galva	Max	85	79	70	84	82	81	75	79	82	91	91	89	82	82	85	89	83	90	87	90	92	92	93	92	92	79	83	88	74	81	87	84.5
	Min.	57	54	67	55	56	59	56	49	54	64	61	56	65	63	63	62	59	53	54	57	62	64	59	63	63	57	61	61	58	51	51	63	58.6
Glenwood	Max.	89	82	77	84	85	88	82	78	81	92	90	89	86	86	87	80	84	86	86	89	88	91	89	89	93	89	71	87	80	79	85	85.2
	Min	62	61	62	63	61	64	67	53	59	66	61	69	66	68	66	62	53	53	61	63	65	61	67	66	53	67	60	64	58	52	65	61.9
Greene	Max.	90	83	80	85	88	87	80	84	86	89	93	92	78	84	82	85	86	90	91	92	97	98	96	91	97	91	89	89	80	87	89	88.0
	Min.	56	60	60	59	57	62	60	47	51	61	64	57	66	68	62	62	55	50	56	60	67	63	68	65	53	61	61	58	52	40	56	58.7
Greenfield	Max.	88	81	75	84	87	79	76	80	93	92	90	88	87	92	84	82	84	85	90	89	89	93	92	86	87	88	79	87	76	79	82	85.3
	Min.	58	60	63	60	63	58	52	55	63	62	72	69	68	65	64	54	54	58	60	63	65	61	65	68	60	65	58	62	57	53	60	61.2
Grin'l (nr)	Max	87	82	75	77	83	84	82	74	78	79	83	89	81	81	82	82	82	85	84	88	90	89	89	87	90	87	83	87	82	80	81	83.5
	Min.	58	63	65	65	63	65	64	55	55	61	63	67	69	68	68	65	55	58	59	62	63	68	69	69	63	61	64	63	59	54	57	62.5
Grundy C'r	Max.	89	81	71	80	86	88	72	78	82	82	89	91	78	80	83	83	84	88	88	90	92	93	90	89	92	84	79	87	75	79	80	84.0
	Min.	53	58	60	60	57	62	60	49	51	59	60	58	66	67	68	62	55	53	55	55	62	61	64	66	55	61	59	55	54	43	53	58.1
Guthrie C'r	Max.	88	82	75	82	82	85	83	77	79	92	92	88	83	84	86	81	84	88	85	89	89	91	93	89	89	84	75	88	80	78	85	84.6
	Min.	58	57	56	59	59	60	61	53	54	66	61	60	68	68	63	63	55	54	62	61	60	64	65	68	54	65	59	62	55	41	45	59.2
Hampton	Max.	88	83	78	84	88	85	71	80	80	87	89	91	75	80	87	80	83	88	89	89	91	95	92	92	93	80	84	86	73	79	82	84.6
	Min.	58	60	59	59	60	62	60	52	55	62	65	62	67	66	67	65	58	57	60	59	66	65	66	69	60	65	63	59	58	49	57	60.8
Harlan	Max.	86	83	78	82	88	86	82	79	84	92	93	94	88	83	88	85	82	87	86	88	89	92	93	86	89	85	77	88	85	81	85	86.0
	Min.	55	58	61	63	59	61	59	52	54	62	58	67	68	65	61	61	54	52	55	58	61	63	66	66	52	60	60	62	55	50	60	59.3
Hedrick	Max	84	87	83	82	87	89	78	76	80	86	90	93	84	87	86	83	84	85	86	90	91	89	89	90	89	92	78	89	80	80	80	85.5
	Min.	56	62	65	66	64	62	61	54	54	59	62	62	64	67	69	65	58	65	58	60	61	67	65	65	61	62	62	61	57	50	54	61.4
Hopeville	Max.	88	83	75	79	83	86	75	75	77	80	87	86	79	85	84	81	81	82	82	86	86	90	89	87	88	90	72	87	75	80	80	82.5
	Min.	58	63	66	63	63	64	60	56	56	61	65	71	68	70	71	64	59	62	62	64	62	67	69	67	61	67	63	63	58	54	60	63.2
Humboldt	Max.	88	80	80	84	84	82	70	79	82	91	90	92	83	82	82	80	83	88	88	91	92	92	91	86	88	86	84	88	73	79	87	84.7
	Min.	60	58	60	57	56	61	60	49	54	65	63	65	68	67	66	64	55	54	53	63	64	64	67	66	57	66	64	58	53	46	59	60.1
In'pend'ce	Max.	86	85	71	80	85	83	72	79	80	78	87	86	77	81	80	82	81	84	86	88	91	91	89	88	90	87	79	84	76	78	76	82.7
	Min.	54	61	63	64	60	65	63	50	53	58	60	59	65	66	67	63	57	54	55	57	63	65	65	60	60	64	60	58	57	46	54	59.5
Indianola	Max.	89	82	75	81	84	87	82	76	79	85	91	88	81	86	86	82	84	86	84	88	87	89	88	89	89	88	77	87	81	78	83	84.3
	Min.	59	62	65	66	61	63	63	54	67	63	63	68	70	69	68	64	59	61	61	63	62	66	68	68	60	67	61	64	59	52	58	63.1
Iowa City	Max.	88	88	78	84	87	89	76	80	82	80	91	91	79	87	85	85	85	87	87	89	93	92	94	92	93	90	76	88	78	81	81	85.6
	Min.	54

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
kuk....	Max	87	88	86	77	86	86	83	77	80	84	91	92	86	84	82	86	84	86	86	88	89	90	88	92	91	95	86	87	74	80	74	85.3
	Min	62	60	68	68	67	70	69	60	58	63	68	69	75	75	70	69	64	62	65	69	65	69	70	73	68	69	69	69	65	56	61	76.6
oxville..	Max.	90	87	80	84	87	87	79	78	81	86	91	91	86	87	86	85	85	87	85	91	89	90	89	81	89	91	78	89	78	80	82	85.8
	Min .	57	63	66	64	63	63	66	55	57	62	64	64	69	67	69	67	60	63	60	62	62	67	68	68	62	65	62	61	58	52	57	62 7
noni....	Max	93	82	79	82	88	90	80	78	82	90	93	90	88	89	87	84	84	87	85	89	88	92	93	90	91	..	78	89	81	81	81	86.1
	Min .	54	63	65	63	61	60	65	55	51	58	61	67	67	70	67	63	59	56	57	60	56	65	57	66	60	..	63	62	56	50	57	60 4
sing....	Max.	89	83	78	86	88	88	84	81	81	86	91	84	78	75	82	86	85	88	88	90	94	94	94	88	92	86	88	88	78	81	82	85.8
	Min .	55	63	62	60	60	68	63	52	53	60	61	60	66	69	68	64	55	54	60	62	69	64	62	68	58	66	62	58	58	43	51	60 5
Mars....	Max.	82	75	78	82	83	83	75	80	80	90	91	88	85	84	85	80	83	86	86	91	90	90	88	90	88	81	87	86	74	80	87	84 0
	Min .	60	60	56	56	55	59	55	49	58	60	61	68	65	63	64	60	54	56	59	64	66	64	58	57	62	61	58	57	51	52	65	59 1
ox.....	Max.	91	85	74	78	84	86	78	75	78	86	87	85	81	83	83	81	79	81	81	86	86	88	88	84	88	88	71	85	83	77	78	82.5
	Min .	60	62	65	61	60	64	65	55	55	62	61	70	61	70	67	65	59	56	60	65	61	66	67	69	60	66	62	62	57	55	61	62 6
an.....	Max	88	80	88	80	84	88	78	80	79	94	92	93	85	89	91	85	80	89	91	92	90	94	95	90	89	88	85	86	83	84	89	87 1
	Min .	54	60	65	60	68	70	60	58	60	70	68	64	60	62	62	60	47	55	60	64	60	62	64	60	56	58	54	58	50	52	58	60 0
quoketa	Max	87	85	74	80	85	89	78	84	83	79	88	90	81	82	84	84	86	85	89	91	96	91	91	94	90	91	77	86	81	78	73	84.8
	Min	52	53	65	62	55	69	66	55	52	57	61	62	67	66	67	54	58	58	53	59	64	60	70	67	64	62	64	61	61	45	47	59.9
rsh'lt'n.	Max.	82	89	81	85	85	89	86	88	80	79	91	91	91	92	87	91	87	89	87	90	92	95	93	94	94	90	76	89	80	82	84	87.4
	Min .	59	59	65	64	71	71	59	55	52	55	52	60	60	60	61	58	67	58	54	60	60	64	67	68	56	61	62	57	58	46	56	59 8
son City	Max.	85	77	77	..	..	..	..	83	77	83	85	86	88	85	80	80	79	81	84	85	88	90	91	91	87	92	90	85	85	85	83	84.5
	Min .	44	58	57	..	..	..	..	53	43	46	60	60	55	60	67	66	61	61	51	56	60	65	62	63	66	51	59	59	57	38	62	57.1
nticello.	Max.	85	88	86	88	87	87	85	80	82	80	90	91	82	84	84	86	85	86	92	91	93	92	93	91	90	91	90	90	89	90	87	87.6
	Min .	55	56	63	75	65	67	62	58	52	50	60	61	65	67	71	72	68	55	59	68	67	68	69	60	61	60	59	60	54	49	48	58 2
par	Max	86	87	74	83	85	84	80	79	78	84	91	89	83	83	79	78	85	83	83	86	90	90	90	94	92	96	89	86	75	75	71	84.1
	Min .	50	61	61	60	60	65	68	57	57	59	61	63	67	67	70	68	59	54	54	62	58	64	65	66	67	60	66	65	63	63	50	61 6
Ayr.	Max.	90	83	77	79	82	90	79	76	81	88	90	87	85	87	87	82	81	84	81	88	89	91	90	87	90	89	74	89	75	80	82	84 3
	Min .	57	63	65	64	62	64	63	55	56	60	63	69	67	70	67	64	60	60	63	61	61	67	67	68	68	61	68	63	57	55	60	62.9
Ple'sn't	Max.	89	94	94	83	90	90	85	78	78	90	90	95	89	90	90	92	86	91	91	95	93	95	95	93	95	97	86	95	84	82	80	89 5
	Min .	51	59	65	65	62	63	66	54	50	56	70	62	68	66	68	68	60	61	56	60	65	66	66	67	65	59	62	62	62	58	52	61.7
Vernon	Max.	91	93	78	86	89	90	77	87	88	79	93	92	84	87	89	89	90	90	89	90	95	94	92	94	91	92	76	88	82	85	84	87.9
	Min .	58	65	66	65	64	68	64	54	55	60	63	63	67	67	69	64	59	60	61	65	65	68	69	63	64	63	63	59	50	57	62.5
wton....	Max.	91	85	74	82	85	89	77	80	80	87	92	92	83	85	87	84	86	87	87	91	91	93	91	90	92	90	70	88	78	80	81	85 5
	Min .	55	63	68	64	61	62	64	54	53	61	63	66	69	63	67	64	58	59	59	60	63	66	68	69	58	66	62	62	58	50	55	61 6
wH'pton	Max.	85	79	76	81	84	85	71	78	..	79	87	86	75	79	79	79	80	84	85	87	91	89	..	88	88	81	83	83	76	77	79	81.9
	Min	66	58	60	59	59	65	59	52	.	50	60	61	69	69	67	62	60	61	58	58	66	66	.	67	61	65	60	59	52	46	63	60.6
rthwood	Max.	85	80	82	84	89	84	69	80	83	91	87	91	84	77	83	80	81	87	87	89	93	92	92	84	90	79	86	86	71	82	85	84.2
	Min	52	58	58	55	55	60	56	51	49	58	64	57	64	65	62	59	54	57	60	63	60	60	65	61	56	62	56	58	61	43	54	57.8
ebolt	Max	86	81	84	88	85	85	81	84	86	95	97	94	85	88	88	83	88	93	89	94	98	95	96	90	94	91	86	92	82	85	91	88 8
	Min .	58	54	53	53	57	60	55	48	54	64	61	66	67	64	61	60	52	53	57	65	65	60	64	63	55	64	61	56	53	53	62	58.6
ien.....	Max.	89	79	74	81	83	87	74	77	80	91	91	89	81	83	85	82	85	86	85	88	89	91	92	87	89	83	73	86	77	78	84	83 8
	Min .	57	58	62	62	58	61	61	53	55	63	62	64	69	68	65	61	55	54	58	60	59	65	65	68	54	65	62	60	56	51	59	60.3
n	Max.	85	83	75	81	85	87	76	..	80	78	88	90	83	85	83	85	82	84	85	87	89	90	90	91	88	89	76	84	76	77	77	83.6
	Min	53	63	64	65	63	68	65	54	53	57	60	63	67	67	69	62	58	57	59	59	64	63	68	68	62	62	62	62	61	46	50	61 1
aha.....	Max.	87	82	74	82	86	85	78	79	82	92	92	89	80	82	84	81	82	86	83	88	88	91	89	88	92	83	72	86	74	78	85	83.9
	Min .	65	64	64	66	70	67	64	58	63	69	67	92	68	68	67	67	64	62	65	67	68	69	72	70	67	70	62	67	60	62	66	66.1
awa. ...	Max.	82	79	77	83	83	85	79	79	83	90	91	90	84	83	85	83	83	86	85	90	90	92	90	89	92	90	79	87	84	82	86	85 2
	Min .	62	61	61	59	63	63	59	53	59	66	65	70	70	65	63	63	57	56	61	56	68	64	68	65	59	66	64	62	57	56	66	62.5
age.....	Max.	86	78	78	82	83	85	73	79	80	85	86	90	76	79	81	79	81	85	85	88	92	90	89	86	90	80	84	85	73	78	82	82 9
	Min .	54	58	58	56	55	62	58	48	58	60	63	58	65	67	66	61	57	54	58	58	65	63	67	67	55	61	67	67	50	42	55	58.8
ceola ...	Max.	89	84	76	80	84	89	78	75	79	86	90	88	79	85	85	83	83	85	82	88	88	90	89	88	89	91	70	87	76	80	83	83 8
	Min .	59	62	66	63	63	63	65	55	53	62	63	70	70	68	67	64	58	60	62	61	59	64	68	66	61	65	61	62	58	52	58	62.2
kaloosa..	Max.	91	88	76	82	88	88	78	78	81	85	91	92	80	86	86	85	84	87	85	92	91	93	91	91	91	93	72	89	79	81	80	85.6
	Min .	57	65	65	65	62	64	65	56	53	61	61	64	70	68	70	65	58	57	57	60	60	63	67	62	61	62	62	60	59	47	61	61 7
umwa...	Max.	90	88	77	81	88	88	81	77	81	81	93	92	82	82	85	85	86	87	87	93	90	93	88	91	91	96	82	88	80	80	79	85 9
	Min .	58	68	66	68	65	72	67	57	55	62	65	67	71	72	71	67	68	61	60	60	63	61	69	70	63	64	63	63	60	52	59	64.1
ld	Max.	88	88	74	84	86	89	80	79	80	87	92	88	79	85	87	86	86	86	85	88	89	92	90	92	92	93	79	89	80	81	80	85.6
	Min	62	58	66	65	62	63	63	54	54	60	63	66	69	70	67	64	57	60	61	61	59	64	66	66	59	63	60	61	58	50	58	61.6
cific Jct.	Max	86	80	76	80	85	85	78	78	79	90	93	90	82	83	83	82	81	83	83	87	88	92	88	88	90	89	74	89	75	80	82	84.4
	Min .	60	63	63	62	60	65	65	54	55	66	65	65	67	67	63	64	53	53	56	60	62	68	65	67	53	62	60	63	58	50	65	61 3
la.....	Max.	87	81	73	77	81	87	69	74	77	77	89	83	75	81	82	79	80	85	79	82	86	87	83	87	86	80	70	84	75	76	88	80 3
	Min .	56	63	61	65	62	63	63	54	54	61	63	66	69	66	65	66	60	60	68	61	61	66	67	68	62	62	60	60	59	49	57	61.6
ver. ...	Max.	90	78	80	85	83	81	70	84	85	91	91	96	81	88	84	82	84	88	89	92	92	91	94	88	92	88	87	90	78	88	90	86.6
	Min .	60	62	60	62	64	62	55	54	60	62	64	63	67	65	64	62	55	52	54	52	62	63	60	60	55	60	56	55	49	45	54	58.6
mghar..	Max.	80	70	80	83	80	85	83	80	80	95	90	88	82	85	88	80	89	90	87	95	93	90	93	93	90	84	93	87	77	92	90	86.3
	Min .	55	60	70	72	60	65	53	62	67	64	63	65	76	68	63	60	73	65	68	63	65	57	66	74	60	60	80	59	47	74	65	61.5
d Oak...	Max.	92	87	85	85	85	93	86	80	81	92	91	89	84	89	92	89	88	90	86	90	88	92	93	93	92	95	76	87	91	72	75	87 7
	Min .	64	60	64	66	62	62	60	54	59	65	63	62	70	72	66	66	66	56	62	66	64	61	69	68	55	64	64	65	59	55	64	63.0
dgeway..	Max.	90	78	78	84	84	86	72	82	85	79	88	82	74	74	79	81	83	88	90	90	90	93	90	91	91	83	82	86	80	82	82	83.7
	Min .	57	62	59	59	61	63	60	53	55	60	64	63	61	69	67	62	59	58	64	60	67	70	70	71	62	67	62	62	54	50	60	61.7
ckwell C	Max	89	82	87	82	88	85	78	79	85	91	90	92	84	83	86	80	84	87	87	89	91	92	93	85	89	84	84	89	75	71	85	85.7
	Min .	55	55	60	59	58	60	57	52	55	61	62	65	68	67	64	62	54	53	59	60	65	61	66	65	57	62	62	61	54	53	60	59.7
thven...	Max.	80	82	80	84	82	80	78	80	86	92	92	90	86	85	84	90	90	90	92	94	92	91	92	90	92	88	86	88	90	88	90	87.4
	Min .	48	46	50	52	58	50	46	50	54	56	54	52	56	54	52	50	54	60	60	62	58	64	68	70	64	68	66	64	70	74	70	58.1
c City....	Max.	86	78	76	81	81	84	73	77	81	91	90	88	79	83	84	80	82	86	84	88	90	90	91	86	91	79	81	87	83	80	85	83 7
	Min .	58	58	60	57	59	60	57	51	54	64	63	67	68	66	62	62	54	55	58	61	65	72	68	64	59	68	62	59	52	52	61	60 5
ranton ..	Max.	88	81	55	81	84	78	78	79	83	90	93	90	82	83	84	80	85	90	87	90	93	93	92	87	81	86	76	87	81	81	87	85.0
	Min .	58	60	62	61	62	60	54	57	58	65	64	72	70	68	64	64	57	57	62	62	67	64	68	68	59	68	62	63	56	54	61	62.1
eldon ...	Max.	79	72	77	80	80	80	75	77	82	89	88	83	83	82	83	80	82	87	86	92	90	88	90	87	89	85	81	87	73	80	86	83 0
	Min	56	60	51	56	55	60	47	50	56	61	59	65	64	63	64	60	51	57	56	60	60	60	66	55	57	59	60	60	45	45	64	57.6
ley	Max.	80	68	77	81	80	81	71	79	85	90	89	84	81	85	86	80	84	88	88	93	93	91	90	90	92	81	82	88	74	81	89	83.9
	Min .	54	58	53	53	55	59	53	49	52	60	59	64	60	62	63	58	51	52	56	60	59	60	61	54	55	60	68	54	46	45	45	55.7
gourney..	Max.	96	92	81	89	94	95	83	90	85	88	99	97	85	90	88	83	90	93	90	94	97	97	96	95	98	94	83	91	80	88	84	90.6
	Min .	54	62	64	63	62	61	62	52	51	58	60	61	68	64	67	63	57	56	55	57	60	63	64	66	60	64	59	60	58	45	52	59.6
oux City..	Max.	80	73	76	83	84	83	77	80	85	92	92	91	82	85	84	81	85	90	87	94	91	90	90	92	78	80	89	75	80	87	84.7
	Min	54	62	60	59	64	72	58	54	60	64	65	67	68	66	66	64	67	58	65	67	68	67	70	60	62	66	63	64	54	54	62	62.3
oux C'ntr	Max.	..	..	..	..	..	..	..	..	85	93	92	88	80	85	87	81	88	94	91	97	95	93	91	91	92	86	81	88	76	83	90	88.2
	Min .	..	..	..	..	..	..	..	..	59	65	66	68	66	65	68	61	58	62	63	64	68	67	69	61	68	64	64	61	51	58	68	63.6
encer ...	Max.	83	81	81	83	85	81	75	80	85	93	92	..	..	..	..	..	84	88	86	92	92	91	91	90	90	79	86	84	78	74	88	85 1
	Min .	53	56	54	55	53	62	54	48	53	62	58	..	..	..	54	..	..	54	55	62	61	62	66	60	55	62	55	52	47	45	62	56.2
irit Lake	Max.	78	65	84	84	84	82	68	84	82	94	95	88	78	82	86	86	86	89	92	93	93	91	90	92	89	80	88	89	86	84	83	81.4
	Min .	58	59	58	56	58	60	55	54	52	65	63	67	67	65	65	65	65	60	..	64	65	66	65	58	60	62	61	60	56	53	49	60.4
ormLake	Max.	82	75	75	80	78	78	70	75	78	87	87	85	77	80	81	77	80	84	82	86	87	87	87	84	88	76	78	84	71	77	82	80.6
	Min	60	59	58	56	64	58	58	51	59	67	63	70	67	66	64	60	55	60	63	65	68	67	69	62	64	66	63	63	51	52	63	61.6
uart	Max.	87	87	85	92	87	92	85	84	78	90	97	92	89	87	89	83	83	93	88	90	86	95	94	92	88	89	86	89	80	84	85	88.5
	Min .	62	63	62	72	70	64	56	63	62	64	64	68	64	69	60	58	56	61	64	62	65	65	67	68	65	67	64	64	58	57	54	63.3
ra.....	Max.	92	88	80	87	95	85	95	87	92	95	92	96	80	84	85	85	90	94	93	95	94	96	99	90	93	90	87	90	83	84	85	89 2
	Min .	80	80	67	78	83	75	65	70	77	78	78	80	70	74	75	72	73	85	85	80	85	87	85	76	88	78	75	70	68	69	68	76.6
urman..	Max.	90	87	77	84	88	89	84	83	84	91	92	90	85	85	86	84	85	89	85	90	91	93	91	91	92	89	79	92	81	78	68	86.1
	Min .	60	62	64	64	61	64	66	53	54	66	60	67	67	68	65	65	53	52	56	60	59	60	66	68	51	66	63	63	58	52	67	61.3
ledo.....	Max.	80	83	76	82	85	89	75	83	83	82	94	93	82	87	88	88	89	89	88	90	93	92	94	95	91	92	75	88	81	82	82	86.1
	Min .	57	60	65	65	60	67	63	48	54	61	60	61	68	68	67	63	57	54	59	60	64	62	66	67	56	62	62	57	58	43	54	60.3
llisca ...	Max.	94	88	78	85	85	92	82	78	81	90	90	89	86	88	92	86	84	88	87	93	91	93	95	93	93	95	76	88	73	72	80	86.6
	Min .	57	61	64	65	65	65	65	53	54	63	60	68	69	70	67	66	55	54	59	59	69	61	67	70	53	61	62	64	58	53	52	61 6
apello ...	Max.	91	87	82	76	84	86	80	79	81	80	91	89	82	83	88	86	86	89	87	91	91	93	89	92	93	00	95	92	80	84	74	86 5
	Min .	58	64	67	68	64	69	66	56	57	60	63	62	61	68	72	68	60	58	60	64	65	68	70	70	67	164	65	64	65	50	57	63.4
ashingt'n	Max.	88	88	78	80	86	88	80	77	81	83	90	92	80	84	85	85	84	85	85	91	91	93	89	91	90	93	77	88	78	80	77	82.5
	Min .	54	55	65	65	63	64	62	53	53	57	62	64	68	64	67	64	58	58	58	60	62	65	67	68	62	62	62	61	58	48	54	60 7
aterloo...	Max.	89	84	73	83	87	88	74	80	81	80	89	89	78	80	84	85	85	88	89	91	92	93	92	91	93	87	82	85	80	79	80	84.9
	Min .	56	62	62	64	59	56	64	51	52	60	60	60	67	68	68	67	53	55	57	59	66	65	67	69	57	64	63	60	57	45	55	60 7
averly...	Max.	88	80	74	81	84	86	79	78	80	82	86	88	76	77	81	86	82	86	86	88	88	91	91	89	88	92	83	86	74	78	79	83.1
	Min .	58	62	62	61	59	65	63	51	53	63	62	61	68	68	69	64	60	56	59	60	66	66	69	69	58	68	63	60	57	45	59	61.5
est Br'ch	Max.	82	80	76	84	86	88	78	84	86	90	90	88	89	86	88	87	86	88	86	89	90	90	88	89	91	91	88	89	90	80	76	86.6
	Min .	52	50	56	60	62	68	56	58	56	54	52	58	56	54	52	58	60	56	56	60	62	60	62	63	63	60	62	61	62	45	50	57 5
lton Jc..	Max.	87	87	84	83	87	90	78	77	84	84	90	94	82	88	87	84	87	86	88	91	92	91	93	92	92	93	79	88	76	80	77	86.2
	Min .

MONTHLY REVIEW OF THE

DAILY AND MONTHLY PRECIPITATION FOR JULY, 1899.

STATIONS.	DATE.																														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	....	.25	1 69	..	....	1 43	.19	..	....	.21	...	...	T	.38	.43	..	...	...	...	...	...	..	...	T	..	..	.12	....	.40	...	1.23	
Algona	..	.23	....	....	80	...	..	...	..	....	...	....	56	...	T	.06	...	..	...	...	...	..	...	.05	....	...	...	.42	....	....	...	
Alta (Hadden)	..	.09	..	..	1.51	..	..	..	..	...	..	.01	.21	..	.13	..	....	....	...	...	..	..	...	.89	..	T	....	.03	....	....	.02	
Alta (near)	..	.09	....	...	.94	....	..	....	....	..	...	.03	.16	..	..	.11	....	....	..	..	..	..	..	63	....	.02	...	.09	....	..	.03	
Albia	....	T	1.67	..	..	.59	1.61	..	...	....	..	..	..	.80	..	....	....	....	..	..	..	....	....	..	....	..	T	....	..	....	..	.02	
Amana	...	..	3.60	.31		.18	.11		..	.63	....	..	.06		82	..			....	....	..	..	....	....	..	..	T	..	....	..	.03	
Ames	....	40	....	...	.25			..	..	50	..		T	T	...	...	....	..		....	....	..	....	..	...	....	T	....	....	...	.04	
Atlantic	....	1.10	...	...	.36	.10	.05	...		..	....	....	.09	....	..	..	....	..		...	....	..	....	....	....	..	....	....	....	..	.45	
Audubon	..	1.35	..	...	.30	..		..		..	....	..	T	...	T	..	....	..		...	....	..	....	.21		....	.80	..	....	...	3.00	
Batavia	..	..	.78	.92	..	.38	...	..	....	..			..	.85		...	...	..	...	..	..	..	..	T			.61	..	..	....	.38	
Baxter	....	....	.86	T	..	.13	...	..		...	....	...	.05	.20	...		..	...	...		..	..	..	...	..		..	..	...	..	.40	
Bedford	..	.27	3.60	T	..	1 00	.07			.60	..	..	..	.10	.02			...	...		..	..	..	1.30	...	..	.07	....	.32	..	.14	
Belknap	....	..	.70	1.20	..	.40	.40	...	..		50	T	T	T	T	T		..	..	..	...	..	...			....	.10	.11	1.10	....	.33	
Belle Plaine	..	..	1.80	.02		.25	...	...	...	.30	..	...	.20	T				...	..	....	..	....	...	...	..	....	....	.05	1 75	..	.25	
Blockton	..	.40	1.90	.40	..	.38			...	10	..	...	....	T	.77	.	.	.		...	...	..	....	.42		..	.07	....	.57	....	.92	
Bonaparte	....		.40	.30		.08		..	..		..	..	....	.29		.	....	....	..	..	..	..	....		..	..		....	.65	....	.56	
Britt	....	06	.09	..	T	.96	T	..		..	..	T	.68	.12	.03	..	..	.	..	...	..	..	..	.41	....	..	..	.23	...	..	....	..	
Burlington	...	.21	.40	.68	..		.06	..	...	.55	..	..	.04	.10	.15	..	..	.	..	...	..	..	..	T	....	..	..	..	..	..	..	..	
Bussey	....	2.10	.34	..	.43	1 65	..	..	..	..	..	..	..	1.35	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Carroll	....	.40	..	..	..	.73	..	..	..	..	..	..	.12	..	.04	..	..	..	....	..	....	..	..	..	..	..	....	.60	..	.95	..	.40	
Carson	...	06	.26	..	.18	..	..	..	..	.19	..	..	..	..	..	..	..	....	..	....	....	..	..	.06	..	..	....	.	.04	....	.01	
Cedar Rapids	..	1.13	.44	T	.16	..	..	..	..	.67	..	.03	.07	10	..	..	..	..	..	..	....	....	..	..	..	..	.42	..	....	..	1.11	
Centerville	..		1 40	T		.52	.09	..	..	....	..	..	T	T	T	..	..	..	..	....	..	..	..	....	..	..	T	T	....	....	.60	
Charlton	...	.01	2.61	..	.02	1.15	.47	.01	..	..	..	..	..	.07	1.23	.03	..	..	..	..	..	..	..	....	..	....	T	.05	.75	..	.55	
Chillicothe	....	...	1.10	.30	....	.45	55		..	..	..	....	..	.53	90	...	..	..	..	..	..	..	..	..	..	..	..	.02	10	..	1.48	
Charles City	..	T	.18	..	..	.30		..	..	.62	..	.46	.28	T	T		..	..	..	..	..	..	..	..	..	..	T			..	.30	
Clarinda	..	1.87	T	..	.08	1.14	..	..	.32	.85	..	..	.07	..	.33		..	..	..	..	....	....	..	..	..	..	....	....	..	..	....	
Clinton	...	...	1 12	.22	T	..	..	..	....	..	T	..	.28	.52	..		..	..	..	....	..	..	..	..	1.40	....	.09	..	.45	..	.19	
Clear Lake	..	..	.20	..	....	....	..	..	..	54		.40	....	....	..		..	..	....	....	..	....	....			....	..	..	....	..	..	
College Springs	....	1.56	.08	..	..	1 82	.			.57	..	....	.04	.04	..	..	....	..	..	..	..	.	..	..	..	..	..	.28	....	..	T	
Coon Rapids	..	.15	.70	..	T	.15	..	..	..	.20		..	39	.	T	..	..	..	....	..	..	..	..	.02	..	..	.63	..	1.17	..		
Council Bluffs	...	.57	..	..	.07	.02	..	....	..	..		T	.45		.09	..	..	..	..	..	..	..	..	.27	....	..	.24	..	T	..	.20	
Cresco		.13	..	..	.05	..	..	..	..	..																					
Cumberland	...	T	1 20	....		.82	.32		..	.91	..	1.00	.35	.53	.17	..	..	..	.10	..	....	....	..	.10	..	.03	47	..	.05	..	.54	
Danville	..	..	.23	.63	..			..	..	T			T	T	T	..	..	..		..	..	..	..	..	..		..	..		..		
Davenport	...	..	.48	.56	T	T	.43	..		.18	....	..	T	T	.41	..	..	..	..	..	....	..	..	..	..	..	.56	..	....	..	2.00	
Decorah	...	.07	....	..	..	..	.08	..	..	T	..	..	T	.66	.62	..	..	..	..	..	..	..	..	.30	..	....	..	..	.24	..	.35	
Delaware	....	..	1.03	..	..	.02	..	..	..	.55	..	.53	.16	.08	.03	..	..	.03	..	..	..	..	..	.04	..	....	T	..	T	..	.03	
Denison	.	.40	..	..	.05	.81		..	..	.31	..	.42	.08	23		.04	..	..	..	..	..	..	..	..	..	.02					.02	
Des Moines	....	T	1.01	.14	T	.87	.31	..	..	T		..	16	..	.35		....	..	..	..	..	..	..	..	....	....	..	..				
De Soto	....		1.50	.	..	1.03	.05	..	.	T	..	..	02	.16	T	..	..	..	..	..	..	..	..	.18	..	....	T	....	..	....	T	
Diagonal	....	.30	2.30	.20	..	.20	.10	..	..	1.30	..	....	T	4	.50	.	....	....	....	....	....	..	..	..	..	....	.38	...	.05	...	.26	
Dows	..	T	.21	..	T	.54		..	..	.23	....	..		1.00		..	..	..	..	....	..	..	..	.30	..	..	.79	..		..	.16	
Dubuque			1.57	.52	T	.03		..		.42	....	....	.24	T	T	..	..	..	..	..	..	..	..	T	..	T	.20	..	.20		.30	
Eldon	...	T	.77	.19	..	.14	.09	..	...	.36	..	T	T	.77	38	.02	...	....	..	....	....	....	....	.40	..	T	T	.01	..	..	T	
Elkader	..	....	.06	..										..	.03	...	..														
Emerson	...	.80	....	....	T	1.00	..	....	..	.33	..	1.50	.11	.02	..	...	....	....	....	....	....	..	....	..	..	..	..	.08	1.58	....	.43	
Emmetsburg	..						...				T	T	..	..	..																
Fairfield	..	.05	1 09	.29	..	.10	.05	....	..	...	....	.32	28	..	82	.10	...	..	..	....	....	..	..	..	..	..	.60	....	..	..	..	
Fonda	....	T	T	....	T	1.37	...	..	..	..	....	T	.02		18	...	....	..	..	....	....	..	..	T	..	..	..	.45	..	..	..	
Forest City	..	.10	..	..	T	.37	...	..	..	..	...	T	.10	T	1.27	....	..	..	..	..	....	..	..	..	....	..	T	.02	T	..	.42	
Ft. Madison	..	T	.68	.53		03	1.32	..	....	T	....	.65	.52				..	....	..	..	....	..	..	23	..	..	T	.05		T	T	
Galva	..	.06	..	..	.51	..		..	..	..	..	....	T	T	.60	T	..	..	..	..	..	..	..	.30	.06	....	..	.20	..	..	..	
Gladbrook	...	T	..	....	1.25	....	..	..	..	..	..	.22	....	..	..	....	..	....	....	....	..	..	..	....	....	..	..	.15			.45	
Glenwood	...	.25	.94	....	..	.41	..	..	..	....	..	..	..	..	..	.25	..	....	..	....	..	..	..	.19	.	T		33		.	.08	
Gilman	....	.	1.55	...	T	.36		..	.	....	..	....	.28	....	....	....	..	..	..	....	..	..	..	....	..	..	T	..	..	..	.40	
Grand Meadow	..	....	....	..	....	..	..	..	..	....	..	....	....	.21	..	..	..	..	..	..	..	..	..	....	..	..	1 07	..	..	..	..	
Greene	....	..	..	..	....	.36	..	....	..	.58	..	1.48	.09	....	..	..	..	....	....	....	..	..	..	T	..	..	.06	....	T	..	.12	
Greenfield	....	66	.69	..	22	.73	...	....	..	..	..	.0	.25	..	..	..	..	..	..	....	..	....	..	..	....	.04		....	..	..	.05	
Grinnell (near)	...	T	1.84	..	....	.50	.03	..	....	..	..	..	.07	.02	.08	....	..	..	....	....	..	..	....	.81	..	..	.48	...	..	....	.98	
Griswold	...	.56	.28	..	..	.95	.24	...	..	....	..	..	.80	..	..	..	....	..	..	..	..	..	..	..	....	....	.07	T	T	....	.23	
Grundy Center	....	.43		T	52	....	..		.24	....	T	.25	....	....	....	..	..	....	....	..	..	..	..	..	..	.47	....	....	....	1.93	
Guthrie Center	...	..	1.07	..	.08	.33	.05		..																						
Hamburg	...		....	..	..	1.00	.45	..	..	72			.09	....	.01	....	....	....	....	....	..	..	..	..	..	..	T	.25	..	..	....	
Hampton	....	.22	..	..	.86			..	..							..	....	....	....	....	..	..	....	.48	..	.04	.44	.01	....	.	.20	
Harlan	...	.02	.38	..	T	.11	....	....	....	.13	..	T	.80	.16	..	..	..	..	....	..	..	..	..	..	....	..	.10	1.50	..	..	..	
Hawkeye	...	.06	....	....	.05		..	....	....	....			.27	..	.07	.	..	....	....	..	..	..	..	..	..	..	....	60			.02	
Hedrick	....	..	.59	.20	....	..	.22	....	....	.74	....	2.50	.25	....	....	....	.76	....	....	....	..	..	..	T	..	..	.62		.		.85	
Hopeville	..	...	1.36	..		.88	.09	..	..	.10	...	.05	....	....	1.34	..	....	....	..	..	..	..	..	T	....	....	....	....	....	....	....	
Humboldt	...	..	.24	..	.01	1.00	..	....	..	.33	..	..	T	..	.23	....	..	..	..	..	..	..	..	..	..	..	.02	..	..	..	.42	
Independence	...	....	.20	..	..	.12	..	..	..	.65	....	.10	.13	..	.02	..	..	..	....	..	....	....	..	.34	..	T	03	28	04	..	1.40	
Indianola	....	....	1.40	T	T	1.05	2.05	..	...	1.05	.	..	.03	.65	.22	T	..	.	....	....	..	....	....	..	..	..	T	..	T	..	T	
Iowa City	....	....	2.09	.28	....	.04	.44	....	..	.31	....	.39	.11	.07	..	..	..	..	....	....	..	..	..	T	..	..	.22	..	T		.67	
Iowa Falls	...	.27	.	..	....	.67	....	....	....	.18	....	....	.05	....	..	..	..	..	....	....	..	..	..	.05	..	....	..	..	T			
Keokuk	....	.22	.42	1.22	..	.17	..	....	....	T	..	....	T	..	.11	18	..	....	....	....	..	..	..	T	T	T	.23			.03	
Keosauqua	....	T	.43	.06	....	.14	.96					.02		..	.90	.10	..	....	..	....	....	..	..	..	....	....		2.34	....	.73	
Knoxville	...	....	3.37	..	..	.86	.72						..	..	T	T	....	....	....	....	....	..	..	.27	..	....	.02	1.00	....	.63	
Lacona	....	.16	2 34	.02	..	1.00	.30	..	....	....	....	..	..	..	.27	....	....	....	....	....	....	....	....	..	..	....	.06	..	.07	....	.73	
Lamoni	...	.23	1.20	T	..	.66	.08	..	..	.05	..	T	..	..	.04	.10	....	..	..	....	....	..	..	..	..	..	T	..	.05	..	.37	
Lansing	....	....	.19	..				..	..	.21	...	.27	.37	.07	T	....	....	....	....	....	....	....	....	T	..	T	.04	.15	.08		2.40	
Le Claire	....		.10	1.31	.02	..	28	....	....		T	....	..	.97	.23	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	
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Maquoketa	....	...	1.71	.07	....	....	....	....	....	.15	..	..	.25	.06	.35	.15	..	....	....	....	....	....	....	T	..	T	....	....	....	....	.83	
Marshalltown	....		.25	.10	T	.26	....	....	..	....	..	..	T	23	....	....	....	....	....	....	....	....	..	T	....	T	....	....	....	....	T	
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Mt. Ayr	..	.10	1.75	.02	..	.02	.10		..	.75		..	T	.02	1.00	....	....	..	....	..	T	....	..	..	T	....	....	....	....	T	....	
Mt. Pleasant	...	....		.56		.06	.09	..	....	04		..	....	....	....	....	....	..	....	..	..	....	....	T	....	..	.02	.05	.27		2.15	
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DAILY AND MONTHLY PRECIPITATION FOR JULY, 1899—CONTINUED.

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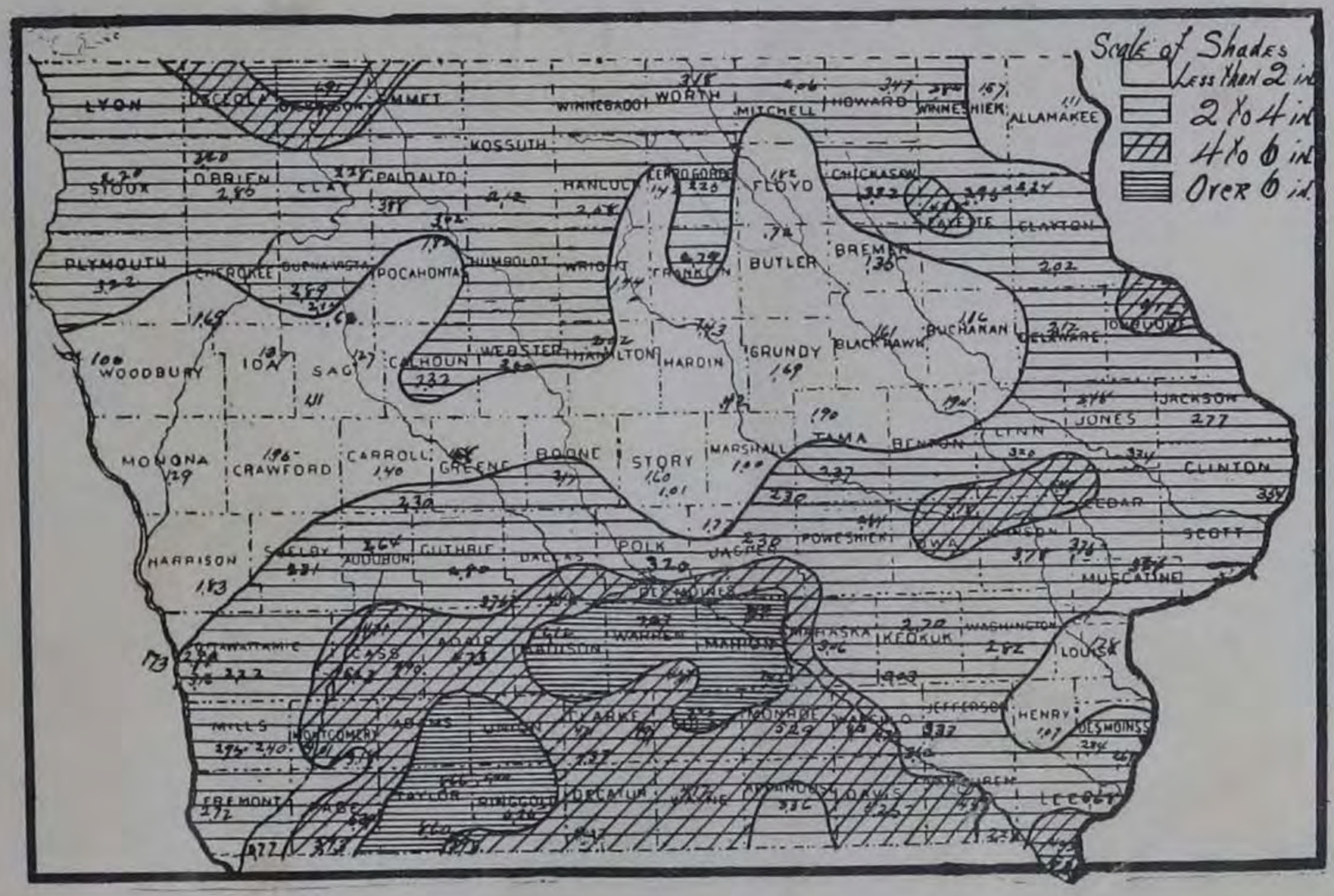
Precipitation Chart July 1899.



Vol. X. August, 1899. No. 8.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE



STAR ENG CO

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Central Station, Des Moines, Iowa.

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DES MOINES:
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1899.

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Farlin	Jesse Johnson.
Fontanelle	Hon. L. M. Kilburn.
Ford	J. C. Richards.
Fort Dodge	R. W. Blaine.
Geneva	Wm. H. Thompson.
Hesper	G. E. Dillingham.
Humeston	Hon. S. H. Moore.
LeMars	Hon. Henry Schrooten.
Lockridge	John F. Farman.
Marshalltown	Hon. S. B. Packard.
Mapleton	A. Lamb.
Mt. Pleasant	W. S. Wright.
Milton	Hon. E. C. Holland.
Mount Vernon	Robert Smith.
Nevada	Geo. C White.
Osage	E. W. Stacy.
Orange City	H. J. VandeWas.
Owen	Hon. J. W. Bird.
Paton	A. B. Condit.
Pittsburg	G. C. Duffield.
Rock Rapids	D. E. F. Merrill.
Rockwell City	J. G. Palmer.
Rossville	T. B. Wiley.
Rowley	L. Maxson.
Sageville	Hon. F. N. Knoll.
Seymour	L. B. Sager.
Shenandoah	Reuben Mullison.
State Center	E. P. Thompson.
Stuart	W. W. Bailey.
Unity	Edw. Hummer.
Van Horne	Spencer Smith.
Winterset	H. A. Kinsman.
Wall Lake	T. E. Wilcox.
Wilton	Thos. Boot.
Wiota	I. S. Coomes.

U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME X. AUGUST, 1899. No. 8.

CLIMATE AND CROP REVIEW FOR AUGUST.

The month of August was warmer than usual, the average temperature for the state being slightly above the mean for the preceding month.

The first week was seasonably warm, with an excess of rainfall in the central and southern districts, and more than the normal amount of humidity and cloudiness. Some damage to corn and grain in shocks resulted from severe rain and windstorms in numerous localities; but the benefits resulting from the timely and liberal supply of moisture greatly exceeded the local and incidental damage and inconvenience of delay in harvest operations. Pastures, potatoes, garden vegetables, as well as late corn, were greatly benefited by the abundant moisture of that period.

The second week brought three days of high temperature, with excessive humidity, and unequally distributed rainfall. The conditions were favorable for the very rapid advancement of corn, which, at that period of the month, was reported to be in all stages, from tassel and silk to well filled and hardening roasting ears.

The third week brought typical August weather, being both dry and warm, with only scattered showers, and general prevalence of drouthy conditions. It was favorable for maturing early planted corn, but the later fields were beginning to show signs of suffering for want of more moisture.

The fourth week and balance of the month averaged several degrees warmer than usual, with variable rainfall and weather conditions favorable for threshing and closing up work in the harvest fields. At the close of the month the larger part of early planted corn was sufficiently advanced to be cut and shocked. Late corn needed more moisture, and the leaves were "fired" to some extent on dry and sandy soils.

As a whole, August was a favorable month for harvesting and ripening the abundant crops of the state.

A DESTRUCTIVE HAILSTORM IN JULY.

Probably the most destructive hailstorm of the past stormy season in Iowa occurred at Pleasantville, Marion county, on the night of Thursday, July 6th. From the columns of the Pleasantville *News*, of July 13th, we glean some items of general interest relating to this notable disturbance.

The storm reached Pleasantville about 10 o'clock P. M. The area of destruction by hail was about three miles wide and over fifteen miles in length, beginning about five miles west of Pleasantville and extending eastward beyond the Des Moines river at Red Rock. The town of Pleasantville was about in the center of the hail belt, and the damage to buildings and gardens in that place very heavy. Skylights in brick blocks, and window lights on the south and west sides of houses, suffered almost total destruction. The hailstones ranged from the size of walnuts to goose eggs; some of them round and others irregular in shape, like masses of small stones frozen together, and these were driven with tremendous force by the heavy wind accompanying the storm. Fruit and shade trees were blown down; shrubbery and garden truck were destroyed, and general desolation was left in its pathway. Some of the larger hailstones broke through roofs of buildings, and in some cases they penetrated the ceilings of the rooms below. The destruction of farm crops within the hail belt was almost total Corn, oats and wheat were beaten to the ground. Small fruits were destroyed, and apples were beaten from the trees. The destruction of exposed crops in the fields was as near total as was ever known to result from the effects of hail. Happily no human lives were lost, and the loss of live stock was small. The damage to window glass in Pleasantville and vicinity amounted to about $4,000, and that was one of the least items of loss resulting from this terrific storm.

The citizens of Marion county responded liberally to calls for assistance to those who were greatest sufferers by this unusual catastrophe.

APPLE CROP IN IOWA.

[From the Altoona Herald.]

The state crop report says there will be a shortage of apples this year. Apples in Iowa are sadly neglected. The orchard gets the least attention of any wealth-producing crop on the farm. When planted it is left to hustle for itself and is expected to raise a good crop for twenty-five years without a break. But it won't do it. Every year our hard Iowa winters and severe winds freeze out and destroy apple trees. To meet this loss one must be ever vigilant and plant new trees when an old one dies. If our farmers would fill the orchards in with new trees as fast as the old ones die, and give the orchard the care it deserves, there would be an abundance of as fine apples in Iowa almost every year as the world produces.

A FOREST RESERVE.

A proposal to make a great national park of the forest and lake region of northern Minnesota is strongly advocated by western people. This section embraces the lakes and streams that contain the sources of the Mississippi. It is very important that these should be preserved from denudations of forests, leaving the country barren and desolate. The country has little value for agricultural purposes. If used as a park,

and its waters stocked with fish, it will become the paradise for sportsmen, and be worth more to the country than any other disposition that can be made of it. There are 3,300 Indians within the limits of the park who make their living by fishing and hunting. They are peaceable, and make the best of guides for those who visit the region for sport. There is more valuable game in this region than anywhere else in the west. To keep it as a game preserve is probably the best thing that can be done with it.—*Exchange.*

CAREER OF A SMALL TORNADO.

[From the Nebraska Weather Bulletin.]

On Wednesday, July 5th, Brown county, near Ainsworth, was visited by a tornado at 5:20 P M., central time Mr. A. H. Gale, voluntary observer at Bassett, Neb., rode over the entire track on the 7th, interviewing persons nearby, who witnessed and suffered by it, and has furnished a most interesting account of the storm:

"Mr. A. Brown, living five and one-half miles northwest of Johnstown, saw it form. He was at work in the barnyard, and saw a whirlwind, such as is often noticed on still, hot days, pass through the yard. It was noticed by the whirl it made among the grass, straws and chaff on the ground. He watched its onward movement, indifferently at first, but soon saw it gather a color which made it definable, and, afterwards, he paid close attention and saw it become black, angry, and gyrating vigorously. At the same time a funnel began to lower from a turbulent, low-hanging cloud. The column and cloud soon connected and took on a terrifying aspect. Up to this time he had no feeling of apprehension. About two and one-half miles from Mr. Brown's house, it struck the house of Mr. John Strohm, where the first damage was done The destruction here was complete; house of heavy logs, windmill and tower, and stables in all, seven buildings destroyed. The direction of movement was a little south of east The path of the storm was eighteen to nineteen miles long, and required about sixty minutes to pass that distance. Four houses were destroyed and one woman killed. It was noticed that the tendency of the tornado was to quickly empty itself of the trash picked up, but the very lightest material remained long afloat. The electrical discharges, which might be expected, were missing; but one person observed any, and then but one flash. Mr W. E. Jerome, living four and one-half miles from Long Pine, observed the breaking up of the funnel. He says it came to a stand, wavered, spread out, lost color and motion, and collapsed with a fall of light rubbish and loose trash, immediately followed by sharp hail."

FREQUENCY OF TORNADO VISITATIONS.

[From Davenport Democrat, June 20th.]

This has been a cyclone season beyond question. The frequency of these atmospheric disturbances is causing much discussion as to their origin or cause. Most persons undoubtedly hold to the view that the tornado is a comparatively new agency of destruction, and many go so far as to account for the storms in a way satisfactory to themselves, if not to others. The most commonly-advanced explanation is that the excessive rains are due to the cutting away of vast tracts of timber at the north; and there are those who maintain that this holds true in the south and elsewhere.

James E. Lindsay, of this city, does not accept this theory. Mr. Lindsay is one of the best-known lumbermen and sawmill men in the northwest. He is also a very close observer, and has had wide range for note-taking. Some of the newspapers, in referring to the Wisconsin storm of the past week, have called attention to this tornado as being something new to that part of the country. Mr. Lindsay thinks they are mistaken. He maintains that the violent storm did its work of demolition long before there was a town by the name of New Richmond, before the county of St. Croix was even surveyed. The path of the tornado is familiar ground to him. He speaks of having visited it years ago in company with E. W. Durant, of Stillwater, another experienced lumberman. They then found unmistakable evidences of earlier cyclones. They came across a stretch of country, a wide swath or path, which had been mowed of its big pine trees. On either side of this swath or path the old pines were growing in their virgin strength, but where the storm had done its devastation a new growth was making its way. The woodman's ax had never been there. Fires are not so eccentric in destroying timber as tornadoes.

Down in Arkansas Mr Lindsay has traveled on his prospecting tours over large tracts of forests, and there he also found evidences of just such storms as those of the past few days in northwestern Wisconsin and Nebraska In the case of more recent storms, the pines had been blown and twisted, and lay rotting on the ground, with the new growth coming up among the fallen, old monarchs. And so he concludes that the tornado is not a modern invention in any sense.

There is reason in this position. A tornado in Iowa, half a century ago, would have found no cars to be blown from the track; no towns to level; and no telegraph wires to tell the story in all its detail. In Wisconsin acres of mighty trees might have been uprooted and news of the havoc would never have been spread. So, as cities and towns multiply, more of them will be placed in the track of tornadoes, provided these occur no more frequently than they did before the country was settled. There is no comfort in this conclusion, but it is evidently warranted.

Iowans refer to the Camanche tornado of thirty-nine years ago as the first one to visit the state Joseph Wright, of Plato, writes a letter to the Des Moines *Register* to say that a frightful tornado passed over the south half of Cedar county June 5, 1854, or six years before the Camanche storm. Mr. Wright says it would have been far more destructive if the country had been settled then as it is now. "The path of the storm," he remembers, "was half a mile wide; could easily see the width of the storm as it cut its way through the timber. Everything was taken clean; nothing left When the storm crossed Cedar river it took large stones from the bottom and carried them on land. From the best and most reliable information I could gather at the time the storm of 1854 reached Lake Erie."

This is a timely confirmation of Mr. Lindsay's position. It goes to prove that the tornado is nothing new under the sun.

INCENDIARY BACTERIA.

The list of harmful microbes—those of plague, cholera, typhoid, etc.—was already long enough, but new ones are being discovered every day. The latest is the incendiary microbe, which, according to M. Jean de Loverdo, causes spontaneous combustion.

The spontaneous combustion of hay appears to be its work. Among those who have been converted by the evidence of facts is a large Austrian farmer. He had stored 300 cartloads of hay and cereals in a barn to which no one had access, and, after a few days, perceived that the middle of the heap was becoming heated

At first he paid little attention to this, but when, at the end of a week, a light vapor began to appear he gave orders for

earing out the barn. His men set to work, but as soon as ney began to disturb the middle of the heap flames burst out l all directions, and it was all they could do to escape from ne blazing building, which was soon reduced to ashes.

Damp is particularly favorable to the development of the ncendiary microbe, and spontaneous combustion is much nore frequent in seasons when the hay has been spoiled by ain than in dry ones. Favored by the moisture, the microbes nultiply enormously and attack vegetable fibres, which they o not take long to digest.

A certain amount of heat is soon given out, and before long he temperature rises in a most extraordinary way.—*Volonte.*

THE BANNER CORNFIELD.

HOW A SHALLOW, MIASMATIC LAKE WAS CONVERTED INTO A GREAT CORN FARM.

Correspondence of the St. Louis Globe-Democrat.—South of Ava, n southern Illinois, from the brow of one of the Kinkaid hills, an be seen the most magnificent field of corn upon which the white man's vision has rested since the time the Pilgrims anded and learned to know the merits of maize in hasty pud- ing. The September sun is putting the golden color upon ,000 acres of corn in one great body. This is the banner corn- ield of the world. It will give this year 600,000 bushels of orn, an average of 100 bushels to the acre. The statement will be questioned; and the people who know most about corn utside of the American bottom will be the first to challenge. Even the Egyptians of Illinois look askant at such a claim. But those who have seen the extraordinary spectacle agree that nowhere in the world is there such a crop of corn maturing on he same ground space.

Even from the nearest hill-top this field appears to be a olid mass. As far as the vision reaches the corn extends with- ut apparent break. On closer approach the spectacle is even nore impressive. The corn stands at an average height of fif- een feet. So heavy is it that a man four rows from the outer dge cannot be seen. At a little distance the edge of the great body presents an unbroken line. Close views show an occa- ional dividing boundary in the form of a narrow road or lane. On either side of these lanes the corn rises like a wall high above the wagon Having once entered the lane, the traveler inds it impractical to turn around. The only thing to do is to drive to the other side of the great field. Nobody who has ridden through the 6,000 acres questions the estimate of 100 bushels to the acre. And nobody who has visited the field since the present crop began to mature can remember to have seen the like of it before.

Even the cultivators of this exceptional field admit that they have never seen such a crop as this year's. To them there is nothing unusual in a yield of seventy-five bushels to the acre. In unfavorable seasons they can safely count on fifty to sixty bushels. But 100 bushels for the entire tract is the record breaker. A capitalist from the greatest corn raising section of Illinois, the vicinity of Springfield, last week bought 600 acres of this banner field of corn. He paid $18,000. A cash offer of $30,000 for 1,000 acres was refused. By way of interesting contrast, it may be stated right here that less than ten years ago the ground upon which stands the banner corn crop of the banner corn year changed hands at $1 an acre. Where the banner crop is denting and hardening, within half a dozen years, wild ducks had a summer nesting and hatching place.

The banner cornfield of the United States occupies what was recently Big lake, in the American bottom. Water stood at a depth of two feet over an irregularly formed tract, perhaps two miles wide and four miles long in its largest measures Long ago an abortive attempt at draining was made, but it failed of its purpose. Big lake continued to furnish sport to the duck hunters, but was worthless in all other respects. Whitney Gilbreth, of Ava, began to speculate upon the possibilities of reclamation. The fellow citizens of Mr. Gilbreth are now rather loth to recall the uncomplimentary things they said about his want of sound sense in wasting his time with Big lake. They saw him put into the overflowed land his money until he owned thousands of acres. They saw a drainage district formed. A steam dredge cut a channel twenty-five feet wide from the lake to the Mississippi river. This ditch ranges from eight to thirty feet in depth. The citizens commented sarcastically and could hardly be patient until the time to say, "I told you so." That time never came for them The water drained from the lake into the cut and passed away, leaving in one body 6,000 acres of almost inconceivably fertile land And that is where to-day ripens this mass of corn which beats the world

Two other lakes have since been included in the drainage districts. Canals nearly thirty miles in all have been dug. Where these other lakes were are other bodies of corn 2,000 and 3,000 acres in extent. They will show yields proportionate to that of Big lake; but there is only one body of 6,000 acres which will give 600,000 bushels.

THE CLAYS OF IOWA.

JOINT COMMISSION TO INVESTIGATE AND REPORT THEREON.

In 1898, eighty-seven out of the ninety-nine counties of Iowa produced some form of clay goods. In all, over $2,000,000 worth of brick, tile, etc., were manufactured and sold, and 349 establishments were reported. The increase in output of recent years is very marked. The great paving brick industry with its output valued at from a quarter to a half million dollars, has grown up within the last few years. In 1897 Iowa ranked third in the production of paving brick, and it is now the most important state west of the Mississippi in that industry. Important, however, as the clay industry has become, it still lags behind the opportunity. There is cheap and abundant fuel. Almost every geological formation in the state yields some clay suitable for manufacture. There are large areas underlain by the clays of the cretaceous, which yield such superior product in New Jersey and other Atlantic states, as well as at Golden, Colo., and other points in the west. The coal measures, the great storehouse from which Pennsylvania, Ohio and Illinois, draw their clay, cover nearly 20,000 square miles in Iowa. They afford a wide variety and a great abundance of clay. The loess, an incomparable material for ease of working and cheap production of standard builders, covers all or parts of sixty-nine counties. Lumber is largely imported, stone is not much in use, the cities and towns are now putting up the second generation of buildings, and everything conspires to favor a good local market. To the north and west is a wide area devoid of fuel, and largely wanting in suitable clays, which must ultimately be good trade territory.

In spite of these favorable conditions, Iowa has for years and does now import large quantities of clay goods. The bulk of the pottery used in the state, both fine and common, is manufactured elsewhere; the bulk of the fire brick is also shipped in. Large quantities of sewer pipe, paving brick, terra-cotta and fancy building brick, come from outside its borders. This can only come from lack of appreciation of the importance of the local clays, or lack of ability to develop them.

When, in 1892, the geological survey was organized, it was seen that the clays would be one of the most important subjects for investigation, and provision was made for their study. Mr. E. H. Lonsdale, at that time engaged in work for the Missouri geological survey, was placed in charge of the work, and devoted his attention to it in the years 1893 and 1894. His removal from the state, and subsequent death, left the work unfinished, though many valuable notes had been collected In the need of pushing the areal work it was found impossible to detail anyone else to this particular subject. In the meantime the work of the county surveys continued to show the great extent of undeveloped resources and notes on the extent and occurrence of the various clay beds were continually collected. It was impossible, however, to take up the study of the clays themselves, for want of either proper laboratory equipment or the funds to purchase necessary instruments and supplies.

In the meantime the paving brick industry became more and more important. The city engineers of the state and other members of the Iowa Engineering society had the problems relating to brick paving brought to their attention in the course of their professional work, and at their annual meetings a number of important papers were read bearing on different phases of the subject. The engineers, however, worked almost alltogether with the finished material. They could determine the faults of the latter, but had little opportunity to study the causes back of these faults, and none to apply a corrective. It was also found that there was strong need of standard specifications and standard methods of testing. The tests formulated by the National Brick-Makers' association were found to be open to some doubt. The exhaustive work of Marston showed that the cross breaking test was probably much more reliable than the national committee had rated it. Boynton, after a careful series of tests, found it better to use scrapiron in the rattler. There was grave question, in particular, whether the National Brick-Makers' association test did not rate the soft brick unduly high.

When these matters were brought to the attention of the society at its meeting in 1898, a committee was appointed to consider the entire subject of paving brick and paving brick tests, with a view to some common understanding as to the qualities desirable and attainable This committee consists of Messrs. A Marston, of Ames; C. R. Allen, of Ottumwa; C. P. Chase, of Clinton; C. S. McGowan, of Iowa City, and E P. Boynton, of Cedar Rapids.

The brick-makers of the state have been vitally interested in the development of the paving industry and of the clay industries in general. Individually. they have experimented and have employed experts to study their clays and products. Large sums of money have been spent in an effort to determine the needs and proper methods of manufacture of pavers. So long, however, as there was neither a standard of quality nor any uniform method of testing, the results were uneven. A manufacturer might spend money, time and labor to turn out a brick which he knew would wear well and then have it rejected by some test of which he had never before heard. The necessity for a common understanding became apparent. This matter of paving brick is simply one in which there was this necessity There were other problems which quite as much needed careful and systematic investigation by experts.

The notable work done in Ohio by the school of ceramics at the Ohio State university, under the aggressive direction of Prof. Edward Orton, Jr., has attracted much attention and in Iowa there has been a growing conviction among those interested that a similar institution was badly needed. At Columbus they have a complete plant for testing clays on a working scale. Soft and stiff mud machines, dry presses, repress, driers and kilns are all in use. Most of the machinery was donated by the manufacturers in the interest of better clay working.

At the winter meeting of the Iowa Brick and Tile-Makers' association, at Sioux City, resolutions were passed urging the advisability of a fuller investigation of the clays of the state. A committee consisting of Messrs. J. H. Charles, of Sioux City; D. W. Townsend, of Cherokee, and J. B. McHose, of Boone, to which has later been added Mr. C. B Platt, of Van Meter, was appointed to agitate the matter and, if possible, secure action.

At the Iowa State College of Agriculture and Mechanic Arts, located at Ames, tests of paving brick have been carried on quite extensively, and Professor Marston and his associates were planning to carry on the work the coming year. At the State university, Professors Sims and McGowan were also planning to take up the work. Under the circumstances it was thought that the time for united effort had arrived and a call was issued for a meeting at Ames June 14th. Representatives of the Engineering society, Brick-Makers' association, Geological survey and State university accordingly met with the professors of the engineering department of the college, and a joint commission was organized with Prof. A. Marston, of the State college, as chairman and H. F. Bain, of the Geological survey, secretary. The visitors were welcomed by President Beardshear, after which there was a general discussion of subjects and methods and a plan of work was adopted.

It was decided as a first step to make a careful study of paving brick with a view to the preparation of a report on the methods of manufacture, the formulation of a series of tests, the adoption of uniform specifications and the collection of data as to methods of laying pavements, its cost and life. The latter portion of the work was placed in the hands of the subcommittee of engineers, who were requested to prepare blanks for the collection of this data. The Geological survey agreed to detail Dr. S. W. Beyer to visit the various plants in Iowa and study their methods of manufacture, carrying on temperature, shrinkage, drying and other tests, and collecting samples for farther laboratory studies. Chemical analysis of the clays are to be made by Dr. J. B. Weems, of the college. Cross-breaking, rattler and absorption tests of the brick are to be made in duplicate at the college and the State university, and tensile strength and other physical tests of the clays are to be carried on at the same time. The manufacturers are furnishing the material for these tests and bearing a portion of the expense. It is expected that when complete they will yield very important information and will be of material aid in developing the paving brick industry.

It is hoped that this work will prepare the way to the opening of a complete clay-testing laboratory at Ames. At present the college has no room to spare for the work, nor sufficient available funds to carry it on. It is expected that the work on paving brick will be of sufficient practical importance to induce the authorities to provide the necessary funds for further work.

Before adjournment the following resolutions were adopted:

WHEREAS, The clay resources of Iowa have been shown by the Geological survey to be vast and varied; and,

WHEREAS, These resources are as yet largely undeveloped; therefore, be it

Resolved, That the plan of investigation here outlined is heartily indorsed and the co-operation of the machine manufacturers, brick-makers, and all others interested is urged. Furthermore, be it

Resolved, That the state be urged to establish at Ames a complete laboratory for the testing of clays and clay products.

H. F. BAIN,
Secretary.

AUGUST WEATHER RECORD.

The month of August was warmer than usual. The average temperature for the state was 74.4°, which is about 3 3° above the normal, 1 3° above the average for the preceding month. The averages by sections were as follows: Northern section, 73.1°; central section, 74.4°; southern section, 75.6°. The highest average in the state was 77.2° recorded at Glenwood; lowest, 71° at Eagle Grove and Cresco. The maximum temperature recorded was 100°, at Wapello, on the 3d, at Bedford on the 9th, and at Hampton and Clarinda on the 23d.

The average rainfall for the state was 3.68 inches, which is about .61 of an inch above the normal for August. The averages by sections were as follows: Northern section, 3 40 inches; central section, 3.38 inches; southern section, 4 25 inches. The greatest amount reported for the month was 10 45 inches, at Thurman; least amount, 1.12 inches at Algona. There were 17 clear days, 10 partly cloudy, and 4 cloudy days. Sioux City reported wind velocity of 59 miles an hour, from the northwest, on the 2d.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 29.92 inches; hest observed, 30.25, at Cresco on the 15th; lowest observed, 10, at Omaha, Neb., on the 10th; range for the state .65 hes.

Temperature —Monthly mean, as deduced from 116 reports, s 74 4°; highest monthly mean, 77 2°, at Glenwood; lowest nthly mean, 71°, at Cresco and Eagle Grove; the highest nperature reported was 100° at Wapello, Bedford, Hampton l Clarinda on the 3d, 9th and 23d; the lowest temperature orted was 41°, at Hampton on the 25th; the average nthly maximum was 95 4°; the average monthly mini- m was 51 6;° the greatest daily range was 45°, at Elkader; rage daily range, 33 6°.

Precipitation —Average for the state, as determined from reports of 133 observers, 3 68 inches; the largest amount orted was 10.45 inches, at Thurman; the least amount was 2 at Algona; the greatest daily amount reported was 4 1 hes, at Thurman on the 12th; average number of days on ich .01 inch or more of precipitation was reported, 7.

Wind.—Prevailing direction, southeast; highest velocity orted, 59 miles per hour from the northwest, on the 2d, at ux City.

Weather.—There were 17 clear days, 10 partly cloudy days, d 4 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES. Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
venport	29 93	30.16	15,18	29.68	10
s Moines	29.93	30.19	15	29.68	10
arinda	29 91	30.15	28	29.66	10,19
esco	.....	30.25	15	29.63	10
buque	29.94	30.22	15	29.63	10
naha, Neb	29.86	30 11	15	29.60	10
okuk	29.93	30.14	28	29.70	11
ux City	29 92	30.12	15	29.66	10
Means	29.92	30.25	15	29.60	10

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
avenport	4,477	24	W	20
es Moines	5,170	30	N	20
ubuque	4,374	36	NW	20
eokuk	4,066	24	W	4
a Crosse, Wis	4,227	37	SW	20
maha, Neb	5,387	42	NE	1
oux City	8,912	59	NW	2

OBSERVERS' NOTES.

BONAPARTE—*B. R. Vale.* A profitable and seasonable month; temperature above normal at close; soil too dry for seeding at close of month.

CLINTON—*Luke Roberts.* The hailstorm of the 11th was an unusual one for this section; hailstones as large as walnuts fell and did considerable damage.

COON RAPIDS—*Downs & Co* Small grain all stacked or threshed out of shock; threshers report above average yield of oats and wheat; storm of 23d blew down corn some, but prospect is good for a large crop.

FOREST CITY—*J. A. Peters.* No fall plowing done on account of the dryness of the ground; it will require fifteen days to ripen corn from danger of frost; pastures need rain.

GRINNELL—*A O. Price* For finishing harvest and rounding out the corn crop an ideal month.

HUMBOLDT—*H. S. Wells.* Corn cutting has begun; threshing is about done or is in stack; too dry and hard for plowing; most pastures are good; best yield of oats, 60 bushels; wheat, 20; flax is nice crop; the bulk of corn crop should be safe from frost now.

LAMONI—*T. J. Fitzpatrick.* The month closed very dry and hot; corn at end of the month safe from frost but suffering some from the dry weather.

OVID—*H. C. Miller.* A very warm, clear month with no high winds.

TOLEDO—*L. G. Bookwalter.* The month of August has had hot days and cool nights; corn is making progress and that which was planted early is ready to be cut and shocked; the high temperature has dried the blades in some places; the apple crop is very thin; pastures are very good.

WEST BEND—*Phil. Dorweiler.* Month was favorable for haying and threshing; corn planted in season will be all right in about a week.

ERROR IN JULY REVIEW.

OSCEOLA.—Total precipitation should have been 4.80 inches.

BELATED REPORTS.

FAYETTE.—Mean temperature, 71 2°; highest 92°, on the 21st and 25th; lowest 41°, on the 30th; total precipitation, 2.34 inches; greatest amount in twenty-four hours, 1.38 inches, on the 12th; prevailing direction northwest; number of clear days, 20; partly cloudy, 8; cloudy; 3; rainy, 6.

CLIMATOLOGICAL DATA FOR IOWA, AUGUST, 1899.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIPITATION, INCHES.				Number rainy days	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days	
Algona*	Kossuth	1,500	7	74.6	+6	94	10, 19	58	24		1 12	-1 72	.55		10	14	17	0	SE
Alta	Buena Vista	1,519	8	72.7	+3	94	10, 27	53	24, 25	34	2 37	-1.39	.73		10	17	12	2	S
Alta (near)	Buena Vista										2.77		.75						
Britt	Hancock	1,230		72.7		96	10	50	15	31	1 49		.47		7	6	25	0	SW
Charles City	Floyd	1,012	8	73 2	+3	95	10	48	15	31	5 68	+3.43	1 45		8	9	20	2	SW
Cresco	Howard	1,312	27	71.0	+2	93	19	48	15	30	4.52	+1 62	1 78		11	18	8	5	SE
Decorah	Winneshiek	900	6	72 8	+3	99	17	44	15	39	4.51	+3.13	2.10		8				SE
Dows	Wright			72.8		95	23	48	25, 26	42	2 34		1 32		9	21	7	3	SW
Eagle Grove †	Wright			71.0															
Elkader	Clayton		19	73.9	+4	99	18	43	15	45	3.10	+ 25	1 52		6	19	11	1	SE
Emmetsburg	Palo Alto										3.97		2.53		6				
Fesherville (a)	Emmet			71.4		96	10	48	13	40	2.39		.50		8				
Fonda	Pocahontas			75.8		98	9	52	15, 17	39	2.49		1.15		8	21	2	8	S
Forest City	Winnebago	1,220		73.6		94	28	52	15	32	1.52		60		10	18	7	6	S
Grand Meadow *	Clayton		8	71 2	+3	90	10, 19	52	15		5 85	+3 49	3.70		6	10	17	4	SE
Greene ‡	Butler	943		75.2		98	10,18,19 23	48	15	40	2 68		.86		11	13	16	2	S
Hampton	Franklin	1,240		74 8		100	23	41	25	41	3 33		.70		9	12	16	3	SE
Hawkeye ‡	Fayette										3 83		1 54		6				
Humboldt	Humboldt	1,082		74.2		96	10	53	15	32	1.46		.37		8	27	1	3	SE
Lansing	Allamakee			71.9		96	10	51	2, 16	36	5 00		2.83		8	17	9	5	
Larrabee	Cherokee		8	72 4	+2	93	10	48	24	31	3 57	+ 38	1 27		10	11	18	2	SE
Le Mars	Plymouth	1,221		73.4		92	28	50	24	32	5.51		1 10		11	14	13	4	S
Mason City (d)	Cerro Gordo	1,130		71 1		96	10	45	16, 25	34	2 80		1.30		4				
New Hampton	Chickasaw	1,166		72.5		92	10	48	25	30	3.44		1.05		6	14	10	7	NW
Northwood	Worth	1,210		72.6		96	10	52	2	34	6 31		2.90		7	24	3	4	S
Osage	Mitchell	1,178		71 1		94	10	47	15	33	5 75		2 01		12	8	10	13	S
Plover	Pocahontas			73 4		98	19	50	14, 25	35	1.61		.35		7	23	4	4	SE
Primghar	O'Brien			73.6		97	11	49	23	35	2 20		1 00		4	19	0	12	SW
Ridgeway	Winneshiek			72.7		95	10	52	15	28	5.26		1.62		14	15	15	1	S
Ruthven	Palo Alto			73 4		97	10	50	15	30	3.85		2.20		5	15	8	8	S
Sheldon ‡	O'Brien	1,406		71 6		93	10	46	24	35	3 97		1.10		14	14	6	11	S
Sibley	Osceola	1,509		71.8		96	28	46	24	39	2.20		.55		12	12	15	4	S
Sioux Center	Sioux			73.7		94	9, 10	54	24	34	3 72		1.23		11	17	7	7	SE
Spencer	Clay			73.2		94	10	50	15	30	4 21		1.45		8	14	17	0	S
Spirit Lake	Dickinson		5	73.4	+1	96	27	53	12, 24	34	3.22	+ 57	1 38		6	14	13	4	S
Storm Lake (e)	Buena Vista			73 4		92	10, 27	51	24	31	2 01		.74		6	18	11	2	S
Washta	Cherokee										3.59		1 00		7	15	14	2	S, SE
Waverly	Bremer	942		73 6		93	10, 19	53	15, 25	28	3.66		1 60		8	14	12	5	S
West Bend *	Palo Alto		6	71.4	+2	94	10	50	15		2 04	-.55	.64		11	11	11	9	S
West Union	Fayette	1,105														16	0	15	
Average				73.1	+3	95 1		49.7		34 2	3.40	+ 92			8	16	11	4	S

CENTRAL SECTION.

Amana	Iowa		23	73 9	+4	93	11	51	25	34	2.69		1.22		8	19	8	4	SE
Ames	Story	936	19	74 2	+2	95	23	51	25	32	3 70	+ 30	1.75		8	16	15	0	
Audubon	Audubon		6	73.8	+2	92	23	55	24	30	5 25	+2 04	2.25		8	8	17	6	S
Baxter	Jasper			74.6		96	3, 18	52	25	32	5.40		1.26		8	4	21	6	SE
Carroll	Carroll		9	73.4	+3	96	10	51	15,16,25	35	5 07	+2.26	2.40		7	22	5	4	
Cedar Rapids	Linn	744	17	77 1	+5	98	18	54	25	36	1 82	-1.16	.74		6	19	4	8	SE
Clinton	Clinton	609	8	73.9	+2	95	11	52	16, 17	38	3 91	+1.13	1.12		8	10	20	1	SE
Coon Rapids	Carroll			74.4		93	10, 23	54	25	30	4 06		1.17		7	19	10	2	S, SE
Davenport	Scott	615	27	75.6	+3	95	3	55	14	31	4.47	+ .96	2.61		7	15	9	7	E
Delaware	Delaware	1,081	8	72 5	+3	94	18	49	15	35	3.27	+ .39	1 38		8	12	16	3	S
Denison (b)	Crawford	1,192	6	73.6	+3	94	27, 30	53	24	34	3 49	+ .49	1.30		5				S
Des Moines	Polk	867	21	75 0	+3	95	23	56	25	32	3.53	+ .34	1.27		9	9	15	7	SE
De Soto	Dallas	886		75 7		97	9,10,23	47	25	35	2.61		.81		6	25	4	2	SE
Dubuque	Dubuque	665	23	74.4	+2	93	10	53	15	31	1.95	+1.14	.54		8	14	15	2	SE
Galva	Ida		6	73.6	+4	94	10,27,28	51	25	32	3.03	+ .13	1.26		8	5	0	25	S
Gilman	Marshall	1,035									4 17		.96		8	20	6	5	SE
Grinnell (near)	Poweshiek			73.8		94	23	54	14, 15	32	3.61		1.52		8	18	9	4	SE
Grundy Center	Grundy	966	8	73 0	+3	99	24	48	25	44	3.35	+ .36	1 20		5	18	8	5	S
Guthrie Center(j)	Guthrie	1,269		74 4		94	10	52	14	31	4.16		1 70		8				
Harlan	Shelby			74.1		94	9,10,23	51	25	34	4 44		1.62		8	13	12	6	S
Independence	Buchanan	921	37	72 3	+5	91	19	50	15	30	2 55	-.59	.70		7	22	6	3	SE
Iowa City	Johnson	644	9	75.2	+4	97	20	53	14, 15	39	2 39	+ .04	1.25		6	15	12	4	S
Iowa Falls ‡	Hardin			74.2		96	23	48	25	35	2 57		.70		8	21	6	4	SE
Le Claire	Scott										3.00		1.21		5				
Logan	Harrison	928	34	75.8	+4	95	24, 26	55	15	31	5.90	+2.02	1 34		12	22	7	2	S
Maquoketa	Jackson		6	72 6	+1	92	11	49	17	39	2.89	+ .11	.98		6	20	10	1	S
Marshalltown	Marshall	898	7	75.4	+4	96	28	51	25	32	4.62	+1.99	1.27		9	21	8	2	SE
Monticello	Jones	800	45	74 2	+4	95	11,18,19	52	13	39	1.75	-1.91	.76		6	21	6	4	SW
Mt Vernon (Hubbard)	Linn			75.4		96	11	51	15	35	2 49		.70		7	22	5	4	S
Newton	Jasper	958	12	74.0	+2	93	23	52	25	28	4.51	+ .96	.85		9	20	9	2	SE
Odebolt	Sac			75.4		99	9	51	24, 25	38	2.10		.95		5	25	2	4	
Ogden	Boone	1,109		74.1		95	23	53	25	33	3.71		1.01		8	24	6	1	SE
Olin (a)	Jones			74.5		96	19	52	25	33	1.88		.46		6	24	7	0	S
Onawa	Monona			76 3		95	10,27,28	53	25	32	2.48		1.40		8	24	4	3	SE
Rockwell City	Calhoun	1,219		74.2		96	10, 30	51	15	34	1 85		.75		4	27	3	1	
Sac City	Sac	900		73.4		95	27	51	25	36	2.79		1.38		5	20	9	2	SE, S
Scranton	Greene			74 3		95	10	54	15	28	3.26		1.12		5	19	11	1	SE
Sioux City	Woodbury	1,122	10	74 2	+3	98	10	54	24	31	4 91	+1.11	1.62		10	12	11	8	SE
Toledo	Tama		5	74.6	+4	99	11	47	26	44	3.93	+1.37	1.60		7	23	0	8	SE
Vinton* (a)	Benton	800	9	74.8	+5	94	11	56	25		2.55	+ .34	.87		5	25	4	2	SW
Waterloo	Black Hawk	862	20	73 6	0	95	11	50	15	38	3.59		1.02		7	16	12	3	S
West Branch	Cedar	708		76.5		94	16, 18	55	8, 26	35	3.17		1.55		4	25	6	0	SW
Whitten (a)*	Hardin			73.7		94	23	58	15		2.78		1.40		4	9	20	2	S
Wilton Juncton	Muscatine			74.4		94	3, 18	52	14	34	2 72		95		6	21	4	6	S, SW
Average				74 4	+3	95 2		52 2		34 0	3 38	+ 60			7	18	9	4	SE

CLIMATOLOGICAL DATA FOR IOWA, AUGUST, 1899—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES				Number rainy days.	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days	Number partly cloudy days.	Number cloudy days.	
ton	Union	...	...	75.4	....	96	23	54	4	34	5 14	.....	2 10	.....	7				SE
bia	Monroe	945		74 6	..	93	3, 29	52	15, 25	30	4 49	....	1 90	....	10	22	2	7	SE
luntic	Cass.		8	74 6	+1	97	10	48	25	38	4 66	+2 00	2 17	.....	9	7	17	7	SE
tavia	Jefferson	640	..	.....	.....	...	.. ....		.....	.....	2.43	.....	.90	.....	5	...	...	...	.....
dford	Taylor	...	..	76.4	....	100	9	50	25, 26	37	3.54	.....	1.65	.....	8	11	19	1	SW
lknap	Davis	857	....	75 6	.....	93	3,11,23,29	55	15, 16	32	5.33	.....	3 50	.....	4	26	4	1	S & E
ockton (a)	Taylor	...	....	75.0	..	93	3	51	25	31	2.19	..	1.30	...	4	....	..	..	SE
naparte	Van Buren	....	8	76 1	+2	98	3	55	15, 16	34	2.84	-1.05	1 25	...	5	..	..	..	... .
rlington	Des Moines.	526	....	76.8	...	98	3	53	17	39	3.56	....	1.62	....	7	.	..	..	... .
ssey	Marion.	...	....	.....	.....	....	....	.....	.....	.....	3.82	... ...	1.20	. .	6	...	...	...	... .
rson	Pottawattamie	...	..	...	...	....	...	...	...	.....	8 32	.....	3.04	.....	8				... ..
nterville	Appanoose	1,013	6	76.2	+2	95	11,23,27-8	56	25	33	3.04	-.42	1.50	.....	7	22	6	3	SE
ariton	Lucas	1,030	...	74.4		94	3	53	25	32	4.51		1.67	.....	11	15	12	4	S
arinda	Page	1 069	9	77 0	+3	100	23	51	25	38	5 03	+1 68	2.33	...	8	19	8	4	S
rning	Adams	1,127	7	75.2	+3	94	23	52	25	34	3 99	+.86	1 29	....	6	23	2	6	S
llege Springs	Page	....	8	76.1	+2	99	3	57	25	31	4 19	+1.50	1.65	...	8	24	4	3	SE
uncil Bluffs	Pottawattamie	989	..	76 8		96	23	59	24	32	6.93	.....	2.80	.....	7	25	2	4	S
mberland	Cass	...	...	...	....	...	.....	.....	.....	...	6 26	.....	2.32	...	9	26	2	3	S
nville	Des Moines	715	...		...	....	...	.....	.....	.....	3.13	.....	78	....	7	22	8	1	...
agonal	Ringgold	....		73.8	....	94	23	51	25, 27	39	2 20	.....	.70	....	8	...	..	...	SE
don (a)	Wapello	....	...	76.8	.....	98	3, 27, 30	54	14	39	2.75	.....	1.69	....	8	..	...	...	E
merson	Mills	...		..	..	....	..	....	...	...	4.30	.....	2.80	....	5	...	..	..	.....
irfield	Jefferson	767	13	74.0		95	3	55	15	26	2.66		1 00	.....	11	19	9	3	... ..
. Madison	Lee	516	51	76.4	+2	91	3	60	8	22	4 11	+.46	1.70	....	7	13	14	4	NE
enwood	Mills	979	29	77.2	+5	96	23, 31	50	25	39	7.19	+3.82	2 50	. .	6	8	20	3	SE
iswold	Cass.	....	....	....			.... ..	.....	.....	.....	6 58	.....	2 65	....	6	19	3	9	S
amburg	Fremont	912	..		.. ..		.....	.....	.....	.....	6.46	.....	2.23	...	5	16	6	9	.....
edrick (a)	Keokuk	.....	..	74.2	.....	94	3	52	25	35	3 68	.....	.77	....	9	..	..	..	S
dianola	Warren		7	75 2	+2	99	3	55	25	32	3.83	+53	.85	...	9	15	13	3	E & S
eokuk	Lee	618	28	77.0	+2	96	4	58	14, 15	28	4 01	+1 22	1 90	..	7	17	9	5	SW
eosauqua	Van Buren	.....	7	75.6	+2	97	3	56	16, 25	33	4.05	+.70	2 43	...	5				.....
noxville	Marion	....	6	75.2	+2	92	23	50	13	30	3 48	-.42	.97	.....	8	19	6	6	SE
acona	Warren	....	....	....	....	...	.....	.....	.....	.....	3.46	.....	.75		10				.....
amoni	Decatur	....	....	74 0		93	23	53	25	27	3.87	.. ....	2.50	.. .	6	22	3	6	SW
enox	Taylor	....	..	74.3	...	92	23	55	25	27	3.58	..... .	1 23	.....	8	23	3	5	S
elrose	Monroe	850	....				.....		...		4.77	.....	1.50	.....	7	24	7	0	S
ooar ‡	Lee		...	76.2		99	28	55	16, 24	41	3 67	....	3 20	.....	4	20	7	4	S
t. Ayr	Ringgold	1,236	6	75.2	+2	95	23	56	25	28	2 12	-.89	.77		6	18	10	3	SW
t. Pleasant	Henry	725	....	75.2	...	97	1, 3, 11	50	14, 15	38	2.93	.....	1.00	. ....	7	19	11	1	S
urray	Clarke	1,183			...		....		....		4.05	.....	2.00	.....	4				.....
maha (Neb.)	Douglass	1,113	...	76 9	....	95	10	60	25	25	6 18	.....	2.88	...	10	13	10	8	SE
sceola	Clarke	1,123	...	75 2	.....	95	9, 23	52	25	31	2 89	.....	1.03	...	6	11	19	1	S
vid	Wayne	...	6	75.8	+2	95	2	52	25	34	4.02	+.16	1.40	.....	8	21	4	6	SE
skaloosa	Mahaska	850	16	75 0	+4	95	3	52	25	32	3.94	+1 21	.82	.....	10	22	4	5	SE
ttumwa	Wapello	630	5	76 2	+2	93	3	55	25	34	2.52	-.83	1.30	....	6	22	8	1	SE
cific Junction	Mills	960	.	75.0	.....	95	23	50	25	34	6 94	.....	2.95	.....	7	9	18	4	SE
lla	Marion		..	72.6	....	91	3	52	24	24	3.36	.....	.85	.....	8	20	9	2	SE
ed Oak	Montgomery	1,033	..	77.0		98	3	54	25	35	5 08	.... ..	2.06	.....	9	13	10	8	S
gourney	Keokuk	....	..	75.2		99	18	49	14,15,16	37	4 86	..	1.16	.....	8	18	13	0	NW
uart	Guthrie	.	..	76.2	...	96	23	54	25	28	2.90	...	1 10	....	5			..	.....
hurman	Fremont	.		76 1		95	23	52	25	34	10 45	....	4 10	.....	11	12	12	7	SE
illisca	Montgomery	1.058	6	75.8	-1-5	98	23	50	25	34	3.31	-1.11	1 12	.....	7	20	8	3	SE
apello (a)	Louisa	578	....	75.4	...	100	3	55	14	31	3 39	....	1 25	..	7	..	...	...	SE
ashington (a)	Washington	738	8	74 1	-1-1	95	3	50	14	31	2.61	-1-.05	.80	...	6	...	...		SW
interset	Madison	...	8	75 0	-1-4	96	23	52	25	33	3 27	-1- 27	1.18	.....	7		....	..	.....
oodburn	Clarke	..	..	.....	.....		.....	.....	..		3.14	.	1 40	..	8	19	6	6	.....
Average		.	...	75.6	-1-3	95 8	.....	52.9	.....	32 6	4 25	-1-.51	.....	.....	7	18	9	4	SE
Av. for the state		.		74 4	-1-3	95 4		51 6	....	33 6	3 68	-1-.68		.....	7	17	10	4	SE

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined om 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR AUGUST, 1899.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Means.
Afton	Max.	93	94	95	82	78	82	77	90	94	93	91	86	80	78	82	87	90	93	91	82	89	87	96	90	83	82	92	92	93	91	..	87.8
	Min	69	65	61	54	70	62	60	64	69	69	69	61	62	59	55	57	60	65	67	67	60	64	73	61	62	61	62	63	62	68	..	63.1
Albia	Max.	92	91	93	85	72	85	77	85	90	87	91	85	80	75	79	85	87	92	90	83	87	85	92	82	85	85	91	92	93	89	90	86.3
	Min	62	67	73	61	62	60	57	64	68	67	71	77	63	56	52	55	60	67	67	69	58	65	65	65	52	63	57	63	60	63	64	63.0
Alta	Max.	84	77	84	70	82	82	79	87	92	94	88	80	78	78	82	86	90	86	92	82	88	85	88	80	78	88	94	93	92	90	72	84.4
	Min	60	58	62	62	57	58	62	64	70	67	65	56	53	60	54	58	62	68	63	58	58	64	70	53	53	60	60	64	63	59	61	61.0
Amana	Max	86	83	90	84	73	81	76	72	91	90	93	84	79	78	80	85	90	92	92	82	86	79	91	81	83	87	89	90	87	89	88	84.6
	Min	65	66	71	67	62	63	58	64	67	67	69	62	64	53	53	55	56	66	69	66	61	64	66	68	51	62	65	63	61	63	63	62.0
Ames	Max.	90	84	88	85	78	83	76	81	75	93	90	85	81	78	81	85	90	93	91	84	91	86	95	79	80	91	91	93	91	90	86	86.1
	Min	64	65	72	63	62	63	62	61	68	70	67	58	63	58	54	53	60	64	68	65	59	63	65	60	51	61	60	61	65	63	62	62.4
Atlantic	Max	94	89	95	77	76	81	69	89	95	97	92	85	79	76	82	85	87	90	90	85	91	84	96	81	79	87	94	91	92	92	91	86.8
	Min	63	65	74	62	61	62	63	63	70	67	67	56	60	60	54	59	64	68	67	62	53	65	70	57	48	62	58	65	65	81	62	62.1
Audubon	Max.	88	86	87	75	78	80	70	87	91	86	81	77	78	73	78	83	85	90	88	82	87	85	92	77	78	84	90	89	88	88	88	85.5
	Min	65	66	73	64	63	63	64	64	69	67	64	62	60	61	56	63	64	67	68	62	57	66	69	55	58	65	65	66	68	68	65	64.1
Bancroft	Max.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	80	86	84	90	82	90	80	86	85	89	78	80	86	90	..	90	82	.....
	Min	..	..	..	..	..	..	..	..	..	..	..	..	..	..	60	58	53	64	70	68	53	62	58	56	..	52	62	61	..	68	65	.....
Baxter	Max	90	85	96	80	80	81	74	78	94	91	95	86	78	74	79	84	89	96	97	83	92	81	94	81	80	88	90	92	92	90	92	86.4
	Min	64	65	71	61	61	61	59	63	67	70	68	60	62	55	53	53	62	68	68	63	60	64	67	61	52	62	61	65	62	65	62	62.4
Bedford	Max	97	97	99	89	75	82	76	95	100	96	96	96	84	83	88	88	92	94	93	88	96	87	98	82	84	84	96	95	96	96	96	90.8
	Min	69	66	72	65	62	63	62	65	70	66	66	63	62	61	62	58	63	65	65	65	52	63	67	61	50	50	59	61	61	61	60	62.1
Belknap	Max.	90	89	93	90	75	83	75	82	90	84	93	83	75	80	80	87	89	92	92	83	89	82	93	86	86	87	92	91	93	90	87	86.5
	Min	61	70	75	70	65	62	59	62	67	70	70	70	65	63	55	55	65	67	70	71	64	67	71	66	54	58	60	62	61	61	64	61.6
Blockton	Max	90	91	93	88	75	80	75	90	92	90	91	89	78	75	81	78	88	90	90	86	89	..	90	94	81	81	90	91	91	90	90	88.0
	Min	62	65	72	67	63	65	63	65	73	65	71	62	62	60	58	63	65	71	64	60	58	..	65	63	51	58	62	61	61	64	62	63.3
Bonaparte	Max	93	95	98	82	72	83	77	81	88	85	95	90	78	76	82	86	90	94	93	87	91	80	94	84	88	89	95	93	93	92	89	87.1
	Min	66	71	73	73	67	66	56	68	65	68	70	72	65	56	55	55	60	67	71	69	63	65	66	68	56	64	61	68	61	64	64	63.1
Britt	Max	80	76	84	82	85	87	81	83	90	96	87	78	76	78	80	85	89	92	94	80	82	88	93	77	82	89	91	90	92	94	83	85.2
	Min	62	54	64	60	54	52	64	59	69	69	61	51	57	57	50	54	62	66	68	61	56	62	66	57	50	59	57	64	70	65	62	60.1
Burlington	Max	93	92	88	93	73	85	80	77	89	87	..	97	92	81	..	89	92	96	95	90	91	86	93	86	89	93	96	94	94	93	92	89.8
	Min	63	78	75	69	67	54	68	65	65	65	..	71	66	61	..	55	53	62	65	70	63	64	62	66	56	64	62	67	62	60	65	61.9
Carroll	Max	90	80	89	68	81	82	72	88	94	96	90	84	81	77	81	86	90	91	92	86	90	86	93	83	79	90	93	93	92	92	87	86.4
	Min	60	62	64	62	59	61	61	61	69	69	63	54	57	61	51	51	55	67	66	59	56	62	70	54	51	57	59	60	66	60	60	60.2
Cedar Rap	Max.	88	88	92	80	81	88	80	73	95	94	97	91	85	85	87	89	95	98	97	84	92	83	96	84	87	91	97	95	95	91	90	89.4
	Min	66	64	73	65	63	63	60	64	68	70	70	64	64	67	55	58	59	68	71	66	63	65	68	66	54	63	66	68	64	64	66	64.5
Centerville	Max	93	95	95	90	72	81	72	83	92	87	95	89	85	74	87	83	90	92	93	86	92	83	93	82	87	85	95	95	94	92	92	87.9
	Min	60	69	67	65	65	65	60	66	67	69	70	70	68	59	57	58	63	68	69	70	63	66	69	67	56	66	60	63	62	63	64	64.8
Charlton	Max	91	88	94	84	69	81	71	85	92	82	92	84	77	73	78	84	88	90	89	85	88	88	92	83	80	89	91	90	89	88	89	85.8
	Min	64	66	75	62	63	61	61	66	64	62	68	65	64	57	55	57	63	67	68	70	59	64	67	65	53	64	59	67	62	63	66	63.5
Charles Cy	Max	84	79	85	80	82	84	79	78	92	95	90	85	76	77	79	85	91	93	93	85	86	83	93	77	79	88	89	92	87	89	86	85.2
	Min	64	55	66	65	60	58	62	61	67	66	66	58	60	56	48	55	56	65	67	62	60	61	68	60	51	59	62	65	67	66	66	61.8
Clarinda	Max	95	96	99	84	79	83	75	93	97	96	96	92	85	80	86	88	90	93	93	88	93	89	100	85	84	83	93	93	94	94	93	90.0
	Min	66	68	70	64	64	66	64	65	73	69	66	62	61	62	58	59	64	66	67	66	55	66	68	60	51	62	60	65	63	61	62	64.0
Clinton	Max	88	85	92	92	73	83	81	81	88	91	95	83	76	79	83	85	90	94	94	86	87	88	92	85	82	90	92	91	90	91	92	87.1
	Min	63	66	67	66	63	60	55	63	64	65	63	63	58	53	54	52	52	58	64	66	61	64	61	66	53	56	63	61	59	61	63	60.7
College Sps	Max	97	94	99	84	74	82	77	92	95	95	94	87	79	78	83	85	85	91	91	86	89	88	95	81	82	80	88	89	91	90	90	87.5
	Min	65	68	70	64	63	65	64	66	73	70	68	67	59	60	58	60	64	63	68	64	69	67	68	59	57	64	62	66	66	65	64	64.7
Coon Rap	Max	86	80	86	81	77	80	77	85	91	93	87	83	78	74	80	85	88	90	91	83	88	85	93	77	77	85	91	90	90	90	88	85.0
	Min	63	65	74	64	62	65	63	67	73	70	68	59	61	61	55	58	62	69	69	63	60	65	64	58	54	62	61	65	68	64	64	63.5
Corning	Max	90	91	91	85	82	78	72	87	91	90	89	89	78	74	80	83	83	89	90	83	89	85	94	81	79	84	91	90	91	89	89	85.7
	Min	64	70	78	68	64	64	63	65	74	69	69	62	62	60	57	60	62	68	68	65	55	65	59	60	52	69	59	66	66	63	67	64.6
Co. Bluffs	Max	95	96	96	70	75	80	80	89	94	95	92	89	80	79	84	86	90	90	93	89	92	89	91	81	83	83	93	91	93	93	90	87.8
	Min	64	69	65	64	64	64	65	64	67	72	67	64	64	65	62	67	69	74	64	64	60	72	60	59	60	67	69	70	67	67	70	65.9
Cresco	Max	86	74	84	74	82	84	77	74	87	91	85	76	74	72	74	82	87	89	93	75	83	82	88	76	79	86	88	89	84	88	83	83.1
	Min	63	53	64	63	58	56	59	59	66	64	61	56	56	56	48	54	57	66	66	62	58	62	66	56	49	59	64	65	66	65	64	63.0
Davenp'rt	Max	86	83	95	85	73	81	76	73	87	88	93	87	78	77	81	85	90	94	92	85	87	86	90	84	85	90	93	94	90	91	89	85.9
	Min	65	69	72	67	64	64	58	65	66	70	70	68	62	55	56	56	58	59	68	72	68	65	66	66	66	59	62	68	67	67	70	71	65.3
Delaware	Max	84	78	86	80	76	79	77	74	87	89	91	80	74	75	78	82	89	94	93	82	88	84	92	82	78	83	90	90	88	89	89	83.8
	Min	64	58	68	67	59	58	56	59	65	64	70	60	60	53	49	54	54	67	67	65	61	59	65	65	54	58	63	64	63	63	64	61.2
Decorah	Max	87	88	84	79	84	87	82	73	90	94	88	76	76	77	78	84	99	91	94	82	84	83	90	75	80	87	91	91	87	88	87	85.0
	Min	62	65	66	63	60	53	62	69	66	63	60	57	59	56	44	55	60	67	64	62	63	57	65	61	50	58	62	66	60	65	64	60.5
Denison	Max	89	80	88	69	79	81	78	87	86	94	87	81	79	75	85	84	55	60	67	64	62	63	57	65	61	50	58	62	66	60	65	64	60.5
	Min	62	60	64	61	62	57	62	63	67	68	63	55	59	61	55	64	..	..	91	84	89	85	92	85	79	87	94	92	92	94	84	85.2
Des Moines	Max	87	82	92	78	73	81	71	83	92	90	92	84	78	76	80	94	88	90	90	84	89	84	95	79	80	83	91	92	91	89	89	85.1
	Min	63	68	77	60	64	65	63	65	70	70	70	65	65	59	58	60	63	70	71	66	60	67	68	63	56	64	59	66	66	68	67	65.0
De Soto	Max	94	85	91	78	77	83	75	89	96	96	92	85	79	79	81	86	90	95	92	84	91	91	97	80	82	92	92	94	92	90	94	87.8
	Min	65	67	77	62	63	63	62	67	73	70	69	69	61	62	55	56	64	68	68	64	58	66	70	59	47	64	58	59	63	66	63	63.0
Diagonal	Max.	92	90	93	85	73	73	73	83	90	86	88	85	79	75	78	81	85	88	89	83	88	84	94	85	82	81	90	91	91	89	91	85.1
	Min	63	72	70	63	62	63	60	64	73	68	68	61	62	59	56	58	61	65	61	63	56	64	67	61	51	63	51	62	61	64	62	63.5
Dows	Max	83	75	85	73	82	83	83	79	91	93	89	80	77	77	80	84	89	91	91	81	89	87	95	86	79	90	93	93	91	91	88	85.3
	Min	62	67	66	62	61	56	57	61	68	66	67	53	63	58	50	52	59	67	65	62	57	63	66	55	48	48	58	63	68	66	62	59.2
Dubuque	Max.	86	81	87	81	79	81	79	77	90	93	93	80	73	74	80	84	89	93	92	83	87	86	92	81	80	85	93	92	88	90	89	85.1
	Min	64	63	65	66	64	63	60	63	67	70	71	63	62	56	53	55	58	69	69	66	63	61	64	63	55	61	66	67	68	67	67	64.6
Eldon	Max	95	95	98	94	71	82	78	84	91	88	97	94	79	87	88	93	97	95	87	93	85	97	86	89	..	90	98	97	97	98	93	90.1
	Min	66	70	75	65	66	63	57	66	61	65	65	71	57	54	55	59	66	69	70	61	64	66	67	55	..	64	60	63	58	62	62	63.4
Elkader	Max	91	83	90	76	88	87	84	75	93	98	93	85	80	80	85	90	95	99	97	85	92	84	97	83	83	89	97	95	93	93	94	88.5
	Min	61	54	66	65	61	56	60	59	65	63	66	54	60	57	43	49	50	66	63	64	59	54	54	67	53	50	63	63	62	62	63	59.0
Estherville	Max.	80	71	81	79	86	87	81	87	95	16	90	75	80	84	85	91	94	85	..	83	90	85	84	82	82	92	93	95	91	87	68	85.4
	Min	60	51	58	60	50	54	61	60	65	60	58	51	53	56	48	51	61	63	..	57	53	59	64	49	50	58	57	62	68	67	53	57.3
Fairfield	Max.	90	86	95	85	73	80	75	78	86	82	92	85	78	73	79	81	85	88	89	82	86	77	89	81	81	85	88	87	88	85	84	83.6
	Min	65	70	74	69	65	64	57	65	66	68	69	70	64	56	55	57	61	67	67	68	65	65	66	67	57	65	63	66	62	65	65	64.4
Fayette	Max.	87	78	87	72	84	84	81	73	90	95	93	80	78	78	81	87	92	96	95	81	89	87	93	78	81	87	93	92	89	91	91	85.9
	Min	63	54	67	63	61	56	58	60	66	54	68	53	60	54	44	53	54	67	65	64	59	56	65	58	48	57	62	65	65	62	63	59.3
Ft. Madis'n	Max.	84	87	94	86	78	78	73	74	77	80	90	84	73	72	77	82	87	90	90	84	84	78	84	84	82	86	86	89	87	88	84	83.3
	Min	69	75	75	75	70	70	65	60	71	73	73	75	67	60	61	63	65	71	70	73	67	71	72	77	64	71	70	70	70	72	69	69.5
Fonda	Max.	80	87	92	82	84	82	84	87	98	97	94	90	87	84	86	89	91	96	94	93	91	92	88	90	89	94	91	93	90	93	91	92.2
	Min	60	59	64	61	58	54	58	60	79	81	70	61	68	54	52	53	52	58	60	59	55	63	59	61	54	57	61	59	62	64	61	60.6
Forest City	Max.	80	72	82	80	85	85	80	78	91	96	89	78	78	78	80	85	90	90	93	82	87	86	93	78	81	90	93	94	93	90	88	85.3
	Min	61	55	57	63	59	59	63	61	69	67	62	58	58	58	52	57	62	70	66	62	59	64	66	55	55	61	61	65	71	66	63	61.8
Galva	Max	84	79	86	75	82	83	79	89	93	94	89	80	84	80	82	89	90	90	93	83	90	88	89	81	81	89	94	94	92	93	75	86.1
	Min	60	59	63	62	56	56	62	64	70	71	66	59	56	61	54	57	64	69	67	59	56	66	68	52	51	61	62	67	69	64	61	61.0
Glenwood	Max	92	92	93	83	74	78	72	92	94	95	91	85	80	75	81	85	88	89	91	88	90	86	98	80	89	82	89	91	92	92	96	89.7
	Min	68	69	70	62	62	65	66	65	72	70	70	62	61	63	57	63	58	71	70	62	57	70	70	60	50	64	61	68	70	63	64	64.7
Greene	Max	86	80	88	79	89	88	86	79	93	98	95	84	83	84	87	91	96	98	98	85	95	88	98	79	84	95	96	97	95	94	94	89.8
	Min	62	55	66	63	61	57	52	58	67	66	68	55	60	56	48	53	56	65	67	62	58	62	67	59	50	58	62	61	67	66	65	60.5
Grin'l (nr)	Max	84	82	89	84	71	80	74	76	89	88	90	81	78	74	78	85	90	93	92	82	88	80	94	83	80	86	91	93	90	89	89	84.8
	Min	63	65	70	64	59	63	58	63	65	70	69	63	61	54	54	57	61	67	69	65	60	65	67	64	55	63	59	62	66	65	64	62.9
Grundy C'r	Max.	87	83	88	74	80	83	77	75	90	93	92	84	79	77	80	85	91	94	93	83	90	83	93	89	80	89	91	92	89	89	90	86.2
	Min	62	58	66	62	60	58	59	59	65	66	66	56	60	54	49	52	57	65	66	62	59	63	63	55	48	57	59	61	60	63	62	59.7
Guthrie C'r	Max.	91	85	9	85	78	81	76	85	96	94	88	80	79	80	84	87	90	88	83	90	85	90	..	..	..	..	..	..	..	..	..	.....
	Min	60	64	74	60	61	60	62	65	75	67	60	59	59	62	58	62	67	67	61	60	66	66	..	..	..	..	..	..	..	..	..	.....
Hampton	Max.	83	77	85	73	85	85	82	79	92	94	91	89	79	79	83	86	91	93	93	83	91	88	95	79	82	94	100	92	92	94	94	88.8
	Min	62	57	65	65	62	58	62	60	68	66	62	58	61	59	51	55	60	68	68	64	61	63	66	59	41	56	63	64	61	63	68	61.4
Harlan	Max.	90	85	88	86	79	83	74	91	94	94	88	85	78	75	81	83	87	89	90	85	88	85	94	79	79	85	90	91	90	90	90	86.0
	Min	62	65	72	60	61	61	62	63	69	69	64	59	60	61	56	57	63	64	68	60	54	66	69	56	51	62	60	65	67	61	63	62.8
Hedrick	Max	94	86	94	84	70	83	78	80	91	87	92	85	76	74	85	88	93	..	91	82	88	80	93	80	82	86	90	92	93	90	90	85.9
	Min	64	67	72	61	63	66	56	65	64	65	67	..	64	54	54	58	65	..	67	67	61	62	64	64	52	62	60	64	58	61	62	62.3
Humboldt	Max.	83	78	85	76	84	84	83	83	94	96	90	85	78	78	82	85	90	93	93	84	88	88	92	80	80	90	93	94	91	91	82	85.2
	Min	63	57	65	66	58	57	65	65	70	67	66	54	62	61	53	55	62	68	69	64	57	65	68	51	54	64	61	64	69	66	62	62.9
In'pend'ce	Max.	84	81	87	77	80	83	79	72	88	91	92	80	76	77	80	84	90	93	94	85	88	83	92	85	80	85	91	90	88	89	89	86.2
	Min	56	57	68	63	62	58	57	75	59	65	66	53	60	58	50	52	54	63	67	63	61	60	65	64	50	59	62	63	60	62	63	59.7
Indianola	Max.	91	83	91	82	71	81	76	84	92	89	92	84	75	74	80	82	89	91	89	87	90	84	95	80	79	85	92	91	90	88	88	85.4
	Min	64	67	75	62	63	63	61	65	71	71	69	64	63	63	60	59	64	69	71	68	63	66	68	64	55	70	60	68	64	66	65	65.1
Iowa City	Max.	88	87	93	88	75	85	81	72	91	93	94	87	80	82	87	89	94	96	97	84	88	82	94	83	86	90	94	94	92	92	91	88.0
	Min	58	68	70	71	63	62	57	63	66	66	67	63	63	53	53	54	55	63	68	66	61	62	65	67	53	62	65	65	61	63	63	62

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Means.
osauqua	Max.	93	93	97	92	72	82	77	68	88	84	91	89	74	75	85	86	89	93	92	85	82	81	93	83	87	87	91	93	93	90	90	86.5
	Min.	67	78	74	70	66	63	59	49	67	67	70	70	66	58	57	56	60	68	68	71	65	65	67	65	56	65	61	65	69	64	65	64 6
oxville..	Max.	90	85	93	87	75	81	79	82	90	90	89	87	80	77	81	84	89	91	91	85	89	90	92	85	82	85	91	91	87	83	88	86.0
	Min.	68	67	75	63	62	63	76	67	67	77	67	65	50	57	58	58	61	63	68	68	62	66	67	61	54	64	62	64	60	62	64	64.3
mont....	Max.	91	92	92	85	74	79	76	89	89	88	86	88	79	74	78	82	86	88	88	82	86	84	93	82	83	83	88	90	83	87	89	85.1
	Min.	65	67	68	66	64	64	60	65	71	69	66	67	61	60	56	55	62	65	66	67	60	63	67	53	53	63	59	62	60	61	61	63 0
nsing....	Max.	89	82	82	77	85	82	81	80	92	96	89	81	79	77	80	85	90	95	93	82	83	80	92	79	80	87	93	92	90	91	87	85.7
	Min.	63	51	63	67	61	56	63	63	68	64	67	59	67	57	47	51	54	70	65	64	62	55	64	65	52	57	63	64	66	65	65	58 0
rrabee..	Max.	84	80	87	68	83	86	82	88	91	93	88	80	81	81	84	88	91	88	88	82	88	87	89	82	81	88	91	91	89	90	70	85 1
	Min	59	56	60	61	52	55	61	64	65	67	60	57	58	59	50	58	64	64	67	58	56	64	67	48	52	60	60	60	67	66	59	59.8
Mars....	Max.	83	79	83	75	83	83	81	87	90	91	90	80	78	78	82	85	89	87	91	87	87	85	84	80	82	83	91	92	89	90	73	85 6
	Min.	61	55	62	62	56	56	63	65	63	63	63	53	57	54	56	60	67	69	67	59	55	54	66	50	59	64	61	69	71	69	57	61 1
nox.....	Max.	89	88	91	80	70	76	71	85	88	87	88	86	77	72	78	82	86	88	88	83	87	83	91	81	78	81	90	90	89	88	87	83.8
	Min	65	67	73	62	63	64	62	65	74	69	70	63	63	60	57	61	64	69	69	65	61	67	69	62	55	65	63	66	63	64	65	64.8
gao.....	Max	90	92	91	89	82	84	80	91	91	90	89	88	87	89	85	88	91	92	94	91	88	89	90	95	90	95	88	92	93	92	85	89.7
	Min.	60	62	64	61	60	62	62	64	70	60	62	60	58	60	55	59	63	64	64	68	60	55	60	67	60	64	60	68	62	61	60	61.8
quoketa	Max	86	82	90	84	75	83	80	77	89	91	92	84	78	77	81	84	88	93	91	85	87	86	91	84	83	88	91	90	88	89	89	85.7
	Min	63	64	67	65	61	59	55	58	64	67	62	61	52	52	50	50	49	60	64	65	62	57	63	63	52	57	61	63	57	62	60	59.5
rsh'lt'n.	Max.	90	86	92	87	89	85	78	80	94	95	95	87	83	81	82	87	93	95	95	83	92	82	93	82	82	90	94	94	93	92	91	88.8
	Min	64	62	71	65	62	61	61	63	64	69	69	58	62	56	52	55	58	68	68	64	60	62	65	62	51	53	61	64	63	64	64	62 0
son City	Max.	88	74	83	75	84	84	80	77	91	95	91	79	77	78	80	87	91	92	95	..	84	87	92	78	82	92	82	93	..	.	..	84 9
	Min.	61	53	64	62	54	55	61	52	66	62	62	52	57	56	54	45	55	65	64	..	61	57	57	56	45	58	55	55	..	..	..	57 3
nticello.	Max	86	80	91	83	82	83	82	74	88	90	95	91	82	84	85	87	90	95	95	93	93	89	93	92	90	89	94	93	91	93	91	88 4
	Min.	62	60	65	63	60	57	58	62	65	68	72	69	52	53	59	55	60	70	65	60	53	50	60	58	60	54	60	60	60	65	60	60.0
oar	Max	92	93	95	95	74	77	78	80	88	85	91	93	75	77	86	89	90	95	91	92	90	95	92	85	88	90	94	99	98	91	90	84.9
	Min	63	72	75	66	65	63	60	65	63	60	62	65	65	59	60	55	63	65	67	61	61	60	68	55	62	66	65	65	57	66	63	63.4
. Ayr	Max	91	91	94	81	69	77	72	90	93	87	92	86	76	72	81	84	87	90	90	84	89	86	95	78	80	88	91	93	92	89	90	85.7
	Min.	65	67	70	65	63	63	61	65	72	70	70	65	63	59	57	60	64	65	67	67	61	66	67	62	53	64	67	65	64	65	65	64.7
. Ple's'nt	Max	97	93	97	96	74	85	82	82	88	93	97	89	78	84	84	85	91	95	92	89	87	89	92	83	85	93	91	91	93	90	91	88.8
	Min	63	67	71	65	61	58	52	65	63	65	63	68	63	50	50	51	53	61	66	67	59	58	63	69	51	59	55	68	65	67	62	61.5
. Vernon	Max	86	85	91	87	77	85	85	71	95	92	96	91	84	83	86	83	92	95	91	85	91	84	90	84	86	87	95	93	93	93	90	88.3
	Min.	63	63	65	67	61	62	57	61	65	67	68	62	61	52	51	55	60	65	70	64	65	64	65	65	53	61	65	68	65	66	66	62 6
wton ..	Max	87	82	92	81	73	82	74	78	92	91	92	84	78	74	80	84	89	92	92	82	88	80	93	79	80	86	91	91	89	88	89	85.1
	Min	63	66	73	61	61	62	59	68	68	70	68	61	62	55	54	56	61	67	68	64	60	63	67	63	52	64	61	63	61	63	63	62.8
wH'pton	Max.	83	76	84	76	82	82	78	72	83	92	87	78	75	74	76	83	88	90	91	81	84	81	90	75	78	85	90	84	85	83	83	82.7
	Min	62	63	65	67	67	65	60	60	66	67	64	64	59	55	49	55	64	75	70	62	53	60	60	62	48	60	53	70	60	65	65	62.3
rthwood	Max	82	75	82	79	85	86	82	80	88	96	87	85	81	82	84	86	83	90	93	81	85	86	91	76	81	89	92	92	88	91	74	85 2
	Min.	63	52	63	61	55	56	55	58	65	63	62	60	58	57	59	61	62	61	62	60	59	58	65	55	53	61	58	62	63	64	61	59.9
ebolt....	Max	89	81	90	87	85	85	83	91	99	98	92	87	85	82	86	89	92	94	94	84	93	88	92	87	83	91	97	95	95	93	84	89 4
	Min	61	62	62	63	57	55	62	65	70	69	65	55	58	62	53	58	59	58	63	64	55	66	72	51	51	61	60	68	70	61	63	61.5
den.....	Max.	88	79	88	71	77	77	74	83	92	94	91	83	79	76	80	85	88	92	91	83	89	84	95	80	79	83	93	92	91	90	90	85.2
	Min.	62	65	72	64	62	63	62	64	70	72	67	60	62	58	51	57	62	66	69	60	58	65	67	59	53	61	60	65	65	65	64	64.0
n	Max	85	81	89	84	78	81	..	76	89	90	94	86	74	74	80	85	88	93	92	84	86	84	91	81	82	86	91	90	89	89	89	85.5
	Min	62	63	69	74	61	70	66	..	66	76	76	62	65	64	68	53	50	60	65	64	61	59	63	66	52	59	62	64	60	61	63	63.5
awa. ...	Max	88	86	88	86	82	83	79	88	94	95	90	85	82	79	83	86	91	90	94	92	90	88	88	84	83	87	95	95	95	93	86	87.7
	Min.	64	66	76	64	60	59	67	66	72	69	66	57	60	65	57	62	67	72	72	62	58	70	74	54	53	65	63	71	73	67	64	64.9
aha. ...	Max.	90	93	83	73	74	78	73	89	93	95	83	86	80	78	82	85	88	88	91	86	90	83	93	80	80	82	90	90	91	91	88	85.7
	Min.	69	69	70	64	64	67	67	67	74	67	74	66	64	65	63	66	69	72	73	63	64	70	74	61	60	67	68	71	73	70	66	68.1
age.....	Max	84	74	84	76	82	84	79	79	89	94	83	76	75	74	78	83	89	90	92	82	84	84	92	74	79	89	89	92	87	86	83	83 5
	Min.	62	53	64	62	56	56	61	59	56	64	61	54	56	53	47	53	53	64	64	60	58	59	65	53	49	57	60	62	65	65	62	58 8
ceola ...	Max.	92	91	94	91	74	78	75	83	95	88	92	85	78	74	81	85	89	90	90	84	90	84	95	78	80	87	92	93	90	90	91	86.4
	Min	64	66	76	64	63	63	60	67	72	70	69	63	63	59	53	57	60	63	68	68	63	64	69	62	52	62	61	65	63	64	54	64.0
kaloosa..	Max	82	87	95	82	69	93	74	80	90	89	92	86	73	76	79	86	91	94	93	82	89	82	94	81	84	85	90	93	91	91	91	86 1
	Min.	65	69	77	62	63	62	59	65	67	69	69	67	64	55	55	58	62	68	70	70	60	66	67	65	52	65	59	63	59	62	63	63.8
cumwa..	Max	93	89	98	86	73	83	75	81	91	91	95	88	76	76	81	85	91	94	93	95	92	83	95	81	85	86	94	91	91	91	91	87 7
	Min	66	69	74	63	65	64	58	61	67	67	70	70	65	57	56	58	62	73	71	70	62	66	64	68	55	65	60	65	60	66	66	64.7
id	Max	92	95	94	83	69	78	71	85	94	88	94	88	77	75	84	85	89	90	90	83	91	83	91	85	82	86	93	93	91	90	90	86.7
	Min	64	66	74	66	63	61	60	66	89	67	68	65	64	58	54	58	62	68	69	70	61	64	67	65	52	65	59	60	61	63	64	65.0
cific Jct.	Max	91	92	93	73	77	77	74	89	92	92	89	86	80	76	80	84	86	88	90	84	87	83	95	78	80	81	89	89	89	89	90	85.4
	Min.	67	74	74	62	62	66	65	65	71	69	65	60	59	64	60	63	67	67	72	63	53	70	74	59	53	59	63	65	67	63	65	64.7
lla.....	Max.	84	80	91	67	68	78	67	77	89	84	90	80	73	76	80	83	86	85	83	86	79	87	75	76	80	84	87	85	82	85	84	81.5
	Min.	65	66	74	61	62	62	58	64	67	64	64	62	68	58	58	61	67	69	67	60	65	67	65	52	64	62	64	63	62	61	64	64.2
over.....	Max.	80	75	85	75	85	85	86	85	93	93	93	80	82	84	84	88	91	91	98	82	89	90	92	90	80	90	90	95	91	94	91	87.1
	Min.	64	60	62	64	52	55	52	63	72	65	64	54	53	59	52	56	53	65	69	62	55	65	63	51	50	53	60	65	64	65	60	59.6
imghar..	Max.	85	70	85	75	85	87	91	91	95	96	97	77	80	75	83	89	85	89	90	83	90	85	84	84	80	80	91	94	91	90	70	85 5
	Min.	65	58	62	63	52	60	71	63	63	62	64	55	55	60	55	65	63	65	70	54	60	62	49	63	56	53	61	72	70	65	57	61.7
d Oak...	Max.	94	93	98	85	75	80	74	91	97	97	91	87	83	83	84	85	88	90	91	87	93	87	97	80	80	83	92	92	94	93	93	88.6
	Min.	61	69	74	64	65	67	66	66	70	70	72	64	63	58	59	61	67	70	71	65	58	70	72	60	54	65	60	69	68	65	66	68.8
dgeway..	Max	88	75	82	78	80	80	74	73	89	95	87	78	74	73	76	82	88	92	92	84	81	80	90	76	77	84	93	90	83	87	84	82 8
	Min.	64	58	63	65	61	60	59	60	68	69	64	58	60	57	52	57	60	70	71	62	61	62	69	60	55	60	65	70	66	68	65	62.6
ckwell	Max	85	80	87	75	82	84	80	87	94	96	85	82	79	77	81	86	90	92	93	82	89	86	95	80	80	88	94	95	95	96	89	86.7
	Min.	62	60	65	64	58	59	63	65	72	70	67	54	60	60	51	54	61	65	67	61	59	66	67	55	52	61	60	64	68	62	62	61.8
thven...	Max.	84	92	80	73	80	86	90	83	93	97	92	88	78	86	83	86	90	80	90	85	85	83	86	88	80	88	90	88	86	84	76	86 0
	Min	60	64	62	60	64	66	68	70	68	70	68	70	58	54	59	54	58	63	64	60	56	58	60	58	64	58	62	60	58	54	50	60 9
e City....	Max	86	79	86	74	82	82	76	88	93	93	88	81	79	76	80	86	90	90	92	83	88	86	90	80	79	88	95	93	92	91	82	85.4
	Min.	62	60	64	63	58	57	63	65	71	70	65	55	57	61	52	56	62	69	67	60	57	68	70	53	51	52	59	63	60	62	63	61.4
ranton ..	Max	83	81	86	79	78	83	77	85	93	95	89	82	80	75	81	85	88	91	91	85	83	85	93	77	78	88	91	93	91	91	88	85.5
	Min.	62	65	71	61	64	65	63	66	64	70	68	59	61	60	51	57	61	68	69	63	61	63	66	57	55	62	62	65	63	64	64	63 6
eldon	Max.	86	77	82	76	83	83	79	85	92	93	89	80	78	80	82	87	90	86	89	84	87	85	85	81	80	89	89	90	88	84	72	84 2
	Min	60	54	59	63	56	54	63	62	65	59	60	53	55	58	52	57	65	65	69	56	54	66	65	46	52	62	61	62	59	60	56	59 0
ley	Max.	80	72	83	79	84	85	80	90	95	94	89	76	78	80	84	89	90	88	87	84	91	85	81	85	81	91	93	93	93	84	70	84.8
	Min.	61	52	57	62	51	54	63	61	58	60	53	52	53	57	51	58	64	66	67	57	52	65	66	45	49	60	62	67	70	65	55	58 9
courney..	Max.	95	93	97	88	72	88	82	81	94	92	95	89	81	82	87	90	91	90	95	85	92	84	98	86	89	92	97	92	96	95	94	90.1
	Min.	62	64	70	61	61	59	52	62	63	64	65	60	62	49	49	49	53	65	66	66	59	62	64	63	50	60	60	67	58	62	61	60 3
ux City..	Max	85	80	85	69	82	82	79	90	93	98	90	81	79	79	81	85	90	87	91	85	90	83	83	82	79	90	92	93	91	91	74	85 2
	Min	62	58	58	65	58	59	62	66	67	70	71	59	59	60	59	61	65	67	69	62	59	64	71	54	56	62	63	67	72	70	59	63 1
ux C'ntr	Max.	87	79	81	77	82	84	80	89	94	94	91	83	77	80	84	87	87	83	88	85	87	83	80	82	81	89	91	93	89	86	74	84.7
	Min.	64	57	61	63	60	62	65	66	64	69	65	54	57	61	56	62	68	62	70	59	62	67	68	54	58	64	57	71	72	64	58	63 6
encer ...	Max	80	74	88	78	82	84	80	90	93	94	90	87	78	83	88	87	92	88	86	87	83	87	86	81	88	88	90	91	88	88	72	85 7
	Min	63	63	60	62	58	63	68	64	63	61	63	63	60	56	50	55	62	62	62	60	58	60	59	58	57	58	61	63	62	63	58	60 7
irlt Lake	Max.	78	71	81	83	89	89	84	94	96	95	93	73	80	82	85	88	89	82	82	83	89	88	79	82	83	87	96	94	93	89	68	85.3
	Min	54	57	61	60	68	71	64	64	63	63	61	53	61	60	55	59	65	67	59	61	57	64	64	53	55	62	62	65	72	64	57	61.5
rmLake	Max.	82	..	..	..	..	..	75	84	91	92	86	78	76	76	78	83	87	88	90	82	83	84	87	79	77	86	92	90	90	89	74	84 0
	Min	61	..	..	..	..	..	65	66	71	72	65	56	52	52	54	62	64	71	70	60	61	67	67	51	59	63	61	68	71	65	61	62 9
uart.....	Max.	92	90	90	88	89	81	80	86	92	93	90	85	78	77	85	83	92	90	90	84	90	90	96	80	80	86	92	88	93	90	93	87 7
	Min.	68	65	68	68	71	62	61	65	63	69	70	62	63	60	59	62	68	63	62	62	62	65	60	61	54	68	64	62	64	68	65	61.7
urman..	Max.	93	94	94	85	74	81	77	91	91	92	89	86	78	73	82	85	87	89	91	85	88	87	95	78	78	76	85	89	89	87	86	85 6
	Min.	84	69	71	64	62	67	67	68	71	76	64	64	62	61	66	64	63	71	71	61	54	69	74	63	52	64	65	68	71	63	66	66.6
ledo	Max.	92	79	95	81	75	81	77	78	95	93	99	89	81	78	83	87	91	95	94	87	91	82	95	85	83	91	93	94	92	88	93	87 7
	Min.	64	62	70	65	60	61	60	62	67	66	69	55	61	55	50	56	59	69	69	61	58	62	67	63	57	47	60	61	61	61	62	61 4
llisca....	Max	93	93	96	80	72	76	73	89	93	91	94	88	86	75	80	86	88	92	93	85	89	91	93	82	84	85	94	93	95	93	92	87.9
	Min	62	68	69	65	65	64	61	65	73	69	68	62	62	61	58	60	65	63	68	64	57	60	67	62	50	61	62	65	63	65	63	64 6
apello ...	Max	87	87	100	86	77	84	76	70	87	85	96	89	75	79	83	83	90	91	94	87	88	80	83	82	88	85	90	89	89	88	..	85.9
	Min.	65	69	75	73	67	62	57	61	67	67	68	70	67	55	56	56	53	66	70	71	63	65	67	68	57	63	65	67	65	64	..	64.8
ashingt'n	Max.	90	87	95	85	72	83	77	75	89	89	92	81	75	78	84	87	92	94	94	86	88	83	94	83	83	88	92	92	92	90	..	86.5
	Min.	64	66	79	62	64	60	54	63	64	65	68	65	61	55	52	54	56	63	68	68	58	63	64	62	52	61	63	65	62	64	..	61 7
aterloo...	Max.	89	80	90	73	82	84	81	73	89	93	95	85	78	78	83	87	93	94	94	83	90	82	93	80	80	88	93	93	89	90	91	86.2
	Min.	63	58	68	65	64	62	61	60	67	64	68	57	62	55	50	53	55	61	62	64	59	62	68	62	51	59	62	63	62	63	65	61.1
averly...	Max.	85	76	86	77	82	84	79	74	88	93	90	80	74	75	79	85	89	92	93	84	87	82	90	77	79	86	89	91	86	88	87	84.0
	Min.	65	59	67	66	66	60	62	62	68	63	72	58	62	58	53	58	61	68	69	66	60	64	67	63	51	61	64	66	65	67	67	63 1
est Br'ch	Max.	88	86	92	92	80	86	84	85	90	90	93	90	88	90	92	94	93	94	92	90	92	92	90	86	84	90	93	90	89	90	91	89.5
	Min.	64	64	68	68	62	62	60	55	60	56	65	64	62	63	64	63	68	70	68	58	60	58	58	60	60	55	58	62	60	64	63	62.1
ilton Jc..	Max.	87	85	94	87	76	83	80	73	89	90	93	85	76	78	84	83	89	94	92	87	86	88	91	84	85	91	92	92	92	90	90	86.7
	Min.	63	67	69	67	62	65	55

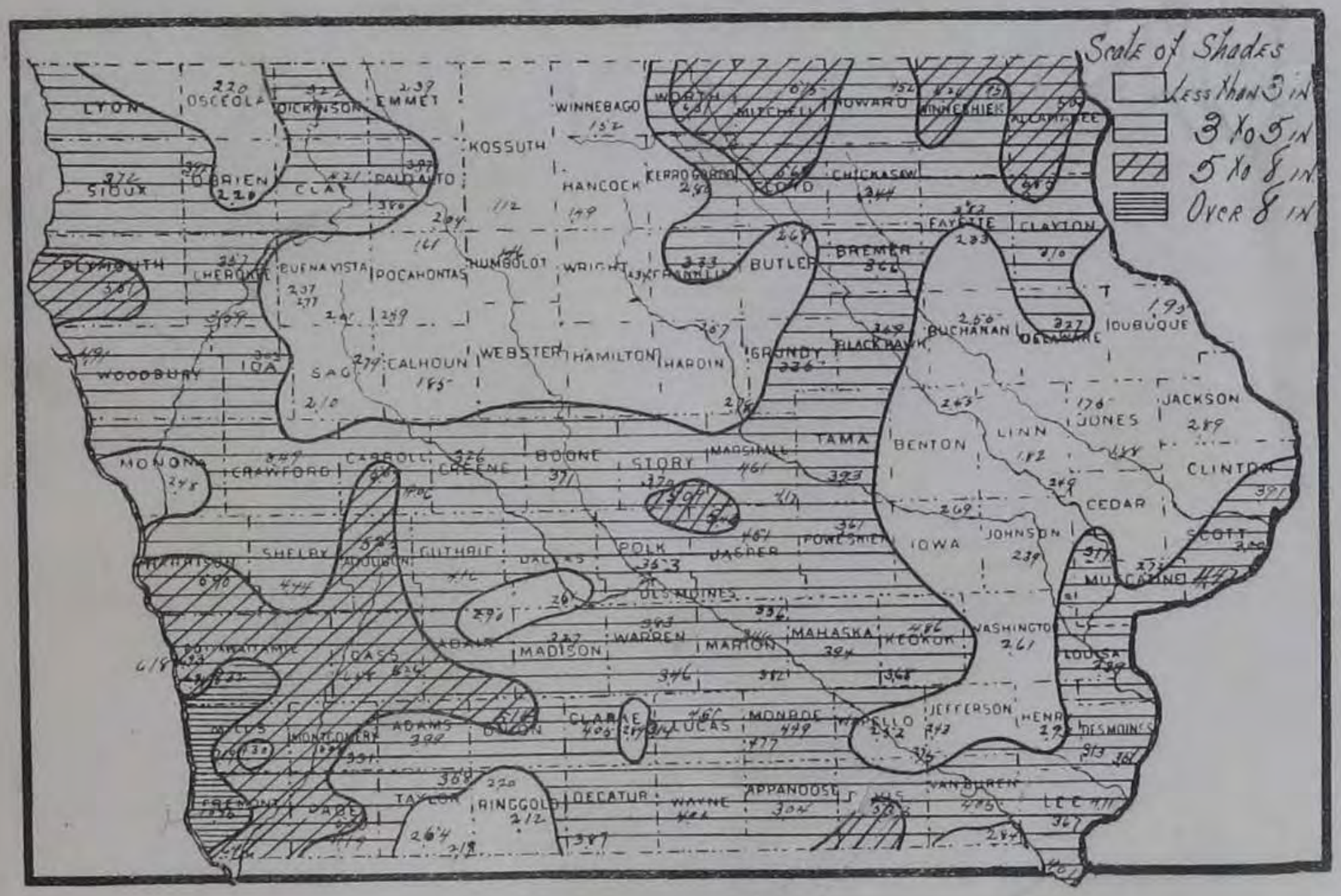
DAILY AND MONTHLY PRECIPITATION FOR AUGUST, 1899.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Afton	T			.54	.78		.26	2.10	.40				.26											.80								5.14
Algona	.15	.05	.10	.08														.02	.05	.55		.05	.02									1.12
Alta (Hadden)	.45	.31		.43			.15				T	T						24	.73			.02	01					.05				2.37
Alta (near)	.75	.25		.47			.43											.18	.67			.02	T					.01		.02		2.17
Albia	.10			.15	1.75		T	1.90	.12											.23		.16		21		.23				T		1.49
Amana	.40		.18	.27	.28		.03													1.22				.29		02						2.69
Ames	.80			.23	1.75			.12														35	.45									3.70
Atlantic	.11			2.17	.08		1.03	.20				.66		.12								.18	.11									4.88
Audubon	.15			2.2	1.33		.23	.13			.32									.20				.64						T		5.55
Batavia				.66	.14		.90													.36				37								2.12
Baxter	.94	.01		1.26	1.02			.48					T							.42		.17		1.10								5.46
Bedford				.15	.45		.27	.83					1.65											.05		.07	.07					3.54
Belknap	.30			T	1.20		T	3.50	T					T						T				.33								5.53
Blockton				.14			.44	.31					1.80																			2.19
Bonaparte	.10			.60				1.25	.38											.51												2.84
Britt	.47	.10	.27	.09																.42		.08	.08									1.84
Burlington	.20			.20				1.01	.20				.02							1.62				.31								3.56
Bussey				1.20			.96	.44										.26			.41		.55								3.60
Carroll	1.22			.35	.65		.20	.15				T							2.40					.10							5.07
Carson			2.14	.75		1.24	3.04					.40	.46										.23			.08		T			8.32
Cedar Rapids	T	.09	.11	.43	.05		T					T							.74				40								1.32
Centerville			T	.05	.85		T	1.50	.10											13		.20		.21								3.91
Chariton	.03			.10	1.60	.02	.04	1.67	T				.05							.01		.33		.40		17						4.51
Charles City	.83	.14	.64	T							.04		T							1.17				1.33				.09		1.45		5.69
Clarinda			30	.69		.10	.86					2.33											.11		T	.47	.17					5.03
Clinton	1.12		.13		1.09				.20		.56		.01							.14				.39								3.01
College Springs				1.03	T		.20	.46				1.65																				4.19
Coon Rapids	.80			.85	.95		.10	T				T	.08						.03		10			02	.70							4.06
Corning		T		1.29	.80		.47	.75	T			T	.55							.11			1.17									3.99
Council Bluffs			1.14	1.55			2.80	T				.91	T						T			T	.13		T	T					6.91
Cresco	.08	.02	1.78			.10					.58		.08							.84		.05	.58		.07		.06					4.52
Cumberland	.05			2.32	30		67	2.12				.01	.66	04									.09		T							6.35
Danville	.10			.10	.20			.75	.35				T							.78				.75								3.13
Davenport	.31	T		.02	2.59			.02	.85				T							.27				41								4.47
Decorah	2.10		.04									.60		.04							.36			1.24	.07						06	4.51
Delaware	1.38	.05	.10	.04	.27					.08										.32			1.03									3.37
Denison	1.00			1.05			1.30	.10				.04			.05								T								3.49
Des Moines	.60	T	T	.86	.57		.23	.57	T				14						T	.03		.10		.43								3.33
De Soto	.24			.50	81		.32	38				.38											T					T				3.63
Diagonal				.10	.60		.40	.10				.70										10		.10		.10						2.60
Dows	1.32	.32		.04	.02				.26											.18		05	05	.10	T			T		T		2.38
Dubuque	.52	01	.36	01	.13			T	.02				T							33				.54						T		2.34
Eldon	.08			43	.15		T	1.69	.01				T						.15		06	.18									1.86
Elkader	.36	T	.75	02					.05											.40			1 52		T							2.75
Emerson				2.80			.60					80					.06	01														5.19
Emmetsburg	.48										22							2.53		.48		.19		.05								4.30
Estherville	.40	.35	.23	.10							.10							50		.35		.30	T							.02		3.97
Fairfield	.08			52	.03		T	1.00	.02			T	.05							.52		.06		.38								2.32
Fayette	.51	.05	.33	.06				T												.27			1.05					.06				2.86
Fonda	1.15	.40		.23	.02	04	03					T								43		.19										2.33
Forest City	.16		.31	.01	.05				.02		.03		T					.06		.60		.09		.19								2.49
Ft Madison	.16			1.70	T		T	1.17	.03				T							.75		T		.25	05							1.52
Galva	1.26	.12	T	.47			.33											.05	T	.65		.01	T								T	4.11
Glenwood				2.24			.76	.53				2.50										T	.36		T	T	.80		14		T	3.01
Gilman	.50	T	T	.91	.96			.28					.07							.47		.09		.8						T		4.17
Grand Meadow	.60		1.11	.02																.17		T	3.70								.25	5.85
Greene	.55	.07	.15	.05									.02							.29		05	.86	.07				.08		.49		2.68
Grinnell (near)	63	T	20	72	.80			44												.56		.03		.23								3.61
Griswold				1.10	1.10		78	2.65					.87	.08																		6.58
Grundy Center	T	.16		72			.27															1 00	1.20									3.35
Guthrie Center	31			1.05	1.70		.23	.25					32							.08			.22									4.16
Hamburg				1.45			1 51					2 23													.67		.60					6.46
Hamptoa	.70	32	.07	.63					.16										16			03	.59									3.32
Harlan	.20			1.62	95		.67	.04					.63	T					T	.22		T	.11		T						.68	4.44
Hawkeye	.68	T	1.23							T									.15			T		1.54				05		.15	3.83
Hedrick	01			.75	.50		.03	.72	25											.77		.04		.58								3.01
Humboldt	.37	28		.12			.03			.01										22		.12		T				.28				1.46
Independence	.70	T	T	.12	.20				.42											.60			.50			.01						2.55
Indianola	22	T		.80	.55		.45	.57	.16			.10										.13		.85	T							3.81
Iowa City	.18		.09	T	.49			.07	T											1.25				.31								2.20
Iowa Falls	.70	.18	.07	.23					T											.32		.17	.45			T		T	T	.45		2.57
Keokuk	.08			1.70	20		T	1.74	.01				T							.12				.18								4.01
Keosauqua	.03			80				2 43						T						.35		T		44								4.03
Knoxville	.11			68	.20		.10	85	.25											T		.32		.9								3.48
Lacona	.10			.33	.45	.53	.25	75	.20				.10									.35		.40								3.40
Lamoni				.16	.25		.15	2.50					70							T				11								3.87
Lansing	.14	.03	2.81	T							.42		.05							.36		T	.80	37								5.09
Larrabee	.42	.48	.10	.27			.14																									3.57
Le Claire	.31	T	T		.89				1.21					T				1.27	.62			.19	T				.05		03			3.09
Le Mars	1.06	.68		.33	.04		1 10	T												.08				.51								5.51
Lenox				.23	68		48	.40				.04	60					60	.04	.40			84								.12	3.88
Logan			1 34	.93	.04	1.00	1.25	.05				.71			.07		.05		.35			.10			.05		.10					5.90
Maquoketa	98		.35	.21	28															.58				49								2.89
Marshalltown	1.00	.02	.19	.42	1.27			.07												.79		.09		.77								4.62
Mason City	1.30	T	.30	T										T							1.10	T	.10									2.90
Melrose	.33			.69	1.00			1.50												.15			1 00			.10						4.77
Mooar				.25				3.20	T				T							.10		T	.43									3.67
Monticello	.76		.15		21		T	T	.10				T							.10				12								1.75
Mt. Ayr				.09	21		.17	.62					.77							.10		T	.43									2.13
Mt. Pleasant	.17			.18	02			.76	03															.25		T						2.05
Mt Vernon (Hubd)	.45		.27	.13	.61								T							1.00				.77								2.49
Murray				1.00			2.00					.20								.70		T	.20	.13		T						4.05
New Hampton	.71		1.05																T				.85									3.44
Newton	.85		.06	.61	.59		.69						.05							.36		T	.42	.80					.10			4.31
Northwood	.10	2.90	.06								.28								.65			.18	.83									6.31
Odebolt	.11	T		.65			.35												.04	2 15								.64		.18		2.10
Ogden	.70			60	.77		.02	.23												.95												3.71
Olin	.35		33	32																1.01		.15	.23									1.88
Omaha (Neb)				1.76	.48		.64	2 24				.48	.38							.46				.38		.04						6.18
Onawa	.25	T		1.40	.01		.38		.02			.02	.05							T		.07	.01			T	.07			.07		2.48
Osage	.33	.09	1.44	06							.26		.04							.35			T							T		5.73
Osceola				.36	.49		.19	1 03					.13							1.03		.03	.20	.04				.22		2.01		3.62
Oskaloosa	.10			.62	42		.16	56	.39													T	T	69								3.91
Ottumwa				.51	.10		T	1.30											.64			.04	82			.19						3.89
Ovid				.48	1.19		.15	1.25				.05								.16		.13	.32									4.02
Pacific Junction				1.58	.15		.80	.35				2.95								.13		76	.01									6.94
Pella	.23			.45	.35			.80	.10										.03		.55		.85									3.30
Plover	.27	.35		.28			.10											T		.34		.24						.03		T		1.61

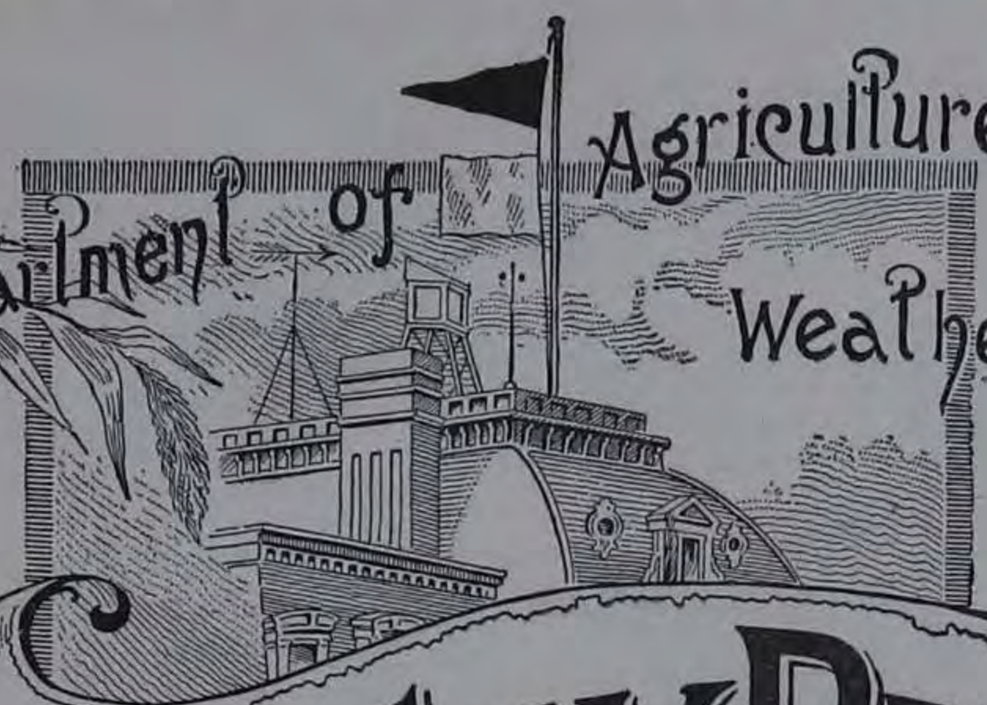
DAILY AND MONTHLY PRECIPITATION FOR AUGUST, 1899—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
ghar		.40				.40												1.00	.40													2.20
Oak				2.06	.48		.56	.80	.26			.62											.05		.03		.22				.40	5 08
eway	.19	.02	1.62	.06		.06					.50		.06						.92		01	.04	1.20		.01				.17		T	5.26
well City	.75	T		.3			.18					T							T	60											1 85
ven			.50	.50														2.20		45			.20								3.85
City	1.38	T	T	.35			.10		.03								T		T	.93		T	T								2.79
nton	.73				1.12			.33	.33			T								.54			54								3.26
lon	.42	.32	.23	.09			.18			.01	.01						.04	1.10	.01	70		.09	T		T			62	T	.15	3 97
y	.17	.10	T	.06			.06				.08						.33	.24		55		.14	T		.05					.36	2.20
rney	.24			.89	.38		T	1.16	.95								.09	1 23		45		.06		.73							4 86
x Center	.42	.47	.10	.12			.14				T	T					.02	1 00		.92		.04	.02					T		.17	3.72
x City	1.62	.19		.60			.48				T	.06	T				.02	1.45		.62		01	T					T	T	.31	4 91
cer	.16	.30					.04											.80		.61	.32							1 32			.01	4 21
t Lake	T	T	1 38								.08	T								.50			.39								.07	3.22
m Lake	.74	.25		.36	T		12					T						T	.48			.06	T					T			2.01
rt				.40	1.10		.75						.32										.33								T	2 90
rman	1.87	.16	.02	1 40	.82	T			4.10	.30													.08		.10	.20	1.30				T	10 45
do	.57		.31	1.60									.05							.75		.05	.10	60		.12						3.93
sca	.03			1.12			.91			19		.84		T						.35			.87									3.31
on	.27		.56	50				T					T							1.25				.80								2.55
ello	.26	.05	.23		.01			.76												.78				.26								3 39
hington	.22			.33				.10	22					.05				.40	1.00				T					T		T		2.61
hta	1.00	.12		.60			42				T	T								1 02			.91						T			3 59
erloo	.96	04		.28	09					29										.58			1.49	.11				.07				3.59
erly	1.01	30		.05	.05															.30		09	.01					.11		T		3 66
t Bend	.64	.29	.02	.13			.07				.05							.28		1.55				.42								2 04
t Branch	.65			.55	T		T	T											.25			T										3.17
tten	1 40			60	.53																											2.78
on Junction	.35			.10	.30				.95											.42				60								2.72
terset	.04		T	.78	1.18			.90	.05				.30											02								3 27
dburn				.31	.37		.13	1.40					.12							03		.02		.76								3 14

Precipitation Chart, August, 1899.



Vol. X. SEPTEMBER, 1899. No. 9.



U. S. Department of Agriculture
Weather Bureau

MONTHLY REVIEW
OF THE
IOWA WEATHER AND CROP SERVICE

STAR ENG. CO

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Central Station, Des Moines, Iowa.

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DIRECTOR.

GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
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DES MOINES:
F. R. CONAWAY, STATE PRINTER
1899

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Algona	C. D. Pettibone.
Alta	D. E. Hadden.
Alta (Near)	W. J. Minard.
Amana	Conrad Schadt.
Ames	Exp. Station.
Ames (6 miles s. e.)	Isaac Young.
Atlantic	J. W. Love
Audubon	F. P. Hocker.
Bancroft	E G. Bailey.
Batavia	Agent C. B. & Q. Ry.
Baxter	Agent C. G. W. Ry.
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Belle Plaine	S. P. Vandike.
Blockton	Agent C. G. W. Ry.
Bonaparte	Hon. B. R. Vale.
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Burlington	Prof. Maurice Ricker.
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Carson	Agent C., B. & Q. Ry.
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Cherokee	Hon. L. W. Beal.
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Clarinda	A. S. Van Sandt
Clear Lake	G. A. Watts.
Clinton	Luke Roberts
College Springs	A. M. Finley.
Coon Rapids	Downs & Co.
Corning	Jerome Smith.
Council Bluffs	J. B. Rishel.
Cresco	Gregory Marshall.
Cumberland	Agent C., B. & Q. Ry.
Danville	Agent C. B. & Q. Ry.
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Delaware	Wm. Ball.
Decorah	F. H. Baker.
Denison	James H. Holmes.
Des Moines	*Geo. M. Chappel, M. D.
De Soto	R. D. Minard.
Diagonal	Agent C. G. W. Ry.
Dows	E. G. Lotts.
Dubuque	*E. H. Bowie.
Eagle Grove	Smallpage Bros
Eldon	T. Madden.
Eldora	Prof. C. F. Woodward.
Elkader	Chas. Reinecke.
Emerson	Agent C. B. & Q. Ry.
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Fayette	R. Z. Latimer.
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Fonda	H. P. Barron.
Forest City	J. A. Peters.
Galva	Miss Ida Ackert.
Gilman	Jas. L. Wylie.
Gladbrook	Agent C. G. W. Ry.
Glenwood	J. P. Jackson.
Grand Meadow (Postville P. O.)	F. L. Williams.
Greene	J. L. Cole
Greenfield	J. G. Culver.
Grinnell	Prof. S. J. Buck.
Grinnell (Near)	A O. Price.
Griswold	Agent C., B. & Q. Ry.
Grundy Center	Geo. F. Ellis.
Guthrie Center	Ralph H. Jones.
Hamburg	Agent C., B. & Q Ry.
Hampton	E. C. Grenelle.
Harlan	C. A. Reynolds.
Hawkeye	Miss Beatrice Kirkendall.
Hedrick	J. T. Brooks.
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Hoprig	O. N. Young.
Humboldt	H. S. Wells
Independence	E. F. Wulfke
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Iowa Falls	J. B. Parmelee.
Keokuk	*Fred. Z. Gosewisch.
Keosauqua	Prof. J. H. Landes
Knoxville	Casey & Belville
Lacona	Agent C., B & Q Ry.
Lamoni	T. J. Fitzpatrick.
Lansing	G. H. Markley.
Larchwood	W. B. Martin.
Larrabee	H. B. Strever.
Lenox	J L. Hurley.
Le Mars	Dr. T. E. Cole.
Lockridge	Agent C. B. & Q. Ry.
Logan	Mrs. M. B. Stern.
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Mason City	Norman Dinsmore.
Marshalltown	Branch S. Jones.
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Mount Vernon	Prof. A. Collin.
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Mt. Ayr	A. F. Beard.
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Murray	Agent C. B. & Q. Ry.
New Hampton	R. H. Gurley.
Newton	A. Lufkin.
Northboro	Agent C., B. & Q. Ry.
Northwood	A. L. Thompson.
Odebolt	E. Starner.
Ogden	E. Sayre
Olin	Hon. Nathan Potter.
Omaha, Neb	*L. A. Welsh.
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Ovid	H. C. Miller.
Osage	G. D. Pattingill.
Oskaloosa	Jos. Boyd.
Ottumwa	Dr. J. F. Herrick.
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Pioneer	A. W. Hawley.
Plover	J. S. Smith.
Primghar	P. R. Bailey.
Red Oak	William Boll.
Ridgeway	Arthur Betts.
Rockwell City	C. M. Randall.
Ruthven	C. E. McGlasson.
Sac City	J. A. Sodestrom.
Scranton	E. A. Olive.
Sheldon	J. B. Frisbee.
Sibley	H. G. Doolittle.
Sigourney	Mrs. K. F. Ashbaugh.
Sioux Center	Jacob de Ruyter.
Sioux City	*U. G. Purssell.
Spencer	S. Gillespie.
Spirit Lake	W. C. Drummond.
Storm Lake	Prof. M. L. Fuller.
Stuart	H. E. Boatright.
Tara	W. E. Humphry.
Thurman	C. R. Paul.
Toledo	Grace Bookwalter.
Vinton	J. E. Catlin
Villisca	C. E. Matteson.
Wapello	Geo. W. Schofield.
Washington	Wm. A. Cook.
Washta	H. L. Felter.
Waterloo	M. L. Newton.
Waverly	H. S. Hoover.
Webster City	Louis Frank.
What Cheer	Hon. J. C. Beem.
Whitten	Dr. Frank P. Butler.
Wilton Junction	J. M. Rider.
Winterset	W. W. McKnight.
West Bend	Phil. Dorweiler
West Union	J. M. Lisher
West Branch	A. A Madson
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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME X. SEPTEMBER, 1899. NO. 9.

CLIMATE AND CROP REVIEW—SEASON OF 1899.

The unusually severe winter of 1898-9, which began about en days earlier than the average, was protracted fully two veeks beyond the usual period for the advent of spring. The xtremely low temperature that prevailed in February and larch froze the soil to an unusual depth, and the season for arming operations opened two to three weeks later than the verage of recent years. Seeding of spring wheat and other mall grain was begun in the northern and central districts bout April 10th, and continued, with more or less interrupions, to about the 25th of the month. In portions of the southrn section seeding operations and field work generally were reatly delayed by excessive moisture, resulting in a material ecrease of the acreage of small grain. It was early disovered that more than 80 per cent of the winter wheat in the outhern section and a very large percentage of the clover in ll parts of the state, had been killed by alternate freezing nd thawing during the winter and spring months. The creage of winter wheat sown in the fall of 1898 was very mall, and the aggregate loss by winter-killing was relatively ight; but the almost total destruction of the clover plant was eriously felt in nearly all parts of the state. The last half of April was somewhat warmer than usual, with plentiful rainfall, giving a vigorous start to vegetation, and by the close of he month farm work was fairly well advanced, and the fields showed a good stand of spring wheat, oats and barley. Grass was about as well advanced as usual in meadows and pastures by the close of April.

In May the temperature of the air was about normal, though quite variable. The soil, however, was unseasonably cold during the larger part of the month, in consequence of the deep freezing during the latter part of the winter, the lateness of the spring, the excessive precipitation, and prevalence of cloudy weather. The number of stormy days was unusually large, and the amount of rainfall was much above the normal in all sections of the state. Under these conditions plowing and planting operations were greatly retarded, especially in the southern and central sections, where the soil was almost continuously saturated. A fair beginning was made in corn planting in the central and northern districts during the first half of the month, but the cool, wet and cloudy weather that followed rendered germination unusually difficult, and more than the usual amount of replanting was made necessary. The heavy showers caused much damage in cornfields by washing of slopes and flooding the undrained low lands and bottoms. All these drawbacks caused a material lessening of the corn acreage, compared with the area that would have been planted under more favorable conditions. At the close of the month there remained much planting to be done, especially in the southern section. The stand secured in the area planted was very uneven, ranging from fair to poor. Grass, spring wheat, oats, barley and garden truck made remarkable growth during the month. The condition of small grain at the close of the month was very good, the chief drawback being a tendency to rank growth on rich moist soils.

June, as a whole, was seasonably warm, and the average amount of rainfall was slightly above the normal, though quite unequally distributed. The average of the northern section was 6.70 inches, the central section 5 10 inches, and the southern section only 3.33 inches. The greater number of showers occurred in the first half of the month, with much humidity and warmth, causing a rapid growth of all kinds of vegetation. The last half of the month was generally dry and more favorable for cultivation of corn, especially in the southern section where dry weather was greatly needed. At the close of the month corn was in all stages of growth, ranging from an inch to two feet in height; and fair progress had been made in its cultivation, though under great disadvantages in many localities. Small grain was mostly headed out, with rank growth and a marked tendency to lodge, and numerous indications of damage by rust.

July was normal in temperature and the weather conditions were generally favorable for the rapid advancement of crops, and also for the comfort of those who were engaged in farming operations The rainfall was less than normal, the southern section receiving the larger amount; but there was sufficient moisture in the larger part of the state. From the 3d to 15th the weather was murky, cloudy and showery, causing much delay in haying and cultivating late corn. But the moisture was beneficial to corn, potatoes, pastures and garden truck. The last half of the month was dry and warm, affording ideal weather conditions for harvesting hay and grain. The month, as a whole, was favorable for the rapid advancement of corn, which had made a late start and needed forcing weather to bring it to maturity in advance of frost. And all growing crops were well advanced during July.

August was warmer than usual, the daily average for the state being 1.3° above the mean for July. And the average rainfall in all sections was slightly above the normal for August. During the first week there was an excess of rain in the central and southern districts, with local windstorms of considerable severity, causing some damage to corn and grain in shocks; but the benefits resulting from the timely and liberal supply of moisture greatly exceeded the incidental damage and delay in harvest operations. The month closed with a protracted period of warm and dry weather, which was favorable for maturing early planted corn, and for threshing and closing up work in the harvest fields. And at the end of the month the larger part of early planted corn was sufficiently advanced to be cut and shocked. The soil was generally too dry for plowing, and pastures were short.

September was notable for extremes of hot and cold weather, exceeding all previous records for that month in all

the years since observations have been recorded in the state. Hot winds prevailed during the larger part of the first week, and on the 5th and 6th the maximum temperatures at numerous stations registered from 96° to 104°. This period of extreme heat terminated on the night of the 7th, with light and fairly well distributed showers, followed by much cooler and generally very dry weather during the remainder of the month. The effects of the hot and dry winds were very marked in the cornfields; but the crop as a whole was much benefited by being swiftly hastened to maturity, placing it beyond danger of harm by the killing frosts that reached all parts of the state during the last five days of the month. Frosts were noted at various places as early as the 14th, and thereafter on various dates with increasing severity until freezing temperatures were recorded at all stations from the 26th to the 30th. The month was generally favorable for bringing the late growing crops to maturity; but unquestionably corn and potatoes would have been better in quality and total yield if the temperature had been equable and the killing frosts had been deferred till the normal period. The total output of soil products in the state, however, will be fairly satisfactory and remunerative. The drouthy conditions in the latter part of the season materially retarded fall plowing and lessened the acreage of fall wheat and rye compared with former years. And the bare pastures will cause early feeding of stock and make heavier drafts upon the stores of winter forage.

NOTE AND COMMENT.

At the close of the month, on the Chicago board of trade, December corn closed at 29⅞ cents; wheat, 73½; oats, 22⅞.

* * *

The Sioux City station registered forty-six miles per hour of wind, September 21st, and scored a total of 9,242 miles during the month.

* * *

The first snowstorm of the season in the northwest occurred at North Fork, N. D., September 27th, says a newspaper special. A high wind gave the storm the appearance of a blizzard.

* * *

A storm of hurricane force swept over a portion of Lake Erie, near Toledo, Ohio, on the evening of September 24th, the wind velocity reaching a maximum of 70 miles an hour. Numerous small vessels were capsized, and in northwestern Ohio considerable damage is reported to buildings.

* * *

The total yearly slaughter of meat-producing animals in the United States is estimated by the Cincinnati *Price Current* to be approximately 35,000,000 swine, 10,000,000 to 12,000,000 cattle, and 18,000,000 to 20,000,000 sheep and lambs. The aggregate value, when marketed, is about $700,000,000.

* * *

At Pajaro, Cal., in 1893, a Chinaman raised 47 tons of beets per acre on a 7 acre field, and sold the product for $5 per ton. It was a case of intensive culture, not a weed being allowed in the field, every inch of space being utilized. A gross return of $235 per acre will pay a good net profit on that sort of culture, and it will pay in Iowa as well as in California.

* * *

During a thunderstorm that occurred at Ft. Madison, September 7th, lightning struck the residence of Recorder Hays Mrs. Hays received a severe shock, but soon recovered from its effects. Two men were unloading coal near the residence; one was prostrated by the shock, and a shovel was wrenched from the hands of the other. Various people in the vicinity stated that the whole atmosphere appeared to be ablaze, causing much excitement in the neighborhood.

The August report of the Minnesota Climate and Crop Service states that on August 11th lightning came from a clear sky and struck the chimney of a two-story building at Fisher, demolishing the chimney and tearing out the back of the house; also destroying the front of a butcher shop on the first floor. No fire resulted, and none of the several occupants were injured.

* * *

Michigan has joined those states that propose to do something toward preserving the forests that remain, and devise means for reforesting, so far as possible, those sections from which the timber has been cut. A State Forestry Commission has been organized, and measures will be taken to secure titles to lands that may be suitable for forest reserves, and are not desirable for agricultural purposes.

* * *

A recent special from Topeka, Kan., to the New York *News Bureau* says: "Secretary Coburn, of the state board of agriculture, is urging the farmers to hold their surplus corn. In a circular he says that Kansas farmers should market as grain, no more of their present crop than is necessary." That is good advice, especially in Kansas, which may have a recurrence of arid seasons in the near future. And it is sound advice also for the farmers of Nebraska and Iowa. They should crib and hold a goodly store of corn to provide for the lean years that are likely to follow the fat seasons, as in the times of the Pharaohs in Egypt. We may safely assume that we shall have droughty, as well as wet, seasons in the future, in about the same order of succession that we note in the records of the past. The climate does not change in its essential features and general averages, but there is marked variability in the seasonal rainfall, especially in the mid-continent region. We should recognize this fact, and provide for seasons of shortage.

* * *

Mr. J. S. Hazen, observer in charge of the Weather Bureau station at Springfield, Mo., formerly assistant observer in this office, contributed to the July issue of the *Monthly Weather Review*, a valuable paper on "Cold Waves in the Southwest." As a result of his study of the phenomena preceding the occurrence of severe cold waves, he arrives at the following conclusions:

"*First.*—Preceding cold waves, with temperature above normal, there is low humidity in advance of, or coincident with, fall in temperature.

"*Second.*—The lower the humidity, and the more violent its fluctuations, the greater will be the fall in temperature.

"*Third.*—The earlier the low humidity reaches the station in advance of the fall in temperature, the longer will the period of cold last.

"*Fourth.*—Coincident with, or shortly before, the lowest temperature, the humidity usually attains a value above normal, and begins to fall as the temperature begins to rise."

* * *

A recent dispatch from Constantinople states that 15,000 persons perished in the earthquakes in Asia Minor, around Aidin. The first shock occurred at 4 o'clock in the morning, September 20th, and lasted forty seconds. The effects were appalling. Whole villages were completely destroyed. The earthquake was felt as far as Scio, Mitylene and Smyrna. Men, women and children were buried in the ruins of their dwelling places before they realized their danger. Numerous bodies still lie beneath the ruins. About 500 persons were killed at Sarakeni, and about 500 at Denizli, where three-fourths of the buildings fell. There was proportionate loss of life in many of the smaller villages. One consequence of the earthquake is the subsidence of the level of the Aidin Mist, by two yards. Sulphurous springs burst out in the valley of Noander, and the country between Aidin and Denizli become full of crevices out of which rushed black, muddy water, with sufficient volume to wash away a flock of 1,000 sheep.

ECONOMIC VALUE OF CORN.

[Washington letter in the New York Evening Post.]

The extraordinary size of this year's corn crop makes of nterest some information as to the economical value of the Indian corn plant which has appeared in a bulletin of the Department of Agriculture, compiled chiefly from the records of the division of chemistry. Corn is not only a valuable food for man, but it is the chief food of the domestic animals of this country. Large quantities of starch are made from it, and also glucose and grape sugar. It is used in the various grades of Bourbon whiskey. Even the inner portion of the stalk—the pith—possesses such remarkable properties in the way of being compressed into small space without losing its resiliency that it is used in the construction of battleships, to close up holes made by shot and shell.

Professor Wiley, chemist of the Department of Agriculture, in his bulletin combats the opinion that corn is less digestible and less nutritious than wheat. In experiments made upon animals the nutritive value of corn has been distinctly brought out. A bushel of wheat in one set of experiments produced on an average 13.7 pounds of pork, while a bushel of corn produced 12 3 pounds. But when the difference in weight between the two is considered the actual gain is about the same in each case, and, calculated upon the market price of wheat and corn, it costs $4.01 to produce 100 pounds' increase in pork by feeding wheat, and $2.85 to produce the same increase with Indian corn. In point of digestibility for human beings, which is something rather harder to reach by practical tests, the conclusion is offered, based on what is known as digestion coefficients of wheat and other grains, that Indian corn is not inferior in this respect to wheat. Bread made from Indian corn is the great food of the southern part of the United States. With fat pork it is the food upon which severe manual labor is performed in a climate excessively trying to the laborer on account of its heat.

From the germ of the grain, which is extracted in the manufacture of starch and glucose, a valuable oil is pressed out, while the residue also forms a food material. Nearly all the starch made in the United States is from the grains of Indian corn. In a few localities it is still made from potatoes, and in Florida and some of the other parts of the south it is made from the cassava. The starch of commerce, however, is made from Indian corn. About 40,000 000 bushels of Indian corn are annually consumed in the manufacture of glucose.

VITALITY OF THE SOIL.

[Yearbook of the United States Department of Agriculture.]

Not many years ago the soil was regarded by the agriculturists as dead, inert matter, devoid of all vitality. The theories of fertilization of the soil were based upon this idea, and the methods of culture were conducted according to the same theory. The only vital thing which the farmer considered was the growing crop itself, and there was no suspicion of the relations existing between the vitality of the crop and the living organisms of the field. The reader of the agricultural literature of to-day does not need to be told how all this has been changed in the last twenty years. The soil is no longer regarded as dead and inert matter, but is known to be so permeated with living beings as to entitle it to be considered a living mass. The parts of the soil which are not endowed with life now receive the highest significance as the environment of the living organisms which they contain and which they may help to nourish. The plant which forms the growing crop receives its nourishment through the medium of the air and soil, but this nourishment must undergo a process of digestion, before it becomes available as a plant food, similar to that suffered by the food which nourishes animals. Indeed, the purely mineral, inorganic foods of plants are probably always absorbed as such, and must undergo a decomposition before they are assimilated. A striking instance of this is shown in the case of silica, an important plant food and a type of inert mineral matter. Silica is highly insoluble and apparently the least suited of the mineral constituents of the earth to enter the vital organism of the plant. Yet not only do we find it in the tissues of the mature plant, but also, strange to say, in the greatest abundance in those parts of the plant organism, viz , the leaves, most remote from the sources of supply. It is evident from this that the highly insoluble silica of the soil must undergo a complete solution in order to be carried by the juices of the plant through the network of cellular tissues to be finally redeposited in the leaf.

The same statement may be made with regard to the other purely mineral foods of plants. It is quite certain that they do not become a part of the plant organism in the form in which they are found in the soil or in applied fertilizers. In phosphorus, for instance, is found one of the most important mineral foods of plants. This substance exists in the soil almost exclusively as mineral phosphates, or is applied as such in fertilizers. Nevertheless, the phosphorus which is found in plants, and especially in the seeds of cereals, exists in organic combination, showing that the original mineral phosphates have been entirely decomposed by the process of digestion to which they have been subjected. Even the mineral phosphates which are found in the plants are not those which pre-existed in the soil. Soil phosphates are chiefly those of lime, iron, and alumina, while plant phospates are chiefly those of potash.

TORNADO, HURRICANE AND CYCLONE.

SCIENTIFIC FACTS PRESENTED IN POPULAR STYLE.

[By Harvey M. Watts, Editor Philadelphia Press.]

Owing to the confusion attendant upon the popular use of the words cyclone, hurricane and tornado, as if they were interchangeable, it may be well, in these days of tornado and hurricane occurrence, to point out the radical differences between the three great classes of storm phenomena which are known to the United States. To begin with, the tornado is a purely local storm of great intensity and concentrated energy, whose main destructive effects are the result of the almost incredible velocity of its rotary winds that blow spirally into and about its vortex. Though terribly destructive to life and property, it is at the same time the smallest of local weather disturbances, being limited in duration, in the width of its path, and extent of its track. In one case it may last but a few minutes along a track a few hundred feet wide and a mile or so in length; in another it may persist for hours, its path several hundred yards in width and extending from fifty to one hundred miles in length. Its forward motion on its track may vary from fifteen to thirty to sixty miles an hour, but this speed is insignificant, compared with the velocity of the rotary winds which may have any speed from one hundred to five hundred miles an hour and over.

The rotary motion of the winds about the central core is the axis of the tornado and is usually made visible by the twisting movement of the funnel-shaped cloud, which is one of the most marked features of the typical tornado, and the actual existence of the rotary winds is made clear by the character of the destruction and the lay of the debris after the tornado has passed by. The tornado is in type nothing more than the familiar dust whirlwind common to city streets on warm or windy days, differing from it only in intensity, not in

kind. Though the tornado under given conditions, may form in any part of the United States east of the Rocky mountains, it is of most frequent occurrence in the plains and rolling country of the Mississippi valley, where topographical, as well as meteorological, conditions favor the formation and persistence of local whirlwinds of the tornadic type.

Aside from the destructive effects due to the rotary winds, there are in every tornado ascending currents of terrific velocity which rush up the core of the vortex, as a draught of hot air up the center of a tall chimney. As the rotary motion causes a movement of the winds away from the center of the core, the air here is so exhausted that it almost reaches the condition of a vacuum. The result of this is that in addition to the destructive effects of its rotary and ascending currents the tornado causes serious damage by reason of explosive effects, for if the center with its partial vacuum passes over a house in which the air is at ordinary atmospheric pressure, this air blows outward as if gunpowder had exploded within it. In this way some houses are destroyed which escape damage from the whirling winds.

Though not as destructive as the tornado, and hence second to it in importance in this respect in the classification of local storm phenomena, the thunderstorm is a much more extensive weather disturbance. It is not a storm disturbance rotating about a vertical axis, but moves across the country with a comparatively straight front, often many miles in extent, out from under which rushes the wind squall. In depth from front to rear, the typical thunderstorm may reach from five to fifteen miles and more. The destructive effects of a thunderstorm are due to the lightning, hail, the heavy rainfall, which sometimes approaches the character of a so-called cloudburst, and the high winds that make up the familiar outrushing thundersquall, which may occur before or after rain has begun to fall. The squall winds may reach a velocity of sixty miles an hour or so in gusts, and hence may do a considerable damage, though the velocity is nothing compared with the rotary velocity of the tornadic winds.

Covering a large area, under favorable conditions, the thunderstorm may endure for hours, and in its track may cover a region from one hundred to two hundred and fifty miles in linear extent. Itself the result of unstable conditions of the atmosphere, it may develop within its sphere of influence secondary disturbances of particularly violent type, and hence it is often the parent of tornadoes, which are small compared with the thunderstorms, while it itself is comparatively limited in comparison with greater weather disturbances that affect the circulation over extensive areas. The thunderstorm is the most extensive of local storms, and between it and the dry squalls of wind, local gusts and tornadoes, there are many variations, none of them, however, being anything but secondary disturbances, whirls and eddies in the general circulation.

The cyclone is differentiated from all local storms, whose operations are confined to a comparatively small region, since it is a weather disturbance, at its smallest on a large scale, and at times reaches a continental magnitude. The name is of technical not popular origin, and was first used by Piddington, an English meteorologist, to describe the tempests of the Bay of Bengal and other tropical waters. It is a descriptive epithet and refers to the almost circular movement of the winds about a common center, then supposed to be the unvarying characteristics of these great and destructive storms that are called typhoons in the eastern seas, and hurricanes in the Caribbean and West Indian waters. The word has been generalized in meteorology and is used to denote one of the two types of atmospheric eddies into which the circulation of the air in temperate zones is thrown. These are cyclonic and the anti-cyclonic.

The most destructive of all cyclones, and in fact the most dsstructive weather outbursts known, are the tropical cyclones, the so-called typhoons of the Philippines, China sea and Japanese waters, the hurricanes of the West Indies, and Atlantic and Gulf coasts of the United States. Though the largest tornado rarely has a diameter of a mile, the smallest tropical cyclone rarely falls below one hundred miles in diameter, and its sphere of destructive influence may range from one hundred to six hundred, even to one thousand miles. As the hurricane now ravaging the West Indies shows, the tropical cyclone may persist for days, traveling thousands of miles. The point of origin for the tempests that visit our coast is the eastern Atlantic in low latitudes. They cross over to the West Indies, recurve in the Gulf of Mexico, over or east of Florida, and then travel to the northeast, along the coast line of the United States, then out into the Atlantic over Newfoundland, sometimes reaching English waters. By that time they have taken on all the characteristics of a cyclone originating in the temperate zone. The destructive effects of the cyclone are the result of the winds that blow in spirally about its center, which in the front of the cyclone may reach any velocity from sixty to ninety miles an hour. The low pressure of the barometer in the center of the storm and the terrific winds lift up a tremendous sea that raises the tides above the normal, and hence through disastrous floods cause great loss to life and property along the low-lying coasts, as has been the fate of the bayou region of Louisiana and the sea islands of Georgia and North Carolina on numerous occasions. The rainfall is also often excessive and destructive.

Differing from the tropical cyclones merely in degree are the continental cyclones of the temperate zone. These are the largest weather disturbances known, but are not necessarily violent. On the contrary, they often represent a mild, vague, general circulation of the winds about a common center, within which area the rainfall may be light, heavy, nearly continuous, or broken up into separate areas. These cyclones—the real cyclones of the American continent—may have a diameter of from five hundred to fifteen hundred miles, and even larger, thus covering an area of over one million square miles. They persist for weeks, and, traveling from west to east may go two-thirds of the way around the globe. Save when their vortex is contracted to about the size of that met with in tropical cyclones, fifty to one hundred miles or so, the continental cyclones are beneficial rather than destructive factors in the general circulation.

When such contraction occurs in the fall, winter, or spring over the region of the Great Lakes, or over the Atlantic, the conditions repeat all the phenomena of a coast hurricane, and may cause loss of life and damage to property by reason of the hurricane velocity of the winds, the excessive rainfall, and the heavy weather on the lakes or at sea. From this it must be clear that the confusion of general cyclonic with local storm or tornado conditions, so common in the west is easily avoidable, as the contrasts are marked and the distinctions based on broad differences. The mere fact that a storm is local, of limited extent, no matter how great its violence, is the first proof that it is not a cyclone, though the tendency in the west and south is to apply the technical term "cyclone" to all violent local outbursts, on the mistaken idea that the word "cyclone" means a tornado and a tornado only. Compared with the tremendous size and appalling character of the Porto Rico hurricane and other tropical cyclones of like destructive effects, such as that of St. Vincent and Barbadoes last year, the tornado at New Richmond, Wis., was of small account and thunderstorm casualties trival.

UNNECESSARY TORNADO ALARMS.

The following paragraphs are clipped from the June number of the *Monthly Weather Review*, edited by Prof. Cleveland Abbe:

"It seems wise and necessary for the officials of the Weather Bureau to improve every occasion to allay the unnecessary alarm that pervades the community whenever one mentions the subject of tornadoes. Twenty years ago, when the Bureau began to collect and publish fairly correct statistics relative to these storms, the sum total of their number and the attendant destruction was so large as to be very impressive. The figures gathered by the meteorological reporters, purely for meteorological study with a view to the prediction of storms, were converted by sensational writers into a most alarming picture of the condition of the atmosphere in this country. Kansas, Iowa, and other portions of our fair land, became known as 'tornado states' Many were frightened away from these states, and those who remained suffered unnecessary terror. Out of the natural desire to avoid a reputation for frequent tornadoes there grew a widespread determination to avoid the use of the word. Good citizens would allow that on very rare occasions they had an occasional 'twister' or cyclone, a whirler or cloud-burst a hailstorm or hurricane, but *never a tornado.* Newspapers shunned the word and insisted on using evasive terms.

"In 1884 the editor prepared for the proposed fourth edition of a little pamphlet entitled 'Weather Maps, and How to Use Them,' a table of relative frequency that clearly showed, not only the small chance of injury from tornadoes, but also that the chance was just as great in many small eastern states as in the large western states that had come especially under the ban of popular writers One of the latter even went so far as to upbraid him for shirking his duty in that he did not join in the popular cry: 'Beware of the western tornado.'

"There is really no more destruction done by tornadoes than by lightning, high winds, hailstorms, droughts and floods, or other meteoric visitors. Fear and dread are inspired by the general knowledge that harm may occur, but fright and panic do not seize one until the dreaded apparation is at hand and visible. Fright is largely a matter of the nerves and imagination; fear, of the intellect. Fright is not subject to reason, but fear may be so. By a careful, reasonable study of the maps of tornado tracks our observers will always be able to calm the minds of the citizens. It is unnecessary to resort to the caves and cellars or to stop our ordinary avocation for fear of a tornado, until we see the cloud in the distance, or are positively certain that one is about to pass near us."

DRY WEATHER HALF A CENTURY AGO.

The Annals of Iowa, Vol. IV, No 3, contained the following note on the weather, reprinted from the Bloomington (now Muscatine) *Herald*, dated February 26, 1847. It will be seen that there were some droughty periods in this section before the climate was "ruined" by drainage of shallow ponds and sloughs:

Since last July, there has scarcely been enough rain to keep vegetation from being parched up completely. Throughout the fall and winter thus far, it may be said that a drouth has rested upon the country. On the 1st of January a little rain fell—sufficient to make it quite muddy and on the 2d it changed to snow, which fell to the depth of six or eight inches in this place, but was much deeper north and west. At Iowa City the snow was nearly twice as deep as here—enough to make sleighing of the most superb quality. The sleighing lasted just one month. The climate of Iowa must ever be subject to less rain than almost any other portion of the west—lying, as it does, far from the influence of the Great Lakes, and having no range of mountains or highlands to operate as condensers to the rarefied and ascending vapors; the natural laws of evaporation will exhaust the moisture from her soil and bear it away to some cooler state of the atmosphere. It is only when a long continued heat shall operate to rarefy the air to an excess sufficient to produce a rapid circulation approaching to a storm, that we can reasonably expect rain. In this latter event the cooler vapors are forced into the vacuum, and if collected in sufficient quantities, fall of course, to the earth.

SEPTEMBER WEATHER RECORD.

The month was characterized by abnormal extremes of temperature, breaking all previous September records in Iowa for both hot and cold weather. At the central station the average temperature of the first seven days was 80 2°, and on the 5th and 6th the maximum was 99°. Several voluntary stations reported maximum temperatures exceeding 100°, the highest being 104°, at Eldon on the 6th. The mean for the state for the month was 62.5°, which is about 1.8° below the normal for September. By sections the averages were as follows: Northern section, 60.6°; central section, 62.8°; southern section, 64.1°. The coldest weather occurred during the last five days of the month, all portions of the state being visited by killing frosts and freezing temperature. The lowest recorded was 15° at Sheldon and Sibley on the 29th, and at Mason City on the 30th.

The month was unusually dry, the average rainfall for the state being .93 of an inch, which amount is 2.06 inches below the normal. The average of the northern section was 1 01 inches; central section, .72 of an inch; southern section, 1.06 inches. Blockton station reported only a trace, and at Fonda no rainfall was recorded. There were 16 clear days, 9 partly cloudy, and 5 cloudy.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30 06 inches; highest observed, 30.49, at Cresco on the 30th; lowest observed, 29.65, at Omaha, Neb., on the 27th; range for the state, .84 inches.

Temperature.—Monthly mean, as deduced from 120 reports, was 62 5°; highest monthly mean, 67°, at Red Oak; lowest monthly mean, 54.4°, at Eagle Grove; the highest temperature reported was 104°, at Eldon on the 6th; the lowest temperature reported was 15°, at Sheldon, Sibley and Mason City on the 29th and 30th; the average monthly maximum was 96.7°; the average monthly minimum was 21.4°; the greatest daily range was 54°, at Sibley; average daily range, 40.7°.

Precipitation.—Average for the state, as determined from the reports of 138 observers, .93 inches; the largest amount reported was 4.32 inches, at Keokuk; the least amount was trace, at Blockton; the greatest daily amount reported was 2 88 inches, at Keokuk on the 7th and 8th; average number of days on which .01 inch or more of precipitation was reported, 4.

Wind.—Prevailing direction, northwest; highest velocity reported, 46 miles per hour from the northwest, on the 27th, at Sioux City.

Weather—There were 16. clear days; 9 partly cloudy days, and 5 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.05	30.43	30	29.67	24
Des Moines	30.08	30.42	30	29.71	27
Clarinda	30.08	30.38	29,30	29.70	27
Cresco	.....	30.49	30	29.83	24
Dubuque	30 07	30.48	30	29.73	27
Omaha, Neb	30.03	30 38	29	29.65	27
Keokuk	30.07	30.43	30	29.78	24
Sioux City	30.08	30.44	29	29.77	27
Means	30.06	30.49	30	29.65	27

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	4,909	28	NW	28
Des Moines	5,668	35	SW	6
Dubuque	5,431	34	NW	12
Keokuk	4,747	28	W	28
La Crosse, Wis	4,753	27	W	28
Omaha, Neb	5,855	40	N	24
Sioux City	9,242	46	NW	27

OBSERVERS' NOTES.

BONAPARTE—*B. R. Vale.* Too dry for fall plowing or seeding to advantage.

GREENFIELD—*J. G. Culver.* Corn generally well matured; pastures very short; very little fall plowing done.

OVID—*H C. Miller.* All tender vegetation killed by frost on the 29th and 30th.

SIOUX CENTER—Threshing about half done; corn is ready and husking will be commenced.

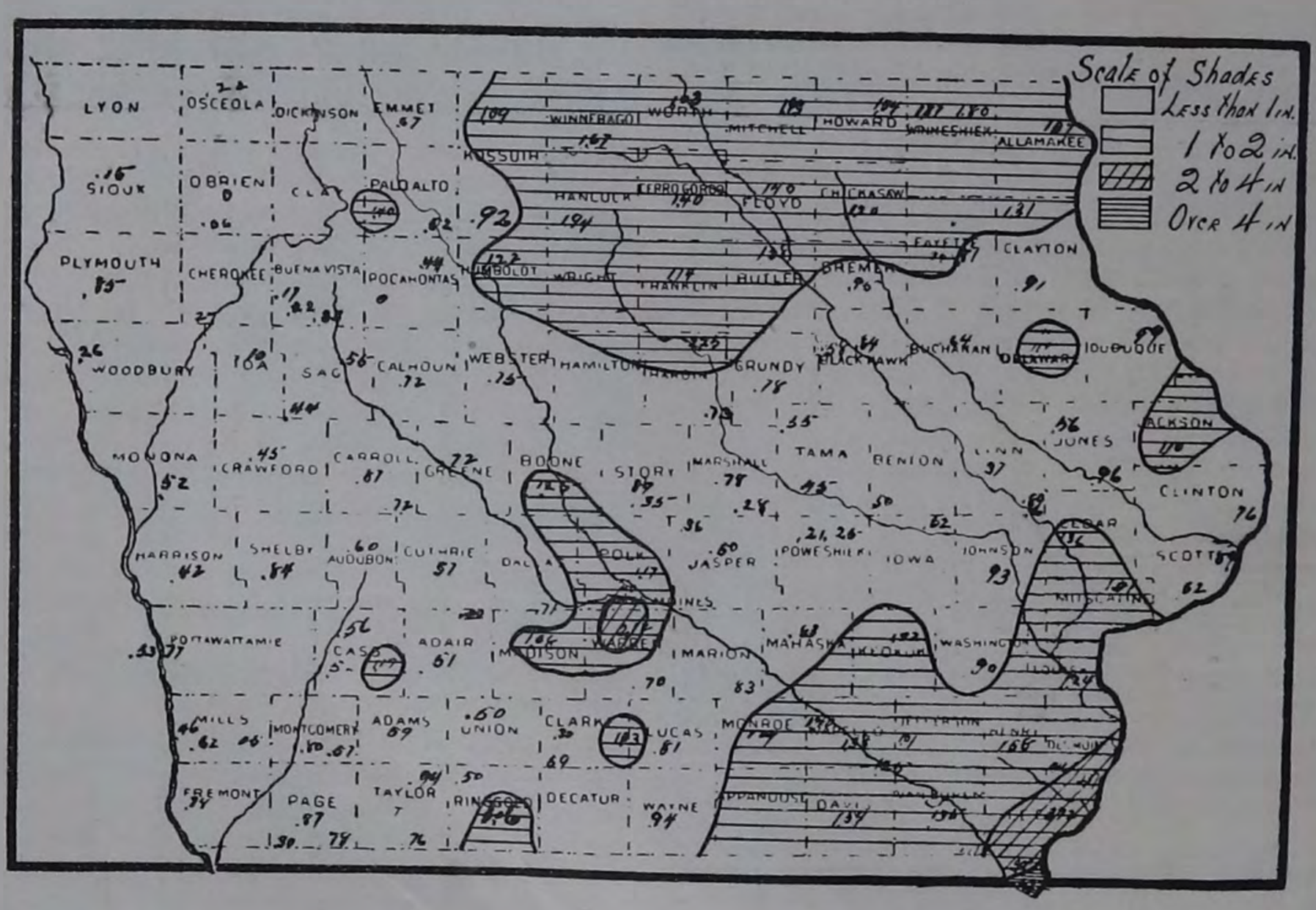
TOLEDO—*L. G. Bookwalter.* This has been a very dry and dusty month; the latter part of the month has been unusually cold, with frost and frozen water.

WEST BEND—*Philip Dorweiler.* A fine month but too dry; no killing frost till the 26th; very hard frost on the 29th and 30th; corn all right and will be a good crop; oats yield well; wheat only fair, hardly an average.

ERRATA IN AUGUST REVIEW.

Ames.—Total precipitation should have been left blank.
Eldon.—Mean maximum temperature should have been 90 5°; mean temperature should have been 77°.
Harlan.—Mean temperature should have been 74.2°.
Osage.—Mean temperature should have been 71.2°.
Sioux Center.—Mean temperature should have been 73.6°.
West Branch.—Mean temperature should have been 75.8°.

Precipitation Chart September 1899.



CLIMATOLOGICAL DATA FOR SEPTEMBER, 1899.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIPITATION, INCHES.				Number rainy days	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Algona*	Kossuth	1,500	7	60.8	-3	94	6	24	29	....	.92	-.90	.40	.....	3	12	13	5	NW
Alta	Buena Vista	1,519	8	61.8	-3	98	6	20	29	42	.17	-1.94	.10	.....	3	18	9	3	S, NW
Alta (near)	Buena Vista	....	....	.....	.....	...	.....	....	.....	.....	.22	.....	.15	.....	3	..	..	..	..
Britt	Hancock	1,230	..	59.8	.....	97	6	20	29	49	1 94	.....	1.20	...	7	6	23	1	SW
Bancroft	Kossuth	....	...	60.4	.....	96	6	19	29	42	1.09	.....	1.00	.....	7	15	7	8	S
Charles City	Floyd	1,012	8	60.8	-3	90	2	19	30	39	1.45	-.83	.62	.....	4	7	15	8	NW
Cresco	Howard	1,312	27	58.2	-2	90	2	21	30	39	1.54	-2.10	.60	.....	10	16	6	8	NW
Decorah	Winneshiek	900	6	59.4	-4	90	2	18	30	38	1.80	-1.11	.60	.....	5	...	...	...	....
Dows	Wright	....	...	59.6	.....	98	6	19	29	48	2.00	.....	1.20	.....	8	11	6	13	SE
Eagle Grove †	Wright	....	..	54.4	.....	.....	.....	....	.....	.....	.....	.....	.....	.....	...	...	...	...	.....
Elkader	Clayton	....	19	59.8	-2	100	5	17	30	47	.91	-3.00	.56	.....	5	13	12	5	N
Emmetsburg	Palo Alto	....	...	.....	.....	...	.....	....	...	.....	.67	.....	.25	.....	5	...	...	...	.....
Fonda	Pocahontas	....	...	.....	.....	...	.....	....	...	.....	0	.....	0	.....	0	30	0	0	.....
Forest City	Winnebago	1,220	..	61.4	....	97	6	22	29	47	1.67	.....	.67	.. ..	8	15	10	5	W
Grand Meadow *	Clayton	....	8	59.0	-4	97	5	26	30	...	1.21	-1.68	.63	.....	5	8	14	8	SW
Greene	Butler	943	...	61.6	.....	95	6	19	30	43	1.28	.....	.47	....	5	8	13	9	SW
Hampton	Franklin	1,240	...	62.1	....	100	6	24	29, 30	41	1.74	... ...	1.09	....	5	14	10	6	NW
Hawkeye	Fayette	....	...	.....	...	.....	.....	....	...	....	1.27	... ...	.31	.....	3	...	...	...	.....
Humboldt	Humboldt	1,082	...	62.0	.	97	6	21	29	44	1.22	... ...	.53	.....	6	21	2	7	NW
Lansing	Allamakee	....	...	61.9	....	93	2	22	30	40	1.57	.....	.87	.....	3	11	10	9	... .
Le Mars	Plymouth	1,221	.	62.5	.....	96	6	25	29	46	.85	.....	.60	.....	3	23	2	5	S
Mason City (c)	Cerro Gordo	1,130	..	60.2	....	97	6	15	30	50	1.40	... ..	.50	....	3	...	...	...	.....
New Hampton	Chickasaw	1,166	...	61.9	....	89	4	22	30	38	1 20	.....	.59	.....	6	8	17	5	NW
Northwood	Worth	1,210		59.4	....	92	4	20	30	40	1.03	.....	.72	.....	3	20	2	8	S, NW
Osage	Mitchell	1,178	8	60.2	+1	89	4	20	30	37	1.93	-1.45	.61	....	9	5	13	12	NE, NW
Plover	Pocahontas	....	...	63.8	.....	99	6	19	29	45	.44	.....	.20	.....	3	20	7	3	S
Primghar	O'Brien	....	....	60.5	.....	98	6	17	29	43	0	.....	0	.	.	....	...	.	S
Ridgeway	Winneshiek	....	...	60.8	.....	90	4	26	30	33	1.87	.. ...	.50	.....	14	17	8	5	S
Ruthven	Palo Alto	.	....	62.4	.....	97	6	17	29	47	1.40	.....	.60	.....	3	5	20	5	S
Sheldon (a)	O'Brien	1,406	...	59.2	.....	93	4	15	29	52	.06	.....	.04	.....	3	..	...	...	S
Sibley	Osceola	1,506	...	59.5	....	99	6	15	29	54	.22	.....	.08	.....	4	13	14	3	S
Sioux Center	Sioux	....	....	62.2	..	96	6	22	29	39	.15	.....	.07	...	3	18	6	6	SW
Spirit Lake	Dickinson	. .	5	62.2	-3	98	6	21	29	45	.30	-1.84	.30	. ..	1	17	5	8	NW
Storm Lake	Buena Vista	....	....	62.4	.....	94	6	22	29	40	.33	.....	.13	....	6	18	9	3	W
Washta	Cherokee	....	....	....	...	...	.....	....	.....	.....	.27	.....	.22	....	2	24	5	1	N
Waverly	Bremer	942	...	60.6	...	91	2, 4, 5	22	30	37	.95	.....	.43	....	8	9	9	12	N, NW
West Bend *	Palo Alto	....	6	58.9	-3	98	6	20	29	...	.52	-1.64	.13	...	6	8	15	7	NW
West Union	Fayette	1,105	....	.....	....	...	.....	...	.....	.....	.81	.....	.81	....	1	13	0	17	NW
Average		....	....	60.6	-2.6	95.1	.....	20.3	.....	43.0	1.01	-1.65	.....	....	5	14	9	7	NW

CENTRAL SECTION.

Amana	Iowa	....	23	62.9	+1	97	5	18	30	37	.62	-2.75	.26	.....	3	15	11	4	N
Ames	Story	936	19	62.8	-1	93	6	22	30	41	.89	-2.62	.50	.....	4	11	12	7	....
Audubon	Audubon	....	6	62 6	-1	95	6	24	29	40	.60	-2.54	.60	.....	1	17	9	4	NW
Baxter	Jasper	...		63 1	-	101	5	22	28	41	.36	.....	.18	....	3	0	23	2	NW
Belle Plaine	Benton	840	9	62.3	-2	96	5	23	30	38	.50	-2.27	.15	....	4	10	17	3	SE
Carroll	Carroll	....	9	61 8	-2	97	6	19	29	46	.87	-1.32	.83	....	2	24	3	3	.....
Cedar Falls	Black Hawk	844	8	62.8	-2	99	5	19	30	40	.58	-2 48	38	.....	2	20	6	4	S
Cedar Rapids	Linn	744	17	65.9	+3	102	5	22	30	39	.37	-2.58	.15	.....	5	20	5	5	N
Clinton	Clinton	609	8	62 3	-3	98	5	19	30	44	.76	-2 23	.41	....	5	8	19	3	SE
Coon Rapids	Carroll	..	..	63.1	.....	96	6	23	29, 30	37	.72	... ..	.45	..	3	15	14	1	N
Davenport	Scott	615	27	64 4	-1	99	5	28	30	33	.82	-2 32	.40	.....	6	15	7	8	SW
Delaware	Delaware	1,081	8	61.2	-1	95	5	16	30	38	1.11	-2.25	.72	...	5	15	9	6	N
Denison	Crawford	1,192	6	62.5	-3	98	6	18	29	48	45	-1.84	.45	...	1	20	8	2	S
Des Moines	Polk	867	21	64.0	-1	99	5, 6	26	30	38	1.17	-1.91	.75	.....	3	13	10	7	NE
De Soto	Dallas	886		63.6	.....	100	5	22	30	41	.71	.....	.49	....	2	23	4	3	S
Dubuque	Dubuque	665	26	62 4	-2	96	5	24	30	34	.99	-3 08	.34	.....	8	12	13	5	NW
Galva	Ida	....	6	66.7	+1	98	6	20	29	47	.10	-1.86	.02	. .	3	16	11	3	SE
Gilman	Marshall	1,035	..	...	.....	....	.....	....	.....	....	.28	.....	.12	....	3	18	7	5	S
Gladbrook	Iowa	....	....	.....	...	...	.....	....	.....	.....	.55	.....	.30	...	2	.	..	..	.....
Grinnell	Poweshiek	1,011	..	62.8	.....	96	6	25	29	32	.21	.....	.09	.....	4	12	14	4	N
Grinnell (near)	Poweshiek	....	..	62.7		98	5, 6	24	29	40	.25	.....	.08	....	4	16	9	5	NE
Grundy Center	Grundy	966	8	60 2	-4	99	5	20	30	42	.78	-2 12	.35	...	4	16	8	6	W
Guthrie Center (e)	Guthrie	1,269	...	60.1	.....	98	6	19	30	40	.57	.....	.38	...	3	..	...	...	NW
Harlan	Shelby	....	..	63 0	.....	96	5, 6	20	29	44	.84	.....	.46	...	3	10	14	6	N, S
Independence	Buchanan	921	37	60.8	+1	96	5	18	30	44	.64	-3.65	.62	...	2	20	6	4	SW
Iowa City	Johnson	644	9	62 1	-3	101	5	20	30	42	.93	-1.77	.36	....	3	15	11	4	N, S
Iowa Falls	Hardin	....	6	60.6	-1	98	6	19	30	38	2 25	-.74	1 24	.....	6	19	4	7	NW
Le Claire	Scott	....	....	...	...	...	.....	....	...	....	.89	.....	.51	.....	5	...	..	..	....
Logan	Harrison	928	34	64.0	-2	97	6	19	29	45	42	-2.64	.42	.....	1	24	4	2	S
Maquoketa	Jackson	....	6	61.6	-3	96	5	17	30	43	1.10	-1.68	.39	....	5	22	5	3	NW
Marshalltown	Marshall	898	7	63.8	-1	100	5, 6	22	30	42	78	-1.35	.42	....	6	19	9	2	S
Monticello	Jones	800	45	59.1	-3	98	5	16	30	44	.56	-3 23	.45	...	3	17	6	7	NW
Mt. Vernon* (d)	Linn	858	..	60.3	.....	99	5	32	30	....	.86	... ..	.58	....	2	...	...	.	.....
Mt. Vernon (Hubbard)	Linn	....	...	64.0	...	100	5	27	30	37	.80	... ...	.39	.... .	6	21	3	6	S
Newton	Jasper	958	12	62.9	0	99	5	22	29	36	.50	-2 80	.20	....	7	17	11	2	SE
Odebolt	Sac	....	..	63.9	.....	99	6	20	29	49	.44	.....	.20	..	4	22	4	4	.....
Ogden	Boone	1,109	....	63.1	....	97	5, 6	22	29	41	1.25	.....	.50	.....	4	20	3	7	SE
Olin	Jones	....	....	61 4	.....	96	5	17	30	40	.96	.....	.43	....	4	22	5	3	N
Onawa	Monona	....	..	66.0	....	102	6	23	29	40	.52	.....	.39	.....	3	26	3	1	SE
Rockwell City	Calhoun	1.219	...	62 0	....	97	6	20	29	43	.72	.....	.28	.....	5	22	5	3	.....
Sac City	Sac	900	....	62.6	.....	98	6	21	29	42	.55	.....	.25	.....	6	21	5	4	SW
Scranton	Greene	....	...	62.2	....	97	6	29	24	38	.72	.....	.47	....	2	19	8	3	NW
Sioux City	Woodbury	1,122	....	62.6	....	99	6	25	29	43	.26	.....	.24	.....	2	18	7	5	S
Tara	Webster	1,159	...	.....	....	.	.....	....	.....	...	.75	...	.50	...	2	5	24	1	NW
Toledo	Tama	.	5	64.6	0	103	5	17	30	43	.45	-2 66	.30	.....	3	19	0	11	SW
Waterloo	Black Hawk	862	20	61.6	-4	97	5	19	30	42	.84	-3.40	.50	.....	9	20	5	5	N
West Branch	Cedar	708	....	61.5	....	98	5	17	30	42	1.36	.....	.62	...	4	21	8	1	NW
Whitten*	Hardin	.....	..	62 8	....	97	6	30	30	.....	.73	.....	.25	....	3	17	8	5	SW
Wilton Juncton	Muscatine	....	..	63.3	.....	98	5	18	30	35	1.01	.....	.61	.....	3	19	5	6	SW
Average		....	...	62.8	-1.4	95 9	.....	19 4	.....	40.6	.72	-2.32	.....	.....	4	17	9	4	S, NW

CLIMATOLOGICAL DATA FOR SEPTEMBER, 1899—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES				Number rainy days.	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days	Number partly cloudy days.	Number cloudy days.	
Afton	Union	....	....	63.0	....	98	5, 6	24	29	37	.50	.....	.50	....	1	14	14	2	SW
Albia	Monroe	945	....	62 8	...	97	5, 6	22	29	35	1.09	.....	.50	....	3	26	2	2	NW
Atlantic	Cass	....	8	62.0	-4	99	5	17	29	49	.56	-2.24	.56	....	1	11	13	6	SE
Batavia	Jefferson	640	...	.....	.....	.....	.....	.....	.....	.....	1.01	.....	.45	....	3	...	...	...	.....
Bedford	Taylor	....	...	64.6	...	102	5	22	29	49	.76	.....	.74	.....	2	15	14	1	SW
Belknap	Davis	857	....	65.0	..	100	6	27	29	41	1.59	.....	.80	.....	5	26	3	1	N
Blockton	Taylor	....	....	63.8	....	97	5	28	30	37	T	.....	T	.....	0	6	21	3	NW
Bonaparte	Van Buren	....	8	60.4	-9	103	5	26	29, 30	34	1 11	-3.30	.58	....	2	....	...	..	.....
Burlington (a)	Des Moines	526	....	65.5	....	103	5	23	30	39	2.37	.....	.71	.....	7	...	...	...	.....
Bussey	Marion	....	....	.....	.....	.....	.....	.....	.....	..	.83	.....	.33	....	4	...	...	...	.....
Charlton	Lucas	1,030	....	63 8	....	98	5	24	29	37	.81	.....	.26	....	5	17	12	1	S
Chillicothe	Wapello	645	..	.....	.....	.....	.....	.....	.....	.....	1 40	....	.70	.....	3	...	...	...	.....
Clarinda	Page	1.069	9	65.4	-3	101	5	23	29	46	.87	-1.26	.73	....	8	21	7	2	S
Corning	Adams	1,127	7	63.4	-3	96	5, 6	24	29	44	.59	-1.68	.44	...	3	22	4	4	N
College Springs (c)	Page	.....	8	61 6	-7	97	5	24	29	35	.78	-1.59	.75	...	2	23	5	2	SW
Council Bluffs	Pottawattamie	989	..	65.8	.....	101	5	26	29	40	.77	.....	.52	....	3	26	0	4	S
Cumberland	Cass	....	...	.....	.....	...	.....	...	.....	....	1.17	.....	1 00	.....	2	22	7	1	N
Danville	Des Moines	715	...	...	....	..	.....	...	.....	....	1.46	.....	.58	.....	4	20	7	3	.....
Diagonal	Ringgold	....	...	63.0	....	96	5, 6	24	29	39	.50	.....	.40	....	2	17	13	0	N,S,SW
Eldon	Wapello	....	....	65.5	.....	104	6	22	30	38	1.25	.....	.55	.....	5	19	6	5	S
Emerson	Mills	....	..	.....	....	...	.....	..	.....	....	.05	.....	.05	.....	1	...	...	...	SE
Ft. Madison	Lee	516	51	63.6	-2	98	1	31	30	23	3.72	-.13	1.73	.....	8	11	11	8	N
Glenwood	Mills	979	29	66 0	+4	100	5	22	29	42	.62	-1 61	.42	.....	2	11	17	2	SE
Greenfield	Adair	...	8	63.2	-3	97	5	22	29	39	.51	-2.52	.51	.....	2	21	8	1	N,S
Griswold	Cass	....	....	.....	.....	.....	.....	.....	.....	.....	.52	.....	.52	.....	1	22	1	7	S
Hopeville	Clarke	.....	8	64.4	-3	97	5, 6	27	29	37	59	-2 57	.45	.....	3	13	15	2	N,NW
Indianola (a)	Warren	...	7	64.3	-3	99	5	23	29	47	2.12	-.72	1.90	.....	3	18	12	0	SW
Keokuk	Lee	618	28	65.2	-2	99	6	30	29	32	4.32	+.69	2.88	.....	9	19	7	4	SW
Keosauqua	Van Buren	.....	7	65.8	-2	100	5, 6	24	30	34	1.35	-3.78	.71	... ..	5	....	...	...	.....
Knoxville	Marion	....	6	64.5	-3	98	5	25	29	33	.58	-2.77	.20	.....	4	13	10	7	SE
Lacona	Warren	....	....	....	....	....	.....	.....	.....	.....	.70	.....	.30	.....	3	....	....	....	.....
Lamoni	Decatur	....	....	63.4	.....	96	5, 6	24	29	41	.73	.....	.50	.....	3	22	1	7	SW
Lenox	Taylor	....	...	63.6	.....	95	5, 6	25	29	34	.94	.....	.79	.....	2	21	6	3	N,S,NW
Melrose	Monroe	850	....	.....	.....	....	.....	.....	.....	...	1.37	.....	.71	.....	3	.....	.....	.....	.....
Mooar	Lee	...	...	65.0	.....	100	6	25	30	36	3.04	.....	1.54	.....	3	16	8	6	S
Mt. Ayr	Ringgold	1,236	6	64.8	-3	98	5	24	29	35	1.06	-1.71	.90	.....	3	12	16	2	N
Mt. Pleasant	Henry	725	....	65.0	.....	101	6	25	29	37	1.55	.....	.60	.....	4	18	9	3	S
Murray	Clarke	1,183	...	.....	.....	...	.....	.....	.....	.....	.30	.....	.30	.....	1	28	2	0	.....
Northboro	Page	...	...	.....	.....	....	.....	.....	.....	.....	.30	.....	.30	.....	1	....	....	....	.....
Omaha (Neb.)	Douglas	1,113	....	66.4	.....	99	5	33	29	35	.53	.....	.32	.....	2	12	13	5	N
Osceola	Clarke	1,123	...	64.8	.....	99	5, 6	23	29	36	1.07	.....	.60	.....	3	16	7	7	NW
Ovid	Wayne	...	6	64.8	-3	100	5	23	29	38	.94	-2 80	.38	.....	4	20	3	7	NW
Oskaloosa	Mahaska	850	16	63.4	-4	99	5	23	29	38	.83	-2.08	.35	.....	5	22	5	3	SW
Ottumwa	Wapello	630	5	65.6	-2	102	5, 6	26	29, 30	40	1.38	-1.98	.55	.....	5	23	2	5	W
Pacific Junction	Mills	960	...	64.2	.....	97	5	20	29	46	.46	.....	.43	....	2	14	12	4	N
Pella ‡	Marion	....	...	60.7	.....	91	5	25	29, 30	30	.44	.....	.15	.....	3	20	8	2	.....
Red Oak	Montgomery	....	...	67.0	..	100	5	26	29	43	.80	.....	.65	....	4	18	5	7	N
Sigourney	Keokuk	1,033	....	61.0	.....	103	6	21	29, 30	39	1.92	.....	.94	.....	3	19	11	0	NW
Stuart	Guthrie	....	...	64.1	..	96	4, 5	24	29	42	.....	.....	.....	.....	...	...	...	...	.....
Thurman	Fremont	....	..	64.6	.....	96	5, 6	23	29	41	.78	.... ..	.58	.....	3	17	8	5	NW
Villisca	Montgomery	1,058	6	63.2	-2	100	5	25	29	42	.57	-1.82	.47	.....	2	22	3	5	S
Wapello	Louisa	578	....	63.9	.....	100	5	23	30	30	1.24	.....	.60	.....	5	18	10	2	SE
Washington	Washington	738	8	61.4	-5	101	5	24	30	39	.90	-1.72	.37	.....	3	....	...	...	N,SW
Winterset	Madison	.....	8	62.9	-3	100	5	24	29	40	1.08	-2.02	.55	.....	2	....	....	....	.....
Woodburn	Clarke	....	....	.....	.....	....	.....	.....	.....	.....	1.02	.....	.48	.....	3	19	10	1	.....
Average		....	...	64.1	-3.1	99.1	.....	24.4	.....	38.5	1.06	-1.93	.....	....	3	18	8	4	N
Av. for the state		...	..	62.5	-2.4	96.7	.....	21.4	.....	40 7	.93	-1.97	.....	.....	4	16	9	5	NW

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR SEPTEMBER, 1899.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Means.
Afton	Max	91	92	88	94	98	98	86	75	75	76	82	76	73	78	85	81	64	64	70	71	79	78	79	75	64	65	80	74	51	62	77.5
	Min	66	64	60	62	71	68	62	65	50	53	48	54	42	48	55	61	53	40	44	41	44	52	52	55	42	36	43	41	24	26	48.4
Albia	Max	91	91	86	93	97	97	91	75	71	75	80	83	71	75	80	85	72	69	72	70	70	73	72	74	62	62	74	66	49	57	76.1
	Min	65	66	61	67	70	70	65	55	58	54	45	50	40	42	54	54	53	45	40	37	42	52	54	49	38	32	40	39	22	25	49.5
Alta	Max	90	88	82	94	90	98	67	76	79	79	88	74	73	70	83	64	68	70	68	70	80	74	82	70	64	70	82	48	51	61	74.9
	Min	64	67	56	64	64	68	60	49	49	50	46	51	40	48	55	56	46	41	48	40	43	53	48	52	35	40	45	37	20	29	48.7
Amana	Max	90	92	83	92	97	93	87	77	76	73	81	75	70	67	79	86	73	70	67	67	78	69	65	73	59	60	74	65	48	55	74.7
	Min	66	65	64	60	74	70	72	60	50	56	48	56	43	40	52	60	55	50	46	39	41	56	51	55	43	35	36	40	32	18	51.1
Ames	Max	90	92	87	94	96	98	86	72	75	80	86	75	74	72	82	76	63	69	68	69	81	71	76	67	59	65	81	71	50	58	76 1
	Min	66	66	59	64	71	69	61	57	50	51	45	55	43	47	53	58	50	40	44	39	42	55	51	51	41	33	37	40	24	22	49.5
Atlantic	Max	90	91	89	93	99	97	81	74	76	80	86	79	76	77	82	71	62	73	71	71	80	82	81	76	67	70	82	61	55	63	78.8
	Min	62	65	59	70	72	70	57	55	43	50	38	40	35	49	58	57	42	32	35	32	31	59	53	42	36	26	45	38	17	22	46.3
Audubon	Max	87	89	83	91	94	95	82	70	75	78	82	74	72	75	81	78	62	73	73	70	80	78	78	72	64	62	80	58	50	62	75.6
	Min	65	68	63	68	71	68	57	55	55	55	43	55	43	48	56	55	45	37	42	33	40	57	53	50	42	31	44	36	24	27	49.5
Bancroft	Max	88	90	83	93	84	96	90	75	76	76	87	70	70	66	80	72	65	67	67	69	79	64	52	50	52	38	43	35	19	23	73.4
	Min	65	67	50	65	65	65	59	45	45	46	45	46	43	45	52	58	43	37	52	39	44	52	50	52	38	33	43	35	19	23	47.4
Baxter	Max	91	94	83	93	101	98	85	75	79	79	86	79	78	72	82	85	62	74	73	71	83	75	72	73	62	67	78	54	53	58	77.2
	Min	67	66	60	61	73	70	65	56	49	54	46	51	43	44	52	50	52	41	43	41	42	57	50	38	35	40	42	22	25	30	49.0
Bedford	Max	94	96	97	97	102	100	96	78	79	80	87	82	82	82	86	83	62	74	70	75	80	78	81	84	76	74	84	61	61	66	81.7
	Min	60	61	63	67	66	65	63	54	46	53	38	52	38	48	56	59	49	34	35	33	34	52	54	52	40	25	40	38	22	28	47.5
Belknap	Max	92	92	87	94	99	100	94	73	75	78	82	77	74	74	82	86	89	70	68	68	68	70	72	74	75	63	76	56	57	58	78.0
	Min	65	68	65	64	68	70	75	60	53	68	50	52	45	46	51	62	58	50	47	40	44	50	50	46	46	36	35	43	27	28	52.1
Belle Plaine	Max	90	91	87	90	96	98	87	76	79	79	88	74	73	70	83	64	68	70	68	70	80	74	82	70	64	70	82	48	51	61	74.7
	Min	65	66	68	59	65	69	70	58	49	54	46	53	42	43	50	58	55	47	45	41	41	53	48	58	40	34	39	40	32	23	49.4
Blockton	Max	90	91	93	93	97	95	90	74	75	76	82	75	73	78	84	71	60	69	70	75	78	72	79	70	66	70	66	72	75	62	77.4
	Min	65	64	64	67	69	68	55	55	57	56	45	57	42	50	57	44	54	40	42	40	39	52	53	44	42	44	32	42	36	28	50.1
Bonaparte	Max	94	96	91	87	103	102	100	74	75	75	82	80	74	74	81	88	77	71	69	71	78	79	78	75	64	65	80	74	51	62	68.0
	Min	65	68	67	63	73	73	74	57	52	58	49	58	46	45	51	60	56	55	49	41	45	54	53	57	45	36	39	40	32	26	52.8
Britt	Max	89	88	80	94	85	97	82	76	80	78	87	72	69	66	82	75	75	66	66	70	79	62	75	60	58	67	78	62	41	57	73.9
	Min	65	64	51	62	64	65	62	48	42	48	38	46	34	44	40	57	48	36	46	35	36	52	58	47	37	28	40	36	20	21	45.7
Burlington	Max	94	97	90	98	103	102	101	97	77	73	83	80	80	76	82	89	74	53	46	44	45	44	52	..	45	36	36	34	28	23	80.1
	Min	64	64	66	66	71	63	68	59	51	58	50	59	43	45	48	61	57	53	46	44	45	44	52	..	45	36	36	34	28	23	51.0
Carroll	Max	90	91	85	95	96	97	72	75	77	80	87	78	77	76	77	70	67	73	70	72	81	78	82	73	64	70	83	52	55	62	76.5
	Min	60	67	58	61	65	73	62	51	44	51	41	52	37	44	54	63	41	35	42	34	41	54	50	48	35	28	45	38	19	21	47.2
Cedar Falls	Max	90	94	86	93	99	95	75	72	87	85	85	77	77	65	79	83	82	82	74	73	80	82	66	66	61	68	75	60	52	61	77 5
	Min	60	59	58	39	59	68	63	57	47	50	45	53	42	42	52	62	60	45	45	52	48	44	50	42	42	30	47	33	34	19	48.2
Cedar Rap	Max	94	97	94	96	102	96	94	83	82	75	87	80	79	70	83	90	67	80	76	74	83	73	66	71	65	68	76	67	54	60	79.4
	Min	68	69	65	59	76	72	70	61	52	59	49	57	45	45	54	62	56	51	49	43	44	55	50	51	45	36	39	38	33	22	52.5
Charlton	Max	88	92	88	93	98	97	90	75	73	76	83	78	74	76	82	84	65	71	72	71	77	76	76	70	63	65	76	68	52	58	76.9
	Min	67	67	61	65	74	70	71	56	48	55	46	55	40	45	55	65	64	41	43	37	43	58	53	50	40	31	42	41	24	28	50.8
Charles City	Max	87	90	77	90	86	88	84	73	76	74	83	66	83	65	75	80	63	65	65	66	78	67	65	61	79	60	75	68	46	55	73.0
	Min	67	67	56	59	68	66	68	53	45	51	44	40	50	41	51	62	53	42	44	38	39	53	48	54	42	30	39	39	33	19	48.7
Clarinda	Max	93	95	96	97	101	99	89	79	76	82	89	83	80	82	86	77	66	76	75	74	84	80	86	80	72	75	83	68	60	66	81.3
	Min	64	64	63	69	68	66	58	55	48	57	43	54	43	56	56	56	47	37	38	37	38	55	51	46	41	31	40	39	26	30	49.2
Clinton	Max	90	93	86	92	98	92	92	77	79	77	80	78	71	40	49	52	56	54	45	43	39	49	50	47	43	33	29	39	28	19	75.5
	Min	66	63	66	56	69	66	66	56	46	57	47	56	45	80	84	79	65	72	71	73	81	75	72	75	..	..	..	..	..	63	49.1
College Sps	Max	90	91	93	93	97	96	90	75	76	78	84	80	77	47	57	58	58	52	41	41	38	41	56	54	39	38	42	42	56	24	80 4
	Min	67	64	65	68	70	68	68	54	53	56	49	57	47	57	58	58	52	41	41	38	41	56	54	39	38	42	42	56	24	32	51.8
Coon Rap	Max	89	90	84	92	95	96	87	70	73	77	83	78	55	41	48	59	58	49	40	45	38	48	59	52	53	43	33	47	39	23	75.3
	Min	66	70	62	66	73	74	59	55	48	54	48	54	48	77	73	78	83	78	62	69	69	68	79	76	80	78	65	68	80	75	53	62	77.4
Corning	Max	89	91	91	92	95	96	84	74	74	77	84	77	74	82	86	89	70	68	68	68	68	68	79	70	68	68	80	78	65	68	80	75	53	62	77.4
	Min	66	67	61	70	73	71	58	57	45	57	40	55	37	49	59	56	53	33	35	33	39	57	52	53	39	28	45	40	24	28	49.3
Co. Bluffs	Max	92	92	95	97	101	99	80	72	75	80	90	79	77	81	85	71	67	75	72	75	81	87	84	77	70	72	86	59	60	66	79 9
	Min	68	66	62	68	70	68	59	50	53	48	50	51	49	57	60	53	50	40	39	53	44	60	54	50	42	37	47	40	26	34	51.6
Cresco	Max	87	90	77	88	87	83	75	74	78	73	82	72	66	67	76	83	63	65	64	67	76	54	67	59	58	58	72	42	43	51	69.9
	Min	64	66	52	56	65	62	61	53	43	51	43	47	40	40	49	57	49	44	41	37	40	47	46	46	40	29	42	34	27	21	46.4
Davenp'rt	Max	90	92	86	92	99	94	93	76	76	73	80	77	72	71	80	85	62	57	56	48	49	48	53	52	53	44	39	43	36	34	74.9
	Min	70	72	67	59	76	70	69	62	53	61	51	57	49	46	51	62	57	56	48	49	48	53	52	53	44	39	43	36	28	28	53 8
Delaware	Max	88	92	82	92	95	90	84	72	77	74	82	74	69	65	79	89	69	69	65	66	80	67	66	61	57	57	72	63	46	54	73.2
	Min	67	68	58	57	72	64	67	57	49	57	45	53	42	59	51	60	54	47	41	42	42	49	46	50	40	33	37	37	33	16	49.2
Decorah	Max	88	90	78	88	87	88	83	73	80	73	83	75	61	69	76	84	63	67	65	66	77	67	72	62	57	58	70	65	44	43	71.7
	Min	61	60	56	56	58	63	61	54	45	45	45	51	39	40	49	60	52	46	42	39	41	49	46	53	42	29	36	34	28	18	47.1
Denison	Max	90	91	86	94	96	98	69	74	77	79	88	77	79	76	84	69	67	73	71	71	80	80	81	81	67	69	83	55	52	62	77.3
	Min	64	69	60	70	66	70	59	52	53	43	40	53	37	48	60	57	47	31	41	31	38	56	51	49	41	27	45	35	18	20	48 0
Des Moines	Max	89	93	85	94	99	99	82	73	75	79	85	78	72	49	49	58	58	54	43	46	40	44	55	52	50	42	35	43	37	28	75 9
	Min	70	69	65	66	80	74	59	59	51	58	47	59	49	72	78	84	82	64	69	70	70	78	76	78	72	61	62	78	65	48	58	76 9
De Soto	Max	92	95	87	95	100	99	82	73	80	78	84	77	50	39	48	59	59	52	38	47	36	42	58	54	47	44	29	42	38	28	22	50.2
	Min	67	68	65	68	78	72	60	58	47	50	43	50	43	72	78	82	82	82	69	69	70	78	72	79	78	65	61	73	72	52	62	77.0
Diagonal	Max	91	91	89	93	96	96	87	73	76	75	82	76	72	39	47	55	60	53	38	39	37	36	55	51	52	40	30	40	40	24	29	49.0
	Min	65	62	61	63	68	66	66	54	48	55	43	54	39	47	55	60	53	38	39	70	70	80	61	72	66	60	64	78	77	48	58	75 9
Dows	Max	89	91	84	93	92	98	88	75	78	78	86	82	84	65	80	78	65	69	70	80	61	72	66	60	64	40	37	40	37	19	21	43 3
	Min	51	55	52	52	52	50	48	37	43	49	40	40	38	46	52	57	47	38	43	34	42	54	48	48	37	27	40	70	63	44	53	72.6
Dubuque	Max	89	93	82	90	96	90	86	73	76	72	82	73	68	67	77	82	65	69	65	65	79	58	68	60	57	60	37	39	40	32	24	52.2
	Min	67	72	65	58	74	64	66	59	54	60	51	57	47	44	53	63	51	52	46	46	45	49	48	53	46	37	39	40	28	60	79.7
Eldon	Max	94	97	97	98	103	104	98	72	79	75	85	81	80	76	84	87	75	73	70	71	79	72	76	76	64	66	78	69	53	60	79.7
	Min	63	67	64	64	71	70	67	57	51	58	47	59	46	43	52	61	56	53	44	39	39	56	54	55	43	33	36	44	25	22	51.3
Elkader	Max	95	96	86	93	100	93	78	72	82	71	86	78	74	75	81	90	61	73	70	69	83	57	71	64	62	65	75	44	51	60	71.8
	Min	68	65	56	57	71	66	64	57	46	49	43	49	36	35	53	65	55	49	39	40	36	50	48	53	39	29	32	38	28	17	47.8
Ft. Madis'n	Max	98	90	89	96	96	97	92	70	78	78	89	75	72	68	68	71	81	64	63	67	65	70	61	63	69	69	59	67	68	47	50	70.0
	Min	80	71	65	76	76	74	97	83	76	80	78	89	80	72	67	79	72	78	67	67	69	80	66	48	51	37	35	40	35	22	26	48.2
Forest City	Max	90	86	84	94	84	97	65	65	51	50	50	42	51	41	43	43	59	48	41	45	40	40	80	79	83	79	65	71	85	61	53	63	78.3
	Min	66	70	54	68	69	93	98	77	76	78	79	90	76	74	87	85	75	79	71	66	72	34	42	55	50	46	35	30	45	36	20	30	55.1
Galva	Max	91	89	87	95	93	66	69	60	49	44	51	43	50	38	49	57	56	45	35	46	34	72	82	80	83	78	79	72	86	77	55	65	80.5
	Min	61	69	76	67	66	69	60	49	44	51	43	50	38	49	57	56	45	35	74	71	72	82	80	83	78	79	72	86	77	55	65	80.5
Glenwood	Max	91	95	92	95	100	98	89	76	73	80	89	81	76	80	85	76	65	74	71	72	35	40	59	50	57	40	31	51	43	22	33	51.5
	Min	67	68	62	74	75	75	61	54	48	57	47	55	43	55	60	58	49	35	43	68	71	84	73	68	62	60	67	79	71	49	59	75.8
Greene	Max	91	93	84	94	93	95	87	75	80	78	87	75	72	67	71	82	65	69	68	71	84	73	68	62	60	67	79	71	49	59	75.8
	Min	67	67	54	58	69	67	62	53	46	50	44	48	38	51	61	52	39	40	37	42	52	49	52	39	29	38	35	32	19	47 6
Greenfield	Max	91	91	86	92	97	96	84	76	76	73	75	84	78	75	76	83	78	65	70	70	71	79	77	80	75	65	67	79	55	53	63	77.7
	Min	66	67	62	67	74	71	63	54	52	48	45	52	53	70	72	82	84	61	68	66	67	80	68	70	69	59	64	83	68	48	60	75.3
Grin'l (nr)	Max	89	93	83	94	98	98	86	72	75	74	84	75	70	72	82	84	61	68	66	67	80	68	70	69	59	64	83	68	48	60	75.3
	Min	66	66	61	60	74	66	69	56	50	55	45	45	44	44	52	62	53	44	45	40	40	56	50	50	39	35	45	41	24	25	50.3
Grundy C'r	Max	89	93	81	92	99	97	83	70	76	75	85	75	70	60	79	84	62	69	66	69	80	68	68	64	57	63	75	54	47	57	73.1
	Min	65	64	58	58	67	65	60	55	43	48	43	50	40	39	48	57	51	41	40	39	41	50	48	48	40	29	36	33	27	20	46.6
Guthrie C'r	Max	98	..	..	..	..	98	87	71	76	77	84	81	74	74	87	77	62	79	71	73	79	76	79	73	64	67	78	74	52	60	72.0
	Min	71	..	..	..	..	71	63	56	45	54	44	50	38	46	52	53	49	35	43	34	41	59	52	49	39	29	45	41	22	19	43.6
Hampton	Max	92	92	86	95	94	100	73	76	82	82	90	77	77	59	82	84	66	71	73	74	86	63	70	65	62	70	78	48	51	60	75.9
	Min	63	64	56	60	68	65	63	54	48	51	49	51	41	42	51	51	53	42	45	40	47	50	48	47	40	33	43	36	24	24	48.3
Harlan	Max	90	92	87	93	96	96	87	72	79	78	85	78	74	76	83	75	65	71	68	73	80	77	81	75	65	71	82	72	52	62	77.8
	Min	63	64	56	60	68	65	63	54	48	51	49	51	41	42	51	51	53	42	45	40	47	50	48	53	53	40	29	39	38	20	27	48 2
Hopeville	Max	90	91	87	93	97	97	87	73	73	75	83	77	73	78	82	80	58	69	70	72	81	74	79	75	64	65	79	68	54	59	76.5
	Min	64	63	61	69	65	65	54	55	46	53	41	53	40	51	58	56	49	34	42	34	36	70	74	79	75	64	65	79	68	54	59	76.5
Humboldt	Max	90	91	87	93	97	97	87	73	74	77	83	77	73	78	82	80	58	69	70	70	70	74	79	75	64	65	79	68	54	59	76.3
	Min	68	67	63	68	74	70	73	55	54	57	50	55	45	50	59	59	53	43	45	42	47	57	53	49	42	37	42	40	27	89	52.4
In'pend'ce	Max	90	90	83	94	92	97	93	75	78	79	88	78	71	70	81	72	69	68	66	68	80	66	72	62	64	79	76	49	59	76.3
	Min	66	60	54	66	66	67	57	49	46	53	44	50	37	48	51	60	45	37	46	36	44	56	51	50	38	30	43	58	21	25	47.8
Indianola	Max	89	92	84	92	96	91	76	71	80	71	82	75	69	62	77	85	69	71	67	68	82	63	64	62	60	62	74	67	47	54	73.4
	Min	66	64	56	57	72	66	65	55	48	49	47	52	40	39	50	57	53	43	46	43	39	38	52	47	52	41	33	34	36	32	18	48.2
Iowa City	Max	89	92	87	94	99	98	87	76	75	76	85	78	75	92	..	82	61	73	71	71	90	76	76	71	63	65	78	73	51	58	77.7
	Min	66	64	56	57	72	66	65	55	48	49	47	52	40	39	50	57	53	46	43	39	38	52	47	52	41	33	34	36	32	18	48.2
Indianola	Max	89	92	87	94	99	98	87	76	75	76	85	78	75	92	..	82	61	73	71	71	90	76	76	71	63	65	78	73	51	58	77.7
	Min	66	64	56	57	72	66	65	55	48	49	47	52	40	39	50	57	53	43	46	43	39	38	52	47	52	41	33	34	36	32	18	48.2
Iowa City	Max	89	92	87	94	99	98	87	76	75	76	85	78	75	92	..	47	49	52	41	44	40	43	59	52	50	40	34	43	41	23	28	50.9
	Min	69	68	63	65	75	71	66	56	52	56	48	56	44	..	47	49	52	41	44	40	43	59	52	50	40	34	43	41	23	28	50.9
Iowa Falls	Max	93	94	89	96	101	97	92	78	78	75	82	77	73	73	82	87	60	62	70	69	79	72	67	75	61	63	76	51	51	59	72.7
	Min	66	64	64	58	73	69	70	57	50	58	48	55	43	57	61	80	80	65	68	68	68	80	65	69	65	59	62	76	60	47	57	74.0
Keokuk	Max	89	92	85	94	95

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Lansing....	Max.....	87	93	83	91	90	85	81	75	78	72	83	76	70	71	77	86	69	69	66	65	78	70	69	61	65	62	72	70	48	56	73.0
	Min.....	69	67	55	57	70	63	67	59	46	50	45	48	40	40	57	66	55	47	44	47	38	50	47	53	53	32	34	40	35	22	49.9
Le Mars....	Max.....	88	82	83	94	89	96	86	78	78	78	89	78	72	75	80	75	67	68	67	69	79	80	82	68	68	78	83	63	52	64	77.0
	Min.....	66	68	55	70	64	70	57	46	42	52	43	49	37	50	57	55	40	34	33	34	41	53	50	50	29	49	49	43	25	29	48.0
Lenox.....	Max.....	87	90	89	91	95	95	86	72	73	76	81	76	71	71	81	77	60	69	69	68	72	74	78	65	65	65	78	74	52	60	75 3
	Min.....	69	67	62	70	73	72	65	55	53	58	47	57	45	51	58	60	53	40	42	42	44	57	52	55	40	35	44	40	25	28	52.0
Logan.....	Max.....	92	90	93	94	95	97	80	75	79	76	84	76	72	79	83	76	73	70	70	78	80	79	81	80	78	78	80	68	66	58	79 3
	Min.....	60	64	65	67	65	70	61	58	46	53	43	50	41	53	58	53	46	33	32	32	35	57	50	51	50	48	52	20	19	29	48 7
Maquoketa	Max	88	92	89	90	96	92	89	76	77	77	79	76	69	66	68	90	86	72	67	68	79	71	68	70	62	63	61	64	50	54	75.0
	Min.....	66	63	63	56	61	63	71	59	47	56	47	56	41	36	42	53	47	53	44	43	37	52	49	46	41	34	30	39	35	17	48.2
Marsh'lt'n.	Max.....	92	95	87	95	100	100	87	76	80	77	87	79	74	71	84	84	64	74	72	71	81	72	70	71	63	65	77	71	51	52	77.4
	Min.....	68	68	61	62	77	69	67	57	46	53	45	52	41	43	52	63	54	42	45	38	42	55	51	49	40	32	40	43	26	22	50 1
Mason City	Max.....	..	94	94	94	88	97	86	75	80	90	..	86	.	69	77	76	65	67.	68	67	67	80	67	62	59	62	76	69	47	54	74.7
	Min.....	..	60	52	58	63	64	64	48	40	40	..	35	..	42	47	56	51	36	40	45	55	58	47	48	37	28	40	36	27	15	45 6
Monticello.	Max.....	94	93	92	85	98	92	76	75	79	87	83	76	71	61	80	88	79	72	73	71	70	80	67	62	70	65	72	62	48	55	72.6
	Min.....	60	61	56	76	75	60	58	52	45	43	41	42	37	38	50	51	48	47	39	38	36	46	47	46	47	32	33	34	34	16	45.6
Mooar	Max.....	94	92	92	94	99	100	97	73	77	69	80	78	72	77	84	86	62	70	74	70	74	70	77	76	70	63	72	60	52	61	77.2
	Min.....	59	65	70	63	64	65	68	63	55	58	50	55	46	44	49	60	58	55	60	50	52	51	53	55	42	35	44	35	28	25	52 7
Mt. Ayr....	Max.....	91	92	90	93	98	97	88	72	75	76	83	76	78	77	84	79	61	69	69	71	78	73	80	77	65	65	78	68	52	61	77.3
	Min.....	66	64	64	68	71	70	68	56	54	56	50	58	46	50	56	61	53	43	45	44	43	55	52	53	41	37	52	41	24	29	52.3
Mt. Ple's'nt	Max.....	94	94	96	96	100	101	94	77	78	78	80	84	77	75	80	88	80	80	79	70	77	71	71	77	65	61	76	63	50	56	78.9
	Min.....	64	65	64	69	70	68	68	55	48	54	50	50	45	41	47	58	54	53	45	38	40	51	50	54	52	34	36	41	25	44	51.1
Mt. Vernon	Max.....	90	93	90	93	100	95	89	82	80	77	83	78	76	78	78	86	61	74	74	67	82	71	67	67	60	68	72	58	51	62	76 7
	Min.....	67	65	62	57	74	69	73	58	50	57	49	55	44	46	50	57	53	50	47	43	45	53	49	53	43	35	38	33	34	27	51 2
NewH'pton	Max.....	85	89	76	89	86	86	82	77	75	72	81	72	65	65	76	83	63	65	64	65	78	68	68	58	58	58	74	64	44	53	71.3
	Min.....	66	70	55	57	72	74	62	62	57	61	54	59	54	52	51	61	52	44	51	47	48	49	47	51	48	47	36	34	32	22	52.5
Newton....	Max.....	89	93	82	93	99	98	85	74	76	75	83	76	72	71	81	83	60	70	68	69	78	72	71	70	61	62	75	67	49	57	75.3
	Min.....	67	66	62	63	75	70	65	56	50	55	47	54	44	46	54	63	54	43	44	39	44	56	51	48	39	34	39	39	22	25	50 5
Northwood	Max.....	88	85	78	92	83	90	78	74	81	76	85	71	67	68	77	76	64	64	65	67	78	64	70	68	57	74	70	60	58	56	72.8
	Min.....	63	66	53	58	64	62	62	50	44	45	46	49	40	38	49	56	48	41	42	40	42	49	47	46	38	34	31	29	30	20	48.1
Odebolt	Max.....	93	94	89	96	95	99	90	77	79	80	90	87	78	80	83	82	70	74	70	70	83	81	81	75	65	74	83	73	55	63	80.3
	Min.....	64	69	60	66	65	73	60	48	44	52	41	50	39	48	47	55	45	33	43	32	48	55	50	44	35	27	46	38	20	27	47.5
Ogden.....	Max.....	90	92	84	93	97	97	75	75	77	79	85	77	73	72	83	87	63	72	69	72	81	75	78	73	62	66	80	55	52	58	76 4
	Min.....	67	66	66	65	68	71	69	55	51	53	44	52	43	47	54	63	48	36	43	36	41	56	51	50	37	32	42	41	22	25	49.8
Olin.....	Max.....	89	89	84	90	96	91	89	76	77	76	80	75	70	69	78	85	61	69	66	77	78	65	67	58	60	58	71	52	47	54	73.3
	Min.....	63	63	63	57	65	68	69	57	48	55	44	53	41	40	50	53	55	51	55	43	38	50	50	52	43	33	32	44	35	17	49.6
Onawa.....	Max.....	92	89	90	97	98	102	90	79	78	83	94	86	76	82	81	80	73	72	70	72	84	84	85	74	70	73	84	59	57	67	81.0
	Min.....	66	69	62	73	68	72	60	53	48	55	46	54	44	56	63	58	45	36	44	36	42	62	53	58	38	33	48	39	23	29	51.1
Omaha.....	Max.....	89	90	91	96	99	98	81	71	74	78	89	76	74	78	81	72	65	71	67	69	81	81	83	76	66	70	84	56	54	64	77.5
	Min.....	72	71	66	74	74	75	58	58	52	60	54	58	52	59	63	57	49	44	46	45	50	60	55	54	46	42	50	42	33	38	55.2
Osage.....	Max.....	85	85	77	89	84	85	81	74	75	73	82	72	65	66	73	78	62	65	63	66	76	63	64	60	57	59	72	63	44	52	73.7
	Min.....	64	66	52	57	65	63	64	50	45	48	45	48	37	41	48	58	50	40	42	37	43	49	46	49	39	30	37	35	31	20	46 6
Oskaloosa..	Max.....	92	93	85	94	99	99	88	76	76	74	82	78	74	75	82	85	60	70	69	70	78	72	71	74	61	63	75	62	50	59	76 2
	Min.....	64	66	61	64	77	73	65	58	48	56	44	56	44	47	56	59	55	47	44	39	42	55	51	47	40	32	40	39	23	25	50.6
Ottumwa...	Max.....	91	95	89	96	102	102	93	74	73	74	84	78	74	74	82	86	68	69	75	75	79	72	73	75	61	62	76	70	66	64	78.4
	Min.....	66	69	65	64	77	71	59	58	53	58	50	50	45	47	55	69	56	54	49	44	47	55	53	50	43	35	42	45	26	28	52 7
Ovid	Max.....	90	94	93	94	100	98	96	75	75	74	84	84	79	77	83	86	57	76	74	75	80	72	79	76	67	70	77	56	58	61	78 7
	Min.....	66	67	62	63	72	70	68	56	49	55	47	53	41	46	55	63	52	42	42	39	44	57	54	60	39	34	41	36	23	26	50 7
Pacific Jct.	Max	88	92	90	93	97	96	76	71	79	73	87	78	74	80	83	73	65	71	68	68	82	79	81	78	69	70	84	58	56	61	77.3
	Min.....	67	67	64	72	73	73	67	61	57	46	41	54	45	54	61	68	49	34	43	33	34	61	52	56	36	29	45	43	20	30	51.2
Pella.....	Max.....	83	88	82	88	91	90	67	76	80	88	77	74	65	70	74	74	70	66	70	74	68	66	64	70	52	55	67	70	50	53	72.1
	Min.....	65	64	61	62	76	69	57	50	52	52	50	60	43	44	46	50	48	46	50	47	40	44	40	48	42	36	46	40	25	25	49 3
Plover.....	Max.....	93	88	82	97	92	99	78	76	78	87	78	78	73	72	80	73	68	72	73	75	82	65	82	60	65	72	82	84	44	55	80.8
	Min.....	64	65	54	65	67	65	60	48	42	48	41	42	37	45	55	48	46	40	45	44	38	55	50	48	40	50	40	39	19	25	46.8
Primghar..	Max.....	88	87	82	94	88	98	56	86	80	93	84	75	69	74	75	78	72	61	75	84	78	68	60	60	68	56	50	57	50	52	73 3
	Min.....	68	70	52	68	64	65	46	43	50	45	48	45	50	52	53	56	52	47	38	43	60	45	32	46	35	24	37	39	17	30	47 7
Red Oak...	Max.....	92	94	95	95	100	98	85	78	80	81	83	85	78	80	83	79	71	78	80	80	83	81	83	85	73	74	83	64	62	64	81.9
	Min.....	68	68	65	74	76	74	58	59	58	52	47	56	44	55	58	60	40	37	40	38	40	58	56	51	43	34	54	40	26	33	52.1
Ridgeway..	Max.....	84	84	75	90	87	84	80	76	75	75	81	74	65	65	75	82	66	66	64	65	76	69	64	62	57	57	71	65	49	52	71.2
	Min.....	65	69	57	57	71	62	74	56	51	55	50	53	46	42	50	62	53	47	45	43	45	52	47	52	42	35	39	37	31	26	50.5
Rockwell C	Max.....	91	92	86	94	92	97	74	75	79	79	83	75	72	71	83	75	65	70	70	73	80	77	80	75	62	66	80	51	50	60	75.9
	Min.....	65	66	62	65	66	68	62	50	47	52	47	50	40	46	53	57	47	38	46	37	44	53	50	45	36	32	37	40	20	22	48.1
Ruthven...	Max.....	78	74	87	83	93	97	73	97	79	80	89	90	70	69	80	81	82	65	68	65	67	71	80	70	75	76	75	82	49	53	76.6
	Min.....	60	50	62	71	85	86	60	48	50	53	45	43	53	45	52	53	55	50	41	51	41	26	50	40	37	33	39	28	17	25	48.3
Sac City....	Max.....	91	89	85	94	92	98	74	76	78	80	88	76	72	74	82	75	67	71	68	72	81	76	81	70	64	70	82	68	51	60	76.8
	Min.....	66	70	58	64	63	72	60	50	46	54	46	50	38	48	55	56	46	32	47	36	43	56	49	50	39	32	41	38	21	26	48.4
Scranton ..	Max.....	89	90	83	93	94	97	87	70	75	77	85	74	69	74	82	75	61	69	66	72	79	74	79	73	60	64	80	72	48	58	73.6
	Min.....	67	68	61	65	71	72	60	54	50	54	47	54	42	48	56	58	48	40	46	49	49	56	52	51	40	36	44	40	24	26	50.9
Sheldon....	Max.....	86	76	70	93	75	98	71	77	82	79	90	77	73	66	74	70	65	66	67	71	72	74	82	64	65	..	85	68	52	62	74.1
	Min.....	65	65	49	65	62	63	51	42	40	50	38	46	34	50	56	50	31	32	44	30	35	50	50	45	31	..	40	32	15	25	44.3
Sibley.....	Max.....	90	80	82	94	79	99	72	79	82	80	91	76	75	64	85	64	71	68	66	70	82	75	82	67	68	73	83	49	55	62	75.4
	Min.....	62	69	56	56	59	62	54	42	40	50	37	47	36	46	52	54	33	34	44	31	34	47	49	47	33	28	37	34	15	21	43.6
Sigourney..	Max.....	95	96	91	98	102	103	95	78	81	72	84	79	76	75	84	89	71	75	72	71	80	76	72	74	62	65	77	68	50	61	72.4
	Min.....	63	63	61	59	73	68	72	55	48	62	45	55	41	39	48	59	54	50	44	38	40	50	50	55	46	33	38	40	21	21	49.5
Sioux City..	Max.....	90	82	87	95	92	99	66	77	75	79	92	75	74	78	83	63	69	67	64	70	82	78	83	71	68	70	84	51	53	64	76.0
	Min.....	62	69	59	61	68	69	62	50	48	49	49	64	43	45	58	56	42	37	40	33	42	49	54	55	39	32	50	38	25	36	49.3
Sioux C'ntr	Max.....	87	82	82	92	87	96	82	75	77	77	89	84	72	68	81	78	68	63	63	68	79	74	78	72	67	68	80	61	49	59	75.3
	Min.....	66	60	55	68	62	62	59	50	54	50	50	52	45	52	58	57	39	44	45	40	45	52	51	45	38	40	45	35	22	29	49.0
Spirit Lake	Max.....	91	89	87	91	80	98	78	76	82	79	91	73	78	68	85	70	73	72	69	68	73	75	80	68	63	72	82	54	50	64	76.0
	Min.....	64	67	54	63	64	63	60	48	49	55	46	49	41	49	53	42	48	48	49	46	48	49	50	51	39	34	43	33	21	27	48.4
Storm Lake	Max.....	88	86	88	92	91	94	84	72	71	79	89	76	72	70	80	73	66	70	66	68	69	79	81	68	53	68	80	63	50	58	74.8
	Min.....	66	67	58	67	66	72	60	48	57	56	49	50	40	49	55	56	46	40	47	48	39	48	49	50	40	38	48	37	22	29	49.9
Stuart	Max.....	92	92	91	96	96	85	72	76	80	82	83	82	80	75	78	82	81	80	78	82	84	75	80	78	62	64	80	76	50	60	79.1
	Min.....	68	68	66	75	70	50	55	50	56	54	49	53	50	45	43	45	43	42	43	42	42	57	52	47	40	36	44	37	24	26	49.1
Tara	Max.....	97	96	94	95	96	100	80	77	85	87	90	85	80	85	85	80	75	70	71	72	82	78	70	65	65	69	82	55	55	60	80.0
	Min.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Thurman..	Max.....	83	91	90	94	96	96	89	73	74	78	85	77	75	79	84	73	64	71	69	69	79	78	80	77	67	68	84	74	54	64	77.8
	Min.....	65	68	61	74	76	74	56	55	48	58	44	56	45	55	63	60	50	36	44	35	35	60	48	58	40	31	50	44	23	31	51.4
Toledo.....	Max.....	93	94	87	94	103	100	90	79	83	71	87	82	78	68	83	81	61	77	75	77	83	86	69	72	64	72	77	55	55	60	79.5
	Min.....	66	68	59	60	74	72	71	56	45	53	44	50	40	41	53	63	54	44	42	36	45	56	50	60	40	30	31	43	30	17	49.8
Villisca....	Max.....	93	94	95	95	100	99	85	74	75	75	85	80	75	80	81	75	73	70	70	73	75	77	80	77	70	70	65	65	55	60	78.0
	Min.....	62	62	64	68	70	68	69	55	48	54	43	50	42	51	53	50	53	37	35	37	35	42	53	62	40	30	42	28	25	28	48.5
Wapello ...	Max.....	89	95	94	92	100	97	94	78	75	73	78	71	69	71	78	84	74	66	66	66	73	66	64	70	61	53	70	67	49	49	74 4
	Min.....	68	70	67	61	76	72	72	64	52	60	49	51	46	45	49	62	58	56	49	47	44	54	52	55	46	36	40	45	33	23	53.4
Washingt'n	Max.....	92	94	88	95	101	100	93	75	77	73	82	78	73	74	87	76	60	70	70	70	79	71	67	75	63	62	74	58	57	58	73.1
	Min.....	64	61	62	58	72	69	65	56	49	57	47	53	42	40	48	58	52	50	44	41	40	52	50	51	41	33	38	38	27	24	49.6
Waterloo...	Max.....	91	95	83	83	97	93	80	72	80	72	85	77	72	63	80	86	66	72	69	71	83	71	62	61	60	63	76	67	49	57	74 6
	Min.....	65	66	55	58	69	67	62	56	46	50	46	50	40	40	50	60	53	45	45	39	41	53	48	54	41	32	36	37	33	19	48.5
Waverly...	Max.....	87	91	80	91	91	89	84	72	76	73	83	73	68	61	77	82	63	68	67	68	80	66	66	62	59	61	74	67	47	56	72.7
	Min.....	68	69	56	59	69	69	65	57	49	52	46	52	42	42	54	61	54	46	47	41	42	53	49	52	44	32	40	37	35	22	48 6
West Br'ch	Max.....	90	89	90	92	98	92	89	75	80	76	78	64	60	70	74	85	86	80	76	73	84	65	70	73	72	64	65	60	58	55	76.1
	Min.....	62	60	61	64	63	66	69	48	52	54	46	44	40	42	50	60	48	56	50	46	42	50	38	40	38	32	32	24	22	17	47.2
Wilton Jc..	Max.....	90	93	86	92	98	95	92	77	77	78	79	75	70	75	78	87	79	71	76	72	77	68	69	73	63	58	72	63	55	53	76.4
	Min.....	64	67	64	57	72	69	60	57	47	48	46	53	46	41	50	55	55	54	46	40	51	53	51	51	47	34	35	42	34	18	50.2
Winterset .	Max.....	92	94	87	95	100	91	85	75	78	77	85	77	73	74	82	81	61	71	71	72	78	76	78	70	75	65	77	52	51	59	74.7
	Min.....	66	65	61	68	74	72	68	55	50	53	45	53	43	48	58	65	54	41	44	48	43	56	52	51	40	34	44	42	24	27	51.2
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DAILY AND MONTHLY PRECIPITATION FOR SEPTEMBER, 1899.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total.
Afton								.50									T					T								.50
Algona							T							.40		T						.27		.25							.92
Alta (Hadden)	T						10							.05	T	.02								T							.17
Alta (near)			.04				.15							.03																	.22
Albia							T	.44									.50							.15							1.09
Amana								.26		T				T			.21					.15									.62
Ames							.50							T		T					.15			.24							.89
Atlantic							.56																								.56
Audubon							.60																								.60
Bancroft				T	01		.01			.01				.01	.04	T						1.00		.01							1.09
Batavia								.36									.45							.20							1.01
Baxter							T	.18									T					.02		.16							.36
Bedford								.74								T	T					.02									.76
Belknap								.80		.05							.33	.18				T			.20							1.59
Belle Plaine								.10		.10				T			.15					.15		T							.50
Blockton																	T														T
Bonaparte								.53									.58														1.11
Britt										T				.03	.42	.14						1.20									1.94
Burlington	.09					.02	.04										.43	.10				.58						.02			2.37
Bussey							.46	.71	.07													.12		.15							.83
Carroll							.23									.33						T		.04							.87
Carson							.83							T		T					T										
Cedar Falls																															.58
Cedar Rapids							.38								T	.20															.37
Centerville							.08			.04				03		.15					T	.07	T	T							
Chariton																															.81
Chillicothe							.25						T	T	.04	.23						.25									1.40
Clarinda								70								.45						T	T	T							1.45
Clarion													T	.11	T	T					.62	T	T	T							.87
Clarksville										.26						.05						.09									.76
Clear Lake														T		T	.14	.41				.11		T							
College Springs																															.78
Coon Rapids							.75									T	.03					T	T	.07							.72
Corning							.45	.20														.05									.59
Council Bluffs							.44										.10					.10									.77
Cresco						T	52									.08						.60		.18							1.54
Cumberland	.13				.16		.06	.04		.04				.03	.29	.01						T									1.17
Danville							1.00	17								T						.38									1.46
Davenport							.15	.35		T							.58					.10	T	T							.82
Decorah							.08	.12		.02				T	T		.39	.11													1.80
Delaware	.60						.30					.10				.25					.55										1.11
Denison								.10		.10						.13						.72		.06							.45
Des Moines							.45							T			T					T	T	75							1.17
De Soto							.04	.38						T		T								.22							.71
Diagonal							.49															.10									.50
Dows								.40														1.20		.09							2.09
Dubuque							.39	.10		05				.25	.02	.04						.33	.01	.12	T						.99
Eagle Grove					.01	.01	T	.08		.15				T			.28					.12		.03	.01						1.25
Eldon								.55		.05							.47														
Eldora																						.56		.05							.91
Elkader							.20			.08				.02																	.05
Emerson							T									.05					T										.67
Emmetsburg					.25		.05							.13								.05		.19							0
Estherville																															
Fairfield																															0
Fayette																															
Fonda																						.62		.02							1 67
Forest City					.12		.02	T		.08				.05	.67	.09															3.72
Ft. Madison						.01	.70	1.73		.08						.25	.49					.41		T				.05			.10
Galva							.02	.02						.06	T	T				T											.55
Gladbrook								T						T							.25										.62
Glenwood				.30																											.28
Gilman						20	T	.42					T									.12		.06							
Grand Meadow								.10			T					T						.63		.16							1.21
Greene	T						24			.12				.06								.47									1.28
Greenfield								.40	.04	.29				T	T	T															.51
Grinnell	.08			T			.18	.33	T							T															.21
Grinnell (near)								.09						T		.04						.03		.05							.25
Griswold			T					07						T		T	.07					.03		.08							.52
Grundy Center			T				T	52																							.78
Guthrie Center	.02						.35							.07		T	T					.34		T							.57
Hamburg							.11	.38																08							
Hampton																															1.74
Harlan														.09		.02						1.09		.02							.84
Hawkeye	T						.52									.03	T	T													1.27
Hedrick			T				.46	.35						T		T					81									
Hopeville								.35		.11				T		T															.59
Humboldt																.09						.05									
Independence								45																.26							1 22
Indianola							.53	03						.17	.18	.05															.61
Iowa City								T	.02		T				T		T	.02	T				T	.20	T						2.12
Iowa Falls								1.90									T	T				.21		T							.93
Keokuk						T	.36										.36	T													2.25
Keosauqua				T			.57	.07		.08				.20		T						1.24		.09							4.32
Knoxville							1.10	1.78		.18							.46	.20				.44		.10	04			02			1.35
Lacona							T	.41		.09							.68	.03				.14									.58
Lamoni								.12						T			.18					.08		.20							.70
Lansing								.22									.18							.30							.73
Larchwood								.50		T								.12				.11									1.57
Larrabee					.20		T								T	T						.87		.50							
Le Claire								.13		.02												.14			T						.89
Le Mars							.15							.60		.10															.85
Lenox							.15	.79									T					T									.94
Lockridge																															.42
Logan							.42										T							T							1.10
Maquoketa					.06	.04		.09		.06								.39	.07			.39	.07								.78
Marshalltown	T						.02	.20		03							.01					.42		10							1.40
Mason City								50						T	.40							.50		T							1.37
Melrose								.71						.45								.21									3.04
Mooar							1.00	1 54		T								T				.50		T							.56
Monticello					.08	T	T	.03		T							T					.45				T					1.06
Mt. Ayr								.90						T		T		.11				.05	T	T							1.55
Mt. Pleasant							.60			.03								.17	.35			.40		T							.86
Mt. Vernon (Hubbard)																	.58														.80
Mt. Vernon								23		.01				.01			.08	.39				.08									
Murray																															
New Hampton																															.50
Newton			.01					.10						.01			.02	.04				.09		.13							

DAILY AND MONTHLY PRECIPITATION FOR SEPTEMBER, 1899—CONTINUED.

STATIONS.	DATE.																													Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Northwood										.06					.72							.25									
Northboro							.30																								
Odebolt							.30	.06						T		.12		T	.05												
Ogden	.02						.50	.25						T																	
Olin						T	.30									.40								.40							
Omaha (Neb.)							.35	T					T	.05		T						.20									
Onawa							.30	.10								.30						.21									
Osage	.20				.15		.14			.11				.05	.61	T															
Osceola								.60									.14					.21		.05	.03						
Oskaloosa							.02	.18								.25						T		.27							
Ottumwa							.55									.45	.07					.16		.11							
Ovid							.38									.02	.30					.02		.21							
Pacific Junction							.42									.45						T		.02							
Pella																	.15														
Plover							.12							.12									.15	.14							
Primghar																								.20							
Red Oak							.65									.05					.05										
Ridgeway	.30		.01	.06	.11		.07	.05		.09				.04	.26	.05						.43		.20	.01		.06		.01		
Rockwell City							.20							.15	.21	.05		T						.04							
Ruthven														.30								.10			.30						
Sac City							.20	.06						.08	.07	.03						.09									
Scranton							.47																								
Sheldon		T			T		.01							T	T	.04		T	.01												
Sibley					T		.05							T		.06															
Sigourney							T	.41						T		T	.07	T				.04		.05							
Sioux Center		T			.07	T	.02						T	T		.05		T	T					T							
Sioux City							.24							T		.02															
Spencer														T																	
Spirit Lake														T	T	T															
Storm Lake		T					.12	.03						.06	.01	.01		T	T					.20							
Stuart																								.09							
Tara																															
Thurman							.56	.15														.25		.50							
Toledo								.10							.60							T					T				
Villisca							.47									.05						.30									
Vinton														T		.10					T										
Wapello							.07	.11	T	T							.03	.02				.03		T							
Washington								.20									.07														
Washta							.10							.05	T							.20									
Waterloo					.01		.10	.17		.06				.01		.05	.05					.50		.02							
Waverly	.04						.20	.07		.06				.02		.07						.42		.03							
Webster City					T		.07																								
West Bend														.10	.12	.04						.06		.15							
West Branch					T	.10	T	.20									.02														
West Union																T						.01		T							
What Cheer				T			T	.24		.20				T								.24		T							
Whitten							.10									T	.01														
Wilton Junction								.50								T	T					.20		.35							
Winterset							.37																								
Woodbine																															

Vol. X. OCTOBER, 1899. No. 10.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

STAR ENG. CO

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Central Station, Des Moines, Iowa.

J. R. SAGE,
DIRECTOR.

GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. B. CONAWAY, STATE PRINTER
1899.

THE IOWA WEATHER AND CROP SERVICE

Was established by act of the Twenty-third General Assembly, and placed under supervision of the Board of Directors of the State Agricultural Society, constituted as follows:

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METEOROLOGICAL STATIONS AND OBSERVERS.

From the following, weekly and monthly reports of Meteorological data are received by the Iowa Weather and Crop Service.

Afton.....Hon. N. W. Rowell.
Albia.....R. Moore.
Algona.....C. D. Pettibone.
Alta.....D. E. Hadden.
Alta (Near).....W. J. Minard.
Amana.....Conrad Schadt.
Ames.....Exp. Station.
Ames (6 miles s. e.).....Isaac Young.
Atlantic.....J. W. Love
Audubon.....F. P. Hocker.
Bancroft.....E G. Bailey.
Batavia.....Agent C. B. & Q. Ry.
Baxter.....Agent C. G. W. Ry.
Bedford.....Prof. E. H. Griffin.
Belknap.....A. W. Rankin.
Belle Plaine.....S. P. Vandike.
Blockton.....Agent C. G. W. Ry.
Bonaparte.....Hon. B. R. Vale.
Britt.....G. P. Hardwick.
Buckingham (Traer P. O.).....Dr. W. A. Daniel.
Burlington.....Prof. Maurice Ricker.
Bussey.....Agent C., B. & Q Ry.
Carroll.....Moses Simon.
Carson.....Agent C., B. & Q. Ry.
Cedar Falls.....Prof. A. C. Page.
Cedar Rapids.....Electric Light & Power Co.
Centerville (Walsh P. O.).....J. W. Tanner.
Chariton.....Hon. S. H. Mallory.
Charles City.....Chas. O. Schmidt.
Cherokee.....Hon. L. W. Beal.
Chillicothe.....Agent C. B. & Q. Ry.
Clarinda.....A. S. Van Sandt.
Clear Lake.....G. A. Watts.
Clinton.....Luke Roberts.
College Springs.....A. M. Finley.
Coon Rapids.....Downs & Co.
Corning.....Jerome Smith.
Council Bluffs.....J. B. Rishel.
Cresco.....Gregory Marshall.
Cumberland.....Agent C., B. & Q. Ry.
Danville.....Agent C. B. & Q. Ry.
Davenport.....:.*J. M. Sherrier.
Delaware.....Wm. Ball.
Decorah.....F. H. Baker.
Denison.....James H. Holmes.
Des Moines.....*Geo. M. Chappel, M. D.
De Soto.....R. D. Minard.
Diagonal.....Agent C. G. W. Ry.
Dows.....E. G. Lotts.
Dubuque.....*E. H. Bowie.
Eagle Grove.....Smallpage Bros.
Eldon.....T. Madden.
Eldora.....Prof. C. F. Woodward.
Elkader.....Chas. Reinecke.
Emerson.....Agent C. B. & Q. Ry.
Emmetsburg.....A. L. Ormsby.
Estherville.....M. L. Archer.
Fairfield.....Charles J. Fulton.
Fayette.....R. Z. Latimer.
Ft. Madison.....Miss L. A. McCready.
Fonda.....H. P. Barron.
Forest City.....J. A. Peters.
Galva.....Miss Ida Ackert.
Gilman.....Jas. L. Wylie.
Gladbrook.....Agent C. G. W. Ry.
Glenwood.....J. P. Jackson.
Grand Meadow (Postville P. O.)..F. L. Williams.
Greene.....J. L. Cole.
Greenfield.....J. G. Culver.
Grinnell.....Prof. S. J. Buck.
Grinnell (Near).....A. O. Price.
Griswold.....Agent C., B. & Q. Ry.
Grundy Center.....Geo. F. Ellis.
Guthrie Center.....Clam Holden.
Hamburg.....Agent C., B. & Q Ry.
Hampton.....E. C. Grenelle.
Harlan.....C. A. Reynolds.
Hawkeye.....Miss Beatrice Kirkendall.
Hedrick.....J. T. Brooks.
Hopeville.....M. T. Ashley.
Hoprig.....O. N. Young.
Humboldt.....H. S. Wells.
Independence.....E. F. Wulfke
Indianola.....Prof. J. L. Tilton.
Iowa City.....Prof. A. A. Veblen.
Iowa Falls.....J. B. Parmelee.
Keokuk.....*Fred. Z. Gosewisch.
Keosauqua.....Prof. J. H. Landes
Knoxville.....Casey & Belville
Lacona.....Agent C., B & Q Ry.
Lamoni.....T. J. Fitzpatrick.
Lansing.....G. H. Markley.
Larchwood.....W. B. Martin.
Larrabee.....H. B. Strever.
Lenox.....J L. Hurley.
Le Mars.....Dr. T. E. Cole.
Lockridge.....Agent C. B. & Q. Ry.
Logan.....Mrs. M. B. Stern.
Maquoketa.....Dr. A. B. Bowen.
Mason City.....Norman Dinsmore.
Marshalltown.....Branch S. Jones.
Melrose.....Agent C. B. & Q. Ry.
Monticello.....C. E. Heisey.
Mooar.....F. G. Thomas.
Mount Vernon.....Prof. A. Collin.
Mount Vernon.....Rev. J. W. Hubbard.
Mt. Ayr.....A. F. Beard.
Mt. Pleasant.....Dr. Frank T. Stevens.
Murray.....Agent C. B. & Q. Ry.
New Hampton.....R. H. Gurley.
Newton.....A. Lufkin.
Northboro.....Agent C., B. & Q. Ry.
Northwood.....A. L. Thompson.
Odebolt.....E. Starner.
Ogden.....E. Sayre
Olin.....Hon. Nathan Potter.
Omaha, Neb.....*L. A. Welsh.
Onawa.....C. G. Perkins.
Osceola.....A. W. Lewis.
Ovid.....H. C. Miller.
Osage.....G. D. Pattingill.
Oskaloosa.....Jos. Boyd.
Ottumwa.....Dr. J. F. Herrick.
Pacific Junction.....Agent C., B. & Q. Ry.
Pella.....T. W. Cox.
Pioneer.....A. W. Hawley.
Plover.....J. S. Smith.
Primghar.....P. R. Bailey.
Red Oak.....William Boll.
Ridgeway.....Arthur Betts.
Rockwell City.....C. M. Randall.
Ruthven.....C. E. McGlasson.
Sac City.....J. A. Sodestrom.
Scranton.....E. A. Olive.
Sheldon.....J. B. Frisbee.
Sibley.....H. G. Doolittle.
Sigourney.....Mrs. K. F. Ashbaugh.
Sioux Center.....Jacob de Ruyter.
Sioux City.....*U. G. Purssell.
Spencer.....S. Gillespie.
Spirit Lake.....W. C. Drummond.
Storm Lake.....Prof. M. L. Fuller.
Stuart.....H. E. Boatright.
Tara.....W. E. Humphry.
Thurman.....C. R. Paul.
Toledo.....Grace Bookwalter.
Vinton.....J. E. Catlin
Villisca.....C. E. Matteson.
Wapello.....Geo. W. Schofield.
Washington.....Wm. A. Cook.
Washta.....H. L. Felter.
Waterloo.....M. L. Newton
Waverly.....H. S. Hoover.
Webster City.....Louis Frank.
What Cheer.....Hon. J. C. Beem.
Whitten.....Dr. Frank P. Butler.
Wilton Junction.....J. M. Rider.
Winterset.....W. W. McKnight
West Bend.....Phil. Dorweiler
West Union.....J. M. Lisher.
West Branch.....A. A Madson.
Woodburn.....Agent C. B. & Q. Ry.

*U. S. Weather Bureau.

WEATHER-CROP OBSERVERS.

Reporting for the Weekly Bulletin.

Agency.....J. H. Van Zant.
Albia.....Wm. Mercer.
Allerton.....James Piper.
Alta.....Jonas Cushman.
Battle Creek.....E. G. Preston.
Blairstown.....T. H. Weil.
Cedar Rapids.....Hon. A. J. Fuhrmeister.
Centerville.....Henry Galle
Charles City.....W. B. Towner.
Chariton.....C. C. Burr.
Clarksville.....F. M. Russell.
Correctionville.....Hon. W. B. Chapman.
Corwith.....Wm. Oxley.
Clermont.....Chas. Larrabee.
Council Bluffs.....L. Prouty
Creston.....M. V. Ashby.
Danville.....Sherman Matthews.
Estherville.....E. Dawson.
Emerson.....D. B. Nims.
Farlin.....Jesse Johnson.
Fontanelle.....Hon. L. M. Kilburn.
Ford.....J. C. Richards.
Fort Dodge.....R. W. Blaine.
Geneva.....Wm. H. Thompson.
Hesper.....G. E. Dillingham.
Humeston.....Hon. S. H. Moore.
LeMars.....Hon Henry Schrooten.
Lockridge.....John F. Farman.
Marshalltown.....Hon. S. B. Packard.
Mapleton.....A. Lamb.
Mt. Pleasant.....W. S. Wright.
Milton.....Hon. E. C. Holland.
Mount Vernon.....Robert Smith.
Nevada.....Geo. C. White.
Osage.....E. W. Stacy.
Orange City.....H. J. VandeWaa.
Owen.....Hon. J. W. Bird.
Paton.....A. B. Condit.
Pittsburg.....G. C. Duffield.
Rock Rapids.....D. E. F. Merrill.
Rockwell City.....J. G Palmer.
Rossville.....T. B. Wiley.
Rowley.....L. Maxson.
Sageville.....Hon. F. N. Knoll.
Seymour.....L. B. Sager.
Shenandoah.....Reuben Mullison.
State Center.....E. P. Thompson.
Stuart.....W. W. Bailey.
Unity.....Edw. Hummer.
Van Horne.....Spencer Smith.
Winterset.....H. A. Kinsman.
Wall Lake.....T. E. Wilcox.
Wilton.....Thos. Boot.
Wiota.....I. S Coomes.

U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME X. OCTOBER, 1899. No. 10.

PERSONAL.

By a special order of the President, the director of the Iowa Weather and Crop Service was recently brought into the classified service, and was appointed by Secretary Wilson a section director of the Climate and Crop Service of the United States Weather Bureau, said appointment taking effect October 1, 1899. This honor is most highly appreciated because of the fact that it came without personal solicitation or political influence, accompanied by very pleasant messages from the Secretary of Agriculture and the Chief of the Weather Bureau, commendatory of the work that has been done in Iowa during the past ten years. This appointment does not imply any change in the existing system of co-operation of the United States Weather Bureau and the Iowa Weather and Crop Service, except that it may enlarge its scope and make the bond of union more close and effective for good results. It is certain that the results achieved during the past decade have been more valuable than could have been secured without such co-operation, though justice requires the statement that the national Weather Bureau has been the major factor in this joint enterprise. The state, through its moderate appropriation, has undertaken to supplement the government along practical lines, thereby securing a larger measure of the benefits of scientific investigation, and promoting a general knowledge of the climatology of this great agricultural section. How well this beneficent end has been attained the people of Iowa may be allowed to judge.

No change is necessitated in the personnel of the central station. Dr. George M. Chappel will serve, as heretofore, as assistant director of the state service, and Local Forecast Official, with general supervision of the distribution of forecasts, storm warnings and signals. There is, in fact, ample scope and plenty of work to employ the energies and talents of the very efficient assistants connected with the central station of the Iowa section.

NOTE AND COMMENT.

Mr. B. W. Snow, of the *Orange Judd Farmer*, one of the ablest crop statisticians in the United States, has recently published his final estimate of the total yield of the corn crop for the past season. The average for the whole country is placed at 26.4 bushels per acre, against 23.2 last year. This makes the total crop, on the basis of an area of 83,677,000 acres, 2,207,473,000 bushels. The estimate of the crop of 1898, at the corresponding date last year, was 1,868,000,000 bushels. For Iowa Mr. Snow's estimate is an average yield of 35.5 bushels per acre, and this, on the basis of an area of 8,610,000 acres, would give Iowa a total yield of 305,655,000 bushels. According to Mr. Snow's figures Iowa leads all the surplus corn states in acreage and in the total yield. The other leading corn producing states are credited with totals as follows: Illinois, 282,924,000 bushels; Kansas, 236,334,000 bushels; Nebraska, 211,737,000 bushels; Missouri, 179,010,000 bushels; Indiana, 142,454,000 bushels. These figures are likely to stand the test of comparison with official returns.

* * *

Rain and snow bring down about one-sixth of the nitrogen required for growing crops during the season.

* * *

There is no danger of over-production of farm products when the factories are running and other industries are in full blast. American people are enormous consumers of food stuffs when they are fully employed and liberally paid. Low prices of farm products in former years were caused by under-consumption rather than over production.

* * *

The *Dow City Enterprise* reports that on the morning of October 24th lightning set fire to the prairie two miles southeast of that town, burning over a considerable area of land with but slight damage. It was a rare incident.

* * *

About ten billion eggs are produced in this country annually. And still the demand is greater than the home supply.

* * *

The *Odebolt Chronicle* reported a severe electric storm on October 24th, causing considerable damage to the telephone poles and wires about five miles east of that town. Several poles were splintered and the wires were melted.

* * *

The American Public Health association, at its recent session in Minneapolis, expressed the opinion, in form of a resolution, that the presence of forests is conducive to public health, and recommends that all governments should set apart forest reserves as national parks.

* * *

The science of living, of getting from our years on earth the most that they can be made to yield, will be one of the great developments of the twentieth century. The condition of the people has greatly improved in this century, as Henry Higgs stated at a recent meeting of the British association, for houses are better and more sanitary, wages are higher, while commodities are cheaper, and such institutions as free libraries,

museums, picture galleries, etc., with parks and promenades, have multiplied. Yet it is to be feared that housekeeping is no better understood than it was two centuries ago. Professor Marshall has estimated that £100,000,000 annually is spent even by the working classes, and £400,000,000 by the rest of the population of England in ways that do little or nothing toward making life better or happier, and that something like £100,000,000 a year might be saved if a sufficient number of able women went about the country and induced the other women to manage their households as they do themselves. There are, at any rate, great possibilities of improvement in details of food, dress and habits, without any curtailing of luxuries or amusements. —*Exchange.*

* * *

It is said that Spain has more sunshine than any other country in Europe. The yearly average is 3,000 hours. In America it is 2,100.

* * *

The Omaha *Bee* recently mixed up meteorological terms in the following ludicrous style:

The nearest approach a cyclone ever made to Omaha was at the time two spans of the east end of the Union Pacific bridge were lifted off the piers and dropped into the river. At the time there was a difference of opinion as to the nature of the storm that did the work, some contending that it was simply a tornado and others that it was a cyclone. When a portion of one of the spans was recovered and found to have been twisted with great violence it was generally agreed that there must have been a cyclone.

* * *

A news special from Fort Dodge, dated October 20th, states that during a recent shower a bolt of lightning struck the Catholic church at Vincent, causing considerable damage. Miss Welch, aged 16, who was engaged in cleaning the church, was stunned by the shock and remained unconscious for some time.

* * *

The farmers of Broome county, N. Y , have organized a combine for the sale of their products, and will have headquarters in New York city. In other eastern counties similar movements are being discussed. The tendency in the business world is towards combination and concentration of capital, to counteract the injurious effects of competition.

LOSSES BY LIGHTNING IN 1899*.

A notable feature of the crop season of 1899 was its unusual number of severe storms and excessive display of electric energy. This was an especial characteristic of the season from about the first of May to the middle of July, during which period more than three-fourths of the reported losses by lightning occurred. May was the stormiest month, the records showing that a measurable amount of rain fell at some station in the state during every day of the month. In June there was but one absolutely rainless day for the state at large. And nearly all the severe storms that occurred in these two months were accompanied by electric disturbance, resulting in more or less damage to farm property.

The United States Weather Bureau office in this city has received 395 reports of damage to farm property from the effects of lightning during the past season. Last year the number received was only 204, the increase indicating a more general interest in the collection of these statistics, and also the fact that the season of 1899 was more prolific in violent storms than the preceding year. Nearly all of these reports were contributed by the agents and other officials of insurance associations; and it is understood, of course, that they cover only a small percentage of the total losses that have occurred in the state during the season. The details are of interest, whether viewed from a practical or scientific standpoint.

The aggregate loss of property covered by these 395 reports is $52,524, of which sum $35,194 was the total loss estimated on buildings, and $17,330 on live stock.

The number of buildings struck was 86, including 29 houses and 57 barns and outbuildings. Of the 57 barns 22 were consumed with their valuable contents, involving a total loss of $31,657. In 4 of the barns and stables 109 head of live stock were consumed, and are not included in the number of stock killed by lightning strokes. Only 3 of the 29 houses struck were consumed, and the total loss on that kind of property was $2,696.

The reports show that two barns and one house of the number struck were provided with plain wire lightning rods, but there is no evidence to prove that they were properly constructed and attached to the buildings. The fact that over 96 per cent of the buildings were destitute of rods seems to carry some weight of evidence in favor of that form of protection.

These reports give details of the loss of 581 farm animals from the direct effect of lightning, and this number does not include the 109 that were cremated in buildings fired by electric bolts. Of the live stock nine were killed in barns that were struck and not fired; the others were in yards and fields

And we are again confronted by the fact that wire fences are directly responsible for a very large percentage of the loss of live stock in the fields. The reports show that of the 581 farm animals killed by lightning 395, or 68 per cent of the whole number, were "electrocuted" while in close contact with wire fences. Tabulated by classes of live stock the figures are as follows:

KIND OF STOCK.	No. killed.	No. against wires.	Per cent.
Cattle	411	275	67
Horses	81	40	49
Hogs	22	19	86
Sheep	67	61	91
Totals	581	395	68

These are astounding figures, and vastly more effective and convincing than volumes of scientific theories relating to this matter. It appears that the stock growers of this state are paying a very heavy tax on their wire fences, in addition to the cost of construction. Or, possibly, these losses by lightning may not be considered a tax on that kind of fence, but rather a penalty for not constructing the fences properly, with necessary safeguards against such casualties. It is clear that some means should be devised to render wire fences less deadly, or, failing in that, they should be discarded altogether. It is believed that they may be rendered practically safe by the use of ground-wires.

The fact may be noted that many of the storms of the past season have been accompanied by driving winds, with more or less hail, as well as an unusual amount of electric disturbance. During the prevalence of that class of storms farm animals in the fields seek closer companionship, and by the force of the storms are driven and crowded together in bunches or herds against the fences that obstruct their way. The reports show that many animals were killed in bunches by single strokes of lightning. A few of the details from the reports will be of interest. On April 30th three valuable steers were killed in Chester, Poweshiek county, by a stroke that splintered posts and fused the wires for some distance. May 15th thirteen young cattle were killed near Grinnell by a single shock that came over the wires. May 16th four head of cattle in Clinton county were killed by a single stroke that traveled a long distance. On May 22d thirteen head of Red Polled Angus cows valued at $780, were killed, in Jackson county. They were

ound huddled together against a wire fence. May 27th five oung cattle were killed in Hamilton county, and three of eir carcasses were found hanging over the wires. On June th, in Rock township, Sioux county, three head of cattle nd thirty-eight sheep were killed by a single stroke. The nimals were in the same pasture, and the bolt struck the ires half a mile distant from the spot where the cattle were illed. The sheep were crowded against the wires, many of em were found with their heads between the strands. June th, in Sac county, thirteen head of cattle and horses were illed by the same stroke, and the horses and cattle were wenty rods apart, on the same line of fence. August 23d wenty-three sheep in Palo Alto county were "electrocuted" y the same strand of wire, and a single shock These few istances serve to illustrate the manner of the taking off of any thousand farm animals in our country every year. There as been a notable increase in that class of fatalities since vire fences came into general use. The wires carry the elec- ric force considerable distances. In one instance referred to n the reports of this season a single stroke of lightning estroyed a wire fence for a distance of forty rods. A half ozen ground-wires would have switched off that destructive urrent in short order.

The larger number of reports received this season give some letails as to the localities where destructive strokes occurred, whether moist or dry, upland or lowland, near timber or in an pen field. But from the mass of statements we are not yet ble to make any special deduction of practical value or scien- ific interest. Nearly 50 per cent of the reports show that the trokes occurred on high and dry lands, somewhat dis- ant from timber; nearly 40 per cent on low, moist ground, without timber; and 20 per cent in or near groves or timber ots. This may signify merely that more stock are pastured n high and dry than on low, moist or timbered lands; and lso that buildings are generally erected on elevated and dry ites. It appears to be certain that isolated trees in pastures re sources of danger to stock or persons that seek shelter nder their branches, and it is probably true that dense groves r heavy timber afford a measure of protection against electric force as well as the other elements of severe storms The conclusion of the matter is that the safest retreat for man or beast, during a thunderstorm, is in a building protected by a well constructed rod or metallic roof.

It is gratifying that we have received so large a number of reports during the past season, and in my judgment it is worth while to continue our investigations along this line. I trust that a larger number of agents and officials will co-operate with the Weather Bureau in this work next year, and that the reports will be made to cover the more important details as to the losses that occur.

I am convinced that a very large percentage of losses by lightning may be prevented, and the special purpose of our investigations should be to discover the means of prevention. An ounce of prevention is better than a pound of indemnity.

* Report read before the annual meeting of the Iowa Mutual Insurance Association at Des Moines, November 15, 1899, by J. R. Sage.

DEEP SEA TEMPERATURE.

[Sir John Murray before the British Association.]

It appears that considerably more than half of the sea-floor lies at a depth exceeding 2,000 fathoms, or over two geographical miles. On the Challenger charts all areas where the depth exceeds 3,000 fathoms have been called "deeps," and distinctive names have been conferred upon them. Forty-three such depressions are now known. Twenty-four are situated in the Pacific ocean, three in the Indian ocean, fifteen in the Atlantic ocean, and one in the Southern and Antarctic oceans. The area occupied by these deeps is estimated at 7,152,000 square geographical miles, or about 7 per cent of the total water surface of the globe. Within these deeps over 250 soundings have been recorded, of which twenty-four exceed 4,000 fathoms, including three exceeding 5,000 fathoms. Depths exceeding 4,000 fathoms (or four geographical miles) have been recorded within eight of the deeps, viz: In the north Atlantic within the Nares deep, in the Antarctic within the Ross deep, in the Banda sea within the Weber deep, in the north Pacific within the Challenger, Tuscarora, and Supau deeps, and in the south Pacific within the Aldrich and Richards deeps. Depths exceeding 5,000 fathoms have been hitherto recorded only within the Aldrich deep of the south Pacific, to the east of the Kermadecs and Friendly islands, where the greatest depth is 5,155 fathoms, or 530 feet more than five geographical miles, being about 2,000 feet more below the level of the sea than the summit of Mount Everest, in the Himalayas, is above it.

Our knowledge of the temperature on the floor of the ocean is derived from observations in the layers of the water immediately above the bottom by means of deep-sea thermometers, from the electric resistance of telegraph cables resting on the bed of the great ocean basins, and from the temperature of large masses of mud and ooze brought up by the dredge from great depths. These observations are now sufficiently numerous to permit of some general statements as to the distribution of temperature over the bottom of the great oceans All the temperatures recorded up to the present time in the subsurface waters of the oceans indicate that at a depth of about 100 fathoms seasonal variation of temperature disappears. Beyond that depth there is a constant, or nearly constant temperature at any one place throughout the year. It is estimated that 92 per cent of the entire sea floor has a temperature lower than 40° Fahrenheit. This is in striking contrast to the temperature prevailing at the surface of the ocean, only 16 per cent of which has a mean temperature under 40° Fahrenheit. The temperature over nearly the whole of the floor of the Indian ocean in deep water is under 35° Fahrenheit. A similar temperature occurs over a large part of the south Atlantic and certain parts of the Pacific; but at the bottom of the north Atlantic basin, and over a very large portion of the Pacific, the temperature is higher than 35° Fahreneit. In depths beyond 2,000 fathoms the average temperature over the floor of the north Atlantic is about 2° Fahrenheit above the average temperature at the bottom of the Indian ocean and south Atlantic, while the average temperature of the bed of the Pacific is intermediate between these.

The deep sea is a region of darkness as well as of low temperature, for the direct rays of the sun are wholly absorbed in passing through the superficial layers of water. Plant life is in consequence quite absent over 93 per cent of the bottom of the ocean, or 66 per cent of the whole surface of the lithosphere. The abundant deep-sea fauna, which covers the floors of the ocean, is therefore ultimately dependent for food upon organic matter assimilated by plants near its surface, in the shallower waters near the coast lines, and on the surface of the dry land itself. It thus happens that at the present time over nearly the whole floor of the ocean we have mingled in the deposits the remains of organisms which had lived under widely different physical conditions, since the remains of organisms which lived in tropical sunlight and in water at a temperature of above 80° Fahrenheit all their lives now lie buried in the same deposit on the sea floor, together with the remains of other organisms which lived all their lives in darkness and at a temperature near to the freezing point of fresh water.

THE SUGAR BEET INDUSTRY IN IOWA.

Unquestionably in the near future this country will produce all the sugar that is required for home consumption, and most likely the time is not far distant when we shall be able to enter the markets of the world as sellers instead of buyers. We have the requisite conditions of soil and climate to grow sugar beets in almost unlimited quantities, sufficiently rich and pure in quality to develop a profitable industry in that line. The question for Iowa farmers and capitalists to consider at this time is of a practical character, and not theoretical, viz: Shall this state have a part in the development of that great industry? The period of experimentation to test the fitness of our soil and climate is past, and now we are confronted by the necessity of practical work in the line of organization to secure a fair portion of the business and profits.

The convention at Clear Lake, October 18th, gave a strong impetus in the right direction, and it only remains to secure the co-operation of farmers, gardeners and capitalists to start a half dozen or more factories in Iowa within the coming year. Michigan is reported to have nine beet sugar factories erected, with an average capacity of 500 tons of beets per day, which will be able to turn out 45,000 tons of granulated sugar per annum. Shall Iowa lag in the rear?

At the Clear Lake convention Secretary Wilson presided and delivered a very able address, from which we make a few interesting extracts:

The United States for a number of years past has been buying about $100,000,000 worth of sugar from foreign countries. It has been sometimes more and sometimes less than this amount. The experiment stations of the several states of the Union have been looking into the feasibility of producing our own sugar at home from the sugar beet. This is done in many countries of Europe, and to such an extent has this industry grown that more sugar is now made from beets than from cane. Experimentation has been carried on at the Iowa Experiment Station for quite a number of years, and valuable information can now be had by anyone who desires to consult the records of the work there. From 1891 to 1896 Professor Curtiss and myself annually grew beets on quite a large scale for the economic purpose of feeding to the dairy cows, young cattle, fattening animals, and, incidentally, for the purpose of ascertaining the per cent of sugar in the beets, the purity of the juice, and the tonnage to be had from various Iowa conditions This work will be found recorded in the bulletins of the station, beginning with No. 15 and running on through succeeding years, and experimental work along these lines is still being done at Ames.

The history of sugar-making from beets in the several nations of Europe tells us that 12 per cent of sugar in the beet, with about 80 per cent of purity of juice, gives a profitable crop. The French people made an exhibition of information regarding the sugar beet and the production of sugar, on cards at the exposition at Chicago in 1893, showing that they had 13 and a fraction per cent of sugar in the beet. There is no difficulty in getting beets as rich as this in sugar in the state of Iowa In some parts of the state the percentage has run much higher. One of the first considerations, however, in the profitable production of sugar beets, is, the conditions that will produce a heavy tonnage by the acre. In this regard the state of Iowa will have very few equals in the United States. Our rich soils will give us a heavy tonnage. We got as high as twenty-eight tons to the acre at Ames in 1891. From ten to twelve tons is the average throughout the United States at the present time, perhaps, though in some of the rich valleys of the Rocky mountain states they grow as high as twenty or thirty tons to the acre, where all the conditions are favorable. There are many reasons why the state of Iowa should at this time turn its attention to this industry. It introduces intensive farming, calling for the application of skill and experience that will set at work elements in a neighborhood heretofore unproductive. Young people can get work to do in thinning the beets. We had that done at Ames by the students, who were always glad to help us out. Young people in the village will be quite anxious as the students to earn a little money. It will extend labor further into the fall for people in the several neighborhoods than heretofore. It will be a new creation for the neighborhoods engaging in it—a creation fresh from the so and atmosphere that did not take place before. The expen iture in a neighborhood of two hundred thousand dollars f beets, labor, skill and other things, would work quite revolution in many of our Iowa towns and villages throughou the state. The industry would result in the cleaning up many of the farms Systems of agriculture would be inaug urated that would result in the destruction of weeds and othe parasites, and would add 25 per cent of increased value to lan Crops should be grown after clover has enriched the soil wit nitrogen and other atmospheric elements and rested the lan from crops that contribute toward the reduction of the humu in the soil. Time will determine whether it is wise to take crop of corn or oats following clover before the beets ar grown. It will be ascertained that a crop would not be take oftener than once in four or five years from the same piece o land, for the reason that these hard-leaved plants, are gros feeders on potash, and while there is plenty of potash in Iow soil, as is demonstrated by our heavy crops of corn, yet th successive growing of any one crop that calls heavily fo potash will reduce that element.

After the crop of beets is taken, corn, clover, the grasse and the grazing animal should intervene, so as to bring the soi back to its best possible condition for growing crops. The most profit from growing sugar beets will be had by the neighborhood that feeds the by-product or pulp to the dairy cow. We grew sugar beets and other roots at Ames so as to have something of that kind to give to all the animals on the place in the winter time. Europeans who have had experience feed this by-product to every animal on the place. The managers of the Agricultural College of Iowa, where the finest animals in the United States are found, and where the best beef, mutton and pork ever taken to Chicago is finished, find it necessary to have roots; and I have no hesitation in saying that the Iowa farmer can afford to grow roots for his animals, no matter how cheaply he can get other feeds. The Iowa farmer can afford to grow beets for the pulp alone. The carbonaceous matter that goes to make the sugar is of no value to the dairy cow, which has all the carbonaceous matter she requires from her hay and corn and other earbonaceous feeds. This pulp is a necessity in the finishing of our fine steers. We have come to the time when we must keep an eye on the South American republics. The Argentine Confederation has learned to grow alfalfa, and is sending very fat grass-fed animals to the European markets. We must send something better than they can possibly produce; we must finish animals young, and finish them completely, and put such a product on the market as the South American cannot compete with. Well informed dairy men are aware that the dairy cow must have a highly nitrogenous ration in order to do her best work. For this reason the by-products of the mills are purchased—bran, oil meal, etc. When the sugar content has been removed from the beet, the nitrogenous element is left in the pulp, and the nutritive ratio is reduced to something like the nutritive ratio of oats, which makes a very valuable feature in the ration of the dairy cow The neighborhood producing sugar and butter and sending these things into the world's markets, will never reduce the fertility of the soil, for the pulp is returned to the fields through the domestic animals. And this is quite an important consideration when we are thinking of introducing new crops We are admonished by the experience of our fellow citizens in the east and south and west in this regard, that we should avoid reducing the fertility of the soil as they have reduced and are reducing it. It is true we have a richer soil than the people in New England and the southern states have, but we have no richer soil than the people in the valleys of the Rocky mountain states and the Pacific coast states have; and they have succeeded in so reducing the fertility of their lands that they take a crop of wheat only once in two years We must avoid reducing Iowa soils to this condition. Here is a promising crop that will grow on what comes from the atmosphere and not what comes from the soil

The principal question affecting sugar beet factories in the United States at this time, is to get a full supply of beets. If we consider the fact that the western half of the United States is a dry country, and that most of the sugar beet factories are located in that country, and that lack of water frequently cuts short the tonnage, you will appreciate this feature of my observations. It is necessary to have a plenty of beets to keep the factory going, to make it profitable, and the more beets the factory gets, the more it can pay by the ton for what it takes. Factories should not be built nearer than within 100 miles of each other in the state of Iowa, for the present, so that advantage can be taken of the usual and customary low rate on the

railroads, fifty miles in every direction. This would help to nsure the factories getting enough raw material and thus nsure its profitable running.

With regard to the ability of the state of Iowa to produce sugar, we can make here all the nation wants. A million and a quarter or a million and a half acres would make all the sugar that the United States now pays one hundred million dollars for annually. That is, I mean Iowa acres, where full crops are grown. It will be demonstrated in the coming years that Iowa can produce a ton of sugar beets cheaper than most other states, just as she produces corn, oats, beef, mutton and pork cheaper now than other states. Those with whom we compete in foreign countries are compelled to pay large amounts for fertilizers to keep up the fertility of their acres and produce reasonable crops By systematic rotation and by keeping half of the farm or more in grazing conditions, and by returning all the fertilizer made on the farm strictly to the land, there is no difficulty in keeping up Iowa soils, providing we sell things that come from the atmosphere as much as possible.

WEATHER SIGNS.

[J. S. Trigg, in Rockford Register.]

A whole lot of wiseacres are giving the dear people the signs for the coming winter. It is to be a hard winter, because the muskrat has built him a high house in the swamp; because the fur on the squirrel is extra thick; because the goose bone is of a certain shape; because the cornhusks are thick, and a whole lot more of such meteorological rot. While it is true that the wild Indian read signs for his weather forecasts, he was not always correct by a long way, for we have personally known a wise medicine man of the Sioux as a sign reader to be as far out of the way as is the scientific weather prophet (so called) of today. The fact is that north of latitude 42 degrees, anywhere in the United States, save on the Pacific coast, the normal winter is a cold one, bringing more or less snow, according to locality, and it is always safe to make ample provision for such cold weather by covering all tender vines and plants, closing all cracks in the barns, banking up the cellar and getting prepared for the intense cold and the blizzard which is more likely to come than not. Nobody is wise enough to correctly forecast the seasons and the type of weather they will bring. Get prepared for the worst and you are all right.

SCARCITY OF FARM LABOR.

The wave of prosperity that has swept over this country has caused a demand for labor such as has never been experienced before. Factories and furnaces are running everywhere and have attracted labor from the country by their offer of good wages, and the result is a scarcity of men for farm work. Wages in the country have had to be advanced in consequence. Even at the higher rate it has been very difficult for the farmer to secure satisfactory help, and in some instances it has been found impossible to secure workmen at any price. In such cases, if the time was limited, school children and housewives have been pressed into service to help secure the crops.

The industrial activity has brought with it a greater consumption of farm products, and the prices for staples are on a basis that would return a good profit to the producer, but his capacity of production is greatly inhibited by his inability to secure the right kind of labor. The improvement in machinery has helped to ease the labor stringency, but there is little prospect of further immediate relief in this line. That the farmer, like the manufacturer, must so arrange that every stroke of his own work as well as that of his hired labor should show to the best advantage, is apparently the only method by which he may overcome the disadvantage of the present condition.—*Hay Trade Journal*, Canajoharie, N. Y.

THESE LAST DAYS.

[J. S. Trigg, in Rockford Register.]

The beauty of the dying year still lingers with us The snow king, the great north wind, the frost elves and the blizzard demon, while all ready to descend upon us. as did the Gauls upon sunny Italy in the olden time, still grant us a little respite, while the Indian summer queen invests the landscape in a soft, delicious purple haze, through which the sun glows like a ball of carmine fire and the new moon becomes a bloody scimiter hung across the western evening sky. A hush of expectancy is in the air, a premonition of a coming change, a subtle feeling that to-day is surely the last, just as to the dying there comes sometimes a brief, uncertain moment of transcendent intelligence and rapture ere they pass away. All nature is hushed, for, save the pirate crow, the saucy jay, the cheery little chickadee and the sparrow, the birds have all gone, seeking a kindlier winter home. Here and there in the woods a squirrel or a chipmunk may be seen these last bright days securing for his winter store a few more nuts and acorns The prairies look cold and gray and sere, and the woods are full of the delicious fragrance of newly fallen leaves, while here and there among the all prevailing somber tone of color may be seen a stray leaf of a poison ivy or a Virginia creeper, blood red and dying late, or a yellow festoon of partridge berry twining across some old, decaying stump like a golden chain enlacing the breast of a skeleton, lone relics these of the late resplendent pageant of color and beauty, left like fragments of decoration in some deserted festival hall. A little while, and the legions of the north will fall upon us, and as the snow king enfolds the earth in a mantle of ermine, and the great north wind roars tumultuously through the forest and over the prairies, and the frost elves trace fairy geometric pictures on the window and electroplate each tree and bush and smallest twig with a scintillant crystal, let us welcome the season of Thanksgiving, of holiday pleasure, of social intercourse, and cement anew around the fireside those ties of love, friendship and neighborly regard which make life so well worth living.

THE MARYLAND WEATHER SERVICE.

The Maryland Weather Service is conducted under the joint auspices of the U. S. Weather Bureau, the Johns Hopkins University, and the Maryland Agricultural College, including the agricultural experiment station.

The board of control is composed of Wm Bullock Clark, director, representing the Johns Hopkins University; Milton Whitney, secretary and treasurer, representing the State Agricultural College, and Ferdinand J. Walz, meteorologist, representing the U. S Weather Bureau. By means of a liberal state appropriation to cover necessary expenses, and a wisely devised system of co-operation, these three great scientific and educational forces are doing a great work for the people of that commonwealth.

This office has been favored with a copy of Volume I of a series of reports of the Maryland Weather Service, giving a full account of the climatic features of Maryland, including comprehensive treatment and graphic illustration of the meteorology, the physiography, the hydrography, the medical climatology, the agricultural soils, the forestry, the crop conditions, and the flora and fauna of the state The first volume, which is confined to the physiography and meteorology, is an octavo volume of 566 pages, with an appendix containing lithographed charts illustrating in graphic form the monthly, seasonal, and annual normals of temperature and precipitation for Maryland, Delaware, and the District of Columbia. It is copiously

illustrated, printed on the best of book paper, in the highest style of typographic art. Volume I is divided into three parts, as follows: Part I. Introduction, by Director Clark, discussing the plan of operation of the Maryland Weather Service, with a recital of the facts connected with its organization, and presenting the scope of the proposed publications. Part II. A general report on the physiography of Maryland, prepared by Cleveland Abbe, Jr., embracing a general statement regarding the more important physiographic features of the state, to which is appended a detailed discussion of stream development in the Piedmont region. Part III. A very comprehenisve report on the meteorology of Maryland, the joint work of Prof. Cleveland Abbe, Ferdinand J. Walz, and O. L. Fassig, all of whom are members of the official staff of the U. S. Weather Bureau.

The division of the work relating to meteorology, covering 333 pages exclusive of the 18 charts, is exceedingly interesting and valuable to students of science as well as to people who are specially interested in the climate of that section. Professor Abbe contributed the section on the aims and methods of meteorological work, especially as conducted by national and state weather services. Mr. O. L. Fassig wrote the section relating to the progress of meteorology in Maryland and Delaware. And Mr. F. J. Walz, local forecast official in charge of the U. S. We ather Bureau station at Baltimore, and director of the Maryland and Delaware section, contributed the paper giving an outline of the present knowledge of the meteorology and climatology of Maryland.

In the production of this great work the Maryland Weather Service has taken the lead of all similar auxiliary services in the union, demonstrating the value of co-operation of the state with the national bureau in the dissemination of scientific and practical knowledge among the people. Every state in the union may wisely follow that lead by establishing some system of co-operation whereby every section may enjoy the full measure of benefits to be derived from the generous helpfulness of the government.

In the introductory part of the report under review, Director Clark sets forth the special purpose had in view in the organization of the Maryland service in co-operation with the National Weather Bureau. He says:

> The practical significance of climatic study is to-day recognized by all governments, state and national, and nearly every one, both in this country as well as abroad, makes provision for its maintenance. Both from an economic and an educational standpoint it has been found of such value to the people that there is a growing appreciation in all quarters of its importance. To Maryland especially, with its lowlands and highlands, its ocean front and included estuaries, a complete knowledge of the climate must be of much practical value. Not only is this information of importance from the standpoint of personal comfort, and thus of interest to those who now abide within the state or who contemplate residence among us, but the character of the climate likewise affects the soil conditions, the distribution of plant and animal life, the water supply and the drainage, and therefore the general health of every community in the state. All of these factors, which are so intimately connected with the climate, must be regarded as within the province of a weather service, and it was with the purpose of investigating them that the present organization was established.

NATIONAL BULLETIN FOR OCTOBER.

WASHINGTON, D. C., November 1, 1899.

The average temperature for October, 1899, was above the normal in all districts east of the Rocky mountains, with the exception of the upper Missouri valley, where it was slightly below, the month averaging decidedly warm in the central valleys, gulf states, and lake region, where the mean daily temperature excess generally ranged from 3° to 8°. In the Rocky mountain and plateau regions the month was cooler than usual, the average daily temperature deficiency over the middle plateau region and in western Montana ranging from 3° to 5°. Along the immediate Pacific coast there was a general but slight deficiency in temperature.

The temperature extremes of the month have been very unusual, more particularly the minimum temperatures of the first decade in the northern districts east of the Mississippi and the maximum temperatures of the second and the third decades over a large part of the central and northern districts to the east of the Rock mountains. From the 1st to the 3d the temperatures at a number of places in the upper Mississippi valley and lake region were the lowest observed in the first decade of October since the establishment of the stations, while the 1st was an unusually warm day over the middle Rocky mountain slope. From the 11th to the 14th and from the 21st to the 23d the highest temperatures yet observed in the second and third decades of October occurred at a large number of Weather Bureau stations in the lower Missouri and central Mississippi valleys and lake region. From the 24th to the 27th maximum records of former years were broken at numerous stations in New England and the middle Atlantic states.

PRECIPITATION.

There was more than the usual amount of precipitation during October, 1899, in the central and northern Rocky mountain regions, over the greater part of the Pacific coast districts, central and western Texas, western Kansas, Oklahoma, southern portions of Missouri and Illinois, southern Florida, and over an area extending from southern Georgia to southern Virginia. Over some areas in these districts the precipitation was heavy and exceeded the average from 1 to more than 4 inches, the greatest monthly rainfall occurring on the east Florida coast, nearly 17 inches being reported from Jupiter. In western Texas, New Mexico and Arizona, over a large portion of the lower Missouri, Mississippi and Ohio valleys, the greater part of the lake region, New England and the middle Atlantic states the precipitation was below the average, portions of the lower and upper Mississippi valley, lower Missouri valley, and middle Atlantic states receiving less than 1 inch. There was also a deficiency along the south Atlantic cost and over a limited area on the north Pacific coast.

In the districts east of the Rocky mountains the month of October has been very mild, and the first half generally dry. These conditions proved very favorable for maturing and gathering late crops, but were not favorable for plowing, fall seeding, and germination of sown grain over a large part of the winter wheat region. During the latter part of the month the droughty conditions were largely relieved, although Iowa and portions of eastern Nebraska, northern Missiouri, and the central gulf states were suffering for rain at the close of the month. The weather conditions on the Pacific coast have been very favorable.

Under exceptionally favorable weather conditions, cutting, husking, and cribbing corn have made rapid progress.

SECTION SUMMARIES.

Iowa.—Des Moines, 28th: The extremely dry fall has been very favorable for cribbing corn in excellent condition, and the work is well advanced; soil has been generally too dry for plowing, and much less than the usual amount of fall grain has been sown; most of the grass seed and grain sown early in September failed to germinate; the potato crop is mostly harvested, and yield good; pasturage is very short, and stock feeding is quite general.

Illinois.—Chicago, 29th: Month highly favorable, except ther too dry first half; fall seeding completed, about usual reage of wheat, rye, and grasses, except short wheat acreage ntral district; rains middle of the month caused satisfactory ermination of wheat, which is in splendid condition, except ight damage by army worm and Hessian fly; corn husking id cribbing well advanced, with good yield; little damage by ost and little rot or mold; pastures short; plowing progress-g, with soil in good condition.

Minnesota.—Minneapolis, 28th: Until October 10th little rain ll, and threshing, plowing, and corn and potato harvest pro-ressed favorably; after the 10th frequent rains delayed thresh-ig; nearly all wheat in shock is threshed, including most of the ed River valley crop, but much remains in stack in southern alf of state; the small areas of winter wheat and rye are look-ig well; plowing is well advanced; the soil seems to be well upplied with moisture for the winter.

Nebraska.—Lincoln, 28th: Dry and warm weather first wenty days of October was very favorable for outstanding rops; corn husking commenced early and progressed rapidly; igh wind broke corn down badly; large crop of potatoes ecured in fine condition; dry weather interfered with plowing nd seeding, and acreage of wheat and rye sown is unusually mall; grain started slowly and unevenly, many fields are badly lamaged; rain in eastern portion during the last ten days very eneficial.

Kansas.—Topeka, 29th: Drouth prevailing at close of Sep-ember continued till the 24th, relieved slightly by light rain 5th–16th, and broken by fine rains 25th–27th; growth of early own wheat and germination of late sown retarded by drouth; ome plowing and seeding yet to be done; conditions materially mproved by late rains; all corn matured and being cribbed; late corn light crop; early Kaffir corn harvested, a good crop; late Kaffir a good crop, generally matured, except in northern counties, where caught by frost.

Missouri.—Columbia, 30th: Warm and dry to 25th; good gen-eral rain 25th–27th; in eastern and southern sections conditions favorable for wheat sowing; seed germinated well and crop very promising, but in many northern and western counties soil too dry, seed germinated poorly and some that came up died; seeding about completed; no serious damage by insects except in few counties; cotton three-fourths gathered; corn gathering progressing; pastures generally short but improving.

BELATED REPORTS FOR SEPTEMBER.

CARSON.—Total precipitation, .63 of an inch.

CENTERVILLE.—Mean temperature, 65.4°; highest, 100°, on the 6th; lowest, 25°, on the 29th; total precipitation, 1.55 inches; greatest amount in 24 hours, .58 of an inch, on the 8th; prevailing direction, southwest. Number of clear days 24; partly cloudy, 5; cloudy, 1; rainy 4.

FAIRFIELD.—Mean temperature, 64.1°; highest, 99°, on the 5th; lowest, 27°, on the 30th; total precipitation, 1.69 inches; greatest amount in 24 hours, .74, on the 9th. Number of clear days, 15; partly cloudy, 10; cloudy, 5; rainy 5.

ESTHERVILLE.—Mean temperature, 58.9°; highest, 97°, on the 6th; lowest, 18, on the 30th; total precipitation, trace; greatest amount of precipitation in 24 hours, trace; prevailing direction, southeast and northwest.

FAYETTE —Mean temperature, 60°; highest, 95°, on the 5th; lowest, 15°, on the 30th; total precipitation, .70 of an inch; greatest amount in 24 hours, .48 of an inch, on the 22d; prevailing direction, northwest. Number of clear days, 16; partly cloudy, 7; cloudy, 6; rainy, 4.

OCTOBER WEATHER RECORD.

The month was warmer than usual, with a very large percentage of clear and fair weather, and generally deficient rainfall. The monthly mean temperature of the state, as shown by 118 reports, was 56.7°, which is about 6 5° above the October average. The mean of the northern section was 54.2°; central section, 57°; southern section, 59°. The highest temperature reported was 95°, on the 13th, at Mooar, Lee county; lowest, 17°, at Hampton on the 29th.

The average precipitation for the state, as deduced from reports, of 136 stations, was 1.73 inches, which is about .5 of an inch below the normal for October. The average for the northern section was 1.90 inches; central section, 1.44 inches; southern section, 1.73 inches. The largest amount reported was 4.64 inches at Thurman. and the least amount .15 of an inch at Hamburg, both places being located in Fremont county. Of the total reported at Thurman, 3 72 inches fell in 24 hours, on the 24th and 25th. The prevailing wind direction for the month was south. The month was very favorable for farm operations, except plowing, for which work the soil was too dry and hard.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30.06 inches; highest observed, 30.48, at Dubuque on the 20th; lowest observed, 29.51, at Clarinda on the 9th; range for the state, .97 inches.

Temperature —Monthly mean, as deduced from 118 reports, was 56.7°; highest monthly mean, 61°, at Keokuk; lowest monthly mean, 52°, at West Bend; the highest temperature reported was 95°, at Mooar on the 13th; the lowest temperature reported was 17°, at Hampton on the 29th; the average monthly maximum was 87.9°; the average monthly minimum was 27.2°; the greatest daily range was 56°, at Bedford; average daily range, 42.4°.

Precipitation.—Average for the state, as determined from the reports of 136 observers, 1.73 inches; the largest amount reported was 4.64 inches, at Thurman; the least amount was .15 of an inch, at Hamburg; the greatest daily amount reported was 3.72 inches, at Thurman on the 24th and 25th; average number of days on which 01 inch or more of precipitation was reported, 5.

Wind.—Prevailing direction, south; highest velocity reported, 49 miles per hour from the south, on the 15th, at Sioux City.

Weather.—There were 17 clear days; 8 partly cloudy days, and 6 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES. Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.07	30.42	20	29.63	
Des Moines	30.06	30.41	4	29.74	
Clarinda	30.04	30.39	4	29.51	9
Cresco	.....	30.44	4	29.52	9
Dubuque	30.08	30.48	20	29.60	9
Omaha, Neb	30.00	30.40	4	29.52	9
Keokuk	30.08	30.38	20	29.65	9
Sioux City	30.03	30.44	4	29.57	9
Means	30.05	30.48	20	29.51	9

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,456	24	SW	13
Des Moines	6,595	38	SW	24
Dubuque	5,650	24	SE	15
Keokuk	5,580	24	SE	1
La Crosse, Wis	5,432	30	NW	31
Omaha, Neb	6,792	36	N	2
Sioux City	9,276	49	S	15

OBSERVERS' NOTES.

ALGONA—*C. D. Pettibone.* First snow of the season on the 19th.

AMANA—*Conrad Schadt.* The weather was very dry and windy, so that sparks from passing locomotives started several fires, destroying considerable timber and several buildings.

BONAPARTE—*B. R. Vale.* A splendid month for maturing corn and all kinds of work except plowing; fall grain very spotted. Corn husking in progress the last ten days.

FOREST CITY—*J. A. Peters.* Temperature about 8° above normal, and precipitation about 1 inch below. Many of the farmers have finished picking corn; ground very dry.

GRAND MEADOW—*F. L. Williams.* The month was extremely favorable for all farm work; corn husking well along and the crop is in good cribbing condition; pastures still fair.

GRINNELL—*A. O. Price.* Too dry for plowing, but a pleasant month for farm work otherwise Less than an inch of rain during the past two months.

GUTHRIE CENTER—*Clem Holden* There has been no thunder storm during the month and the winds have been very light

HUMBOLDT—*Henry S. Wells.* Many are through huskin corn and others are making haste to finish. A few have los hogs but stock in general is doing well. But 50 per cent of th usual amount of fall plowing has been done, on account o drouth.

LAMONI—*T. J. Fitzpatrick.* The first killing frost occurre on the 17th.

OVID—*H. C. Miller.* A remarkably warm and dry month.

RIDGEWAY—*Arthur Betts.* A warm October; minimum temperature did not go as low as in September; much hazy weather; wild geese around since the 16th; no frost during the first 16 days. The 23d was a phenomenal day with the temperature ranging from 64° to 88° and averaging 76°, with a gale from the south.

TOLEDO—*Lulu G. Bookwalter.* A very pleasant month for corn picking but too dry for plowing.

WEST BEND—*Phil Dorweiler.* Month favorable for farm work and corn husking well along with pretty good yield.

ERRATA IN SEPTEMBER REVIEW.

Bonaprate.—Mean maximum temperature should have been 78°; mean temperature should have been 65 4°.

Cedar Rapids —Mean temperature should have been 66°.

College Springs.—Mean temperature should have been 66.1°.

Denison.—Mean temperature should have been 62 6°.

Dows.—Total precipitation should have been 2.14 inches.

Ovid.—Mean temperature should have been 64.7°.

Winterset.—Mean temperature should have been 63°.

CLIMATOLOGICAL DATA FOR OCTOBER, 1899.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIPITATION, INCHES.				Number rainy days	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Algona*	Kossuth	1,500	7	54 7	+7	82	22, 23	32	26,29,30	...	2 45	+.69	1.05	T	4	14	11	6	SE
Alta	Buena Vista	1,519	8	55.0	+6	88	12	28	28	40	1.98	- 33	.72	...	12	16	9	6	S
Britt	Hancock	1,230	...	53 2	....	85	12, 22	21	29	41	1.44	.....	.48	T	7	7	22	2	SE
Bancroft	Kossuth	...	...	53.2	...	85	12, 22	22	29	42	2.16	....	.75	...	8	18	6	7	SE
Charles City	Floyd	1,012	8	54.5	+5	84	22, 23	24	29	41	1 73	-.31	.50	.....	6	7	16	8	S
Cresco	Howard	1,312	27	52.2	+6	83	23	25	29	36	1 55	-.83	.75	.....	8	16	4	11	S
Decorah	Winneshiek	900	6	55.4	+7	85	23	23	26	40	1 04	-1.11	.59	.....	5	...	...	...	.....
Dows	Wright	...	...	55.3	.....	87	23	18	29	44	.69	.....	.32	.....	4	14	10	7	S
Eagle Grove †	Wright	...	...	45 4	.....	...	.....	.....	.....	...	.....	.....	.....	.....	...	...	...	...	.....
Elkader	Clayton	...	19	55.4	+7	88	23	27	29	50	3 09	+.35	1.70	.....	5	12	13	6	SE
Emmetsburg	Palo Alto	...	...	.....	.....	.....	.....	.....	.....	...	3 05	....	1.05	....	6	...	...	...	.....
Fayette ‡	Fayette	1,000	9	54 7	+7	84	15, 23	25	29	43	4.42	+1.67	2.72	.....	6	12	12	7	SE
Fonda	Pocahontas	...	...	53.7	.....	90	12	27	27	50	2.90	.....	1 08	.....	8	18	8	5	S
Forest City	Winnebago	1,220	...	55.4	...	85	15, 22	22	29	42	1.61	...	.61	...	6	14	9	8	N, W
Grand Meadow *	Clayton	...	8	53.8	+6	82	23	30	29	.....	2.02	- 52	.92	.....	3	8	16	7	NE, SW
Greene	Butler	943	..	56.2	.....	86	22, 23	24	29	45	1.22	.....	.46	.....	7	15	8	8	S
Hampton	Franklin	1,240	...	56.6	.....	88	22	17	29	46	1 39	.....	.40	.....	5	11	17	3	NW
Hawkeye	Fayette	...	...	.....	.....	...	.....	.....	.....	...	1 91	.....	1.00	.....	4	...	...	...	.....
Humboldt	Humboldt	1,082	..	56.3	.....	89	12	23	29	44	1.09	.....	.56	.....	10	22	4	5	SE
Hoprig	Emmet	...	...	.....	.....	...	.....	.....	.....	...	2.30	.....	.88	.....	6	21	7	3	.....
Lansing	Allamakee	...	8	57 0	.....	86	22, 23	27	30	42	1 27	.....	.47	.....	4	8	13	10	.....
Larrabee	Cherokee	...	...	52 8	+4	88	12	25	27, 28	52	1.42	-.73	55	.....	8	11	17	3	SW
Le Mars	Plymouth	1,221	..	54.7	.....	88	12	27	28	44	1.55	.....	50	.....	5	21	3	7	S
Mason City	Cerro Gordo	1,130	...	52.6	.....	87	22	19	31	52	.30	.....	.30	.....	1	...	...	...	.....
New Hampton	Chickasaw	1,166	...	55.8	.....	84	22, 23	25	29	41	1.31	.....	.60	.....	7	10	15	6	NW
Northwood	Worth	1,166	...	55.8	.....	84	22, 23	25	29	41	1.31	.....	.52	.....	5	19	4	8	S
Osage	Mitchell	1,210	...	53.0	.....	83	22, 23	24	29	41	1.41	.....	.24	.....	7	8	5	18	S
Plover	Pocahontas	1,178	8	53 2	+9	83	22, 23	22	29	35	.87	-1 70	1.00	.....	5	20	10	1	S
Primghar	O'Brien	...	...	55.6	.....	90	12	26	29	45	2.38	...	1.00	.....	3	23	0	8	S
Ridgeway	Winneshiek	...	...	52.6	.....	88	12	30	3	43	1.25	.....	.62	.....	13	15	11	5	S
Ruthven	Palo Alto	...	...	55.6	.....	88	23	28	29	38	2 07	.....	1.10	.....	6	3	14	14	S, E
Sheldon	O'Brien	1,406	...	55.4	.....	90	24	27	27	53	3 00	.....	1 97	.....	5	16	11	4	S
Sibley	Osceola	1,506	...	.....	.....	...	.....	.....	.....	...	4.39	.....	.89	.....	8	14	10	7	S
Sioux Center	Sioux	...	...	52 8	.....	87	12	24	28	48	2 68	.....	1.00	.....	7	16	7	8	SE
Spirit Lake	Dickinson	...	5	53.1	.....	79	12, 23	29	28	43	2.46	....	.74	.....	4	18	3	10	S
Storm Lake	Buena Vista	...	...	54.6	+7	87	12	28	27	43	2 07	-.11	.85	.....	10	22	3	6	S
Washta	Cherokee	...	...	55.0	.....	86	12	30	27, 28	39	2.12	.....	.40	.....	6	18	6	7	S
Waverly	Bremer	942	...	.....	.....	...	.....	.....	.....	...	1.11	.....	.82	.....	6	10	6	15	S
West Bend *	Palo Alto	...	6	56.4	+6	82	22	26	29	41	2 61	.....	1.14	.....	8	12	9	10	S
Average	.....	...	...	52 0	+6	86	15	25	29	.....	2.27	+.89	.....	.....	...	...	...	...	.....
		...	...	54.2	+6.4	86.0	.....	25.2	.....	43.5	1.90	-.34	.....	.....	6	15	9	7	S

CENTRAL SECTION.

Amana	Iowa	...	23	57.0	+9	86	15	29	17, 29	41	.98	-1 69	.55	.....	4	20	5	6	S, SW
Ames	Story	936	19	57.2	+7	88	22	23	29	44	.....	.....	.....	.....	...	10	14	7	.....
Audubon	Audubon	...	6	56.4	+7	88	12	30	29	43	2.80	+0 84	1 25	.....	5	2	20	9	NW
Baxter	Jasper	...	...	58.4	.....	88	12, 22	28	31	43	.64	.....	.32	.....	6	4	15	12	SE
Belle Plaine	Benton	840	9	56.2	+7	86	13	25	30	40	1 15	-1.37	.40	.....	6	9	15	7	SE
Carroll	Carroll	...	9	55 4	+6	92	12	25	26	53	1 79	-0 86	.88	.....	5	22	5	4	.....
Cedar Rapids	Linn	744	17	59.6	+10	88	13,15,23	31	29	44	.88	-1.78	.47	.....	2	16	7	8	SE
Clinton	Clinton	609	8	56 2	+5	88	13	27	30, 31	40	1 48	-0.10	.51	.....	7	13	12	6	SE
Coon Rapids	Carroll	...	..	57.4	.....	86	12, 22	29	29	42	2.23	.....	.87	.....	6	19	7	5	S
Davenport	Scott	615	27	59 2	+7	86	13	34	29	31	1.46	-1.07	.76	.....	9	17	5	9	SE
Delaware	Delaware	1,081	8	55.5	+10	85	23	26	29	37	1.14	-1 14	.54	.....	6	11	12	8	S
Denison	Crawford	1,192	6	55.8	+8	91	12	28	5	44	3.20	+1 55	1.25	.....	6	23	2	6	S
Des Moines	Polk	867	21	59.1	+6	91	12	27	29	40	.59	-2 36	.34	.....	5	17	8	6	SW
De Soto	Dallas	886		57.6	.....	88	22	24	29	43	1 38	.....	.66	.....	3	17	4	10	SW
Dubuque	Dubuque	665	26	56.8	+6	85	23	33	29	34	1.63	-2.06	.50	.....	8	12	10	9	SE
Galva	Ida	...	6	55.8	+7	90	12	27	27	39	1.57	+0.43	.80	.....	2	20	5	6	N, NE
Gilman	Marshall	1,035	..	...	.....	...	.....	.....	.....	...	.38	.....	.14	.....	2	...	..	....	S, SE
Grinnell	Poweshiek	1,011	..	57.9	.....	84	22	31	29	36	.61	.....	.36	.....	4	14	11	6	S
Grinnell (near)	Poweshiek	...	..	58.0	...	87	22, 23	30	28, 29	39	.60	.....	.25	.....	5	11	13	7	SE
Grundy Center (f)	Grundy	966	8	53.8	+4	86	22	24	29	42	1.19	-0.81	1.65	.....	2	.	...	...	.....
Guthrie Center (c)	Guthrie	1,269	...	60.2	.....	87	12	27	30	48	1.76	.....	94	.....	4	20	8	3	NW
Harlan	Shelby	...	...	57.2	.....	90	12	29	17, 29	44	2 93	.....	1.48	.....	8	13	10	8	S
Independence	Buchanan	921	37	55.6	+9	86	22	23	29	42	.72	-1.65	.62	.....	4	20	7	4	S
Iowa City	Johnson	644	9	58.1	+7	88	15, 22	28	31	42	1.66	-0.33	.76	.....	5	15	10	6	S
Iowa Falls	Hardin	...	6	55.4	+7	87	22	23	29	42	1.67	-0 59	.66	.....	5	15	9	7	NE, SW
Le Claire	Scott	928	34	55.2	+3	88	12, 22	27	28	42	1.70	.....	.61	.....	7	...	...	...	.....
Logan	Harrison	...	6	56.2	+3	88	13	24	31	45	1.39	-0.98	.70	.....	2	21	4	6	.....
Maquoketa	Jackson	898	7	58.4	+7	87	12, 23	23	29	45	1.59	-1.37	.57	.....	7	20	3	8	S
Marshalltown	Marshall	800	45	56 6	+9	88	12	25	29	42	.62	-1 94	.31	.....	4	24	2	5	N
Monticello	Jones	858	..	58.0	.....	86	13,15,23	30	29	...	1.10	-1.65	.57	.....	4	19	6	6	SW
Mt. Vernon*	Linn	...	...	59.0	.....	87	15, 22	28	29	41	1.30	.....	.70	.....	3	...	..	...	.....
Mt Vernon (Hubbard)	Linn	958	...	57.4	.....	87	22	26	29	36	1 28	.....	.60	.....	4	17	4	10	S
Newton	Jasper	...	..	56.7	.....	90	12	27	27	43	.61	.....	.31	.....	5	18	6	7	SE
Odebolt	Sac	...	..	58.8	.....	89	12	26	29	40	1.95	.....	.85	.....	4	23	0	8	.....
Ogden	Boone	1,109	....	55.4	.....	86	12,13,15	25	31	41	2.01	.....	1 02	.....	4	25	1	5	SE
Olin	Jones	...	....	58.4	.....	91	12	28	28	42	.89	.....	.45	.....	4	19	6	6	S
Onawa	Monona	...	..	55.9	.....	89	12	29	28	42	1.22	-0.89	.50	.....	8	22	6	3	SE
Rockwell City	Calhoun	1,219	..	55.8	+5	89	12	29	28	42	2.03	.....	.90	.....	8	24	0	7	.....
Sac City	Sac	900	20	57.6	.....	90	12	29	27	42	2.78	+0.50	1 47	.....	5	21	2	8	S
Scranton	Greene	...	...	54.2	+4	87	22	31	28, 29	37	1.65	.....	.66	.....	4	17	9	5	NW
Sioux City	Woodbury	1,122	10	58 3	+9	89	12	30	28	46	1 33	-0.30	.33	....	7	17	5	9	S
Toledo	Tama	...	5	56 2	+4	90	22	22	29	52	.49	-1 55	.16	.....	5	22	0	9	SE, SW
Waterloo	Black Hawk	862	20	57.5	.....	87	22	24	29	43	1.55	-0.73	.89	.....	5	10	13	8	N
West Branch	Cedar	708	....	55.3	.....	85	22	28	1	38	1 70	.....	.82	.....	5	13	10	8	SW, NW
Whitten*	Hardin	...	..	56.8	.....	88	24	32	29	.....	1.74	.....	.87	.....	5	8	21	2	S
Wilton Juncton	Muscatine	...	...	.....	.....	90	23	26	31	40	1.64	.....	.78	.....	4	18	6	7	S
Average	.....	...	...	57.0	+6.4	87.8	.....	27.3	.....	41.7	1.44	- 88	.....	.....	5	17	7	7	S

CLIMATOLOGICAL DATA FOR OCTOBER, 1899—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Afton	Union	..	..	58.8	.....	89	12	28	29	37	2.25	.....	.92	.....	4	15	13	3	S
Albia	Monroe	945	..	58.6	.....	87	10	27	29	44	2.17	.....	1 85	.....	2	9	15	7	SE
Atlantic	Cass	....	8	56 8	+7	90	12	26	29	50	3.66	+1.47	1.00	.....	8	9	15	7	S
Bedford	Taylor	...	..	60 7	.....	94	12	25	29	56	1 89	.....	1 16	.....	7	18	11	2	SW
Belknap	Davis	857	...	59 9	.....	90	12	31	29	46	1.20	.....	.60	..	5	21	7	3	S
Blockton	Taylor	....	....	59 4	.....	89	12	28	29	44	2 45	.....	1.14	....	3	18	4	9	.....
Bonaparte	Van Buren	....	8	59.4	+5	92	13	29	29, 31	39	1.20	-0 36	42	....	5	....	....	....	.....
Buckingham	Tama	....	....	.....	.....	....	.....	.....	.....	.....	.62	.....	.27	.....	4	16	10	5	.....
Bussey	Marion	....	....	.....	.....	....	.....	.....	.....	.....	1.55	.....	1 30	.....	2	....	....	....	.....
Centerville	Appanoose	1,013	6	59 8	+8	91	12	30	29	40	35	-1.67	35	.....	1	23	5	3	SW
Chariton	Lucas	1,080	....	59.8	.....	89	12	27	29	42	2 09	.....	.95	.....	9	20	6	5	S
Chillicothe	Wapello	645	..	.....	.....	....	.....	.....	.....	.....	1.95	.....	1 50	.....	2	....	....	....	.....
Clarinda	Page	1,069	..	60.2	+7	93	12	29	29	50	3.21	+1.88	2.16	.....	7	20	5	6	S
Corning	Adams	1,127	....	58 2	+5	89	12	28	29	45	2.35	+0.62	1 60	.....	4	23	3	5	S
College Springs	Page	....	....	60.0	+4	91	12	32	17, 28	39	2 42	-0.20	2 26	.....	3	23	3	5	S
Council Bluffs	Pottawattamie	989	...	59.2	.....	93	12	30	26 28,29	42	1.87	.....	1.00	.....	3	25	1	5	SW
Cumberland	Cass	....	....	....	.....	....	.....	.....	.....	.....	3 30	.....	1.50	.....	4	19	6	6	S
Danville	Des Moines	715	...	....	.....	....	.....	.....	.....	.....	1 47	.....	.45	.....	6	21	4	6	N
Diagonal	Ringgold	....	..	56.2	...	89	12	25	29, 30	39	1.10	.....	.70	.....	4	14	17	0	.....
Eldon	Wapello	....	..	60.2	....	93	13	27	17	47	.86	.....	.60	.....	6	20	5	6	S
Emerson	Mills	....	....	....	.....	....	.....	.....	.....	.....	1 50	.....	.80	....	2	..	....	...	E
Ft. Madison* (a)	Lee	516	51	60 0	+7	89	1	31	30	41	1.94	-0.81	50	....	6	....	....	....	S
Glenwood	Mills	979	29	60 5	+11	92	12	32	5	48	3 57	+1.16	2.60	.....	3	7	20	4	.....
Greenfield	Adair	....	8	58.6	+7	91	12	31	27, 29	39	1.67	-0 14	1.02	....	3	21	7	3	SW
Griswold	Cass	....	....	...	....	....	.....	.....	.....	....	3.25	.....	2 10	...	5	19	2	10	.....
Hamburg	Fremont	912	.	.....	.....	....	.....	.....	.....	.....	15	.....	.15	....	1	18	9	4	S
Hopeville	Clarke	....	8	59 0	+6	88	12	32	29	34	1.48	-0.38	.64	...	5	12	15	4	SW
Indianola	Warren	..	7	59 6	+5	88	12	27	29	37	.68	-0 94	.29	.....	5	19	5	7	S
Keokuk	Lee	618	28	61.0	+6	90	13	34	29	33	2 06	-0.56	.81	...	9	20	6	5	SW
Keosauqua	Van Buren	....	7	60.7	+6	92	13	29	31	40	1.02	-0 45	.69	.. ..	5	..	..	....	SE
Knoxville ‡	Marion	...	6	60.0	+8	87	12, 15	33	19	37	1.04	-1 38	.37	....	5	17	4	10	.....
Lacona	Warren	....	....	....	.....	....	.....	.....	.....	.....	.87	.....	.45	....	3	..	....	....	SE
Lamoni (d)	Decatur	....	....	59.3	....	88	12	27	5	55	.....	.....	.....	....	....	....	....	....	.....
Lenox	Taylor	....	....	59.0	...	88	12	32	29	37	2 01	.....	1.33	....	4	19	6	6	S
Melrose	Monroe	850	...	....	....	....	.....	.....	.....	...	.33	....	.30	....	2	20	0	11	SW
Mooar	Lee	....	..	60.2	.....	95	13	29	30	41	2 73	..	1.00	....	8	19	11	1	SE
Mt. Ayr	Ringgold	1,236	6	60 1	+7	89	12	32	17, 29	40	2 01	+0 13	.98	..	7	16	10	5	S
Mt. Pleasant	Henry	725	....	58.3	....	91	13	27	29	40	.62	.....	.32	....	3	22	5	4	S
Murray	Clarke	1,183	....	....	....	....	.....	..	.....	..	.95	.....	60	.. .	4	26	5	0	.....
Northboro	Page	....	..	...	...	....	.....	.....	.....	....	2.94	.....	2.46	....	2	....	..	....	.....
Omaha (Neb.)	Douglas	1,113	....	59.6	....	92	12	35	28	40	2 26	.....	1 44	....	6	14	12	5	SE
Osceola	Clarke	1,123	..	59.6	.....	90	12	30	29	39	1.75	.....	.73	.....	4	15	10	6	S
Ovid	Wayne	....	6	60.2	.....	90	12	28	29	44	2 91	.....	2.51	.....	6	19	3	9	SE
Oskaloosa	Mahaska	850	16	58.3	+7	88	15	23	29	42	1 45	+0 83	1.14	.....	4	19	4	8	SW
Ottumwa	Wapello	630	5	.....	.....	92	23	....	.....	.....	1 35	.....	1 00	....	2	20	3	8	E, S
Pacific Junction	Mills	960	.	58.8	....	93	12	29	28	45	2.28	.....	2.00	.....	6	15	16	0	S
Pella	Marion	....	...	58.8	.....	80	12	25	31	40	.51	.....	.30	.....	2	22	5	4	.....
Red Oak	Montgomery	1,033	....	60.9	.....	93	12	34	27	43	4.09	.....	2 98	...	4	15	14	2	S
Sigourney	Keokuk	....	..	58.9	.....	88	12,13,15	28	29	40	2.81	.....	1.25	.....	4	16	13	2	SE
Stuart	Guthrie	.. .	..	57.2	....	83	15	32	21,26,29	41	1 55	.....	1 09	.....	2	....	....	....	N
Thurman	Fremont	....	.	59 0	....	92	12	31	5, 29	44	4 64	....	3 72	.....	5	20	6	5	SW, NW
Villisca	Montgomery	1,058	6	58 8	+8	90	12	29	29	45	2.82	-0 91	2 15	.....	4	20	7	4	S
Wapello	Louisa	578	....	58 8		88	13	29	29, 31	36	1.07	.....	.26	.....	7	18	9	4	SE
Washington	Washington	738	8	57 8	+6	91	13	29	29, 31	40	.60	-1.05	.33	....	5	....	....	....	SW
Winterset	Madison	....	8	55.8	+4	90	12	28	29	37	1.20	-0.74	.45	.....	5	...	...	...	.....
Woodburn	Clarke	....	....	.....	.....	..	.....	.....	.....	.....	1.12	.....	.44	.....	6	16	11	4	.....
Average		....	...	59 0	+6.4	90.0	.....	29.1	.....	41.9	1.85	-.12	.....	..	4	18	8	5	S
Av. for the state		....	..	56.7	+6.4	87.9	....	27 2	....	42.4	1 73	- 34	.....		5	17	8	6	S

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Means.
	Max.	80	83	65	70	71	77	76	75	83	70	76	89	79	67	86	76	66	55	65	67	85	87	84	83	70	57	51	52	61	65	67	72 2
ton	Min.	44	50	46	46	40	44	39	42	47	50	52	59	64	41	57	44	29	41	32	36	48	62	61	62	52	45	42	34	28	37	34	45.4
	Max.	77	81	70	71	70	76	72	72	82	87	80	90	87	72	85	78	65	60	62	67	80	85	83	80	74	58	51	57	57	61	66	72.5
ola	Min.	33	49	43	48	48	41	42	47	44	62	54	53	55	43	51	44	32	38	32	37	41	52	62	61	55	47	41	33	27	34	34	44.6
	Max.	78	81	63	70	73	74	79	78	68	54	73	88	65	53	84	50	62	48	54	63	84	85	83	66	48	54	57	51	64	68	63	67.1
ta.....	Min.	44	56	40	41	39	44	38	42	54	47	46	62	45	34	47	34	34	30	34	34	48	64	65	58	45	37	32	28	31	38	41	43 0
	Max.	63	80	69	69	70	74	72	73	76	74	73	82	84	66	86	76	61	55	58	60	72	85	84	81	71	55	51	50	57	59	64	69.3
iana.....	Min.	47	48	47	51	34	33	36	34	45	46	57	63	66	46	56	49	29	41	34	33	45	59	62	63	55	49	46	33	29	33	31	44 6
	Max.	75	83	70	70	73	75	77	76	76	63	76	89	78	59	85	78	64	55	59	63	86	88	86	80	73	52	55	51	61	65	69	71 3
nes	Min.	48	53	47	46	33	32	33	35	48	52	52	60	55	39	52	44	30	40	34	34	47	62	47	65	48	44	37	33	23	33	34	43.2
	Max.	81	82	61	73	74	78	78	76	71	58	76	90	79	53	84	60	64	53	65	68	85	87	83	78	60	52	53	55	62	67	68	70.2
lantic...	Min.	47	56	49	40	27	28	31	30	55	51	51	64	52	42	53	33	32	37	33	38	52	66	66	59	47	40	35	31	26	40	34	44 4
	Max.	78	81	64	70	71	73	75	74	70	56	75	88	78	53	83	64	63	53	61	63	83	85	83	76	63	52	50	51	60	65	66	68 6
udubon...	Min.	48	59	49	41	33	35	38	38	55	51	50	62	50	40	40	38	34	38	35	38	51	65	66	61	48	32	35	32	30	35	37	41 1
	Max.	71	78	66	68	70	69	76	75	70	59	66	85	73	55	84	50	60	43	52	61	81	85	83	76	54	47	54	50	60	56	58	65.6
ncroft...	Min.	33	51	40	35	33	34	34	38	51	48	44	50	50	33	53	39	33	33	34	30	46	65	64	54	45	34	28	30	22	36	38	40 8
	Max.	72	83	78	78	76	82	80	80	81	69	75	88	84	66	87	60	64	56	64	63	84	88	87	82	63	51	56	54	64	63	74	72 6
xter	Min.	30	45	47	42	41	43	43	49	50	52	54	61	41	47	46	31	41	32	34	41	49	66	64	58	45	42	32	46	34	35	28	44 2
	Max.	83	86	80	76	80	86	83	83	88	74	82	94	84	77	88	77	68	60	72	75	90	90	87	79	69	53	53	60	67	70	73	77.0
dford ...	Min.	50	53	50	46	29	30	30	33	43	52	53	62	60	43	63	36	26	28	35	43	56	63	66	63	54	45	38	29	25	40	32	44 4
	Max.	70	82	70	70	72	77	77	77	84	76	75	90	89	80	86	57	66	65	63	75	80	86	84	80	64	54	54	53	60	60	67	72 4
lknap....	Min.	47	47	48	50	42	43	47	40	46	63	62	60	70	50	52	49	33	46	40	35	40	40	61	63	61	49	45	37	31	35	37	47.4
	Max.	65	80	65	70	69	73	72	73	75	72	70	82	86	70	85	58	62	53	58	60	73	85	84	81	69	52	55	53	50	58	66	68 5
elle Pl'ne	Min.	45	48	45	38	42	38	37	40	45	47	50	58	63	41	45	50	30	36	30	29	38	58	66	64	60	48	46	33	28	33	34	43 9
	Max	74	82	72	70	73	77	74	74	84	76	78	89	83	75	85	76	65	58	66	69	84	85	83	78	72	60	52	54	60	65	68	72.9
tockton ..	Min.	44	53	45	47	33	33	31	35	47	52	53	62	68	43	64	41	31	41	35	40	52	62	61	55	47	41	33	27	34	34	41	45.9
	Max.	67	83	74	64	74	77	74	75	84	73	74	86	92	73	88	56	64	61	65	65	75	87	82	62	57	50	46	37	29	33	29	71 7
onaparte.	Min	47	50	47	50	38	35	41	37	45	60	61	62	67	53	62	49	32	40	40	38	46	58	61	62	57	50	46	37	29	33	29	47.2
	Max.	70	80	65	69	69	69	74	74	73	51	68	85	76	58	84	74	63	54	51	60	82	85	84	74	55	50	54	49	49	62	61	66.8
ritt.....	Min	41	51	42	37	30	33	33	35	48	49	45	60	47	32	51	37	28	32	31	32	45	51	64	51	45	35	26	25	21	36	36	39 6
	Max	80	82	70	70	75	78	79	78	69	55	77	92	74	69	85	65	58	56	64	66	85	88	85	75	52	55	56	54	65	56	60	70.1
arroll.....	Min.	41	54	44	40	30	34	30	32	52	50	46	60	47	34	32	37	36	33	33	32	36	65	65	65	38	25	29	27	28	40	45	40.7
	Max	64	84	75	77	75	81	78	81	78	69	73	85	88	68	88	77	65	60	65	64	73	88	88	82	72	56	54	53	62	62	71	72 8
edar Rap.	Min.	48	50	49	49	38	37	41	37	48	49	58	64	65	47	56	47	35	39	36	35	45	59	61	64	54	49	44	35	31	33	33	46 4
	Max.	74	82	70	75	75	70	75	76	80	76	79	91	90	76	85	57	66	65	69	74	83	80	89	82	60	60	50	50	55	74	69	72.5
entervil'e	Min	49	53	50	43	40	47	42	46	47	60	60	60	70	42	59	47	32	33	46	50	48	46	49	58	49	48	40	33	30	43	36	47.0
	Max.	75	83	71	71	75	80	75	77	84	76	75	89	87	69	86	77	63	60	64	67	83	86	84	79	72	54	55	53	60	69	72	73.2
hariton...	Min.	48	54	48	48	35	38	44	37	45	47	52	62	64	44	60	45	33	40	32	38	49	62	62	62	51	46	45	35	27	47	37	46 4
	Max.	68	81	70	68	68	69	73	75	71	65	65	70	78	60	83	72	61	55	51	59	72	84	84	79	67	50	51	46	57	60	65	66 9
harles Cy	Min	45	47	47	37	29	30	32	36	49	50	50	50	56	36	52	44	31	35	34	29	45	59	64	63	48	45	37	32	24	33	35	42.1
	Max.	83	85	69	75	78	83	81	79	80	70	81	93	79	79	87	64	78	60	72	73	89	91	87	82	60	51	55	58	67	71	73	75 3
larinda...	Min	49	53	45	46	32	33	36	35	49	53	54	62	56	43	58	35	32	40	35	40	52	64	65	60	48	46	39	34	29	41	34	45.1
	Max.	57	78	75	71	70	73	71	70	75	75	75	82	88	69	86	72	67	62	59	60	59	82	82	80	76	61	52	55	56	60	52	69.4
linton	Min.	39	41	43	44	32	33	36	33	35	35	60	62	64	54	55	47	31	36	36	36	40	50	58	61	59	47	41	42	28	27	27	43 0
	Max.	82	83	68	73	75	79	77	73	83	..	80	91	79	68	85	77	65	60	68	69	85	88	85	80	71	52	54	55	64	68	68	73.5
ollege Sps	Min	48	53	44	47	36	40	45	42	50	51	54	62	52	41	59	43	32	39	37	40	52	63	64	63	51	44	41	32	33	42	39	46.4
	Max.	77	80	73	67	70	72	73	73	70	61	73	86	78	61	81	70	61	39	37	35	36	51	66	67	66	48	41	36	32	29	42	69 2
con Rap..	Min.	46	59	48	47	34	39	31	46	55	50	49	62	51	47	49	41	62	55	65	69	86	87	83	82	73	51	52	53	60	65	67	45 7
	Max.	80	80	69	70	74	76	74	74	79	64	77	89	79	62	85	77	65	43	30	41	30	38	51	63	64	64	49	45	40	33	28	41	30	71.6
orning....	Min.	48	54	44	46	35	31	34	33	50	54	55	62	59	42	56	43	61	66	67	67	72	90	89	86	75	54	57	53	54	63	67	70	44.9
	Max	85	86	68	76	76	79	82	78	78	61	79	93	73	56	84	67	51	36	38	45	43	60	58	64	50	47	30	32	30	30	38	35	73.4
o. Bluffs..	Min.	51	50	46	45	36	38	40	40	54	53	55	69	50	42	67	51	53	58	41	47	56	67	82	83	76	60	49	48	43	54	59	65	45.9
	Max.	60	77	67	67	68	67	72	74	71	55	62	74	70	58	81	53	58	41	47	56	67	82	83	76	60	46	41	34	30	25	33	35	63 4
resco.....	Min.	39	41	41	39	29	32	38	38	47	49	49	61	49	36	54	35	30	32	32	31	44	54	61	62	46	41	34	30	34	57	59	61	41.0
	Max.	57	78	74	66	70	74	71	72	76	72	70	82	86	67	85	73	63	61	61	58	62	82	83	79	73	59	47	46	40	34	36	26	69.0
Davenp'rt.	Min	44	49	55	50	43	43	44	42	50	63	62	63	67	56	56	49	43	42	38	41	45	58	63	63	59	47	46	40	34	36	26	49.3
	Max.	59	79	79	68	69	71	73	73	73	70	66	79	84	65	83	76	58	52	51	57	64	84	85	79	71	55	49	46	66	57	66	68 0
Delaware..	Min.	36	44	46	48	37	35	39	26	47	46	52	62	63	43	52	45	29	35	29	31	43	54	62	62	54	45	41	31	23	30	30	43.0
	Max.	60	78	66	68	66	71	73	74	70	62	63	74	76	63	82	71	61	55	50	59	67	82	85	71	70	70	65	68	70	69	64	68.5
Decorah....	Min.	40	44	45	44	32	36	42	34	47	49	50	61	54	38	52	39	30	33	33	27	42	58	67	64	47	23	30	32	40	38	40	42.3
	Max.	81	83	68	70	72	74	78	77	69	68	79	91	70	67	87	52	64	50	60	66	85	87	82	70	51	49	54	62	66	65	65	69.7
Denison	Min.	45	57	42	38	28	30	34	31	55	50	49	51	46	37	45	36	34	34	36	36	49	61	61	60	47	30	30	30	40	37	37	42.0
	Max.	76	82	65	72	73	77	75	75	83	63	75	91	81	62	88	77	64	54	62	66	86	87	84	80	65	52	55	56	54	60	65	71.5
Des Moines	Min	49	58	50	49	36	37	44	39	54	54	54	63	53	42	60	40	33	39	36	39	50	65	69	65	47	47	44	36	27	36	37	46.8
	Max.	77	82	66	72	72	74	75	74	80	63	77	87	78	58	84	76	65	53	61	65	83	88	84	80	60	50	54	51	59	63	68	70.3
De Soto....	Min.	43	55	50	46	32	33	32	34	54	54	54	64	58	42	63	37	31	40	34	37	51	61	66	65	49	45	39	33	24	40	34	41.8
	Max.	80	80	69	70	71	72	74	74	85	73	78	89	81	71	85	77	65	57	64	67	83	81	62	60	63	51	51	52	60	60	62	70 0
Diagonal ..	Min	42	51	44	46	32	35	40	35	47	45	51	61	63	41	63	41	29	40	33	33	50	65	40	43	45	48	42	32	25	25	31	42 5
	Max.	70	82	76	70	70	72	76	76	78	65	72	85	79	58	85	78	62	56	55	61	81	86	87	80	72	60	54	46	60	63	68	70.4
Dows	Min	47	52	57	34	30	32	32	34	50	50	47	62	51	34	50	37	31	33	31	30	30	60	62	61	46	42	32	26	18	35	33	41.2
	Max.	56	79	69	69	69	72	70	73	74	70	69	79	84	64	84	73	60	55	51	57	61	83	85	78	71	54	47	39	58	59	65	67 5
Dubuque ..	Min.	41	46	53	47	37	41	43	39	49	52	55	63	59	47	53	45	37	38	35	36	44	55	66	63	54	46	43	33	60	33	34	46.0
	Max.	71	85	75	70	75	80	78	77	86	78	77	80	93	75	89	80	67	65	68	70	80	89	87	82	75	59	52	55	60	62	70	74 5
Eldon	Min.	47	48	46	52	33	33	36	33	46	55	62	61	68	51	60	56	64	53	53	63	63	86	88	83	65	50	52	50	61	64	72	68.9
	Max	64	84	68	85	75	79	78	80	73	68	67	81	85	65	86	51	48	30	33	33	30	44	57	68	64	52	47	44	30	27	29	42 0
Elkader ...	Min.	35	45	46	41	29	33	32	30	41	45	52	63	56	40	64	88	52	62	50	57	64	85	87	86	70	50	53	57	52	64	67	69 3
	Max.	78	82	73	74	74	75	79	78	69	54	77	90	70	64	30	38	30	34	32	33	34	62	67	60	48	37	29	27	28	34	37	38 1
Fonda.....	Min	44	40	32	29	31	25	31	40	47	46	48	49	30	30	57	85	77	60	55	59	57	83	85	84	77	66	50	55	48	60	63	61	68 3
	Max.	68	78	66	70	71	72	76	75	71	67	64	84	73	47	41	51	35	32	33	32	35	44	65	62	60	45	36	31	30	22	35	42.5
Forest City	Min.	43	44	45	40	34	40	50	54	53	49	48	50	80	54	85	57	65	64	57	65	88	89	85	75	50	54	77	52	58	60	63	69 4
	Max.	80	81	60	70	73	65	78	76	67	59	77	90	63	57	32	47	35	35	32	35	32	35	60	62	55	45	36	27	28	38	30	38	41.1
Galva.....	Min.	45	40	40	30	33	30	37	35	53	50	58	79	92	86	62	87	87	65	60	65	70	89	90	85	80	68	55	55	58	34	43	33	46.5
	Max.	86	85	77	73	77	80	80	78	71	64	79	92	62	49	43	53	39	37	40	35	40	54	70	69	66	50	44	35	38	62	65	68	70.1
Glenwood ..	Min.	51	62	47	46	32	34	36	34	58	52	66	67	81	76	64	85	75	62	63	54	62	76	86	86	80	69	52	53	47	62	65	68	42.3
	Max.	68	84	74	72	73	74	78	78	72	66	51	49	62	55	36	51	45	31	38	33	29	45	60	60	63	48	44	36	54	55	63	67	71 6
Greene.....	Min.	44	47	45	38	31	32	33	36	50	50	78	77	91	85	55	84	76	65	54	63	86	89	85	82	65	50	54	36	31	33	31	40	45 6
	Max.	80	83	66	72	72	70	76	77	78	54	51	53	62	52	40	52	37	33	37	32	39	62	64	62	46	71	52	52	50	56	58	66	69.6
Greenfield.	Min.	45	55	46	43	44	45	47	48	54	79	70	73	84	81	65	84	76	61	56	58	61	78	84	84	79	52	47	44	33	52	38	38	46 2
	Max.	68	80	75	68	69	74	72	73	79	49	49	53	61	63	43	51	48	35	40	32	35	45	59	67	64	72	52	52	52	60	62	63	71.1
Grinnell...	Min	32	50	46	50	43	48	44	76	79	71	73	86	80	65	86	80	65	58	58	62	80	87	87	83	63	58	45	43	30	30	32	33	44 8
	Max.	72	83	72	71	73	72	74	74	78	73	86	73	87	79	52	82	71	61	55	50	59	67	84	87	87	63	63	58	45	52	60	63	71.1
Grin'l (nr.).	Min.	33	48	45	48	40	41	41	40	48	48	52	60	63	41	55	45	32	63	52	55	63	77	86	85	80	70	50	51	48	59	61	69	67.4
	Max.	68	83	66	70	70	72	75	76	75	62	..	..	..	..	..	..	..	40	31	30	30	43	57	63	61	45	44	36	30	24	31	32	40 1
Grundy C'r	Min.	46	49	44	43	30	35	33	32	46	47	..	..	..	..	..	..	..	..	63	60	64	83	84	82	81	73	..	52	51	..	59	67	75 4
	Max.	78	83	71	73	75	75	78	76	73	66	73	87	79	52	82	71	..	63	60	64	83	84	82	81	73	..	36	32	..	27	41	45.1
Guthrie C'r	Min.	46	58	45	46	29	31	30	40	55	52	50	62	51	38	46	41	..	36	35	36	52	66	68	66	47	..	52	57	48	63	65	71	69.9
	Max.	70	85	70	75	74	80	80	81	72	57	69	83	73	61	87	56	60	62	64	61	80	88	87	80	55	52	57	48	63	65	66	71.3
Hampton..	Min.	46	49	47	42	36	39	35	43	53	51	48	61	50	37	52	44	33	34	32	30	45	63	66	64	46	42	34	32	17	38	37	43.4
	Max.	80	84	74	70	72	73	76	76	69	61	77	90	81	60	86	79	65	56	63	66	85	87	83	63	65	47	41	33	30	29	37	35	43.1
Harlan	Min.	46	57	45	43	32	33	35	32	52	50	49	61	48	40	47	37	29	36	35	38	49	63	63	63	47	41	33	53	60	64	68	71.3
	Max.	79	82	64	69	73	78	75	74	83	72	75	88	78	69	84	63	67	57	63	67	84	86	86	83	78	72	50	41	53	60	64	68	71.3
Hopeville .	Min.	45	52	46	49	42	44	45	48	49	51	52	61	59	43	55	33	39	40	33	39	51	61	63	64	50	46	42	35	32	39	38	46 6
	Max.	74	80	70	68	71	72	76	76	72	61	75	89	84	57	84	79	63	59	53	62	84	87	84	76	68	52	54	50	62	64	64	70.0
Humboldt.	Min.	46	60	56	40	31	32	32	36	52	50	47	60	53	33	48	40	35	35	34	54	60	70	86	85	80	70	53	51	45	58	60	69	68.8
	Max.	62	82	69	77	70	73	74	75	74	69	70	81	80	61	85	78	60	51	54	60	70	86	85	80	70	55	46	43	30	23	31	31	42 5
In'pend'ce.	Min.	42	44	42	35	37	33	39	36	42	45	51	62	66	38	54	45	29	41	29	34	42	55	61	60	55	46	43	30	23	31	31	42 5
	Max.	76	82	73	71	73	78	75	76	83	70	75	88	83	67	86	80	63	58	62	66	86	87	85	80	72	53	52	52	61	65	71	72.2
Indianola..	Min.	48	54	46	49	38	41	44	42	52	51	53	62	66	40	58	45	33	43	31	37	49	65	67	64	52	46	46	34	27	38	38	47.1
	Max.	62	83	73	71	72	78	76	76	78	76	76	86	87	70	88	76	65	58	61	63	73	88	86	82	71	58	52	51	59	61	67	71.7
Iowa City..	Min.	40	45	44	51	34	43	36	34	43	44	61	62	67	48	54	48	32	38	35	37	42	53	61	58	56	48	45	34	30	29	28	44.5
	Max.	70	81	67	70	70	72	75	75	73	58	72	83	72	59	82	71	60	55	56	62	80	87	84	80	72	52	54	54	57	61	67	68.7
Iowa Falls.	Min.	47	50	45	41	30	31	33	33	49	50	50	61	48	38	54	36	30	33	31	31	45	62	65	63	45	43	35	30	23

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR OCTOBER, 1899—CONTINUED.

STATIONS.		DATE.																														Means
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Lansing....	Max.	60	70	80	72	72	69	74	77	79	72	62	73	80	76	83	72	62	56	68	60	66	86	86	82	75	57	52	52	64	63	72	70.
	Min.	35	42	45	42	32	34	34	35	44	40	52	61	58	58	51	49	30	42	52	30	44	56	70	66	55	47	44	30	28	27	32	44.
Larabee....	Max.	79	80	65	67	70	70	72	69	68	57	70	88	63	53	85	50	52	53	60	64	84	85	86	75	50	62	57	50	65	67	63	67.
	Min	27	38	35	38	33	37	40	36	50	46	42	57	42	30	42	33	33	26	35	33	47	63	65	46	37	33	25	25	29	37	37	38.
Lenox.....	Max.	79	80	71	69	72	76	74	74	79	66	76	88	81	66	84	81	64	55	61	68	83	84	87	80	72	50	50	53	60	64	67	71.
	Min	48	48	46	48	39	44	46	43	50	52	53	61	66	41	52	44	33	41	33	38	64	51	61	63	50	45	41	34	32	40	38	46
Le Mars....	Max.	79	75	64	63	73	73	76	73	71	70	70	88	72	63	82	68	64	55	56	66	82	82	82	74	52	54	57	54	65	62	60	68.
	Min.	47	57	37	37	29	31	35	32	51	48	43	54	42	29	49	34	37	30	35	36	52	62	62	49	40	34	31	27	31	40	39	40
Logan.....	Max.	65	80	70	75	71	75	80	76	65	72	79	88	76	71	64	60	67	58	64	67	86	88	84	71	64	58	52	54	65	60	64	70
	Min.	38	54	52	48	30	35	38	34	39	40	47	50	42	38	35	33	35	33	34	38	44	65	63	42	45	40	30	27	34	38	32	40.
Maquoketa	Max	57	80	71	70	71	75	77	73	74	71	70	82	88	74	87	75	64	68	63	65	63	85	86	81	76	62	52	58	60	60	62	71
	Min	34	44	43	50	31	43	32	31	34	42	59	61	64	49	59	46	32	30	38	30	31	41	50	59	52	46	43	35	28	25	21	41.
Mason City	Max.	65	84	72	68	68	70	77	76	73	56	65	78	75	60	84	72	61	..	51	60	76	87	78	76	69	52	51	47	62	..	..	68.
	Min.	45	45	40	38	27	29	25	31	52	48	45	62	51	32	59	40	32	..	31	25	46	68	64	63	45	36	25	27	19	..	..	38.
Marsh'lt'n.	Max.	70	83	69	74	74	78	77	77	76	68	75	87	83	66	84	81	66	56	61	63	82	88	87	81	73	52	54	54	62	63	72	72.
	Min.	47	50	45	45	34	33	39	36	52	49	52	62	66	42	55	45	31	37	32	33	46	61	66	65	51	46	43	31	23	34	35	44.
Monticello.	Max	68	60	62	72	71	76	75	72	70	71	82	88	80	82	85	86	83	75	68	60	65	86	87	80	72	67	68	60	58	60	66	72.
	Min.	40	40	48	30	29	31	34	30	31	43	64	69	60	58	49	46	33	32	33	31	41	54	56	58	52	47	33	29	25	27	26	40.
Mooar	Max	67	86	77	71	77	78	77	75	82	68	70	88	95	85	88	72	68	61	66	68	72	86	86	75	64	56	62	58	59	61	65	73.
	Min.	47	45	46	40	46	45	36	42	44	60	61	60	67	55	60	48	39	37	45	41	43	60	49	60	60	50	44	42	33	29	30	47.
Mt. Ayr. .	Max	80	81	67	77	78	78	74	74	84	75	78	89	80	73	85	77	65	56	65	70	84	86	82	79	71	51	52	53	62	65	68	72.
	Min.	48	50	45	49	38	50	44	48	47	52	52	61	63	43	65	43	32	41	33	39	51	62	62	63	51	45	46	34	32	40	38	47.
Mt. Ple's'nt	Max.	67	80	73	66	70	75	73	72	82	74	76	84	91	72	87	79	62	64	61	63	73	87	85	83	76	64	52	55	56	63	64	72.
	Min.	44	46	44	43	33	35	37	35	44	58	60	58	64	48	56	44	31	36	34	34	64	54	58	58	55	48	43	35	27	29	29	44.
Mt. Vernon	Max.	63	83	75	79	78	84	82	83	78	70	76	86	84	68	87	53	66	63	63	66	72	87	85	82	66	52	51	53	63	63	70	72.
	Min.	45	47	48	51	39	44	43	42	44	55	60	62	60	46	54	44	33	42	32	35	43	55	61	60	57	47	43	33	28	35	35	45.
NewH'pton	Max.	61	80	72	68	67	69	72	74	71	66	66	78	74	60	83	83	59	55	50	59	71	84	84	77	69	50	50	44	56	60	66	67.
	Min	41	45	51	45	53	46	50	41	45	51	49	61	57	45	45	42	38	36	33	32	44	57	60	60	48	44	41	30	25	33	34	44.
Newton....	Max.	70	80	64	70	71	75	73	74	82	70	72	85	78	60	85	74	63	54	61	60	81	87	83	79	70	50	53	50	58	62	68	69.
	Min.	48	48	45	48	41	39	39	46	48	50	51	59	58	42	57	42	31	38	34	35	47	62	65	64	50	47	44	32	26	33	33	45.
Northwood	Max.	65	80	65	67	70	67	74	74	71	55	63	77	72	59	82	71	60	53	46	58	74	83	83	71	57	49	52	46	58	60	60	65.
	Min.	40	46	45	48	32	38	35	33	44	48	44	61	47	33	49	36	28	33	31	29	43	59	63	55	54	38	40	30	24	30	31	40.
Odebolt	Max	80	82	68	71	74	77	79	78	69	59	77	90	85	60	85	79	62	58	60	65	86	87	84	78	69	55	56	52	64	66	65	71.
	Min	45	58	40	39	31	35	34	41	35	48	46	64	60	35	48	36	35	33	35	33	49	60	66	46	47	39	27	28	31	41	32	42.
Ogden.....	Max.	77	83	71	74	76	77	77	78	73	66	76	89	73	60	85	78	64	57	60	64	86	87	85	80	75	52	65	61	62	66	73	72.
	Min.	47	53	50	44	44	35	42	38	52	51	50	63	52	40	54	42	34	37	34	37	49	68	64	64	47	42	33	30	26	37	35	44.
Olin.....	Max.	59	78	71	69	69	74	72	71	76	69	72	86	86	65	86	52	61	57	58	64	67	86	88	84	71	64	58	52	54	65	60	64
	Min	30	41	44	50	32	33	37	32	39	45	54	62	72	48	50	50	29	34	33	36	42	56	62	62	60	50	44	34	26	27	25	43.
Omaha.....	Max.	85	84	64	70	75	77	77	76	66	60	77	92	82	60	86	54	65	57	64	70	89	88	84	75	60	55	56	57	63	69	67	71.
	Min.	53	51	46	48	43	43	47	47	56	53	53	66	50	43	46	41	39	40	39	43	56	69	71	59	48	44	37	35	41	47	39	48.
Onawa....	Max.	82	84	68	73	80	79	81	81	68	64	80	91	68	59	88	66	63	58	69	69	87	89	86	70	58	61	63	62	65	68	68	72.
	Min.	50	58	42	39	34	37	39	39	58	52	50	65	46	35	48	38	35	34	39	39	53	65	68	54	46	37	31	28	31	44	42	44.
Osceola....	Max.	78	83	64	70	74	80	76	72	83	72	76	90	81	73	86	57	64	56	63	68	86	87	87	79	61	59	52	53	61	66	71	71.
	Min.	46	54	45	48	40	41	43	49	50	49	53	62	63	42	60	46	34	42	32	37	50	63	65	63	57	46	46	35	30	40	38	47.
Ovid	Max.	76	84	76	74	77	83	79	80	85	76	75	90	86	73	86	61	64	66	71	69	84	87	85	79	61	51	63	56	63	65	74	74.
	Min	47	52	43	49	37	39	43	44	50	47	55	60	60	45	63	38	33	39	32	39	49	64	62	62	51	46	44	31	28	37	37	46.
Osage.....	Max.	62	78	67	66	66	67	72	72	71	60	63	75	71	58	81	78	59	54	49	57	70	83	83	76	68	50	50	45	55	59	63	65.
	Min.	39	45	46	38	32	33	37	38	46	49	45	60	51	34	49	38	30	34	31	29	43	59	63	63	45	42	31	31	22	33	35	41.
Oskaloosa..	Max.	71	84	69	70	72	77	76	75	81	77	76	88	87	67	88	77	64	60	61	66	81	86	86	80	69	52	52	54	59	62	70	72.
	Min.	48	53	43	48	34	37	38	33	48	47	55	60	60	45	58	43	23	40	32	36	47	59	63	64	52	48	44	29	23	35	29	44.
Ottumwa...	Max.	71	80	71	68	75	77	76	75	84	76	75	84	90	74	87	63	69	63	64	65	81	87	92	87	71	58	56	55	60	62	66	73.
	Min.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Pacific Jct.	Max	86	85	64	70	74	75	78	77	70	61	80	93	72	56	87	54	65	55	66	73	89	90	87	84	75	50	55	54	55	69	69	71.
	Min.	51	62	47	44	31	32	33	32	58	53	53	65	49	43	53	41	31	43	38	40	55	67	67	67	58	43	33	29	35	45	35	46.
Pella.....	Max.	70	75	70	64	63	60	58	64	68	70	70	80	67	64	60	51	50	47	59	58	75	78	76	72	55	50	50	45	50	60	65	62.
	Min.	40	43	48	46	40	40	42	44	46	40	45	60	50	48	44	43	35	31	30	32	48	56	58	60	55	40	45	33	30	30	25	42.
Plover.....	Max.	78	80	70	65	76	78	76	78	64	60	76	90	72	60	86	60	55	65	55	70	82	86	87	70	60	70	62	50	70	60	65	70.
	Min.	35	50	40	55	40	30	38	40	40	38	42	45	48	40	55	36	29	40	35	30	45	65	67	60	45	40	29	27	26	50	35	41.
Primghar ..	Max.	53	68	60	70	58	60	56	85	75	50	54	88	70	72	70	70	56	52	50	52	60	75	85	75	75	48	60	45	57	70	70	64.
	Min.	45	42	30	40	37	48	45	42	45	45	40	48	43	32	35	33	35	29	35	37	42	55	50	60	45	33	46	35	33	40	38	40.
Red Oak...	Max.	75	80	83	80	81	85	79	80	74	63	79	93	80	65	86	62	65	62	72	70	88	90	80	81	63	55	45	54	57	69	75	73.
	Min.	50	51	51	48	39	35	43	37	55	42	54	64	65	45	58	45	37	42	36	42	64	67	63	61	50	47	34	46	45	45	47	48.
Ridgeway..	Max.	60	80	74	69	70	71	74	76	71	66	66	74	75	63	82	74	60	50	50	57	68	83	88	78	66	51	49	46	57	65	71	67.
	Min.	39	44	47	45	40	40	36	44	50	53	50	65	53	37	54	42	30	36	34	30	42	59	64	64	49	44	35	34	28	35	37	43.
Rockwell C	Max	76	81	66	72	73	73	76	76	71	60	78	89	69	55	84	52	63	48	59	63	83	86	83	74	52	56	70	50	61	65	65	68.
	Min	46	56	44	42	31	35	46	40	51	49	48	59	50	34	48	39	34	34	35	31	49	52	67	62	46	48	30	29	31	34	35	43.
Ruthven...	Max.	70	78	83	68	73	70	77	71	75	72	61	80	75	76	81	81	58	59	60	59	80	82	82	90	60	65	56	55	60	65	66	70.
	Min.	36	41	30	45	65	59	35	36	52	51	42	55	44	35	32	32	35	30	32	29	40	45	65	62	30	35	27	28	30	32	33	40.
Sac City....	Max.	79	81	67	71	74	74	78	77	68	59	75	90	69	54	86	57	62	58	58	64	85	87	84	73	60	52	55	52	63	67	64	69.
	Min.	45	50	40	40	36	40	34	40	54	48	48	60	48	34	47	32	35	33	35	34	50	65	67	60	41	38	29	31	30	37	41	42.
Scranton ..	Max	77	82	71	68	70	71	74	75	70	63	74	82	78	63	82	77	63	57	58	63	85	87	84	78	75	50	53	50	60	64	65	70.
	Min	46	58	48	45	39	40	41	43	55	51	49	61	51	37	49	40	35	32	35	35	50	66	67	67	48	40	32	31	31	38	39	45.
Sheldon ..	Max.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
	Min	45	58	33	34	27	33	32	30	50	45	40	50	42	28	34	40	33	27	33	34	45	57	60	47	45	33	27	27	30	34	39	38.
Sibley.	Max.	78	72	68	68	74	75	82	78	63	57	52	87	71	53	83	70	57	53	50	64	82	80	83	75	50	53	57	53	67	69	55	67.
	Min.	40	55	34	34	28	38	34	38	47	44	39	49	41	32	47	32	33	27	33	33	45	53	55	44	42	33	37	24	29	37	35	38.
Sigourney..	Max.	71	85	73	..	..	..	77	81	77	75	88	88	71	88	67	68	61	65	66	79	87	87	82	74	59	52	54	59	62	68	72.
	Min.	48	48	44	35	35	37	35	37	46	48	60	61	64	45	57	47	30	40	34	36	45	60	67	61	58	49	45	34	28	33	31	45.
Sioux C'ntr	Max	76	73	63	64	70	68	70	71	63	59	55	79	68	52	76	61	56	52	51	62	76	78	79	77	63	50	53	49	59	63	60	64.
	Min.	44	56	32	45	41	45	43	42	52	49	43	52	43	31	48	32	34	30	34	37	50	58	61	34	43	35	32	29	34	42	41	41.
Sioux City..	Max	83	72	63	66	74	74	76	70	61	58	73	89	59	52	83	53	58	50	58	66	86	83	83	56	52	55	57	56	65	69	62	66.
	Min	52	59	41	41	32	34	38	37	36	49	46	64	43	34	45	38	38	32	32	39	40	53	65	51	46	38	32	30	32	37	42	41.
Spirit Lake	Max.	78	78	78	70	73	75	84	77	82	74	61	87	65	53	83	57	60	52	50	64	81	83	82	73	47	51	56	52	65	69	65	68.
	Min.	42	35	42	38	37	39	41	35	50	47	40	60	42	35	50	35	36	30	36	35	47	65	63	47	43	34	28	30	32	39	35	40.
StormLake	Max.	75	78	64	69	72	72	77	74	65	56	72	86	78	53	82	77	62	52	53	61	81	82	80	73	52	54	56	50	62	65	63	67.
	Min	45	56	39	42	40	38	42	45	54	48	46	58	45	34	43	34	37	32	35	34	49	62	62	52	40	35	30	30	35	41	35	42.
Stuart	Max.	67	80	75	70	75	73	75	70	77	75	70	72	75	57	83	80	63	58	65	68	73	80	80	82	68	70	67	63	54	65	67	70.
	Min.	52	45	46	49	40	43	43	45	52	52	54	56	40	40	48	55	33	40	39	38	32	58	54	55	37	32	35	34	32	34	38	43.
Thurman..	Max.	84	83	75	70	75	76	75	74	71	63	77	92	82	60	86	80	64	57	65	69	87	88	84	80	64	53	54	55	62	67	68	72.
	Min.	51	60	48	46	31	33	34	32	57	54	54	66	50	45	51	40	32	41	36	42	49	65	66	60	50	45	35	32	31	45	36	45.
Toledo.....	Max.	70	84	63	78	81	82	80	80	76	75	87	83	75	70	89	61	65	65	60	64	80	90	87	76	70	55	57	50	65	58	75	72.
	Min.	46	51	43	45	31	30	36	32	51	53	62	70	42	45	55	46	28	41	32	33	45	60	67	61	51	47	45	28	22	30	36	44.
Villisca....	Max.	78	80	62	70	75	80	78	75	77	65	80	90	75	80	86	81	71	54	66	70	89	88	85	82	76	57	52	55	52	68	69	72.
	Min.	43	55	50	47	32	35	37	35	44	48	53	60	55	43	65	44	30	40	35	34	43	50	64	65	58	46	38	31	29	40	36	44.
Wapello ...	Max	59	79	71	64	69	72	70	69	78	70	82	78	88	68	84	75	60	61	59	60	69	83	85	80	76	64	57	58	60	58	65	70.
	Min.	47	46	54	50	37	38	43	38	48	61	60	59	63	55	57	50	37	41	40	40	44	58	64	63	60	43	47	39	29	39	29	47.
Washingt'n	Max.	66	82	73	66	72	77	74	73	80	73	77	86	91	67	88	58	65	63	64	65	76	88	86	82	70	54	51	55	60	62	68	71.
	Min.	45	46	45	48	35	37	39	37	46	53	58	58	62	49	55	43	31	38	32	35	42	56	62	60	52	45	41	32	29	33	29	44.
Waterloo...	Max.	65	83	67	73	72	75	77	78	75	64	69	82	79	63	85	69	62	56	56	62	74	87	86	81	76	51	52	50	60	62	71	69.
	Min.	46	47	43	40	33	32	37	35	47	47	51	64	52	39	55	45	31	37	33	32	44	58	67	61	47	46	41	31	24	32	31	42.
Waverly...	Max.	64	81	69	70	69	72	74	76	73	59	68	81	77	61	85	75	61	54	55	61	75	86	85	80	71	50	51	47	57	63	68	68.
	Min.	46	49	45	43	33	34	36	37	51	51	51	64	61	39	55	45	33	38	34	34	34	61	66	61	49	46	40	32	27	36	38	44.
Wilton Jc..	Max.	60	78	72	68	69	73	68	70	76	70	75	83	88	65	84	76	60	59	59	59	67	83	90	87	83	60	58	54	55	60	62	69.
	Min	44	46	47	41	34	33	38	34	42	54	60	61	56	52	54	48	33	40	35	36	42	55	56	57	57	42	39	38	29	28	26	43.
Winterset.	Max.	78	77	64	72	74	79	78	78	82	65	77	90	73	67	86	54	65	56	63	66	86	88	85	83	61	59	53	56	52	65	79	64.
	Min.	44	53	46	48	37	49	41	42	48	52	52	61	67	43	67	45	32	34	33	36	50	63	65	64	56	45	40	53	28	40	48	47.
West Br'ch	Max.	60	72	65	79	76	68	68	70	74	76	65	80	82	82	84	70	60	60	62	65	70	85	84	80	65	62	64	63	68	60	72	70.
	Min.	28	34	36	48	40	30	34	38	42	40	48	62	58	48	56	60	30	35	38	36	40	56	60	56	48	45	48	50	45	42	41	44.
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DAILY AND MONTHLY PRECIPITATION FOR OCTOBER, 1899.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
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																									.92							2.25
			T	T						.80	.20			.33											.32	T	T					2.17
										1.85						T									.90							2.45
		T								.25					1.05		.25								.05							1.98
			.10							.25	05	T				.60	.05	.15					.01	.72	.42							.98
	T									.07	.48					.01									.40							2.03
											1.10			.50		.03							1.00	.90	.11						3.63
			T							.31	.03			.43	.77	.11								1.25							2.80
			.20							.22				.33		.80							60	.20	.10						2.16
			.01							.28	.20	.02		T		.75							.05	.06	.01						.64
										.10		T		.32	.10									1.16		.02					1.89
				.07						.02	.09			.45		.08								.60	.35	.05					1.20
										.10			T			.10								.25	.10						1.15
				.10						.10	.40			.20										1.14							2.45
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			.08							.26				.27		.01									.25						1 55
										1.30														.58							1.79
										T		.06		.14	.88								T	.47							.88
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										.95	.70	.03			T	.04							T	.10	.47						1.73
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										1.50						T								2.16	T						3.21
										.05				.57		.33									.37							1.48
			.10								.13		.41			.32						.25			2.26	.07						2.42
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		T	.10						T	T		T			.77									13	.28							3.30
										.75	.03		.07	.17		.10				.02					1.50	T						1.47
			T							T	.30			1.2		.30									.45	.10						1.46
											.32		.10	.30		.20									.02	.22	.02					1.14
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										.59	.05			.06										1.25	.75							.59
										T	T			T		1.05		.05		.05					.34	T						1.38
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			T						T		T			.66		.15								.70							.69
										.10	.10			.20										T	.20							1.63
										.05	T			.12		.32									.38	.03						.86
	T		T							.19	.50		.02	.17		.12		T				.22			.60	.09	.02					3.09
	T			T						.09	T		T	.02		.04								T	.25							1.50
										.10	.91			1.70		.10		T								.80						3.05
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										.29	.10					.81		.15							.50	.44	.14					2.90
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		T							.04	.03	.01				T	1.08	.07							.22	.42							1.57
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										.46	.16			.13		.11								T	1.02							.61
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										.20	.10			.03		.82									.24							1.76
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										.52				.27																		1.39
										.15														.20	.33							2.93
										.4				.3	.09							T		.08	1 48	.05						1.91
			.11							.05	.03			.02		1.13									.35							1.48
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			.02								.5			.26		.06								.85								1.09
							.01		.01							.88		.15		.40		.01		.06	.10							.72
										.03			.03	.08	.03	.56		.05						T	.01							.68
			.14							.62						.02						T			.29	T	01					1.66
				.02						T	.24	T		.12										.76	.04							1.67
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			T						T	.33	.22			.66		.13	T								.18	.81	.02	.22				1.02
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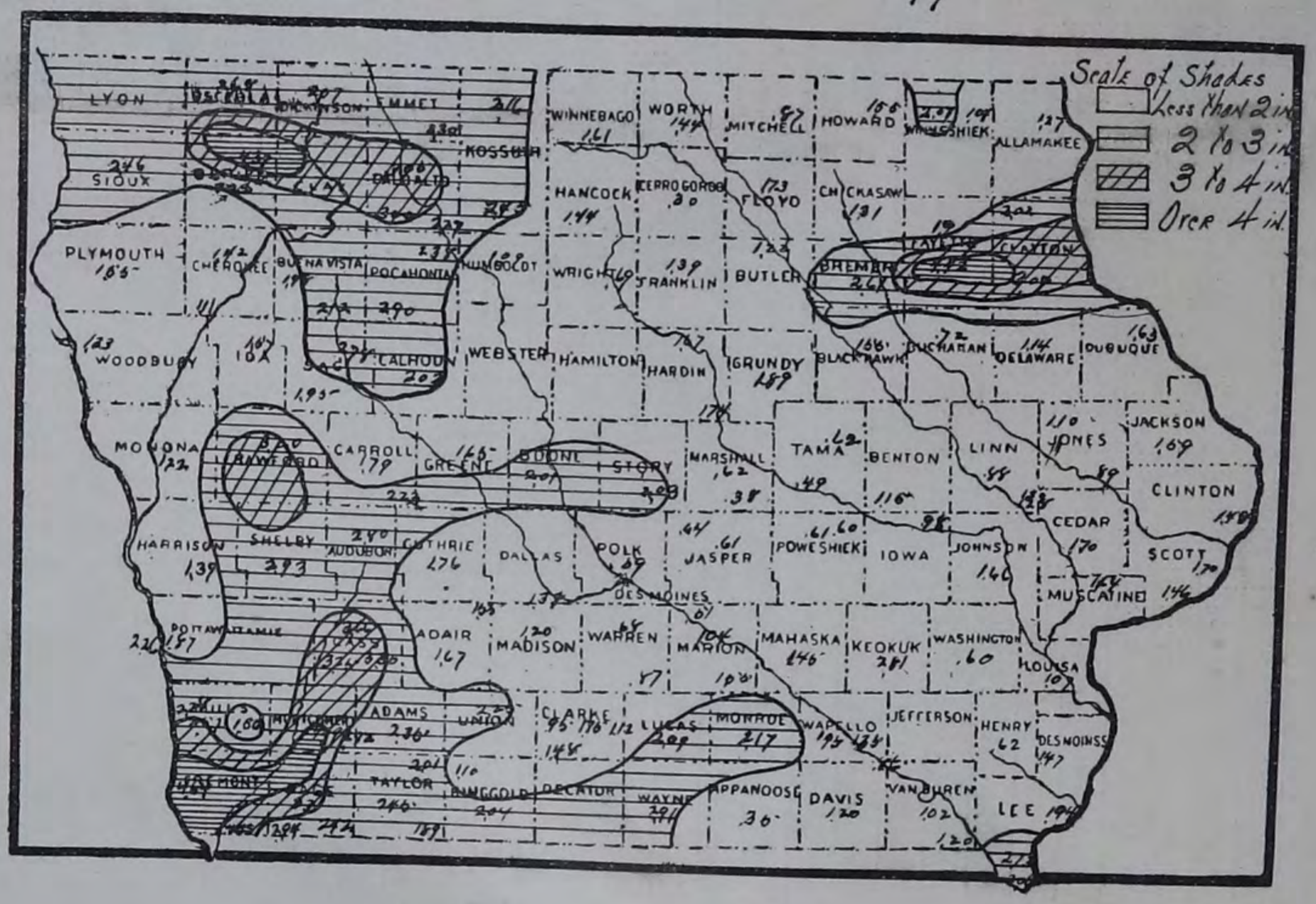
										1.16		T		.02		.08									.20							1.42
										.20	.47				.40	T								.12	.18							2.01
		.05								.10	.20				55		.22		T						1.33							1.55
											.29			.27		.12								.40							..	1.70
		.15									.4					.50		.10								.31	.30						1.39
		T									.11	T		.61			.21					.11	.05									1.59
									T					T	.65										.70							.30
			.03								.14			.37		.16						.04			.28	03						.62
										.57																						.33
										.30				T											.08							1.10
										T	.12			.31		.11									.30							2.73
										.03														T	T	.57						1.28
									T	.25			T	T	.13						T	.15			.20	1.00	.04	.08				1.30
										.25	.08		.90	T		.20									.6	T						2.04
	T		T							.60				T		.01						.07			.70	T						.62
										.5								T				.10			.98	T	.03					.95
			.14							.29	.31			.21		.06									.32							1.31
	T									T				.17		.13									.60							.61
										.15					.20									.04	.60							2.94
										.26	.19		.09	.01		.12								T	.16	T	T					1.44
			T							.31		.01		.05		.08									2 46							1.95
													.48											.31	.2							2.01
										.21						.52		.18						.65	.40							.89
										T	T					.85		.05							1.02							2.26
											.25	.51		.23								.07			.45	T						1.22
										.28						.09								.31	1.24	.02						1.75
			.09							T					.02	.58		T					.02	.12	.50						2.91
			.12							.04	.01					.37		.04				T			.68	T	T					.87
			T							.05	.29	T		.73		T									.33	.02						1.45
										2.15	36				.01	.01								.06	.21							1.35
										.24	.02			T	.12	.18		.04							.26							2 28
	T			T						79	.35					.05								T	1.00							.51
									T	.35															2.00	.05						
			.15								.01	.03			.04										.21							
										.30																						

DAILY AND MONTHLY PRECIPITATION FOR OCTOBER, 1899—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Plover										.10				T	1.00	.18								1.00	.10							2.38
Primghar		.10									.15													1.00								1.25
Red Oak			T							.03				.98											2.98	.10						4.09
Ridgeway									.01	.52	.05	.05		.07	.12	.09			.02			.01		.62	.44	.04		.03				2.07
Rockwell City			.21						T	.06	T	.22		.12	.05	.90								.12	.35							2.03
Ruthven										.20	.40					1.10		.20						.90	.20							3.00
Sac City										.07				T		.91	.06							1.47	.27							2.78
Scranton			T							.12	T			.24	.66										.63							1.65
Sheldon			.25						T	T	1.04				.26	.34								1.97	.78							4.39
Sibley									T	T	.33	.01				.60		.05	.04						.51							2.68
Sigourney										1.25	.94													.89	.60	.02						2.81
Sioux Center		T	.24						.03	T	.27	.05			.67			T						1.00	.20							2.46
Sioux City		T	.24						T	.18	.23				.33	.12		T							.18							1.33
Spirit Lake										T	.70				.50	T	.13						.05	.74								2.07
Storm Lake			.03							.20	.01		.01	T		.85	.01	.16					.05	.45	.32							2.12
Stuart														.55	T	T									1.00							1.55
Thurman			T						T	.06				T		.76								1.00	2.72	.10						4.61
Toledo									.04	.15				.10		.09									.10							.49
Villisca			T							.15						.52									2.07	.08						2.82
Wapello	T									.13	.14		.26	.09		.20									.15	.10						1.07
Washington										T	.06		.18			T										.33	.03					.60
Washta			.21								.13				.40		.11						T	.1/	.15							1.11
Waterloo										.06	.83			.41		.10									.15							1.55
Waverly										.57	.15			.09	.82	.12									.26							2.61
Whitten			T							.05	.87			.35		.18								.28								1.74
Wilton Junction										.63			.78			.18						15										1.64
Winterset										T	.40	T			.06	.15						T										1.20
West Bend			.02							.20	.02	T		T		1 14		.18	T					.55	.16	.14						2.27
West Branch											.82					.22						.04			.42	.20						1 70
Woodburn			.01	T						.01	.28			.44		.08									.30		T					1.12

Precipitation Chart October 1899.



Vol. X. NOVEMBER, 1899. No. 11.

U. S. Department of Agriculture
Weather Bureau



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

STAR ENG. CO

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Central Station, Des Moines, Iowa.

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DIRECTOR

GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

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1899.

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Alta	D. E. Hadden.
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Amana	Conrad Schadt.
Ames	Exp. Station.
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Audubon	F. P. Hocker.
Bancroft	E G. Bailey.
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*U. S. Weather Bureau.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME X. NOVEMBER, 1899. No. 11.

IOWA CROP REPORT, 1899.

FINAL REPORT OF THE SEASON, SHOWING AVERAGE PER ACRE AND TOTAL YIELD OF STAPLE FARM PRODUCTS.

AVERAGE FARM PRICES, DEC. 1, 1899.

Final reports for the season have been received from the county and township correspondents of the Iowa Weather and Crop Service, giving the average yield of the staple soil products, and the average home prices obtainable therefor on or about Dec. 1st. Special pains have been taken to secure reliable statistics of the ACREAGE of the staple farm crops harvested this year, and by using the official returns of township assessors as the basis of estimates it is believed that the figures given herewith are approximately correct. The reports as to the average yield per acre have been made by a large corps of able and experienced crop reporters, most of whom are practical farmers, and their conservative estimates are accepted as reliable. These reports have been tabulated by counties, and the following summary is made for the state.

WHEAT.--The greater part of the winter wheat acreage sown in the fall of 1898 was lost by winter-killing, and much difficulty has been experienced in securing data as to the area saved and actually harvested. The returns indicate a total yield of only 226,040 bushels, with an average of about 11 bushels per acre. In 1898 the total was 3,168,000 bushels. The spring wheat acreage harvested this year was 1,539,391 acres, and the total yield was 19,574,792 bushels. Average per acre, 12.7 bushels. The average farm price of winter wheat is 58 cents, and spring wheat 54 cents per bushel Total value of wheat crop Dec. 1st, $10,701,490.

CORN.—The area of corn harvested was 8,460,521 acres. The average yield in the respective counties was quite variable, ranging from 25 to 45 bushels per acre. Five counties reported averages per acre of 25 to 29 bushels; seventy-three counties, 30 to 39 bushels; and twenty-one counties, 40 to 45 bushels. The aggregate for the state was 306,852,714 bushels, an average of 36.3 bushels per acre. In 1898 the state average was 34.5 bushels, and the total 289,214,850 bushels.

The average farm value of corn in the state, Dec. 1st, is placed at 23 cents per bushel, showing the market value of the crop on that date, $70,429,415. As fully 80 per cent of the crop will be consumed within the state, the increment gained by marketing it in the form of beef, pork, mutton, dairy goods, etc., will make the total value of the crop at least $105,000,000.

OATS.—The acreage of oats harvested was 4,069,557 acres, and total yield is reported to be 140,647,309 bushels—an average of 34.5 bushels per acre. The average farm price Dec. 1st was 19 cents per bushel, making the total value of the crop $26,722,988.

BARLEY.—Area of barley harvested, 557,598 acres; average per acre, 25.6 bushels; total yield, 14,719,311 bushels. Farm price 30 cents per bushel. Value of crop Dec. 1st, $4,415,579.

RYE.—Area harvested, 126,236 acres; total yield, 2,061,169 bushels; average per acre 16.3 bushels. Farm price Dec. 1st, 40 cents per bushel; total value of crop, $824,467.

FLAX —Number of acres harvested, 142,175; average per acre, 11.2 bushels; total yield, 1,597,979 bushels. Farm value, $1 04 per bushel. Value of crop, $1,661,898.

POTATOES.—Area harvested, 154,243 acres; average yield per acre, 98.8 bushels; total product, 15,252,934 bushels. Farm value, 24 cents per bushel; value of crop, $3,660,714.

SWEET POTATOES.—Average yield per acre, 87 bushels. Estimated product, 305,300 bushels. Value, $253,390.

HAY (cultivated).—Area, 2,544,343 acres; average yield per acre, 1.5 tons; total yield, 3,852,941 tons. Value of crop, $5.75 per ton; total value, $22,154,410.

HAY (wild).—Area cut, 1,198,312 acres; total yield, 1,458,195 tons. Farm value $4 90 per ton; total value of product, 7,145,-155.

BUCKWHEAT.—Average yield per acre, 15 bushels; total yield, 172,500 bushels; value, $96,600.

TIMOTHY SEED.—Average yield, 4.3 bushels per acre. Estimated product, 780,000 bushels. Value, $834,600.

CLOVER SEED —Value (estimated) $250,000. Average yield per acre, 1.7 bushels.

MILLET SEED.--Yield, 20 bushels per acre. Value of product, $75,000.

SORGHUM.—Average, 85 gallons per acre. Estimated value of product, $375,000.

BROOM CORN.—Estimated value of crop, $45,000.

CORN FODDER.—In shock and fields, worth, $8,460,000.

PASTURAGE.—Estimated value $30,000,000.

FRUITS AND VEGETABLES.—Estimated value, $6,500,000.

The average farm price of horses is shown to be $61; milch cows, $35; wool per pound, 17 cents. The amount of fall plowing, compared with the average of former years, appears to be about 64 per cent. By sections the average is, northern section, 88; central section, 57; southern section 49 per cent.

The crop reporters made estimates of the percentage of loss of hogs by cholera or other diseases in their respective counties, and their reports show an average loss of about 11 per cent for the state. The averages by counties range from less than 1 to 35 per cent. The reports show a steady decrease in virulence of the disease compared with its ravages in recent years.

GENERAL CROP STATEMENT.

CROPS.	Yield per acre.	TOTAL PRODUCT.	Farm values December 1st.
Winter wheat	11.3 bus.	226,040 bus.	$ 131,103
Spring wheat	12 7 bus.	19,574.792 bus.	10,570.387
Corn	36 3 bus.	306,852,714 bus.	70,429,415
Oats	34 5 bus	140,647,309 bus.	26,722,9?8
Barley	25 6 bus.	14,719,311 bus.	4,415,579
Rye	16.3 bus.	2,061,169 bus.	824.467
Flax	11 2 bus.	1,597.979 bus.	1,661,898
Potatoes	98.8 bus.	15.252,394 bus.	3,660,714
Hay (cultivated)	1 5 tons	3,852.941 tons	22,154,410
Hay (wild)	1.2 tons	1,458,195 tons	7,145,155
Buckwheat	15 bus.	172.500 bus.	96 600
Sweet potatoes	87 bus.	305,300 bus.	253,390
Timothy seed	4.3 bus.	780,000 bus.	834.600
Clover seed	1.7 bus.	.....	250.000
Millet seed	20 bus.	.....	75,000
Sorghum	85 gals.	.....	375,000
Broom corn	.....	.....	45,000
Corn fodder	.....	.....	8,460,000
Pasturage	.....	.....	30,000,000
Fruit and vegetables	.....	.....	6,500,000
Total	.....	.....	$ 194,605,706

To the above total there should be added the increment gained by consumption of crops in the production of beef, pork, mutton, wool, dairy and poultry products, horses, etc. This would make the aggregate value of all soil products for the year not less than $230,000,000. On the whole the season has been fairly productive, and the people of Iowa have abundant cause for devout thankfulness.

IOWA'S CORN YIELD FOR PAST TEN YEARS.

The records of the Iowa Weather and Crop Service show that the total output of corn in this state for the ten years from 1890 to 1899 inclusive, amounts to over two and a half billion bushels, or an average of over two hundred and fifty-two million bushels per year. During the past decade we have passed through about all the climatic extremes to which this region is subjected.

The following table gives some interesting figures from the records of this office, showing the yield of corn per acre, and total output for the years of this decade; also the average rainfall for the state per year, and for the six crop months of each season:

YEARS.	Average yield per acre.	Total amount for the state—bushels.	Rainfall for the year—inches	Rainfall for six crop months, April 1st to October 1st—inches.
1890	28.0	239,675,000	31.12	22.48
1891	38.0	335,031,000	33.13	20.51
1892	29.0	173,867,000	35.74	27.77
1893	35.7	214.804,000	27.31	19.56
1894	14.0	128,989,000	21.95	13.39
1895	38 0	285,000,000	26.63	20.99
1896	39.0	313,692,000	37.45	29.33
1897	29.0	239,452,000	26 99	18.24
1898	34.5	289,214,000	31.69	21.06
1899	36.3	306,852,000	.....	21.35
Total for decade	.....	2,526,576,000	.....	.....
Averages per year	32.1	252,657,600	30.21	21.46

NOTE AND COMMENT.

This has been an ideally perfect fall for gathering and cribbing our very heavy corn crop. And it seems to be providential that the conditions were so favorable for securing it in good order, in view of the fact that so much of it was broken down by windstorms, and a considerable portion was caught by frost in September and would have been very badly damaged if the weather had been wet and cold as in 1898. Now it is well dried out and safely sheltered, and even the poorest of the crop possesses good feeding value, though it may not be in first-class merchantable condition. It has been a marvelously favorable fall for corn growers.

* * *

Josiah P. Walton died at his residence in Muscatine, Iowa, November 24th, at the age of 73 years. He resided in Muscatine county continuously since 1838, and was a most worthy and useful citizen. For twenty-six years he served as a voluntary weather observer, continuing the records of observations begun by Prof. Theodore S. Parvin in 1839. These records have served a very useful purpose in affording a basis for the study of the climatology of the state, and the men who thus served the public are entitled to recognition and honor. The citizens of Muscatine should find some public-spirited citizen to maintain the records in the future.

* * *

Everybody probably feels that his or her mental condition depends, to some extent, upon the character of the weather. In gloomy weather we are apt to be depressed and in fair weather exhilarated. When the atmosphere is stimulating, the mental and physical energies are enhanced. Starting from these generally recognized facts, Mr. Edward G. Dexter has made a study of the effects of the weather on human conduct, the results of which are rather surprising. He shows, by a system of tabulation, the misdemeanors involving violence, such as assaults, are more common in bright weather, and that the same is true of suicides. On the other hand, mental errors, such as mistakes in bank figures, are more common in damp, rainy weather. His inference is that the excess of energy produced by a bracing condition of the air is responsible for more violence than is the "ugly temper" caused by bad weather, because the latter, while lowering the spirits, diminishes the activity of men.—*Youth's Companion.*

* * *

The Leonidic stream of meteors, through which the earth was scheduled to pass about the middle of November, was very disappointing to the thousands who waited and watched through the small hours of several nights to witness the celestial display. The stream has been deflected or materially dried up, and the question is what did it. This problem is submitted to the philosophers who have been gravely assuring us that by man's agency in tiling and cultivating the soil, the meteorological conditions have been changed, and the sources of rainfall have been dried up. Assuredly man has as much power over the movement of meteoric streams as he possesses to change the general climatic conditions of this continent.

* * *

Some man has figured out that the corn crop of America this year would furnish three pounds of food every day to every man, woman and child of this country, for twelve months.

* * *

American corn in all its forms is to be made a striking feature in our exhibit at the Paris exposition. The people of Europe know little of the food value of our Indian corn, and it is intended to make a practical demonstration which will appeal to their palates. A corn-kitchen will be established in the agricultural pavilion, where it is Secretary Wilson's intention to install skilled cooks to prepare corn in every possible form for free distribution to all visitors. The dishes will include corncakes, corn puddings, corn bread, canned corn, desiccated corn, popcorn, breakfast foods of all kinds made from

(*Continued on page 6.*)

FINAL CROP REPORT, 1899—AVERAGE PER ACRE AND TOTAL YIELD BY COUNTIES.

COUNTIES.	WINTER WHEAT.		SPRING WHEAT.		CORN.		OATS.		RYE.		BARLEY.		FLAX.		POTATOES.		CULTIVATED HAY.		WILD HAY.	
	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Bushels per acre.	Total bushels	Tons per acre	Total tons.	Tons per acre.	Total tons.
Adair	....	.....	15	176,550	45	4,480,065	35	1,618,890	18	7,380	29	11,000	....	.....	130	242,190	1.6	43,390	1.0	6,560
Adams	13	1,284	10	78,400	41	2,935,920	25	287,000	....	.....	....	.....	....	.....	90	79,200	1.3	30,036	1 0	2,270
Allamakee	10	31,080	9	43,830	35	1,834,210	30	1,325,640	12	5,880	28	46,200	15	110,490	100	225,300	1.2	41,850	1 0	1,740
Appanoose	12	2,160	....	.....	27	1,154,520	25	218,125	14	4,760	....	.....	....	.....	84	40,992	1.5	66,240	1.0	1,174
Audubon	....	.....	14	278,880	35	3,168,900	27	1,008,720	11	5,665	26	99,216	....	.....	125	64,375	1.4	20,090	1.2	8,268
Benton	....	.....	15	53,250	39	4,708,860	40	2,980,400	15	20,400	31	488,570	....	.....	140	237,420	1.5	53,475	1.2	11,560
Black Hawk	....	.....	18	12,744	41	3,778,150	43	2,463,986	13	42,293	33	222,783	....	.....	112	187,040	1.7	57,876	1.5	19,320
Boone	....	.....	17	140,488	40	4,209,600	41	2,076,850	13	15,860	28	25,088	8	1,280	105	146,475	1 5	23,580	1.0	22,340
Bremer	....	.....	12	9,960	35	2,105,250	35	1,842,575	14	12,320	30	82,500	15	30,405	80	128,640	1.2	25,350	1.2	26,841
Buchanan	....	.....	20	12,280	39	3,334,890	40	2,096,400	15	15,600	30	92,160	12	1,896	110	166,320	1.5	57,240	1.2	18,906
Buena Vista	....	.....	13	236,990	33	3,629,076	28	1,638,440	15	9,525	22	167,860	10	14,900	85	174,335	1.6	23,695	1.2	32,524
Butler	....	.....	16	82,560	34	3,337,710	38	2,697,810	15	53,295	31	148,490	12	11,352	130	189,280	1 4	27,090	1.2	18,549
Calhoun	....	.....	14	225,820	33	3,384,150	35	1,810,830	16	20,240	34	133,280	10	11,980	120	154,800	1 5	16,650	1.3	32,913
Carroll	12	2,190	13	344,760	38	4,351,570	28	1,114,512	15	3,900	25	20,670	....	.....	105	383,980	1.6	35,320	1.5	8,184
Cass	....	.....	11	15,675	44	4,384,950	35	1,512,420	16	18,600	28	180,600	....	.....	85	107,440	1.7	78,417	1.0	1,070
Cedar	....	.....	12	78,996	37	3,231,950	33	2,437,271	11	19,437	22	181,940	10	56,600	109	179,850	1.7	44,890	1.4	22,210
Cerro Gordo	....	.....	13	511,810	36	3,852,612	31	1,564,260	12	2,880	34	335,240	15	6,675	80	128,640	1.5	24,525	1.4	23,540
Cherokee	....	.....	14	34,330	35	1,989,700	33	2,027,124	16	10,912	30	154,200	12	82,320	100	160,200	1.4	41,690	1.0	15,660
Chickasaw	12	2,160	11	830	35	1,944,880	32	536,480	15	15,450	....	.....	....	.....	80	70,640	1.4	51,170	1.0	760
Clarke	....	.....	11	181,390	36	2,758,210	33	1,439,790	10	16,150	34	652,590	11	27,380	100	124,300	1.5	20,950	1.2	26,220
Clay	11	22,760	14	82,040	40	2,982,800	41	2,443,190	12	54,960	32	172,890	12	1,320	105	224,700	1.8	68,610	1.0	450
Clayton	....	.....	15	27,075	37	4,336,650	30	1,689,900	14	48,160	25	50,375	....	.....	120	182,080	1.8	85,705	1.0	4,570
Clinton	....	.....	14	772,058	33	4,084,080	32	1,389,240	20	10,240	30	159,270	....	.....	110	232,430	1 8	41,652	1.2	29,760
Crawford	9	2,520	13	89,010	42	3,789,980	35	1,029,275	15	9,750	30	21,150	....	.....	110	120,010	1.5	30,160	1.3	14,030
Dallas	5	2,050	....	.....	29	1,624,875	25	403,000	8	6,040	....	.....	....	.....	92	43,976	1.2	55,140	1.0	104
Davis	9	5,130	10	2,400	31	1,956,720	32	532,000	11	6,710	....	.....	....	.....	73	54,969	1.4	56,938	1.0	1,180
Decatur	....	.....	13	11,986	35	3,097,955	37	1,756,205	12	16,884	33	177,210	....	.....	130	189,800	1.2	49,097	1.0	11,090
Delaware	....	.....	12	3,360	30	1,564,290	25	783,925	15	14,700	....	.....	....	.....	95	84,265	1.2	23,870	1.5	890
Des Moines	....	.....	10	221,020	34	936,224	27	638,820	....	.....	32	538.140	11	81,950	70	42,070	2.0	11,930	1.2	23,540
Dickinson	....	.....	15	2,910	34	2,148,698	35	2,891,790	18	72,720	28	49,640	....	.....	94	231,650	1.0	39,262	1.0	3,710
Dubuque	10	950	13	394,316	30	1,134,600	31	1 733,150	15	8,100	30	325,500	10	60,280	115	49,450	2.0	13,120	1.5	30,183
Emmet	....	.....	18	54,750	35	3,121,700	36	2,290,680	20	42,060	25	178,075	10	22,400	105	201,600	1.8	94,563	1.0	15,650
Fayette	15	2,250	15	59,400	40	3,193,600	38	2,612,230	18	35,640	33	175,295	14	60,270	120	377,040	1.4	31,835	1.0	9,240
Floyd	....	.....	15	139,050	36	3.572,710	38	2,911,180	15	19,950	32	117,760	14	47,460	110	145,200	1.3	24,840	1.2	19,220
Franklin	....	.....	13	138,870	28	3,031,000	28	331,072	18	4,860	22	15,840	....	.....	120	79,600	1.5	16,460	1.2	5,480
Fremont	11	27,588	14	94,640	32	3,610,560	33	1,782,990	18	15,750	32	91,520	10	5,300	130	169,780	1.3	19,590	1.2	31,590
Greene	....	.....	18	187,002	40	3,854,800	35	2,474,150	15	14,400	33	453,090	10	4,020	140	300,720	1.5	33,750	1 2	20,384
Grundy	....	.....	12	163,920	39	3,724,280	31	1,444,970	14	10,500	25	39,000	....	.....	95	143,450	1.5	38,520	1.0	9,690
Guthrie	....	.....	18	178,920	41	4,226,403	45	2,653,650	20	5,600	33	59,697	12	9,288	130	156,400	1.7	30,909	1.5	55,870
Hamilton	....	.....	13	261,014	35	2,510,550	36	2,302,560	18	32,040	30	295,080	10	85,940	95	106,400	1.3	20,105	1.2	38,110
Hancock	....	.....	17	196,520	38	3,573,368	40	2 246,480	18	8,640	33	98,703	10	6,510	98	126,420	1.5	31,185	1.3	24,390
Hardin	....	.....	14	578,620	32	3,284,800	30	474,060	15	15,375	25	21,250	....	.....	130	195,260	1.5	12,915	1.5	25,620
Harrison	....	.....	13	2,119	35	2,370,550	33	919,050	15	14,850	....	.....	....	.....	80	56,960	2.0	54,605	....	.....
Henry	7	2,940	15	50,910	37	1,868,130	35	1,732,530	18	4,500	30	202,260	13	82,745	110	120,890	1.5	53,280	1.3	18,533
Howard	....	.....	14	343,056	38	2,328,754	40	1,394,840	20	4,940	27	71,760	10	20,680	120	102,640	1.5	17,495	1.0	23,055
Humboldt	....	.....	12	304,270	32	3,136,448	35	1,396,150	15	2,850	25	109,820	....	.....	90	106,920	1.5	27,039	1.0	5,182
Ida	....	.....	16	27,680	33	2,915,616	35	1,424,990	20	28,200	25	81,750	....	.....	75	94,365	1.5	56,625	1.0	4,050
Iowa	20	8,200	15	19,450	41	3,151,383	30	1,247,700	20	140,360	22	35,485	....	.....	102	166,790	1.5	59,715	1.0	1,930
Jackson	....	.....	16	249,760	45	5,244,075	42	1,769,640	20	14,800	30	40,560	....	.....	93	627,750	1.2	43,092	1.3	3,900
Jasper	10	4,200	....	.....	33	1,811,930	32	677,340	16	24,590	....	.....	....	.....	110	56,100	1.4	49,290	....	320
Jefferson	15	1,630	14	22,670	42	4,139,520	38	1,853,640	17	64,940	32	56,640	....	.....	120	196,200	1.5	64,620	1.3	3,031
Johnson	....	.....	20	15,920	45	3,643,650	36	1,130,040	16	41,760	32	44,096	....	.....	120	128,400	1.5	60,046	1.2	1,879
Jones	....	.....	12	11,980	38	3,627,100	35	1,477,560	20	35,600	25	20,500	....	.....	85	120,275	1.4	58,632	....	.....
Keokuk	....	.....	15	762,600	33	3,780,180	35	2,744,245	....	.....	23	437,360	9	88,920	70	205,100	1.5	22,890	1.0	68,400
Kossuth	6	2,880	....	.....	25	1,154,650	24	336,160	11	13,695	....	.....	....	.....	63	73,710	1.4	48,846	1.0	280
Lee	....	.....	15	20,850	34	3,568,980	40	2,017,400	18	60,750	32	60,800	....	.....	120	277,200	1.5	70,965	1 2	9,038
Linn	11	2,310	13	8,515	34	1,912,840	30	755,130	14	211,820	....	.....	....	.....	97	53,350	1.4	26,453	1.3	1,590
Louisa	....	.....	11	3,190	26	1,223,630	30	527,400	14	15,680	25	1,400	....	.....	62	28,520	1.8	72,420	1.2	610
Lucas	....	.....	11	1,048,157	36	1,999,450	30	1,068,900	12	7,320	25	1,330,750	11	10,109	100	156,900	1.5	5,570	1.3	20,198
Lyon	13	2,730	13	104,520	41	3,402,180	35	925,750	16	19,680	27	22,840	....	.....	110	135,850	1.3	46,110	1.2	4,108
Madison	15	2,850	15	41,700	37	3,169,570	40	1,348,560	20	22,520	20	22,920	....	.....	75	133,350	1.5	44,148	1.0	1,228
Mahaska	12	576	12	10,220	33	2,955,875	30	936,390	14	22,680	25	19,975	....	.....	85	125,460	1.4	33,860	1.2	2,750
Marion	....	.....	18	319,176	38	3,784,100	42	2,029,440	16	6,992	31	61,380	....	.....	95	174,610	1.3	39,560	1.2	3,720
Marshall	8	2,520	12	231 648	38	3,660,084	32	464,576	16	4,704	20	6,800	....	.....	130	142,480	1.8	27,810	1.5	9,940
Mills	....	.....	15	87,585	35	1,884,295	35	1,795,850	12	12,168	24	366,240	13	156,250	110	222,970	1.5	50,760	1.0	4,320
Mitchell	18	860	13	428,298	30	3,579,600	35	517,300	20	18,200	28	127,240	....	.....	115	129,950	1.8	13,608	1.5	44,640
Monona	5	1,200	....	.....	26	1,102,630	25	254,075	10	7,720	....	.....	....	.....	60	28,200	1.2	37,101	1.0	465
Monroe	15	2,850	13	327,080	42	4,026,540	32	540,160	16	4,448	....	.....	....	.....	120	121,680	1.5	24,540	1.2	2,847
Montgomery	18	15,120	17	31,280	40	2,580,320	41	1,040,580	17	38,590	30	115,050	....	.....	70	110,550	1.4	32,772	1.0	4,280
Muscatine	....	.....	10	421,290	37	3,370,848	30	1,360,290	....	.....	31	153,745	12	23,472	95	128,250	1.5	18,510	1.0	15,743
O'Brien	....	.....	8	333,968	30	2,733,120	27	1,072,980	20	7,160	25	692,250	9	38,916	90	80,460	1.5	10,898	1.3	15,104
Osceola	12	20,160	12	160,440	33	3,307,414	35	787,885	10	9,050	....	.....	....	.....	102	134,640	1.6	45,131	1.2	5,031
Page	....	.....	8	110,736	35	2,397,745	33	1,639,770	14	11,312	35	247,590	11	58,476	80	79,200	1.5	9,388	1.2	46,115
Palo Alto	....	.....	10	1,135,600	38	4,944,978	35	1,604,400	....	.....	30	276,570	11	4,070	80	178,240	1.6	16,249	1.2	37,680
Plymouth	....	.....	11	197,445	32	2,885,536	33	1,757,910	15	13,650	26	187,720	9	46,890	92	188,232	1.5	13,410	1.3	54,203
Pocahontas	....	.....	16	239,040	41	4,089,752	40	1,370,400	18	9,720	35	1,050	....	.....	71	272 356	1.5	32,035	1.0	14,574
Polk	....	.....	15	945,870	39	8,313,864	27	1,033,155	16	14,960	25	24,000	....	.....	105	431,550	1 8	48,762	1.3	25,262
Pottawattamie	....	.....	16	54,240	38	3,997,524	39	1,907,880	15	10,850	30	104,700	....	.....	120	165,600	1.5	59,070	1.2	2,502
Poweshiek	8	2,540	10	2,700	36	3,132,576	32	818,496	12	7,080	25	5,250	....	.....	95	87,400	1.5	60,930	1.2	1,820
Ringgold	....	.....	14	261,260	36	4,303,800	30	1,504,560	10	7,300	25	170,050	10	6,200	110	139,700	1.8	36,306	1 5	29,016
Sac	10	30,480	12	90,480	36	2,660,580	32	763,500	9	18,180	25	611,900	....	.....	91	491,582	1.4	35,877	1.3	7,165
Scott	....	.....	14	651,560	39	4,883,580	32	1,032,432	16	8,203	25	142,250	....	.....	105	218,715	1.3	30,747	1.0	9,868
Shelby	....	.....	12	1,434,876	36	3,852,470	28	1,637,440	18	9,306	25	688,100	11	5,445	90	135,360	1.4	8,5 7	1.2	28,920
Sioux	....	.....	15	92,220	38	3,902,334	40	2,010,800	15	17,100	33	31,746	....	.....	106	122,112	1.5	32,464	1.2	23,450
Story	....	.....	15	197,250	34	3,841,160	38	2,016,774	15	12,135	30	824,640	....	.....	108	181,440	1.5	48,170	1.3	9,227
Tama	....	.....	15	8,950	36	3,108,240	30	711,210	14	10,056	32	16,192	....	.....	65	139,490	1.8	65,665	1.2	2,234
Taylor	10	11,940	13	7,488	41	2,489,274	33	859,221	16	9,760	30	7,500	....	.....	120	111,120	1.4	48,730	1.0	1,132
Union	....	.....	10	.....	27	889,704	24	369,264	11	11,385	....	.....	....	.....	80	30,960	1.5	61,860	....	.....
Van Buren	9	1,620	10	5,400	30	1,598,190	30	595,290	10	10,080	....	.....	....	.....	80	72,080	1.5	49,890	1.0	250
Wapello	....	.....	10	103,077	36	2,038,220	34	1,006,740	15	17,190	20	7,000	....	.....	92	172,960	1.5	51,105	1.3	8,025
Warren	12	1,080	13	4,764	40	3,420,680	30	1,229,580	13	27,460	30	13,800	....	.....	88	83,248	1.3	52,338	1.0	250
Washington	....	.....	12	13,138	26	1,072,760	28	379,120	11	4,180	....	.....	....	.....	61	52,277	1.5	74,857	.9	306
Wayne	8	1,072	6	202,132	35	4,022,130	40	2,838,320	15	20,250	25	123,000	10	18,700	87	117,710	1.7	20,806	1.3	54,960
Webster	....	.....	14	368,160	30	1,201,740	30	1,126,800	....	.....	25	98,925	8	33,520	75	71,850	1.2	11,820	1.0	24,282
Winnebago	....	.....	13	158,250	38	2,752,340	34	2,220,540	15	152,670	30	321,510	12	106,200	107	154,615	1.5	63,255	1.2	9,820
Winneshiek	17	4,080	15	904,178	31	4,481,515	29	820,120	18	13,104	25	129,125	10	4,500	77	145,530	1.6	12,883	1.4	31,407
Woodbury	....	.....	11	93,000	41	1,527,619	34	1,717,680	15	4,050	29	207,350	12	115,440	114	128,820	1.7	28,152	1.5	25,334
Worth	....	.....	12	270,250	35	3,066,315	38	2,323,016	15	7,200	34	173,400	9	34,830	99	120,780	1.5	20,625	1.2	35,547
Wright	....	.....	16	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Total yield	11.3	226,040	12.7	19,574,792	36.3	306,852,714	34.5	140,647,309	16.3	2,061,169	25.6	14,719,311	11.2	1,597,979	98.8	15,252,934	1.5	3,852,941	1.2	1,458,195
Average per acre																				

corn, hominy grits, cornmeal mush, corn pone, corn-flour bread, roasted green corn, and corn in about twenty other forms. The secretary believes that the opportunity for educating the people of the old world to the use of this cheap and nutritious food is a golden one, and that any money invested in this kind of advertising will be amply repaid in an increase in our corn exports.—*Cincinnati Price Current.*

* * *

In many localities stock feeders are paying more for corn than shippers or local cribbers. This is a pointer as to the increased number of cattle and sheep in the state.

* * *

The warm weather prevalent in October and November was damaging to apples, and the aggregate loss will be very heavy.

* * *

According to the estimates of crop reporters for the state, the amount of fall plowing, compared with the average, is about 64 per cent. In the northern section the average is 88 per cent; in the central section, 57 per cent, and in the southern section, 49 per cent. The difference in the amount of plowing in the sections is about the measure of the difference in the amount of moisture in the soil.

* * *

As much as 500,000 feet of lumber has been taken from a single acre of the forests of British Columbia, near the coast.

* * *

A meteorological station has been established at Ft. Dodge, and the instruments have been placed in charge of Mr. William U. Turpin, station agent of the Chicago, Rock Island & Pacific railway in that city. The station at Tara has been discontinued. We hope to establish a station at Gowrie, in the near future, in co-operation with the Chicago, Rock Island & Pacific Railway company. That will cover two important points of observation in Webster county.

* * *

Prof. Jennie E. Curtis will serve as meteorological observer at the State Normal school in Cedar Falls, in place of Prof. A. C. Page, resigned. While regretting to lose the services of Professor Page, we gladly welcome his successor in charge of the department of physiography. This bureau has always received faithful service from lady observers.

* * *

The National Stockman is not inclined to congratulate farmers over the wonderful increase in the exportation of corn. It says: "We should like to see American farmers exporting a billion bushels of corn every year if they could profitably raise it and export it in the right way—in the form of horse flesh, beef, pork, mutton, poultry, butter, cheese, etc. But when it comes to exporting corn as corn it is a question if any real profit is realized by American farmers. It is true that the market for corn is strengthened somewhat by the large export buying; but the market price of corn does and should affect only a small portion of the crop. The great bulk of our corn should be fed on the farms where it was raised or on other farms. The market price cuts little figure in the actual value of the grain for this purpose, save as it affects future live stock markets by encouraging people to feed it or not to feed it. The man who has the stock and the corn should feed it, and usually does, regardless of market quotations."

* * *

A correspondent of the *Sioux City Journal*, writing from Sanborn, describes one of the good farms in O'Brien county. He says: "We have a $36,000 farm three miles west and one mile north of Sanborn, owned by Theo. Zimmerman, consisting of five quarter sections. There are on this farm over eleven miles of good, substantial fence; four groves, in all eighteen acres, and all good; three good houses; three large barns; four windmills; hog houses; corn cribs and granaries sufficient for all crops raised, and all shingle roof and stone foundations, and no tiling used or needed. On this farm there were raised this year 8,000 bushels of corn, 3,000 bushels of wheat, 2,000 bushels of oats, 1,000 bushels of barley, 220 tons of hay—all in barns and cribs Mr. Zimmerman also owns 258 head of cattle, 470 head of sheep, 60 head of hogs and 13 head of horses, with machinery sufficient to carry on the farm. Also has water tanks with heater in so the stock need not drink cold water. Water is piped from tank into hog pens and pastures, and everything is handy and in fine shape. Mr. Zimmerman is quite a feeder and shipper of stock."

* * *

Prof. Robert DeCourcy Ward, instructor in climatology in Harvard college, is the author of a new meteorological work, entitled "Practical Exercises in Elementary Meteorology," issued by the well known publishing house of Ginn & Co., Boston, Mass In the preface the author says: "The object of this book is to supply a guide in the elementary observational and inductive studies in meteorology. It is not intended to replace the text-books, but is designed to prepare the way for their more intelligent use. * * * The book contains specific instructions to the student as to the use of instruments, the carrying out of meteorological observations; the investigation of special simple problems by means of the instruments; and the practical use of the daily weather maps." For this work Mr. Ward is well equipped, and the book should have a place in the library of the student in meteorology. The publishers' mailing price is $1.25.

EXPANSION OF THE WEATHER BUREAU.

[From The Inter Ocean.]

The increasing importance to agriculture, commerce, and navigation of the work of the United States Weather Bureau is shown by Professor Moore in his annual report. During the past year the bureau was able to send out warnings well in advance of every serious storm which visited the Atlantic and gulf coasts. This was made possible by the establishment of the West Indian stations. The bureau is now able to learn promptly of the beginning of West Indian hurricanes and to trace their course. Timely warnings have also been issued of storms on the great lakes, and of frosts and blizzards, with the result of preventing great loss of life and property. The bureau has also been able to extend the time covered by its daily forecasts from thirty-six to forty-eight hours.

The United States has led the way for the world in systematic observation and forecast of weather conditions. The general public was at first slow to believe that the new idea could result in anything of value. Navigators, having lives and fortunes directly at stake, soon admitted merit in the plan. American warnings of storms moving across the Atlantic were found of value to shipping in European waters. The vast English maritime interests soon convinced their government of the expediency of adopting the Yankee notion. Other governments followed suit. The most intelligent farmers and stockmen now scan the weather forecasts closely and are governed by them. Every well-managed railway now collects weather reports along its lines to supplement those of the bureau. Yet many people, from mere force of habit, scoff at the weather forecasts, remember only the bureau's occasional failures, and forget its nearly 80 per cent of successes.

With the extension of American authority to the Philippines omes an important enlargement of weather bureau activities. he Jesuit priests in charge of the Manila observatory were ready doing something in the way of the storm warnings for ie China sea. When it is possible to organize the weather ervice throughout the Philippines, then the several governients on the western shores of the Pacific, from Tasmania to apan, will doubtless, by co-operation and by exchange of bservations, be able to give commerce the aid and protection now has on our Atlantic and gulf coasts. When cables are aid to Hawaii, Samoa, Guam, and other important islands the North Pacific can be covered with storm warnings as the North Atlantic is now. Cloud observations, with a view to determine certain facts regarding the horizontal motions of the air, have been made in concert for a year by international agreement. An international weather service is plainly among the probabilities of the near future.

VALUABLE FORECASTS.

While recognizing that forecasts based upon legitimate data cannot be regularly made for a period greater than forty-eight hours in advance, the chief of the Weather Bureau has encouraged the forecast officials to give to the public all information regarding unusual and severe types of weather permitted by their reports and experience.

Preceding special events, a forecast for three days is of interest, and often of great value to communities and districts, and upon occasions to the entire country, and during periods of intense heat or cold and in the presence of drought or continued rains information bearing upon the indicated duration of existing conditions is at times of incalculable value, not only to the agricultural and commercial interests, but also to the public at large.

The month of May, 1899, was not marked by unusual or severe types of weather. Two events, however, called for special long-range forecasts. The first of these was made for Chattanooga, Tenn., for the period covered by an open-air festival. The *Chattanooga News* of May 10th commented upon this forecast as follows: "The festival committee was much gratified over the weather during the festival. Nothing better could have been desired. Four days before the great event came off the committee made a request of Mr. L. M. Pindell, the Weather Bureau observer in charge here, for a prediction of the festival weather. This was furnished to Washington, and a long advance forecast three days ahead was made for the week. The prediction was verified to the letter. The committee feels under great obligations to the Weather Bureau and Mr. Pindell."

From May 23d to 25th, inclusive, a peace jubilee was held in Washington, D. C. As this was an open-air celebration, a knowledge of the probable character of the weather during the three-day period which it covered was valuable to the committee on arrangements. The weather had been unseasonably warm, and this was a condition which, in common with rain, was not calculated to contribute to the success of the undertaking. On Monday morning, May 22d, the following forecast for the District of Columbia was made:

"Continued cool during the next three days; to-night will be cloudy and threatening, but generally fair weather is indicated for Tuesday, Wednesday, and Thursday; fresh northeasterly winds."

Barring a shower, which passed over the eastern part of the district early Tuesday afternoon, no rain fell during the three days, the temperature conditions were ideal, and the forecast, made for a period of four days in the presence of weather conditions which were far from being settled, indicated with great exactness the character of the weather which actually prevailed during the days of the jubilee.—*United States Monthly Weather Review.*

A SEED-TESTING PLANT.

The Agricultural Department is putting the finishing touches on a plant whereby it will be more able to protect itself, farmers, and seedsmen generally, against dishonest or careless persons who impose on their customers by selling bad seeds. A seed-testing house is being erected, comprising a store and packing house 30x20 feet and a hothouse 80x18 feet, in which germination tests will be made. For years these tests have been made by the botanists in various parts of the department's main building; but the work has so grown in importance and magnitude that a special building has become necessary. According to Botanist F. V. Colville, "From tests in the past it is evident that there is great carelessness in planting and harvesting seeds, and also, undoubtedly, much sharp practice is indulged in by dealers, who mix seeds of very inferior grade or of an entirely different variety with good seeds, and sell the stuff as the best quality of seeds." For example: "A lot of meadow foxtail seed from Germany was only 27.5 per cent pure; it cost 35 cents a pound and was adulterated with seed worth only 10 cents. Of seeds purchased in the open market, the tests showed orchard grass 53 per cent bad; red-top clover, 73 per cent; a lot of crimson clover, 98 per cent bad; and some Hungarian brome grass that failed to germinate at all." It is to defend our agriculturists against such frauds as this, especially, that the new system is being established.—*Scientific American.*

SUN AND WIND.

[From a lecture by Gerald Molloy.]

Wind is simply air set in motion by the heat that comes to us from the sun. The earth is heated unequally by the sun's rays. Within the tropics where they come down almost vertically, the effect is greatest, and it gradually gets less and less as we go from the tropics toward the poles. Hence the air near the surface of the earth, within the tropics, being most heated, expands and rises; then the colder air on each side flows in to take its place while the heated air above moves off, towards the colder regions, north and south. Thus two great currents are established in each hemisphere; a current of cold air below, near the surface of the earth, flowing from the polar regions towards the equator; and a current of warm air above, flowing from the equator towards the poles. These are the so-called trade winds so well known to sailors. There is a very simple and instructive experiment by which one may illustrate for himself the principle of the trade winds. Suppose that you have two ordinary sitting-rooms, with a door between them; that a fire is burning in one room, no fire in the other; and that a difference of temperature, amounting to five or six degrees is thus established between the two rooms. If, under these circumstances, you open the door, and hold a lighted taper in the lower part of the doorway, you will find that the flame of the taper, instead of standing upright, will be bent in towards the room with the fire in it; proving that a steady current of air is flowing in below, from the cold room to the warm room. Next, hold the taper in the upper part of the doorway, and you will find that the flame is bent in the opposite direction, proving that a current of air is flowing out above, from the warm room to the cold room. Now what the fire does for the air of your room the sun does for the atmosphere within the tropics. And just as the little currents of your experiment

are due to the heat of your fire, the energy of the trade winds is due the heat of the sun.

But there are other winds besides these. Take, for example, the land breeze and the sea breeze, which are found generally to prevail on the sea coast. In the morning, after sunrise, the land is more quickly heated than the sea, the air in contact with the heated surface expands and rises, while the cooler air from the sea flows in to take its place. In the evening, on the other hand, the land is more quickly chilled by radiation, when the sun's heat begins to fail, and, the conditions being reversed, a current of cold air flows back from the land to the sea. Thus the sea breeze of the morning, and the land breeze of the evening, derive their existence and power from the action of the sun's heat.

Wherever a breath of wind is moving over the surface of the earth, it is moving from a point of higher atmospheric pressure to a point of lower pressure: the difference of pressure is caused by the expenditure of the sun's heat; and the lost energy of the sun's heat reappears as the energy of the moving air. We may conclude, therefore, that all the wind power of the world, no less than the water power, owes its existence to the energy that is borne to us by the rays of the sun.

A SCHEME TO DEEPEN LAKE ERIE.

The project of damming Niagara river near the city of Buffalo so as to raise the level of water in Lake Erie two or three feet is seriously discussed. A board of army engineers has for several years past been making investigations in an effort to ascertain the feasibility of the work, and it is said that a favorable report will soon be forthcoming. Lake Erie is the shallowest of the great lakes, and its sandy and gradually shelving shores make the approach to landing places precarious and in constant need of dredging. It is considered cheaper in the long run to construct a dam and raise the level than to dredge the bottom of the lake to a depth suitable for floating the large freight-carrying steamers now used in the lake trade. The engineers also expect by raising the water in Lake Erie three feet to so retard the flow as to raise the level of Lake St. Clair two feet and the levels of Lake Huron and Lake Michigan about one foot each.

A special interest in this scheme and its possibilities is induced by the near approach of the completion of the Chicago canal, which will drain a portion of the water in Lake Michigan southward, by way of the Illinois river, into the Mississippi. The dam in the Niagara, by lessening the flow into Lake Ontario and the St Lawrence river, may make good the intended Chicago diversion of water, and avert an apprehended lowering of the level of Lake Michigan. No reliable estimate has yet been furnished of the cost of the undertaking. —*Philadelphia Record.*

EXTRACTS FROM NATIONAL BULLETIN.

WASHINGTON, D. C., December 1, 1899.

The month of November was exceptionally mild over nearly the whole of the United States, only a few stations in northern New England and central California showing a slight deficiency in temperature. Along the middle and south Atlantic coasts, in the Rio Grande valley, southern Arizona, and over the greater part of California the temperature excess was slight, generally below 3°, but over much the greater part of the country it amounted to more than 3° per day, and from the Lake region and central Mississippi valley westward to the north Pacific coast ranged from 6° to more than 12°, the most marked excess occurring in the Dakotas and Minnesota.

More than the usual amount of rain fell during November, 1899, from central Texas northward over Oklahoma, western Kansas, eastern Colorado, and portions of Nebraska and western Iowa. There was also more than the usual rainfall in Washington, Oregon, western Idaho, northern Utah, and in portions of central and northern California, the excess being very marked on the north Pacific coast, where the total rainfall was from 1 to 10 inches above the average. The excess over northern Texas and Oklahoma was also very decided, this region receiving from 1 to 5 inches more than the usual amount Over much the greater part of the country, however, the precipitation was decidedly below the average, only a few areas of very limited extent receiving as much as 4 inches, while the greater portion of the central valleys and a large area east of the Mississippi received less than 2 inches.

There was no snow on the ground at the close of the month, except a very light covering over a limited area in western Montana.

Under the very mild temperature conditions which prevailed throughout the month winter wheat has rooted well, and at the close of the month was in excellent condition to withstand the winter. There are, however, considerable complaints of damage by hessian fly, while in portions of Ohio and Michigan the crop has suffered from lack of moisture. Rank growth is quite generally reported, and in Illinois, Kansas, and Oklahoma, is being pastured to a considerable extent. The reports generally indicate increased acreage.

NOVEMBER WEATHER RECORD.

The month of November was much warmer than usual in all parts of the state, breaking all previous records for the state. The mean temperature, deduced from 124 reports, was 43.9°, which is about 11° above the normal. The mean by sections was as follows: Northern section, 41.9°; central section, 43 8°; southern section, 46°. Burlington reported a maximum of 86° on the 17th. The lowest temperature reported was 8°, at Primghar, on the 2d.

The average precipitation for the state was 1.20 inches, which is about 22 of an inch below the normal. The average for the northern section was 1.16 inches; central section, 1.41 inches; southern section, 1.03 inches. Belle Plaine reported the largest amount for the month—2.97 inches; Estherville the lowest, .13 of an inch.

There were 12 clear days, 8 partly cloudy days, and 10 cloudy days. The month was favorable for cribbing corn, and securing in prime condition all late-maturing crops.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30.07 inches; highest observed, 30.61, at Sioux City on the 2d; lowest observed, 29.35, at Omaha, Neb., on the 30th; range for the state, 1.26 inches.

Temperature.—Monthly mean, as deduced from 124 reports, was 43.9°; highest monthly mean, 49°, at Wapello; lowest monthly mean, 35°, at Estherville; the highest temperature reported was 86°, at Burlington on the 17th; the lowest temperature reported was 8°, at Primghar on the 2d; the average monthly maximum was 68.6°; the average monthly minimum was 17.3°; the greatest daily range was 50°, at Clarinda and Toledo; average daily range, 39.1°.

Precipitation.—Average for the state, as determined from the reports of 143 observers, 1.20 inches; the largest amount

eported was 2.97 inches, at Belle Plaine; the least amount was 13, at Estherville; the greatest daily amount reported was 1.80 nches, at Belle Plaine on the 14th; average number of days on vhich .01 inch or more of precipitation was reported, 5.

Wind.—Prevailing direction, south; highest velocity reported, 40 miles per hour from the north, on the 30th, at Omaha, Neb.

Weather.—There were 12 clear days, 8 partly cloudy days, and 10 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.05	30.39	6	29.37	30
Des Moines	30.08	30.49	2	29.41	30
Clarinda	30.09	30.57	2	29.36	30
Cresco	.....	30.48	2	29.47	29
Dubuque	30.07	30.44	2	29.39	29
Omaha, Neb	30.04	30.54	2	29.35	30
Keokuk	30.06	30.40	6	29.37	30
Sioux City	30.08	30.61	2	29.49	16
Means	30.07	30.61	2	29.35	30

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	4,730	22	SW	4
Des Moines	4,913	27	SW	16
Dubuque	4,442	27	NW	1
Keokuk	5,378	24	S	16
La Crosse, Wis	3,965	30	NW	1
Omaha, Neb	5,256	40	N	30
Sioux City	7,016	38	NW	30

BELATED REPORTS FOR OCTOBER.

CARSON—Total precipitation, 3.16 inches; greatest amount of precipitation in 24 hours, 2.42 inches on the 24th; number of rainy days, 3.

CEDAR FALLS—Mean temperature, 54.4°; highest, 87° on the 22d; lowest, 25° on the 29th; total precipitation, 3 04 inches; greatest in 24 hours, 1.62 inches on the 11th; number of rainy days, 3; prevailing direction of wind, south.

FAIRFIELD—Mean temperature, 59.9°; highest, 92° on the 13th; lowest, 30° on the 29th.

WEST UNION—Total precipitation, 1.72 inches; greatest in 24 hours, 1 inch on the 11th; number of rainy days, 2.

ERROR IN OCTOBER REVIEW.

AFTON—Total precipitation recorded 2.25 inches; should have been 1.53 inches.

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* First snowfall of the season on the 30th. November, 1899, was a warm and very pleasant month: lawns were green during the entire month.

BONAPARTE—*Hon. B. R. Vale.* An ideal month for all kinds of work. Since the rain on the 14th a large acreage has been plowed.

BRITT—*Geo C. Hardwick.* Very mild and pleasant month. Comparatively free from frost, and dry.

CARROLL—*Moses Simon.* A very fine month. Farmers plowing up to the 30th.

CLINTON—*Dr. Luke Roberts.* Lightest November rainfall in 21 years, except in 1885 and 1889. The warmest November in 21 years.

CORNING—*Jerome Smith.* Dandelions in blossom in the fields on the 30th. First snow of the season on the 30th.

CRESCO—*Gregory Marshall.* The mean temperature, 39.6°, is the highest ever known here.

FONDA—*N. C. Barron.* Corn husking is nearly all done and more than the average amount of fall plowing done.

FOREST CITY—*J. A. Peters.* Farmers are plowing at the close of the month. Corn is all gathered. Temperature over 15° above normal.

FORT MADISON—*Miss L. A. McCready.* A very pleasant but dry month. Thanksgiving was more like a spring day.

GRINNELL—*A. O. Price.* Perfect weather for husking corn and preparing for winter. Roads like a pavement.

GUTHRIE CENTER—*Ralph H. Jones.* The month has been mostly clear.

FORT DODGE—*R. W. Blain.* November was fine for fall work. Corn all gathered in good condition; too dry to plow; first snow on the morning of the 30th; there were 11 clear, 11 partly cloudy, and 11 cloudy days.

HUMBOLDT—*Henry S. Wells.* Corn all harvested; plowing all done; much attention is paid to purchasing sheep

LAMONI—*T. J. Fitzpatrick.* The month was remarkable for dry, warm weather—excellent for the corn harvest.

LARRABEE—*H. B. Strever.* The month has been very warm; corn husking completed near the close and considerable plowing done late in the month. First snow on the 30th.

LOGAN—*Mrs. M. B. Stern.* The fall has been dry, but remarkable for clear, warm sunshine. The morning of the 30th was ushered in with a thunderstorm with bright, vivid lightning followed by our first snow, which melted as it fell.

MOUNT VERNON—*Rev. Jos. W. Hubbard.* A wonderful November; nothing to compare with it in fourteen years.

OVID—*H. C. Miller.* A very warm and pleasant month; grass as green as in the spring and lots of dandelions in bloom.

RIDGEWAY—*Arthur Betts.* This November has been a phenomenon; it is a winter shortener; children were gathering wild flowers on December 1st; the dandelions and white mallows are quite abundant; no frost from 14th to 24th. October, 1898, was only 3° warmer than this November; wild geese going south 22d.

TOLEDO—*Lulu G. Bookwalter.* This has been a pleasant month, and dry up to the 14th, when a good rain fell; husking is out of the way and farmers have done some plowing.

OSKALOOSA—*Jos. Boyd.* Barn was struck by lightning and burned on the 20th, in Garfield township, near Oskaloosa.

CLIMATOLOGICAL DATA FOR NOVEMBER, 1899.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIPITATION, INCHES.				Number rainy days	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Algona*	Kossuth	1,500	7	42.9	+23	60	5	22	26	.....	1.40	+.11	1.05	3.0	2	8	14	8	NW
Alta	Buena Vista	1,519	8	43.8	+22	66	15	16	2	36	1.37	+.39	.78	2.0	9	13	10	7	S
Alta (near)	Buena Vista	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.15	.....	.60	.....	5	.....	.....	.....	.....
Bancroft	Kossuth	.....	.....	42.9	.....	67	15	12	2	36	.34	.....	.25	1.0	4	14	8	8	SE
Britt	Hancock	1,230	.....	41.4	.....	65	15	15	4	44	1.31	.....	.95	3.9	3	6	20	4	N
Charles City	Floyd	1,012	8	42.0	+21	62	5,16	17	4	42	1.61	+.19	.45	T	7	8	12	10	N
Cresco	Howard	1,312	27	39.8	+22	63	17	18	26	38	1.13	-.17	.60	.8	5	15	5	10	NE
Decorah	Winneshiek	900	6	40.0	+19	65	17	13	3	40	1.59	+.33	.70	.....	7	.....	.....	.....	.....
Dows	Wright	.....	.....	42.7	.....	65	5,16,17	13	3	42	1.23	.....	.73	1.0	4	15	3	12	W
Eagle Grove †	Wright	.....	.....	36.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Elkader	Clayton	.....	19	42.6	+21	72	17	15	3,4	49	1.29	-.94	.45	.....	4	14	9	7	SE
Emmetsburg	Palo Alto	.....	.....	.....	.....	.....	.....	.....	.....	.....	.57	.....	.41	.....	3	.....	.....	.....	.....
Estherville	Emmet	.....	.....	35.0	.....	64	5	11	3	44	.13	.....	.13	T	1	14	10	6	NW
Fayette ‡	Fayette	1,000	9	40.5	+17	65	17	13	3	43	1.29	-.17	.46	T	5	14	6	10	NE
Fonda	Pocahontas	.....	.....	39.2	.....	65	5	16	1,2	42	1.91	.....	.67	1.3	11	12	5	13	NE
Forest City	Winnebago	1,220	.....	43.4	.....	67	7,8	18	2	37	1.56	.....	1.00	2.0	5	16	3	11	W
Grand Meadow *	Clayton	.....	8	39.6	+18	60	6	20	3	.....	1.60	+.01	.65	T	6	10	10	10	SE, SW
Greene	Butler	943	.....	43.6	.....	69	5	16	3	44	1.12	.....	.37	T	4	11	10	9	W
Hampton	Franklin	1,240	9	44.0	+23	70	5	20	3	37	1.03	-.32	.34	1.5	7	9	15	6	NE, SW
Hawkeye	Fayette	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.56	.....	.65	.....	5	.....	.....	.....	.....
Humboldt	Humboldt	1,082	.....	43.0	.....	64	5,10,16	14	3	44	1.67	.....	1.08	2.0	7	18	7	5	SE
Lansing	Allamakee	.....	.....	44.2	.....	69	17	17	3	44	1.75	.....	1.15	T	3	11	7	12	.....
Larchwood	Lyon	.....	.....	.....	.....	.....	.....	.....	.....	.....	.67	.....	.27	T	7	11	11	8	SE
Larrabee	Cherokee	.....	8	41.8	+19	67	19	13	2	39	.97	-.17	.50	2.5	7	10	13	7	SW
Le Mars	Plymouth	1,221	.....	42.4	.....	66	16	11	3	42	1.81	.....	1.13	T	4	16	6	8	S
New Hampton *a*	Chickasaw	1,166	.....	43.3	.....	63	5,17	20	3	39	1.39	.....	.55	T	5	10	10	10	SW, NW
Northwood	Worth	1,210	.....	41.6	.....	62	5,15	21	26	38	1.26	.....	.88	2.0	2	20	2	8	N, S
Osage	Mitchell	1,178	8	40.5	+21	62	5	17	3	38	1.19	-.12	.64	4.0	7	6	8	16	S
Plover	Pocahontas	.....	.....	42.0	.....	70	6	11	2	48	1.64	.....	1.20	1.0	5	13	2	15	S
Primghar	O'Brien	.....	.....	45.2	.....	78	16	8	2	38	.45	.....	.25	T	2	11	0	19	SE
Ridgeway	Winneshiek	.....	.....	44.6	.....	68	5,9	21	3	39	1.57	.....	.66	.3	11	9	12	9	S
Ruthven	Palo Alto	.....	.....	43.0	.....	70	16	16	3	35	.21	.....	.17	T	2	5	22	3	W
Sheldon	O'Brien	1,406	.....	42.2	.....	65	16	16	3	42	.77	.....	.22	.....	6	16	6	8	S
Sibley	Osceola	1,506	6	40.8	+22	65	5,16	12	3	41	.67	-.03	.21	.2	7	12	10	8	S
Sioux Center	Sioux	.....	.....	42.2	.....	63	16	11	2	29	.66	.....	.51	.....	3	14	8	8	SW
Spirit Lake *f*	Dickinson	.....	5	41.8	+21	65	5	18	2,3	39	.32	-.27	.32	T	1	20	0	10	S
Storm Lake	Buena Vista	.....	.....	42.6	.....	64	15	17	2	33	1.10	.....	.62	.8	6	15	7	8	SW
Washta	Cherokee	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.23	.....	.38	T	6	18	7	5	S
Waverly	Bremer	942	.....	43.2	.....	66	17	19	3,4	42	1.37	.....	.40	T	6	10	11	9	S
West Bend *	Palo Alto	.....	6	40.8	+23	62	5	13	2	.....	1.35	+.47	.90	T	6	11	9	10	S, W
West Union	Fayette	1,105	.....	.....	.....	.....	.....	.....	.....	.....	1.23	.....	.67	.....	2	12	0	18	NE, SW
Average		.....	.....	41.9	+21.2	65.7	.....	15.7	.....	40.0	1.16	-.04	.....	0.9	5	13	8	9	S

CENTRAL SECTION.

Amana	Iowa	.....	23	44.7	+23	69	17	19	3	39	1.62	+.18	1.03	.....	5	12	8	10	SW
Ames	Story	936	19	44.1	+22	68	16	18	3	35	1.25	+.26	.57	T	4	14	3	13	.....
Audubon	Audubon	.....	6	43.6	+20	65	9	17	3,4	38	1.40	+.28	.55	4.0	3	3	13	14	NW
Baxter	Jasper	.....	.....	44.0	.....	70	5,16,17	16	2	39	1.68	.....	.66	.5	5	1	20	9	SW
Belle Plaine	Benton	849	9	43.2	+19	68	16,17	15	3	41	2.97	+1.64	1.80	.....	5	10	9	11	E
Buckingham	Tama	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.50	.....	.64	.....	5	14	7	9	.....
Carroll	Carroll	.....	9	42.6	+20	67	9	12	3	40	1.23	+.31	.82	4.5	4	19	1	10	.....
Cedar Falls	Black Hawk	844	8	44.0	+21	69	6	19	3	40	.88	-.28	.40	.....	3	14	6	10	S
Cedar Rapids	Linn	744	17	47.2	+22	72	17	20	3	42	2.04	+.40	1.24	.....	5	10	6	14	NW
Clinton	Clinton	609	8	43.1	+17	70	17	19	4	38	1.05	-.09	.70	.2	6	10	7	13	N
Coon Rapids	Carroll	.....	.....	44.0	.....	64	16	18	3	29	1.06	.....	.45	T	4	16	5	9	NW
Davenport	Scott	615	27	46.4	+18	70	17	28	4	30	.90	-.75	.70	T	8	10	6	14	NE
Delaware	Delaware	1,034	8	42.0	+21	68	17	17	3	40	1.21	-.31	.74	1.0	6	10	9	11	S
Denison (*a*)	Crawford	1,192	6	41.9	+20	65	15	13	3	40	1.05	+.64	.55	T	4	.....	.....	.....	S
Des Moines	Polk	867	21	45.8	+20	70	16	20	3	38	1.76	+.37	.64	T	7	11	10	9	NE
De Soto	Dallas	883	.....	44.4	.....	68	17	17	3	41	1.25	.....	.45	1.0	6	16	5	9	SW
Dubuque	Dubuque	665	26	44.0	+18	69	17	23	25	34	.97	-.75	.72	T	6	10	8	12	SE
Galva	Ida	.....	6	40.8	+19	65	16	14	3	35	.60	-.12	.40	.....	2	19	7	4	NE
Gilman	Marshall	1,035	.....	.....	.....	.....	.....	.....	.....	.....	2.03	.....	1.17	.....	4	11	5	14	S
Gladbrook	Iowa	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.36	.....	.42	.....	9	.....	.....	.....	.....
Grinnell	Poweshiek	1,011	9	44.6	+20	70	16	18	3	34	2.69	+1.49	1.47	.....	5	12	5	13	S
Grinnell (near)	Poweshiek	.....	.....	43.2	.....	70	16	18	4	41	2.41	.....	1.35	T	5	11	6	13	NE
Grundy Center	Grundy	966	8	41.8	+19	67	16	18	4,5	42	2.49	+1.21	.71	T	5	14	7	9	W
Guthrie Center	Guthrie	1,269	.....	43.2	.....	64	16,17	20	2	36	.43	.....	.42	T	2	15	6	9	N
Harlan	Shelby	.....	.....	43.0	.....	66	9	12	3	40	.91	.....	.41	T	6	6	11	13	S
Independence	Buchanan	921	37	42.6	+22	67	17	16	3	41	.72	-.66	.58	T	6	15	9	6	N, NW
Iowa City	Johnson	644	9	45.0	+18	68	16	20	2,3	42	1.15	-.49	.81	.....	3	9	10	11	SW
Iowa Falls	Hardin	.....	6	42.1	+21	66	16	17	3,4	41	1.00	-.10	.32	T	6	14	4	12	NE, S
Le Claire	Scott	.....	.....	.....	.....	.....	.....	.....	.....	.....	.83	.....	.78	T	4	.....	.....	.....	.....
Logan	Harrison	928	34	42.4	+15	68	16	10	26	42	1.11	-.19	.61	T	4	18	4	8	S
Maquoketa	Jackson	.....	6	44.5	+19	71	17	19	4,6	47	1.26	-.38	1.17	.....	2	19	1	10	S
Marshalltown	Marshall	898	7	45.2	+21	70	16	17	3	42	1.81	+.27	.77	.....	9	16	6	8	S
Monticello	Jones	800	45	44.4	+22	72	18	15	5	49	1.60	-.62	1.31	.....	5	15	4	11	NW
Mt. Vernon*	Linn	858	.....	44.9	.....	67	17	21	3	.....	1.47	.....	.60	.....	5	.....	.....	.....	.....
Mt Vernon (Hubbard)	Linn	.....	.....	45.6	.....	73	17	20	3	40	1.50	.....	.91	.5	4	15	2	13	N
Newton	Jasper	958	12	44.2	+22	70	16	18	3	42	1.52	+.25	.68	.5	6	12	10	8	N
Odebolt	Sac	.....	.....	43.5	.....	69	9	13	3	37	1.07	.....	.78	.....	4	17	3	10	.....
Ogden	Boone	1,109	.....	43.4	.....	67	17	13	3	41	1.16	.....	.40	2.0	5	14	4	12	SE
Olin (*a*)	Jones	.....	.....	42.2	.....	70	17	19	4	42	.92	.....	.52	T	4	14	7	9	NE, W
Onawa	Monona	.....	.....	45.4	.....	69	16	13	3	42	1.11	+.05	.58	T	8	16	9	5	SE
Rockwell City	Calhoun	1,219	.....	43.9	.....	66	17	15	3	37	1.44	.....	.75	.5	6	15	6	9	.....
Sac City	Sac	900	20	43.6	+21	64	16	16	3	35	1.45	+.21	.80	T	10	15	3	12	S
Scranton	Greene	.....	.....	44.3	.....	64	17	18	2	33	.73	.....	.43	1.0	2	17	4	9	SW
Sioux City	Woodbury	1,122	10	43.4	.....	68	16	14	3	35	.85	-.03	.35	.....	5	9	13	8	S, NW
Toledo	Tama	.....	5	45.6	+23	71	5,17	16	3	50	2.47	+1.29	1.05	.....	7	14	0	16	SW
Vinton* (*c*)	Benton	800	9	43.3	+18	70	17	16	3	.....	1.02	-.21	.52	.....	2	.....	.....	.....	NW
Waterloo	Black Hawk	862	20	43.4	+20	68	17	16	3	44	1.38	+.15	.52	T	7	14	6	10	W
West Branch	Cedar	708	.....	46.2	.....	74	7	22	16	40	1.48	.....	.94	T	3	9	7	14	S W
Whitten*	Hardin	.....	.....	40.7	.....	68	6	22	3	.....	1.18	.....	.68	T	3	11	9	10	SE
Wilton Juncton	Muscatine	.....	.....	44.5	.....	83	16	22	6	35	1.82	.....	1.18	.....	4	12	5	13	NW
Average		.....	.....	43.8	+20.0	68.5	.....	17.4	.....	39.3	1.41	+.13	.....	.5	5	13	6	11	S

CLIMATOLOGICAL DATA FOR NOVEMBER, 1899—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
...n	Union	....	....	4.40	....	67	15,17	18	3	37	.45	.....	.23	T	3	....	....	....	SSW
...a	Monroe	945	....	46.4	.....	75	16	18	3	35	.85	.....	.32	T	3	5	11	14	E, NW
...antic	Cass	....	8	43 0	+18	69	9	11	3	43	.72	-.58	.44	T	4	7	13	10	NE
...avia	Jefferson	....	....	.....	.....	....	.....	.....	.....	.....	.40	.....	.30	T	4	....	....	....	NW
...napp	Davis	857	....	47.8	.....	72	16	22	3	38	2.31	.....	1.10	.....	2	14	12	4	NW
...kton	Taylor	....	....	45.8	.....	68	9	18	3.4	39	1 16	.....	.57	.....	5	14	6	10	....
...aparte	Van Buren	....	8	47 0	+18	74	16	22	4	38	2.55	+.83	1.70	.....	4	....	....	....	.....
...lington (g)	Des Moines	....	....	47 8	.....	86	17	25	3.4	40	.93	.....	.46	.....	5	..	...	....	.....
...sey	Marion	....	....	....	.....	....	.....	.....	.....	.....	.97	.....	.30	...	4	....	....	....	.....
...son	Pottawattamie	1,013	6	....	.....	....	.....	.....	.....	.....	.50	.... ..	.50	2.0	1	....	....	....	....
...riton	Lucas	1,080	....	46.8	.....	73	16	18	3	40	1.17	.....	.41	T	9	7	10	13	SW
...llicothe	Wapello	645	..	....	.....	....	.....	.....	.....	.....	1.60	.....	.57	T	4	....	....	....	.....
...rinda	Page	1,069	..	45.8	+19	75	5	15	3	50	1.10	.....	.47	T	7	13	9	8	NE, S
...ning	Adams	1,127	....	44.6	+18	68	9	14	3	44	.68	-.21	.27	.....	4	16	4	10	NE, SW
...lege Springs(a)	Page	....	..	44 2	+16	70	9	15	3	38	1.13	-.37	.46	....	5	....	....	....	NE
...ncil Bluffs	Pottawattamie	989	..	46.2	.....	70	17	19	3	33	1 45	.....	.64	...	3	17	3	10	S
...mberland	Cass	....	....	.....	.....	....	.....	.....	.....	.....	.22	.....	.16	T	4	16	1	13	N
...nville	Des Moines	715	...	.....	.....	....	.....	.....	.....	.....	1.05	.....	.75	.. ..	2	15	6	9	.....
...gonal	Ringgold	....	..	42 5	.....	68	15	13	26	34	....	.....	....	....	..	10	19	1	NW
...lon	Wapello	....	....	47.3	....	75	16	12	4	48	.72	.....	.72	T	1	12	9	9	NW
...erson	Mills	....	..	...	.....	....	.....	.....	.....	.....	.50	.....	.50	T	1	....	....	....	.....
...rfield (a)	Jefferson	516	51	47.3	+22	72	16	24	4	33	1.60	-.01	1.00	.....	2	15	4	11	.....
Madison*	Lee	979	29	47.2	+20	68	17	26	4	....	1.10	- 93	.67	T	2	6	12	12	SW
...nwood	Mills	....	8	46.4	+21	70	9,16	14	3	39	.94	+ 13	.38	.5	3	6	17	7	SE
...eenfield	Adair	....	....	45 0	+22	70	9	15	3	36	1 04	-.42	.45	.5	6	14	7	9	N, S
...iswold	Cass	912	..	...	...	....	.....	....	.....	.....	.44	.....	25		3	12	4	14	N
...drick	Keokuk	....	8	45.8	.....	72	17	19	3	34	.83	.....	.41	T	5	17	3	10	NW
...peville	Clarke	....	7	45.4	+19	70	9	18	3	32	.67	-.40	.38	T	4	6	13	11	S
...dianola (b)	Warren	618	28	46.6	+21	71	16	22	3,27	31	1.21	-.32	.71	T	5	..	..	..	SW
...okuk	Lee	....	7	48 8	+19	72	16	28	4	30	1.19	-.69	.73	T	4	11	8	11	SW
...osauqua	Van Buren	....	6	48.2	+21	72	9,16	24	4	39	2.38	+.80	1.27	T	3	....	....	....	.....
...oxville	Marion	....	..	45.1	+19	73	16	20	3	34	.82	-.43	.21	T	5	11	7	12	SE
...cona	Warren	....	....	.....	.....	....	.....	.....	.....	.....	1.08	.....	.45	.....	3	....	....	....	.. ..
...moni	Decatur	....	..	46.5	.....	70	15	20	3,4	41	.63	.....	.30	T	7	17	8	5	N, S
...nox	Taylor	850	....	45.6	.....	68	9	17	3	32	.41	.....	.21	T	5	14	9	7	S
...lrose	Monroe	....	....	.....	.....	....	.....	.....	.....	.....	.15	... .	.14	....	2	....	....	....	.....
...oar	Lee	1,236	6	47.4	.....	76	16	24	27	37	1.02	.....	.64	....	2	18	7	5	.....
...t. Ayr	Ringgold	725	....	46.0	+20	69	9	19	3	35	.52	-.77	.16	T	8	6	11	13	NE
...t. Pleasant	Henry	1,183	..	45.6	.....	74	19	23	27	48	2 11	.....	1.40	.	4	15	8	7	N
...urray	Clarke	....	....	.....	.....	....	.....	.....	.....	.....	.88	.....	.50	T	4	13	17	0	....
...maha (Neb.)	Douglas	1,113	....	46.8	.....	70	9	21	2	32	1.38	.....	.79	T	5	11	7	12	N
...skaloosa	Mahaska	1,123	....	45.1	+19	74	16	17	3	42	1.03	-.12	.49	.....	6	15	1	14	S
...sceola	Clarke	....	6	46.8	.....	72	9	24	2	34	1.00	.....	.58	T	5	3	21	6	SW
...ttumwa	Wapello	850	16	47 9	+20	74	16	21	3	34	1.95	+.16	.70	T	4	12	5	13	S
...vid	Wayne	630	5	47.2	+21	73	9	16	3	40	1 77	+.19	1.20	T	5	12	2	16	SW
...acific Junction	Mills	960	...	44 4	....	72	8	13	3	45	.76	.....	.33	T	3	9	14	7	SE
...ella	Marion	....	...	41.2	....	65	21	18	3,27,30	34	1.24	.....	.38	....	4	11	8	11	NE
...ed Oak	Montgomery	1,033	....	48.8	....	75	17	18	3	40	.83	.....	.26	T	5	16	2	13	S
...lgourney	Keokuk	....	...	47 0	....	74	17	20	3	40	1.00	.....	.57	T	3	12	12	6	NW
...tuart	Guthrie	....	...	43.4	.....	65	9,10,16	20	2	30	1.32	.. ....	.45	1 2	5	10	9	11	N
...herman	Fremont	....	...	45.2	.....	68	16	15	3,4	42	.96	.....	.40	T	4	14	4	12	SW
...illisca	Montgomery	1,058	6	43.8	-[-20	70	9	17	3	41	.75	-.25	.35	T	4	16	7	7	NW
...apello	Louisa	578	....	49.0	.....	74	10	21	4	40	1.06	.....	.01	....	4	16	5	9	SE, SW
...ashington (d)	Washington	738	8	45 0	+19	73	17	18	4	42	.74	-.48	.52	....	2	....	....	..	.....
...interset	Madison	....	8	45.4	+19	69	9	18	3	34	.82	..53	.45	.....	4	..	...	....	.....
...oodburn	Clarke	....	....	.....	...	....	.....	.....	.....	.....	.83	.....	.27	.5	8	13	13	4	.....
Average		....	...	46 0	+19.6	71.5	.....	18.9	.....	37.9	1 03	-.22	.....	0.2	4	12	9	9	SW
Av. for the state		....	..	43 9	+20.3	68.6	.....	17 3	.....	39.1	1 20	- 04	.....	0.5	5	12	8	10	S

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.



DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR NOVEMBER, 1899.

STATIONS		DATE.																												
		1	2		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Afton	Max.	60	35	44	56	62	63	58	65	68	60	47	58	48	62	67	66	67	55	57	66	59	55	40	44	43	35	48	57	57	48	55
	Min.	29	22	18	23	31	26	31	33	33	46	37	33	34	42	42	48	52	36	30	50	53	39	26	27	25	24	23	23	26	32	53
Albia	Max.	60	52	45	56	62	66	60	59	67	49	54	58	64	59	62	75	72	62	60	62	67	59	55	43	42	49	52	55	61	56	58
	Min.	27	28	18	21	28	31	38	33	40	27	40	31	37	44	43	45	53	42	31	39	47	50	33	37	30	25	20	28	37	35	54
Alta	Max.	33	40	48	60	64	62	55	60	62	50	40	58	52	43	66	63	60	53	61	59	46	56	43	46	48	50	52	57	51	35	52
	Min.	28	16	20	24	24	32	40	33	36	36	34	34	35	36	35	44	41	30	34	42	40	40	30	25	26	27	25	30	34	31	35
Amana	Max.	57	38	45	58	63	61	61	60	64	64	50	56	52	51	56	67	69	57	58	56	60	58	48	42	45	45	47	53	55	45	54
	Min.	31	26	19	20	25	22	37	35	39	42	35	34	36	45	45	45	56	36	28	45	51	48	34	38	27	24	23	29	30	36	54
Ames	Max.	52	38	49	60	65	60	53	58	62	58	46	58	58	50	61	68	64	53	58	59	55	54	54	45	46	47	51	55	57	50	54
	Min.	27	23	18	25	22	25	42	33	37	42	37	37	38	43	43	46	32	34	27	45	51	46	33	31	25	25	20	28	35	33	53
Atlantic	Max.	35	38	47	57	61	62	56	60	69	55	44	56	63	54	67	65	66	56	61	64	54	52	51	40	46	48	49	59	58	45	54
	Min.	29	19	11	14	18	22	43	29	29	42	38	36	37	43	38	49	43	32	26	49	48	47	29	22	22	18	18	26	32	33	51
Audubon	Max.	45	35	40	55	54	55	56	58	65	55	45	55	62	52	63	63	55	54	61	63	53	52	50	40	45	42	48	53	57	58	53
	Min.	29	20	17	17	33	30	32	30	35	33	37	37	42	43	50	44	48	35	32	48	45	45	33	27	27	25	25	35	35	33	51
Bancroft	Max.	44	38	44	60	64	61	59	58	57	55	45	53	51	49	67	60	60	55	58	60	58	57	42	43	45	49	57	54	52	46	53
	Min.	30	12	18	24	31	25	41	42	34	44	30	43	34	37	37	43	47	31	31	43	44	37	31	29	21	19	25	31	35	29	52
Baxter	Max.	41	39	50	61	70	..	51	64	68	65	46	60	56	48	62	70	70	51	65	60	58	55	47	45	50	43	51	58	53	42	55
	Min.	22	16	19	30	31	36	34	33	38	41	38	38	40	42	44	41	34	30	35	50	38	34	34	25	25	25	24	28	37	26	32
Blockton	Max.	57	35	44	56	60	62	60	62	68	62	50	60	65	64	67	62	62	61	53	67	67	57	54	42	41	47	35	57	59	48	56
	Min.	29	21	18	18	26	23	44	31	35	50	33	35	44	44	41	53	53	35	30	50	52	51	36	27	39	20	27	27	37	32	45
Belknap	Max.	42	40	47	64	66	65	70	61	70	71	50	60	63	50	65	72	71	56	60	64	66	57	44	43	46	53	27	37	32	35	51
	Min.	30	28	22	34	35	32	32	40	42	44	43	38	38	43	44	46	54	39	32	48	44	48	35	34	35	32	25	31	36	41	58
Belle Pl'ne	Max.	39	38	45	58	63	62	62	62	65	64	58	56	54	48	55	68	68	58	65	57	60	55	47	42	45	43	48	53	56	44	53
	Min.	29	25	15	17	26	28	36	30	31	40	38	35	37	39	43	44	50	34	29	45	48	45	35	34	28	26	22	25	32	36	53
Bonaparte	Max.	53	40	47	59	66	65	61	62	70	71	56	57	55	57	66	74	69	60	62	57	62	55	53	42	42	49	41	55	63	63	57
	Min.	31	28	25	22	28	28	38	38	38	41	40	39	37	46	45	46	37	38	30	50	52	45	33	39	37	34	25	29	29	40	56
Britt	Max.	49	36	45	59	62	62	59	57	57	58	42	51	52	48	65	61	60	51	57	60	53	56	43	42	46	46	48	51	52	38	52
	Min.	27	18	16	15	21	27	41	35	28	39	31	30	33	38	37	41	49	29	32	43	41	39	29	34	23	20	17	25	31	28	52
Burlington	Max.	52	41	59	67	..	66	65	..	70	..	55	58	54	60	67	70	86	..	..	..	..	63	50	43	42	57	61	58	65	65	59
	Min.	35	30	25	25	..	26	36	..	41	..	40	34	38	45	42	45	40	..	..	..	..	48	35	38	38	33	28	30	31	43	35
Carroll	Max	42	42	50	60	65	63	60	62	67	55	60	58	54	58	44	65	65	52	56	66	62	47	52	43	48	50	53	55	50	37	54
	Min.	27	16	12	20	25	30	34	26	35	34	35	35	40	33	34	49	31	35	32	34	40	45	30	23	21	20	22	28	37	30	50
Cedar Falls	Max.	46	40	50	62	64	69	51	53	64	65	50	53	52	56	64	65	68	67	60	64	58	60	57	51	51	52	51	52	50	45	56
	Min.	30	29	19	23	24	30	38	35	34	39	40	30	35	45	42	48	33	29	30	31	33	35	34	35	25	21	22	30	26	25	51
Cedar Rap	Max.	54	41	50	62	70	67	62	64	69	67	64	57	56	54	60	68	72	53	62	60	61	60	53	59	51	54	52	54	58	68	59
	Min.	32	29	20	24	29	25	38	35	37	42	34	34	38	44	43	47	51	37	30	44	53	43	35	33	28	27	25	30	31	34	51
Chariton	Max.	61	38	46	60	66	64	55	62	72	68	47	57	67	56	65	73	72	57	57	63	65	60	53	42	43	45	52	61	62	51	53
	Min.	28	28	18	20	28	30	41	35	40	44	39	36	40	44	43	48	54	36	30	46	53	50	35	33	27	24	22	28	37	32	52
Charles Cy	Max.	52	37	45	58	62	60	50	53	58	54	54	51	50	50	55	62	61	52	53	54	51	55	58	40	47	45	50	49	50	45	52
	Min.	31	27	18	17	20	22	37	37	33	41	34	30	31	41	40	40	51	32	32	39	46	43	32	34	23	21	20	27	31	32	52
Clarinda	Max.	47	45	49	62	75	63	62	65	74	61	47	60	65	56	70	66	69	59	60	66	65	55	51	44	45	40	50	59	61	49	58
	Min.	29	21	15	19	25	30	29	31	31	43	38	33	44	43	35	51	43	35	31	53	54	51	33	28	28	25	18	25	35	34	53
Clinton	Max.	51	39	46	57	55	60	60	60	65	63	45	49	53	51	55	60	70	53	54	61	58	55	45	43	47	46	49	52	56	51	53
	Min.	33	28	28	19	22	24	30	33	32	39	30	28	29	44	38	37	49	34	29	36	50	43	38	37	29	22	22	26	38	31	52
College Sps	Max.	59	38	44	58	60	..	59	62	70	59	..	60	60	54	67	67	66	67	60	65	55	53	41	41	42	31	47	57	60	49	55
	Min.	28	20	15	21	22	27	42	33	33	44	..	54	46	42	34	44	49	36	35	52	49	37	29	25	25	25	20	26	35	32	53
Coon Rap	Max.	54	38	44	56	60	60	58	57	62	54	45	55	61	55	61	64	63	50	60	62	56	53	52	43	45	45	48	54	56	45	53
	Min.	28	19	18	27	33	32	34	34	40	39	35	35	36	42	39	45	48	37	32	47	46	44	31	25	25	23	25	32	39	32	54
Corning	Max.	54	37	42	56	60	62	54	62	68	60	47	64	64	61	61	66	67	65	56	66	60	54	54	41	44	37	45	58	50	46	55
	Min.	29	20	14	15	16	28	36	32	36	45	39	33	42	43	37	51	45	42	34	49	52	59	32	25	24	21	18	28	34	33	53
Co. Bluffs	Max.	35	41	48	50	63	60	55	65	68	57	50	50	62	51	68	65	70	56	60	65	53	60	42	46	49	40	52	59	61	47	55
	Min.	28	21	19	28	30	40	42	48	45	44	35	41	44	38	40	50	48	40	41	48	45	43	30	30	29	28	30	32	38	35	57
Cresco	Max.	37	35	44	59	61	60	53	57	59	45	39	44	47	45	54	59	63	48	53	53	50	51	39	40	46	47	48	52	50	36	49
	Min.	30	24	21	21	23	24	35	35	34	39	27	27	31	40	39	41	39	31	31	38	44	31	31	29	24	18	22	26	31	27	50
Davenp'rt	Max.	48	38	47	58	61	63	62	61	66	66	47	53	51	51	58	64	61	70	58	55	60	60	56	44	42	45	49	50	53	59	56
	Min	33	31	29	28	32	33	42	42	44	44	36	34	36	46	44	41	54	38	32	42	52	44	34	40	35	31	30	33	37	37	54
Delaware	Max.	53	36	45	59	61	62	59	60	64	64	45	43	49	49	56	58	68	56	52	57	54	52	42	40	45	48	49	54	54	43	52
	Min.	30	25	17	19	24	21	34	32	39	41	30	25	30	42	42	37	52	33	28	35	47	40	35	30	24	23	20	27	23	30	31
Decorah	Max.	54	43	46	58	60	63	56	47	65	60	42	43	48	47	55	58	65	48	56	53	51	56	42	45	48	47	50	53	52	42	51
	Min.	34	24	13	23	20	19	30	18	35	38	22	23	27	42	34	32	45	33	30	33	45	33	32	28	20	18	20	25	28	23	28
Denison	Max.	35	38	45	58	60	62	..	61	62	52	48	57	60	44	65	65	63	62	60	63	47	55	39	42	40	47	50	55	57	40	52
	Min.	29	18	13	18	22	32	..	27	28	42	38	35	42	40	29	49	45	30	32	45	43	45	21	24	22	19	20	25	25	32	31
Des Moines	Max.	40	38	47	69	65	62	54	60	68	59	47	58	62	50	59	70	69	52	57	62	59	55	51	43	46	43	52	56	60	45	55
	Min	32	27	20	22	28	29	44	35	40	44	40	40	40	43	43	48	47	38	33	49	53	49	35	34	29	18	22	30	41	31	46
De Soto	Max.	47	37	44	57	62	62	60	62	65	58	47	58	62	52	63	67	68	50	57	61	57	53	51	41	44	41	49	54	59	45	54
	Min.	30	23	17	20	25	21	48	30	37	43	38	38	38	44	44	49	45	33	28	51	53	48	34	27	26	21	18	29	33	32	51
Diagonal	Max.	62	38	43	56	61	63	60	61	69	60	58	57	58	60	68	67	67	51	60	58	65	53	41	42	46	45	41	58	59	47	54
	Min.	28	21	15	18	24	45	29	28	35	37	30	33	43	43	41	53	41	39	43	49	55	33	21	26	24	13	22	21	35	25	52
Dows	Max.	50	38	46	60	65	64	55	59	61	50	54	53	54	52	63	65	65	50	58	55	55	54	52	41	47	50	53	55	54	42	54
	Min.	37	18	13	18	25	23	40	30	33	32	30	35	34	39	40	45	50	29	30	43	45	43	29	32	22	19	21	27	34	28	51
Dubuque	Max.	55	36	45	60	60	63	57	60	64	57	44	44	58	59	60	61	69	53	54	58	55	51	43	42	46	48	51	54	57	44	53
	Min.	33	31	25	26	30	29	37	36	45	43	30	29	34	44	44	38	53	35	31	40	50	39	33	32	23	28	24	31	31	35	54
Eldon	Max.	51	39	48	60	69	68	62	64	72	72	57	60	62	58	70	75	73	58	64	60	62	58	53	44	45	52	54	54	64	62	59
	Min.	31	27	22	12	23	22	35	35	37	42	43	40	32	46	45	46	57	31	27	50	50	48	34	40	30	30	22	26	30	33	54
Elkader	Max.	40	41	51	64	68	68	63	65	68	56	49	45	49	49	65	60	72	46	61	55	54	57	43	48	55	56	57	54	56	40	55
	Min.	32	30	15	15	19	19	28	26	36	40	38	23	29	44	43	32	45	32	28	36	41	38	37	30	22	20	20	25	26	29	52
Estherville	Max.	46	25	31	40	64	52	40	51	48	41	35	44	37	41	53	58	46	39	57	53	47	44	34	35	30	45	43	41	40	32	43
	Min.	24	15	11	20	20	21	37	32	29	29	28	23	23	33	30	37	38	26	37	37	29	37	28	16	17	15	18	18	32	26	26
Fonda	Max.	38	40	49	61	65	62	57	60	63	56	43	58	55	43	61	54	62	57	62	60	48	55	43	44	47	51	53	58	54	38	51
	Min.	16	16	17	19	25	26	31	30	30	34	35	36	37	30	32	34	30	34	34	42	42	31	21	20	19	20	23	27	32	22	27
Forest City	Max.	51	38	47	60	64	61	67	67	58	52	45	59	51	66	60	61	59	58	57	54	52	47	48	50	52	51	53	53	50	44	54
	Min.	29	18	21	24	27	29	41	37	32	40	31	35	39	37	44	49	32	32	40	42	30	30	34	23	30	25	22	28	35	34	52
Galva	Max.	39	40	49	32	49	62	55	49	62	50	44	49	55	58	56	65	63	59	62	60	55	43	34	50	52	45	50	55	43	40	50
	Min.	29	16	14	18	29	32	40	29	39	40	35	35	40	33	30	45	42	30	35	42	40	31	20	29	30	20	22	29	27	33	50
Glenwood	Max.	60	50	48	61	63	65	59	65	70	60	52	59	64	60	67	70	67	60	66	58	53	52	44	45	47	50	61	61	52	54	58
	Min.	28	20	14	22	26	38	41	28	35	47	39	37	45	43	28	53	45	33	49	50	47	36	27	27	25	19	29	35	42	30	54
Greene	Max.	55	39	47	62	69	60	64	59	62	58	46	54	52	54	61	62	63	53	59	55	53	56	49	42	50	51	54	55	53	47	54
	Min.	30	25	16	21	25	25	37	36	35	42	36	28	31	41	40	42	32	20	38	45	43	32	34	25	22	24	27	34	30	32	55
Greenfield	Max.	47	38	47	57	64	68	63	63	70	60	57	58	65	50	69	66	67	54	62	65	58	52	50	41	45	41	48	48	60	44	55
	Min.	28	19	15	23	28	34	43	34	37	47	37	36	40	42	39	47	47	34	32	51	49	47	33	25	25	24	20	23	36	32	54
Grinnell	Max.	54	36	44	56	61	60	52	59	62	59	52	55	52	51	56	70	67	54	56	56	58	54	50	41	44	42	48	50	56	44	53
	Min.	30	27	18	22	32	35	41	36	41	46	38	39	38	44	44	45	54	35	32	48	52	49	35	32	25	24	28	30	38	22	35
Grin'l (nr.)	Max.	56	35	46	59	65	65	50	59	60	59	40	57	52	50	59	70	69	49	57	57	58	50	40	40	43	43	47	52	57	45	53
	Min.	28	28	19	18	26	28	35	32	37	43	37	37	35	43	43	43	54	33	28	45	52	33	33	33	25	26	22	25	33	32	53
Grundy C'r	Max.	47	42	41	43	60	65	64	58	63	62	46	54	54	48	60	67	66	48	59	58	54	53	41	42	47	46	50	51	55	39	52
	Min.	28	27	27	18	18	28	25	29	36	41	29	30	33	40	41	40	45	31	27	32	46	36	31	28	24	22	23	28	31	30	30
Guthrie C'r	Max.	53	37	45	38	53	52	50	62	55	50	44	57	52	49	62	64	64	56	60	62	57	54	51	38	45	45	48	52	58	41	52
	Min.	29	20	27	22	29	34	44	29	37	41	35	35	40	47	40	47	47	36	27	49	48	45	33	25	25	23	21	30	21	32	53
Hampton	Max.	39	41	48	62	70	67	53	60	63	63	45	53	52	44	63	66	63	49	61	51	52	60	46	45	53	53	56	57	54	38	54
	Min.	29	23	20	26	33	31	40	35	37	39	32	30	33	40	40	42	46	32	34	37	44	43	32	35	26	25	26	31	35	31	53
Harlan	Max.	46	39	44	56	60	62	55	61	66	53	45	55	64	55	61	65	63	54	60	64	58	55	50	46	44	47	50	56	59	45	54
	Min.	28	19	12	16	22	25	36	28	30	42	37	33	39	40	36	49	41	32	28	41	45	44	32	26	26	22	18	27	33	32	51
Hedrick	Max.	42	37	45	57	62	62	61	60	67	67	54	59	60	51	61	64	72	57	60	59	67	58	52	42	43	47	50	53	60	50	56
	Min.	24	25	19	21	29	28	30	35	54	45	41	37	31	44	44	43	54	36	26	50	52	48	32	39	31	26	22	28	35	30	55
Hopeville	Max.	42	36	45	56	63	52	57	61	70	63	47	57	64	55	66	68	69	54	54	66	62	56	49	41	42	36	49	59	59	47	54
	Min.	29	22	18	24	32	32	41	37	39	43	39	35	43	43	43	49	51	38	32	49	54	49	32	30	27	25	24	29	38	33	36
Humboldt	Max.	48	38	47	60	64	62	57	60	60	64	48	52	56	54	60	64	62	58	58	61	54	55	53	42	48	47	52	53	52	41	54
	Min.	30	18	14	18	20	24	41	38	32	42	32	42	35	40	36	44	48	32	30	45	42	45	31	22	22	19	20	29	38	22	31
In'pend'ce	Max.	50	38	46	60	66	64	57	67	62	62	49	52	49	48	61	64	67	50	57	59	53	56	48	43	48	47	49	51	55	40	53
	Min.	28	23	16	19	19	23	32	32	34	42	37	26	31	43	41	39	51	33	26	37	45	45	35	35	21	23	17	26	29	30	31
Indianola	Max.	61	37	..	64	55	61	..	..	67	59	48	58	64	53	63	71	69	57	57	63	57	58	52	42	45	40	51	55	59	53	56
	Min.	29	25	22	33	44	35	..	..	39	46	38	38	39	44	43	50	56	35	30	48	52	54	35	34	24	24	22	30	39	32	37
Iowa City	Max.	56	40	47	59	65	65	63	62	66	62	52	59	52	50	60	68	67	58	58	56	60	56	48	42	47	47	51	55	59	51	56
	Min.	23	20	20	21	24	23	35	34	34	38	38	36	36	45	45	42	56	36	38	43	53	47	33	39	27	23	22	26	29	32	33
Iowa Falls	Max.	44	38	46	59	62	62	52	54	62	61	44	53	55	48	59	56	64	47	47	58	52	55	45	41	46	46	50	53	53	37	52
	Min.	29	23	17	17	25	21	39	35	36	43	29	29	35	41	42	43	43	29	28	42	46	43	31	28	24	21	20	27	31	30	31

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR NOVEMBER, 1899—CONTINUED.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Mean.
)kuk.....	Max.	43	39	46	56	63	64	63	63	69	66	54	57	54	61	68	72	69	55	60	59	63	56	46	42	42	48	51	52	62	63	56.9
	Min.	35	31	29	28	35	34	43	43	45	50	42	40	39	48	45	47	58	43	36	52	57	50	38	37	38	35	29	32	38	43	40.7
)sauqua....	Max.	52	38	47	60	69	66	60	64	72	70	51	58	57	59	58	72	71	69	61	54	64	57	52	42	43	49	53	56	63	64	58.4
	Min.	33	29	26	24	30	29	40	40	43	45	44	40	40	48	44	48	59	41	31	30	51	49	36	39	37	31	25	32	35	37	30.0
oxville.....	Max.	41	41	43	58	65	63	55	62	67	63	48	53	63	49	63	73	72	52	65	62	65	55	51	43	45	43	51	53	60	49	56.0
	Min.	41	41	43	58	65	63	55	62	67	63	48	53	63	49	63	73	72	52	65	62	65	55	51	35	38	27	26	24	24	39	34.2
noni.....	Max.	41	30	20	35	31	31	43	37	42	46	42	39	38	45	44	47	57	37	37	48	52	51	35	38	27	26	24	24	39	32	34.2
	Min.	29	30	20	35	31	31	43	37	42	46	42	39	38	45	44	47	57	37	37	48	52	51	35	38	27	26	24	24	39	32	34.2
	Max.	60	40	43	56	60	61	59	59	67	61	57	68	63	67	70	54	38	31	51	54	52	37	31	32	25	24	27	30	35	33	35.8
	Min.	27	24	20	20	29	27	43	34	34	48	33	42	44	43	59	53	69	61	55	54	54	55	44	51	52	52	55	58	55	49	55.7
asing.....	Max.	64	41	51	64	65	65	60	63	65	65	45	45	50	48	61	55	69	61	55	54	54	55	44	51	52	52	55	58	55	49	55.7
	Min.	36	31	17	20	25	23	28	29	35	35	37	33	30	44	43	35	55	35	30	34	47	43	36	37	24	24	23	28	29	36	32.7
rabee.....	Max.	38	41	47	57	63	62	58	58	63	49	42	58	53	55	58	65	57	53	67	55	53	57	53	46	48	49	52	57	58	42	53.8
	Min.	38	41	47	57	63	62	58	58	63	49	42	58	53	55	58	65	57	53	67	55	53	57	53	46	48	49	52	57	58	42	53.8
	Max.	20	13	14	18	25	30	38	28	31	33	32	31	36	31	36	45	40	27	33	40	39	39	30	24	22	19	24	28	35	30	29.7
	Min.	20	13	14	18	25	30	38	28	31	33	32	31	36	31	36	45	40	27	33	40	39	39	30	24	22	19	24	28	35	30	29.7
Mars.....	Max.	43	42	47	60	61	60	56	60	61	56	44	56	55	53	63	66	63	60	60	60	61	56	52	48	46	46	52	52	57	45	51.6
	Min.	28	17	11	18	20	33	41	28	27	36	33	33	36	39	36	48	36	28	36	33	37	38	33	26	22	19	25	27	37	30	30.3
nox.....	Max.	60	42	43	54	59	62	57	62	68	60	51	56	63	43	38	51	65	66	59	55	65	61	56	52	40	43	39	46	57	58	48	55.8
	Min.	28	17	11	18	20	33	41	28	27	36	33	33	36	39	36	48	36	28	36	33	37	38	33	26	22	19	25	27	37	30	30.3
	Max.	60	42	43	54	59	62	57	62	68	60	51	56	63	43	38	51	52	37	34	49	54	50	34	28	23	23	20	28	35	33	35 4
	Min.	28	20	17	22	27	31	45	35	38	48	38	34	42	54	64	68	66	60	61	58	56	55	45	44	46	40	50	55	64	38	55.4
gan.....	Max.	47	41	40	57	60	61	59	65	66	58	55	56	64	41	36	34	30	31	30	35	38	40	38	25	18	10	24	26	40	30	29.3
	Min.	25	17	12	15	25	28	30	35	33	30	34	30	40	57	57	60	65	71	64	56	62	60	58	62	58	50	51	61	58	59	59.9
quoketa....	Max.	61	44	47	61	63	66	61	67	65	65	62	64	57	57	60	65	71	64	56	62	60	58	62	58	50	51	61	58	60	59	59.9
	Min.	35	28	23	19	21	19	25	22	35	32	28	22	27	33	44	42	35	34	25	32	35	38	32	35	24	21	28	21	30	26	29.1
rsh'lt'n.....	Max.	53	39	38	61	67	64	51	60	65	65	53	57	55	59	60	70	68	53	59	58	59	55	43	47	47	50	55	58	63	64	55.6
	Min.	30	28	17	23	26	22	37	39	40	45	40	37	37	44	43	45	52	34	28	44	51	46	34	31	25	23	22	29	33	34	34.9
nticello. ...	Max.	64	68	47	58	64	62	64	62	70	60	63	48	50	60	61	70	70	39	38	33	62	58	63	54	43	47	52	55	56	58	58.7
	Min.	24	26	19	16	15	33	32	31	30	30	24	25	31	35	37	37	39	38	33	25	54	50	33	36	22	21	19	25	29	31	30.0
oar.....	Max.	44	43	48	52	54	62	64	67	70	63	52	48	48	49	63	73	76	69	63	60	61	65	58	56	43	47	48	53	44	66	65	57.2
	Min.	34	30	29	25	31	25	30	35	38	42	43	33	33	42	45	46	47	57	37	37	48	52	51	35	38	27	26	24	24	39	32	34.2
. Ayr..	Max.	59	35	45	57	62	63	59	61	69	60	48	57	64	61	68	51	53	38	34	52	54	51	35	29	28	26	24	25	35	32	36.1
	Min.	28	21	19	23	29	33	45	37	35	48	37	34	43	43	41	71	73	73	74	72	66	58	51	43	43	49	49	52	61	61	59.2
. Ple's'nt....	Max.	52	40	46	64	62	63	64	63	63	69	58	56	54	57	69	71	73	73	74	72	66	58	51	42	29	26	32	27	23	24	29	38	38.1
	Min.	29	25	24	26	24	29	34	35	35	39	37	32	32	42	37	41	39	32	26	23	51	42	29	26	32	27	23	24	29	38	32.1
. Vernon...	Max.	44	40	52	63	70	67	64	67	68	68	48	46	56	50	63	66	73	46	62	57	59	53	43	41	33	31	25	26	25	30	32	52	56.5
	Min.	31	28	20	23	30	31	39	39	37	44	39	33	36	38	36	55	60	63	53	55	54	52	56	53	41	48	47	49	49	51	51	52.6
wH'pton....	Max.	51	37	59	..	63	62	51	57	59	55	45	50	50	48	55	60	63	53	55	53	55	56	53	46	32	33	27	25	21	25	32	29	34.0
	Min.	34	27	20	..	28	29	34	45	36	42	32	29	38	44	40	39	50	33	39	38	41	45	32	33	27	25	23	21	25	32	29	34.0
	Max.	51	37	59	..	63	62	51	57	59	55	45	50	50	48	55	60	63	53	55	53	55	56	53	46	32	33	27	25	21	25	32	29	34.0
	Min.	34	27	20	..	28	29	34	45	36	42	32	29	38	44	40	39	50	33	39	38	41	45	32	33	27	25	23	21	25	32	29	34.0
wton.....	Max.	52	37	45	58	63	63	52	58	62	59	47	56	57	50	57	70	65	52	56	57	59	52	50	42	44	43	43	51	57	42	53.5
	Min.	28	27	18	22	21	24	38	33	40	45	41	38	37	44	43	46	51	34	30	49	51	48	34	32	26	25	23	29	37	34	34.9
	Max.	44	48	56	59	62	61	52	56	57	50	40	48	49	45	38	46	44	43	62	59	60	48	56	54	47	47	50	50	48	38	51.0
orthwood ...	Max.	44	48	56	59	62	61	52	56	57	50	40	48	49	45	38	46	44	43	62	59	60	48	56	54	47	47	50	50	48	38	51.0
	Min.	30	29	28	29	27	23	33	33	35	39	27	23	30	38	55	66	61	62	51	61	62	58	58	51	42	47	50	52	57	55	46	55.4
lebolt.....	Max.	41	40	48	59	63	59	55	61	69	55	43	57	58	39	32	44	44	32	33	44	41	42	32	32	23	18	22	33	39	32	31.6
	Min.	29	17	13	23	26	25	39	30	35	32	33	35	36	39	55	63	65	67	50	60	61	51	54	43	41	44	51	53	33	59	42	55.0
gden.....	Max.	61	40	43	63	66	64	58	62	65	59	48	58	59	38	42	41	47	43	30	30	45	49	44	24	24	20	25	47	50	50	44	43	53.9
	Min.	29	18	13	18	25	31	41	31	32	41	35	37	52	50	64	62	70	46	55	57	60	53	44	46	46	22	20	26	26	27	30	30.6
lin	Max.	43	41	46	59	61	62	61	60	64	65	..	53	29	35	44	38	59	34	24	32	46	43	33	39	25	22	48	52	60	61	50	55 9
	Min.	28	25	21	19	24	20	27	32	31	35	..	23	56	61	54	65	68	66	56	60	65	55	52	51	45	46	26	28	36	43	32	37.7
maha.....	Max.	39	41	48	59	62	62	58	64	70	58	45	33	47	43	34	57	49	38	39	51	47	46	33	30	30	50	52	56	58	62	50	58.6
	Min.	31	21	23	30	34	40	44	37	40	42	40	33	60	60	60	66	69	68	59	63	63	58	55	54	50	29	22	22	28	38	32	32.2
nawa.....	Max.	52	47	55	63	65	63	60	66	66	57	47	37	31	40	42	30	49	40	31	33	43	42	44	36	24	42	37	52	60	60	42	56.5
	Min.	28	17	13	19	25	31	40	23	30	43	37	58	64	49	67	70	71	53	55	65	60	54	41	41	27	25	27	30	40	32	37.0
sceola.....	Max.	71	44	54	53	66	62	56	62	72	63	46	39	35	41	44	43	50	55	37	60	65	53	50	35	31	40	52	54	64	62	52	53.5
	Min.	25	24	32	32	36	28	42	32	38	50	39	59	68	49	67	73	74	57	60	65	69	57	57	41	33	28	25	23	29	37	33	35.9
vid	Max.	41	41	50	61	69	65	51	65	73	68	39	34	39	44	43	49	56	35	31	49	53	49	33	33	48	45	51	49	49	41	49.9
	Min.	28	28	16	23	29	29	41	35	40	42	48	50	46	57	60	60	47	52	54	51	54	35	30	30	24	21	25	28	33	28	31.1
sage.....	Max.	47	35	43	57	62	59	36	35	35	40	23	26	31	39	39	38	45	34	32	35	60	64	56	50	42	44	45	51	53	60	51	56.0
	Min.	30	22	17	25	24	25	57	61	68	69	49	59	60	52	63	74	72	52	59	49	52	47	30	37	27	23	19	29	32	33	34.2
skaloosa.....	Max	37	35	47	60	65	64	22	37	32	40	41	40	39	36	43	43	45	48	34	27	49	61	60	67	51	43	45	50	46	53	63	54	57.5
	Min.	29	27	17	20	24	22	61	60	61	70	68	52	59	60	54	66	74	73	58	39	34	53	52	57	34	39	34	31	25	34	38	41	38.3
ttumwa.....	Max.	51	50	46	43	60	26	27	38	38	44	46	43	41	42	41	45	49	58	39	60	68	53	52	45	44	45	43	50	59	61	40	55.5
	Min.	29	28	21	22	26	62	65	59	72	70	59	47	58	65	53	67	69	63	59	60	52	50	47	38	27	26	22	18	26	34	32	33.3
acific Jct.....	Max.	38	42	45	46	62	34	23	42	27	29	42	40	35	38	43	29	50	48	39	30	31	60	52	50	46	48	46	45	47	56	41	51.4
	Min.	31	21	13	17	34	50	48	49	55	59	55	51	54	52	52	55	58	64	62	60	65	52	50	46	48	46	24	23	18	28	30	18	31.1
'ella.....	Max.	34	33	44	51	50	48	49	55	59	41	45	41	42	36	33	42	43	55	50	61	60	56	60	60	58	53	56	46	60	51	45	36	53.1
	Min.	29	28	18	21	22	22	21	21	41	45	41	42	36	33	42	43	55	50	61	60	56	60	60	58	53	56	46	18	30	30	31	35	31.0
'lover.....	Max.	38	40	42	55	62	70	60	58	61	58	40	50	48	33	62	50	33	32	29	40	42	35	44	24	22	18	30	30	31	35	31.0
	Min.	28	11	20	22	22	22	36	33	30	35	24	37	34	35	36	78	75	73	74	72	53	52	72	37	65	60	58	58	60	58	58	60	58.6
'rimghar.....	Max.	60	32	58	55	55	62	55	52	61	50	40	40	60	58	75	40	50	35	30	30	42	32	30	25	25	28	25	23	28	38	28	38	31.9
	Min.	28	8	20	20	30	40	35	33	38	33	30	34	36	36	50	70	66	75	63	62	68	67	55	55	52	55	54	55	65	66	49	61.3
ted Oak.... ..	Max	65	45	51	64	68	64	60	64	74	63	48	62	66	67	70	53	55	45	37	31	50	50	50	37	29	27	26	22	25	32	29	32	36.4
	Min.	30	22	18	24	28	34	40	33	35	44	41	37	48	47	57	58	65	56	59	53	54	59	46	46	55	56	52	60	51	41	44	55.1
Ridgeway	Max.	50	43	58	61	68	67	57	63	68	55	50	45	48	48	57	41	38	48	35	34	45	38	36	35	28	28	27	29	35	33	34.1
	Min.	33	26	21	27	29	32	37	37	37	41	35	27	32	43	55	61	62	66	53	51	56	54	55	45	47	47	52	53	56	47	55 0
Rockwell C....	Max.	51	45	45	58	65	62	58	61	65	55	45	56	63	55	45	31	39	48	30	31	43	43	45	31	25	25	22	26	36	35	32.8
	Min.	29	19	15	22	30	25	46	31	41	40	33	36	35	51	51	69	70	58	58	50	60	65	56	54	55	56	46	20	26	53	35	49	54.9
Ruthven.....	Max.	50	38	41	58	62	63	64	55	59	58	44	49	30	31	39	34	40	43	30	31	49	44	42	30	31	28	49	52	22	25	25	31.0
	Min.	26	19	16	25	31	30	29	35	31	38	31	30	55	56	53	63	64	61	52	61	60	56	54	52	43	47	20	25	30	38	32	54.1
Sac City.....	Max.	50	40	47	59	63	61	57	60	61	56	42	34	36	40	33	47	45	32	30	44	42	30	23	24	45	45	50	54	56	48	54.6
	Min.	29	29	16	24	35	30	42	30	35	38	36	55	58	55	58	63	61	59	59	60	57	53	53	55	30	25	24	25	32	39	32	34.1
Scranton	Max.	55	37	44	58	61	61	56	59	60	57	44	36	36	43	37	45	52	34	31	45	46	43	19	52	50	49	50	52	56	50	38	53.9
	Min.	29	18	28	35	30	30	41	33	39	41	34	40	52	51	48	64	65	59	51	57	62	62	58	52	30	26	24	19	22	33	30	30.5
Sheldon	Max.	58	42	42	60	64	61	57	59	59	50	30	33	36	36	29	44	36	29	34	40	40	42	30	50	51	49	49	51	58	48	44	53.3
	Min.	38	25	16	28	22	29	38	27	27	32	41	54	51	45	64	65	60	50	62	54	53	57	40	29	26	22	18	23	27	30	28	28.4
Sibley.....	Max	42	42	48	59	65	61	58	60	60	27	30	28	33	32	35	26	43	36	26	32	35	40	40	59	50	47	48	50	52	57	61	60	58.4
	Min.	27	14	12	18	22	26	37	28	27	67	70	56	58	55	51	62	72	74	64	63	53	63	50	48	32	38	27	23	24	28	37	38	35.7
Sigourney.....	Max	57	38	47	59	65	66	62	62	62	41	45	40	38	36	45	44	44	56	36	27	49	50	56	51	52	45	45	44	47	51	49	41	51.4
	Min	30	26	20	21	29	28	37	36	56	55	53	43	52	50	49	58	63	58	52	59	56	56	41	39	33	31	27	29	27	32	40	30	32.9
Sioux C'ntr....	Max.	46	39	44	54	57	56	57	56	35	34	34	31	32	37	38	34	46	40	31	35	62	46	41	39	33	47	47	49	55	55	55	38	53.3
	Min.	27	11	22	25	29	34	41	55	63	61	50	43	56	55	55	65	63	61	52	62	60	43	41	34	26	26	22	23	30	37	33	33.6
Sioux City.....	Max.	34	41	49	61	61	62	43	30	33	37	35	34	43	40	30	56	45	31	33	62	54	58	46	46	52	52	52	57	59	39	33	33.0
	Min.	29	17	14	27	28	35	63	59	58	43	44	46	48	50	..	..	..	..	..	..	44	43	46	31	25	26	26	27	30	36	51	44	52.4
Spirit Lake ...	Max.	35	40	35	61	65	63	59	58	43	44	46	48	50	..	..	..	..	..	..	..	44	43	46	31	25	26	26	49	51	51	51	44	52.4
	Min.	30	18	18	25	26	30	38	33	35	34	35	33	30	..	..	..	..	..	..	..	57	56	55	51	44	46	49	22	29	31	36	32	32.8
StormLake. ..	Max.	35	39	47	58	61	58	54	59	60	52	42	54	53	48	64	61	60	52	60	57	43	41	42	29	25	23	22	29	53	55	55	47	52.3
	Min.	26	17	21	25	30	33	42	33	36	38	33	35	33	37	53	62	65	64	56	60	64	58	50	36	43	45	43	53	23	38	31	34.4
Stuart.....	Max.	50	36	39	39	43	46	49	63	65	65	45	57	62	30	28	45	53	35	32	48	48	47	32	28	28	30	23	47	56	58	49	56.1
	Min.	24	20	23	28	32	34	33	35	40	45	36	31	42	57	65	57	64	68	65	55	57	64	59	53	53	43	44	46	23	19	27	35	32	34.3
Thurman.....	Max.	57	39	45	57	62	63	59	61	67	60	52	57	36	45	41	29	55	45	33	29	50	55	48	37	28	41	41	52	53	61	50	51	56 8
	Min.	29	22	15	15	28	40	42	28	29	45	40	36	60	52	49	65	70	71	63	57	58	57	55	45	44	38	22	21	21	28	32	35	34.3
Toledo.....	Max.	40	40	57	69	71	67	60	63	69	67	39	36	37	44	44	45	55	33	23	45	51	47	35	33	23	45	46	42	40	48	52	36	54.8
	Min.	30	30	16	19	28	21	40	30	40	42	51	59	56	50	67	68	62	58	59	68	57	53	48	40	26	25	21	20	24	30	24	32.9
Villisca.....	Max.	48	45	45	58	62	64	58	63	70	62	45	36	35	38	45	42	50	45	36	30	48	54	48	54	45	43	56	57	53	61	62	60.9
	Min.	28	20	17	18	21	25	35	30	32	72	74	59	55	51	46	57	66	74	61	59	51	60	47	35	34	33	35	25	29	35	40	37.1
Wapello	Max.	48	39	39	61	68	65	69	66	39	42	42	41	35	36	36	45	44	55	38	39	45	51	51	45	42	45	49	52	58	62	60	57.0
	Min.	36	31	28	21	29	25	38	39	65	70	71	50	58	52	50	63	71	73	..	..	..	..	42	31	34	29	25	22	26	32	35	32.9
Washingt'n....	Max.	44	42	48	60	68	67	64	36	36	38	42	40	35	35	38	42	42	48	..	..	..	..	59	46	45	51	50	53	53	57	48	55.0
	Min.	28	26	20	18	28	28	36	36	65	63	50	54	53	48	62	66	63	46	60	55	54	45	33	31	25	23	20	28	30	31	31	31 7
Waterloo.....	Max

DAILY AND MONTHLY PRECIPITATION FOR NOVEMBER, 1899.

STATIONS.	DATE.																													Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Afton	...	...	...	...	...	...	.08	...	...	...	...	...	...	...	...	...	...	...	...	...	.28	..	..	...	...	...	...	...	...	...	
Albia	T	...	...	...	...	...	T	...	..	..	...	...	T	.25	...	...	...	...	...	.28	...	...	T	...	...	...	...	...	.09	...	0.4
Algona	...	...	...	...	...	...	...	...	..	..	...	...	...	...	...	.35	..	...	...	...	...	...	...	...	...	...	...	...	...	.32	0.8
Alta	...	...	...	...	...	...	.23	...	...	...	.03	...	.02	...	...	.03	...	..	...	.02	.17	..	...	...	...	...	...	T	...	1.05	1.4
Alta (near)	...	..	...	...	...	.19	...	...	...	...	.05	...	...	...	...	...	...	...	...	...	.22	...	..	...	..	...	...	...	.09	.78	1.3
Amana	...	...	...		..	...	T	..	..	...	...	T	.15	.88	...	T	...	.	...	...	.42	...	..	..	...	...	...	.09	..	.60	1.1
Ames	T	...	...	..	...	...	.05	...	...	...	...	...	T	...	...	...	..	...	...	...	.57	..	...	..	..	..	..	..	.09	.08	1.6
Ames (near)	...	..	...	...	...	...	.10	...	...	..	...	...	.10	...	...	..	...	...	...	...	.55	..	..	...	..	..	...	.10	..	.53	1.2
Atlantic	...	...	...	...	...	.14	...	...	...	...	...	...	T	...	T	.05	..	..	..	.09	...	..	..	...	...	...	...	.10	...	.47	1.3
Audubon	T	...	...	...	...	...	.42	...	...	...	...	...	...	...	...	...	..	...	...	..	.55	...	..	...	..	..	...	...	..	.44	0.7
Bancroft	T	..	..	..	...	...	...	...	...	...	..	..	...	...	...	.25	.05	...	..	..	T	...	..	..	..	...	...	...	...	.43	1.4
Batavia	...	..	...	...	...	..	..	.01	..	..	..	...	.04	T	...	...	..	..	...	.05		...	..	..	..	..	..	...	.01	.03	0.3
Baxter	...	...	...	...		...	.13		...	...	...	..	.66	T	...	T	...	...	...	.47	.02	..	..	...	...	...	...	...	...	.30	0.4
Belknap	...	...	...	...	..	..	...	T	..	...	...	..	..	1.10	...	...	...	...	...	...	1 00	...	...	...	...	...	...	...	...	.40	1.6
Belle Plaine	..	...	..	..	...	...	.10	..	...	...	T	T	...	1.80	...	..	..	..	...	...	.62	T	...	...	...	..	...	...	..	21	2.3
Blockton	...	..	...	..	..	...	.11	..	..	..	..	..	...	T	..	...	...	..	...	.10	.28	.57	...	...	...	...	...	...	.20	.25	2.9
Bonaparte	T	...	..	..	...	...	...	..	...	...	...	...	...	1 70	...	...	.08	..	...	...	.64	...	...	...	...	...	...	...	...	.10	1.1
Britt	...	...	...	...	..	...	T	..	...	..	..	T	...	...	..	.21	...	..	..	...	.15	..	..	...	...	..	..	...	...	.13	2.5
Buckingham	...	...	...	...	...	..	.26	...	..	..	...	...	.42	...	..	...	...	...	...	...	.64	...	..	...	...	...	..	..	..	.95	1.3
Burlington	..	...	...	...	...	...	...	...	...	..	...	...	.02	.46	..	..	...	...	...	...	.40	.03	..	...	..	..	..	..	.03	.15	1.5
Bussey	..	...	.	...	..	.13	.30	..	..	...	..	..	.15	...	...	...	..	..	...	.22	...	...	..	...	..	..	...	...	.02	..	0.9
Carroll	...	...	...	..	...	...	.05	..	..	..	..	...	...	...	...	...	..	...	...	...	.28	..	..	..	...	..	..	..	..	.30	0.9
Carson	...	...	...	...	...	...	...	...	..	...	...	...	...	...	..	...	...	T	...	...	...	..	..	...	...	..	..	..	..	.82	1.2
Cedar Falls	T	...	..	..	...	...	.13	...	...	..	...	...	...	...	..	...	...	..	..	.40	...	...	...	...	...	..	..	.	..	.50	0.5
Cedar Rapids	T	..	..	..	..	...	...	...	...	T	...	1.24	...	...	...	...	...	..	..	.43	.07	..	..	..	..	..	..	..	..	.35	0.8
Chariton	T	...	..	...	..	...	T	.05	..	...	...	...	.11	.32	..	T	..	..	.02	.04	.41	.02	..	..	..	..	..	.08	..	.22	2.0
Charles City	T	..	..	..	..	...	.07	...	...	..	...	.06	...	.45	..	.14	..	..	..	...	.34	..	..	..	...	...	...	...	.01	.19	1.1
Chillicothe	...	...	...	.	..	..	.23	..	..	..	...	T	.40	..	...	T	..	...	...	..	.57	...	...	..	..	..	..	..	.20	.35	1.6
Clarinda	T	...	...	..	..	...	.08	..	..	...	...	...	.02	...	...	.01	.	...	...	.41	.17	.14	...	...	..	..	..	..	...	.40	1.6
Clinton	T	.01	..	..	..	..	...	...	...	..	...	.02	.70	...	..	...	.01	.	...	..	.22	...	..	..	..	..	...	...	...	.18	1.1
College Springs	...	..	..	...	...	...	.12	...	...	...	...	..	.02	..	..	...	...	..	.38	..	.46	...	..	...	..	..	.	..	..	09	1.0
Coon Rapids	...	...	...	...	..	...	.15	...	...	..	...	...	...	T	...	T	..	..	..	.12	.34	...	..	..	..	..	...	...	...	.15	1.1
Corning	...	...	...	...	..	....	T	...	..	..	...	..	.26	..	..	T	..	..	..	..	.27	.09	..	..	..	..	...	....	T	.45	1.0
Council Bluffs	T	...	...	..	...	...	T	...	...	..	...	...	...	..	.17	.	..	..	..	64	...	..	..	..	..	..	..	..	..	.06	0.6
Cresco	...	..	..	..	...	....	.01	...	..	..	...	.03	.30	..	..	T	...	..	..	..	.1	..	..	..	..	..	..	..	....	.64	1.4
Cumberland	T	T	..	..	...	....	...	...	..	..	...	..	.02	..	..	T	..	..	..	T	.16	..	..	..	..	..	..	.07	...	.60	1.1
Danville	T	T	.01	..	...	..	..	T	..	..	..	...	.75	..	..	T	T	..	..	....	.3	T	..	..	..	..	....	..	..	.03	0.2
Davenport	.14	...	..	..	..	...	..	..	..	..	T	.02	.68	T	T	.01	.	..	..	....	.12	.01	T	..	..	..	...	..	..	..	1.0
Decorah	...	...	..	...	..	...	...	...	...	...	...	.06	...	.41	..	.02	...	..	...	.	.22				..	..	...	..	0.	.02	0.9
Delaware	...	..	..	...	..	...	..	..	...	..	..	.10	.74	.01	..	..	...			..	.10	...	..	..	..	..	...	..	.04	.70	1.5
Denison	T	..	..	....	....	....	.16	.28	...	...	..	..	.05	T	...	T	...	..	..	.05	.5	...			..	..	..	..	.11	15	1.2
Des Moines	T	..	..	..	...	..	.03	...	...	...	..	T	.04	.60	..	T	T	T	...	....	.45	T			..	..	....	..	..	.40	1.0
De Soto	...	...	...	...	...	...	...	...	...	...	...	...	.45	T	..	.02	.	..	..	....	.29	.02	..	...	...	..	..	..	.01	.21	1.7
Dows	T	T	...	...	...	..	..	...	...	...	.10	...	...	...	...	.25	..	..	..	..	.15	.	..	..	...	..	..	..	..	.44	1.2
Dubuque	T	T	...	...	...	...	T	...	...	...	T	.02	T	.72	T	...	...	...	...	...	.09	.0	...	...	...	..	..	..	....	.73	1.2
Eldon	...	..	..	...	...	...	...	...	...	...	...	...	...	.72	....	..	...	..	....	T	T	T	..	...	...	..	..	..	.07	.04	0.9
Elkader	...	...	...	...	...	T	...	..	...	...	..	T	.42	....	...	...	...	..	...	..	.27			..	...	..	..	..	T	T	0.7
Emerson	...	...	...	...	...	..	.12	...	...	...	...	...	...	...	T	..	..	.50	T	T	...			..	...	...	..	..	.15	45	1.2
Emmetsburg	...	...	..	..	...	...	T	..	..	...	...	...	.04	....	..	..	..	..	..	..	..	..	..	....	..	..	..	..	T	T	0.5
Estherville	T	...	...	...	...	.12	.03	...	..	....	.05	....	.11	.02	..	.06	..	..	..	.09	.08	.02	..	..	..	..	..	.08	..	.22	2.0
Fonda	T	...	...	..	...	..	.03	T	...	...	.02	....	T	..	.35	..	..	..	..	.16	..									.6	1.9
Forest City	T	...	..	...	.	..	.03	T	...	...	.02	....	T	..	..	.43	..	..	..	.67	T	..	..	..	..	..	..	.06	.67	1.00	1.5
Ft. Madison	..	..	...	...	..	T	T	..	...	..	...	..	..	.43	..	..	..	..	..	.67	T	..	..	..	..	..	..	..	T	T	1.1
Galva	..	...		..	...	T	T	..	...	..	T	..	..	T	....	..	..	..	..	..	T	..	..	..	..	..	T	.20	..	.40	0.6
Gilman	..	..	.30	.35	.07	..	.42	....	..	...	...	..	...	1.17	....	..	..	..	..	...	.38	..	..	...	..	..	....	..	.06	..	2.0
Gladbrook	...	..	..	..	..	...	T	..	...	...	..	T	..	.30	.42	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	2.3
Glenwood	...	...	..	....	....	...	T	....	....	....	....	....	....	....	....	T	....	....	T	.38	2.	....	....	....	....	37	.20	..	..	..	0.9
Grand Meadow	T	..	....	..	..	..	..	..	..	.02	..	.03	..	.65	..	..	....	....	....	....	.29	...	....	....	....	....	....	....	....	....	1.6
Greene	...	...	...	...	....	....	T	....	....	....	....	T	...	.30	....	T	....	....	....	....	.33	..	..	..	....	....	....	....	.16	.4	1.6
Greenfield	T	..	...	...	..	T	.05	..	..	..	....	....	.45	.	..	.02	..	....	..	.30	..	T	.16	....	..	..	....	....	.1	.37	1.1
Grinnell	..	...	..	..	..	...	.41	..	..	..	....	..	1.47	..	..	.	..	..	..	..	.42	..	..	..	..	..	....	....	..	06	1.0
Grinnell (near)	T	..	....	....	..	..	.40	..	..	....	..	..	T	1.35	.	T	....	....	....	....	.3	....	....	....	....	....	....	....	.08	3	2.6
Griswold	....	....	....	....	..	....	.03	..	....	....	....	....	....	....	....	T	..	....	T	..	.25	....	....	....	....	....	....	....	0	.20	2.4
Grundy Center	T	....	..	..	....	.	....	..	....	..	..	.32	..	....	T	.	..	....	..	T	.71	....	....	....	....	....	2	.52	....	.70	2.4
Guthrie Center	...	....	....	....	....	....	.09	....	....	..	.12	....	.18	..	....	.05	....	....	....	.01	.42	..	....	....	....	....	....	....	....	....	0.4
Hampton	T	.	..	..	....	..	.01	T	....	....	..	T	T	..	..	.08	....	....	....	.03	.34	..	....	....	....	....	0	....	.20	1.0
Harlan	T	....	....	....	....	....	....	T	....	..	.10	....	....	.65	....	....	....	....	....	....	.41	.01	..	..	..	....	..	..	..	37	0.9
Hawkeye	T	T	..	..	..	..	.08	....	....	....	....	T	.20	.	....	....	....	....	....	....	.26	....	..	..	....	..	..	.15	....	.40	1.5
Hedrick	T	T	....	....	....	....	.06	....	....	....	....	....	.11	....	T	....	..	..	38	..	.41	.	..	....	....	....	....	....	.02	.12	0.8
Hopeville	T	T	..	..	..	..	.16	..	....	....	...	.07	..	04	..	.10	..	....	....	....	.14	....	....	....	....	....	....	....	....	.12	0.6
Humboldt	T	T	..	....	.02	.22	..	....	....	....	....	.01	.09	....	....	....	....	....	..	..	.58	0	....	..	..	....	....	....	01	02	0.7
Independence	T	T	...	...	...	...	....	....	....	....	....	....	T	.10	T	T	...	...	....	....	.71	T	..	....	....	....	....	....	T	.16	1.2
Indianola	T	T	..	..	..	..	.09	....	....	....	....	.08	T	.18	....	T	....	....	....	..	.25	T	..	....	..	..	..	..	.0	..	1.1
Iowa City	..	T	T	....	....	....	....	T	....	....	....	....	.04	.41	....	....	.01	....	....	....	.32	....	....	....	....	....	....	....	.0	.30	1.0
Iowa Falls	T	T	....	....	....	....	T	....	....	....	....	....	.11	1.27	....	....	....	....	....	....	.75	....	....	....	....	....	....	....	T	....	1.1
Keokuk	T	....	....	....	....	....	.10	.21	..	....	....	....	T	.20	....	T	....	....	....	....	1.00	T	..	....	....	....	....	....	..	T	2.3
Keosauqua	..	T	....	....	....	....	T	....	....	....	....	....	....	.35	....	..	....	....	....	....	.21	....	....	....	....	....	....	....	....	.10	0.8
Knoxville	T	....	....	....	....	....	.08	.02	....	....	....	T	.10	....	....	....	....	....	....	....	.45	....	....	....	....	....	....	....	T	.28	1.0
Lacona	T	....	....	....	....	....	....	....	....	....	T	....	1.15	....	..	....	....	....	05	.30	.03	....	-	....	....	....	....	....	....	04	0.6
Lamoni	T	....	....	....	....	.27	....	....	....	....	.14	....	....	.08	....	.04	....	....	....	....	T	....	....	....	....	....	....	....	T	.50	1.7
Lansing	T	....	....	....	....	.15	....	....	....	....	.10	....	.10	....	T	T	....	....	....	.0	T	....	....	....	....	....	....	....	....	.02	0.6
Larchwood	T	....	....	....	....	.36	....	....	....	....	.02	....	....	....	T	....	....	....	....	....	.03	....	....	....	....	....	....	....	.0	.50	0.9
Larrabee	..	..	....	....	....	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	.13	....	....	....	....	....	....	....	....	.30	1.8
Le Mars	...	...	...	...	...	...	T	....	....	....	....	T	.01	....	....	.06	....	....	....	.07	21	.03	....	....	....	....	....	T	....	.09	0.4
Lenox	T	....	....	....	....	....	....	....	....	....	....	T	1.17	....	....	....	....	....	....	....	.09	..	.06	....	....	....	....	....	....	.38	1.1
Logan	..	..	...	...	....	....	.18	.04	....	....	....	.03	35	.42	....	....	....	....	....	....	.4	.02	..	....	....	....	....	....	T	1.2
Maquoketa	....	....	....	....	....	....	....	..	..	....	..	....	....	.14	....	....	....	....	....	....	....	....	....	....	....	....	....	.06	.30	1.8
Marshalltown	T	T	..	..	..	...	..	..	..	....	..	.05	T	1.31	T	T	T	...	T	....	.10	....	....	....	....	....	....	....	.01	.08	0.1
Melrose	....	T	..	..	..	..	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
Monticello	T	T	..	....	..	....	.09	..	....	....	..	...	T	.38	....	....	....	....	....	....	.64	....	....	....	....	....	....	....	.06	.08	1.6
Mooar	...	...	...	....	..	...	...	..	....	....	..	...	T	.02	..	.01	....	....	.16	.10	.01	.0	..	....	....	....	....	....	....	.10	0.5
Mt. Ayr	T	T	..	....	..	...	...	..	....	....	..	.15	1 40	..	....	T	..	....	..	33	..	..	....	..	..	..	..	..	..	.23	2.1
Mt. Pleasant	....	..	...	....	....	...	...	..	..	....	..	.35	.60	..	....	....	....	....	..	.1	....	....	....	....	....	....	....	.07	.35	1.4
Mt Vernon (Hubd)	T	T	...	...	..	...	...	..	..	....	T	91	T	....	T	...	..	....	..	.11	T	..	...	..	..	..	..	.05	.43	1.5
Murray	T	....	....	....	....	.10	.08	..	....	..	...	.20	....	.40	..	..	..	..	.50	....	....	..	..	....	..	..	..	T	..	0.8
New Hampton	....	...	..	....	..	..	....	..	....	....	T	.02	....	.40	..	....	....	....	..	....	.27	..	..	....	....	..	..	....	.15	.55	1.3
Newton	T	....	....	....	....	....	.18	..	....	..	..	....	.68	T	...	T	....	....	..	.32	T	.03	..	....	....	..	..	....	.05	.26	1.5
Northwood	....	....	....	....	....	...	T	..	..	...	...	T	.	..	..	.38	....	..	..	..	T	....	..	....	....	..	..	....	..	.88	1.2
Odebolt	....	..	....	....	....	....	.14	..	....	..	....	03	..	..	....	T	.	....	..	T	.12	....	.	....	....	....	....	....	....	.78	1.0
Ogden	...	...	..	..	....	....	.10	....	....	....	..	T	....	.20	..	..	..	....	....	....	.40	....	....	....	....	....	....	....	....	....	
Olin	...	T	..	....	....	....	....	...	.	....	..	..	....	.52	..	....	T	..	....	....	T	.11	T	....	....	....	....	....	.06	.40	1.1
Omaha (Neb)	....	....	...	....	..	...	T	....	....	....	..	....	....	....	..	.06	..	..	..	.20	.59	.27	T	..	..	..	....	..	05	.24	0.9
Onawa	...	....	....	....	....	....	.01	.06	...	....	....	..	.01	....	.	....	.01	....	....	.02	.58	....	....	....	....	....	....	....	..	.26	1.3
Osage	....	...	....	....	....	....	....	.04	...	...	....	..	.08	....	.09	....	.13	...	..	...	.12	..	....	....	....	....	....	....	.02	.40	1.1
Oskaloosa	....	....	....	....	....	....	....	.09	....	....	....	....	....	.16	.33	....	T	....	....	..	.15	.30	....	....	....	....	....	....	.09	.64	1.1
Osceola	T	T	....	T	....	....	.12	.08	..	....	....	....	T	.06	..	....	....	....	....	..	.58	..	..	....	....	....	....	....	.03	...	1.0
Ottumwa	....	....	....	....	....	....	....	....	....	....	....	....	.55	....	....	....	....	....	....	.70	....	....	....	....	....	....	....	....	.50	.20	1.9

DAILY AND MONTHLY PRECIPITATION FOR NOVEMBER, 1899—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
l	T	T	....	....	....	...	.04	....	....	....	..	..	.44	.76	....	....	....	....	....	.33	....	..	....	....	....	....	....	....	....	.20	1.77
ific Junction	....	....	..	....	..	...	....	....	....	..	...	...	....	....	..	....	....	....	....	....	.36	.15	....	....	....	....	....	..	..	.25	0.76
a	....	....	..	....	....	...	.38	....	....	..	...	...	....	.30	..	....	....	....	....	.28	..	..	..	..	....	....	....	....	..	.28	1.24
ver	....	....	..	....	....	...	T	....	....	..	...	.10	....	....	..	.14	....	..	..	.10	..	....	....	..	....	....	....	....	.10	1.20	1 64
nghar	....	....	..	....	....	.25	..	..	....	..	....	....	.20	....	..	....	....	....	....	....	....	....	....	..	....	....	..	..	T	....	0.45
Oak	T	....	..	....	..	...	.10	..	....	..	....	....	T	....	..	.10	....	....	....	T	.26	.23	..	..	....	....	..	..	....	.14	0.83
geway	.01	....	..	..	....	....	.02	...	...	.01	...	.07	.34	.01	..	.06	....	.01	...	....	.23	....	....	..	....	....	..	..	.15	.66	1.57
kwell City	T	....	....	..	....	....	.14	....	....	....	....	....	....	.15	...	.10	....	..	...	....	.25	....	....	..	....	....	..	..	.05	.75	1.44
hven	T	....	....	..	....	....	.17	....	....	....	....	....	....	....	....	....	....	..	....	....	....	....	....	..	....	....	..	..	.01	..	0.21
City	T	....	....	..	....	....	.37	.02	....	....	....	..	.02	.02	.03	.04	.01	...	....	T	.10	....	....	....	....	....	....	....	.04	.80	1 45
anton	..	....	....	....	....	....	T	...	....	....	....	..	T	....	....	....	T	....	....	....	.43	....	....	....	....	....	....	....	....	.30	0 73
ldon	...	....	....	....	....	.20	....	....	....	....	T	.02	....	.22	....	.07	....	....	....	....	....	....	....	....	....	....	....	....	.06	.20	0.77
ley	...	....	....	....	....	....	.21	....	....	....	....	.04	....	.07	....	.09	....	....	....	.02	....	....	....	....	....	....	....	....	.09	.15	0.67
ourney	T	T	....	....	....	....	T	.09	....	....	....	....	T	.32	.	T	....	....	....	T	.57	T	....	....	....	....	....	....	.01	.01	1.00
ux Center	....	....	....	....	....	....	.51	....	....	....	T	....	....	.05	....	....	....	....	....	T	.10	....	....	....	....	....	....	....	....	....	0.66
ux City	....	....	....	....	....	.32	.07	....	....	....	T	T	....	....	....	.06	....	....	....	T	.05	T	....	....	....	....	....	....	T	.35	0.85
rit Lake	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	.32	....	....	....	....	....	....	....	T	....	0.32
rm Lake	T	....	..	....	....	....	.16	..	....	..	....	.04	T	....	....	.04	....	....	....	....	.18	....	....	....	....	....	....	....	.06	.62	1.10
art	..	....	....	....	....	....	.09	06	...	....	....	....	.45	....	....	....	....	....	....	....	T	.40	....	....	....	....	....	....	....	.32	1.32
urman	T	....	....	....	....	....	T	....	....	....	....	....	T	....	....	T	....	....	....	.20	.40	.10	T	....	....	....	....	....	....	.26	0 96
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ashta	T	....	....	....	....	.21	T	....	....	....	.02	....	....	....	....	.04	....	....	....	T	.38	....	....	....	....	....	....	....	.06	.52	1.23
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est Bend	T	....	....	....	....	....	.04	....	....	....	....	.06	....	....	....	.18	....	....	....	....	.05	....	....	....	....	....	....	....	.12	.90	1.35
est Branch	T	T	....	....	....	....	....	....	....	....	....	....	....	.94	....	....	....	....	....	....	....	.42	....	....	....	.12	....	....	....	....	1 48
est Union	T	T	....	....	....	....	....	....	....	....	....	....	....	.56	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.67	1.23
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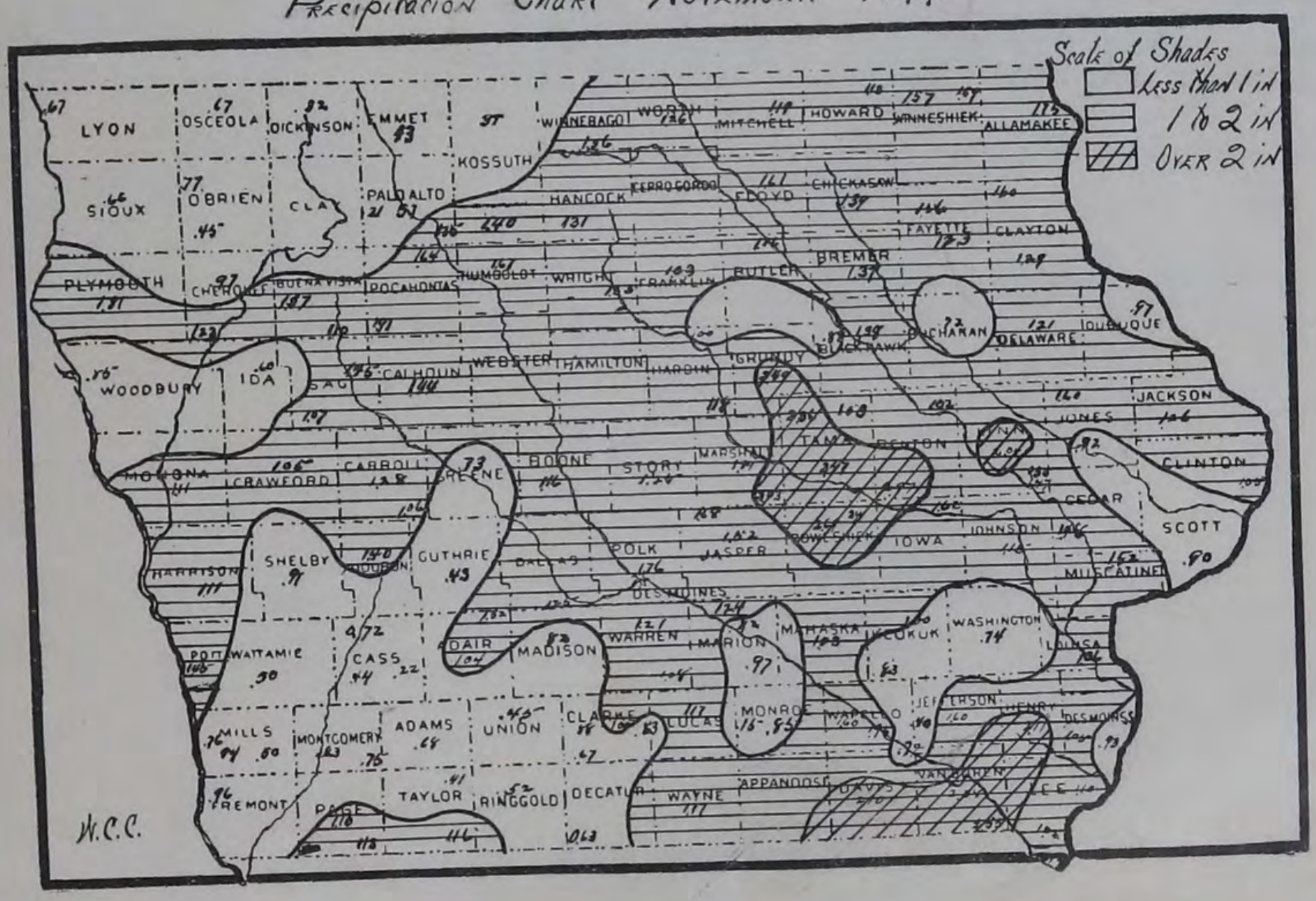
Precipitation Chart November 1899.



Vol. X. DECEMBER, 1899. No. 12.

U. S. Department of Agriculture
Weather Bureau



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

—AND—

ANNUAL SUMMARY

1899

Central Station, Des Moines, Iowa.

J. R. SAGE,
DIRECTOR.

GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER
1899.

THE IOWA WEATHER AND CROP SERVICE

Was established by act of the Twenty-third General Assembly, and placed under supervision of the Board of Directors of the State Agricultural Society, constituted as follows:

OFFICERS.

President—W. F. HARRIMAN, Hampton, Franklin Co.
Vice-President—R. J. JOHNSTON, Humboldt, Humboldt Co.
Secretary—G. H. VAN HOUTEN, Des Moines, Polk Co.
Treasurer—G. D. ELLYSON, Des Moines, Polk Co.

EXECUTIVE COMMITTEE.

W. F. HARRIMAN. R. J. JOHNSTON.
GEO. H. VAN HOUTEN.

DIRECTORS.

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C. E. CAMERON, - Alta, Buena Vista Co.

METEOROLOGICAL STATIONS AND OBSERVERS.

From the following, weekly and monthly reports of Meteorological data are received by the Iowa Weather and Crop Service.

Afton.....Hon. N. W. Rowell.
Alb a.....R. Moore.
Algona.....C. D. Pettibone.
Alta.....D. E. Hadden.
Alta (Near).....W. J. Minard.
Amana.....Conrad Schadt.
Ames.....Exp. Station.
Ames (6 miles s. e.).....Isaac Young.
Atlantic.....J. W. Love
Audubon.....F. P. Hocker.
Bancroft.....E G. Bailey.
Batavia.....Agent C. B. & Q. Ry.
Baxter.....Agent C. G. W. Ry.
Bedford.....Prof. E. H. Griffin.
Belknap.....A. W. Rankin.
Belle Plaine.....S. P. Vandike.
Blockton.....Agent C. G. W. Ry.
Bonaparte.....Hon. B. R. Vale.
Britt.....G. P. Hardwick.
Buckingham (Traer P. O.).....Dr. W. A. Daniel.
Burlington.....Prof. Maurice Ricker.
Bussey.....Agent C., B. & Q. Ry.
Carroll.....Moses Simon.
Carson.....Agent C., B. & Q. Ry.
Cedar Falls.....Prof. Jennie E. Curtis.
Cedar Rapids.....Electric Light & Power Co.
Centerville (Walsh P. O.).....J. W. Tanner.
Chariton.....Hon. S. H. Mallory.
Charles City.....Chas. O. Schmidt.
Cherokee.....Hon. L. W. Beal.
Chillicothe.....Agent C. B. & Q. Ry.
Clarinda.....A. S. Van Sandt.
Clear Lake.....John Cobb
Clinton.....Luke Roberts.
College Springs.....A. M. Finley.
Coon Rapids.....Downs & Co.
Corning.....Jerome Smith.
Council Bluffs.....J. B. Rishel.
Cresco.....Gregory Marshall.
Cumberland.....Agent C., B. & Q. Ry.
Danville.....Agent C. B. & Q. Ry.
Davenport.....*J. M. Sherrier.
Delaware.....Wm. Ball.
Decorah.....F. H. Baker.
Denison.....James H. Holmes.
Des Moines.....*Geo. M. Chappel, M. D.
De Soto.....R. D. Minard.
Diagonal.....Agent C. G. W. Ry.
Dows.....A. C. Fuller.
Dubuque.....*E. H. Bowie.
Eagle Grove.....Smallpage Bros.
Eldon.....T. Madden.
Eldora.....Prof. C. F. Woodward.
Elkader.....Chas. Reinecke.
Emerson.....Agent C. B. & Q. Ry.
Emmetsburg.....A. L. Ormsby.
Estherville.....M. L. Archer.
Fairfield.....Charles J. Fulton.
Fayette.....R. Z. Latimer.
Fort Dodge.....C., R. I & P Agent.
Ft. Madison.....Miss L. A. McCready.
Fonda.....H. P. Barron.
Forest City.....J. A. Peters.
Galva.....Miss Ida Ackert.
Gilman.....Jas. L. Wylie.
Gladbrook.....Agent C. G. W. Ry.
Glenwood.....J. P. Jackson.
Grand Meadow (Postville P. O.)..F. L. Williams.
Greene.....J. L. Cole.
Greenfield.....J. G. Culver.
Grinnell.....Prof. S. J. Buck.
Grinnell (Near).....A. O. Price.
Griswold.....Agent C., B. & Q. Ry.
Grundy Center.....Geo. F. Ellis.
Guthrie Center.....Olam Holden.
Hamburg.....Agent C., B. & Q. Ry.
Hampton.....E. C. Grenelle.
Harlan.....C. A. Reynolds.
Hawkeye.....Miss Beatrice Kirkendall.
Hedrick.....J. T. Brooks.
Hopeville.....M. T. Ashley.
Hoprig.....O. N. Young.
Humboldt.....H. S. Wells.
Independence.....E. F. Wulfke.
Indianola.....Prof. J. L. Tilton.
Iowa City.....Prof. A. A. Veblen.
Iowa Falls.....J. B. Parmelee.
Keokuk.....*Fred. Z. Gosewisch.
Keosauqua.....Prof. J. H. Landes
Knoxville.....Casey & Belville
Lacona.....Agent C., B. & Q. Ry.
Lamoni.....T. J. Fitzpatrick.
Lansing.....G. H. Markley.
Larchwood.....W. B. Martin.
Larrabee.....H. B. Strever.
Lenox.....J L. Hurley.
Le Mars.....Dr. T. E. Cole.
Lockridge.....Agent C. B. & Q. Ry.
Logan.....Mrs. M. B. Stern.
Maquoketa.....Dr. A. B. Bowen.
Mason City.....Norman Dinsmore.
Marshalltown.....Branch S. Jones.
Melrose.....Agent C. B. & Q. Ry.
Monticello.....C. E. Heisey.
Mooar.....F. G. Thomas.
Mount Vernon.....Prof. A. Collin.
Mount Vernon.....Rev. J. W. Hubbard.
Mt. Ayr.....A. F. Beard.
Mt. Pleasant.....Dr. Frank T. Stevens.
Murray.....Agent C. B. & Q. Ry.
New Hampton.....R. H. Gurley.
Newton.....A. Lufkin.
Northboro.....Agent C., B. & Q. Ry.
Northwood.....A. L. Thompson.
Odebolt.....E. Starner.
Ogden.....E. Sayre.
Olin.....Hon. Nathan Potter.
Omaha, Neb.....*L. A. Welsh.
Onawa.....C. G. Perkins.
Osceola.....A. W. Lewis.
Ovid.....H. C. Miller.
Osage.....G. D. Pattingill.
Oskaloosa.....Jos. Boyd.
Ottumwa.....Dr. J. F. Herrick.
Pacific Junction.....Agent C., B. & Q. Ry.
Pella.....T. W. Cox.
Pioneer.....A. W. Hawley.
Plover.....J. S. Smith.
Primghar.....P. R. Bailey.
Red Oak.....William Boll.
Ridgeway.....Arthur Betts.
Rockwell City.....C. M. Randall.
Ruthven.....C. E. McGlasson.
Sac City.....J. A. Sodestrom.
Scranton.....E. A. Olive.
Sheldon.....J. B. Frisbee.
Sibley.....H. G. Doolittle.
Sigourney.....Mrs. R. F. Ashbaugh.
Sioux Center.....Jacob de Ruyter.
Sioux City.....*U. G. Purssell.
Spencer.....S. Gillespie.
Spirit Lake.....W. C. Drummond.
Storm Lake.....Prof. M. L. Fuller.
Stuart.....H. E. Boatright.
Thurman.....C. R. Paul.
Toledo.....Grace Bookwalter.
Vinton.....T. F. McCune.
Villisca.....C. E. Matteson.
Wapello.....Geo. W. Schofield.
Washington.....Wm. A. Cook.
Washta.....H. L. Felter.
Waterloo.....M. L. Newton.
Waverly.....H. S. Hoover.
Webster City.....Louis Frank.
What Cheer.....Hon. J. C. Beem.
Whitten.....Dr. Frank P. Butler.
Wilton Junction.....J. M. Rider.
Winterset.....W. W. McKnight.
West Bend.....Phil. Dorweiler.
West Union.....J. M. Lisher.
West Branch.....A. A. Madson.
Woodburn.....Agent C. B. & Q. Ry.

*U. S. Weather Bureau.

WEATHER-CROP OBSERVERS.

Reporting for the Weekly Bulletin.

Agency.....J. H. Van Zant.
Albia.....Wm. Mercer.
Allerton.....James Piper.
Alta.....Jonas Cushman.
Battle Creek.....E. G. Preston.
Blairstown.....T. H. Weil.
Cedar Rapids.....Hon. A. J. Fuhrmeister.
Centerville.....Henry Galley.
Charles City.....W. B. Towner.
Chariton.....C. C. Burr.
Clarksville.....F. M. Russell.
Correctionville.....Hon. W. B. Chapman.
Corwith.....Wm. Oxley.
Clermont.....Chas. Larrabee.
Council Bluffs.....L. Prouty.
Creston.....M. V. Ashby.
Danville.....Sherman Matthews.
Estherville.....E. Dawson.
Emerson.....D. B. Nims.
Farlin.....Jesse Johnson.
Fontanelle.....Hon. L. M. Kilburn.
Ford.....J. C. Richards.
Fort Dodge.....R. W. Blaine.
Geneva.....Wm. H. Thompson.
Hesper.....G. E. Dillingham.
Humeston.....Hon. S. H. Moore.
LeMars.....Hon Henry Schrooten.
Lockridge.....John F. Farman.
Marshalltown.....Hon. S. B. Packard.
Mapleton.....A. Lamb.
Mt. Pleasant.....W. S. Wright.
Milton.....Hon. E. C. Holland.
Mount Vernon.....Robert Smith.
Nevada.....Geo. C. White.
Osage.....E. W. Stacy.
Orange City.....H. J. VandeWaa
Owen.....Hon. J. W. Bird.
Paton.....A. B. Condit.
Pittsburg.....G. C. Duffield.
Rock Rapids.....D. E. F. Merrill.
Rockwell City.....J. G. Palmer.
Rossville.....T. B. Wiley.
Rowley.....L. Maxson.
Sageville.....Hon. F. N. Knoll.
Seymour.....L. B. Sager.
Shenandoah.....Reuben Mullison.
State Center.....E. P. Thompson.
Stuart.....W. W. Bailey.
Unity.....Edw. Hummer.
Van Horne.....Spencer Smith.
Winterset.....H. A. Kinsman.
Wall Lake.....T. E. Wilcox.
Wilton.....Thos. Boot.
Wiota.....I. S. Coomes.

U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME X. DECEMBER, 1899. No. 12.

DECEMBER WEATHER RECORD.

The general character of the month was very pleasant and favorable. The mean temperature was 22.6°, which is about 1° below the normal for December for the state. By sections the means were as follows: Northern section, 20 2°; central section, 22.7°; southern section, 25°. The maximum temperature reported for the state was 75°, at Belknap, on the 22d; minimum temperature —19° at Ruthven, on the 31st.

The average precipation for the state was 1.61 inches, which is about .23 of an inch above normal. By sections the averages were as follows: Northern section, 1.34 inches; central section, 1.80 inches; southern section, 1 69 inches. The largest amount was reported at Monticello, amounting to 4.28 inches for the month; least amount, .10 of an inch at Clear Lake. There were 12 clear days, 10 cloudy, and 9 partly cloudy days.

SUMMARY OF WEATHER CONDITIONS.

Barometer.—Mean pressure for the month, 30.16 inches; highest observed, 30.83, at Clarinda on the 19th; lowest observed, 29.19, at Davenport on the 11th; range for the state, 1 64 inches.

Temperature.—Monthly mean, as deduced from 118 reports, was 22.6°; highest monthly mean, 30.8°, at Burlington; lowest monthly mean, 16.8°, at Cresco; the highest temperature reported was 75°, at Belknap on the 22d; the lowest temperature reported was 19°, at Ruthven on the 31st; the average monthly maximum was 51.2; the average monthly minimum was —7.8°; the greatest daily range was 50°, at Belknap; average of greatest daily ranges was 33.6°.

Precipitation.—Average for the state, as determined from the reports of 137 observers, 1.61 inches; the largest amount reported was 4 28 inches, at Monticello; the least amount was .10 at Clear Lake; the greatest daily amount reported was 3.50 inches, at Ridgeway on the 11th; average number of days on which .01 inch or more of precipitation was reported, 5.

Wind.—Prevailing direction, northwest; highest velocity reported, 42 miles per hour from the northwest, on the 24th, at Dubuque.

Weather.—There were 12 clear days; 9 partly cloudy days, and 10 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES. Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.11	30.67	19	29.19	11
Des Moines	30.18	30.74	19	29.54	11
Clarinda	30.21	30.83	19	29.67	11
Cresco	.....	30.62	15	29.45	11
Dubuque	30.11	30.66	19	29.30	11
Omaha, Neb	30.17	30.70	19	29.61	2
Keokuk	30.14	30.70	19	29.53	11
Sioux City	30.19	30.69	19	29.72	9
Means	30.16	30.83	19	29.19	11

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	6,354	30	NW	24
Des Moines	5,843	27	N	11
Dubuque	6,466	42	NW	24
Keokuk	6,503	34	SW	5
La Crosse, Wis	5,949	32	NW	24
Omaha, Neb	6,783	35	N	3
Sioux City	8,501	40	NW	3

OBSERVERS' NOTES.

ALBIA—*R. Moore.* Winter has been quite mild so far; very little snow and rain during the month.

BANCROFT—*E. G. Bailey.* December closes with clear skies and no snow; but little wind during the month.

BONAPARTE—*B. R. Vale.* A very pleasant month; favorable for stock and farm work.

CLINTON—*Dr. Luke Roberts.* Maximum temperature, 2.9° below normal; minimum temperature, 4.8° below normal. From 1882 to 1887, inclusive, the mean minimum for December was —20.3°. The mean temperature for December, 1899, was 5° below normal. Rainfall, .24 of an inch below December normal.

DECORAH—*F H. Baker.* Amount of precipitation for 1899 at this station, 27.52 inches; number of days below zero in the year, 42; highest temperature, 93°, July 22d.

ELKADER—*Charles Reinecke.* Mean temperature for 1899 was 46 9°; total precipitation, 29.50 inches; snowfall, 25.16 inches; highest temperature, 100°, September 5th; lowest, —28°, February 9th and 10th.

FAYETTE—*R. Z. Latimer.* Ground and streams froze up December 3d, and thawed out 11th; streams froze again on 14th, with sleighing from 13th to 19th; light snow and ice at end of month.

GRINNELL—*A. O. Price.* No snow of importance; month generally pleasant; only one severe storm.

HARLAN—*C. A. Reynolds.* On the whole a fine month; neither too cold nor too warm for winter weather.

LARRABEE—*H. B. Strever.* Unusually warm until Christmas, when winter was ushered in with a cold wave.

LOGAN—*Mrs. M. B. Stern.* A fine winter month; no severe storms nor extremely cold weather.

NEWTON—*A Lufkin.* Total rainfall, including melted snow, for the year, 27.26 inches.

OVID—*H. C. Miller.* Winter commenced without the usual fall rains; ground dry and water scarce.

RIDGEWAY—*Arthur Betts.* The warmest of three Decembers; big snow on 11th, came to stay. Last week was coldest; plowing was done until the 11th.

BELATED REPORTS FOR OCTOBER.

BURLINGTON.—Mean temperature, 61.6°; highest, 95° on the 13th; lowest, 30° on the 31st; total precipitation, 2.32 inches; greatest in twenty-four hours, .80 inch on the 26th; number of rainy days, 8.

ESTHERVILLE.—Mean temperature, 51.5°; highest, 86° on the 12th; lowest, 25° on the 20th; total precipitation, 1.45 inches; greatest in 24 hours, .60 inch on the 16th; number of rainy days, 4.

CLIMATOLOGICAL DATA FOR DECEMBER, 1899.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES.				Number rainy days	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Algona*	Kossuth	1,500	7	20.4	0	50	23	—10	30, 31	.....	.20	—1.09	.10	2.0	4	9	11	11	NW
Alta	Buena Vista	1,519	8	20.1	—2	52	23	—12	31	34	1.06	+ 08	.86	2.1	6	10	14	7	NW
Alta (near)	Buena Vista	....	...	....	...	....	.....	.....	....	.....	1 33	.....	.94	3.0	4		....	....	.....
Bancroft	Kossuth	....	...	20.8	.....	53	23	—9	30	37	.70	.....	70	T	1	11	9	11	NW
Britt	Hancock	1,230	..	19.3	.....	44	8,21,22	—9	30, 31	36	.84	.....	.54	1.5	5	7	20	4	NW
Charles City	Floyd	1,012	8	19.8	—1	46	8	—11	15	39	.94	—.48	.47	10.0	4	9	15	7	NW
Clear Lake	Cerro Gordo	984	..	19 5	...	45	8	—10	30	32	.10	....	.05	1 0	2	12	6	13	NW
Cresco	Howard	1,312	27	16 8	....	43	8	—15	30	26	1.49	+.19	.85	9.4	5	10	10	11	NW
Decorah (a)	Winneshiek	900	6	18.8	—2	45	8, 9	—13	29	33	2 06	+ .80	.95	12 5	6	....	....	..	.....
Dows	Wright	....	....	20.6	.....	48	8	—11	29	39	.91	.....	.65	2 0	3	12	13	6	NW
Elkader	Clayton	....	19	22.0	0	51	7, 8	—10	30	31	2.20	—.03	1.40	4.0	3	13	11	7	NW
Emmetsburg	Palo Alto	....	....	.....	.....	..	..	...	.....	.....	.92	.....	.84	.....	3		....		.....
Fayette	Fayette	1,000	9	19 3	—4	46	8, 9	—11	30	33	1.84	+.39	1.14	5 6	3	16	6	9	NW
Fonda	Pocahontas		....	18 4	....	54	23	—14	30	36	2 53	.....	.76	12 5	9	16	9	6	N
Forest City	Winnebago	1,220	..	19.1	.....	51	8	—9	31	33	.72	.....	.52	1.5	3	10	4	17	W
Grand Meadow *	Clayton	....	8	19.6	—2	46	8	—10	30	.....	2 13	+.54	1.92	7.0	4	12	10	9	NW
Greene	Butler	943	....	20.4	...	49	8	—11	30	35	1.73	.....	.95	.....	5	6	11	14	W
Hampton	Franklin	1,240	9	20 6	0	51	8	—8	31	30	1 73	+ 38	.90	13.2	4	13	10	8	NW
Hawkeye	Fayette	....	6	....	....	.. .	.....	....	.....	....	3.80	+2 32	2.00	18.0	4	....	....	...	.....
Hoprig	Emmet	....	....	....	.....	..	.....	.....	.....	....	.05	.....	.05	T	1	15	5	11	NW
Humboldt	Humboldt	1,082	6	21.2	.....	52	23	—10	31	30	.73	+.13	.59	T	5	11	5	15	NW
Lansing	Allamakee	....	....	21 8	....	51	7	—12	30	36	2.65	.... .	1.27	13 6	5	9	14	8	.....
Larchwood	Lyon	....	..	19.8	.....	51	23	—14	31	37	.93	.....	.65	3.0	5	16	8	7	NW
Larrabee	Cherokee	....	8	20.0	—3	56	8	—15	30	37	.43	—.71	.19	2 7	5	10	12	9	NW
Le Mars	Plymouth	1,221	..	22.2	....	56	23	—9	31	34	1.06	.....	.78	3.0	3	19	8	4	N
Mason City (d)	Cerro Gordo	1,130	5	22.2	+2	65	1	—10	30, 31	35	....	....	....	....	..	....	..	...	.....
New Hampton	Chickasaw	1.166	...	18.8	.....	44	7, 8, 9	—12	30	27	.29	.....	.17	1.2	2				NW
Northwood	Worth	1,210	..	20 2	..	54	22	—8	30	33	.76	.....	.61	....	2	23	0	8	N, NW
Osage	Mitchell	1,178	8	19 2	0	45	8	—11	30	31	1 91	+.60	1.26	14 0	3	6	6	19	NW
Plover	Pocahontas	....	.. .	21.8	.. ..	54	8, 22	—13	31	37	1.20	.. ....	1.00	1.0	3	16	4	11	NW
Primghar	O'Brien	....	....	22.4	.....	66	24	—17	31	40	.70	.....	.50	T	2	16	0	15	N
Ridgeway	Winneshiek	....	..	22.3	...	46	7, 8, 9	—10	30	32	4.21	.....	3 50	18.5	6	10	13	8	NW
Ruthven	Palo Alto	.....		18 4	.....	52	22, 23	—19	31	32	1 89	.....	1.45	.2	3	9	19	3	N
Sheldon	O'Brien	1,406		19.0	.....	57	23	—13	31	32	1.15	.....	.82	3.2	4	12	5	14	NW
Sibley	Osceola	1,506	6	19 2	0	55	23	—18	26	39	1.29	+.59	.86	4.3	3	14	13	4	NW
Sioux Center	Sioux			20.4	.....	53	23	—10	31	31	1.44	.....	1.16	1.3	4	12	9	10	NW
Spirit Lake	Dickinson	.....	5	21.4	0	54	23	—12	31	30	1.06	+.47	1 01	.5	2	19	2	10	S
Storm Lake	Buena Vista	.....	10	21.6	.....	52	23	—11	30, 31	32	1.06	+.14	.80	2.5	6	10	14	7	NW
Washta	Cherokee				.....	....	.....	.....	...	.....	1 10	.....	91	1 0	4	16	10	5	NW
Waverly	Bremer	942	....	20.7	.....	46	7	—8	30	30	1.97	.... ..	1.66	10.0	4	12	8	11	NW
West Bend *	Palo Alto		6	19.7	+2	53	23	—8	30, 31	.....	1 12	+.24	.87	2.0	4	13	5	13	NW
West Union	Fayette	1,105		.....	....	....	.....	....	.....	.....	.60	.....	.30	6.0	2	17	0	14	NW
Average		.....	...	20.2	—0.5	51.0	.....	—11.5	.....	30.8	1.34	+ 32	....	5.1	4	12	9	10	NW

CENTRAL SECTION.

Amana	Iowa	.....	23	24.0	+2	50	10	—5	31	30	1.64	+.20	1.21	2.5	8	17	5	9	NW
Ames	Story	936	19	21.1	—1	49	1	—8	15, 31	35	2.35	+1.36	1.10	12.2	5	13	4	14	.....
Audubon	Audubon	...	6	23 8	0	55	2	—4	31	36	1 10	—.02	.70	4 0	3	7	10	14	NW
Baxter	Jasper	.....	...	21.0	....	50	1, 7	—9	30	32	1.60	.....	.70	3.0	5	5	12	14	NW
Belle Plaine	Benton	849	9	23 4	—1	50	8	—9	31	31	2 31	+.98	1.60	3 8	7	9	18	4	NW
Carroll	Carroll	.....	9	21 9	—1	56	21	—10	31	38	1.48	+.51	.78	6.0	5	19	4	8	.....
Cedar Rapids	Linn	744	17	24.4	—1	52	8	—4	30, 31	32	1.27	—.37	1.07	1.5	2	17	5	9	NW
Clinton	Clinton	609	8	24.2	—2	51	10	—4	30	30	2.32	+1.18	1.76	2.0	6	11	7	13	W
Coon Rapids	Carroll	....		23.6	...	49	23	—9	31	32	1 19	.....	.60	1 5	5	12	13	6	NW
Davenport	Scott	615	27	25.8	—2	52	11	—3	30	28	2 68	+1.03	1.71	1.8	10	14	9	8	W
Delaware	Delaware	1,084	8	20.4	—1	47	8	—11	30	30	2.14	+ 62	1.50	7.2	4	9	14	8	NW
Denison	Crawford	1,192	6	21.6	0	52	1, 23	—9	31	38	.92	+.51	.50	4.0	4	17	4	10	S
Des Moines	Polk	867	21	23.6	—2	52	1	—5	31	36	2.12	+.73	1 05	10 2	9	8	9	14	NW
De Soto	Dallas	886		22.8	..	49	1, 8	—5	15	33	3 15	.....	1 67	10.0	8	15	11	5	NW
Dubuque	Dubuque	665	26	23 4	—3	48	8	—5	30	27	1.85	+.13	1 27	3 5	7	10	11	10	NW
Galva	Ida	.....	6	20.8	—1	54	1	—9	30, 31	38	.96	+.24	.75	.....	3	26	2	3	NW
Gilman	Marshall	1,035	..	.....	.....	..	.....	...	.....	.....	1.73	. ...	1.16	T	4	12	5	14	S, NW
Gladbrook	Iowa		...	....	...	...	.....	.....	.....	.....	1.17	....	.30	3.0	6		....	....	.....
Grinnell	Poweshiek	1,011	9	23 4	—2	46	8, 10	—6	31	29	1.57	+.37	1.45	T	2	13	10	8	N
Grinnell (near)	Poweshiek	.....	....	22 6	.....	47	8	—8	31	31	....	.. ..	....	....	....	7	6	18	NW
Grundy Center	Grundy	966	8	19 3	—4	47	8	—11	31	32	1.66	+ 38	1.66	6.0	1	14	8	9	NW
Guthrie Center (h)	Guthrie	1,269	....	22.0	.....		.....	—4	30	.....	2.50	....	1 00	11 0	4	10	12	9	N
Harlan	Shelby	.	..	22 4	.....	49	1	—5	31	40	1.43	.....	.76	2.6	6	7	9	15	NW
Independence	Buchanan	921	37	20.0	—1	47	7	—8	30, 31	33	1.67	+.29	1.48	3 5	4	17	8	6	NW
Iowa City	Johnson	644	9	23.8	—3	53	8, 9	—5	31	32	1.93	+.29	1.03	4.0	7	8	11	12	NW
Iowa Falls	Hardin	.....	6	19.2	—2	48	8	—9	15, 30	30	1.64	+.54	.90	9 0	3	10	7	14	NW
Le Claire	Scott	.....		.....	.....	....	.....	.....	....	.....	2.11	... ...	1.03	....	8		....	...	....
Logan	Harrison	928	34	22.6	—4	50	23	—5	31	39	1.51	+.21	.85	2.0	6	14	8	9	.....
Maquoketa	Jackson	.....	6	25.4	0	55	11	—5	29	41	1.82	+.18	1 28	.5	5	15	3	13	NW
Marshalltown	Marshall	898	7	22.6	—1	48	8	—9	31	31	2.17	+ 53	1.46	5 5	5	12	9	10	NW
Monticello	Jones	800	45	24.6	+3	62	10	—10	31	32	4.28	+2.06	3 15	6.5	4	14	9	8	NW
Mt. Vernon*	Linn	858		22 7	.....	50	8, 10	—9	30	.....	2.17	...	1.75	....	4	..	..	...	.....
Newton	Jasper	958	12	21.2	—1	47	8	—10	31	32	2.34	+1.07	1.33	6 5	6	8	16	7	NW
Odebolt	Sac	....	....	23.0	....	52	23	—9	30, 31	44	1.00	.....	.75	2.0	4	17	4	10	.....
Ogden	Boone	1,109	....	21.8	.....	54	1	—14	31	40	1.65	.....	75	12.0	6	17	0	14	NW
Olin	Jones	..	..	22.4	.....	49	8	—6	30	31	2.24	.....	2.00	4.5	4	13	10	8	NW
Onawa	Monona	....	...	24.8	.....	52	1	—5	30, 31	40	1 37	.....	.96	2.0	8	15	7	9	NW
Rockwell City	Calhoun	1,219	....	22.0	.....	47	8	—12	30	34	1 59	.....	.70	7.0	6	20	3	8	.....
Sac City	Sac	900	20	21 9	—1	52	23	—11	31	31	1 50	+ 26	1.04	3 0	5	15	7	9	NW
Scranton	Greene	....	....	22.8	.....	46	8, 23	—7	31	33	2.00	.....	1.30	4.0	4	14	15	2	NW
Sioux City	Woodbury	1,122	10	23 0	—3	56	23	—5	30	33	1 27	+.39	1 14	.....	5	9	9	13	NW
Vinton* (a)	Benton	800	9	23.1	—2	48	7, 8	—6	31	...	.28	—.95	.28	T	1	23	0	8	NW
Waterloo	Black Hawk	832	20	21.6	—1	50	7	—9	31	32	1.80	+.57	1.55	2.5	3	14	10	7	NW
Webster City	Hamilton	....	6	.....	.....	....	.....	....	.....	..	.....	... ...	....	.....	..	...	....	....	.....
West Branch	Cedar	708	....	25.8	.....	60	9	—5	31	32	1.94	.....	1.12	2.0	4	13	6	12	NW
Whitten	Hardin	.....	....	19.5	.....	46	8	—12	31	32	1.61	.....	1.15	8.0	2	12	11	8	NW
Wilton Juncton	Muscatine	.....	...	24.9	....	52	10	—5	31	26	2.55	.....	1.75	2.0	7	19	4	8	NW
Average		.....	....	22.7	—1.3	48.3	...	—7.4	.....	33.4	1 80	+.44	...	4.4	5	13	8	10	NW

CLIMATOLOGICAL DATA FOR DECEMBER, 1899—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days	
...fton	Union			23.0	....	49	8	—4	30, 31	39	1.31	.....	.62	5 0	5	5	15	9	NW
...lbia	Monroe	945	..	25.6		62	7	—9	31	46	1.99		1.00	2.5	5	7	15	11	NW
...tlantic	Cass		8	26.6	+2	50	1	—3	31	41	1.58	+ 28	.53	2.5	7	8	9	14	NW
...atavia	Jefferson	640	..		....						.97	.....	.85	.4	3	..	..	....	
...elknap	Davis	857	...	27.0	...	75	22	—5	31	50	1.85	.....	.69	5.5	7	..	....	....	NW
...urlington ‡	Des Moines		...	30.8	...	60	12	—4	31	36	1.76	.....	1.00	2.1	8	....	....	....	.....
...onaparte	Van Buren		8	26.6	—2	53	8	—4	31	34	89	—.83	.40	4.0	3	....	....	....	.....
...uckingham	Tama	526	..	..	....	..	.....	....	.....	....	1.23	.....	.59	10.0	3	..	....	..	.....
...ussey	Marion		....	....	.....	..	.....	....	.....	....	2.56	.....	1.90	2.0	5	..	....	....	.....
...arson	Pottawattamie		....	....	.....		.....	..		....	1.79	.....	1.22	2.0	4	...	..	....	.....
...hariton	Lucas	1,080	..	25.6	..	53	7	—6	26,30,31	41	2.22	... .	1 22	3.0	10	7	14	10	NW
...hillicothe	Wapello	645	..	.....	....	.....	.....	....	.....	....	1.65	.. ...	.90	.5	4	....	....	....	.....
...larinda	Page	1,069	9	24.3	—3	53	1	—1	15	40	1 87	+.70	88	4 8	8	10	11	10	NW
...orning (f)	Adams	1,127	7	22.6	—4	49	1	—5	15	42	2.29	+1.30	1 45	8.2	6	9	9	13	N W
...ollege Springs	Page		8	25.2	—3	50	1	—1	30	37	1.38	—.12	.80	4.2	8	15	8	8	NW
...ouncil Bluffs	Pottawattamie	989	.	24.9	....	54	1, 23	0	30	33	1.37	.....	.50	.5	6	18	5	8	S
...umberland	Cass		...	...	....	..	.....	.....	.....	.....	1 43	.....	1 01	4 0	4	10	8	13	N
...anville	Des Moines	715	...	....	.....		.....	.....	.....	.....	1.30	...	65	4.0	5	11	15	5	.....
...ldon	Wapello		..	26.7	.....	56	3	—6	31	37	2.52	.....	1.09	5.9	6	11	8	12	W
...merson	Mills		..	.....	.....	.....	.....	.....	.....	.....	2.25	.....	1 00	2.5	7	....	....	....	.....
...airfield	Jefferson	767	13	26.0	+1	52	10	—4	31	31	1 88	+.24	1.10	3.0	4	18	5	8	.....
...t. Madison	Lee	516	51	.....	.....	....	.....	.....	.....	.....	1.91	—.12	1.37	1 5	4	9	10	12	SW, NW
...arden Grove	Decatur		...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	...	...	...	.....
...lenwood	Mills	979	29	26.0	+1	55	1	—1	30	36	.92	+.11	.70	1.2	4	7	10	14	NW
...reenfield	Adair		8	22.4	—1	50	1	—6	30, 31	35	1.47	+.01	.56	6 3	11	11	12	8	W, NW
...riswold	Cass	....	....	....	.....	.....	.....	.....	.....	.....	.95	.....	.45	3.5	5	...	....	....	.....
...edrick (a)	Keokuk	....	.	25.0	.....	55	10	—6	31	35	1.34	.....	1.00	2 5	3	11	8	12	NW
...opeville	Clarke	....	8	23.5	—2	50	1	—4	30, 31	37	1 68	+.61	.77	.....	8	7	14	11	NW
...ndianola	Warren	....	7	22.8	—3	51	1	—16	30	35	1.93	+ 40	.79	.....	5	8	8	15	N W
...eokuk	Lee	618	28	28.4	—2	56	10	—2	31	32	1.67	—.21	.91	.....	9	14	8	9	NW
...eosauqua	Van Buren	....	7	27 2	0	54	8	— 3	31	33	1 67	+.19	1.26	4 5	7	..	....	....	.....
...noxville ‡	Marion	....	6	25 2	—1	53	23	—5	30, 31	33	3.00	+1.77	1.18	2.0	7	13	7	11	NW
...acona	Warren	....	..	.....	.....	.....	.....	.....	.....	.....	2 01	.....	1.00	7.5	7	11	12	8	.....
...amoni	Decatur	....	....	24 6	.....	51	8	—5	31	40	2.07	.....	.97	2.3	10	17	0	14	N W
...enox	Taylor	....	..	23.0	.....	49	1	—5	30, 31	37	1 83	.....	.78	5 9	10	18	2	11	NW
...ooar	Lee	....	...	27 4	....	56	10	—2	31	33	1.27	.....	.96	.....	4	15	7	9	NW
...t. Ayr	Ringgold	1,236	6	23 6	—2	50	1	—4	30, 31	40	1 25	—.04	47	6 0	10	6	13	12	N & W
...t. Pleasant	Henry	725	..	24.6	.....	57	7	—7	31	36	1.89	.....	1.16	T	4	15	8	8	S
...urray	Clarke	1,183	..	.....	.....	...	.....	.....	.....	.....	1.56	.....	.83	3 0	5	...	....	...	.....
...orthboro	Page		...	.....	.....	...	... .	.....	.....	.....	.42	.....	.20	4.2	3	...	...	...	.....
...maha (Neb.)	Douglas	1,113	..	25.8	.....	54	23	0	30	29	1.29	.....	.96	1.5	6	8	9	14	SW
...sceola	Clarke	1,125	..	23 6	.....	53	1	—5	30, 31	40	1 35	.....	.55	3.2	6	6	12	13	NW
...vid	Wayne		6	24.8	—1	54	1. 7	—8	31	43	1.87	+.29	.93	4.2	8	12	1	18	NW
...skaloosa	Mahaska	850	16	24.1	—2	50	8, 10	—5	30, 31	35	1.91	+.76	1.06	1 5	7	13	4	14	N W
...tumwa	Wapello	630	5	27.8	0	54	8	—3	31	32	1.57	—.22	.57	1.0	4	13	8	10	NW
...acific Junction	Mills	960	...	24.4	.....	61	1	—3	30	38	1.39	.....	.80	T	4	8	15	8	N
...ella	Marion		..	21.4	.....	55	8	—10	29	30	1.10	.....	.60	2.0	4	16	8	7	NW
...ed Oak	Montgomery	1,033	...	27 8	.....	64	8	2	30	39	2.15	.....	1 17	3.0	8	15	3	13	N
...igourney (e)	Keokuk		..	27.8	.....	53	8, 10	—7	31	34	.....	.....	.93	...	...	...	...	...	NW
...tuart	Guthrie		..	21.7	.....	50	1	—8	31	32	1.94	.....	1 00	7.5	5	11	8	12	N
...hurman	Fremont		..	24 8	.....	51	1	1	15,30,31	35	2.59	.....	.90	.....	9	....	....	....	.....
...illisca	Montgomery	1,058	6	23.2	—1	60	9	—4	15	36	2 44	+1.44	.95	.....	8	14	12	5	NW
...apello	Louisa	578	....	28.1	.....	63	21	—3	31	39	2.48	.....	1.02	3 5	7	17	5	9	W, NW
...ashington	Washington	738	8	24.0	—2	52	8, 10	—8	31	35	2.09	+.87	1 43	5.0	4	....	....	....	SW
...interset	Madison	....	8	23.0	—3	59	2	—5	30, 31	33	2.00	+.65	.50	7.0	7	.	....	....	.....
...oodburn	Clarke	....	....	.....	.....	..	.....	.....	.....	.....	1.87	.....	.81	7.2	10	12	6	13	.....
Average		....	...	25.0	—1.4	54.4	.....	—4.5	.....	36.7	1 69	+.31	.....	3 5	6	11	9	11	NW
Av. for the state		....	..	22.6	—1.1	51.2	.....	—7.8	.....	33.6	1.61	+.36	.....	4.3	5	12	9	10	NW

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

ERRATA IN NOVEMBER REVIEW,

DIAGONAL—Maximum temperature of 68° on the 15th, should have been 69° on the 9th.

OSKALOOSA—Total precipitation recorded 1.03 inches, should have been 1.06 inches.

MT. VERNON (Collins)—Maximum temperature of 67° on the 17th, should have been 69° on the 17th.

OVID—Maximum temperature of 73° on the 9th and 16th, should have been 74° on the 17th.

The departures from the normal temperature and precipitation, as published in the November Review on pages 10 and 11, were wrong. The corrected departures for that month can be found on pages 16, 17, 20 and 21 of this report.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR DECEMBER, 1899.

STATIONS.		DATE.																														Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max.	29	47	33	30	39	44	46	49	46	45	31	24	19	18	28	18	32	33	30	41	41	40	41	41	21	19	19	16	15	11	13	31.0
	Min.	26	31	22	1	0	17	29	36	42	40	23	18	6	8	2	8	13	24	4	17	20	23	26	18	8	0	8	3	1	- 4	- 4	15 0
Albia	Max.	50	56	34	30	47	37	62	55	51	54	49	30	22	20	20	32	39	33	34	47	50	54	50	48	22	18	22	27	27	14	12	36 9
	Min.	26	31	21	4	1	15	25	25	34	42	28	21	13	10	5	12	18	22	4	13	22	25	24	18	7	- 8	0	1	- 2	- 7	- 9	14.2
Alta	Max.	46	34	28	12	36	33	44	48	42	38	23	20	20	21	26	32	25	32	36	49	47	46	52	21	13	14	15	12	10	2	6	28.5
	Min.	23	29	8	-2	2	20	22	30	39	30	19	13	4	7	8	15	15	21	4	17	18	22	23	15	4	- 8	- 4	- 4	- 4	-10	-12	11.7
Amana	Max.	45	40	34	23	35	36	44	48	44	50	48	33	20	20	24	25	34	37	29	43	42	42	42	40	18	18	22	16	12	5	11	31.6
	Min.	29	34	23	8	5	13	31	24	39	41	33	18	14	11	3	14	16	25	5	18	23	21	26	18	8	3	6	3	1	- 4	- 5	16.3
Ames	Max.	49	45	32	20	38	37	47	47	44	42	38	27	20	17	24	28	29	32	30	40	37	40	45	44	19	14	16	13	11	7	9	30.4
	Min.	28	31	18	4	3	14	28	25	38	35	24	7	8	10	-8	10	12	18	1	11	11	12	19	18	8	- 4	0	1	- 2	- 7	- 8	11.8
Atlantic	Max.	50	45	33	14	39	40	45	44	44	43	33	23	18	22	25	33	31	32	33	45	44	48	45	40	18	19	22	16	20	13	17	32.0
	Min.	23	29	15	0	-2	15	27	28	41	33	22	15	11	5	1	17	15	19	1	4	15	19	17	18	5	1	13	4	2	- 2	- 3	13.8
Audubon	Max.	49	55	33	32	37	40	44	45	45	42	30	28	23	19	15	30	31	32	33	42	42	45	48	42	20	19	23	21	20	8	12	32 4
	Min.	26	30	19	1	1	18	28	30	41	35	20	15	9	14	5	6	22	15	8	19	22	28	28	17	- 2	6	5	- 3	2	- 3	- 4	15.1
Bancroft	Max.	45	35	25	14	35	35	45	43	43	31	35	33	21	20	23	10	28	30	40	50	50	48	53	41	12	11	21	15	10	7	8	30.3
	Min.	26	25	15	-2	5	15	25	27	40	31	25	12	7	6	7	11	12	12	3	5	18	18	24	13	4	- 4	- 4	- 3	- 5	- 9	- 8	11 3
Baxter	Max	50	2*	30	18	40	40	50	48	42	43	32	22	21	19	31	31	32	31	31	42	46	40	40	36	26	20	22	16	14	8	12	31 0
	Min.	25	22	5	-3	16	18	26	44	39	31	20	8	5	-1	2	8	11	1	3	16	17	23	20	16	- 6	- 5	0	- 3	- 8	- 9	- 4	10 9
Bedford	Max	52	47	34	29	43	48	50	48	45	45	37	28	23	30	30	35	35	36	34	45	44	..	..	..	...	...	...	...	...	...	...	....
	Min.	22	30	24	3	5	14	25	19	40	35	27	7	8	-6	2	12	10	26	2	12	12	..	..	..	...	...	...	...	...	...	...	....
Belknap	Max.	58	46	30	16	40	50	51	54	54	55	40	30	22	21	26	29	40	40	50	60	70	75	46	32	13	18	21	18	16	9	16	37 0
	Min.	29	35	25	7	4	20	22	28	42	44	38	22	14	13	4	8	19	28	9	12	20	30	27	20	10	- 2	- 3	5	3	- 3	- 5	16.9
Belle Pl'ne	Max.	45	38	36	16	35	37	45	50	43	49	48	30	33	23	26	27	38	35	29	41	42	42	40	38	18	15	21	15	12	5	12	31.7
	Min.	25	35	24	8	4	15	30	26	40	39	32	18	15	3	3	11	12	24	3	20	15	23	24	23	7	1	0	2	0	- 6	- 9	15.1
Bonaparte	Max	49	49	35	30	39	45	48	53	45	52	52	34	21	20	25	24	38	40	32	46	49	42	44	40	22	21	22	21	18	11	17	35 0
	Min.	30	33	27	9	5	18	32	35	41	45	32	24	9	13	-1	12	19	28	11	20	24	24	26	22	11	3	13	8	4	- 2	- 4	18.4
Britt	Max.	37	41	40	12	31	36	38	44	42	40	33	24	19	18	25	27	31	30	33	43	44	44	40	40	18	14	15	14	9	4	6	28.5
	Min.	20	29	13	-6	-3	7	21	23	38	32	23	15	9	8	1	15	20	10	-3	11	15	16	19	12	3	- 3	- 5	- 3	- 6	- 9	- 9	10 1
Burlington	Max.	57	44	40	33	43	50	60	57	4.	54	53	30	30	31	31	26	42	44	41	52	58	43	58	45	31	35	33	37	33	20	26	41.5
	Min	31	35	28	14	7	20	36	26	40	44	38	25	10	14	5	13	22	32	12	22	25	31	31	22	11	6	14	8	4	- 1	- 4	20.0
Carroll	Max	50	37	32	12	38	47	39	48	43	35	26	21	18	21	24	32	33	48	40	42	56	45	49	23	15	15	16	11	15	8	10	30.6
	Min	22	30	22	-1	0	15	25	31	39	33	22	16	4	10	1	10	20	24	4	18	18	26	24	18	7	- 6	0	- 2	- 3	- 8	-10	13.2
Cedar Falls	Max.	47	37	35	15	35	36	48	45	45	45	42	25	21	19	15	25	30	32	23	34	39	36	40	35	15	...	...	...	...	..	...	....
	Min.	25	26	26	7	10	12	28	40	35	30	20	17	11	5	-4	11	12	25	-2	12	20	20	20	14	5	...	...	...	...	...	...	....
Cedar Rap.	Max.	47	51	45	33	40	38	48	52	48	46	39	25	18	20	25	26	34	39	30	47	42	43	43	26	15	17	21	16	12	6	10	32 3
	Min	29	30	21	9	8	17	29	25	41	39	32	18	13	12	4	14	17	24	5	20	25	21	26	16	8	3	5	5	1	- 4	- 4	16 4
Chariton	Max.	52	45	34	24	41	44	53	52	48	51	45	30	25	20	26	31	39	40	35	51	51	45	46	41	21	19	21	20	17	9	16	35.2
	Min.	25	32	23	5	0	18	33	28	41	42	24	19	12	7	6	17	20	27	7	19	22	26	25	19	9	- 6	4	4	0	- 6	- 6	16.0
Charles Cy	Max.	43	40	38	23	32	33	43	46	43	40	38	38	19	18	17	22	28	32	25	43	50	37	41	30	22	14	19	14	5	5	6	28 5
	Min	26	34	21	8	6	12	26	25	37	35	25	12	3	8	-11	3	15	18	-8	4	8	7	13	10	2	- 4	- 3	- 1	- 5	-10	- 6	10 0
Clarinda	Max.	53	46	36	19	45	48	49	47	45	45	38	25	19	22	29	35	36	34	33	44	39	41	43	41	20	21	23	19	19	15	12	33.6
	Min.	26	31	19	6	5	19	25	24	41	37	21	13	6	6	-1	17	13	23	3	13	16	26	21	20	8	4	14	5	3	0	2	15.0
Clear Lake	Max.	38	27	17	8	20	28	38	45	41	40	35	25	24	19	24	25	30	20	32	40	43	40	44	40	15	15	21	15	11	6	6	26.8
	Min.	23	25	15	2	4	13	25	25	38	33	27	15	11	8	3	11	20	15	3	19	19	19	21	8	4	- 1	0	- 3	- 5	-10	- 9	12.2
Clinton	Max	45	43	34	28	35	35	45	48	43	51	50	28	23	26	21	26	35	40	31	43	43	44	45	35	19	20	22	17	15	9	10	32.5
	Min.	30	33	25	10	5	14	27	21	36	36	36	23	13	15	2	13	15	27	10	15	22	18	23	18	7	1	5	4	0	- 4	- 3	15 0
College Sps	Max	50	47	37	28	43	48	48	45	45	44	36	34	21	28	35	32	34	32	42	42	47	39	41	40	23	22	22	22	13	16	16	34.6
	Min.	25	33	24	5	6	21	26	26	40	35	22	15	11	3	15	15	15	6	16	16	18	28	24	20	6	2	13	2	0	- 1	0	15.7
Coon Rap.	Max.	45	44	35	25	37	38	44	46	45	44	36	25	19	19	26	31	30	32	34	42	42	46	49	44	23	16	20	14	15	10	12	31 9
	Min.	33	30	20	0	5	16	28	30	40	33	23	15	8	9	5	17	23	19	7	22	22	29	29	18	9	- 2	3	2	0	- 6	- 9	15.4
Corning	Max.	49	45	34	25	41	44	47	47	45	46	37	28	19	21	30	32	32	34	29	39	42	4.	40	27	21	18	21	16	19	12	15	31.6
	Min.	25	31	20	1	-1	21	28	22	41	36	30	16	1	4	-5	10	10	20	2	17	12	..	..	..	...	...	...	0	1	- 3	- 3	13 5
Co. Bluffs	Max	54	44	37	23	45	41	49	48	45	40	30	25	20	27	32	32	29	33	41	52	48	52	54	30	19	19	23	20	21	15	18	34.4
	Min.	28	27	8	6	15	24	27	30	35	29	20	12	11	11	11	20	21	8	8	19	21	22	23	10	8	5	5	5	2	0	5	15.4
Cresco	Max.	37	35	28	14	30	30	42	43	42	41	31	31	12	16	16	22	30	29	19	29	33	36	37	17	12	11	16	10	4	1	4	24.5
	Min.	25	26	17	3	3	10	25	23	37	35	28	16	1	5	0	10	17	9	-7	9	15	10	18	8	- 2	- 9	- 7	- 5	-13	-15	- 8	9.2
Davenp'rt.	Max.	47	42	32	21	37	40	45	50	44	52	52	31	21	22	21	24	37	43	29	45	49	44	45	39	17	19	20	19	12	8	11	32.8
	Min	32	32	21	11	9	21	33	31	40	44	31	18	14	13	8	14	23	27	10	24	29	29	30	16	9	5	9	6	1	- 3	- 3	18.8
Delaware	Max.	43	41	31	20	34	32	45	47	45	46	44	42	19	19	20	21	27	35	25	37	37	39	38	33	19	12	17	11	10	3	6	29.0
	Min.	26	29	19	8	4	10	25	24	37	39	30	15	9	6	-3	10	10	20	-3	11	18	16	21	15	2	- 4	- 3	- 1	- 7	-11	- 7	11 8
Decorah	Max.	40	38	30	20	32	32	43	45	45	42	40	32	15	18	20	26	32	30	25	34	35	37	40	36	12	12	17	5	4	3	12	28 0
	Min.	28	27	18	5	3	7	25	24	37	32	28	16	5	2	-10	10	18	15	-8	10	15	5	18	10	0	- 9	- 7	-12	-13	- 7	...	9.7
Denison	Max.	42	35	32	13	38	36	45	46	46	36	25	21	21	22	25	31	26	32	37	46	47	49	52	24	17	15	18	12	17	9	15	30.3
	Min	26	23	10	-1	0	16	25	30	36	32	21	15	7	8	5	13	18	20	5	18	17	25	22	18	7	- 5	2	0	- 1	- 7	- 9	12.8
Des Moines	Max.	52	44	53	17	40	42	49	49	44	44	37	26	22	21	26	31	30	34	32	43	43	42	44	42	18	16	20	17	14	7	14	32 0
	Min	30	29	15	6	4	19	31	30	40	35	25	18	12	7	1	18	16	18	5	21	24	25	27	18	3	- 3	6	5	0	- 5	- 5	15.3
De Soto	Max.	49	43	42	13	37	41	47	49	45	44	37	24	20	21	28	32	30	32	30	40	39	44	42	38	19	17	21	18	12	6	15	31.1
	Min.	29	30	11	5	5	17	31	31	44	37	24	15	11	-2	-5	19	10	18	4	16	21	17	24	19	9	0	5	6	3	- 4	- 4	14.4
Dows	Max	42	40	32	20	34	37	46	48	44	41	38	28	18	11	20	25	31	32	30	40	41	41	45	44	16	12	18	13	10	9	10	29.5
	Min.	20	30	17	0	2	13	25	25	38	33	23	15	10	9	-5	3	20	16	17	11	17	14	17	15	4	- 4	3	- 1	-11	- 7	-10	11.6
Dubuque	Max.	44	42	31	20	33	33	47	48	45	48	46	33	20	21	22	24	32	38	26	41	45	44	44	36	15	12	18	13	7	4	7	30 3
	Min.	32	31	20	7	6	15	31	28	39	39	33	20	15	13	5	15	19	22	7	19	27	20	30	15	7	2	5	4	- 2	- 5	- 3	16.6
Eldon	Max.	51	46	56	31	42	42	52	54	47	55	52	32	22	23	27	22	44	41	35	49	50	41	44	43	23	19	20	20	18	11	16	36.4
	Min.	29	34	26	8	5	15	31	23	41	44	31	20	13	11	-2	12	19	28	9	18	24	21	24	21	11	- 1	10	7	3	- 2	- 6	17.0
Elkader	Max	44	40	32	21	39	33	51	51	45	45	36	28	28	28	28	27	34	33	34	45	47	41	47	24	25	15	23	23	14	8	7	32.1
	Min.	28	30	20	8	7	10	28	23	39	39	31	18	8	5	-8	13	14	20	-5	9	15	5	22	15	4	- 2	- 3	1	- 6	-10	- 5	12.0
Fairfield	Max.	47	44	35	28	39	41	45	51	46	52	51	44	22	22	23	25	36	40	32	44	45	46	43	36	22	21	21	20	17	21	15	34.6
	Min	38	35	27	9	8	19	31	28	40	43	38	20	11	11	5	5	12	28	10	20	25	25	30	19	10	1	0	7	4	- 2	- 4	17 5
Fayette	Max.	42	39	28	20	32	32	44	46	46	44	41	32	18	18	20	22	31	32	25	36	36	39	41	38	13	10	15	12	7	2	5	27 9
	Min	25	28	20	5	3	9	24	26	33	38	32	18	5	4	-8	10	15	15	-8	13	18	10	18	13	2	- 5	- 5	- 2	- 7	-11	- 7	10.7
Ft. Dodge	Max	..	..	..	..	..	..	47	53	48	42	37	25	23	19	24	29	28	32	34	45	45	42	52	43	18	13	16	12	11	6	12	....
	Min.	..	..	..	..	..	..	23	28	40	32	23	15	5	9	-3	19	19	20	4	17	18	18	19	18	13	- 6	- 8	- 4	- 5	- 9	-12	....
Fonda	Max.	48	35	30	20	37	34	42	48	34	36	22	22	21	23	25	26	28	32	35	50	48	48	54	21	10	9	10	11	10	3	16	28.6
	Min.	24	21	0	0	11	22	22	24	22	20	12	6	6	4	10	16	19	2	15	20	18	22	18	5	-12	-11	-12	-11	-13	-14	- 8	8.3
Forest City	Max.	40	36	35	16	32	32	41	51	41	41	34	19	24	17	20	21	28	25	44	48	49	42	19	14	20	21	19	17	11	7	6	28 1
	Min.	22	24	15	0	-1	16	21	35	37	35	22	15	10	9	2	1	15	0	15	18	20	14	4	-2	- 2	3	- 2	- 3	- 5	- 7	- 9	10.1
Galva	Max.	54	30	30	15	35	37	29	35	40	30	32	26	30	25	30	29	34	35	47	49	39	49	46	38	16	18	16	12	11	3	9	30.0
	Min.	29	20	13	0	-3	21	22	25	30	22	20	10	20	20	13	15	15	10	16	15	13	14	16	12	6	- 6	- 1	- 2	- 9	- 9	- 9	11 5
Glenwood	Max.	55	50	37	26	45	43	50	47	45	45	37	27	20	20	13	15	15	10	16	15	13	14	16	12	6	- 6	- 1	- 2	- 9	- 9	- 9	11 5
	Min.	27	32	24	5	9	18	25	30	40	34	25	18	10	10	7	17	20	23	6	21	20	30	23	21	10	3	10	2	0	- 1	2	16 8
Greene	Max.	44	39	30	21	33	35	47	49	44	41	38	33	21	19	23	27	31	31	30	37	39	39	42	40	17	14	21	15	12	6	7	29.3
	Min.	24	29	21	6	5	13	25	24	36	35	25	16	11	5	-8	11	18	17	-5	12	13	7	16	16	2	- 5	- 5	- 1	- 5	-11	- 7	11.0
Greenfield	Max.	50	44	33	15	35	43	46	49	45	45	35	36	17	24	29	33	34	35	32	41	40	44	41	39	23	22	23	18	12	11	16	32.6
	Min.	23	27	15	0	0	17	19	28	41	34	23	12	4	4	3	13	10	17	0	13	18	26	23	15	3	- 2	7	3	- 2	- 6	- 6	12.8
Grinnell	Max.	44	40	33	25	34	38	43	46	45	46	41	28	23	17	24	25	31	34	28	41	39	39	41	41	20	16	17	17	15	8	10	30.6
	Min.	26	32	23	6	5	18	31	28	39	40	27	18	12	7	6	14	17	25	5	20	24	28	26	18	7	0	5	3	0	- 4	- 6	16.1
Grin'l (nr.)	Max.	45	41	31	23	35	39	45	47	44	45	41	28	23	17	27	25	31	35	28	40	40	40	40	40	20	16	16	14	11	7	10	30.5
	Min.	25	31	22	5	4	15	30	25	37	39	27	18	12	7	1	14	17	25	5	17	21	23	23	18	7	- 2	3	1	- 1	- 6	- 8	14.7
Grundy C'r	Max.	45	40	27	14	35	36	46	47	43	40	38	27	24	19	23	27	29	30	27	38	37	39	43	36	15	15	18	14	9	3	9	28 8
	Min.	24	24	15	2	3	13	28	20	31	35	29	14	3	2	-7	11	9	14	-5	11	15	18	16	13	2	- 5	- 2	- 3	- 5	-10	-11	9 8
Guthrie C'r	Max	..	..	..	..	..	..	..	..	43	45	43	25	20	20	25	30	31	32	32	41	42	49	43	42	20	17	20	17	12	11	13	29.3
	Min.	26	26	6	2	5	11	28	29	39	35	37	17	9	8	-2	16	14	19	5	22	22	25	25	20	10	- 3	5	3	1	- 4	- 3	14.6
Hampton	Max.	44	38	27	12	35	35	48	51	47	47	31	22	18	20	25	28	32	33	31	41	45	40	48	25	15	15	19	16	12	6	9	29.5
	Min.	25	25	12	2	5	15	26	27	36	35	23	14	10	7	-1	11	18	13	2	12	22	17	19	2	5	0	1	0	- 2	- 7	- 8	11.8
Harlan	Max.	49	45	33	23	38	38	44	43	44	43	35	23	17	20	28	32	31	33	32	40	39	42	48	44	21	20	19	14	15	9	1.	31.5
	Min.	25	30	21	0	-2	12	24	24	39	34	21	15	7	11	2	15	20	20	2	12	14	20	20	19	6	0	8	2	0	- 4	- 5	13.3
Hedrick	Max.	47	42	34	27	38	43	42	52	45	55	49	..	21	21	27	26	36	39	31	47	48	48	44	40	20	18	20	18	15	9	14	33.9
	Min.	27	32	25	6	3	18	30	22	40	43	29	20	12	10	3	12	16	26	7	20	22	25	24	18	7	- 2	7	5	0	- 4	- 6	16 0
Hopeville	Max.	50	45	31	15	40	45	48	48	44	46	39	23	16	17	25	30	33	35	32	44	44	40	42	39	19	17	19	17	15	8	15	31.6
	Min.	26	29	15	3	3	21	28	27	42	39	23	13	6	8	4	16	19	23	6	20	21	28	27	18	10	0	8	2	1	- 4	- 4	15.4
Humboldt	Max.	42	40	30	12	34	37	41	49	42	42	35	24	20	18	20	24	28	32	34	43	48	46	52	43	19	13	17	12	10	8	8	29.8
	Min.	21	30	12	0	4	13	24	27	40	34	23	16	8	14	5	8	22	24	4	15	19	18	22	17	7	-

STATIONS.		DATE.																															Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Iowa City..	Max.	47	41	31	24	37	44	47	53	53	51	48	38	20	21	21	25	34	38	34	35	45	41	43	41	19	19	20	12	13	7	12	32.7
	Min.	29	30	24	9	6	13	28	21	35	41	32	18	11	10	-1	11	13	24	4	16	21	18	21	19	8	3	6	4	1	- 4	- 5	15 0
Iowa Falls.	Max.	43	40	30	13	34	39	45	48	46	39	35	24	18	19	23	28	32	32	26	35	35	39	42	36	15	14	18	13	10	5	8	28 5
	Min.	23	26	10	5	4	12	25	25	38	35	23	14	9	2	-9	12	16	11	-4	8	13	10	15	10	4	- 4	- 3	- 1	- 5	- 9	- 8	9.8
Keokuk....	Max.	48	47	32	20	40	46	49	53	46	56	52	28	22	22	26	25	45	50	31	47	51	45	49	40	19	22	23	23	18	12	17	35.6
	Min.	32	36	29	12	8	25	35	33	41	46	35	25	15	14	7	13	24	29	14	22	28	30	34	23	12	5	15	8	6	1	- 2	21 1
Keosauqua	Max.	50	46	35	30	40	45	51	54	47	53	53	30	22	21	28	25	38	40	33	47	52	42	43	39	24	23	24	23	20	9	7	35.3
	Min	31	35	28	10	7	18	33	26	42	47	30	20	12	13	5	15	19	32	12	19	26	23	25	24	12	2	12	10	5	0	- 3	19 0
Knoxville..	Max.	60	42	33	27	37	43	49	50	47	47	40	28	22	18	28	30	38	34	34	46	47	43	53	40	21	14	19	18	13	7	13	33.3
	Min	28	33	24	6	4	18	32	28	41	40	27	20	14	7	6	17	18	25	8	22	25	29	27	21	10	- 3	6	5	1	- 5	- 5	17.1
Lamoni....	Max.	49	46	33	32	41	48	48	51	45	49	42	27	21	20	20	32	39	38	33	46	45	45	46	39	20	20	20	16	11	11	14	33.8
	Min	26	32	24	3	1	18	21	25	42	40	22	18	7	6	5	14	18	30	9	17	20	25	27	19	8	- 1	9	2	2	- 2	- 5	15.5
Lansing....	Max.	45	40	33	22	37	33	51	50	47	45	43	34	24	20	23	27	34	34	31	40	40	43	47	42	19	14	22	20	11	6	13	31.9
	Min.	29	32	22	16	5	11	27	24	37	40	33	22	8	4	-9	13	20	18	-5	4	4	5	19	16	3	- 4	4	0	-11	-12	- 3	11.7
Larchwood	Max	44	40	31	12	36	38	45	47	46	41	32	20	22	25	28	31	26	25	36	48	46	49	51	41	15	12	10	7	15	5	7	30 0
	Min.	22	28	9	-4	5	20	19	29	39	29	17	11	2	4	9	20	5	11	2	11	12	11	25	10	4	-11	- 3	- 7	- 5	-13	-14	9.6
Larrabee...	Max	47	40	32	15	37	37	48	56	43	39	30	20	21	22	20	37	28	30	38	48	45	48	53	22	15	17	14	10	9	3	7	30.0
	Min.	22	28	12	3	0	17	21	44	37	30	19	13	3	3	7	15	11	18	1	11	15	18	22	8	-2	-12	- 7	- 7	- 9	-15	-14	10.1
Le Mars....	Max	49	45	31	17	38	40	45	48	45	41	36	20	20	23	29	32	23	26	38	45	43	48	56	43	28	16	13	14	13	13	9	31.9
	Min	25	29	16	-2	4	18	28	30	36	32	19	14	5	7	10	20	9	16	5	15	15	16	25	20	8	- 5	- 3	- 2	- 2	- 7	- 9	12 6
Lenox.....	Max.	49	44	33	32	39	43	46	46	45	45	38	24	17	20	24	30	30	33	30	40	40	40	38	41	20	18	20	15	12	12	13	31.5
	Min.	24	31	24	0	2	20	27	28	41	37	22	15	0	8	1	14	14	25	2	18	18	28	23	18	7	- 2	10	0	0	- 5	- 5	14.4
Logan.....	Max.	48	40	36	21	40	39	45	44	40	42	35	24	18	24	27	34	40	38	34	40	41	46	50	46	38	20	26	16	14	10	15	33.3
	Min.	24	19	15	2	1	15	21	25	28	31	19	12	7	9	6	8	17	11	9	20	19	29	30	22	23	2	12	4	0	- 3	- 5	13 9
Maquoketa	Max	50	48	45	43	39	52	50	51	49	51	55	41	30	28	30	31	35	40	41	38	40	42	47	45	15	20	25	27	19	15	10	37.2
	Min	24	34	30	11	5	11	10	18	30	41	32	19	18	11	8	0	11	23	6	19	18	14	22	10	6	0	5	2	- 5	- 2	- 5	13.7
Mason City	Max.	65	40	30	20	32	32	40	48	42	40	35	23	14	..	..	..	..	..	31	40	42	40	47	38	15	12	20	15	10	-10	-10	30.4
	Min.	12	25	0	18	16	6	23	25	35	32	23	14	..	12	..	..	..	2	-2	5	17	14	22	13	2	- 2	- 3	- 3	- 5	-10	-10	14.1
Marsh'lt'n.	Max	47	44	33	24	37	39	47	48	42	43	40	29	20	20	24	29	32	33	29	40	40	40	40	34	29	25	19	15	13	8	10	31.4
	Min.	27	31	21	6	6	16	29	28	38	38	27	18	13	4	-3	10	12	20	0	19	21	18	23	18	6	- 2	3	1	- 1	- 6	- 9	13.9
Monticello.	Max	52	48	42	30	35	48	52	56	39	37	45	38	17	11	7	-6	11	20	21	-1	10	20	25	31	8	9	- 4	- 4	- 4	- 9	-10	14.6
	Min.	27	31	30	14	4	12	16	39	37	45	38	17	11	7	-6	11	20	21	-1	10	20	25	31	8	9	- 4	- 4	- 4	- 9	- 9	-10	14.6
Mooar	Max	50	48	32	22	38	46	50	52	46	56	54	28	23	22	25	27	44	48	31	45	51	44	47	39	18	20	22	23	19	14	15	35.5
	Min	27	36	29	10	5	18	25	29	35	45	30	25	15	14	13	12	24	27	12	15	25	29	32	22	12	2	15	7	6	0	- 2	19.2
Mt. Ayr.. .	Max.	50	44	34	18	41	47	49	48	44	46	38	24	17	18	26	31	31	36	31	44	43	41	42	40	18	18	19	14	15	10	13	32.0
	Min.	25	32	24	2	1	21	28	26	41	38	23	16	4	10	2	13	18	28	7	15	17	27	26	18	7	- 2	9	1	1	- 4	- 4	15.2
Mt. Ple's'nt	Max.	47	46	39	31	39	45	57	50	45	55	45	38	24	21	22	26	41	42	33	44	46	45	45	42	25	21	24	20	19	14	17	35.8
	Min	26	30	24	9	3	14	29	21	35	39	31	18	7	2	-3	8	12	24	6	15	17	20	23	19	7	0	7	4	0	- 5	- 7	14.4
NewH'pton	Max	41	39	28	21	31	31	44	44	44	41	40	29	18	18	17	21	29	30	22	32	32	37	40	38	15	10	16	14	10	4	4	27.1
	Min.	25	27	20	6	4	13	26	24	36	36	26	15	9	9	0	10	16	18	-5	6	13	8	17	15	0	- 8	- 5	- 4	- 9	-12	- 9	10.5
Newton....	Max	46	42	30	16	36	37	43	47	45	44	39	26	18	17	24	27	31	33	28	39	38	39	39	39	17	12	14	11	10	4	9	29.0
	Min	26	30	16	4	4	17	30	27	39	38	25	16	9	5	0	13	13	18	3	18	22	23	25	16	7	- 7	2	0	- 2	- 7	-10	13.5
Northwood	Max	41	38	27	17	32	32	42	46	41	39	32	25	19	19	25	25	29	32	40	43	44	54	33	30	13	13	20	16	7	5	7	28.6
	Min.	24	25	16	1	2	12	25	22	36	30	24	15	11	7	-2	12	17	12	1	21	14	21	11	12	4	- 1	1	- 1	- 4	- 8	- 6	11.9
Odebolt	Max	49	40	31	28	47	38	45	47	45	43	36	23	20	22	25	30	30	31	47	35	45	49	52	34	19	17	15	12	7	9	9	31.7
	Min	25	31	21	-1	3	18	24	30	40	32	21	16	6	12	6	17	18	23	21	7	28	25	26	18	5	- 4	- 1	- 2	- 4	- 9	- 9	14.3
Ogden.....	Max.	54	40	34	21	40	36	50	48	44	41	37	25	24	24	23	28	33	32	31	42	44	44	45	40	21	15	21	16	13	7	11	31 7
	Min.	20	32	20	1	0	18	25	28	39	34	24	18	3	10	-2	14	17	20	-1	14	30	21	21	20	-1	-11	- 7	- 3	8	-12	-14	12 0
Olin.....	Max	46	42	30	33	36	40	46	49	44	48	39	25	20	21	24	24	36	36	27	36	40	39	16	26	22	7	2	2	4	- 1	- 6	30.2
	Min.	29	32	26	13	5	10	25	21	38	39	38	22	10	8	-2	8	10	20	3	10	20	16	26	22	7	2	2	4	- 1	- 6	- 5	14 6
Omaha.....	Max.	53	47	36	17	45	42	49	47	45	37	33	21	17	24	28	36	29	33	39	50	45	52	54	42	19	20	20	18	16	10	12	33 0
	Min.	30	31	13	1	16	28	29	32	36	33	23	15	10	12	12	21	20	18	10	24	23	33	29	19	13	6	12	6	4	0	2	18.0
Onawa.....	Max	52	48	35	24	46	36	50	46	44	41	40	25	21	27	28	36	35	31	44	51	45	51	58	49	24	20	22	18	20	13	17	35.5
	Min	21	32	21	2	6	20	24	28	36	33	22	15	7	7	10	18	15	20	4	17	15	21	18	21	8	0	8	- 2	- 2	- 5	- 5	14.1
Osceola....	Max	53	42	31	15	41	44	50	50	46	46	33	24	17	17	21	30	38	34	34	20	23	28	28	19	10	- 2	6	2	0	- 5	- 5	15 5
	Min.	27	32	16	3	1	18	29	29	41	38	24	12	8	8	4	16	19	26	6	39	52	51	45	47	28	17	20	21	21	22	13	16	34.7
Ovid	Max.	54	46	31	16	43	45	54	53	45	50	36	28	21	22	26	31	40	42	39	6	20	20	26	25	18	4	- 4	6	- 1	- 1	- 6	- 8	15.0
	Min.	25	31	20	3	0	21	31	29	40	43	24	15	9	7	5	15	20	21	6	20	20	26	37	43	37	17	13	18	12	8	4	6	27 5
Osage.....	Max.	38	37	38	17	31	32	41	45	42	40	35	26	17	19	19	24	30	33	27	33	34	37	43	37	17	13	18	12	8	4	6	27 5
	Min	24	26	15	5	3	11	25	24	36	33	21	16	12	12	-5	11	19	16	-4	12	16	12	18	12	3	- 2	- 2	- 3	- 7	-11	- 7	10.8
Oskaloosa..	Max	49	44	32	20	38	42	48	50	43	50	43	26	22	21	30	27	14	14	23	5	19	22	24	23	20	6	- 4	5	4	0	- 5	33.3
	Min.	26	30	20	6	3	15	28	26	37	42	25	17	11	8	2	24	37	41	40	52	53	47	46	43	23	19	20	20	18	11	16	14.9
Ottumwa...	Max.	51	45	43	44	40	45	48	54	49	53	50	36	23	14	12	6	15	20	35	9	22	23	24	27	20	10	0	10	7	4	- 1	36.7
	Min.	30	34	21	8	14	19	32	28	41	45	36	23	14	12	6	15	20	35	9	22	23	24	27	20	10	0	10	7	4	- 1	- 3	18 9
Pacific Jct.	Max	61	35	36	19	45	44	47	47	45	36	36	24	19	11	10	7	19	20	23	4	10	20	27	19	27	10	1	9	0	2	- 3	33.3
	Min.	25	30	18	6	7	7	21	27	41	35	35	30	32	30	24	23	25	44	30	27	46	41	50	45	20	15	20	19	15	9	2	15.5
Pella.....	Max.	45	30	20	15	35	40	45	55	44	35	28	25	20	14	14	3	15	22	15	0	14	15	25	20	12	9	2	3	0	-10	- 5	29 5
	Min	19	16	12	8	15	18	30	25	30	28	25	20	14	14	3	15	22	15	0	14	15	25	20	12	9	2	3	0	-10	- 5	- 6	13 2
Plover.....	Max.	46	40	20	12	35	38	46	54	42	38	33	22	20	28	31	30	32	38	40	48	46	54	26	24	18	20	18	20	18	-10	-13	31.3
	Min.	24	30	12	0	3	20	19	26	40	30	30	24	18	5	10	8	10	20	22	3	15	15	23	15	12	4	-12	- 7	- 8	- 5	-10	12 4
Primghar ..	Max.	38	40	40	33	40	46	47	50	50	40	32	26	12	3	4	8	18	10	22	3	5	6	30	30	16	2	-14	10	-10	-13	-10	34.3
	Min.	21	20	28	-3	0	20	20	30	40	32	26	12	3	4	8	18	10	22	3	5	6	30	30	16	2	-14	10	-10	-13	-10	-17	10 6
Red Oak...	Max	35	48	42	24	49	51	60	64	49	44	35	32	32	29	29	36	40	38	38	52	52	50	49	39	23	23	28	23	23	22	20	38.0
	Min	29	30	19	6	10	25	29	29	42	35	22	15	10	10	5	17	16	20	9	20	24	32	25	20	10	5	16	6	6	2	4	17 7
Ridge way	Max.	41	45	36	25	36	33	46	46	46	44	42	33	28	24	25	24	32	33	30	35	42	38	42	38	19	16	18	18	18	13	9	31.5
	Min.	27	34	21	5	4	13	24	26	38	38	33	23	9	8	0	13	17	20	0	14	19	13	23	13	2	- 5	- 1	2	- 7	-10	- 7	13.1
Rockwell C	Max.	45	41	41	32	36	36	46	47	45	43	36	26	22	20	21	31	28	45	33	45	45	46	50	25	19	18	20	14	19	6	11	32 0
	Min.	24	31	21	0	2	13	23	27	39	33	22	16	2	12	3	15	21	22	4	22	22	19	18	7	5	-10	- 6	- 5	- 6	-12	-11	12 0
Ruthven...	Max	46	45	40	30	35	33	42	40	41	42	20	20	18	18	20	21	19	25	34	35	46	52	52	16	11	9	11	8	9	2	4	27 2
	Min.	23	25	15	11	3	19	24	23	22	23	19	12	5	6	8	10	10	12	2	18	21	20	20	11	-3	-11	- 6	- 5	- 6	-11	-19	9.7
Sac City....	Max.	49	43	32	20	35	35	45	48	42	42	35	24	20	21	24	21	29	34	35	45	45	48	52	45	20	14	10	11	12	7	8	30.7
	Min	25	31	20	0	4	18	24	30	40	32	21	14	5	12	4	15	19	15	6	20	18	23	25	16	6	- 7	- 3	- 4	- 2	- 9	-11	13 1
Scranton ..	Max.	45	42	33	23	36	35	45	46	45	42	35	24	18	28	24	30	29	31	33	41	42	45	46	42	20	15	11	13	11	9	10	30 6
	Min.	25	32	23	2	3	18	27	28	40	34	23	17	7	12	5	11	22	21	6	21	21	25	27	20	8	- 3	2	1	0	- 6	- 7	15.0
Sheldon ...	Max.	45	40	30	30	30	35	44	48	44	40	32	20	21	20	30	30	32	26	35	45	43	45	57	20	17	12	10	8	8	5	3	29 2
	Min.	22	27	10	-2	2	9	10	29	40	31	17	11	4	5	6	8	10	15	2	15	13	16	19	16	2	-10	- 7	-10	-12	-12	-13	8.8
Sibley.	Max	47	39	29	15	38	35	43	48	44	41	32	19	22	24	28	31	28	26	36	50	45	46	55	42	17	11	13	7	12	4	3	30.0
	Min.	21	27	14	-5	1	15	19	27	39	30	17	10	2	2	5	18	7	17	-1	11	11	15	22	15	2	-18	-15	- 9	-10	-12	-17	8 4
Sigourney..	Max	49	43	36	29	38	43	48	53	48	53	49	35	22	25	28	27	37	39	34	51	50	43	43	..	..	..	..	..	..	17	11	14	37 3
	Min	28	33	35	8	4	17	30	27	40	41	33	20	11	12	3	13	14	26	7	18	20	25	25	..	..	..	..	..	..	0	- 5	- 7	18.4
Sioux City..	Max.	51	38	28	14	39	35	48	50	44	40	32	23	15	5	8	11	20	9	23	6	18	19	23	28	22	7	0	1	0	2	- 1	30.8
	Min	28	31	12	-1	20	25	25	26	36	41	39	29	20	20	18	29	31	28	25	35	52	47	48	54	51	15	14	15	17	12	4	15.1
Spirit Lake	Max.	45	39	30	24	36	37	45	50	41	39	29	18	10	3	6	7	17	11	18	4	17	17	20	27	15	3	- 7	- 8	- 5	- 5	-10	31.1
	Min.	24	24	10	-3	6	18	32	39	48	44	39	33	24	19	19	27	31	28	25	33	44	40	44	53	43	17	15	14	11	10	9	29 6
Sioux C'ntr	Max.	44	41	33	13	34	34	42	48	44	39	33	24	19	19	27	31	28	25	33	44	40	44	53	43	17	15	- 5	- 1	- 5	4	- 9	11.2
	Min.	21	11	11	-9	3	22	22	29	37	31	17	12	4	6	10	20	9	15	7	15	19	19	28	16	5	- 5	- 1	- 5	4	- 9	-10	11.2
StormLake	Max.	46	40	30	19	37	34	44	46	44	41	25	21	20	21	25	31	30	32	36	47	46	45	52	42	16	3	- 5	- 4	- 3	- 3	-11	29.8
	Min.	25	28	18	-1	5	21	24	29	39	31	20	14	5	8	9	16	17	21	6	20	18	24	25	16	3	- 5	- 4	- 3	- 3	-11	-11	13.4
Stuart	Max.	50	42	33	32	35	42	45	47	43	43	35	25	20	24	28	30	22	32	20	35	40	42	36	28	20	12	8	- 2	2	4	- 1	29 5
	Min.	25	30	22	2	3	13	28	28	40	35	20	10	11	12	6	4	8	27	4	20	22	28	20	12	8	- 2	2	4	- 1	- 3	- 8	13.9
Thurman..	Max	51	47	38	20	43	45	48	49	45	44	35	24	17	22	28	34	31	34	33	44	40	44	48	46	22	20	18	15	17	33 0		
	Min.	25	32	30	7	8	17	23	24	33	34	24	16	7	4	1	19	15	22	4	20	22	30	23	21	9	6	15	4	3	1	1	16.1
Villisca....	Max.	34	33	36	18	26	50	52	50	60	42	28	26	25	25	36	35	35	35	36	28	34	38	58	25	33	24	28	23	18	15	17	33 0
	Min.	26	18	20	3	14	30	26	22	30	32	20	14	-1	2	-4	15	16	25	0	10	18	20	22	16	20	- 3	10	0	0	- 3	- 3	13.4
Wapello ...	Max	52	40	37	29	35	40	50	51	43	52	52	48	27	23	29	22	36	40	34	20	24	26	27	21	11	4	11	7	3	- 2	- 3	37.3
	Min.	34	34	27	15	8	16	30	27	40	42	37	24	13	15	2	12	19	29	12	20	32	46	48	45	42	24	18	22	23	20	17	18.9
Washingt'n	Max.	48	40	32	22	38	42	47	52	44	52	42	27	22	22	23	23	36	40	32	46	48	45	42	24	18	6	0	6	3	0	- 6	32.7
	Min.	28	30	20	5	3	16	29	25	38	46	28	15	6	8	0	9	14	26	19	20	20	24	28	15	6	- 7	- 3	- 4	- 2	- 9	-11	15.3
Waterloo...	Max.	48	43	30	18	37	36	50	46	44	42	41	42	18	23	23	24	30	29	31	33	41	42	45	46	42	20	15	11	13	11	9	30 6
	Min.	26	31	22	6	5	14	28	24	38	38	27	17	12	4	-2	12	22	21	6	21	21	25	27	20	8	- 3	2	1	0	- 6	- 7	15.0
Waverly...	Max.	45	40	29	20	34	35	46	46	45	41	40	29	19	21	23	26	13	18	19	-4	8	12	11	17	15	3	- 3

DAILY AND MONTHLY PRECIPITATION FOR DECEMBER, 1899.

STATIONS.	DATE.																															Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	....	.10	....	..	..	....	....	....	.62	.09	.40	T	.. .	....	....	..	..	T	....	....	....	..	T	T	.10	....	..	....	....	..	....	1.31
Albia	....	.41	.05	....	....	....	....	....	.24		1.00	T	...	....	....	....	....	....	....	....	....	..	T	T	.20	....	....	....	....	....	....	1.90
Algona	..	....	.10	..	..	....	....	....	....	.05	..	....	....	T	....	....	....	....	..	..	....	....	..	....	.05	....	....	..	..	....	..	0.20
Alta	....	.02	.04	....	....	....	....	....	.86	.04	...	T	T	...	....	....	..	....	..	....	....	..	....	....	.10	....	..	..	....	....	....	1.06
Alta (near)	..	.09	.10	..	..	....	..	..	.94		....	....	....	....	..	..	..	....	....	....	..	..	..	..	.20	....	....	....	....	....	....	1.33
Amana	.08	.03	.05	..	....	....	.	..	.10	03	1.21	.13	....	....	....	....	..	.01	.	....	..	..	..	..	...	....	....	....	....	....	T	1.64
Ames	.. .	.08	T	.	..	..	....	..	.75	.30	1.10	..	...	...	....	....	..	....	..	....	..	..	..	..	.12	....	....	....	....	..	..	2.35
Ames (near)	....	.05	02	....	..	....	....	..	.95	.53	.52	..	....	..	..	..	....	....	..	....	..	.	..	....	.10	....	..	....	....	....	....	2.17
Atlantic	....	.15	.10	....		....	....	.36	.53	.29	.10	..	...	..	..	..	....	....	..	....	....	....	T	T	.05	....	....	....	....		...	1.58
Audubon	...	..	...	.	....	..	....	...	.70	....	.20		...	T	...	..	....	....	....	....	....	....		.20	....	....	....	..	..	...	...	1.14
Bancroft	.	..	T	....		..	T	.	70	T		T	....	T	..	..	....	....	....	....	....	....	.		T	....	..	....	....	....	....	....	0.70
Batavia	T	T	....	....	.	....	....		T	.08	85	.01	....	....	..	..	....	....	..	....	..	....		....	.05	....	..	....	....	..	....	....	1.60
Baxter	..	.05	T	..	....	..	..	.20	.35	.70	.30	....	..	..	..	..	....	T	....	..	.	..	.	....	....	..	....	....	....	....	T	0.97
Bedford	....	.03	....	..	..	..	....	..	.84	.76	.30	.	..	....	....	..	....	....	....	....	....	....	....	....	..	....	....	....	....	..	....	1.60
Belknap	.21	...	....	.05	..	..		...	.10	.06	69	.64	T	T			..	T	....	....	....	....		....	....	....	..	....	....	..	...	
Belle Plaine	....	..	.20	.08	..	..	..	.10	.30	.02	1.60	...	....	....	..	..	..	.01	..	....	..	..	..	..	..	.10	...	....	....	....	...	1.85
Bonaparte	....	.14	....	..	....	..	....		....	.	.35	.40					...		..	....	..	..	..	..	..	....	..	...	....	..	2.31
Britt	....	..	.05	..	..	....	...	T	.54	.14	.10	T	T	T	..	..	....	....	..	....	....	..	..	..	..	....	..	....	....	..	...	0.89
Buckingham	....	....	.50	..	....	..	..	..	.	.23	50	.	...	..	....	....	....	....	....	....	....	..	....	....	....	..	...	....	....	.01		0.84
Burlington	.05	.25	..	....	....	....	...	....	09	.12	1.00	19	...	.02	....	....	....	.04	..	..	....	....	....	....	..	..	..	....	....	..		1.23
Bussey	...	16	.	....		..	..	...	.30	..	1.90	T	..	.	..	..	..	....	.	....	..	..	....	....	....	....	..	....	....	....	....	1.78
Carroll	...	.08	.10	...	...	....	...	....	.78	..	.32	....	....		..	..	..	....	.	....	..	..			.20	....	..	....	..	....	....	2.56
Carson	..	....	.42	T	T	T	1 22	....	....	..	....	.10	....	....	..	....	..	....	.	....	..	..	T	..	.20	..	....	....	..	....	....	1.48
Cedar Falls	..		T	..	...	..		.10	....	.	1 42	T	....	..	..	..	....	....	....	..	..	..	..	..	.05	....	....	....	....	....	....	1.79
Cedar Rapids	....	T	T	..	..	..	....	..	T	.20	1.07		....	T	..	..	....	....	....	..	....	..	....	....	..	....	....	....	....	....	....	
Chariton	.07	.08	.09		...	....	..	....	41	.12	1.22	.05	..	...	..		....	.04	....	....	..	..	....	.	....	..	....	....	....	....		1.27
Charles City	.27		T	T	...	..	T	...	.47	.10	.10	T		T	..	....	....	....	..	....	....	T	.02	..	.12	....	....	....	....	....	...	2.22
Chillicothe	....	.30	T	..	....		..	....	.40	T	.90		...	....	..		....	....	..	....	....	..	....	....	....	....	....	....	....	....	T	0.94
Clarinda	..	.05			....	....	....	....	.88	20	.37	.22	...	..	....	..	.	....	....	....	..	..	....	..	.05	....	....	..	....	..	....	1.85
Clear Lake	...	...	.05			..	.	....		.05		...	....	....	..	..	..	....	....	....	....	....	....	..	.10	.05	..	..	....	....	..	1.87
Clinton	.30	..	....	05	....	..	....		.15		.75	1.01	06	..	....	.	..	T	....	..	..	..	..	..	....	..	....	....	.	..		0.10
College Springs	....	.	.10	....	..	.	....	.12	.80	.10	.16	.02	T		..	....	....	....	....	....	....	..	..	..	....	..	....	....	....	....	....	2.32
Coon Rapids	...	.23	T	..	..	....	...	T	.60	T	.27	..	....	...	....	..	....	....	....	....	....	..		.06	T	..	.02	....	....	....	...	1.38
Corning	...	.03	..	..	....	.	...	.10	.65	.	1.45	....	..	...			..	....	..	....	..	..	.01	....	.05	.	..	....	..	. .	..	1.19
Council Bluffs	...	.10	..	..	....	..	..	.40	.50	.30	.02	.	.		....	....	..	..	..	....	..	..	..	....	.05	.	..	....	..	..	....	2.29
Cresco	..	....	.04	..	..	..	..		.26	.04	.85	.30	T	...	....	....	..	..	....	..	..	..	..	....	.05	....	..	..	....	....		1.37
Cumberland	....	.01	T	....	..	.	....	.01	1 01	T	.40		....	T	....		.	....	..	....	..	..	..	T	T	..	..	....	....	..	T	1.49
Danville	.05	....	....	..	..	..	..	..		.10	.65	.40	..	....	....	....	....	....	.	....	..	..	....	T	T	..	....	....	..	....	.	1.43
Davenport	.46	.17	.01	.03	..	..		....	.06	.02	1.71	.16	....	.03	T	..	..	.03	....	....	....	..	..	..	..	....	....	..	....	....		1.30
Delaware	..	.02	....		..	..	..	....	.10	1.50	.52	.	....	....	..	....	..	....	....	....	..	..	....	..	....	....	....	..	....	..	T	2.68
Decorah	....	.10	..	..	..	..	....	...	.17	.88	95	.41	.05	T	T	..	....	....	....	..	....	....	..	....	....	....	..	..	.	....	T	2.14
Denison	..	.10		...	....	..	....		.50	.25	....		...		..	..	....	....	....	....	..		T	T	.07	.	..	..	....	..	..	2.06
Des Moines	.05	.22	.02	T	....	..	..	T	62	.05	1.04	.01	T	T	..	..	....	01	....	....	....	....	....	....	....	..	..	....	....	..	....	0.92
De Soto	....	.32	.08	....	..	..		.01	.88	08	1.67	...	T	T	..	....	..	T	..	..	..	....	.01	T	.10	..	..	....	....	....	....	2.12
Dows	....	....	T		..	....	....	..	.65	.24	.02	....			..	..	..	..	....	....	....	....	..	..	..	.10	....	..	....	....	....	3.15
Dubuque	.17	..	T	.04	....	..	..	..	.06	02	1 27	.24	T	T	..	..	..	.05	....	....	..	..	.	.	..	T	....	....	....	....	T	0.91
Eldon	....	.32			..	....	....		.12	.02	.87	1 09	.	....	..	..	..	....	....	....	....	....	T	T	.10	....	....	....	....	....	....	1.85
Elkader	...	...	T	T	..	....	....	....	.15	.65	1.40	....	..	..	..	..	..	....	....	....	....	....	T	T	.10	....	....	..	....	....	....	2.52
Emerson	T	T	...	....	....	....	....	1.00	1.00	.05	.10	.05	..	..	..	..	....	....	....	....	....	....	..	..	...	....	....	....	..	....	....	2.20
Fairfield	..	.40	T	....	..	....	..	....	.08	T	1.10	.30	..	T	....	....	....	T	....	....	....	..	..	.03	.02	..	..	....	....	....	....	2.25
Fayette	....	....	.05	..	....	....	....	....	T	...	1.14	.65	....		....	....	..	T	....	....	....	....	....	....	T	....	....	....	....	....	....	1.88
Ft. Dodge	....	....	..	....	....	....	T	..	.84	.08	.22		..	T	....	....	....	....	....	....	....	....	..	..	....	....	....	....	....	....	T	1.84
Ft. Madison	....	.26	..	....	....	..	..		.13	T	1.37	T	....	.15	..	..	..	T	....	....	....	....	....	....	.15	....	....	....	....	....	T	
Fonda	.06	.04	.12	..	..	....	....	.76	.59	.24	.18	.	.		..	..	..		....	....	....	....	....	....	....	....	....	....	....	....		1.91
Forest City	....	....	.05	....	..	..	..	....	.52	T	.15	T	T	T	..	..	..	.	....	....	....	....	..	....	.38	..	....	....	....	....	.16	2.53
Galva	....	....	.15	..	..	....	....	T	.75	....	..	....	....	..	..	..	....	....	....	....	....	....	....	....	....	..	....	....	....	....	....	0.72
Glenwood	....	T	T	..	....	....	....	....	.70	.10	....	.05	..	....	..	....	....	....	....	....	....	....	....	....	.06	..	....	....	..	....	....	0.96
Gilman	.28	.09	T	....	..	..	..		.20	..	1.16	....	T	T	..	..	T	..	....	....	....	....	T	T	.07	....	....	....	..	....	....	0.92
Gladbrook	.30	.20	T	..	....	....	.20	.25	.12	.30	....	..	..	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.73
Grand Meadow	...	...	....	.10	...	..	..	..	.08	.	1.92	T	...	T	..	..	..	.03	....	....	....	....	....	....	....	..	..	....	T	T	T	1.17
Greene	.34	....	....	..	..	..	....	.	.34	.05	.95	.05	T	T	.	..	....	..	....	....	....	..	..	..	....	..	..	....	....	....	T	2.18
Greenfield	.06	.08	.05	....	..	..	..	.03	.56	.16	.46	..	....	.01	....	..	..	....	....	....	....	..	.01	.01	.04	....	..	..	....	....	T	1.73
Grinnell	..	.	.2	....	....	....	....	....	....	..	..	1.45	T	T	..	..	..	....	..	..	....	....	.01	T	T	..	....	....	....	....	T	1.47
Grundy Center	....	T	T	....	....	....	....	....	....	1 66		....	....	T	....	..	..	....	..	..	....	..	....	....	T	....	....	....	....	....	T	1.57
Guthrie Center	....	.15	.10	....	..	.	....	....	.60	..	.65	....	..	....	..	..	..	....	....	....	....	..	....	....	....	....	....	....	....	....	....	1.66
Hamburg	....	...	T	..	..	....	....	....	.45	.15	.20	.10	....	..	....	..	..	....	....	....	....	....	....	....	1.00	..	..	....	....	....	....	2.50
Hampton	....	02	..	....	..	....	....	....	.57	.24	.90	....	..	..	....	....	..	....	....	....	....	....	....	.05	T	..	....	....	T	....	T	0.95
Harlan	...	.21	.05	T	....	..	....	T	.76	.06	.29	..	..	T	....	.	....	....	....	....	....	..	....	....	....	..	....	....	....	....	....	1.73
Hawkeye	....	..	.20	....	....	....	.	....	2.00	....	1 40	.20	....	....	....	....	....	....	....	....	....	....	T	T	.06	..	....	..	....	..	T	1.43
Hedrick	....	.25	T	....	....	..	....	....	.09	T	1 00	..	..	..	....	....	....	T	....	....	....	....	....	.	.	T	....	....	....	....	....	3.80
Hopeville	....	.02	.02	....	..	....	..	....	.60	.22	.77	T	T	T	....	..	....	....	....	....	....	....	T	..	T	....	....	....	....	....	....	1.34
Hoprig	T	..	....	....	....	....	....	....	....	.05		T	T	....	..	..	....	....	....	....	....	....	.01	.01	.03	....	..	....	....	....	....	1.68
Humboldt	....	.01		..	..	....	....	....	.59	.06	.03	....	....	..	..	..	....	....	....	....	....	....	....	..	T	....	....	....	....	....	..	0.05
Independence	....	.	.07	....	....	....	..	....	.05	.07	1.20	.28	..	....	....	..	....	T	....	..	....	....	....	....	.01	....	....	....	....	....	....	0.73
Indianola	T	.38	T	T	..	....	....	T	.48	.04	.75	T	T	T	....	..	....	T	....	..	....	....	....	....	....	....	....	....	....	....	....	1.67
Iowa City	.13	.07	T	..	..	....	....		.20	.06	1.03	.38	...	....	....	....	....	.06	....	....	....	....	T	T	T	.28	....	....	....	..	....	T	1.93
Iowa Falls		T	T	..	..	...	T	T	.50	.24	.90	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.93
Keokuk	T	.06	.05	....	....	..	....	....	.12	.12	.91	.26	....	.06	....	..	..	.08	....	....	....	..	..	....	....	....	....	....	....	....	....	1.64
Keosauqua	..	T	.21	.01	....	....	....		.11	.06	.75	.51	....	.02	....	....	....	....	....	....	....	....	....	T	T	....	..	....	....	....	....	1.67
Knoxville	.20	.42	T	T	....	..	....	T	.45	.45	1.18	T	...	T	..	..	....	T	....	....	....	..	....	T	T	....	....	....	....	....	....	1.67
Lacona	....	.05	.15	....	.	....	....	...	.42	.10	1.00	.25	...		..	..	....	T	....	....	....	.10	T	.20	..	..	....	....	..	..	....	3.00
Lamoni	.08	.05	T	.05	....	..	....	.09	.55	11	.97	T	....	....	....	....	....	T	T	....	....	T	T	.04	....	....	....	....	....	....	....	2.01
Lansing	.18	....	.05	T	....	....	....	....	T	.03	1.10	1.27	....	....	....	....	....	....	....	....	....	.08	.05	.04	....	....		..	....	T	....	2.07
Larchwood	....	.02	.05	....	....	....	T	....	.65	....	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.65
Larrabee	....	.10	.01	....	....	....	....	.03	.10	....	....	....	....	....	....	....	....	....	....	....	....	....	T	T	.23	.03	....	..	....	....	....	0.98
Le Mars	..	..	.20	..	....	....	....	....	.78	..	....	....	....	....	....	..	....	..	....	....	....	....	....	..	.19	....	..	....	....	..	T	0.43
Lenox	...	.05	.02	.03	....	....	...	.10	.78	.08	.66	.03	....	....	....	....	..	..	....	....	....	....	....	....	.08	....	....	....	....	....	....	1.06
Le Claire	.33	....	.08	.02	....	....	....	....	....	.14	.44	1.03	....	T	.04	....	....	....	....	....	....	T	.03	.05	..	..	....	....	....	....	....	1.83
Logan	....	.33	....	.04	..	....	....	....	.85	.09		.10	....	....	....	....	..	.03	....	....	....	....	....	.	..	....	....	....	....	....	....	2.11
Maquoketa	.24	....	....	T	....	....	....	....	.12	T	1.28	.15	....	T	..	....	....	.03	....	....	....	....	....	....	.10	....	....	....	....	....	....	1.51
Marshalltown	.10	.09	T	....	....	..	....	....	.42	.10	1.46	....	....	....	..	....	....	T	..	....	....	....	....	....	....	....	....	..	....	....	T	1.82
Monticello	.30	....	....	.03	....	....	....	....	....	....	.80	3.15	T	T	....	..	....	T	..	....	....	....	..	....	T	....	....	..	....	....	....	2.17
Mooar	T	.04	.03	....	....	....	....	....	....	....	.96	.24	..	..	....	....	....	T	....	....	....	....	....	....	....	....	....	..	....	..	....	4.28
Mt. Ayr	....	.02	.05	....	....	....	....	.04	.47	.10	.30	T	....	....	....	....	....	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	1.27
Mt. Pleasant	....	26	T	..	....	....	....	....	.32	....	1.18	.15	....	....	....	....	....	....	....	....	....	.02	.10	....	.10	....	....	....	..	....	....	1.25
Mt. Vernon	.10	....	....	....	....	....	..	....	.12	....	1.75	.20	....	..	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	1.89
Murray	....	T	.01	....	....	..	....	..	.70	.83	.01	..	....	....	....	.	....	T	..	..	....	....	T	....	.01	....	....	....	....	....	....	2.17
New Hampton	....	....	T	....	....	....	....	....	.17	....	.12	....	....	....	....	....	....	....	....	....	....	....	T	....	.01	....	....	....	....	....	....	1.56
Newton	....	.22	T	....	....	....	....	T	.52	.11	1.33	.11	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0.29
Northboro	.	....	....	....	....	....	.20	....	....	....	....	....	..	....	....	....	..	....	....	....	....	....	....	.20	.05	....	....	....	....	....	....	2.34
Northwood	....	....	....	....	....	....	....	....	.61	.15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.02	0.42
Odebolt	...	T	.12	....	....	....	....	....	.75	.03	T	....	....	....	....	....	....	....	....	....	....	....	....	.10	....	....	....	....	....	....	....	0.76
Ogden	....	.07	....	.05	....	....	....	....	.75	.05	.60	....	....	....	....	....	....	....	....	....	....	T	....	.13	....	....	....	....	....	....	....	1.00
Olin	....	....	.02	....	....	....	....	....	.14	....	2.00	T	T	T	....	....	..	.08	....	....	....	....	....	....	....	....	....	....	....	T	....	1.65
Omaha (Neb)	....	.06	T	....	....	....	....	.16	.81	.09	.12	T	T	T	....	....	....	....	....	....	..	....	T	T	.05	T	T	....	....	....	T	2.24
Onawa	...	.10	.10	..	....	....	....	.05	.96	.07	....	....	.01	....	....	....	....	....	....	....	....	....	T	.07	....	.01	....	....	....	....	....	1.29
Osceola	T	.11	.06	T	....	....	....	T	.55	.14	.40	T	T	T	....	....	....	T	....	....	....	T	T	.09	....	....	....	....	....	....	....	1.37
Ovid	...	07	.23	....	....		..	.08	.32	.10	.93	....		....	....	....	....	.02	....	....	....	....	....	....	.12	....	....	....	....	....	....	1.35

DAILY AND MONTHLY PRECIPITATION FOR DECEMBER, 1899—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Osage	....	....	T	....	....	....	....	T	.54	.11	1.26	T	....	....	....	....	....	....	....	....	....	....	T	....	.05	....	....	....	....	....	....	1.91
Oskaloosa	....	.46	.02	....	....	....	....	T	.16	.11	1.06	..	....	....	....	....	....	.05	....	.	....	....	....	....	.10	....	....	....	....	....	....	1.57
Ottumwa	T	....	....	....	....	..	....	....	.50	.51	.40	T	T	....	....	....	....	....	....	....	....	....	....	T	....	....	....	....	....	....	....	1.39
Pacific Junction	....	.10	....	....	....	....	....	....	.80	.17	.32	..	....	....	....	.	....	....	....	....	....	....	....	....	.15	....	....	....	....	....	....	1.10
Pella	....	....	....	....	....	....	....	....	.20	.15	.60	..	....	....	....	....	....	....	....	....	....	....	....	....	.10	....	....	....	....	....	....	1.20
Plover	....	....	....	..	....	....	....	....	1.00	.10	T	....	....	....	....	....	....	....	....	....	....	....	....	....	T	....	....	....	....	....	....	0.70
Primghar	.20	....	....	.	....	....	....	....	.50	....	..	....	....	....	....	....	....	....	....	....	....	....	....	.02	.05	T	....	....	....	..	....	....	2.15
Red Oak	....	.11	T	....	....	..	....	.12	1.17	.15	.48	.05	....	T	....	....	....	....	....	....	....	.01	....	....	....	....	....	....	....	....	....	4.21
Ridgeway	....	....	.20	....	....	....	....	....	.36	.13	3.50	..	....	.01	....	....	....	....	....	....	..	....	T	....	.40	....	....	....	....	....	....	1.59
Rockwell City	...	.10	.02	...	....	....	....	....	.70	.07	.30	..	....	....	..	..	....	....	....	....	....	....	....	....	.02	....	....	....	....	....	....	1.89
Ruthven	....	..	....	....	....	..	....	....	1 45	.42	T	....	T	....	....	....	....	....	....	....	....	....	T	....	.15	....	....	....	....	....	..	1.50
Sac City	....	.06	T	....	....	....	....	....	1.04	.10	.15	....	....	....	....	....	.	....	....	....	....	....	....	....	.20	....	....	....	....	....	....	2.00
Scranton	...	T	T	...	....	T	...	..	1.30	.30	.20	.	...	...	....	....	..	..	....	....	....	....	....	T	.30	..	..	....	...	..	....	1.15
Sheldon	...	T	.02	...	....	....	...	.01	.82	...	T	T		...	..	....	..	..	....	....	....	....	....	....	.33	....	....	....	....	..	..	1.29
Sibley	....	...	.05	...	....	..	....	T	.86	...	....	T	T	...	...	..	..	....	....	....	....	....	T	...	...	...	...	.	....	...	...	.....
Sigourney	.30	.45	T	T	...	...	....	..	.11	T	.93	.21	T	T	...	...	...	T	...	..	....	....	T	T	.01	..	T	....	....	...	T	1.27
Sioux City	....	.05	.05	...	....	....	..	.02	1.14	....	....	T	....	....	....	..	..	....	....	....	....	....	T	T	T	.05	....	....	....	..	....	1.06
Spirit Lake	....	..	T	...	. .	...	..	....	1.01	...	...	.	....	..	....	..	....	....	....	....	....	....	T		.08	....	....	....	....	..	....	1.44
Sioux Center	....	.15	.05	....	...	..	T	...	1.16	.	....	T	....	...	..	..	....	....	....	....	....	....	T		.07	..	..	..	....	....	....	1.06
Storm Lake	....	.08	.03	...	...	...	..	.04	.80	.04	...	T	. ..	....	....	....	....	....	....	....	....	....	....	....	.02	..	....	....	....	....	....	1.94
Stuart	....	.02	....	....	...	....	....		1.00	.20	.70	..	...	..	....	..	....	....	....	....	....	....	T	.02	.04	..	T	T	....	....	T	2.59
Thurman	....	.15	.04	...	....	....	....	.20	.90	.42	.79	.03	T	T	....	....	....	T	....	....	..	....	....	....	...	....	....	....	....	....	....	0.28
Vinton	....	....	T	...	....	....	....	T	T	T	.28	..	....	...	..	..	....	....	....	....	....	....	....	....	.10	....	....	....	....	....	....	2.44
Villisca	.10	.28	....	....	. .	....	....	.95	.12	.30	.35	.24	...		....	....	....	....	....	....	....	....	....	....	.	...	....	....	....	....	....	2.48
Wapello	.26	.47	..	...	....	....	....	....	.10	....	1.02	.57	...	.02	....	....	....	.04	....	....	....	....	....	....	...	....	....	....	....	....	....	2.09
Washington	.18	.40	..	. .	....	..	....		.08	33	1.10		....	....	....	....	....	....	....	....	....	....	T	...	.05	....	....	....	....	....	....	1.10
Washta	....	.10	.05		....	....	....	T	.90	....	....	T			....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	1.80
Waterloo		....	T	T	...	....	....	...	.18	....	1.55	T	T	T	...	..	....	.07	...	....	....	....	....	....	....	....	....	....	....	....	T	1.97
Waverly	.05	..	T	T	....	..	...	...	.15	.11	1.66	T	...	T	...	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
What Cheer	....	..	....	....	....	....	....	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	T	....	....	....	....	T	1.61
Whitten	...	T	T	....	....	....	..	T	.46	T	1.15	T	T	T	....	....	....	....	....	....	....	....	....	....	....	..	....	....	....	....	....	2.55
Wilton Junction	..	.20	T	...	....	...	....	...	..	.15	1.75		.05	.10	..	....	.20	.10	....	....	....	....	....	....	....	.20	..	....	....	....	....	....	2.00
Winterset	.23	....	.27	....	....	....	....	...	.50	.23	.27	.30	....	T	....	....	....	....	....	....	....	....	....	....	.10	T	...	....	....	....	T	1.12
West Bend	T	.10	...	...	....	....	..	....	.87	.05	T	....			....	....	....	.20	....	....	....	....	....	....	....	....	....	....	....	....	....	1.94
West Branch	....	....	T	T	...	...	....	.. .	T	.42	1.12	.20	T	T	....	....	....	.30	....	....	....	....	....	....	....	....	....	.30	....	...	....	.60
West Union	....	....	....		....	....	....	....	....	....	....	..	..	..	....	....	....	.02	....	....	....	....	.02	....	.15	....	....	....	....	....	....	1.87
Woodburn	T	.05	.15	T	...	..		.17	.41	.07	.81	.02	....	....	..							....										

Precipitation Chart December 1899.



APPENDIX

SUMMARY FOR THE YEAR 1899.

BAROMETER.—The mean atmospheric pressure for the year was 30.04 inches. The highest observed was 31.08 inches on February 11th, at Sioux City; lowest, 29.19 inches, on December 11th, at Davenport; range for the state, 1.89 inches.

TEMPERATURE.—The mean temperature, as deduced from the complete records for the year of 91 stations, was 47 6°, which is about .2 of a degree above the average for the past decade. The highest temperature reported was 104°, on September 6th at Eldon; lowest reported, 40° below zero, at Sibley, on February 11th. The range for the year was 144°.

PRECIPITATION.—The average amount of rainfall and melted snow for the year was 29.10 inches, as shown by the complete records of 89 stations. This is about 1 inch below the average for the past decade. There was considerable inequality in its distribution, the southern section receiving the larger amount of moisture. The greatest amount reported for the year was 42.06 inches at Ft. Madison; least amount reported, 21 79 inches, at Plover, Pocahontas county. The greatest monthly rainfall was 12.24 inches at Ft. Madison, in May. The least monthly precipitation was nothing, at Northwood and Primghar, in January. The greatest daily rainfall was 7.74 inches, at Sac City, on June 26th. The average number of days on which .01 of an inch or more fell was 77.

WIND AND WEATHER.—The prevailing direction of the wind was south. The highest velocity reported was 50 miles per hour, at Sioux City, on April 28th; average daily wind movement, 211 miles. There were 160 clear days during the year; 89 cloudy days, and 116 partly cloudy days On the whole, the general meteorological features of the year were about normal.

COMPARISON OF PAST DECADE.

YEARS.	MEAN TEMPERATURE	AVERAGE PRECIPITATION.
1890	47.7 degrees.	31.12 inches.
1891	47 4 degrees.	33.13 inches.
1892	47.5 degrees.	35.74 inches.
1893	45.7 degrees.	27.31 inches.
1894	49 7 degrees.	21.95 inches.
1895	45 5 degrees.	26.63 inches.
1896	48.5 degrees.	37.45 inches.
1897	46.7 degrees	26.99 inches.
1898	47.6 degrees.	31 69 inches.
1899	47 6 degrees.	29.10 inches.
Averages	47.4 degrees.	30.11 inches.

MONTHLY SUMMARIES.

JANUARY.—Mean temperature for the state was 19.8°, which is 2.7° above normal. The mean temperature by sections was as follows: Northern section, 15.9°; central section, 19 9°; southern section, 23.5°. Lowest temperature reported, —34°, at Mason City, on 31st; highest, 68° at Council Bluffs, on the 21st. The average precipitation was .28 of an inch for the state; and it was quite evenly distributed by sections There were 15 clear days; 6 cloudy, and 10 partly cloudy.

FEBRUARY.—The month was notable for extremely high pressure and low temperature. The mean temperature for the state was 12.2°, or 9° below the normal. By sections the means were as follows: Northern section, 8 3°; central section, 12.8°; southern section, 15.6°. The lowest temperature was 40° below zero, at Sibley, on the 11th. Estherville reported a mean of 2.6° for the month. The average precipitation for the state was .89 of an inch, which is about .17 below normal. The average for the northern section was 1.17 inches; central section, .73 of an inch; southern section, .78 of an inch. There were 11 clear days; 10 partly cloudy; 7 cloudy. Highest wind velocity, 48 miles an hour, at Sioux City on the 23d.

MARCH —The month was unusually cold for this region. The mean temperature for the state was 24.5°, which is about 8 7° below the normal. The mean for the northern section was 19.6°; central section 25°; southern section, 28.9°. The maximum temperature reported was 75° at Mt. Pleasant, on the 10th and 11th; minimum temperature, —16°, at Charles City and Cresco, on the 7th. Average precipitation for the state, 1.62 inches which is very nearly normal; average for the northern section, 1.92 inches; central section, 1.20 inches; southern section, 1.73 inches. There were 7 clear days; 12 partly cloudy, and 12 cloudy. The general weather conditions were wholly unfavorable for farming operations. At the central station it was the coldest March since the establishment of the service in Des Moines.

APRIL.—The first decade was wintry and much colder than usual; the second and third decades were warmer than usual, bringing the mean up to about the normal for April. The mean temperature for the state was 48.9°. The mean for the northern section was 47 2°; central section, 48.9°; southern section, .50°. The highest temperature reported was 89°, at Thurman, on the 12th; lowest, 1°, at Bedford, on the 4th. The month was notable for its extremes; the average monthly maximum being 82.8°, and average monthly minimum, 11.9°. The average precipitation was 2 40 inches, which is about .60 of an inch below normal. The average for the northern section was 1.82 inches; central section, 2 65 inches, southern section, 2.73 inches. There were several days of very high winds during the closing week. The highest velocity reported was 60 miles an hour at Sioux City, on the 28th. There were 12 clear days, 11 partly cloudy, and 7 cloudy.

MAY.—The month was seasonably warm and unusually wet and cloudy, causing considerable delay in planting and cultivating. The mean temperature was 60 2°, which is slightly above the normal. The mean of the northern section was 58.3°; central section, 60.4°; southern section, 62°. The highest temperature reported was 90° at DeSoto on the 26th; lowest, 27° at Larrabee and Spencer on the 13th, which was the date of the latest frost reported during the spring. The average rainfall for the state was 6.23 inches, which is 2.26 inches in excess of the normal. The average for the northern section was 5.31 inches; central section, 6.83 inches; southern section, 6.55 inches. The greatest amount reported for the month was 11.47 inches, at Keokuk; least amount, 3 09 inches, at Ridgeway. Measurable amounts of rain fell at one or more stations every day during the month. The percentage of sunshine was unusually low. There were an average of 9 clear days, 12 partly cloudy, and 10 cloudy. It was a phenomenally stormy month, with an excessive amount of wind movement and electrical energy. The maximum velocity of wind was 47 miles per hour at Sioux City, on the 28th.

JUNE.—The temperature was seasonable, the mean being 70 7°, or about 7° above normal. The mean of the northern section was 68.9°; central section, 70.9°; southern section, 72.4°. Highest temperature reported, 100° at Clarinda and Stuart, on the 18th; lowest, 42°, at Decorah, Maquoketa, West Branch and Ruthven, on the 12th, 15th, 16th and 17th. The average rainfall was 5.04 inches, which is about .78 of an inch above the normal. The average of the northern section was 6.70

nches; central section, 5.10 inches; southern section, 3.33 nches. The greatest amount for the month was 11.99 inches, t Logan. The greatest daily rainfall was 7.74 inches at Sac ity, on the 26th. The least amount for the month was 1.10 nches at Lockridge. There were 12 clear days, 13 partly loudy, and 5 cloudy. The highest wind velocity reported was 7 miles per hour, at Sioux City, on the 3d. The state was isited by one tornado at Salix and vicinity, on the 11th, and evere storms in numerous localities.

JULY.—The month was about normal in temperature, the nean for the state being 73.1°. The mean of the northern ection was 71.8; central section, 73.4°; southern section, 74°. The extremes for the month were 101° at DeSoto, on the 23d, nd 38° at Mason City, on the 30th. The average rainfall was 3.07 inches. Average for northern section, 2.53 inches; central section, 2.30 inches; southern section, 4 37 inches. The largest amount reported was 8 66 inches at Lenox; least amount, .42 of an inch, at Whitten. The highest velocity of wind was 39 miles per hour, at Sioux City, on the 5th. There were 16 clear days, 10 partly cloudy, and 5 cloudy.

AUGUST.—The month was warmer than usual. The average temperature for the state was 74.4°, which is about 3.3° above the normal, 1.3° above the average for the preceding month. The averages by sections were as follows: Northern section, 73.1°; central section, 74.4°; southern section, 75 6°. The highest average in the state was 77.2° recorded at Glenwood; lowest, 71° at Eagle Grove and Cresco. The maximum temperature recorded was 100°, at Wapello, on the 3d, at Bedford on the 9th, and at Hampton and Clarinda on the 23d. The average rainfall for the state was 3.68 inches. which is about .61 of an inch above the normal for August. The averages by sections were as follows: Northern section, 3.40 inches; central section, 3.38 inches; southern section, 4.25 inches. The greatest amount reported for the month was 10.45 inches, at Thurman; least amount, 1.12 inches at Algona. There were 17 clear days, 10 partly cloudy, and 4 cloudy days. Sioux City reported wind velocity of 59 miles an hour, from the northwest, on the 2d.

SEPTEMBER.—The month was characterized by abnormal extremes of temperature, breaking all previous September records in Iowa for both hot and cold weather. At the central station the average temperature of the first seven days was 80.2°, and on the 5th and 6th the maximum was 99°. Several voluntary stations reported maximum temperatures exceeding 100°, the highest being 104°, at Eldon on the 6th. The mean for the state for the month was 62 5°, which is about 1.8° below the normal for September. By sections the averages were as follows: Northern section, 60.6°; central section, 62.8°; southern section, 64.1°. The coldest weather occurred during the last five days of the month, all portions of the state being visited by killing frosts and freezing temperature. The lowest recorded was 15° at Sheldon and Sibley on the 29th, and at Mason City on the 30th. The month was unusually dry, the average rainfall for the state being .93 of an inch, which amount is 2.06 inches below the normal. The average of the northern section was 1.01 inches; central section, .72 of an inch; southern section, 1.06 inches. Blockton station reported only a trace, and at Fonda no rainfall was recorded. There were 16 clear days, 9 partly cloudy, and 5 cloudy.

OCTOBER.—The month was warmer than usual, with a very large percentage of clear and fair weather, and generally deficient rainfall. The monthly mean temperature of the state, as shown by 118 reports, was 56.7°, which is about 6.5° above the October average. The mean of the northern section was 54 2°; central section, 57°; southern section, 59°. The highest temperature reported was 95°, on the 13th, at Mooar, Lee county; lowest, 17°, at Hampton on the 29th. The average precipitation for the state was 1.73 inches, which is about .5 of an inch below the normal for October. The average for the northern section was 1.90 inches; central section, 1.44 inches; southern section, 173 inches. The largest amount reported was 4.64 inches at Thurman and the least amount .15 of an inch at Hamburg, both places being located in Fremont county. Of the total reported at Thurman, 3.72 inches fell in 24 hours, on the 24th and 25th. The prevailing wind direction for the month was south. The month was very favorable for farm operations, except plowing, for which work the soil was too dry and hard.

NOVEMBER.—The month was much warmer than usual in all parts of the state, breaking all previous records for the state. The mean temperature was 43 9°, which is about 11° above the normal. The mean by sections was as follows: Northern section, 41.9°; central section, 43.8°; southern section, 46°. Burlington reported a maximum of 86° on the 17th. The lowest temperature reported was 8°, at Primghar, on the 2d. The average precipitation for the state was 1.20 inches, which is about .22 of an inch below the normal. The average for the northern section was 1.16 inches; central section, 1.41 inches; southern section, 1.03 inches. Belle Plaine reported the largest amount for the month, 2 97 inches; Estherville the lowest, .13 of an inch. There were 12 clear days, 8 partly cloudy, and 10 cloudy days The month was favorable for cribbing corn, and securing in prime condition all late-maturing crops.

DECEMBER.—Mean temperature, 22.6°, about 1° below normal. Mean of the northern section, 20 2°; central section, 22.7°; southern section, 25°. Maximum temperature reported, 75° at Belknap, on the 22d; minimum, —19° at Ruthven, on 31st. Average precipitation, 1.61 inches. Average of northern section, 1.34 inches; central section, 1.80 inches; southern section, 1 69 inches. Greatest amount reported, 4.28 inches, at Monticello; least amount, .10 of an inch, at Clear Lake. There were 12 clear days, 10 cloudy and 9 partly cloudy.

CLIMATOLOGICAL DATA FOR THE YEAR 1899.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.					PRECIPITATION, IN INCHES.							SKY.			Prevailing direction of wind.
				Annual mean.	Highest.	Date.	Lowest.	Date.	Length of record, years.	Total for the year.	Greatest monthly.	Month.	Least monthly.	Month.	Total snowfall.	Number rainy days.	Number clear days.	Number partly cloudy days.	Number cloudy days.	
Afton	Union	....	....		97	June 18	—26	Feb. 11	....	31.15	6.76	May....	.40	January..	20.0	..	...	..	..	.....
Albia	Monroe	945	..	49.8	97	Sept. 5	—25	Feb. 9	..	31.65	5.94	May. ..	.35	February.	25.5	...	...	...	...	.....
Algona	Kossuth	1,500	8	45 0	94	July *21	—36	Feb. 9	8	22.45	5.56	June	.03	January..	32.5	65	121	181	63	NW
Alta	Buena Vista.	1,519	9	45.2	98	Sept. 6	—33	Feb. 9	9	24.83	8.66	June....	.15	January..	32.1	103	144	153	68	S
Amana	Iowa	.	24	48.4	97	Sept. 5	—25	Feb. 9	25	29.55	7.92	May....	.36	January..	8.4	87	164	117	84	NW
Ames	Story	936	20	48 0	98	Sept. 6	—27	Feb. 9	25	...	...	.....	...	.....	..	....	123	145	97	.....
Ames (near)	Story	....	..	....	..	....		. ....	..	30.07	7 34	May....	.05	January..	21 9	...	....	....	..	.. .. ..
Atlantic	Cass	....	9	48 0	99	Sept. 5	—26	Feb. 11	9	31 25	6 08	May....	T	January..	16.5	..	...	...	..	.....
Audubon	Audubon	.....	7	47 3	95	Sept. 6	—28	Feb 11	7	....	....	.....	...	.....	..	..	....	....	..	. .....
Bedford	Taylor	.....	....	...	102	Sept. 5	—25	Feb. 9	...	....	....	.....	...	.....	..	..	....	....	..	.....
Belknap	Davis	857	....	50.4	100	Sept. 6	—23	Feb. 9	..	36.03	7 45	May....	.10	January.	35 0	..	...	.	....	.....
Belle Plaine	Benton	840	10			....	—32	Feb. 11	10	....	....	.....	....	.....	..	..	....	....	..	.....
Bonaparte	Van Buren		9	50.6	103	Sept. 5	—23	Feb. 9	9	27.56	8.35	May.....	.05	January..	17.5	..	...	..	.	.....
Britt	Hancock	1,230	....	44.4	97	Sept. 6	—33	Feb. 9	...	26.55	7.31	June....	.03	January..	23.7	..	...	....	..	.....
Burlington	Des Moines	526	..	..	103	Sept. 5	—24	Feb. 9	....	....	....	.....	....	.....	..	..	...	....	..	.....
Carroll	Carroll	1,240	10	46.0	97	Sept. 6	—31	Feb. 9	10	32.90	9.04	May.....	T	January..	34.8	73	223	49	93	.....
Cedar Falls	Black Hawk	844	9	..	...	.....	—27	Feb. 9	9	....	....	.....	....	.....	..	....	....	....	..	.....
Cedar Rapids	Linn	744	18	50.0	102	Sept. 5	—25	Feb. 9	18	26.70	9.21	May.....	.37	Septemb'r	9.1	63	175	71	119	NW
Centerville	Appanoose.	1,013	7		100	Sept. 6	—23	Feb. 9	7	....	....	.....	....	.....	..	....	....	....	..	.....
Chariton	Lucas	1,030		49.2	98	Sept. 5	—24	Feb. 9	....	32 62	7 20	July.....	.33	January .	17 0	115	128	154	83	S
Charles City	Floyd	1,012	9	45.3	95	Aug. 10	—31	Feb. 9	9	29.14	5.46	June,...	.85	January.	34.0	83	93	201	71	SE
Clarinda	Page	1,069	10	50 0	101	Sept. 5	—24	Feb. 9	10	34 07	7.09	May. ..	.24	January..	28.6	89	177	117	71	S
Clear Lake	Cerro Gordo	984	....	..	...	.....	—32	Feb. 9	..	....	....	.....	....	.....	..	....	....	....	..	.....
Clinton	Clinton	609	9	48.6	98	Sept. 5	—28	Feb. 9	9	30 31	8 38	May.....	.27	January..	14.5	..	....	..	...	.....
College Springs	Page	.....	9	50.0	99	Aug 3	—27	Feb. 12	9	31 89	8.13	May.....	.12	January.	18.0	....	....	..	..	.....
Corning	Adams.	1,127	8	...	96	Sept. 5	—25	Feb. 11	8	....	....	.....	....	.....	..	..	....	....	..	.....
Council Bluffs	Pottawattamie	989	....	50.8	101	Sept. 5	—24	Feb. 11	.	....	....	.....	....	.....	..	..	....	....	..	.....
Cresco	Howard	1,312	28	42.8	93	Aug. 19	—33	Feb. 9	29	28.92	6.06	June....	.43	January..	30 0	...	229	53	83	S
Davenport	Scott	615	28	50.3	99	Sept. 5	—23	Feb. 9	28	31.64	7.35	May.....	.31	January..	13.9	106	131	95	139	SW
Decorah	Winneshiek..	900	7	44.6	99	Aug. 17	—34	Feb. 10	7	30.19	5.51	June....	.38	January..	0 0	..	..	..	..	.....
Delaware	Delaware	1,084	9	46.0	95	Sept. 5	—28	Feb 9	9	29.18	7.44	May.....	.45	January..	24.7	85	128	163	74	SW, NW
Denison	Crawford	1,192	7	46.2	98	Sept. 6	—31	Feb. 11	7	26.25	6.29	June....	.05	January..	13.5	..	...	....	....	.....
Des Moines	Polk	867	22	49.2	99	Sept. 5	—24	Feb. 11	22	26.73	6.71	May.....	.29	January..	23.5	94	116	151	98	SW
De Soto	Dallas	886	..	49 1	101	July 23	—25	Feb. 11	...	26.38	6.60	May.....	.10	January..	21.7	....	....	....	....	.....
Dows	Wright	...	....	45.4	98	Sept. 6	—30	Feb. 9	....	27 08	7.77	June....	.22	January..	17 7	95	189	77	99	SW
Dubuque	Dubuque	665	27	48.1	96	Sept. 5	—26	Feb. 9	27	28 28	5 75	May.....	.51	January..	19.0	98	140	141	84	NW
Eldon	Wapello	.....	..		101	Sept. 6	—24	Feb. 9	...	28.46	8.69	May....	.10	January..	22.7	...	....	....	....	.....
Elkader	Clayton	...	19	46.5	100	Sept. 5	—28	Feb. *9	21	29.50	5.92	June....	.44	January..	25 3	71	168	148	49	N
Estherville	Emmet	....	....	..	97	Sept. 6	—38	Feb. 9	..	...	....	.....	....	.....	..	..	....	..	....	.....
Fairfield	Jefferson	767	13	50.3	99	Sept. 5	—24	Feb. 9	15	25.18	6 43	May.....	.23	January..	14.0	..	....	..	....	.....
Fayette	Fayette	1,000	10	45.1	96	Aug. 18	—30	Feb. 9	10	33.48	6 69	May.....	.41	January..	34 8	..	....	....	..	.....
Forest City	Winnebago	1,220	...	44.9	97	Sept. 6	—33	Feb. 9	.	26.53	7.15	June....	.22	January..	33.5	93	170	67	128	W
Fort Madison	Lee	644	52	..	...	.....	.....	.....	52	42.06	12.24	May.....	.55	January..	20 0	..	...	...	...	.....
Galva	Ida	...	7	46.5	98	Sept. 6	—30	Feb. 9	....	23.35	7.45	June....	.10	Septemb'r		49	200	106	59	NW
Glenwood	Mills	979	30	50.2	100	Sept. 5	—25	Feb. 9	16	32.59	7.19	August..	T	January..	15.5	57	69	221	75	SE
Grand Meadow	Clayton	1,207	9	44.2	97	Sept. 5	—30	Feb. 9	9	33 93	6 43	June....	.62	January..	31.2	....	....	....	....	.....
Greene	Butler	943	..	46.5	98	July *22	—29	Feb. 8	..	23.45	6 85	May.....	.32	January..	44.5	78	115	156	94	W
Greenfield	Adair	...	9	....	...	.....	—29	Feb. 11	9	....	....	.....	..	.....	..	....	....	..	..	.....
Grinnell	Poweshiek	1,011	10	..	..	.....	—25	Feb. 9	10	....	....	.....	...	.....	..	....	....	....	..	.....
Grinnell (near)	Poweshiek	.....	....	..	98	Sept. 5	—26	Feb. 9	..	....	....	.....	....	.....	..	..	....	....	..	.....
Grundy Center	Grundy	966	9	45.5	99	Aug. *24	—29	Feb. 9	9	29.86	9.15	May.....	.21	January..	10 5	...	....	....	..	.....
Guthrie Center	Guthrie	1,269		47.4	98	Sept. 6	—26	Feb. 11	....	25.06	6.52	May.....	T	January..	22.7	...	....	....	..	.....
Hampton	Franklin	1,240	10	46.0	100	Aug. *23	—30	Feb. 9	10	32 72	8 40	May.....	.27	January..	33.7	91	113	190	62	NW
Harlan	Shelby	....	..	....	96	Sept. *5	—29	Feb. 11	....	....	....	.....	....	.....	..	..	....	....	..	.....
Hawkeye	Fayette	.....	..	..	..	.....	....	.....	7	37.18	7.02	June....	.80	January..	55.6	..	..	....	..	.....
Hopeville	Clarke	....	9	48.8	97	Sept. *5	—25	Feb. 9	9	28.06	5 89	May.....	.15	January..	.8	....	....	....	....	.....
Humboldt	Humboldt	1,082	..	46.6	97	Sept. 6	—31	Feb. 9	7	24.67	7.56	June.....	T	January..	14.1	90	233	56	76	SE
Independence	Buchanan	1,111	38	45.7	96	Sept. 5	—29	Feb. 9	33	23.41	5 80	May.....	.46	January	19 2	77	192	114	59	NW
Indianola	Warren	....	8	49.3	98	Aug. *3	—25	Feb. 11	8	32 88	6 58	May.....	.13	January..		..	....	....	....	.....
Iowa City	Johnson	671	10	49.0	101	Sept. 5	—26	Feb. 9	10	32 90	9 49	May.....	.59	January..	50.5	82	139	153	73	S
Iowa Falls	Hardin	.	7	45.7	98	Sept. 6	—28	Feb. 9	7	23 33	4 85	June....	.10	January..	25.0	....				
Keokuk	Lee	618	29	52 3	99	Sept. 6	—21	Feb. 9	29	40.97	11.47	May.....	.49	January..		117	157	117	91	SW
Keosauqua	Van Buren	..	8	51.5	100	Sept. 5	—22	Feb. 9	8	32.6	7.42	May.....	.08	January..	28.1	....	..	...	....	.....
Knoxville	Marion	....	7	49 7	98	Sept. 5	—23	Feb. 9	7	28.21	5.81	July.....	T	January..	15.0	..	....	..	...	.....
Lamoni	Decatur	....	....	49.7	96	Sept. *5	—24	Feb. 9	...	....	....	.....	....	.....	14 5	...	....	..	..	.....
Lansing	Allamakee	....	....	47.0	96	Aug. 10	—31	Feb. 10	.	32.33	6.01	June.....	.53	January..	49.4	72	131	127	107	.....
Larrabee	Cherokee	....	9	44.7	97	.....	—37	Feb. 9	10	23.49	5.72	June.....	.12	January..	35 6	....	....	....	..	.....
Le Mars	Plymouth	1,221	...	46 2	96	Sept. 6	—35	Feb. 9	..	27.90	6.26	June. ...	T	January..	24 0	67	193	102	70	S
Lenox	Taylor..	...	..	48.6	95	Sept. *5	—29	Feb. *9	..	29.18	8.66	July....	.24	January..	16.2	86	208	77	80	S
Logan	Harrison	928	25	47.3	97	Sept. 6	—27	Feb. 11	34	31 95	11.99	June.....	.10	January..	23.0	65	220	80	65	S
Maquoketa	Jackson	.	7	48.6	96	July *21	—26	Feb. 9	7	27.02	6.74	May.....	.24	January..	12 5	....	....	....	.	.....
Marshalltown	Marshall	898	8	...	100	Sept. 5	—28	Feb. 10	8	.....	....	.....	....	.....	....	....	..	..	....	.....
Mason City	Cerro Gordo	1,130	6	...	97	Sept. 6	—35	Feb. *9	6	....	....	.....	....	.....	....	....	..	..	....	.....
Monticello	Jones	800	46	47.6	98	Sept. 5	—25	Feb. 9	45	27.82	6.19	May.....	.37	March	18.3	66	222	68	75	NW
Mooar	Lee	.	..	50.7	100	Sept. 6	—21	Feb. 9	...	35 95	10.34	May....	T	January..	18.5	71	165	83	117	NW
Mt. Vernon	Linn	900	..		...	.....	—30	Feb. 9	..	....	....	.....	....	.....	..	....	..	..	....	.....
Mt. Vernon (Hubbard)	Linn	....		...	100	Sept. 5	—26	Feb 9	...	.....	.....	.....	....	.....	...	....	....	....	....	.....
Mt. Ayr	Ringgold	1,236	7	49.2	98	Sept. 5	—26	Feb. 9	7	30 03	7.55	May.....	.52	November	28.7	92	97	161	107	.....
Mt. Pleasant	Henry	725	....		101	Sept. 6	—22	Feb. 9	...	24.38	7.30	May....	03	January..	...	...	....	..	...	.....
New Hampton	Chickasaw	1,166	..	45.4	92	Aug. 10	—33	Feb. 9	....	25.95	4.37	May.....	.29	December	27.2	....	....	..	..	.....
Newton	Jasper	958	13	47.9	99	Sept. 5	—28	Feb. 9	13	27.26	6.61	May	.50	Septemb'r	27.0	83	147	164	54	SE
Northwood	Worth	1,210	....	44.2	95	Aug. 10	—34	Feb. 8	....	28 12	6 31	August..	0	January..	...	56	258	26	81	S
Odebolt	Sac		....	47.6	99	Aug. *9	—29	Feb. 9	....	22.50	5.48	May.....	.05	January..	15 3	66	228	62	75	.....
Ogden	Boone	1,109	..	47.4	97	Sept. *5	—2-	Feb. 11	..	30.43	7.80	May. ..	.11	January..	28.7	81	2.8	26	121	SE
Olin	Jones	....		47.4	96	Aug. *19	—26	Feb. 9		28.32	7.58	May.....	.39	January..	15.4	..	..	...	...	.....
Omaha, Neb.	Douglas.	...	29	50 2	99	Sept. 5	—26	Feb. 11	29	26.74	6.18	August..	07	January..	15.9	89	117	135	113	SE
Osage	Mitchell	1,178	9	45.9	94	Aug. 10	—32	Feb 9	9	31.56	8 01	June.....	.41	January..	46 0	100	62	112	191	S
Osceola	Clarke	1,123	....	48 8	99	Sept. *5	—32	Feb. 9	..	29.16	7 85	May. ..	.43	January..	18 9	....		....	....	.....
Oskaloosa	Mahaska	850	17	49 2	99	Sept. 5	—25	Feb. 9	23	23.75	5.58	May....	.44	February.	17.4	85	181	52	132	.....
Ottumwa	Wapello	630	6	50.9	102	Sept. *5	—23	Feb. 9	6	23 24	7 95	May.....	.25	January	10.9	70	147	110	108	NW
Ovid	Wayne	.	7	49.6	100	Sept. 5	—25	Feb. 9	7	33.46	7.03	May.....	.50	January..	24.5	104	159	52	154	NW
Pacific Junction	Mills	961	...	....	97	Sept. 5	—26	Feb. *11	...	.....	....	.....	....	.....	....	....	..	..	....	.....
Pella	Marion	....	....	45.8	91	Aug. *3	—25	Feb. 9	..	26.58	7.18	July.....	.32	January..	9 8	79	170	131	64	.....
Plover	Pocahontas	....	...	46.2	99	Sept. 6	—33	Feb. 9	....	21 79	5 55	May.....	.20	January..	17.0	....	....	...	....	.....
Primghar	O'Brien	....	....	45.7	98	Sept. 6	—38	Feb. 9	..	24.11	7.76	June.....	0	January..	7.0	....	....	..	....	.....
Red Oak	Montgomery	1,033	...	51.3	100	Sept. 5	—25	Feb. 11	....	32.91	6.13	May.....	.15	January..	....	....	....	....	....	.....
Ridgeway	Winneshiek	.....	...	46.3	95	Aug. 10	—32	Feb. 9	....	.....	.....	.....	....	.....	....	140	142	149	74	S

CLIMATOLOGICAL DATA FOR THE YEAR 1899—CONTINUED.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.						PRECIPITATION, IN INCHES.							SKY.			Prevailing direction of wind.
				Annual mean.	Highest.	Date.	Lowest.	Date.		Length of record, years.	Total for the year.	Greatest monthly.	Month.	Least monthly.	Month.	Total snowfall.	Number rainy days.	Number clear days.	Number partly cloudy days.	Number cloudy days.	
ockwell City	Calhoun	1,219	....	46.5	97	Sept. 6	—31	Feb. 9		...	23.94	5.41	June	.04	January	31.3	77	255	42	68	
thven	Palo Alto	...	...	44.7	97	Aug. *10	—38	Feb. 9		...	29.26	8.50	June	T	January	27.7	49	135	137	93	SW, NW
c City	Sac	900	21	...	96	Sept. 6	—29	Feb. 9		25	...	...	...	...	...	...	...	...	...	...	
eldon	O'Brien	1,406	....	....	98	Sept. 6	...	.....		....	.....	.....	.....	...	.....	....	...	...	...	...	
bley	Osceola	1,509	7	43.5	99	Sept. 6	—40	Feb. 9		7	28.21	7.39	June	.20	January	27.0	97	133	169	63	S
gourney	Keokuk	.....	...	49.4	103	Sept. 6	—27	Feb. 9		...	...	...	...	...	...	....	84	141	107	117	S
oux City	Woodbury	1,122	11	47.0	99	Sept. 6	—31	Feb. 11		11	22.67	6.18	May	.08	January	....	...	...	...	...	
irit Lake	Dickinson	.....	6	....	98	Sept. 6	—39	Feb. 9		6	....	.....	.....	...	.....	...	95	164	148	53	S
orm Lake	Buena Vista	.....	...	45 4	94	Sept. 6	—30	Feb. 9		11	26.03	7.98	June	.13	January	21.2	....	...	...	...	
uart	Guthrie	....	..	48.2	100	June 18	—27	Feb. 11		....	....	.....	.....	...	.....	20 6	....	....	....	....	
ara	Webster	1,159	...		100	Aug. *10	—31	Feb. 11		...	...	...	...	...	...	38.1	..	..	....	...	
hurman	Fremont	.....	....	50.0	96	June *19	—25	Feb. 12		....	41.16	10.45	August	.12	January	...	...	...	...	...	
oledo	Tama	.....	6	...	103	Sept. 5	—26	Feb. 9		6	...	...	...	...	...	27.1	63	189	117	59	S
illisca	Montgomery	1,058	7	49.1	100	Sept 5	—27	Feb. 11		7	29.99	6.45	May	.10	January	...	....	....	....	....	
inton	Benton	800	10	...	...	.....	—26	Feb. 9		10	.....	...	...	....	.....	15.3	..	..	....	....	
apello	Louisa	578	...	51.1	100	July *26	—22	Feb. 9		....	22.34	4.64	May	.09	January	15 5	....	....	....	....	
ashington	Washington	738	9	48.2	101	Sept. 5	—26	Feb. 9		10	22.49	5.27	May	.16	January	18.5	99	152	144	69	NW
aterloo	Black Hawk	862	21	46.8	97	Sept. 5	—27	Feb. 9		21	29.85	6 94	June	.27	January	36 1	90	117	136	112	NW
averly	Bremer	942	..	46.7	93	Aug. *10	—27	Feb. 9		....	29.18	6.51	June	.46	January	22.0	78	135	114	116	S
est Bend	Palo Alto		7	43 6	98	Sept. 6	—35	Feb. 9		7	22.91	4 92	June	T	January	5.0	59	174	99	92	W
est Branch	Cedar	708	..	47.9	98	Sept. 5	—23	Feb. 9		...	30 96	8.62	May	.11	January	18 5	..	...	....	..	
hitten	Hardin	.....	...	46.1	97	Sept. 6	—29	Feb. 9		...	.....	.....	.....	...	.....	8.0	....	..	....	....	
ilton Junction	Muscatine	672	....	..	98	Sept. 5	—24	Feb. 9		..	32 54	8 62	May	T	January	16.0	...	...	....	....	
interset	Madison	.....	9	48 4	100	Sept. 5	—25	Feb. 11		9	29 83	6.77	May	.26	January						
Average		.....	....	47.6	...	.....	....	.....		....	29 10	.....	.....	...	.....	23 2	80	160	116	89	S

*And other dates.

MONTHLY MAXIMUM TEMPERATURE FOR 1899 WITH DATES.

STATIONS.	JANUARY.		FEBRU'RY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMB'R.		OCTOBER.		NOVEMBER.		DECEMBER.	
	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.
Afton.....	49	*21	57	*19	65	10	...	..	87	27	97	18	95	12	96	23	98	*5	89	12	67	*15	49	8
Albia.....	66	4	56	20	65	10	82	28	87	16	92	21	92	*12	93	*3	97	*5	87	10	75	16	62	7
Algona....	42	20	50	19	38	*8	78	*20	84	26	91	19	94	21	94	*10	94	6	82	*22	60	5	50	23
Alta..	47	*21	54	19	45	8	84	25	85	26	92	18	90	*20	94	*10	98	6	88	12	66	15	52	23
Amana....	46	3	52	20	61	10	82	25	83	16	92	19	92	12	93	11	97	5	86	15	69	17	50	10
Ames.....	44	20	56	19	62	10	85	20	89	25	94	*18	92	*12	95	23	98	6	88	22	68	16	49	1
Atlantic..	49	21	61	19	66	10	85	25	86	26	96	19	94	*11	97	10	99	5	90	12	69	9	50	1
Audubon..	47	*21	56	19	62	10	82	25	83	27	89	19	91	23	92	24	95	6	88	12	65	9	55	2
Bancroft..	...	.....	....	....	43	11	81	25	84	26	87	*12	....		.....	.....	96	6	85	*12	67	15	53	24
Baxter....	....	....	....		.....	.....	.. ...	.....	82	*16	93	19	98	25	96	*3	101	5	88	*12	70	*5	50	*1
Bedford...	52	*20	61	19	68	10	85	*25	89	15	.....	....	96	*11	100	9	102	5	94	12	76	21	52	1
Belknap..	54	20	58	21	61	10	83	*25	83	27	89	*6	94	26	93	*3	100	6	90	12	72	16	75	22
Belle Pl'n	47	3	53	20	62	10	80	*13	84	16	92	19	94	12	.....	....	93	5	86	13	68	*16	50	8
Blockton .	.....	.....	...	.....	...	....	81	28	85	*15	93	*19	93	23	93	3	97	5	89	12	68	9	....	....
Bonap'rte	51	*3	58	20	66	10	83	28	84	16	90	18	98	26	98	3	103	5	92	13	74	16	53	8
Britt.....	43	21	48	20	40	*8	83	25	83	*25	94	18	93	23	96	10	97	6	85	*12	65	15	44	*8
Burling'tn	47	23	58	20	.....	.....	85	28	87	16	92	19	97	26	98	3	103	5	95	13	86	17	60	7
Carroll....	51	22	54	19	67	10	82	25	85	*26	94	18	93	10	96	10	97	6	92	12	67	9	56	21
Ced'r F'lls	44	15	52	20	48	10	83	25	..	....	.....	.....	..	..	..	..	99	5	.....	.....	69	6	.....	.....
Cedar Rap	49	3	52	16	64	10	84	28	85	* 2	95	19	98	*22	98	18	102	5	88	*13	72	17	52	8
Centerv'll	53	16	60	20	63	*10	83	28	84	*15	90	18	96	26	95	*2	100	6	91	12	70	*9	....	....
Chariton..	51	*16	58	20	64	10	82	28	84	16	89	*18	91	*11	94	3	98	5	89	12	73	16	53	7
Charles C	40	20	47	19	41	11	82	25	81	*16	90	19	93	21	95	10	90	2	84	*22	62	*5	46	8
Clarinda..	51	21	62	19	68	10	84	25	88	27	100	18	96	*28	100	23	101	5	93	12	75	5	53	1
ClearLake	44	16	48	19	58	9	84	25	86	26	88	19	98	*25	..	..	.....	..	..	..	.....	....	45	8
Clinton ...	47	3	57	16	63	*10	85	26	85	*16	92	*4	94	24	95	11	93	5	88	13	70	17	51	10
College S.	53	21	62	19	67	10	82	*25	89	24	98	19	95	21	99	3	97	5	91	12	70	9	50	1
Coon Rap.	.....	..	..	.....	62	10	80	*25	82	26	91	19	90	*10	93	*10	96	6	86	*12	64	16	49	23
Corning...	51	20	62	20	66	10	81	28	84	15	92	18	.....	.....	94	23	96	5	89	12	68	9	49	1
Co. Bluffs.	68	21	66	19	68	10	85	12	87	15	98	18	95	*10	96	23	101	5	93	12	70	17	54	*1
Cresco	37	20	46	21	41	11	82	25	83	25	89	19	90	21	93	19	90	2	83	23	63	17	43	8
Dav'n'port	48	3	53	16	64	10	82	28	83	16	91	19	94	26	95	3	99	5	86	13	70	17	52	11
Decorah ..	40	15	48	20	43	11	83	25	83	25	90	*4	93	*10	99	17	90	7	85	23	65	17	45	*8
Delaware.	.....	.....	52	20	50	11	80	25	86	12	89	19	91	26	94	18	95	5	85	*23	68	17	47	8
Denison...	48	22	53	20	64	10	84	25	84	26	94	19	95	10	94	*27	98	6	91	12	65	15	52	*1
Des M'nes.	51	20	58	19	65	10	82	28	84	15	90	19	91	11	95	23	99	5	91	12	70	16	52	1
De Soto...	52	20	57	*19	66	10	85	25	90	26	97	19	101	23	97	23	100	5	88	22	68	17	49	*1
Diagonal .	.....	.....	..	.....	.....	.....	.....	.....	86	16	93	19	92	1	94	23	96	*5	89	12	68	15	.. ..	.. ..
Dows.....	42	*20	52	19	52	11	81	*25	88	26	90	19	91	22	95	23	98	6	87	23	65	*5	48	8
Dubuque .	46	4	51	21	56	10	81	28	82	13	91	19	92	21	93	10	96	5	85	23	69	17	48	8
Eldon.....	.....	....	58	20	66	10	82	*12	86	*12	94	18	100	26	98	*3	104	6	93	13	75	16	56	3
Eldora....	45	20	55	19	56	10	83	28	87	27	94	19	.....	.....	.....	...	...	...	.....	.....	.....	.....	.....	.....
Elkader ..	48	*15	52	19	45	13	85	28	86	25	97	19	98	21	99	18	100	5	88	23	72	17	51	*7
Estherv'll	35	12	42	15	38	29	.....	.....	89	26	.....	.....	.....	.....	96	10	97	6	83	12	64	5	.....	.....
Fayette...	41	20	47	21	45	10	82	25	82	25	91	19	92	*21	96	18	95	5	84	*15	65	17	46	*8
Fairfield..	63	16	63	20	65	10	86	12	82	*15	88	18	93	26	95	3	99	5	.....	.....	72	16	52	10
Fonda. ...	....		58	16							95	*13	93	23	98	9	....	....	90	12	65	5	54	23
Forest C..	40	20	50	19	47	11	80	*25	81	*11	88	*18	91	23	96	10	97	6	85	*15	67	*7	51	8
Galva.....	49	21	56	20	57	10	83	28	86	26	92	18	93	23	94	*10	98	6	90	12	65	16	54	1
Garden G.	.....	.....	56	20	67	11	83	*25	.....	.....	.....	..	.....	.....	..	....	...	....	.....	.....	...	...	.....	.....
Glenwood.	57	21	63	19	70	10	87	12	87	15	94	18	93	25	96	*23	100	5	92	12	70	*9	55	1
G.Meadow	38	15	46	20	40	11	78	*25	78	12	86	19	88	21	90	10	97	5	82	23	60	6	46	8
Greene....	40	*13	50	20	42	11	85	25	84	*25	95	19	98	22	98	*10	95	6	86	*22	69	5	49	8
Greenfield	49	22	57	19	66	10	83	24	86	26	94	18	93	*9	.....	....	97	5	91	12	70	9	50	1
Grinnell ..	45	*3	50	19	60	10	80	28	81	16	....	....	.. ..	.....	.....		96	6	84	22	70	16	46	8
Grin'll (nr)	. .	....	50	19	61	10	82	28	84	16	89	19	90	*21	94	23	98	*5	87	*22	70	16	47	8
Grundy C.	45	20	53	19	58	10	84	28	83	*16	91	19	93	22	99	24	99	5	86	22	67	16	47	8
Guthrie C.	49	23	56	*20	55	9	83	28	82	*15	92	18	93	23	96	9	98	6	87	12	64	*16	....	....
Hampton .	42	20	50	*19	45	10	83	25	83	*26	92	19	95	22	100	23	100	6	88	22	70	5	51	8
Harlan....	.. ..	.....	57	19	65	10	83	25	85	*15	94	19	94	12	94	*9	96	*5	90	12	66	9	49	1
Hedrick...	45	*15	53	16	64	10	82	28	85	16	91	6	93	12	94	3	....	....	.....	.....	72	17	....	.....
Hopeville.	48	20	57	19	63	10	80	28	84	15	90	*18	90	*22	95	23	97	*5	88	12	70	9	50	1
Humboldt	44	20	54	19	55	10	84	25	86	*26	91	18	92	*12	96	10	97	6	89	12	64	*5	52	23
Indep'n'ce	... ..	.....	49	20	47	11	81	28	82	25	89	19	91	*21	94	19	96	5	86	22	66	17	47	7
Indianola.	47	15	56	19	64	10	82	28	83	*16	92	18	91	11	99	3	99	5	88	12	71	16	51	1
Iowa City.	48	*3	55	20	65	10	84	28	86	16	92	*6	93	*21	97	20	101	5	88	*15	68	16	53	*8
Iowa Falls	42	20	51	19	52	10	83	25	84	*26	93	19	95	*22	96	23	98	6	87	22	66	16	48	8
Keokuk ...	54	3	60	20	70	10	83	*28	86	16	90	6	95	26	96	4	99	6	90	13	72	16	56	10
Keosauq'a	53	3	60	20	65	10	82	*25	86	16	92	*18	97	26	97	3	100	*5	92	13	72	*9	54	8
Knoxv'lle.	57	14	56	16	63	10	82	*25	85	16	91	*18	91	*11	92	23	98	5	.....	.....	73	16	53	23
Lamoni ...	49	21	56	*19	65	10	80	*26	86	16	94	19	93	*1	93	23	96	*5	88	12	70	15	51	8
Lansing...	46	15	51	20	45	9	83	28	85	25	93	19	94	*21	96	10	93	2	86	*22	69	17	51	7
Larrabee .	47	*20	56	19	48	8	86	25	86	11	91	19	91	21	93	10	97	.....	88	12	67	19	56	8
Le Mars...	51	21	58	19	49	8	84	25	87	11	92	*18	91	*11	92	28	96	6	88	12	66	16	56	23
Lenox	47	*20	58	19	63	10	81	25	83	15	91	*18	91	1	92	23	95	*5	88	12	68	9	49	1
Logan	47	21	57	17	54	10	85	11	88	27	95	19	95	23	95	*24	97	6	88	*12	68	16	.....	.....
Maq'oketa	47	*16	53	21	60	11	83	*26	84	16	92	19	96	21	93	18	96	5	88	13	71	17	55	11
Marsh'lt'n	. ....	.....	54	19	62	10	82	28	83	*16	91	*5	95	22	96	28	100	*5	87	*12	70	16	48	8
Mason C..	45	21	50	19	42	11	82	*24	82	25	90	19	92	25	96	10	97	6	87	22	.....	.....	65	1
Monticello	47	20	53	20	57	10	82	25	84	12	92	19	93	*21	95	*11	98	5	88	12	72	18	62	10
Mooar....	50	*3	56	17	65	10	83	*28	85	*15	88	6	96	26	99	28	100	6	95	13	76	16	56	10
Mt. Ayr...	49	*20	58	19	64	10	82	25	85	*15	93	18	91	22	95	23	98	5	89	12	69	9	50	1
Mt. Pl'sant	53	4	....	.....	.....	.....	83	*27	88	16	95	13	97	26	97	*1	101	6	91	13	74	19	57	7
Mt. Vern'n	46	*3	54	20	66	10	84	13	86	25	91	13	94	*22	.....	...	99	5	86	*13	67	17	50	*8
Mt. Ver.(H)	.....	.....	54	20	61	10	82	28	87	12	97	19	95	22	96	11	100	5	87	*15	73	17	49	*1
N.Ham't'n	39	20	46	*20	42	11	83	25	80	*16	90	*19	91	21	92	10	89	4	84	22	63	*5	44	*7
Newton ...	48	20	52	19	62	10	81	28	84	*16	92	*18	93	22	93	23	99	5	87	22	70	16	47	8
N'rthwood	40	*13	50	19	40	11	82	25	83	27	89	19	93	21	96	10	92	4	83	*22	62	*5	54	22
Odebolt ...	49	21	58	19	61	10	84	25	88	26	98	19	97	11	99	2	99	6	90	12	69	9	52	23
Ogden	48	20	56	19	63	10	83	25	87	26	90	*12	92	24	95	23	97	*5	89	12	67	17	54	1
Olin.....	47	21	51	*17	59	10	81	28	83	16	89	*4	91	24	96	19	96	5	86	*12	70	17	49	8
Omaha, N.	58	21	62	19	68	10	84	12	87	15	96	18	92	10	95	10	99	5	92	12	70	9	54	23
Onawa....	.....	.....	.. ..	.....	63	10	85	28	86	*11	93	19	92	25	95	*10	102	6	91	13	69	16	52	1
Osage.....	.....		46	*19	44	11	80	25	81	*16	89	19	92	21	94	10	89	4	83	*22	62	5	45	8
Osceola ...	49	24	58	19	65	10	82	28	85	15	91	18	91	26	95	*9	99	*5	90	12	72	9	53	1
Oskaloosa	51	20	54	16	64	10	84	28	88	25	91	22	93	*22	95	3	99	5	88	15	74	16	50	*8
Ottumwa..	54	*15	57	*15	64	10	83	28	86	16	91	*18	96	26	98	3	102	*5	92	23	74	16	54	8
Ovid.....	51	*15	58	20	63	10	82	28	84	16	89	*18	93	26	95	2	100	5	90	12	73	9	54	*1
Pacific Jc.	.....	....	62	19	69	10	82	*12	85	15	93	18	92	*11	95	23	97	5	93	13	72	8	61	1
Parnell ...	56	4	55	20	50	24	....	....	....	.....	.....	.....	.....	....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pella.....	44	3	50	20	60	10	80	28	82	16	88	17	89	11	91	3	91	5	80	12	65	21	55	8
Plover	45	*13	54	19	48	8	85	25	87	26	93	12	96	12	93	19	99	6	90	12	70	6	54	*8
Primghar.	45	*11	52	*17	40	*5	85	*25	87	11	95	18	95	*10	97	11	98	6	88	12	78	16	66	24
Red Oak..	58	21	64	19	69	10	83	*12	87	15	95	18	95	26	98	3	100	5	93	12	75	17	64	8
Ridgeway.	42	15	51	21	43	9	84	25	85	11	92	19	93	22	95	10	90	4	88	23	68	5	46	7
Rock Rap.	44	27	60	16	.....	... ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

MONTHLY MAXIMUM TEMPERATURE FOR 1899 WITH DATES—CONTINUED.

ATIONS.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMB'R		OCTOBER.		NOVEMBER.		DECEMBER.	
	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.	Max.	Date.
ckwell..	47	20	57	21	60	10	84	25	83	27	92	18	93	23	96	*10	97	6	89	12	66	17	.....	.....
thven..	40	*20	52	19	39	11	81	*25	84	*12	90	20	94	*20	97	10	97	6	90	24	70	16	52	*22
City..	47	*14	57	19	57	10	.....	.....	.....	.....	.....	.....	91	*10	95	27	98	6	90	12	64	16	52	23
anton..	.....	..	.....	.....	.....	.....	82	25	84	26	94	18	93	*21	95	10	97	6	87	22	64	17	46	*8
eldon...	.....	.....	.....	.....	44	8	86	*25	87	11	91	18	92	20	93	10	98	6	.....	.....	65	16	57	23
ley	46	21	56	19	46	8	85	*25	87	11	91	18	93	*.0	96	28	99	6	87	12	65	*5	55	23
lney	53	21	63	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
ourney	51	20	55	16	66	10	85	28	88	16	97	*18	99	11	99	18	103	6	88	*12	74	17	53	*8
ux Cen	.....	.....	.....	.....	.....	.....	.....	.....	85	26	94	18	97	20	94	*9	96	6	79	*12	63	16	53	23
ux City	57	21	61	19	85	12	88	11	94	19	94	19	94	20	96	10	99	6	89	12	68	16	56	23
encer...	45	13	54	19	46	24	83	25	85	26	92	18	93	10	94	10	.....	.....	.....	.....	.....	.....	.....	.....
irit L'ke	43	*22	52	*17	.....	.....	88	25	87	11	96	18	95	11	96	27	98	6	87	13	65	5	54	23
rm L'ke	46	21	56	19	43	*10	79	*25	81	26	89	18	88	25	92	*10	94	6	86	12	64	15	52	23
uart.....	43	3	56	19	55	9	82	25	85	26	100	18	97	11	96	23	96	*4	83	15	65	*8	50	1
ra	45	22	58	19	52	8	85	*25	88	25	95	19	99	23	100	10	100	6	.....	.....	.....	.....	.....	.....
urman.	55	21	62	19	69	10	89	12	88	15	96	19	93	22	95	23	96	*5	92	12	68	16	51	1
ledo....	45	*3	51	21	60	10	83	28	85	*25	92	19	95	24	99	11	103	5	90	22	71	5	.....	.....
llisca...	50	*20	57	20	67	10	84	*14	86	27	94	18	96	23	98	23	100	5	90	12	70	9	60	9
nton ...	47	20	53	20	56	10	82	28	80	25	90	19	90	*21	94	11	.....	.....	.....	.....	70	17	48	*7
apello ..	58	20	64	17	63	11	85	25	87	12	93	17	100	26	100	3	100	5	88	13	74	10	63	21
ash'ton.	51	3	57	16	65	10	81	* 3	83	16	90	*18	93	*22	95	3	101	5	91	13	73	17	52	*3
aterloo..	47	20	53	20	50	10	83	28	84	25	91	19	94	22	95	11	97	5	87	23	68	17	50	7
averly..	43	20	51	20	47	11	83	25	83	16	89	19	91	22	93	*10	91	*2	86	22	66	17	46	7
ebster C.	45	20	55	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
est Bend	43	20	51	19	42	8	84	25	83	26	89	18	92	23	94	10	98	6	86	15	62	5	53	23
. Branch	47	4	52	*15	63	10	80	28	81	31	92	19	91	*24	94	*16	98	5	85	22	74	7	60	9
hitten ..	42	20	50	*19	58	10	84	25	83	*25	96	19	96	22	94	23	97	6	88	24	68	6	46	8
ilton Jc.	49	3	56	16	66	11	82	29	.....	.....	92	*6	94	12	94	*3	98	5	90	23	83	16	52	10
interset.	50	*20	57	19	64	10	83	28	86	*26	91	19	92	*10	96	23	100	5	90	12	69	9	.....	.....

* And other dates.

MONTHLY AND ANNUAL MEAN TEMPERATURES FOR 1899 WITH DEPARTURE FROM NORMAL.

STATIONS.	JAN.		FEB.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCT.		NOV.		DEC.		ANNUAL.	
	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.
Afton	22.5	....	14.1	....	28.2	....	.....	....	61.7	....	73.2	....	74.5	..	75.4	....	63.0	....	58.8	....	44.0	....	23.0	....	.....	.....
Albia	25.2	...	17 3	....	30.6	....	49.9	....	62.0	....	72 0	..	73.0	....	74.6	....	63.8	....	58.6	....	46.4		25.6	....	49 8	....
Algona	16.4	+2	7.2	-12	18 0	-13	47.8	0	59 0	+1	69.8	0	68.6	-5	74.6	+6	60.8	-3	54 7	+7	12.9	+14	20.4	0	45.0	0
Alta	16 9	+2	8.8	-10	19 0	-11	46.6	0	57.8	+2	69.0	0	71.4	-1	72.7	+3	61.8	-3	55 0	+6	43.8	+15	20.1	-2	45.2	0
Amana	20.3	+6	14.0	-7	27.0	-4	50.2	+2	61.4	+1	71.6	+2	73 9	0	73 9	+4	62.9	+1	57.0	+9	44 7	+13	24 0	+2	48.4	+2
Ames	20.1	+4	18 2	-4	25 0	-7	48.6	0	60 5	+1	70.7	+1	73.2	-2	74 2	+2	62.8	-1	57.2	+7	44.1	+12	21 1	-1	48 0	+1
Atlantic	22.1	+4	13 2	-10	26.4	-7	48.3	-1	60.1	+2	71.(	+1	72.4	-1	74.6	+4	62.0	-4	58.8	+7	43 0	+11	26 6	+2	48.0	+1
Audubon	20.6	+3	12 8	-8	24.6	-9	48 4	-2	59.3	-1	69 2	-1	72 2	-1	73.8	+2	62 6	1	58.4	+7	43.6	+12	23 8	0	47.3	0
Bancroft	.....	...	.....	....	18.4	....	46.6		58.2	....	69.0	....	.....	. .	.....	....	60.4	....	53 2	....	42.9	....	20.8	....	.....	...
Baxter	...	....	.....	....	.....	....	.....	....	60 5	....	71.0	....	74 2	....	74.6	....	63 1	....	58.4	....	44 0	....	21.0	....	.....	...
Bedford	21.8		14.8	....	28 3	....	49 8	....	62.8	..	.....	.	74.8	....	76 4	....	64 6	....	60.7	....	44 6	....	.....	....	.....	...
Belknap	24.4	....	15.9	....	29.(	..	50 2	....	63 2	....	72.6	...	74 0	....	75.6	....	65 0	....	59.9	....	47.8	....	27 0	....	50.4	...
Belle Plaine	19.6	+2	14.2	-8	26.7	-5	48.6	-1	58.8	+1	71.0	+1	73 0	(	.....	....	62.3	-2	56.2	+7	43.2	+11	23 4	-1	.....	...
Blockton	.....	.....	.....	..	.....	....	50.0	...	62 0	....	72 4	..	74 8	.	75 0	...	63 8	....	59 4	....	45.8	..	.....	...	.....	...
Bonaparte	25 0	+3	16.4	-9	30.4	-8	51.0	-1	62.4	0	72.2	-1	75 4	-1	76.1	+2	65.4	-4	59.4	+5	47 0	+11	26.6	-2	50 6	0
Britt	14.7	....	7.3	....	18.2	....	46.5	...	60.0	....	68 9	....	70.8	..	72.7	....	59.8	....	53.2	..	41.4	....	19 3	....	44.4	...
Burlington	24.6	....	16 4		.....	.	53.7	....	63.7	...	74.8	....	76 0		76.8	....	6 6	....	61.6	....	47.8	....	30.8	..	.....	...
Carroll	18.2	0	9 4	-12	22.4	-9	47.3	-2	58.3	0	69 7	0	71.4	-2	73.4	+3	61.8	-2	55 4	+6	42.6	+12	21.9	-1	46.0	-1
Cedar Falls	15 7	0	11.9	-8	22.6	-10	47 8	-2	.....	....	.....	....	.....	....	.....	....	62.8	-2	.....	..	44.0	+13	.....	..	.....	...
Cedar Rapids	21 4	+4	14.4	-8	26 8	-6	51 0	+7	63.4	+4	73.2	+2	76 0	+1	77.1	+5	66.0	+3	59.6	+10	47 2	+12	24 4	-1	50.0	+3
Centerville	25.9	+4	17 5	-5	31.8	-9	50.8	-2	62.2	0	72.9	+1	75 4	-1	76 2	+2	65.4	-4	59.8	+8	47.8	+11	.....	..	.....	...
Chariton	23.6	....	15.(	..	28.2	..	48.6	....	61.1	....	71.1	....	72.7	....	74.4	....	63 8	....	59.8	...	46 8	.	25.6	....	49.2	...
Charles City	15.8	+2	9.1	-9	20.5	-10	47.4	0	59.0	+2	69.4	0	71 6	-1	73.2	+3	60.8	-3	54 5	+5	42.0	+13	19.8	-1	45.3	0
Clarinda	23 6	+3	14 4	-11	28.6	-6	49.8	-2	62.2	0	73.4	+1	74 9	-1	77.0	+3	65.4	-3	60.2	+7	45.8	+10	24.3	-3	50.0	0
Clear Lake	12.6	....	8.8	...	23.8	....	47.8	....	59.4	....	69.8	...	.....	....	.....	....	.....	....	.....	..	.....	....	19.5	..	.....	...
Clinton	21 2	+2	15.(	-8	29.0	-8	51 8	+1	61.4	0	71.5	0	73 3	-1	73.9	+2	62 8	-3	56.2	+5	43.1	+9	24.2	-2	43 6	0
College Springs	25.0	+3	13.4	-13	28 3	-9	49.2	-2	63.4	0	73.4	+2	75 3	+1	76.1	+2	66 1	-3	60 0	+4	44.2	+7	25.2	-3	50.0	0
Coon Rapids	.....	....	.....	....	24.4	...	48.2	..	59.5	....	70 4	....	72 6	....	74 4	...	63.1	....	57 4		44.0	...	23.6	....	.....	...
Corning	24 3	+3	15.5	-9	28.0	-9	49.7	-1	60.9	0	71.2	+1	.....	....	75.2	+3	63.4	-3	58.2	+5	44.6	+9	22.6	-4	.....	...
Council Bluffs	25.4	....	15.0	....	27.6	....	50 8	....	62.9	...	73.4	..	75 2	...	76.8	...	65 8	....	59.2	.	46 2	....	24.9	....	50.3	...
Cresco	12.4	+2	6.0	-10	16 9	-9	45.8	+2	57.4	+1	67.4	+1	70.1	-1	71 0	+2	58.2	-2	52.2	+6	39 8	+11	16 8	-1	42.8	0
Davenport	24.0	+4	16.4	-9	29.0	-6	52 3	+2	62.5	+1	72.4	+1	75 2	0	75 6	+3	64.4	-1	59.2	+7	46.4	+9	25.8	-2	50.3	+1
Decorah	15.2	+3	7.6	-10	20.3	-12	47.8	-1	58 9	+1	68 3	0	70.7	+1	72.8	+3	59.4	-4	55.4	+7	40.0	+10	18.8	-2	44.6	0
Delaware	16 5	+3	11.8	-6	23.4	-8	47.0	0	59.3	+1	70 6	+2	71.9	0	72.5	+3	61.2	-1	55.5	+10	42 2	+12	20.4	-1	46.0	+1
Denison	17.3	-3	10.0	-12	22.3	-4	47.2	-2	59.3	-1	70.3	+1	72.6	0	73 6	+3	62 6	-2	55.8	+8	41.9	+10	21 6	0	46.2	-1
Des Moines	23.7	+6	15.6	-7	27.9	-7	49 8	-2	60.9	0	72.0	+1	73.5	-1	75 0	+3	64 0	-1	59.1	+8	45.8	+9	23.7	-2	49.2	+1
De Soto	23.2	....	14.8	....	27 4	....	49.4	....	61.3	...	73.6	....	74.9	....	75 7	...	63 6	...	57.6	..	44.4	....	22 8	....	49.1	...
Diagonal	.....	...	.....	....	.....		.....	..	61.0	....	71 3	....	72.0	....	73.8	...	63.0	....	56.2	....	42 5	....	.....	....	.....	...
Dows	16.6	....	9.8	....	20 4	....	47.5	....	58.4	....	69.1	....	71.2	....	72.8	....	59.6	....	55 8	....	42.7	....	20.6	....	45.4	...
Dubuque	20.3	+3	13 8	-9	25 8	-7	50 6	+2	60.8	+1	70 6	+1	74.0	0	74 4	+2	62.4	-2	56.8	+6	44.0	+10	23.4	-3	48.1	+1
Eagle Grove	14.2	....	8.3	....	21.0	....	44 8	....	58.5	....	69 0	....	71.9	....	71.0	....	54.4	...	.....	....	.....	....	.....	....	.....	...
Eldon	.....	....	14.6	....	31.2	.. .	51.8	....	63.9	...	74.0	....	75 8	...	77.0	....	65.5	...	60.2	...	47.3	....	26.7	....	.....	...
Eldora	17.2	....	10.4	....	21.4	....	47.4	. ..	59.6	..	70.1	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	...
Elkader	17 2	+4	10.7	-8	23.8	-7	49.1	+1	60.0	-1	70 6	+1	73.2	-1	73 9	+4	59.8	-2	55.4	+7	42.6	+12	22.0	0	46.5	0
Estherville	10.8		2.6	...	13.0	..	.....	....	57.1	....	.....	.	.....	..	71 4	...	58 9	..	51.5	..	35.0	..	.....	..	.....	...
Fairfield	23.2	+10	17.0	-6	30.0	-4	52 7	+4	61.9	+2	71.5	+2	73.4	-2	74.0	+1	64.1	0	59.9	+9	47.3	+12	26.0	+1	50.3	+2
Fayette	17.5	+2	9.2	-11	21.8	-9	47.2	0	58.7	+2	68.8	+1	71.2	-1	72 7	+4	60.0	-4	54.7	+7	40 5	+9	19 3	-4	45.1	0
Fonda	. ....	..	9 2	....	.....	...	.....	....	.....	...	71.8	...	72.4	...	75 1	...	....	....	53.7	....	39 2	....	18.4	...	.....	...
Forest City	15.3	....	8.2	....	18.6	..	46.4	...	57.9	....	68.4	....	71 3	...	73.6	..	61.4	..	55.4	....	43 4	..	19 1	.	44.9	...
Ft. Madison	27.2	+4	19.7	-8	32.2	-6	54.3	+2	64.4	+1	74.4	+1	75 5	-2	76.4	+2	63.6	-2	60.0	+7	47 2	+9	.....	.	.....	...
Galva	20.4	+5	11.2	-9	21 6	-12	47.2	-2	59 2	-1	69.2	0	71.6	-2	73.6	+4	66.7	+1	55.8	+7	40.8	+11	20.8	-1	46.5	0
Garden Grove	.	....	15.0	...	28.5	..	47.0	...	..	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	...
Glenwood	24.9	+7	15.4	-9	27.7	-5	50 9	+2	62.0	+2	72.0	+2	73 6	0	77 2	+5	66.0	+4	60.5	+11	46 4	+12	26.0	+1	50 2	+2
Grand Meadow	15.9	+1	9.2	-11	20.6	-10	47.1	0	57.6	0	67 4	0	69.9	0	71.2	+3	59.0	-4	53.8	+6	39 6	+10	19.6	-2	44 2	-1
Greene	15 8		11.0	..	23.0	..	48.5	..	59.7	..	70.7	....	73.4	.	75.2	....	61 6		56.2	...	43 6	..	20 4	.	46.5	...
Greenfield	23.0	+2	13.0	-10	26.3	-8	48 4	-3	60.0	0	71.2	0	73 2	-1	....	...	63.2	-3	58.6	+7	45.0	+11	22.4	-1	.....	...
Grinnell	20 1	+2	13.9	-9	26.0	-7	49.2	-2	60.6	+2	.....	..	...	....	..	...	62.8	0	57.9	+11	44 6	+11	23 4	-2	.....	...
Grinnell (near)	.....	..	13.6	..	26.0	..	49.0	....	60.4	....	70.1	...	73 0	..	73.8	...	62.7	..	58.0	...	43 2	....	22.6	....	.....	...
Grundy Center	17.8	+3	10.6	-9	23.6	-9	48.4	-1	58.4	0	69.2	-1	71.0	-1	73 0	+3	60.2	-4	53.8	+4	41.8	+11	19.3	-4	45.5	0
Guthrie Center	19.8		16.2	..	24.0	..	48.6		59.2	...	69.6	..	71.9		74.4		60.2		60.2		43.2		22 0	..	47 4	....
Hampton	15.8	+2	9 4	-9	20 9	-8	48.0	+1	58.9	+2	69 4	+1	72 7	+1	74 2	+5	62 1	0	56 6	+9	44.0	+14	20 6	0	46.0	+2
Harlan	....	..	11.9	..	25.4	..	48.8	..	60.4	.	71.2	..	72 6	....	74.2	...	63.0	..	57.2	...	43 0	.	22.4	...	.....	...
Hedrick	20.1	....	15.9	..	29 2	....	48.0	..	62.4	....	71.9		73.4	..	74.2		.....		.....		45.8		.....	...	.....	...
Hopeville	23.2	+3	14.2	-10	27 6	-7	48.8	-3	60.8	+1	70.8	+1	72.8	-1	74 6	+3	64.4	-3	59 0	+6	45.4	+11	23.5	-2	48.8	0
Humboldt	18.7		11.0		21 6	..	48.6	....	59.8	..	70.6	..	72 4	....	74 2		63.0		56 3	..	43.0	....	21.2	..	46.6	...
Independence	16.2	+1	11.1	-9	23 6	-7	48.0	+1	58 8	0	68 8	+2	71.1	0	72 3	+4	60.8	+1	55.6	+9	42.6	+11	20 0	-1	45.7	+1
Indianola	23.1	+4	15.5	-9	27.8	-9	50 0	-2	61 7	+2	71.8	+1	73 7	0	75.2	+2	64.3	-3	59.6	+5	46.6	+11	22.8	-3	49.3	0
Iowa City	22.0	+1	14 5	-11	28.6	-6	51.4	0	62.0	+2	72.0	+1	73 6	0	75.2	+4	62.1	-3	58.1	+7	45.0	+9	23.8	-3	49.0	0
Iowa Falls	16 9	+5	10 0	-7	22.4	-10	47.2	0	58.4	-1	69.8	+.	72.4	0	74.2	+5	60.6	-1	55.4	+7	42.1	+12	19 2	-2	45 7	+1
Keokuk	27.8	+5	19.6	-9	32.7	-5	53.3	+1	64.0	+1	74.0	+2	76 0	-1	77.0	+2	65.2	-2	61 0	+6	48.8	+10	28 4	-2	52.3	+1
Keosauqua	26 0	+4	17.8	-9	31.2	-8	51.6	-1	63 9	+2	73.8	+1	76.1	0	75 6	+2	65 8	-2	60.7	+6	48.2	+11	27.2	0	51 5	0
Knoxville	23.1	0	15 4	-9	28.9	-8	50.6	-2	61 6	-1	72.2	0	74.2	-2	75.2	+2	64.5	-3	60.0	+8	45 1	+9	25 2	-1	49.7	0
Lamoni	23.6	..	15.0	.	30.0		52.8	...	61.6	....	72.3	..	73.2	..	74.0	...	63 4	...	59.3	..	46 5	..	24 6	...	49.7	....
Lansing	18.5		12.2	...	23.7		50.2	...	60.3	....	69.5	..	73.2	..	71 9	...	61 9	..	57.0		44 2	..	21.8	....	47.0	....
Larrabee	17 5	+2	7 8	-12	18.8	-12	43.2	-2	57.2	-1	68.6	-1	71.8	0	72 4	+2	61 4	-3	52.8	+4	41.8	+12	20 0	-3	44 7	-1
Le Mars	20.2		9.6	...	20 8	.. .	48.4	...	59 0	....	69 7	....	71.6	....	73 4	..	62.5	...	51.7	...	42.4	...	22 2	....	46.2	....
Lenox	22.7	..	13.6	...	27 4	....	49.0	..	61.3	..	71.4	....	72.6		74 3	..	63.6	...	59.0	...	45 6	....	23.0	...	48 6	..
Logan	18.3	-2	11.8	-10	20.7	-13	50.2	-2	61.4	0	71.0	-1	73.6	-1	75 8	+4	64.0	-2	55 2	+3	42 4	+7	23.6	-4	47.3	-2
Maquoketa	21.9	+4	16.4	-9	31.8	-4	50.1	+2	60.4	-1	70.4	-1	72.3	-4	72.6	+1	61.6	-3	56 2	+3	44 5	+8	25.4	0	48.6	0
Marshalltown		...	16.6	-5	25.6	-6	49.1	0	59 4	0	70.4	+1	73.6	+2	75.4	+4	63.8	-1	58.4	+7	45.2	+12	22.6	-1	...	....
Mason City	13.6	-1	8.0	-9	18.7	-12	45.5	-4	56 9	-1	68.0	0	70.8	-1	71.0	+3	60.2	-3	52 6	+6	...	...	22.2	+2	.....	...
Monticello	19.7	+5	13.6	-7	26.4	-5	49.4	+1	60.1	+1	69.6	+1	72.9	0	72.4	+4	59 1	-3	56 6	+9	44.4	+11	24.6	+3	47.6	+2
Mooar	26.2	..	16.8	...	32 0	...	50.8	...	62.8	..	70.4	..	72 8	....	76.2	....	65 0	...	60 2	....	47.4	..	27.4	....	50.7	....
Mt. Vernon	20 3	....	12.9	..	26.6	....	51 2	....	61.4	....	72.3	...	75.0	...	.	...	60.3	...	58.0	..	44.9	....	22.7	.. .	.....	...
Mt. Vernon(Hubb'rd)	.....	....	13 0	..	27.2	....	51.5	..	61.8	....	72.8	...	75.2		75.4	..	64.0	...	59.0	....	45.6	....	.....	...	.....	...
Mt. Ayr	23.4	+1	13.9	-12	28.2	-8	49.0	-3	61.4	-1	71.5	+1	73 6	-1	75.2	+2	64.8	-3	60.1	+7	46.0	+11	23 6	-2	49.2	-1
Mt. Pleasant	25.8	....	.....	....	.	...	51 8	....	62.8	...	74.1	..	75.6	...	75 2	...	65.0	....	58.3	....	45.6	....	24.6	....	.....	...
New Hampton	15 8	....	8.6	....	20.8	...	48.6	....	58.4	...	69.3	...	71.2	....	72 5	.	61.9	.	55.8	...	43.3	....	18.8	....	45.4	
Newton	20 8	+5	13 2	-9	26.8	-7	48 6	0	60.8	+1	71.6	+1	73 6	-1	74.0	+2	62.9	0	57.4	+7	44.2	+11	21.2	-1	47.9	+1
Northwood	14.3	....	8.2	...	18.9	....	46.6	....	56.8	....	67.6	....	71.0	....	72 6	....	59 4	....	53.0	....	41.6	....	20.2	....	44.2	....
Odebolt	19.2	...	12.2	....	23 6	....	48 8	...	59.8	...	71 2	...	73.7	....	75.4	...	63.9	....	56.7	.. .	43.5	....	23.0	....	47.6	....
Ogden	20.5	....	13.0	...	24.4	....	48 2	....	59.6	....	70.0	....	72.0	...	74.1	....	63.1	...	58.8	....	43.4	...	21.8	..	47 4	....
Olin	19.5	....	14.1	...	26.5	..	49.4	..	59.9	...	70.6	....	72.4	....	74 5	....	61.4	....	55.4	....	42.2	....	22.4	...	47.4	...
Omaha, Neb	25.1	....	14.7	...	26.8	....	50.6	....	62.0	....	72.1	....	75 0	...	76.9	....	66.4	....	59.6	....	46.8	....	25.8	-1	50.2	+.6
Onawa	.....	....	.....	....	25.8	...	49.7	....	62.1	....	71.4	....	73 8	....	76.3	....	66.0	....	58.4	....	45.4	....	24.8	....	.....	....

ONTHLY AND ANNUAL MEAN TEMPERATURES FOR 1899 WITH DEPARTURE FROM NORMAL—CONTINUED.

STATIONS.	JAN.		FEB.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCT.		NOV.		DEC.		ANNUAL.	
	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.	Temperature.	Departure.
...age	11.8	0	8.4	-8	19.2	-9	46 8	†2	57 5	†2	67.8	†2	70.8	†1	71.2	†5	60.2	†1	53.2	†9	40.5	†14	19.2	0	43.9	†2
...iceola	21.0	.	12.9	..	27.8	....	48 8	....	60.6	....	71.3		73.0	.	75.2	.	64.8	...	59.6	...	46.8	.	23.6	...	48 8	....
...skaloosa	22.8	†5	14.9	-7	28.6	-5	50.3	0	62.1	†2	72.2	†2	73.6	-1	75 0	†4	63 4	-1	58 3	†7	45.1	†9	24.1	-2	49.2	†1
...ctumwa	25.3	†2	16.4	-9	30 4	-9	50.2	-4	62.2	-1	73.0	0	75.0	-1	76.2	†2	65.6	-2	60.5	†7	47.9	†12	27.8	0	50.9	0
...vid	23.2	0	15.7	-9	28.8	-8	49.3	-4	61.2	0	71.2	0	73 6	-1	75.8	†2	64 7	-3	60.2	†7	47.2	†11	24.8	-1	49 6	0
...acific Junction	... ..	..	13.2	..	26.7	....	49 2	..	61.0	....	70 8	....	72.4	..	75.0	.	64 2	...	58 8	...	44.4	....	24.4	..	.....	....
...ella	16.2	..	12.2	..	25.1	..	47 5	...	59.4	..	69 0	..	71.0	....	72 6	...	60.7	..	52.8	..	41.2	..	21.4	..	45 8	....
...lover	17 8	....	10.2	....	20.6	...	47.4		59.6	...	70.2	....	72 6	...	73.4	...	63 8	..	55.6	....	42.0	...	21.8	...	46.2	....
...rimghar	17.5	....	10.7	...	16.0	..	47.0	....	57.8	..	69.8	....	75.4	....	73 6	....	60.5	..	52.6	...	45 2	...	22 4	....	45.7	....
...ed Oak	24.8	...	16.1	....	29.5	....	51.6	...	63.2	....	74.0	....	75.4	..	77.0	...	67.0	....	60.9	..	48.8	...	27 8	....	51.3	..
...idgeway	16.6	..	11 1	..	22.7	.	48.6	....	58.8	..	69.1	...	72.7	..	72.7	....	60 8	..	55.6	..	44.6	....	22.3	....	46.3	....
...ockwell City	17.6	..	10.9	....	21.8	....	47 9	..	59.0	....	70 2	....	72.7	...	74.2	..	62.0	....	55.9	....	43.9	..	22.0	..	46.5	....
...uthven	16.4	...	7.2	..	16.3		46.1		58.9	..	66 0	....	72.8		73.4	.	62.4	..	55.4	....	43.0	..	18 4	..	44 7	....
...ac City	18.4	-1	11.8	-8	20.8	-10		..	.....	....	.....	..	72.1	-4	73 4	†1	62.6	-1	55.8	†5	43 6	†11	21.9	-1	.....	....
...cranton	.....	....	.....	....	.....	..	49.0	....	59.4	..	71.4	..	73 6	.	74.6	...	62 2	....	57.6	..	44 3	....	22.8	..	.....	....
...heldon	.....	....	..		18.0	...	47.4	...	56 6	...	66.2	..	70.3	...	71.6		59.2	.	.....		42.2		19.0	..	.....	....
...ibley	16.6	†4	5.9	-12	17.1	-13	45.9	-2	56 1	-2	66.9	0	69.8	0	71.8	†4	59.5	-2	52.8	†5	40.8	†13	19 2	0	43.5	0
...igourney	22.0	...	14.3		26 1	..	49.6	..	62.1	...	73.8	..	75 1	...	75.2	..	61.0	....	58.9	..	47.(	..	27.8	....	49.4	....
...ioux Center	.....	.	.....	....	.....	..	.....	...	58.2	..	70.4	..	75 9	.	73.6	..	62 2	.	53.1		42 2		20.4	...	.....	....
...ioux City	21 1	†3	10.9	-10	22.0	-9	49 4	-2	59.4	0	70.4	0	73.5	0	74 2	†3	62.6	-2	54.2	†4	43.4	†11	23 0	-3	47.0	0
...pencer	15.2	.	6.8	...	17.7	..	45.1		58.1	....	68.7	..	70 6	....	73.2	.	.....	..	....	.	.....		.....	...	.....	....
...pirit Lake	15 0	†1	5 2	-14	.....	..	47 3	-2	58.4	-1	68.4	-1	70.9	-3	73.4	†1	62.2	-3	54.6	†7	41.8	†15	21.4	0	.....	....
...torm Lake	19 0	..	9.6	..	18.8	..	45 6	..	57.4	...	68.6	..	71.1	...	73.4	...	62.4	.	55.0	..	42.6	....	21 6	..	45.4	....
...tuart	21.1	...	13.6	..	23.8	..	48.4	....	60 4	....	73 2	..	75 9	.	76 2	..	64.1	..	57.2	....	43.4	..	21 7	....	48.2	....
...ara	19.0	....	12.4	....	21.4	..	53.6	..	64.9	....	.....	....	.....	....	.....	....	.....	....	.....	..		..	.....	..	.....	....
...hurman	24.6	....	15 8	....	28.6	..	51 5	..	62.8	..	73.0	....	73 7	..	76.1		64 6	..	59 0	...	45.2		24.8	.	50 0	....
...oledo	20.0	†2	13.1	-9	26.0	-9	48.6	-2	60.0	-2	71.6	†2	73.2	-1	74.6	†4	64.6	0	58.3	†9	45 6	†13	.....	..	.....	....
...illisca	21.6	†1	15 2	-9	29.6	-9	49 0	-3	61.8	†1	72.6	†2	74.1	0	75 8	†5	63.2	-2	58.8	†8	43.8	†10	23.2	-1	49 1	0
...inton	20.2	†3	13.4	-9	25 9	-6	49 2	0	60 3	†1	70.4	0	72.9	0	74 8	†5	.....	....	..	.	43 3	†10	23.1	-2	.....	....
...apello	26.6	..	16 9		30.8	....	52.4	..	63 8	..	72 8	.	75.0	..	75.4	.	63.9	...	58.8		49.0		28.1	..	51.1	..
...ashington	21 6	0	14.6	-10	27.4	-8	49.8	-2	60 7	0	70.6	†3	71 6	-4	74.1	†1	61.4	-6	57.8	†6	45.0	†9	24.0	-2	48.2	-2
...aterloo	18.2	†1	12 0	-10	23.4	-10	48.3	-2	59.8	-4	70.4	-3	72.8	-5	73.6	0	61.6	-4	56.2	†4	43 4	†8	21.6	-1	46.8	-2
...averly	18.6	...	11.6	...	23.6	...	49.6	....	60.2	..	70 2	...	72 3	..	73.8	....	60.6	....	56 4	...	43.2	...	20.7		46.7	..
...est Bend	15.9	0	7.4	-13	18.1	-12	46.1	0	56.4	-2	65.6	-2	71.5	-0	71 4	†2	58.9	-3	52.(	†6	40.8	†13	19.7	†2	43 6	0
...est Branch	20.8	...	14.2	....	23.1		47.3	....	60.6	..	69.4	....	72 0	..	75.8	..	61.6	....	57 5	..	46.(	..	25.8	..	47.9	...
...hitten	17.9	.	9 7	....	23.6		47.2		60.8	....	69.3	...	72.8	....	73.7	....	62.8	....	55.3	..	40.7	..	19 5	..	46 1	...
...ilton Junction	22.4	.	15 2	...	30.1	....	51.2	...	.....		72.6		74.4	....	74.4	....	63.3	...	56 8	....	44.5		24.9	..	.....	....
...interset	22.3	†2	15.0	-9	27 4	-6	48.2	-3	60 8	†1	71.8	†2	73.2	0	75.0	†4	63.0	-3	55 8	†4	45.4	†11	23 0	-3	48.4	0

MONTHLY MINIMUM TEMPERATURES FOR 1899, WITH DATES.

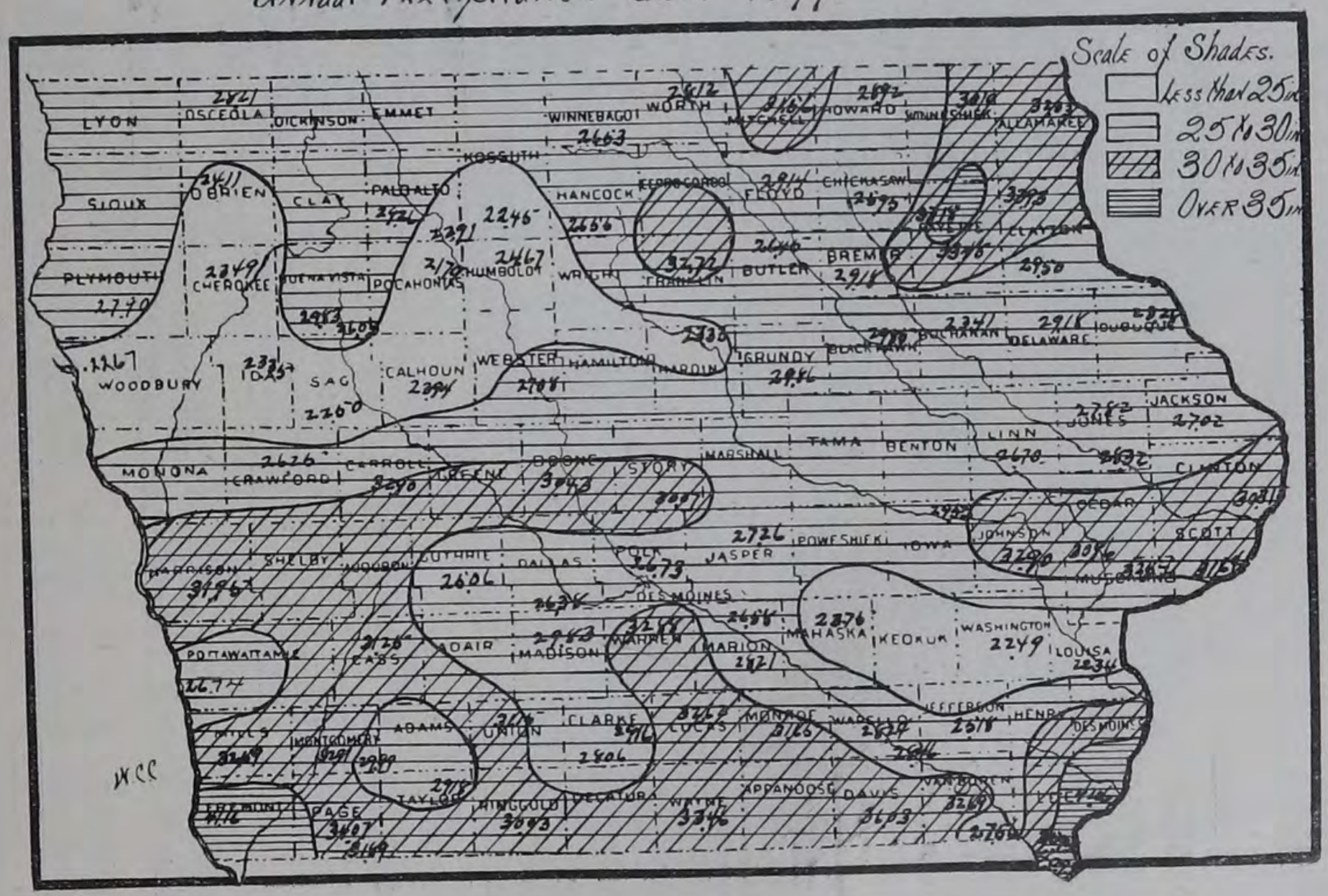
STATIONS.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST		SEPTEMB'R		OCTOBER.		NOVEMBER.		DECEMBER.	
	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date
Afton	—16	30	—26	11	—1	6	14	†1	36	13	51	17	52	†9	54	4	24	29	23	29	18	3	—4	†30
Albia	—16	†29	—25	9	—5	7	8	1	37	13	48	16	47	30	52	†15	22	29	27	29	18	3	—9	31
Algona	—27	30	—36	†9	—11	6	13	1	41	†4	58	9	55	30	58	24	24	29	32	†26	22	26	—10	†30
Alta	—22	30	—33	9	—9	6	11	1	32	4	50	9	48	29	53	†24	20	29	28	28	16	2	—12	31
Amana	—17	30	—25	9	—8	7	12	2	37	4	47	16	48	30	51	25	18	30	29	†17	19	3	—5	31
Ames	—18	30	—27	†9	—7	6	16	†1	36	13	49	16	51	30	51	25	22	30	23	29	18	3	—8	†15
Atlantic	—16	30	—26	11	—1	6	4	4	30	4	46	†10	48	†11	48	25	17	29	26	29	11	3	—3	31
Audubon	—17	30	—28	11	—3	6	12	1	37	†4	46	10	50	30	55	24	24	29	30	29	17	†3	—4	31
Bancroft	.....	....	.....	..	—11	†6	11	1	32	13	51	1	...	...	....	..	19	29	22	29	12	2	—9	30
Baxter	....	..	..	..	..	..	...	...	35	13	48	16	50	30	52	25	22	29	28	31	16	2	—9	30
Bedford	—18	29	—25	9	0	†6	1	4	38	18	....	....	48	30	50	†25	22	29	25	29	15	27	.....	...
Belknap	—14	29	—23	9	—1	7	13	1	42	†4	54	†16	52	30	55	†15	27	29	31	29	22	3	—5	31
Belle Plaine	—19	30	—32	11	—7	7	13	1	38	13	48	17	48	30	..	..	23	30	25	30	15	3	—9	31
Blockton	....	...	.....	....	.....		11	4	41	†13	47	30	52	9	51	25	28	30	28	29	18	†3	.....	...
Bonaparte	—15	29	—21	9	—2	7	10	1	40	4	51	†10	51	9	55	†15	26	†29	29	†29	22	4	—4	31
Britt	—23	30	—33	9	—10	6	10	1	28	13	47	8	43	30	50	15	20	29	21	29	15	4	—9	†30
Burlington	—20	30	—24	9	.....		17	4	41	†4	53	11	48	30	53	17	23	30	30	31	...	....	—4	31
Carroll	—22	30	—31	†9	—7	6	12	†1	32	13	49	†1	45	30	51	†15	19	29	25	28	12	3	—10	31
Cedar Falls	—19	30	—27	9	—9	7	15	†1	....	....	...	..	....	....	....	....	19	30	...	....	19	3	.....	...
Cedar Rapids	—17	30	—25	9	—5	7	15	2	41	†13	50	16	50	30	54	25	22	30	31	29	20	3	—4	†30
Centerville	—16	29	—23	9	—2	7	9	1	40	14	54	10	54	30	56	25	25	29	30	29	20	3	.....	...
Charlton	—16	29	—24	9	—3	7	10	1	38	13	52	10	43	30	53	25	24	29	27	29	18	3	—6	†20
Charles City	—23	30	—31	†9	—16	7	14	1	32	13	47	16	39	30	48	15	19	30	24	29	17	4	—11	15
Clarinda	—17	†29	—24	†9	1	6	7	4	36	4	48	30	51	30	51	25	26	29	29	29	15	3	—1	15
Clear Lake	—22	30	—32	9	—10	†6	10	1	32	3	52	†8	....	....	..	...	...	...	..	....	....	....	—10	30
Clinton	—17	29	—28	9	—3	7	14	2	39	†4	45	16	46	30	52	†16	19	30	27	†30	19	4	—4	30
College Springs	—17	29	—27	12	0	6	11	1	41	4	52	15	54	8	57	25	24	29	32	†17	15	3	—1	30
Coon Rapids	.....	.	..	..	—4	6	14	4	36	13	53	15	50	30	54	25	23	†29	29	29	18	3	—9	31
Corning	—15	30	—25	11	0	6	9	4	37	†4	48	30	...	....	52	25	24	29	28	29	14	3	—5	15
Council Bluffs	—13	30	—24	11	1	6	14	4	41	1	53	15	54	3	59	24	26	29	30	†26	19	3	0	30
Cresco	—25	30	—33	†9	—16	7	7	2	31	13	43	16	41	30	48	15	21	30	25	29	18	26	—15	30
Davenport	—14	29	—23	9	—2	7	17	2	42	13	52	16	54	30	55	14	28	30	34	29	28	4	—3	30
Decorah	—24	30	—34	10	—15	7	12	†1	34	4	42	16	42	30	44	15	18	30	23	26	13	3	—13	29
Delaware	—20	†29	—28	9	—11	7	14	2	36	13	46	16	47	30	49	15	16	30	26	29	17	3	—11	30
Denison	—19	30	—31	11	—5	†8	11	4	34	†4	48	16	43	30	53	24	18	29	28	5	13	3	—9	31
Des Moines	—16	30	—24	11	—1	6	13	4	41	4	54	10	52	3	56	25	29	30	27	29	20	3	—5	31
De Soto	—17	30	—25	11	0	†8	10	4	36	4	49	10	50	30	47	25	22	30	24	29	17	3	—5	15
Diagonal	....	.	..	..	...	...	....	...	35	4	47	29	48	30	51	†25	24	29	25	29	13	26	.....	...
Dows	—22	30	—30	9	—10	6	13	1	29	13	49	8	47	30	48	†25	19	29	18	29	13	3	—11	29
Dubuque	—18	29	—26	9	—4	7	17	2	42	13	49	16	51	30	53	15	24	30	33	29	23	25	—5	30
Eldon	—14	†29	—24	9	—1	7	9	1	37	4	50	16	52	†9	54	14	22	30	27	17	12	4	—6	31
Eldora	—22	30	—30	9	—10	7	12	1	28	13	....	9	...	....	..	....	...	...	...	....	...	.....	.....	...
Elkader	—22	31	—28	†9	—13	7	14	2	35	†4	5	16	42	30	43	15	17	30	27	29	15	†3	—10	30
Estherville	—27	30	—38	9	—14	6	....	....	28	13	....	..	...	...	48	13	18	30	25	20	11	3	.....	...
Fairfield	—15	29	—24	9	—3	7	12	1	41	†4	52	†16	54	30	55	15	27	30	...	....	24	4	—4	31
Fayette	—22	30	—30	9	—15	7	11	2	33	13	43	16	41	30	44	15	15	30	25	29	13	3	—11	30
Fonda	....	..	—30	†8	....	....	.	...	32	3	54	†8	46	30	53	†15	....	...	27	27	16	†1	—14	30
Forest City	—23	30	—33	9	—11	6	10	2	31	13	51	†9	47	30	52	15	22	29	22	29	18	2	—9	31
Galva	—19	30	—30	†9	—5	6	12	†1	32	12	48	1	49	8	51	25	20	29	27	27	14	3	—9	†30
Garden Grove	—17	29	—26	9	—4	7	4	1	...	....	..	....	.	....	....	....	...	....	....	..	..	....	....	...
Glenwood	—15	30	—25	†9	0	6	10	4	36	4	52	†10	52	30	50	25	22	29	32	5	14	3	—1	30
Grand Meadow	—22	30	—30	9	—10	6	15	2	38	13	54	2	54	30	52	15	26	30	30	29	20	3	—10	30
Greene	—20	30	—29	9	—15	7	12	2	31	13	47	16	40	30	48	15	19	30	24	29	16	3	—11	30
Greenfield	—19	30	—27	11	—5	7	12	4	34	13	51	15	52	7	...	...	22	29	31	†27	15	3	—6	†30
Grinnell	—17	30	—25	9	—3	6	15	†1	38	13	..	..	...	..	..	...	25	29	31	29	18	3	—5	31
Grinnell (near)	.....	....	—26	9	—5	7	13	2	37	13	50	16	54	30	54	†14	24	29	30	†28	18	4	—8	31
Grundy Center	—21	30	—29	9	—9	7	17	†2	33	13	47	16	43	30	48	25	20	30	24	29	18	†4	—11	31
Guthrie Center	—17	30	—26	11	—2	†6	12	4	34	13	51	2	41	30	52	14	19	30	27	30	20	2	—4	30
Hampton	—21	30	—30	9	—8	6	15	†1	33	13	50	†10	49	30	41	25	24	†29	17	29	20	3	—8	31
Harlan	.....	..	—29	11	—3	6	11	4	34	4	47	10	50	30	51	25	20	29	29	†17	12	3	—5	31
Hedrick	—14	30	—23	9	—3	7	10	1	39	13	46	15	50	30	52	25	...	....	..	..	19	3	.....	...
Hopeville	—15	30	—25	†9	—1	7	11	1	40	13	51	†9	51	30	55	25	27	29	32	29	18	3	—4	†30
Humboldt	—21	30	—31	9	—7	†6	8	4	34	13	49	1	46	30	53	15	21	29	23	29	14	3	—10	31
Independence	—21	30	—29	9	—12	7	13	2	35	13	47	16	46	30	50	15	18	30	23	29	16	3	—8	†30
Indianola	—17	30	—25	11	—2	7	14	4	38	13	53	10	52	30	55	25	23	29	27	29	22	†3	—16	30
Iowa City	—18	29	—26	9	—3	6	13	2	38	4	48	16	48	30	53	†14	20	30	28	31	20	†2	—5	31
Iowa Falls	—21	30	—28	9	—8	7	14	2	32	13	48	†8	41	30	48	25	19	30	23	29	17	†3	—9	15
Keokuk	—11	29	—21	9	0	7	14	1	43	†20	55	16	56	30	53	†14	30	29	34	29	28	4	—2	31
Keosauqua	—13	29	—22	9	0	7	10	1	41	4	52	†10	54	30	49	8	24	30	29	31	24	4	—3	31
Knoxville	—15	30	—23	9	0	†8	15	1	39	13	53	†16	52	30	50	13	25	29	..	20	3	—5	†30
Lamoni	—16	29	—24	†9	0	7	27	7	37	4	50	10	50	30	53	25	24	29	27	5	20	†3	—5	31
Lansing	—22	31	—31	10	—14	7	14	2	36	4	45	16	43	30	47	15	22	30	27	30	17	3	—12	30
Larrabee	—23	30	—37	9	—11	22	6	4	27	13	46	9	48	†29	48	24	16	....	25	27	13	2	—15	30
Le Mars	—20	30	—35	9	—7	6	12	†1	29	13	46	9	49	8	50	24	25	29	27	28	11	3	—9	31
Lenox	—18	30	—29	†9	—2	†8	10	4	39	13	53	†10	55	†8	55	25	25	29	32	29	17	3	—5	†30
Logan	—15	30	—27	11	—3	6	14	1	40	†3	45	10	47	†17	55	15	19	29	27	28	10	26	—5	31
Maquoketa	—16	†29	—26	9	—3	6	16	†1	38	4	42	17	45	30	49	17	17	30	24	31	19	†4	—5	†29
Marshalltown	....	..	—28	10	—4	†6	15	2	33	7	47	1	46	30	51	25	22	30	23	29	17	3	—9	31
Mason City	—34	31	—35	†9	—15	7	11	2	32	13	46	16	38	30	45	†16	15	30	19	29	...	...	—10	†30
Monticello	—18	30	—25	9	—9	7	14	3	36	3	45	16	48	31	50	15	16	30	25	29	15	5	—10	31
Mooar	—14	29	—21	†9	—1	7	9	1	41	11	46	†9	50	†1	55	16	25	30	29	30	24	27	—2	31
Mt. Vernon	—20	†29	—30	9	—8	7	14	1	40	13	50	16	60	†8	....		32	30	30	29	21	3	—9	30
Mt. Vernon (Hubbard)	....		—26	9	—8	7	15	1	38	13	49	16	50	30	51	15	27	30	28	29	20	3	—6	†30
Mt. Ayr	—16	29	—26	†9	—1	7	7	1	40	13	53	17	55	†8	56	25	24	29	32	†17	19	3	—4	†30
Mt. Pleasant	—15	29	—22	9	—1	7	12	2	36	4	48	†16	50	9	50	†14	25	29	27	29	23	27	—7	31
New Hampton	—23	30	—33	9	—13	7	13	1	30	13	46	16	46	30	48	25	22	30	25	29	20	3	—12	30
Newton	—20	30	—28	9	—3	†6	15	1	37	13	50	16	50	30	52	25	22	29	26	29	18	3	—10	31
Northwood	—23	30	—34	8	—10	6	9	2	30	4	47	16	43	30	52	2	20	30	24	29	21	26	—8	30
Odebolt	—19	30	—29	9	—4	7	13	1	29	13	49	†1	48	8	51	†24	20	29	27	27	13	3	—9	†30
Ogden	—19	30	—28	11	—5	7	12	4	31	14	51	15	51	30	53	25	22	29	26	29	13	3	—14	31
Olin	—17	†29	—26	9	—7	7	11	1	39	13	47	16	46	30	50	17	17	30	25	31	19	4	—6	30
Omaha, Neb	—15	30	—26	11	—2	6	17	1	44	14	56	9	58	8	60	25	33	29	35	28	21	2	0	30
Onawa	.....	....	.....	....	—5	6	14	†1	34	†4	50	1	53	8	53	25	23	29	28	28	13	3	—5	†30
Osage	—26	29	—32	9	—10	7	11	1	32	13	47	16	42	30	47	15	20	30	22	29	17	3	—11	30
Osceola	—15	30	—32	9	—1	†7	12	1	37	13	52	30	52	30	52	25	23	29	30	29	24	2	—5	†30
Oskaloosa	—15	30	—25	9	—2	7	12	†1	38	†4	51	†10	47	30	52	25	23	29	23	29	17	3	—5	†30
Ottumwa	—12	†29	—23	9	1	7	12	1	40	5	52	†10	52	30	55	25	26	†29	....	21	3	—3	31
Ovid	—16	29	—25	9	—2	7	8	1	38	13	52	10	50	30	52	25	23	29	28	29	16	3	—8	31
Pacific Junction		....	—26	†11	.....	....	10	4	34	4	49	10	50	30	50	25	20	29	29	28	13	3	—3	30
Parnell	—16	30	—25	9	—7	6	..	....	....	...	..	....	...	...	..	...	....	....	...	.....	.....	....	.....	...
Pella	—17	†27	—25	9	—6	7	14	4	39	13	51	†18	49	30	52	24	25	†29	25	31	18	†3	— 0	29
Plover	—21	30	—33	9	—8	6	6	4	31	†4	48	9	45	30	50	†14	19	29	26	29	11	2	—13	31

MONTHLY MINIMUM TEMPERATURES FOR 1899, WITH DATES—CONTINUED.

STATIONS.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST		SEPTEMB'R		OCTOBER.		NOVEMBER.		DECEMBER	
	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.	Min.	Date.
mghar.	—24	30	—38	9	—10	6	10	1	30	13	45	8	47	29	49	23	17	29	30	3	8	2	—17	31
d Oak	—13	30	—25	11	1	6	9	4	40	4	51	9	54	8	54	25	26	29	34	27	18	3	2	30
lgeway	—25	30	—32	9	—9	†6	12	2	34	13	48	16	50	30	52	15	26	30	28	29	21	3	—10	30
ck Rapids	—25	30	—40	9																				
ckwell City	—20	30	—31	†9	—6	6	10	4	31	13	51	15	52	8	51	15	20	29	29	28	15	3		
thven	—24	30	—38	9	—12	6	8	2	28	13	42	†2	46	†2	50	15	17	29	27	27	16	3	—19	31
c City	—19	30	—29	†9	—6	6							51	8	51	25	21	29	29	27	16	3	—11	31
ranton							15	†1	35	13	53	†11	54	†7	54	15	24	29	31	†28	18	2	—7	31
eldon					—11	23	7	3	28	13	45	†1	45	†29	46	24	15	29	27	†5	16	3	—13	31
oley	—24	30	—40	9	—13	23	10	†1	28	13	45	†9	45	†30	46	24	15	29	24	28	12	3	—18	26
iney	—16	30	—28	11																				
gourney	—18	30	—27	9	—7	7	9	1	36	4	45	16	45	30	49	†14	21	†29	28	29	20	3	—7	31
oux Center									31	13	49	9	51	29	54	24	23	29	29	28	11	2	—10	31
oux City	—19	30	—31	11	—6	6	15	1	34	13	50	9	54	†8	54	24	2›	29	30	28	14	3	—5	30
encer	—24	30	—36	9	—12	6	5	4	27	13	45	2	45	30	50	15								
irit Lake	—25	30	—39	9			11	†1	30	13	48	9	49	31	53	†12	21	29	28	27	18	†2	—12	31
orm Lake	—21	30	—30	9	—8	6	6	4	31	13	51	9	51	8	51	24	22	29	30	†27	17	2	—11	†30
uart	—18	30	—27	11	—5	6	10	1	32	14	50	29	54	31	54	25	24	29	31	†21	20	2	—8	31
ra	—23	30	—31	11	—5	†5	17	1	45	17														
urman	—14	29	—25	12	1	7	13	4	39	5	50	10	51	25	52	25	23	29	31	†5	15	†3	1	†15
ledo	—18	30	—26	9	—10	7	13	2	35	4	47	16	43	30	47	26	17	30	2	29	16	3		
llisca	—15	†29	—27	11	0	6	4	4	35	4	49	30	52	31	50	25	25	29	29	29	17	3	—4	15
nton	—16	29	—26	9	—7	7	18	1	43	13	55	16	53	30	56	25					16	3	—6	31
apello	—14	29	—22	9	—3	7	11	1	41	18	52	† 6	50	30	55	14	23	30	29	†29	21	4	—3	31
ashington	—16	29	—26	9	—6	7	7	1	38	†4	47	16	48	30	50	14	24	30	29	†29	18	4	—8	31
aterloo	—19	30	—27	9	—9	11	15	2	36	13	47	16	45	30	50	15	19	30	24	29	16	3	—9	31
averly	—19	30	—27	9	—13	7	17	1	37	13	50	16	45	30	53	†25	22	30	27	29	19	†3	—8	†30
ebster City	—19	30	—27	11																			—8	†30
est Bend	—22	30	—35	9	—9	6	10	4	40	13	56	7	55	29	50	15	20	29	25	29	13	2	—5	31
est Branch	— 4	†29	—23	9	—4	8	14	1	36	4	42	1	45	30	55	†8	17	30	28	1	22	16	—12	31
hitten	—19	30	—29	9	—4	6	18	1	40	†2	57	16	56	31	53	15	30	30	32	29	22	3	- 5	31
ilton Junction	—17	29	—24	9	—5	7	14	1			45	16	46	30	52	14	13	30	26	31	22	6		
interset	—15	30	—25	11	—1	7	13	4	36	13	50	36	51	30	52	25	24	29	28	29	18	3		

†And other dates.

Annual Precipitation Chart 1899.



MONTHLY AND ANNUAL PRECIPITATION FOR 1899, WITH DEPARTURES FROM NORMAL.

STATIONS.	JAN.		FEB.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCT.		NOV.		DEC.		ANNUAL.	
	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.
Afton	.40	....	.50	.....	1 25	....	3.25	....	6.76	....	4.73	...	6.33	.....	5.14	...	.50	.....	1.53	....	.45	.....	1.31	....	31.15	.....
Albia	.71	...	.35	.....	2.02	....	4.30	.....	5.94	...	2.54	..	5.29	...	4.49	...	1.09	.....	2.17	....	.85	.....	1.90	.....	31.65	.....
Algona	.03	-.58	.92	‡ 05	2.47	‡.84	1 95	-1 99	3.31	‡ 29	5.56	‡1 98	2 12	-.11	1.12	-1.72	.92	-.90	2.45	‡ 69	1 40	‡.36	.20	-1.09	22.45	-2.76
Alta	.15	-.58	.68	-.08	1 58	-.31	1.17	-2.87	7.75	‡3.53	8.66	‡3 30	2.89	-.71	2.37	-1.39	.17	-1 94	1 98	- 33	1 37	‡.37	1.06	‡.08	29.83	-0 83
Alta (near)	...		...		1.88		1.34	.....	7.29	.....	11.32	.....	2 15		2 77		.22		2.10		1.15	....	1.33			
Amana	.36	-1.18	.71	-.56	.63	-1.35	3.04	‡.10	7.92	‡3.72	3 56	- 91	5.78	‡1 67	2.69	-.71	62	-2.75	.98	-1.69	1 62	-.12	1.64	‡.20	29.55	-3 58
Ames	.11	-.93	.3	- 62	.49	-.90	2.01	-.84	7.23	‡3.39	6 45	‡2.01	1.60	-2.85		....	.88	-2 62	1.25	‡.03	2 35	‡1.36	....	....		
Ames (near)	.05		.55	.....	1.43	..	2.22		7.34		6 51	....	1.01		5 09		.35	.....	2.03	....	....	..	2.17			
Atlantic	T	-.77	65	-.26	1.24	- 61	1.69	-1 84	6.08	‡1.76	5 70	-.15	4.71	‡1.14	4.66	‡2.00	.56	-2.24	3.66	‡1 47	.72	-.02	1.58	‡.28	31 25	‡0.76
Audubon	....	...	.40	-.49	1.2	-.66	1.75	-2.19	8.14	‡4.48	6.27	‡3.01	2.64	-.69	5.25	‡2.01	.60	-2.54	2.80	‡.84	.40	-1 24	1.10	-.02	....	....
Bancroft	....	....	..	....	1 03	....	1.07	...	5.62	....	5.84	....	....	....		....	1.09	...	2.16	....	.34	.....	.70	....	....	....
Batavia	...	..	..	....	.87	....	1 74	....	5.95	....	2.66	....	3 33	.....	2 43	....	1 01	.....	..	....	.40	....	.97	.....	....	....
Baxter	...	.....	....	....	...	.....	1 90	....	8.96	....	3 56	....	1.77	...	5.40	....	.36	....	64	....	1.68	....	1.60	....	....	....
Bedford	.26	....	57	....	3 68	....	2.91	....	5.73	.....	.....	.....	8.60	...	3 54	....	.76	....	1.89	....	63	....	.....	.....	.....	.....
Belknap	.50	.....	1.10	...	3.10	....	2.90	....	7 45	...	3.45	.....	5.25	.....	5.35	.....	1.59	....	1.20		2.3		1.85		36.03	.. ..
Belle Plaine	.82	-.91	.76	-.36	1.42	-.65	5.76	‡2.26	8 60	‡4.56	6 02	‡2.46	2 87	-.32		...	.50	-2.27	1.15	-1.37	2 97	‡1.31	2.31	‡.98	.....	.....
Blockton	....		...		...	...	2.69	....	7.81	.....	1.47		5.93		2.19		T	....	2.45	....	1.16	....	....	.....	.....	.....
Bonaparte	.05	-1.96	1.12	‡-10	3.08	‡.20	2 44	-1.36	8.35	‡4.30	1.65	-2 63	2.28	-1.46	2.84	-1.05	1 1	-3 30	1.20	-.36	2.55	‡.63	.89	-0.83	27.56	-7.71
Britt	.03	....	1.15	.....	2.06	..	1.63	....	4.77	....	7.31	....	2 58	....	1.49	...	1.94	.....	1.44	....	1.31	....	.84	.....	26.55	.....
Buckingham	....	.....	.....	.....	...	.....	...	...	...	...	...	.....	...	.....	...	.....	...	.....	.62	.....	1.50	....	1.25	.....	...	...
Burlington	....	.....	1.74	.....	3.83	.....	3.45	....	6 16	.....	1.71	.....	2.69	.....	3.56	.....	2.37	.....	2.32	.....	.9	...	1.7	.....	.....	.....
Bussey	...		..	.	..		2.78		6.30		2 25		7 42		3.82		.83	....	1.55	... ..	.97	.....	2.56			
Carroll	T	-1.23	.55	-.48	1.89	-.59	2.28	-1.59	9.04	‡4.71	7 25	‡3.07	1.40	-1 82	5.07	‡2.2	.87	-1.32	1.79	-.86	1.28	‡ 20	1.48	‡ 51	32.90	‡2.86
Carson	.	....	.....	.....	.		2.36		5.99	....	7.99	.....	2 22		8.32	....	.68		..	.....	50	....	1 79	....	....	....
Cedar Falls	.50	-.71	1.50	‡.59	1.45	‡ 03	2.15	-1.34	..	..	..	..	..	..	..	..	.58	-2.48	..	....	.88	-.48	....	....	....	....
Cedar Rapids	.53	-1.07	.50	-1.17	.53	-1.73	2 89	- 27	9.21	‡4.73	3.46	-.36	3 20	-.55	1.82	-1.16	.37	-2.58	.88	-1.78	2.04	‡.54	1.27	-.37	26.70	-5.77
Centerville	.20	-1.28	.40	-.78	1 05	-.90	3.12	-1.36	6.70	‡3.27	2.43	-1.41	3.36	-2 15	3.04	-.42	1.55	-.94	.35	-1.67	..	.....	....	....	....	....
Chariton	.33	.....	.61		1.42		2 79		6 95		2.52	.....	7 20	.....	4.51		0.81	....	2.09	.....	1.1		2 22		32 62	
Charles City	.85	-.44	1.72	‡.38	1.56	-.02	1 61	-1 77	4.71	‡ 94	5.46	‡.57	1.92	-.94	5.68	‡3.43	1.45	-.83	1.73	-.31	1.61	‡.27	.94	-.48	29.14	‡0.80
Chillicothe	..		....		2 10	.....	3.33	...	6.43	.....	2.47		4.13	...			1 40	..	1 95	.....	1.6		1.65		....	....
Clarinda	.24	-.87	.75	-.31	2.68	‡ 97	4 30	‡1 06	7.09	‡2.50	1.54	-3.51	5.39	‡1.06	5.03	‡1.68	.87	-1.26	3 2	‡1.88	1.10	‡.16	1.87	‡.70	34.07	‡3 51
Clear Lake	.32		1.40	...	...		2 00	.....	11.43		6 07	.....	1.42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.10	.....	.....	.....
Clinton	.27	-1.91	1.45	-.25	1 89	- 66	2 25	- 94	8.38	‡4.24	3.01	-1 77	3 54	‡.20	3.91	‡1 13	.76	-2.23	1 48	-.10	1.0	- 94	2.32	‡1.18	30.31	-2.05
College Springs	.12	-.46	.44	-.48	2.44	‡.64	3.62	-.44	8 13	‡3.58	1.31	-3.07	5.93	‡.49	4.19	‡1.50	.78	-1.59	2.42	-.20	1.13	‡ 35	1.38	-.12	31.89	‡0.30
Coon Rapids	....	....	....	...	.81		1.59	.	6.26		4.85	.....	2.30	.....	4.06		.72	.....	2.25		1 06	.....	1.19			
Corning	.33	-.49	.40	- 43	1.77	‡ 05	2 93	- 63	5.56	‡.91	3.29	-1 07		....	3.99	‡.86	.59	-1.68	2.35	‡ 62	.68	- 20	2 29	‡1.30	....	....
Council Bluffs	T	.....	89		.72	.....	1.27		4 42		.....	.....	2 21	.....	6.93	...	.77	...	1.87	.....	1 45	.....	1.37		.....	.....
Cresco	.43	-.80	.98	‡.05	2.34	‡1 01	1.55	-1.04	3.86	‡.29	6.06	‡.93	3.47	-.45	4 52	‡1.62	1 54	-2.10	1.55	-.83	1.1	-.32	1.49	‡.19	23.92	-1.46
Cumberland	....	...	..	....	.....	.....	1 22	....	5.01	.....	4.61	.....	4.90	.....	6.26	...	1.17	....	3.80	.....	.2	.....	1.43	.....	....	....
Danville	....	....	....	.....	2 94	.....	2.63	.....	5 81	.....	2.40	.....	2.31	..	3.13	..	1 46	.....	1.47	.....	1.05	.....	1 30	.....	.....	.....
Davenport	.31	-1.48	1.91	+ 34	1 94	-.30	2.94	‡.10	7.35	‡3.04	4 02	- 15	2 84	-.50	4.47	‡.96	.82	-2.32	1.46	-1.07	.90	-1.07	2.68	‡1.03	31.64	-1.69
Decorah	.38	-.88	1.43	‡.66	3.51	‡2.03	3.46	‡.14	3.33	‡.13	5.51	‡1 16	1.57	;.82	4.51	‡3 13	1.80	-1.11	1.04	-1.11	1.59	‡.06	2.06	‡ 80	30 19	‡1 19
Delaware	.45	-.77	1.11	‡ 33	1.16	- 65	3.00	- 38	7.44	‡3.62	5.03	‡.75	2.12	-1.18	3 27	‡.39	1.11	-2 25	1.14	-1.14	1.23	-.55	2.14	‡.62	29.18	-1.21
Denison	.05	-.57	.40	-.46	1.00	-.74	2.63	-2.54	4.82	‡.58	6.29	‡3.34	1.95	-1.79	3 49	‡.49	.45	-1.84	3.20	‡1.55	1.0	‡.05	.92	‡.51	26.25	-1 42
Des Moines	.29	-1.06	.57	‡.63	1.04	-.44	2.22	-.82	6.71	‡2.06	3.53	-1.66	3 20	-.19	3 53	‡ 34	1.17	-1.91	.59	-2.36	1.76	‡.14	2.12	‡.73	25.73	-5.60
De Soto	.10	.....	.44	....	.84	....	2 03	... ..	6.66	....	2.79	....	4.48	....	2.61	.....	.71	.....	1.38	.....	1.25	.....	3.15	.....	26.38	.....
Diagonal	..	....	..	....	...	...	....	....	7.60	....	3.30	....	6.40	....	2.20	..	.50	....	1.10	....	.....	.....	.....	....	....	....
Dows	.22	...	.58	...	1 41	.....	2.51	...	5 84	...	7 77	.....	1.44	....	2 34	.....	2.14	.....	.69	..	1.23	.....	.91		27.08	.....
Dubuque	.51	-1.17	.67	-.83	1.52	-.74	4.24	‡1.18	5.75	‡1.64	4,08	-.89	4.12	-.15	1.95	‡1.14	.99	-.308	1.63	-2.06	.97	-1.01	1.85	‡.13	28.28	-4 35
Eldon	.10	.....	.78	.....	2.21	.....	2.11	....	8.69	....	2 85	.....	3.62	.....	2.75	.....	1 25	....	.86	.....	.72	.....	2 52	.....	28.46	.....
Eldora	1 15	.....	1 00	.....	1.45	...	1 50		7.95	.....	7 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Elkader	.44	-1.06	1.25	‡.15	1.69	-.09	2.46	- 50	5.13	‡1.42	5.92	‡2.03	2.02	-2.09	3.10	‡.25	.91	-3.00	3.09	‡.35	1.29	- 43	3.20	-.03	29.50	-3.00
Emerson	..	.. ..	..	.....	.50	....	1.00	....	5.60	.....	6.29	... ..	2.40	....	1.30	... ..	.05	....	1.50	....	.5	.....	2.25	....	....	....
Emmetsburg	.	.....	....	....	..	...	....	....	.	....	.....	.....	....	..	....	.. ..	.67	.....	3.05	... ..	.57	.....	.92	....	....	....
Estherville	.02	.....	1.26	....	2.20	.....	...	...	4.93	.....	.....	.....	.....	.....	2.39	...	T	...	1.45	.....	.13	.. ..	...	...	.....	.....
Fairfield	.23	-1.53	1.08	-.28	1.64	- 48	3 19	‡.14	6.43	‡.41	1.94	-2.45	2.22	-1 06	2.66	-1 05	1.69	-1.09	.62	-2 25	1 60	-.36	1.88	‡.24	25.18	-9.76
Fayette	.41	-1.03	1.83	‡.72	2.22	‡ 12	3 87	‡.25	6.69	‡2.71	5.54	-.56	2.34	-.81	2.33	- 42	.70	-2.13	4 42	‡1.67	1.29	-.46	1.84	‡.39	33.48	‡0.45
Fonda	....	.....	.....	.....	.....	.....	.....	.....	9.12	..	2.90	.. .	3.02	.....	2.49	.....	0	.....	2.90	.....	1 30	.....	2.53	.....	.....	.....
Forest City	.22	..	1 53	.....	3.38	.....	1.18	..	3.79	..	7.15	.....	2.20	.....	1 52	..	1.67	.....	1.61	.....	1.56	... ..	.72	...	26.53	.. ..
Fort Madison	55	-1.45	1.80	- 14	3.47	‡.70	3.95	‡.73	12.24	‡7.85	3 59	-.69	3 68	-.22	4.11	‡.46	3 72	-.13	1.91	-.81	1.10	-1.09	1.91	-.12	42.06	‡5 09
Galva	.15	-.29	.80	‡.47	1.43	‡.16	1.09	-2.51	4.78	‡1.23	7.45	‡3.77	1.39	-2.03	3.03	‡.13	.10	-1.86	1.57	‡.43	.60	-.57	.96	‡ 24	23.35	-0.83
Garden Grove	.20	.....	.27	....	.98	.....	3.67	....	...	.....	.	...	..	.....	....	....	...	.....	...	.....	...	.....	...	.....	.....	.....
Gilman	...	...	....	.....	..	.....	2.81	...	6.70	.....	5.49	.....	2.30	.....	4.17	.....	.28	... ..	.88	.....	2.03	.....	1.73	.....	.....	.....
Gladbrook	..	.....	...	.....	...	...	2.44	.....	5.32	.....	2.50	.....	1 90	.....	...	.....	.55	.....	.	.	2.36		1.17	....	.....	.....
Glenwood	T	-.88	.50	-.30	.68	-.71	3.51	‡.98	5.76	‡.57	5.97	‡1.50	2.95	-.79	7.19	‡3.82	.62	-1.61	3.57	‡1.16	.94	‡.03	.92	‡.11	32.59	‡3.88
Grand Meadow	.62	-.81	1.13	‡.08	1.80	-.25	4.18	‡.60	4.72	‡.51	6.43	‡1 19	2.24	-1.40	5.85	‡3.49	1.21	-1.68	2.02	-.52	1.60	- 02	2.13	‡.54	33.93	‡1.73
Greene	.32	.....	1.89	.....	1.39	..	1.47	.....	6.85	.....	5.78	.....	.72	.....	2.68	.....	1.28	.....	1.22	...	1.12	..	1.73	.....	26.35	.....
Greenfield	.49	-.50	.85	-.32	1.57	-.83	2.38	-1.22	6.69	‡2.26	4.08	-1 13	4.73	‡.29	....	.....	.51	-2.52	1.67	-.14	1.04	‡.04	1.47	‡ 01	.....	.....
Grinnell	.58	-.83	.77	‡.00	1.23	-.35	5.05	‡1.32	6.68	‡2.11	....	.....	..	.....	.....	.....	.21	-1.83	.61	‡1.76	2.69	‡1.16	1.57	‡.37	.....	.....
Grinnell (near)	...	....	.66	.....	1.46	.....	5.2	... ..	7.18	.....	5.44	.....	2.84	....	3.61	..	.25	.....	.60	....	2.41	....	....	....	.....	.....
Griswold	.	.. ..	....	...	....	.....	1.56	....	5.13	.....	5.54	.....	5.23	.....	6.58	.....	.52	.....	3.25	...	.44	....	....	....	.....	.....
Grundy Center	.21	-.54	30	-.40	1.31	-.02	1.76	-2.24	9 15	‡4.74	5.27	‡1.25	1.69	-2.04	3.35	‡ 36	.78	-2.12	1.89	-.81	2.49	‡1.49	1.66	‡.38	29.86	-0.11
Guthrie Center	T	.....	.50	.....	.72	.....	1.25	.....	6.52	. ..	3 85	....	2.80	....	4.16	.....	.57	.....	1.76	.....	.43	....	2.50	.....	25.06	.....
Hamburg	....	...	....	.....	...	....	5.07	.....	6.12	.....	1.69	.....	3.77	....	6.46	.....	....	....	.15	...	...	.....	.95	.....	...	...
Hampton	.27	-.98	1 09	-.08	2.05	‡.04	2.14	-1.99	8.40	‡4.64	6.76	‡1.79	2.79	-.54	3.33	‡.30	1.74	-1.13	1 39	-1.28	1.03	-.76	1.73	‡.38	32.72	‡0.41
Harlan	...	.....	.42	..	.75	.....	4.21	.....	4.49	.....	7 53	.....	2.31	...	4 44	.....	.84	....	2 93	...	.91	....	1.43		...	
Hawkeye	.80	-.94	2.03	-.73	1.70	-.40	3 31	‡.34	5.57	‡1.67	7.02	‡2.56	4.3	-.39	3.83	‡1.27	1.27	-1 39	1.91	-.91	1.56	-.10	3.80	‡2.32	37.18	‡7.70
Hedrick	.05	...	.55	.....	1.17	....	2.70	....	5.92		2.35	..	3.03	.....	3.68	..	..	...	....	.83	....	.....	.....	.....	.....	.....
Hopeville	.15	-1.01	.59	-.29	1.35	-.37	4.08	‡.21	5.89	‡1.05	3 77	-.43	4 37	‡.11	3 44	‡.40	.59	-2.57	1.48	.-38	.67	-.27	1 68	‡.61	28.06	-2.94
Humboldt	T	-.49	.44	-.20	.95	-.57	1.26	-2.77	6 27	‡2.59	7.56	‡3.95	2.02	-1.12	1.46	-1 37	1.22	-.88	1.09	-.67	1.67	‡.77	.73	‡.13	24.67	-0.63
Independence	.46	-.84	.87	-.17	1.02	-.72	3.45	‡1.01	5.80	‡1.79	4.35	-.45	1.16	-3.13	2.55	-.59	.64	-3.65	.72	-1.65	.72	- 69	1.67	‡.29	23.41	-8.80
Indianola	.13	-1.36	.51	-.19	1.06	‡.13	3.70	-.11	6.58	‡1.84	3.79	-.49	7.34	‡4.15	3.83	‡ 53	2.12	-.72	.68	‡.94	1.21	-.09	1.93	‡.40	32.88	‡3.15
Iowa City	.59	-1 44	1.82	‡.57	1.43	-.96	3.23	‡ 05	9.49	‡5.34	4.50	‡.82	3 78	-.35	2.39	‡ 04	.93	-1.77	1.66	-.33	1.15	-.57	1 93	‡.29	32.90	‡1.69
Iowa Falls	.10	- 81	.93	‡.10	1 50	‡.24	1.74	-2.48	3.65	- 03	4.85	‡1.23	1.43	-1.39	2.57	-.35	2.25	-.74	1.67	-.59	1 00	-.35	1.64	‡.54	23.33	-4.63
Keokuk	.49	-1 31	1.65	-.01	2.66	‡.45	3.28	‡ 09	11.47	‡7 47	2.78	-1.70	5.39	‡.88	4.01	‡1.22	4 32	‡.69	2.06	-.56	1.19	-.89	1.67	- 21	40.97	‡6.62
Keosauqua	.08	-1.75	1.39	‡.17	3.15	‡.66	3.26	-1.26	7.42	‡2.69	2.39	-1.55	4 53	‡.71	4.05	‡.70	1.35	-3.78	1.02	-.45	2.38	-1.09	1.67	‡.19	32.69	-2.58
Knoxville	T	-1.39	.49	-.50	1.31	‡.01	3.57	-.53	5.61	‡1.78	2.50	-.95	5 81	‡1.96	3.48	-.42	.58	-2.77	1.04	-1.38	.82	-.40	3.00	‡1.77	28.21	-2.19
Lacona	....	.....	....	.....	...	.....	1.97	.....	7.20	.....	3.21	....	4.51	.....	3.46	.....	.70	.....	.87	....	1.08	.....	2.01	.....	....	.....
Lamoni	.57	.....	.71	.....	2.89	.....	2.60	.....	7.43	.....	2.93	... ..	5.03	.....	3 87	.....	.73	.....	....	.63	.....	2.07	.....	.....	.....	.....
Lansing	.53	.....	1.77	.....	2.68	.....	4.12	.. ..	3.87	.....	6.01	.....	1.11	.....	5.00	.....	1.57	....	1.27	.....	1.75	.....	2.63	.....	32.33	....
Larchwood	.17	.....	1.50	.....	1.31	.....	2.11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.67	.....	.98	.....	.....	.....
Larrabee	.12	-.52	1.13	‡.53	1.40	-.48	1.39	-2.44	4.33	‡.46	5.72	-.44	2.71	-1.23	3.57	‡.38	0.30	-1.67	1.42	-.73	.97	‡ 02	.43	-.71	23.49	-6.83
Le Claire	....	.....	..	.....	1.63	.....	...	.....	6.57	.....	4.11	.. ..	3.06	.....	3.00	.....	.89	.....	.....	.....	.88	.....	2.11	.....	.....	.....
Le Mars	T	.....	.70	.....	1.24	.....	1.98	.....	4.72	.....	6.26	.....	3.22	.....	5.51	.....	.85	.....	1.55	.....	1.81	.....	1.06	.....	27.90	.....
Lenox	.24	.....	.38	.....	1.28	.....	2.22	.....	5.86	.....	1.77	.....	8.66	.....	3.58	.....	.94	.....	2.01	.....	.41	.....	1.83	.....	29.18	.....
Lockridge	...	.....	...	.....	1.75	.....	2.88	.....	4.98	....	1.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Logan	.10	-1.09	.70	-.48	1.30	-.57	2.08	- 90	3.62	-.77	11.99	‡6.48	1.83	-3.03	5.90	‡2.02	.42	-2.64	1.39	-.98	1 11	‡.05	1.51	‡.21	31.95	-1.70
Maquoketa	.24	-1.47	.78	-1.00	.65	-1.79	1.36	-1.86	6.74	‡2.79	5.82	-.52	2.77	-.42	2.89	‡.11	1.10	-1.68	1.59	-1.37	1.26	-.30	1.82	‡.18	27.02	-7.3

[ONTHLY AND ANNUAL PRECIPITATION FOR 1899, WITH DEPARTURES FROM NORMAL—CONTINUED.

STATIONS.	JAN.		FEB.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCT.		NOV.		DEC.		ANNUAL.	
	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.
Marshalltown	....	.....	.26	-.46	1.56	-.02	2.12	-1.51	7.36	‡2.91	4 05	‡.14	1.00	-3 34	4.62	‡2.00	.78	-1 35	62	-1.94	1.81	‡.75	2.17	‡.53	.....	.....
Mason City	T	-1.36	.71	‡ 17	1.80	‡.61	1 81	-1.91	3 29	-1.09	11.05	‡6.35	2.25	-.02	2 80	‡.04	1.40	-.65	30	-2.11	....	.....	.....	.....	.....	.....
Melrose	.....	.....	.....	.....	.82	.....	.77	..	38		1.51	.....	5.70	..	4.77	.....	1 37	.....	.33	.....	.15	.....	.....	.....	.....	.....
Monticello	.47	-1.37	.97	-.74	.37	-2.02	3 81	‡1 13	6.19	‡2.32	4.24	-.22	2 48	-1 66	1.75	-1 91	.56	-3.22	1.10	-1.65	1.60	-.65	4.28	‡2 06	27.82	-7.70
Nooar	T	.....	.45	.....	3.16	.....	3.08	.....	10.34	.....	2.96	.. ..	4.23	.....	3.67	.....	3.04	.....	2.73	.....	1.02	.....	1 27	.....	35.95	.....
Mt. Vernon	..	.....	.....	.. ..	50	.....	3.39	.....	9.28	.. ..	4.18	.. ..	5.49	.....	..	.....	0.86	.....	1.30	.....	1.47	.....	2.17	.....	.....	.....
Mt. V'n (Hub)	...	.....	.58	.....	.97	.....	3.40	..	11.15	....	4.25	.. ..	5 51	.. ..	2.49	.....	.80	.....	1.28	..	1.57	.. ..	2.55	.....	.....	.....
Mt. Ayr	.55	-.77	.81	-.33	1.64	-.49	3.11	-.65	7.55	‡1.78	3.13	-1.47	6.25	‡1.42	2.12	-.89	1 06	-1 71	2.04	‡.13	.52	-.47	1.25	-.04	30.03	-3 76
Mt. Pleasant	.03	.....	.73	.....	1.86	..	2 27	.....	7 30	.....	2 02	.....	1.07	.. ..	2.93	..	1.55	.....	62	.....	2.11	.. ..	1.89	.....	24.38	.....
Murray	....	..	....	..	.....	.....	2.97	.....	6 88	.....	2.86	.....	4.71	.....	4.05	.....	.30	.....	.95	.....	.88	. ..	1.56	.....	.....	.....
New Hampton	.43	.....	1.60	.....	1.61		2.89	....	4 37		4.10	.....	3.32	...	3.44		1.20	.....	1.31	.....	1.39	.....	.29	.....	25.95	.....
Newton	.86	-.06	.75	-.22	.74	-.61	4.52	-1.02	6.61	‡2.11	2.00	-2 06	2 30	-.89	4 51	‡.96	.50	-2.80	.61	-1.95	1.52	-.35	2 34	‡1.07	27.26	3.78
Northboro	...	...	...	....	...	....	3.09	.. ..	3.94	.....	2.49	.....	5.33	....		.....	.30	.....	2.94	.....	...	... ..	.42	....	....	.....
Northwood	.00	.....	1.27	.....	2.83	....	56	.....	3.59	....	5 89	.....	3.18	....	6.31	... ..	1.03	.....	1.44	.....	1.26	.....	.76	.....	28.12	.....
Odebolt	.05	..	.83	..	.72	....	2.35	...	5.48	....	5.40	...	1.11	....	2.10	....	44		1.95	...	1.07	. ..	1.00	....	22.50	.....
Ogden	.11	....	.38	...	1.36	....	1.62	...	7.80	.....	7 21	.....	2.17	.....	3 71	...	1.25	.....	2.01	....	1.16		1.65	....	30.43	.....
Olin	.39	....	1.47	...	.95	...	2 83	.....	7.58	...	4.87	.....	3 34	.....	1.88		.96	....	.89	.....	.92	...	3.24	....	28 32	..
Omaha, Neb	.07	-.62	.71	-.08	.64	-.86	1.73	-1.40	4.45	‡.08	5 77	‡.10	1 73	-3 02	6.18	‡2.84	.53	-2.38	2 26	-.21	1.38	‡.32	1.29	‡ 28	26.74	-4.95
Onawa	....	....			.91	-.60	1.09	-1.70	3.62	-.99	6.36	‡1.25	1.29	-2 94	2.48	-1.56	.52	-1.81	1.22	-.89	1.11	‡.06	1 37	‡ 31	....	.....
Osage	.41	-.51	1.66	‡.49	2.13	‡.68	1.93	-.97	3.71	-.38	8 01	‡3.79	2.06	‡1 34	5.75	‡3.01	1.93	-1.45	.87	-1.70	1.19	-.29	1.91	‡.60	31.56	‡1.93
Osceola	.43	.....	.64		.86	.....	3.61		7.85		2 91		4 80	... .	2.89		1 07	....	1.75	.....	1.00		1.35	.....	29.16	.....
Oskaloosa	.49	-.47	.44	- 63	.71	-1.27	2.76	‡.02	5.58	‡1.78	1.55	-2.45	3.06	-.66	3.94	‡1 21	.83	-2.08	1.45	-.83	1 03	-.63	1.91	‡.76	23.75	-5 16
Ottumwa	.25	-2 25	.52	- 61	82	-1.28	2 19	-1.69	7 95	‡3 08	3.01	-.39	4 78	‡.48	2.52	-.83	1.38	-1 98	1.35	-1.18	1 95	‡ 32	1 57	- 22	28.24	-6 55
Ovid	.50	-1.51	.75	-.60	2 07	-.12	3.21	-.43	7 03	‡3.61	3.67	-.16	4.72	‡1 19	4 02	‡.16	.94	-2 80	2.91	‡.57	1 77	‡.41	1.87	‡ 29	33.46	‡0.61
Pacific Junction	...	.....	.40	...	.75	.....	2 92	.....	4 63	....	6.83	....	3.16	....	6.94	.....	.46	.....	2.28	....	.76	.....	1.39	....	....	.....
Pella	.32	.....	.27	.....	1.04	...	3.62	....	4.83	.. ..	2.67	.....	7.18	....	3.36	.....	.44	....	.51	....	1.24	.....	1.10	...	26.58	.....
Plover	.20	...	35	....	1.35	....	82	...	5.55	.....	4.43	.....	1.82	....	1.61	... .	.44	....	2.38	.....	1.64	. ...	1 20	.....	21.79	.....
Primghar	.00	....	.70	.....	2 75	...	1 50	....	3.95	....	7 76	....	2.85	....	2.20	.....	00	....	1.25	.....	.45	....	.70	.....	24.11	.....
Red Oak	.15	....	.72	....	1.23	.....	2.39	....	6 13	.....	5.33	.....	4.01	.....	5.08	.....	.80	.....	4.09	... ..	.83	.....	2.15	.....	32.91	.....
Ridgeway	1.05	.....	4 32	.....	.....	.....	2.40	....	3.09	....	6.66	.....	2.82	.....	5.26	.....	1.87	.....	2.07	.....	1.57	.....	4.21	.....	.....	.....
Rockwell City	.04	.....	.30	...	1.62	.....	1.90	.....	4 71	.....	5.42	.. ..	2.32	.....	1.85	....	.72	.....	2.03	...	1.44	.....	1.59	....	23.94	.....
Ruthven	T	... ..	.80	... ..	1.65	.....	.78	.....	3.30	....	8.50	....	3.88	.....	3.85		1.40	..	3.00	.....	.21	..	1.89		29.26	.....
Sac City	.04	-1.07	.57	- 49	1.61	‡ 00		.....	....	.....	....	.....	1.27	-2.46	2.79	-.53	.55	-2 54	2.78	‡.50	1.45	‡.29	1.50	‡ 26	.....	.....
Scranton	....	.....	...	.....	.....	.....	1.49	....	5 31	....	4.68	...	1.58	...	3 26	....	.72	....	1.65	....	.73	....	2.00	.....	.....	.....
Sheldon	...	.....	...	.....	.65	.....	1.55		4 49		6 47		3.20	....	3.97		.06	....	4.39	.....	.77		1.15			
Sibley	.20	-.60	.84	‡.46	1.42	‡.25	1.30	-2 18	5.80	‡2 44	7.39	‡3.44	4 20	‡1.19	2.20	‡ .17	.22	-2.17	2.68	‡.78	.67	-.36	1.29	‡.59	28.21	‡4.01
Sigourney	.25	.....	1.03	.....	1.41	.....	2.76	.....	7.79	..	1.99	.....	2.70	.....	4.86	.. ..	1.92	.....	2.81	.....	1.00	.....	...	.....	...	...
Sioux Center		.....		.....		.....		.....	5 0		5.78		2.20	.....	3.72	....	.15	.....	2 46	.....	.66		1.44	.....	.....	.....
Sioux City	.08	-.61	.52	- 04	.55	-.67	0 96	-2 30	6 18	‡2.53	4 76	‡1.01	1.00	-2.16	4.91	‡2.11	.26	-1.22	1.33	-.30	.85	-.04	1.27	‡.39	22.67	-1.20
Spencer	.06	.....	.77	...	1 29	...	1.09	.....	5.28		5.77	.....	2.28		4.21		....		....		....		....		.....	.....
Spirit Lake	T	-.57	1.16	‡ 88			.65	-2.64	3.94	‡1.32	10.39	‡7.37	6 91	‡4.54	3 22	‡ 57	.30	-1.84	2.07	-.11	.32	-.77	1.06	‡.47	.....	
Storm Lake	.13	-.68	.59	-.09	1.02	-.35	1.70	-0 70	7.37	‡3 90	7.98	‡3.46	62	-3.17	2.01	-.65	.33	-2.33	2.12	‡.67	1.10	‡.31	1.06	‡.14	26 03	‡0.42
Stuart	.05	....	.40	....	.85	.....	1.37	....	6.85	....	3 35	.....	3.75	.....	2.90	....	....	....	1.55	.....	1.32	.....	1 94	.....	.....	.....
Tara	T	.....	.40	....	.60	.....	1.85	....	7.50	.....	7.25	... ..	2.00	.....	1.00	...	.75	.....		.....		.....		.....	.....	.....
Thurman	12	.....	1.02	.....	2 38	.....	3 37	.....	7.05	.....	5.08	.....	2 72	....	10.45	...	.78	.....	4.64	.....	.96	.....	2.59	41.16	.....	.....
Toledo	.13	-.87	12	-.50	1.66	‡.33	3.18	-.24	8.56	‡5 42	4 58	‡2.10	2.37	-.71	3.93	‡1.37	.45	‡2 66	.49	‡1.55	2 47	‡1.17			.....	.....
Villisca	.10	-.62	.76	-.09	2 10	-.04	3 38	-.56	6 46	‡2.57	4.13	-.76	3.18	-1.37	3 31	-1.11	.57	-1.82	2 82	‡.91	75	-.37	2.44	‡1.44	29 99	-1 82
Vinton	.53	-.84	1.00	‡.04	2.13	‡.44	2.96	-.19		....	4 51	‡ 97	1.94	-.65	2 55	‡ 34	....	.....		.. .	1.02	-.17	.28	-.95		.....
Wapello	.09	.....	1 24	....	2 20		1.64		4 64		1 51		1.78	.....	3.39		1 24	...	1.07		1.06		2 48	.....	22 34	..
Washington	.16	-1.66	1.21	‡ 21	1 28	-.97	2.81	‡ 10	5.27	‡1.74	2 00	-1.12	2 82	-1.02	2.61	‡.05	.90	-1.72	.60	-1.05	.74	-.72	2.09	‡.87	22.49	-5.29
Washta	.10	....	.60		1.55		1.28	.....	5.22	...	7.84	....	1.69	..	3 59		.27	.	1.11	.....	1.23	.. ..	1.10	..	25 58	..
Waterloo	.27	-.93	1.18	‡.07	2.23	‡.85	2.38	-.10	6 08	‡2.48	6.94	‡3.34	1.61	-2 37	3 59	‡.00	.84	-3.40	1.55	-.73	1.38	-.05	1.80	‡ 57	29.85	-0.27
Waverly	.46	.. ..	1.72	.....	1.76	.....	2.14	.....	4 68	.....	6.51	....	1.35	.....	3.66	.....	.95	.....	2.61	.. ..	1 37	.. ..	1.97	.....	29.18	.....
West Bend	T	-.76	.60	-.32	1.53	-.17	1.50	-1.92	4.04	‡1.23	4.92	‡1.06	3.02	‡.06	2.04	-.55	.52	-1 61	2 27	‡.89	1 35	-.21	1.12	‡.24	22.91	-2.09
West Branch	.11	....	.20	.. ..	.87	.....	2.47	..	8.62	.....	5.29	.....	3 75	.....	3 17		1.36	.....	1.70	.....	1.48	.....	1.94	....	30.96	.....
West Union	.15	.....	1.00	..	.85	.....	2.11	.....	8.53	.....	6.14	.....	2 95	.....	....	.....	.81	.....	....	.. ..	1.23	.....	.60	..	.. ..	.....
Whitten	.02	.....	.80	.....	.91	... ..	1.97	.....		.....	5 14	.....	.42	.....	2.78	. ..	.73	.....	1.74	.....	1.18	.....	1.61	.. ..	.....	.....
Wilton Junction	T	.....	1.71	.	1 59	..	3.45	..	8.62	...	4 19	.....	3.24	..	2.72	..	1.01	.....	1.64	.....	1 82	. ..	2.55	.....	32.54	..
Winterset	.26	-.85	.60	-.29	1.62	-.21	2.40	-2.03	6 77	‡2.21	3.69	-2 48	6.12	‡.81	3.27	‡.20	1.08	-2.02	1.20	-.74	.82	-.36	2.00	‡.65	29.83	-5.11
Woodburn	....	.. ..	..	.....	1.53	.....	2.58	.....	7.81	.....	4.39	.....	4.97	... .	3.14	..	1 02	... ..	1.12	.....	83	..	1.87	..	.. ..	.....

‡ Plus.

CLIMATE AND CROP REVIEW—SEASON OF 1899.

The unusually severe winter of 1898-9, which began about ten days earlier than the average, was protracted fully two weeks beyond the usual period for the advent of spring. The extremely low temperature that prevailed in February and March froze the soil to an unusual depth, and the season for farming operations opened two to three weeks later than the average of recent years. Seeding of spring wheat and other small grain was begun in the northern and central districts about April 10th, and continued, with more or less interruptions, to about the 25th of the month. In portions of the southern section seeding operations and field work generally were greatly delayed by excessive moisture, resulting in a material decrease of the acreage of small grain. It was early discovered that more than 80 per cent of the winter wheat in the southern section and a very large percentage of the clover in all parts of the state, had been killed by alternate freezing and thawing during the winter and spring months. The acreage of winter wheat sown in the fall of 1898 was very small, and the aggregate loss by winter-killing was relatively light; but the almost total destruction of the clover plant was seriously felt in nearly all parts of the state. The last half of April was somewhat warmer than usual, with plentiful rainfall, giving a vigorous start to vegetation, and by the close of the month farm work was fairly well advanced, and the fields showed a good stand of spring wheat, oats and barley. Grass was about as well advanced as usual in meadows and pastures by the close of April.

In May the temperature of the air was about normal, though quite variable. The soil, however, was unseasonably cold during the larger part of the month, in consequence of the deep freezing during the latter part of the winter, the lateness of the spring, the excessive precipitation, and prevalence of cloudy weather. The number of stormy days was unusually large, and the amount of rainfall was much above the normal in all sections of the state. Under these conditions plowing and planting operations were greatly retarded, especially in the southern and central sections, where the soil was almost continuously saturated A fair beginning was made in corn planting in the central and northern districts during the first half of the month, but the cool, wet and cloudy weather that followed rendered germination unusually difficult, and more than the usual amount of replanting was made necessary. The heavy showers caused much damage in cornfields by washing of slopes and flooding the undrained low lands and bottoms. All these drawbacks caused a material lessening of the corn acreage, compared with the area that would have been planted under more favorable conditions. At the close of the month there remained much planting to be done, especially in the southern section. The stand secured in the area planted was very uneven, raging from fair to poor. Grass, spring wheat, oats, barley and garden truck made remarkable growth during the month. The condition of small grain at the close of the month was very good, the chief drawback being a tendency to rank growth on rich, moist soils.

June, as a whole, was seasonably warm, and the average amount of rainfall was slightly above the normal, though quite unequally distributed. The average of the northern section was 6.70 inches, the central section, 5.10 inches, and the southern section only 3.33 inches. The greater number of showers occurred in the first half of the month, with much humidity and warmth, causing a rapid growth of all kinds of vegetation. The last half of the month was generally dry and more favorable for cultivation of corn, especially in the southern section, where dry weather was greatly needed. At the close of the month corn was in all stages of growth, ranging from an inch to two feet in height; and fair progress had been made in its cultivation, though under great disadvantages in many localities. Small grain was mostly headed out, with rank growth and a marked tendency to lodge, and numerous indications of damage by rust.

July was normal in temperature and the weather conditions were generally favorable for the rapid advancement of crops, and also for the comfort of those who were engaged in farming operations. The rainfall was less than normal, the southern section receiving the larger amount; but there was sufficient moisture in the larger part of the state. From the 3d to the 15th the weather was murky, cloudy and showery, causing much delay in haying and cultivating late corn. But the moisture was beneficial to corn, potatoes, pastures and garden truck. The last half of the month was dry and warm, affording ideal weather conditions for harvesting hay and grain. The month, as a whole, was favorable for the rapid advancement of corn, which had made a late start and needed forcing weather to bring it to maturity in advance of frost. And all growing crops were well advanced during July.

August was warmer than usual, the daily average for the state being 1.3° above the mean for July. And the average rainfall in all sections was slightly above the normal for August. During the first week there was an excess of rain in the central and southern districts, with local windstorms of considerable severity, causing some damage to corn and grain in shocks; but the benefits resulting from the timely and liberal supply of moisture greatly exceeded the incidental damage and delay in harvest operations. The month closed with a protracted period of warm and dry weather, which was favorable for maturing early planted corn and for threshing and closing up work in the harvest fields. And at the end of the month the larger part of early planted corn was sufficiently advanced to be cut and shocked. The soil was generally too dry for plowing, and pastures were short.

September was notable for extremes of hot and cold weather, exceeding all previous records for that month in all the years since observations have been recorded in the state. Hot winds prevailed during the larger part of the first week, and on the 5th and 6th the maximum temperatures at numerous stations registered from 96° to 104°. This period of extreme heat terminated on the night of the 7th, with light and fairly well distributed showers, followed by much cooler and generally very dry weather during the remainder of the month. The effects of the hot and dry winds were very marked in the cornfields, but the crop as a whole was much benefited by being swiftly hastened to maturity, placing it beyond danger of harm by the killing frosts that reached all parts of the state during the last five days of the month. Frosts were noted at various places as early as the 14th, and thereafter on various dates with increasing severity, until freezing temperatures were recorded at all stations from the 26th to the 30th. The month was generally favorable for bringing the late growing crops to maturity; but unquestionably corn and potatoes would have been better in quality and total yield if the temperature had been equable and the killing frosts had been deferred till the normal period. The total output of soil products in the state, however, are fairly satisfactory and remunerative. The drouthy conditions in the latter part of the season materially retarded fall plowing and lessened the acreage of fall wheat and rye compared with former years.

Vol. XI. JANUARY, 1900. No. 1.



U. S. Department of Agriculture

Weather Bureau

MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

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Central Station, Des Moines, Iowa.

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DES MOINES:
F. R. CONAWAY, STATE PRINTER
1899.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XI. JANUARY, 1900. No. 1.

NOTE AND COMMENT.

J. T. Willard, chemist of the Kansas experiment station, has made an analysis of corncob ashes and reports that they are especially rich in potash and therefore valuable as a fertilizer. The percentages are as follows: Potash, 51.16; phosphoric acid, 2.82; magnesia, 5.45; soda, .80; iron oxide, .19, and silica, 24.98. Evidently there is not a due appreciation of the value of some of these by-products of the farms.

* * *

In Russia the average yield of sugar beets has been about seven tons per acre. In Iowa it would be easy to produce twelve tons, and when growers become experts the average may range from fifteen to twenty tons per acre. In time the bulk of the work will be done by machines.

* * *

Iowa heads the list of all the states of the Union in the number of milch cows, the number and value of hogs, and in the value of its farm animals. In respect to cash value, Iowa produced one-tenth of all the farm animals of the United States.

* * *

The report of Frank H. Hitchcock, chief of the section of foreign markets in the Department of Agriculture, shows a very gratifying expansion of our commerce with the orient. During the fiscal year 1899 the value of merchandise exchanged with China and Japan amounted to $87,305,689. Our exports to China, Japan and Hong Kong consisted mainly of cotton, cotton manufactures, kerosene oil, wheat flour and manufactures of iron and steel.

* * *

J. S. Trigg, in *Rockford Register:* "Don't worry because you have a wet piece of land on your farm. The chances are that it is by all odds the most valuable tract of land on the farm. Study how it may be most economically and advantageously drained, and then tackle it. The richest lands in Europe are the reclaimed farms wrested from the bottom of the North sea in Holland. The redeemed peat bogs of Minnesota give fields of inexhaustible fertility. The muskrat bogs of Iowa will grow eighty bushels of corn to the acre when drained. The wet lands of the northwest, upon which a settler would have starved to death in an early day, now ditched and reclaimed, are richer and more productive than those of the historic delta of the Nile. Give us bogs before gravel knolls, wet flats before limestone ridges, a black gumbo before a light loam Wet lands are invariably good grass lands. Where grass will grow stock will thrive, and stock means money for the man who raises it."

* * *

Twenty-five and a quarter million tons of freight passed to and from Lake Superior through the American and Canadian canals at Saulte Ste Marie during 1899, four times as much as in 1898. The passages included upward of 10,000 vessels, carrying more than 20,000 passengers.—*Exchange.*

Thuringian peasants, according to a consular report, protect seed potatoes against rot by spreading them out in a sunny place, with frequent turnings, until they become thoroughly green. They are then placed in a cellar until February, when they are removed to a partially warmed room until planting time. The potatoes not only keep well, but do not sprout until planted, a larger and better crop resulting.—*Exchange.*

* * *

The level of the Great Salt lake, says an exchange, is steadily falling on account of the large volume of water tributary to it which is now absorbed by irrigation enterprises. The disappearance of the lake would take from the neighborhood of Salt Lake City one of its chief attractions, but would make easily accessible one of the greatest sources of salt in the world. Conservative calculations of scientific men estimate that the waters hold about 400,000,000 tons of common salt. Accepting this estimate as approximately accurate, every other source of salt pales in comparison with the riches Great Salt lake will offer if its water disappears, leaving the mineral more easily and cheaply accessible, as it will be, than in any other salt mines or evaporation grounds of the world. The United States produced last year 2,450,000 tons of salt. If all the salt makers of the country should go to the dried up bed of Great Salt lake it would take them, at last year's rate of production, more than one hundred and sixty-three years to exhaust the supply. The great salt centers of New York, Michigan and Kansas might be held as a reserve for the sixth or seventh generation to come.

LIVE STOCK STATISTICS.

Statistician Snow, of the *Orange Judd Farmer*, in his report of the number and value of farm animals, January 1, 1900, shows a flattering upward trend in the live stock industry in the United States. He estimates the number of horses at 14 886,000, valued at $678,941,000; milch cows, 19,308,000, worth $600,891,000; other cattle, 32,075,000, worth $796,457,000; sheep. 42 820,000, worth $127,081,000; hogs, 49,242,000, valued at $245,725,000. The total value of farm animals is placed at $2,558,111,000, an increase of $343,058,000 for the year 1899. These figures show the highest total valuation ever recorded.

In Mr. Snow's tables Iowa makes a very fine showing, as follows: Horses, 1,133,000, valued at $55,517,000; milch cows, 1,713,000, valued at $59,200,000; other cattle, 3,206,000, valued at $104,195,000; hogs, 5,298,000, valued at $31,788,000; sheep, 590,000, valued at $2,360,000. Iowa is first in the number and value of milch cows; first in the value of cattle; first in the number and value of hogs; third in the number and second in the value of horses And in the value of all its farm animals Iowa stands at the head of the list of states, with a total of $254,997,000, which is one-tenth of the value of all the live stock in the United States.

NATIONAL CROP REPORTS.

At the recent annual meeting of the National Board of Trade in Washington, D. C., the standing committee on crop reports submitted the following relating to the work of the Department of Agriculture in the collection and dissemination of crop statistics and estimates:

The crop reporting work of the United States Department of Agriculture has been carefully considered by your committee during the past year, with the result that no important ground for criticism has been found; that the existing official service has been earnest in the effort to accomplish effective and worthy work has been apparent; that there is some margin for still further improvement is recognized. On this point it does not seem necessary here to go into much of detail. In the opinion of your committee there might and should be more promptitude in reaching results of investigation. There may, with propriety, and with much of trade interest, be an extension of inquiry concerning minor crops, such as flaxseed, clover seed, broom corn, etc.

Your committee is of the opinion that the statistical division should further extend special effort with reference to areas under leading crops. It is believed that here lies the basis mainly of the under-calculations as to production. It has been plain to careful observers that the disposition of the producer has been to more accurately state conditions with reference to yield than as to area, especially in regard to his own operations. It is to be hoped that more complete means for determining acreage may be reached, and to this end it is important that all needful effort be made to secure co-operation of state and county official service for such information in specific form.

HOW MUCH WILL CORN SHRINK?

[Rockford Register.]

In the fall of 1898 an experiment was undertaken by Professor Atkinson, at the Iowa experiment station, to ascertain the amount of moisture contained in ear corn. A crib was constructed upon the platform of a pair of scales, the scales so constructed that an exact register of the weight could always be made. Seven thousand pounds of corn were husked and placed in the crib October 19, 1898. The crib was thirteen and one-half feet long by seven and one-half feet wide. The corn was then weighed once each week for a year. During the first three months the loss was 630 pounds or 9 per cent of the original weight. During the next three months, from January 19th to April 19th, the loss was 390 pounds, or 5 per cent of the original weight. During the next three months the loss was 220 pounds; during the last three months the loss was 190 pounds. The loss during the full year was 1,430 pounds, or a trifle more than 20 per cent. This means that a bushel of corn weighing eighty pounds when husked like this sample will weigh sixty-four pounds at the end of the year.

DRAINAGE AND CULTIVATION AS AFFECTING CLIMATE.

Following is the substance of a recent off-hand talk, delivered at farmers' institutes by the director of this service:

Thirty to forty years ago a very large percentage of the soil of this state was too wet for general cultivation in seasons when there was a normal spring and summer rainfall. The crops were grown on the ridges and divides between the streams, sloughs and river bottoms. The best and most productive soil in the state was left untouched by the plow because it was covered with miasmatic bogs, or subject to frequent overflow, for want of ditches and tiling to carry off the surplus water. The tough prairie sod of the ridges shed water like a duck's back, and the rainfall that came was held in the basins and depressions, or carried swiftly away to the larger streams and thence to the gulf whence it came. At that period the streams of the state were much larger and carried away much greater volumes of water than in recent years. The Des Moines river was at one time a navigable stream a portion of the year, and all the streams were correspondingly larger than at this time

By drainage and cultivation a very marked change has been effected. The tough sod of the uplands has been broken by deep tillage, making the soil of the ridges porous and receptive of a much greater amount of water than formerly. And the impervious rubber blanket at the bottom of sloughs has been dried off and broken up, allowing the surface waters to enter the subsoil and pass away through the deeper water courses or drains. The public health has been improved by drainage of the seepy bogs and stagnant pools and the old time period of fever and ague, or "shakes" is past and gone. The people are healthier and crops are better, though the daily consumption of quinine has been lessened.

But in these latter years an outcry has been raised that this general drainage of ponds, sloughs and wet lands has brought a damaging change of climate. Since the severe drouth of 1894 some wiseacres and alleged scientists have sounded the alarm against tile-drainage and big open ditches. They tell us that we must have ponds, reservoirs and lakes to make vapor to start the rain-making process, to prevent the state from drying up and becoming a desert. Men of prominence have given currency to this nonsense, and farmers have been scared; some actually dug up or dammed up their drains.

Never was there a more preposterous heresy preached among intelligent men. There is no basis of sense or science in this absurd outcry against soil-drainage. In matter of fact the climate has not changed, and cannot be changed by the work of man. The average annual rainfall of the past twenty years is as great as during any preceding period of the same length. The forces of nature are too gigantic and too far above human reach to be affected by our puny efforts. We may exhaust the soil in some degree by our folly and waste, but we cannot in any measure add to or lessen the rains of heaven that fall upon the just and unjust; nor can we change the direction of the great atmospheric currents that water and make fruitful this great valley.

If local ponds and lakes are necessary to bring rains, how do we account for the fact that the great prairies of Iowa and Illinois have a larger average precipation in the crop season than the northern part of Michigan, that is filled with lakes and swamps and surrounded by vast bodies of water? This is a fact that can be verified by records. And during the years since the drouth of 1894 we have had some very wet springs in Iowa, while the lands near the Atlantic coast, in New England, in Florida and portions of the gulf region, were parched by severe drouths. As a matter of fact the worst drouths in this country have at times occurred in those sections nearly surrounded by water.

We do not depend upon vapor from ponds and lakes to make our summer showers. If all our local lakes, rivers, ponds and sloughs were evaporated at one time, and all came down in rain at one time, the water would not equal a half inch of rainfall. Think of the amount of water that falls annually upon our state. The average rainfall of this state for a single year would fill a lake 50 miles wide, 110 long and 27 feet deep; or it would make a river 1 mile wide, 5,500 miles long and 27 feet deep; or it would fill a ship canal 8 rods wide, 27 feet deep and 220,000 miles long. Now, what portion of this vast quantity of water comes from local evaporation?

But if we need local vapor factories to help us out, what is the matter with our cornfields? An acre of corn will give more vapor to the air during the growing season than an acre of frog pond or slough. Corn is a great vaporizer, for every

on of corn consumes and emits in form of vapor over 300 tons f water. Oats and barley consume still more per ton.

Our streams, lakes and ponds have been partially dried up y breaking up our lands and causing the soil to absorb and old a much larger portion of rainfall than in the old time. It used up in growing our immense crops, and that certainly is etter than to let it run into ponds and sloughs to breed iasma and bullfrogs.

We need millions more of tile in the soil of Iowa. And while they carry off the surplus in wet seasons, they do much more good by conserving moisture in times of severe drouth. Tile drains aerate the soil, and thereby the plants receive the elements needful for their growth.

ADVANCEMENT OF SCIENCE.

[Baltimore Sun.]

At the meeting in Columbus, Ohio, of the American Assocition for the Advancement of Science, an attempt was made by Mr. A. R. Wallace to classify the discoveries and inventions to which the progress of mankind is mainly due Two groups were formed—the first containing the epoch-making advances achieved previous to the present century, and the second embracing those of equal value that have had their origin in the present century. In the first group are fifteen items, in the last twenty-four—the progress of the world in the nineteenth century appearing to exceed that of all the previous centuries put together. In the first list are placed alphabetical writing and Arabic notation. Both originated in prehistoric times. In the fourteenth century comes the mariner's compass, and in the fifteenth the printing press. The seventeenth century gave us the telescope, the barometer, the thermometer, differential calculus, the recognizing of the attraction of gravitation, the laws of planetary motion, the knowledge of the circulation of the blood, and the measurement of the velocity of light. The early steps of the evolution of the steam engine and the foundation of modern chemistry and electrical science belong to the eighteenth century.

Since 1800 the doctrine of the correlation and conservation of forces has been established, and the nebular theory has been set forth. The spectroscope and the germ theory of diseases belong to this period. To be added are the electric telegraph, the telephone and the phonograph. The Bessemer process of making steel, the use of anesthetics, the railway, and the steamship. Mendeleeff's periodic law in chemistry, the molecular theory of gases, Lord Kelvin's vortex theory of matter, the discovery of the glacial period in geology, and the establishment of the origin and antiquity of man—these also belong to the nineteenth century. The list might be extended, but this imperfect enumeration indicates that what has been accomplished in physical science alone has been very considerable. It is, however, hardly just to primitive man not to give him fuller credit for the invention of language, the use of fire, the discovery of metals, the taming of animals, the discovery and discrimination of useful grains, herbs and fruits, the utilization of tools, and the arts of building and navigation. Some of these things look easy now, but they were not so obvious to our remote ancestors.

TOTAL ECLIPSE OF THE SUN, MAY 28, 1900.

[Prof. F. H. Bigelow, U. S. Weather Bureau, in the National Geographic Magazine for January, 1900.]

The path of the shadow of the approaching total eclipse of the sun, May 28, 1900, begins at sunrise over the Pacific ocean, just to the west of Mexico, extends thence northeastward over the southern states from New Orleans, La., to Norfolk, Va., crosses the middle portions of the north Atlantic ocean to Portugal, and terminates near the northern end of the Red sea at sunset. The location of this track in the United States is remarkable for its convenient accessibility to a multitude of people who, with a minimum of trouble, can easily view the wonderful phenomenon of the solar corona. The track passes over New Orleans, La., centrally, touches Mobile, Ala., on the southern, and Montgomery, Ala., on the northern edge, passes just to the north of Columbus, Macon, Milledgeville, and Augusta, Ga., a few miles south of Atlanta, Ga., a little north of Columbia, S. C., just south of Charlotte, N. C., and quite centrally over Raleigh, N. C., and Norfolk, Va. It is easily computed that more than half a million persons will see the total eclipse, of more or less duration, from their homes, and it is not unlikely that many more will take advantage of the opportunity to see the event of a lifetime. Educators ought to encourage their students to go to the track at some point of it, and thus arouse in them a practical interest in solar physics. Transportation companies should find an opportunity, quite equal to an exposition, a yacht race or a grand parade, of enticing many to make such an excursion. The fact that the track, instead of falling on the inaccessible places of the earth, is so near to suitable hotel accommodations, will make the event one of unusual popularity in the United States.

The United States Weather Bureau has been conducting a cloud survey of the region near the track during the seasons of 1897, 1898 and 1899, with the object of determining the localities which have the least tendency to cloudiness at that time of the year. The result is, that near the Atlantic coast and extending back into North Carolina the prevailing cloudiness at the morning hour of the eclipse, 8 A. M. to 9 A. M., is about 40 per cent. In the states of Georgia and Alabama the percentage falls to less than 20 per cent. Near the Gulf of Mexico, in Mississippi and Louisiana, it rises again to more than 30 per cent. Hence it follows that the chances for fair weather are about twice as good in Georgia and Alabama—that is, on the highland of the southern end of the Appalachian system—as near the coast in either direction. Unfortunately the duration of the totality on the central line increases from 1 minute, 13 seconds, near New Orleans, La., to 1 minute, 42 seconds, near Norfolk, Va., so that astronomers would naturally select stations as near the Atlantic coast as possible, in order to secure the longest look at the corona. Since the probability of cloudiness is a maximum at the very part of the track where the duration of the eclipse is greatest, there must be some balancing of chances in selecting the sites of the observing stations.

JANUARY CLIMATOLOGY.

EXTRACTS FROM THE CLIMATE AND CROP BULLETIN OF THE UNITED STATES WEATHER BUREAU.

The month of January, 1900, was milder than usual in all parts of the country, with the exception of a portion of the south Atlantic and east gulf states, including the Florida peninsula, where the average temperature was slightly below the normal. From the upper lake region westward to Idaho, including the middle Rocky mountain slope and lower Missouri valley, the month was exceptionally mild, the temperature excess ranging from 6° to 18°, being most marked in northern Minnesota, the Dakotas and eastern Montana. On the Pacific coast the month generally averaged from 3° to 16° warmer than usual, except in central California, where the excess was somewhat less marked.

As a whole the precipitation during January was much below the average, although portions of the gulf and south Atlantic states, lower lake region, New England, and limited areas in the upper Mississippi received more than the usual

amount. Generally throughout the central valleys, upper lake region and in the Rocky mountain districts, the month was marked by exceptionally light precipitation, portions of the middle Rocky mountain slope and Missouri valley receiving no appreciable amount, and while a marked deficiency exists on the Pacific coast, from two to more than ten inches fell along the immediate coast from central California northward. In portions of eastern Texas and southern Louisiana, and along the south Atlantic and New England coasts there was more than the usual amount of precipitation, the excess over limited areas ranging from one to two inches.

At the close of the month there was but little snow on the ground, except in the lake region and New England, the northern portions of which are covered to depths ranging from three to sixteen inches.

The weather conditions during January, 1900, have been generally favorable for winter wheat, except in New York, Pennsylvania, North Carolina, Ohio and Michigan, although the extremely cold weather of the first and last days of the month, especially the latter period, was damaging in nearly all sections, as the crops had little or no snow protection. With the exception of Ohio and Michigan and a limited area in Indiana, winter wheat was generally in excellent condition prior to the cold period at the close of the month. Unfavorable reports continue from Ohio and Michigan. In the first named state the plant is in very tender condition, with no snow protection, and in the latter state it is small and the fields look poor, especially on high lands. Some injury by hessian fly is quite generally reported, but it is difficult at this time to determine the full extent of the damage. On the Pacific coast the weather has been very favorable and the crop is unusually promising.

Some plowing was done in West Virginia, Illinois, Kansas and Oklahoma during the mild weather.

CLIMATOLOGY OF THE MONTH.

January was phenomenally mild and pleasant, with much less than the usual number of stormy and wintry days. During a portion of the first half of the month the soil in the central and southern district was unfrozen, and for a number of days plowing operations were carried on in numerous localities. The conditions were especially favorable for stock feeding, and securing the forage in the cornfields. The roads were generally good during the larger part of the month. The temperature during more than half the month was spring-like, the mean ranging above 32°.

Barometer.—The mean pressure was 30.14 inches; highest observed, 30.61, at Clarinda on the 28th; lowest observed, 29.57, at Cresco and Davenport, on the 24th; the range for the state was 1.04 inches.

Temperature.—The monthly mean, as deduced from reports of 101 stations, was 25.6°, which is about 8.5° above the January normal for the state. The mean temperature of the northern section was 22.8°; central section, 25 9°; southern section, 28 2°. The highest monthly mean was 33.2° at Burlington; lowest monthly mean, 19° at Cresco. The highest temperature reported was 66° at Ottumwa, on the 4th; lowest, 20° below zero at Ruthven, on the 29th. The average monthly maximum was 52.3°; average monthly minimum, 12° below zero; the greatest daily range was 51° at Council Bluffs; average of greatest daily range, 38.7°.

Precipitation.—The average for the state, as determined from reports of 133 stations was .53 of an inch, which is .69 of inch below normal. The average of the northern section was .41 of an inch; central section, .50 of an inch; southern section, .52 of an inch. The largest amount reported was 2 47 inches at Mooar; least amount, a trace at Hamburg Galva, Guthrie Center, Odebolt and Scranton. The greatest daily amount reported was 1.50 inches at Ft. Madison, on the 17th. The average number of days on which .01 of an inch or more fell was 3.

Wind and Weather.—Prevailing direction of wind, northwest; highest velocity reported, 60 miles per hour from northwest at Sioux City, on the 24th. There were 16 clear days, 7 partly cloudy and 8 cloudy.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES. Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.10	30.45	8	29.57	24
Des Moines	30.16	30.47	28	29.63	24
Clarinda	30.20	30.61	28	29.73	13
Cresco	.....	30.48	8	29.57	24
Dubuque	30.11	30.46	8	29.62	24
Omaha, Neb	30.13	30 51	28	29.67	24
Keokuk	30.12	30.44	8	29.72	24
Sioux City	30.15	30.55	28	29.66	24
Means	30.14	30.61	28	29.57	24

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	6,284	27	W	22
Des Moines	6,117	30	S	22
Dubuque	6,452	34	NW	25
Keokuk	6,371	32	SW	22
La Crosse, Wis	6,070	30	NW	22
Omaha, Neb	6,796	34	NW	24
Sioux City	9,401	60	NW	24

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* January was unusually warm and pleasant. Aurora observed on evening of 20th; first seen about 8 P. M., as a low arch in north. At 10.05 P. M., a fine bright beam of light was observed extending from a point S. of W. to S. horizon, and later to S. E. horizon; other bright patches were noticed in N. W. and S. W. near horizon; ten minutes later the entire manifestations were gone.

BEDFORD—*E. H. Griffin.* Many farmers plowed on the 22d, 23d and 24th; roads were dry and dusty more than ten days.

BONAPARTE—*Hon. B. R. Vale.* A pleasant month, and mostly good for feeding and pasturing stock; no extremely cold weather.

CLARINDA—*A. S. Van Sandt.* Highest barometer 30.61 inches on 28th, lowest 29 73 inches on 13th; mean 30 20 inches.

CLINTON—*Dr. Luke Roberts.* The mean temperature for the month to the 24th was 31.5°; for the last seven days, 11.4°; precipitation, 1 31, which is .58 of an inch below normal. Movement of wind, 4,000 miles; maximum velocity, 23 miles an hour on the 25th; ground bare, and roads good except last few days.

FONDA—*H. P. Barron* The elevation of this station is 1,237 feet. A very fine month, with no severe storms nor extremely cold weather; very favorable for stock, which is doing well.

FT. MADISON—*Miss L. A. McCready.* The Mississippi river closed for the second time on the 29th. Very fine weather during month, until the 27th.

GREENFIELD—*J. G. Culver.* From the 8th to the end of the month the only snow on the ground was a few drifts in shady places.

GRINNELL—*A. O. Price.* Ground bare of snow; less than an inch fell during the month; zero temperature on the 1st and on the last four days; fine weather for stock.

GUTHRIE CENTER—*C. Holden.* Light snow fell on the 15th, ıt not enough to cover ground. Last of month cold.

HARLAN—*C. A. Reynolds.* A remarkable January for mild-ːss of temperature and small amount of storm and snow; ıe for feeding and care of stock.

HUMBOLDT—*H. S. Wells.* Open weather till the last week; ore sickness, but fewer deaths than in January, 1899.

LAMONI—*T. J. Fitzpatrick.* Farmers improved the time owing till the middle of the month. Scarcity of water ported.

LARRABEE—*H. B. Strever.* Ideal weather for feeding stock ıd taking care of corn stalks.

LOGAN—*Mrs. M. B Stern* A remarkable month for moder-ːe weather; many days mild as spring.

RIDGEWAY—*Arthur Betts.* Fields bare at end of month; ery mild January; no frost on 7th, 9th and 24th. Cold the ıst week; eleven days spring temperature, the mean not lower ıan 32°; 169 hours of sunshine; six days below zero tempera-ıre.

STORM LAKE—*M. L. Fuller.* Temperature fell 45° within eighteen hours following noon of the 24th; snow on ground only seven days during month; roads dry most of the time.

VILLISCA—*C. E. Matteson.* An unusual amount of sunshine during month; stock doing well, and no hog cholera reported near station.

WASHTA—*H. L. Felter.* Wild geese were observed flying north on the 22d.

MUSCATINE—*Mrs. J. P. Walton*, in Muscatine *Journal*, reports as follows: The highest range of thermometer, 55°. The lowest range of thermometer, 8° below zero. Mean temperature, 28.43°. Mean thermometer for January for sixty years, 22.04°. There have been in the past sixty years eight Januarys warmer than this, the warmest being that of 1880, with a mean temperature of 35.16°. The coldest January in sixty years was that of 1875, with a mean temperature of 8.81°. The highest range of barometer was 29.66 inches; the lowest range, 28 95 inches. The rainfall was 1.72 inches. The average for January for fifty years is 1.85 inches. The largest rainfall for January was in 1873, being 6.49 inches; the smallest was in 1872, being .03 inches.

CLIMATOLOGICAL DATA FOR JANUARY, 1900.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT. Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	PRECIPITATION, INCHES. Total.	Departure from the normal.	Greatest in 24 hours	Total snowfall (unmelted).	Number rainy days	SKY. Number clear days.	Number partly cloudy days.	Number cloudy days.	Prevailing direction of wind.
Algona*	Kossuth	1,500	7	22.7	+ 8.5	51	22	-18	31	.....	.63	+ 02	.25	6.2	5	12	11	8	NW
Alta	Buena Vista	1,519	8	23.3	+ 8.3	56	22	-15	28	42	.45	- .32	.24	2.0	5	16	8	7	NW
Alta (near)	Buena Vista	.....	..	.....	.....	...	.....	..	...	..	.38	.....	.20	2.0	3	...	..	...	.....
Bancroft	Kossuth	.....	..	23.1	...	53	22	-16	31	39	.50	.....	.20	5.0	3	15	9	7	NW
Britt	Hancock	1,230	..	22.1	...	45	6	-15	31	40	.63	.....	.30	5.0	4	10	17	4	NW
Charles City	Floyd	1,012	8	22.4	+ 1.2	43	22,24	-14	31	37	.58	- .71	.25	3.0	4	12	7	12	NW
Clear Lake	Cerro Gordo	984	..	21.8	...	45	22	-17	31	37	.55	.....	.20	5.5	4	17	3	11	NW
Cresco	Howard	1,312	27	19 0	+ 8.7	40	21	-18	31	32	.80	- .43	.30	7 0	7	10	9	12	NW
Decorah	Winneshiek	900	6	20 2	+ 7 7	43	22,24	-17	31	39	1.07	- .19	.45	7 0	5	.....	.....	.....	.....
Dows	Wright	.....	...	22 8	...	51	22	-15	31	44	.35	.....	.10	3.5	4	16	4	11	8
Eagle Grove †	Wright	.....	.....	21 3	...	...	.....	...	.....	.....	.....	.....	.....	.....	...	...	...	...	.....
Elkader	Clayton	.....	19	24.5	+11.5	54	22	-12	31	38	.73	- .77	.31	3.0	3	14	6	11	NW
Emmetsburg	Palo Alto	.....	.....	.....	.....	...	.....	.....	.....	.....	.36	.....	.23	.....	2	..	..	..	.....
Estherville (a)	Emmet	.....	.....	.....	.....	51	22	-17	31	.....	.....	.....	.....	.....	...	...	...	...	.....
Fayette	Fayette	1,000	9	22.2	+ 7.5	44	22,24	-14	31	32	.88	- .56	.39	4.9	6	14	4	13	NW
Fonda	Pocahontas	1,237	....	22 4	....	56	22	-14	30	44	.85	.....	.50	8.2	3	18	6	7	SE
Forest City	Winnebago	1,220	.....	21.4	.....	50	22	-17	31	40	.65	.....	.30	4 0	3	14	8	9	NW
Grand Meadow *	Clayton	.....	8	21 8	+ 6.9	40	22,23,24	-14	31	.....	.64	- .79	.25	6.0	5	14	7	10	SW,NW
Greene	Butler	943	.....	23 6	.....	47	22	-13	31	35	.55	.....	.17	6.0	5	9	10	12	W
Hampton	Franklin	1,240	9	23.3	+ 9.4	53	22	-14	31	40	.47	- .76	.16	4.0	5	14	9	8	NW
Hawkeye	Fayette	.....	6	.....	.....	...	.....	.....	.....	.....	.96	.....	.40	7.5	6	...	...	...	.....
Hoprig	Emmet	.....	.....	.....	.....	...	.....	.....	.....	.....	.25	.....	.15	2.5	2	16	6	9	NW
Humboldt	Humboldt	1,082	6	24.5	.....	52	22	-13	31	40	.27	- .22	.13	.....	3	19	4	8	NW
Lansing	Allamakee	.....	.....	24.7	..	51	22	-13	31	44	1 05	.....	.49	9.4	3	12	4	15	.....
Larchwood	Lyon	.....	.....	23.6	.....	59	13	-15	31	40	.05	.....	03	.2	2	15	9	7	NW
Larrabee	Cherokee	.....	8	23 2	+ 6.7	57	22	-16	31	42	.35	- .29	.17	.8	3	12	16	3	NW
Le Mars	Plymouth	1,221	..	25.4	...	58	13	-13	28	39	.24	.....	.20	2.5	2	19	7	5	S
Mason City	Cerro Gordo	1,130	5	20 8	+ 6 1	48	22	-18	31	34	.70	- .66	.40	3.0	3	...	...	...	.....
New Hampton	Chickasaw	1.166	...	21 4	....	42	22	-15	31	34	1 22	.....	.52	7.0	4	17	4	10	NW
Northwood	Worth	1,210	.....	21 2	....	49	22	-16	31	38	.65	.....	.50	5 0	2	24	0	7	N,S
Osage	Mitchell	1,178	8	20.4	+ 8.0	43	22	-17	31	38	.93	+.01	.33	7.0	7	9	11	11	NW
Plover	Pocahontas	.....	..	25.1	...	55	22	-14	31	42	.35	.....	.10	2.5	4	22	2	7	S
Primghar	O'Brien	.....	.....	27.0	.....	60	20	-16	31	47	.10	.....	.10	1.0	1	...	...	...	SE
Ridgeway	Winneshiek	.....	...	24.4	.....	45	20,22	-16	31	36	1.65	.....	.60	6 6	13	13	7	11	NW
Ruthven	Palo Alto	.....	.....	.....	.....	...	..	-20	29	.....	.47	.....	.25	4 0	5	13	12	6	NW
Sheldon(a)	O'Brien	1,406	.....	25.0	.....	55	13	-15	28,31	40	.27	.....	.10	1 7	5	18	6	7	S, NW
Sibley	Osceola	1,506	6	22.6	+ 9.9	55	13	-17	31	39	.22	- .58	.10	1.2	4	16	9	6	NW
Sioux Center	Sioux	..	.....	23.4	.....	54	13	-15	28	31	.15	.....	.10	1.5	2	14	6	11	NW
Spirit Lake	Dickinson	.....	5	22.3	+ 8.6	51	22	-16	31	38	.32	- .25	.12	2.0	4	18	2	11	S
Storm Lake	Buena Vista	...	10	24 2	.....	54	22	-14	28,31	38	.35	- .46	.20	2 1	3	16	9	6	NW
Washta	Cherokee	.....	.....	.....	.....	...	.....	.....	.....	.....	.34	.....	.22	T	2	20	6	5	NW
Waverly	Bremer	942	....	23 3	.....	46	22	-12	31	34	.64	.....	.22	.....	5	11	9	11	NW
West Bend *	Palo Alto	.....	6	21.9	+ 6.3	53	22	-15	31	.....	.70	- .06	.20	6.5	6	14	7	10	NW
West Union	Fayette	1,105	.	.....	.....	...	.....	.....	.....	.....	.45	.....	.30	4.5	4	13	0	18	NW
Average	.....	.....		22.8	+ 7.7	50.2	.....	-15.2	.....	38.4	.57	- .41	.....	4 2	4	15	7	9	NW

CENTRAL SECTION.

Amana	Iowa	.....	23	26.9	+12.5	49	24	-10	31	35	.72	- .82	.37	.5	7	17	4	10	NW
Ames	Story	936	19	26.4	+10 6	54	22	-11	28,31	28	.38	- .66	.33	T	2	18	1	12	.....
Audubon	Audubon	....	6	26.0	+ 7.8	52	22	-12	28	41	.37	- .35	.27	1.0	2	6	14	11	NW
Baxter	Jasper	.....	...	24.2	.....	53	22	-12	30	46	.26	.....	.16	1.0	3	8	13	10	SE
Carroll	Carroll	.....	9	24 0	+ 5.5	59	13	-14	28	46	.18	-1.05	.13	.5	2	23	1	7	.....
Cedar Rapids	Linn	744	17	28 4	+11.7	53	22	-10	31	35	.61	- .99	.26	.....	3	16	5	10	NW
Clinton	Clinton	609	8	27.0	+ 8.3	51	24	- 8	31	31	1.31	- .87	1.00	1.2	4	12	6	13	W
Coon Rapids	Carroll	....	.....	26 5	.....	51	22	-15	28	44	26	.....	.16	0 5	2	16	10	5	NW
Davenport	Scott	615	27	28.2	+ 7	52	24	- 8	31	30	1.27	- 45	.92	1.6	7	15	4	12	NW
Delaware	Delaware	1,084	8	24.1	+10.8	46	22	-13	31	37	.74	- .48	.22	1.0	5	15	5	11	NW
Denison	Crawford	1,192	6	26.1	+ 6.1	54	22	-14	28	34	.20	-1.26	.15	T	2	21	6	4	N
Des Moines	Polk	867	21	27.5	+ 9	54	22	-10	28	40	.20	-1.05	.18	- .6	3	10	10	11	N
De Soto	Dallas	866	.....	26 9	.....	53	22	- 9	28,31	41	.20	.....	.13	.....	3	17	6	8	NW
Dubuque	Dubuque	655	26	25.6	+ 8	49	22	-13	31	32	1.15	- .47	.35	4.9	7	13	6	12	NW
Fort Dodge	Webster	.....	.....	.....	...	58	22	-14	28	40	.10	.....	.10	1.0	1	19	7	5	SW,NW
Galva	Ida	.....	6	24.5	+ 9.1	57	22	-13	28	37	T	- 44	T	.....	0	20	8	3	NW
Gilman	Marshall	1,035	..	....	.....	...	.....	....	.....	....	14	.....	.14	T	1	18	4	9	N,S
Gladbrook	Iowa	.....	...	.....	.....	...	.....	.....	.....	.....	1.35	.....	.50	2.0	3	...	...	...	.....
Grinnell	Poweshiek	1,011	9	25.8	+ 7.5	48	23	-10	31	34	.54	- .87	.28	T	2	13	7	11	W
Grinnell (near)	Poweshiek	.....	.....	26.2	.....	48	22,24	-11	31	38	.70	.....	.32	.7	5	15	4	12	NW
Grundy Center	Grundy	966	8	22.4	+ 7.5	50	21	-15	31	39	.42	- .33	.20	4 0	3	17	5	9	NW
Guthrie Center	Guthrie	1.269	....	28 5	.....	52	22	-11	30	48	T	.....	T	T	0	21	3	7	N
Harlan	Shelby	.....	.....	26.0	...	52	22	-12	28	47	.35	.....	.32	.3	2	10	12	9	NW
Independence	Buchanan	921	37	23.2	+ 8 4	46	22,24	-13	31	36	.34	- .96	.20	3.2	5	17	3	11	SW, NW
Iowa City	Johnson	644	9	27.1	+ 6.1	54	23	-10	31	38	.73	-1.30	.43	1.0	3	14	6	11	NW
Iowa Falls	Hardin	.....	6	22.2	+10.0	48	22	-13	31	38	.46	- .45	.15	4.0	5	17	5	9	NW
Le Claire	Scott	.....	.....	.....	.....	...	.....	...	.. ..	.....	1.16	.....	.81	.....	6	...	...	..	.....
Logan	Harrison	928	34	27.1	+ 6.8	53	24	-10	31	37	.20	- .99	.20	.....	1	16	9	6	S
Maquoketa	Jackson	.....	6	25.7	+ 7.9	54	23	-11	31	38	83	- .88	.43	2.5	4	17	2	12	NW
Marshalltown	Marshall	898	7	26.4	+ 8.4	51	22	-12	31	41	1.08	+.24	.25	...	8	17	3	11	S
Mt. Vernon*	Linn	858	.....	24.8	.....	49	24	-14	31	.....	.....	.....	.....	.....	...	...	...	...	.....
Mt. Vernon (Hubbard)	Linn	.....	.....	26.2	.....	51	22,24	-12	31	34	.91	.....	.40	2 4	8	17	1	13	W,SW
Newton	Jasper	958	12	.....	.....	...	.....	-13	31	.....	.37	-.55	.21	T	2	17	5	9	SE
Odebolt	Sac	.....	...	26.0	.....	57	22	-12	28	41	T	.....	T	T	0	17	9	5	.....
Ogden	Boone	1,109	...	26.2	.....	54	22	-12	28,31	44	.31	.....	.16	1 2	3	17	2	12	NW
Olin	Jones	.	..	29.7	.....	49	24	-11	31	35	.81	.....	.40	2.0	4	18	4	9	NW
Onawa	Monona	.....	...	27.9	....	63	22	-10	28	44	26	.....	.22	.....	3	22	4	5	NW
Rockwell City	Calhoun	1,219	....	26.3	....	53	22	-13	31	42	.55	.....	.45	3.0	2	18	3	10	.....
Sac City	Sac	900	20	25.8	+11.9	56	22	-13	28	48	.38	-.73	.25	1.3	3	21	4	6	NW
Scranton	Greene	.....	.....	26 7	...	47	24	-11	28	40	T	.....	T	T	0	19	7	5	NW
Sioux City	Woodbury	1,122	10	26 6	+ 8	60	13	-12	28	35	.24	-.35	.18	.....	2	16	9	6	NW
Vinton* ‡	Benton	800	9	25.4	+ 8 2	50	22	-11	31	...	.20	-1.17	.20	2.0	1	22	0	9	NW
Waterloo	Black Hawk	862	20	24.1	+ 7.4	49	22	-12	31	36	.70	-.50	.25	3.5	4	18	2	11	NW
Whitten	Hardin	....	....	22.3	....	48	22	-15	31	42	.10	.....	.10	1.0	1	13	10	8	NW
Wilton Junction	Muscatine	.....	....	27.9	.....	48	22	- 8	28,31	34	1 65	.....	1.10	3.0	3	14	5	12	W
Average	.....	.....		25 9	+ 8.1	52.1	.....	-11 8	.....	38 5	.52	-.69	.....	1.8	3	16	6	9	NW

CLIMATOLOGICAL DATA FOR JANUARY, 1900—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES				Number rainy days.	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
ola	Monroe	945	....	28.8	.....	54	22,24	-10	28,30,31	50	.34	.....	.20	T	2	3	19	9	NW
lantic	Cass	.....	8	27.2	+ 8.8	53	22	-10	28	40	.40	-.37	.35	.5	2	13	8	10	NW
tavia	Jefferson	640	....	.....	.....	...	.....	...	.....	....	.06	.....	.06	T	1	...	...	...	.....
dford (b)	Taylor	....	....	28.6	.....	55	23	-10	28	45	.32	.....	.32	....	1	15	10	6	NW
lknap	Davis	857	....	28 1	.....	57	22	- 8	28,31	32	.80	.....	.31	1.0	5	24	2	5	N
rlington ‡	Des Moines	.....	....	33.2	.....	61	7,24	- 4	28	37	1.68	.....	.99	...	5	...	...	...	.....
naparte	Van Buren	....	8	29.8	+ 8.2	55	22	- 6	31	34	1.54	-.47	1.17	.....	2	..	...	...	.....
ckingham	Tama	526	...	....	.....	....	.....	....	.....	....	.42	.....	.40	0.5	2	17	4	10	.....
ssey	Marion	....	....	....	...	..	.....	.....	.....	.....	.38	.....	.23	T	2	....	....	....	.....
rson	Pottawattamie	....	....	....	.....	.....	.....	....	.....	....	.79	.....	.77	0.2	2	....	...	...	.....
nterville	Appanoose	1,013	6	29.5	+ 8.0	55	24	- 8	28,31	36	.30	-1 12	.30	.....	1	13	8	10	SW
nariton	Lucas	1,030	..	28.4	....	55	22	-10	28	43	.15	.....	.10	T	2	14	9	8	NW
illicothe	Wapello	645	....	....	.....	....	.....	....	.....	....	.72	.....	.40	....	2	....	...	...	.....
arinda	Page	1,069	9	28.4	+ 7.2	57	23	- 8	28	35	.49	-.52	.39	T	4	18	5	8	NW
rning ‡	Adams	1,127	7	28.0	+ 7.4	50	23,24	-10	28	44	.25	-.57	.25	.....	1	18	5	8	NW
llege Springs	Page	....	8	29.0	+ 6.5	53	23	- 8	23,31	44	.22	-.36	.22	.....	1	20	6	5	NW
uncil Bluffs	Pottawattamie	989	.	28.8	.....	63	22	- 8	25	51	.19	.....	.14	...	2	20	3	8	S
mberland	Cass	...	...	....	.....	...	.....	....	.....	...	.10	.....	.10	1.0	1	13	9	9	N
nville	Des Moines	715	...	....	.....	....	.....	....	.....	.....	1.20	.....	.50	1.0	5	17	5	9	.....
don	Wapello	....	....	30.0	.....	58	22	- 8	28,31	38	.57	.....	.32	.3	4	20	2	9	W
merson	Mills	.....	.....	.....	.....	.....	.....	.....	.....	.....	.29	.....	.23	.6	2	..	...	....	.....
irfield ‡	Jefferson	767	13	29.0	+13.6	53	24	- 7	31	34	.83	-.93	.58	T	2	15	7	9	.....
. Madison	Lee	516	51	....	.....	....	.....	....	.....	....	2.00	.....	1.50	.....	2	13	7	11	SW
lenwood	Mills	979	29	30 0	+12.3	56	22	- 8	28	45	.27	-.61	.27	T	1	10	15	6	NW
reenfield	Adair	....	8	26.3	+ 6.2	52	22	-12	28	50	.33	- 76	.29	.3	2	....	..	..	.....
riswold	Cass	.....	....	....	....	..	.....	....	....	....	.34	.... ..	.34	T	1	16	3	12	S
amburg	Fremont	912	....	....	.....	....	.....	....	.....	....	T	.....	T	T	0	15	11	5	NW
edrick	Keokuk	.....	.	28.2	.....	53	22	- 9	31	37	.27	.....	.16	.5	3	19	0	12	NW
opeville	Clarke	.....	8	27.8	+ 7.4	51	22 23	-10	28	41	.17	-.99	.11	T	2	9	15	7	NW
ndianola (a)	Warren	.....	7	27.7	+ 8.4	52	22	-10	28	42	.39	-1.10	.27	1.6	4	....	...	...	NW
eokuk	Lee	618	28	32.0	+ 8	57	22	- 4	31	33	2.46	+ .62	1.46	.....	6	15	9	7	NW
eosauqua	Van Buren	.....	7	30.0	+ 7.6	56	22	- 6	31	32	.75	-1.08	.72	T	2	....	....	....	.....
acona	Warren	....	..	.....	.....	....	.....	....	.....	....	.25	.....	.15	T	2	11	10	10	.....
amoni	Decatur	....	....	29.0	....	53	23	- 9	28	42	.23	.....	.12	....	2	21	1	9	NW
enox	Taylor	....	....	27.8	.....	51	23	-11	28	43	.39	.....	.39	T	1	21	5	5	S
ockridge	Jefferson	.....	...	....	....	..	.....	....	.....	...	.15	.....	.10	1.5	2	17	8	6	W
elrose	Monroe	850	...	....	.....	....	.....	....	..	.....	....	.....	.....	.....	....	12	0	19	NW
looar ‡	Lee	.....	...	30.6	.....	58	24	- 4	28,30,31	31	2.47	.....	1.48	.....	6	17	7	7	NW
lt. Ayr	Ringgold	1,236	6	27.8	+ 5.6	52	13,22-24	-10	28	46	.24	-1.08	.19	T	2	11	14	6	W
lt. Pleasant	Henry	725	....	26.0	.....	51	24	-12	31	39	1.23	.....	.97	T	2	14	10	7	NE
maha (Neb.)	Douglas	1,113	...	29 6	...	57	22	- 8	28	33	.15	-.54	.14	T	2	15	8	8	NW
sceola	Clarke	1,123	...	27.9	....	54	22	-10	28	43	.19	...	.11	1.0	2	7	17	7	NW
vid	Wayne	.....	6	28.0	+ 5.4	57	22	- 9	28,31	44	.25	-1.76	.15	T	4	15	2	14	NW
skaloosa	Mahaska	850	16	24.5	+ 6 9	55	22	-10	28,31	37	.34	-.62	.16	.6	5	17	3	11	N W
ttumwa	Wapello	630	5	29 8	+ 7.2	66	4	- 6	28,31	37	.50	-2.00	.40	1.0	2	19	3	9	W
ella	Marion	.....	...	23.8	....	47	22	-10	28,31	40	.10	.....	.10	.....	1	16	7	8	SW
ed Oak	Montgomery	1,033	....	31 6	.....	58	7,23	- 8	28	33	.34	.....	.34	.5	1	18	3	10	S
igourney	Keokuk	....	..	28.8	.....	55	22	-10	31	39	.32	.... ..	.13	.3	5	18	7	6	NW
tuart	Guthrie	....	..	24.4	....	48	23	-12	28,31	30	.....	.....	.....	.....	...	..	....	..	N
hurman	Fremont	...	..	28.6	.....	57	13	-5	28	41	.80	.....	.60	T	2	17	3	11	SW
illisca	Montgomery	1,058	6	26.8	+ 6 0	50	7,23,24	- 9	28	37	32	-.40	.32	.....	1	21	4	6	S,NW
apello	Louisa	578	....	29.4	...	53	24	- 6	31	30	1.40	.....	.72	1.2	4	17	3	11	NW
ashington	Washington	738	8	26.4	+ 4 9	54	24	-11	23,31	38	.74	-1.08	.52	.....	3	....	..	...	SW, NW
interset	Madison	....	8	27 0	+ 7 2	52	22	-11	28	31	.23	-.88	.23	T	1	....	..	....	.....
oodburn	Clarke	....	....	.....	....	.....	.....	...	.....	....	.27	.....	.10	1.0	3	16	8	7	.....
Average		....	...	28.2	+ 7 3	54 7	.....	-8.9	.....	39 3	.50	-.75	.....	0.8	2	16	7	8	NW
Av. for the state		.....		25.6	+ 7.7	52.3	.....	-12.0	...	38.7	.53	-.62	.....	2.3	3	16	7	8	NW

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JANUARY, 1900.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Albia	Max.	22	26	31	44	47	50	53	49	52	45	40	46	47	52	40	42	35	32	40	47	50	54	52	54	47	27	35	21	36	40	15	41 0
	Min	0	7	3	9	21	27	30	22	28	17	21	18	25	30	28	30	28	27	25	24	21	27	28	35	7	3	8	-10	- 4	-10	-10	16.6
Alta	Max.	18	20	32	38	38	48	42	40	41	27	40	38	48	31	35	30	32	34	50	43	48	56	40	46	18	28	16	5	36	4	6	33 1
	Min	2	-5	3	20	15	23	29	24	25	8	15	17	22	25	26	24	27	25	22	32	25	29	22	8	0	4	- 4	-15	- 6	-12	-14	13 5
Amana	Max.	20	26	31	43	40	42	46	40	47	33	37	35	37	38	38	35	34	34	33	43	44	48	44	49	38	22	28	14	33	5	6	34 3
	Min	6	6	2	26	29	23	34	22	33	23	24	27	26	30	33	33	32	29	27	27	21	27	32	34	7	4	13	- 8	- 2	- 6	-10	19.5
Ames	Max.	20	22	30	40	36	42	42	41	45	30	41	32	47	42	36	36	33	33	41	42	48	54	44	48	22	23	24	10	...	...	...	38 0
	Min	5	3	5	25	24	20	32	23	28	13	10	19	25	28	30	30	30	26	21	23	22	26	29	26	5	4	9	-11	- 2	- 7	-11	16 8
Atlantic	Max.	22	24	38	45	43	43	52	40	44	29	41	43	48	48	41	41	34	32	44	47	48	53	50	50	21	31	23	9	34	19	9	27 1
	Min	9	5	-1	25	23	22	25	22	29	22	25	22	22	29	27	30	30	26	22	22	18	23	23	17	7	5	5	-10	- 1	- 5	- 8	17 4
Audubon	Max.	19	19	39	44	41	46	47	43	42	28	41	42	46	43	39	34	34	32	44	46	46	52	47	48	20	31	22	7	38	15	8	35 6
	Min	8	2	3	1	26	26	29	30	23	19	24	24	26	30	29	30	30	22	17	30	23	29	30	20	5	5	1	- 2	- 3	- 7	-10	16 5
Barcroft	Max.	27	25	31	30	34	43	42	44	43	38	36	30	42	40	37	32	33	33	43	41	46	53	46	44	21	24	20	4	31	15	4	31 4
	Min	3	0	-2	13	11	21	31	16	25	15	16	13	29	21	28	25	28	27	15	18	24	30	20	17	-1	1	1	-13	- 8	2	-16	12 8
Baxter	Max	20	25	32	43	39	42	45	40	46	27	41	33	44	32	36	33	33	30	37	45	49	53	45	50	21	31	2.	7	38	8	9	31 2
	Min	4	1	7	26	2	34	23	25	15	15	18	19	22	28	20	29	16	22	21	22	27	28	32	4	3	4	-11	- 9	- 8	-12	- 8	14 3
Bedford	Max	...	..	37	47	47	42	51	37	49	31	44	42	52	46	42	37	36	33	41	40	50	53	55	53	34	37	32	18	40	10	14	30 8
	Min	...	..	-2	12	22	23	32	22	33	22	22	22	23	26	32	29	29	27	21	20	17	22	23	29	4	7	14	-10	- 5	- 5	- 7	17 4
Belknap	Max	18	28	38	40	44	50	54	48	50	34	41	39	47	40	44	37	34	33	37	45	50	57	53	54	21	29	30	10	31	9	12	32 3
	Min	- 2	8	5	28	30	29	37	24	28	20	21	21	27	30	30	32	31	30	26	26	22	26	28	21	9	7	12	- 8	- 1	- 2	- 8	18 9
Bonaparte	Max	22	30	36	47	46	46	51	45	49	40	48	38	40	42	44	35	35	34	35	46	48	55	51	55	34	27	35	18	31	3	10	39 1
	Min	7	9	5	26	27	29	33	21	36	23	24	20	27	32	31	32	32	31	30	26	24	27	31	34	1	7	15	- 5	0	1	- 0	20 6
Britt	Max	21	23	30	39	39	45	40	43	42	22	37	29	39	39	39	33	32	31	36	40	43	41	40	42	22	23	21	5	33	18	2	31 9
	Min	3	0	-5	18	13	19	25	16	25	5	11	12	22	25	28	28	27	23	13	21	28	28	24	17	-1	-2	6	-13	- 7	-12	-15	11 3
Burlington	Max.	38	40	43	52	58	46	61	51	49	46	43	39	49	44	52	37	36	34	36	52	54	59	58	61	40	37	41	21	35	31	29	44 3
	Min	4	9	6	26	30	29	36	24	37	26	25	27	32	33	32	32	32	32	31	32	27	25	29	34	32	13	8	16	- 4	0	1	3
Carroll	Max	20	22	39	44	39	46	47	58	40	30	43	42	59	34	39	32	36	35	50	47	50	55	46	48	19	30	20	0	40	7	8	33 1
	Min	2	-1	-2	22	21	23	30	23	34	12	20	18	20	22	25	26	28	22	15	25	22	27	25	25	1	3	14	-14	- 6	-11	-12	14 8
Cedar Rap	Max	30	28	35	48	45	47	48	44	49	44	41	43	42	45	42	38	36	37	38	42	48	53	48	50	27	23	28	11	35	21	6	37 2
	Min	7	7	5	27	28	24	30	22	30	24	24	27	25	30	33	30	30	28	25	26	22	28	31	27	6	5	9	- 9	0	- 6	-10	18 9
Centervi le	Max.	25	26	38	43	48	44	45	47	50	42	43	40	46	47	43	37	34	31	36	46	48	50	52	55	42	30	34	20	35	28	10	39 2
	Min	7	5	5	30	26	28	25	28	40	20	20	20	24	30	30	31	26	30	30	25	30	28	30	32	9	6	16	- 8	- 1	0	- 8	19 8
Charlton	Max.	17	26	36	44	46	44	51	47	54	31	45	40	49	47	41	36	32	33	34	49	50	55	53	44	34	30	31	16	40	32	9	38 6
	Min	6	2	4	27	25	29	31	24	30	18	20	20	26	30	30	30	30	27	24	24	18	24	28	33	7	5	15	- 0	- 3	- 4	- 8	15 1
Charles Cy	Max.	21	23	23	35	30	37	38	37	40	29	36	29	32	37	34	33	32	31	38	39	34	43	37	43	33	37	22	13	28	21	9	31 4
	Min	4	3	-5	5	18	16	32	17	27	13	21	17	22	25	30	27	27	24	15	10	13	25	28	31	0	0	6	-11	- 4	-10	-14	13 3
Clarinda	Max	21	26	40	43	45	44	53	39	49	30	44	47	52	47	43	36	36	33	41	51	51	54	57	52	24	31	28	10	23	8	13	38 0
	Min	9	4	5	25	27	32	31	26	29	22	26	24	25	31	28	31	31	29	28	23	21	26	24	18	9	9	8	- 8	- 3	- 3	- 6	18 7
Clear Lake	Max.	22	23	30	39	36	41	40	38	40	27	37	27	37	40	38	32	33	30	38	41	41	45	41	42	20	23	20	7	32	15	3	31 5
	Min	3	1	-1	21	13	19	26	18	25	5	17	10	19	24	28	25	25	23	8	24	16	30	26	18	-2	-3	3	-14	- 5	-10	-17	12 1
Clinton	Max	23	29	30	44	44	42	48	42	40	41	33	35	35	39	39	35	35	35	37	45	43	49	46	51	35	20	31	13	29	28	5	35 3
	Min	3	12	3	23	23	21	28	19	30	29	21	29	29	27	32	30	30	31	29	26	21	22	28	29	8	3	8	- 7	- 2	- 3	- 8	18 3
College Sps	Max	20	25	35	42	43	44	50	38	48	36	42	47	50	50	40	37	37	33	41	47	47	51	53	50	31	30	26	16	-2	34	12	38 6
	Min	7	3	7	20	27	35	30	28	36	21	24	25	25	33	28	29	29	29	23	24	22	25	32	32	8	11	16	- 8	- 2	- 5	- 8	19 5
Coon Rap	Max	20	24	37	43	37	44	45	44	45	32	42	42	46	44	38	34	33	33	44	45	45	51	44	50	27	28	21	13	40	29	9	36 4
	Min	2	2	2	26	24	25	33	25	29	14	23	21	25	29	27	29	30	24	17	32	23	29	27	20	1	7	6	-1	- 2	- 8	-12	16 6
Corning	Max.	20	26	36	39	40	42	49	39	48	36	42	43	48	46	42	38	35	33	42	47	46	49	50	50	34	31	25	22	42	24	11	37 9
	Min	6	4	1	26	26	28	31	27	34	24	23	24	25	31	28	31	28	28	21	25	20	27	27	28	1	1	15	-10	- 2	- 6	8	18 2
Co. Bluffs	Max	21	30	38	45	48	46	51	43	46	32	49	50	62	44	40	34	35	40	50	55	52	63	52	52	28	41	22	15	47	13	11	33 9
	Min	6	5	12	24	28	30	27	30	22	21	25	26	29	32	30	30	33	22	22	25	26	29	28	10	8	12	- 6	- 4	- 4	- 6	- 6	17 7
Cresco	Max.	19	22	23	34	27	36	34	35	37	25	31	27	31	32	33	31	31	28	26	38	37	39	34	40	7	17	22	- 2	21	- 4	- 2	26 2
	Min	1	2	-4	21	15	18	24	16	25	16	22	21	25	28	28	25	26	22	14	16	7	25	25	12	-2	-6	- 2	-12	- 8	-12	-18	11 3
Davenp'rt	Max.	22	29	33	46	46	45	49	43	48	33	32	33	39	41	41	34	37	35	35	46	45	50	46	52	26	21	31	10	31	19	5	35 6
	Min	6	8	8	28	31	28	31	26	30	27	25	30	30	32	32	32	31	33	31	27	27	33	30	26	9	5	10	- 7	1	- 3	- 8	20 9
Delaware	Max.	18	21	26	41	35	36	40	38	41	31	35	33	31	34	35	32	33	33	33	39	41	46	42	45	31	20	27	13	28	28	3	32 0
	Min	2	4	1	20	24	21	30	20	30	21	21	24	26	27	29	27	27	27	20	22	20	28	28	28	2	0	9	-11	- 5	- 9	-13	16 2
Decorah	Max.	20	22	26	37	32	38	37	38	39	28	33	30	32	35	34	33	33	29	31	39	41	43	41	43	8	18	24	- 1	23	- 3	- 4	28 4
	Min	2	3	3	-2	18	12	26	15	26	18	22	21	25	28	27	25	28	22	15	14	7	25	23	27	-2	-5	3	-12	- 8	-12	-17	12 1
Denison	Max.	17	20	33	42	40	44	52	37	40	28	40	45	48	35	40	37	38	40	42	52	49	54	48	40	27	35	20	10	42	7	8	35 8
	Min	1	0	1	20	20	30	32	29	28	18	16	21	30	25	30	27	28	28	18	28	25	28	28	15	3	7	0	-14	8	-11	-10	16 4
Des Moines	Max.	20	26	36	42	40	44	46	46	49	26	44	38	49	45	40	36	37	34	40	48	50	54	47	52	20	28	28	8	39	15	10	36 7
	Min	7	7	2	30	29	30	31	26	26	19	24	22	28	32	31	30	30	27	22	25	22	28	33	17	7	9	2	-10	- 1	- 5	- 8	18 5
De Soto	Max.	18	25	36	41	39	47	45	50	51	29	42	40	48	43	39	35	34	32	44	46	47	53	47	49	20	29	2	6	40	7	8	35 0
	Min	7	7	-4	28	27	25	30	23	29	16	24	23	28	31	30	31	31	28	24	27	20	27	30	20	6	5	4	- 9	- 1	- 5	- 9	17 8
Dows	Max	20	20	25	39	34	40	41	40	42	30	38	28	40	40	35	33	30	30	36	39	45	51	40	46	24	24	22	10	34	20	4	32 3
	Min	- 4	-2	-4	22	17	19	29	20	26	8	18	12	22	25	28	27	28	25	15	24	20	28	25	20	0	0	7	-12	-10	-10	-15	13 2
Dubuque	Max	19	23	31	43	41	45	46	41	43	33	34	32	35	37	36	34	34	34	31	46	45	49	43	48	20	20	28	6	27	10	2	33 6
	Min	7	8	9	26	28	23	31	22	32	27	25	28	28	31	31	29	30	29	23	25	22	31	28	20	3	0	6	- 9	- 5	- 6	-13	18 4
Eldon	Max	20	30	38	47	48	46	51	46	53	42	41	39	44	45	44	37	35	34	37	48	50	58	53	56	49	28	34	20	36	33	10	40 1
	Min	7	8	0	28	26	25	37	19	37	21	22	19	28	32	31	32	31	29	28	24	20	25	27	34	9	5	15	- 8	- 1	- 2	- 8	20 0
Elkader	Max	22	29	33	47	45	40	43	43	40	31	43	33	32	38	35	32	34	31	40	47	49	54	45	50	16	27	27	2	31	1	2	33 6
	Min	- 5	7	0	20	23	15	28	18	30	24	24	25	28	28	30	29	29	25	18	16	11	25	29	26	3	0	5	-10	- 4	- 8	-12	15 4
Estherville	Max	...	..	..	..	..	..	..	..	..	..	..	..	..	..	..	29	29	25	18	16	11	25	29	26	3	0	5	-10	- 4	- 8	-12	....
	Min	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	29	24	34	47	41	45	51	34	42	12	30	20	5	33	10	4	....
Fairfield	Max.	21	29	32	45	43	44	50	45	49	40	39	32	44	43	43	23	28	24	24	28	23	31	19	12	-1	-2	2	-15	5	-11	-17	....
	Min	7	8	5	16	28	28	39	22	35	22	22	21	27	32	32	35	34	34	36	45	41	50	47	53	43	25	32	19	34	32	8	37 6
Fayette	Max	19	22	27	38	34	41	41	39	39	27	35	30	35	36	35	33	33	33	30	29	26	25	29	33	35	10	8	16	- 6	0	- 1	- 7	20 4
	Min	4	4	-2	24	23	18	28	17	27	20	20	22	26	28	29	26	26	24	16	17	9	26	28	17	1	-3	5	-11	- 4	-10	-14	14 3
Fonda	Max	17	20	32	39	36	46	44	42	43	35	41	41	48	32	36	32	32	34	49	44	52	56	42	46	18	28	20	15	2	2	12	31 4
	Min	-10	-6	16	17	21	30	22	10	9	11	12	21	27	26	26	29	28	13	12	22*	23	24	24	2	1	3	-12	- 9	-11	-14	-13	11 4
Forest City	Max.	21	25	30	41	38	43	40	40	40	26	36	26	38	40	36	35	31	30	39	40	44	50	44	44	14	24	19	6	31	18	3	31 9
	Min	- 2	0	-2	23	12	20	20	18	22	5	17	11	19	24	28	25	23	23	9	24	20	10	22	20	-7	-4	4	-13	- 8	-12	-17	10 8
Ft. Dodge	Max.	20	18	32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32	42	42	45	58	40	40	30	28	20	8	35	3	5	....
	Min	4	10	12	22	20	20	18	22	28	8	18	15	24	22	18	30	28	25	20	15	25	30	20	30	3	0	0	-4	- 5	-10	-13	14 4
Galva	Max	19	22	35	40	39	49	50	49	43	27	40	43	50	29	43	32	35	37	40	47	49	57	40	48	16	29	24	5	19	13	6	34 8
	Min	0	0	-2	20	18	23	25	24	25	12	20	20	23	24	25	26	29	25	23	25	23	30	25	12	1	5	- 1	-13	- 5	- 9	-12	14 2
Glenwood	Max.	20	32	37	45	45	44	52	43	48	32	46	50	53	47	42	34	35	35	48	48	50	56	52	51	28	30	26	16	45	38	15	40 1
	Min	10	6	11	36	26	27	27	30	30	21	26	27	25	32	29	28	30	30	18	29	24	25	30	23	7	10	15	- 8	0	- 5	- 7	19 9
Greene	Max	22	26	26	39	34	37	45	39	39	29	39	30	35	37	35	33	32	31	39	39	45	47	41	45	31	25	23	9	32	24	4	32 6
	Min	4	2	-2	22	18	17	31	19	27	12	21	17	21	25	29	28	27	25	16	17	15	26	29	33	1	1	9	-11	- 3	- 9	-13	14 7
Greenfield	Max	20	25	38	43	45	44	49	45	49	35	43	46	49	40	42	35	35	32	42	47	47	52	50	50	17	33	25	14	41	18	12	37 5
	Min	6	3	5	23	25	30	26	24	29	16	23	20	31	24	18	30	30	22	20	26	22	28	28	15	10	4	2	-12	- 9	- 8	-11	16 1
Grinnell	Max	18	20	31	41	39	42	43	40	46	29	37	32	39	38	36	34	32	32	30	41	38	48	48	47	30	22	28	13	32	28	8	33 6
	Min	5	5	4	25	23	29	33	24	29	18	21	19	22	28	30	30	30	26	23	25	25	29	30	29	6	3	13	-10	- 2	- 6	-10	18 0
Grin'l (nr)	Max	16	20	33	41	40	42	44	41	47	30	38	32	42	38	36	34	34	36	32	42	44	48	44	48	36	38	26	15	34	29	7	35 1
	Min	- 4	3	1	22	25	25	33	21	32	17	21	17	20	28	30	30	30	27	22	24	22	27	32	33	4	12	13	-10	- 4	- 8	-11	17 2
Grundy C'r	Max.	20	21	30	40	42	40	40	42	42	29	39	32	35	40	37	35	32	33	34	45	50	41	46	25	21	27	24	5	31	9	5	32 9
	Min	3	2	-5	18	21	14	19	33	20	14	19	18	19	24	27	29	23	21	18	18	25	23	20	1	8	0	5	-13	- 5	-10	-15	12 7
Guthrie C'r	Max.	20	23	36	33	43	45	46	44	47	37	41	40	47	47	46	40	35	33	45	46	45	52	45	49	33	30	27	15	39	37	32	38 7
	Min	4	4	5	10	26	23	32	26	35	11	24	21	25	30	22	31	29	27	20	30	22	29	28	32	30	7	14	-10	- 1	-11	- 9	18 3
Hampton	Max.	23	24	29	42	37	40	39	41	42	24	40	30	39	42	35	32	33	30	40	41	48	53	44	49	15	29	25	4	37	3	4	32 7
	Min	5	1	1	24	19	20	28	22	22	10	21	14	20	25	25	27	27	24	11	26	22	30	29	13	1	2	0	-12	- 3	-10	-14	13 9
Harlan	Max.	20	24	39	44	41	43	47	40	44	28	41	43	47	43	38	33	35	34	43	47	47	52	48	49	20	30	21	6	40	25	7	36 1
	Min	7	2	2	18	26	24	27	25	26	19	23	24	23	30	28	28	29	27	19	25	19	22	27	19	4	7	5	-12	- 7	- 9	-11	16 0
Hedrick	Max.	19	26	31	44	45	45	48	44	50	39	48	42	41	42	41	36	32	32	37	45	47	53	48	52	40	24	32	18	25	32	8	37 7
	Min	6	6	3	25	25	25	32	20	35	21	18	24	25	30	30	30	30	27	27	25	20	26	30	34	8	3	13	- 8	5	- 5	- 9	18 7
Hopeville	Max.	18	24	35	42	42	44	50	45	49	30	42	41	49	49	39	35	34	31	41	47	47	51	51	50	22	29	29	7	39	29	9	37 1
	Min	7	4	5	28	26	33	33	25	28	18	23	22	26	32	29	30	30	27	22	22	25	25	31	22	7	7	7	-10	- 2	- 5	- 8	18 4
Humboldt	Max.	20	20	29	37	36	48	42	43	42	28	38	32	45	43	36	34	34	32	42	42	46	52	44	47	25	25	20	8	36	30	6	34 2
	Min	2	0	-5	23	17	20	32	21	26	10	18	16	26	27	28	28	29	27	16	26	22	28	24	25	3	0	8	-12	- 4	-10	-13	14 8
In'pend'ce	Max.	20	23	29	41	39	38	42	41	42	28	35	34	36	34	35	30	32	29	28	39	43	46	42	46	13	21	25	3	30	2	3	30 6
	Min	3	3	0	21	25	22	33	20	32	19	21	27	22	25	29	27	27	26	18	21	16	25	28	29	2	1	9	-11	- 6	-10	-13	15 8
Indianola	Max.	17	24	36	43	39	45	..	45	50	30	42	38	49	44	38

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JANUARY, 1900—CONTINUED.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean.
a Falls.	Max	21	21	28	36	31	38	38	39	41	25	37	30	39	38	37	33	33	30	35	39	42	48	38	44	15	24	23	3	34	8	4	30.7
	Min	4	0	-6	20	18	15	24	20	22	16	19	15	18	25	27	23	28	24	17	22	19	29	28	13	1	1	1	-10	- 4	-10	-13	13 6
kuk....	Max.	23	30	39	48	46	51	53	44	49	49	37	38	45	43	46	37	36	34	35	47	49	57	53	56	45	26	38	27	33	30	9	40.4
	Min.	9	10	11	28	37	36	42	26	36	25	24	23	32	35	32	32	33	32	32	28	26	31	36	34	12	9	17	- 4	3	4	- 4	23.5
sauqua	Max.	22	31	36	48	46	46	54	43	50	35	38	39	43	44	44	36	35	34	37	46	50	56	52	43	33	12	7	17	- 4	1	2	38.9
	Min.	8	10	6	28	29	29	35	21	35	23	24	21	29	33	31	33	32	31	30	26	22	27	29	33	12	7	17	- 4	3	4	- 6	21.1
ioni....	Max.	19	24	35	40	43	44	50	43	53	39	43	42	51	45	43	37	34	32	38	48	46	51	53	51	35	30	31	17	38	34	24	39.1
	Min.	7	4	4	25	28	29	35	24	37	19	22	21	24	33	28	31	31	28	23	22	20	24	31	28	7	7	14	- 9	- 4	- 3	- 8	18.8
sing....	Max.	26	30	30	42	37	40	43	44	42	41	35	35	33	34	37	35	36	34	36	48	46	51	45	48	44	20	27	15	23	26	- 1	35.0
	Min.	10	5	0	20	25	14	15	16	32	23	25	25	25	26	20	30	28	28	18	10	12	9	30	28	0	-4	3	- 8	- 8	- 8	13	14 4
chwood	Max.	18	22	32	35	32	32	46	39	40	30	37	38	59	42	32	31	32	37	33	45	53	56	42	52	12	-2	6	0	-14	- 5	-13	33.6
	Min.	2	-12	-2	11	10	22	23	24	23	1	15	14	20	24	21	22	23	24	21	52	23	26	17	13	-2	6	0	-14	- 5	-13	-15	11.5
rabee...	Max.	20	22	32	37	38	49	42	41	41	25	38	39	53	38	36	31	31	37	54	47	49	57	43	46	12	28	15	4	35	12	6	34 8
	Min.	2	- 5	-4	13	13	21	28	20	23	7	17	17	19	25	25	24	28	26	21	24	23	53	44	44	18	26	23	6	38	20	7	12.1
Mars....	Max	20	31	36	37	37	50	44	40	40	30	40	43	58	41	37	37	37	37	53	45	51	53	44	44	18	26	23	6	38	20	7	36 2
	Min.	5	- 2	-4	11	15	27	29	27	27	10	19	20	21	29	28	26	30	26	25	27	22	25	23	17	0	4	4	-13	- 1	-10	-12	14.7
ox.....	Max.	19	19	34	40	41	42	49	45	48	47	41	43	49	43	40	36	34	33	42	46	46	50	51	53	33	29	27	15	38	15	10	37.3
	Min.	5	2	3	23	26	31	32	26	34	19	23	23	25	31	23	29	30	27	21	26	22	24	30	32	6	7	15	-11	- 5	- 8	-10	18.3
ian.....	Max.	21	17	38	42	41	45	49	38	45	29	43	48	51	49	37	33	35	34	50	48	45	53	49	53	48	30	17	12	28	30	9	37.6
	Min.	7	10	1	21	25	23	25	24	25	16	20	24	28	23	27	25	22	27	16	18	19	25	25	31	24	5	7	- 7	- 3	- 7	-10	16.6
quoketa	Max.	26	15	23	40	44	47	42	47	45	49	38	39	38	40	38	35	41	45	39	45	51	49	54	27	25	30	31	-10	- 4	- 6	-11	36.7
	Min.	4	2	3	10	15	22	18	25	26	20	20	22	28	25	25	22	29	22	25	24	21	31	29	5	1	5	8	-10	- 4	- 6	-11	14.7
rsh'll'n.	Max.	21	23	32	41	26	21	84	23	28	17	20	18	21	29	30	30	30	27	21	25	24	41	41	48	41	44	20	22	21	7	31	10	3	35.5
	Min.	4	3	1	26	33	40	40	38	40	22	37	23	35	40	35	38	30	29	34	41	15	12	25	27	17	-3	-4	0	-15	6	-15	17.3
son City	Max.	22	25	26	40	33	40	40	38	40	22	37	23	35	40	35	38	30	29	34	41	41	48	41	44	20	22	21	7	31	10	3	30.9
	Min.	- 2	0	-5	12	15	25	25	15	20	7	15	10	18	24	27	24	25	22	4	15	12	25	27	17	-3	-4	0	-15	6	-15	-18	10.6
nticello.	Max.	23	35	43	43	43	40	43	42	43	40	36	33	32	33	39	43	42	29	33	44	45	47	45	48	10	22	28	13	33	..	..	36 2
	Min.	5	1	20	25	24	17	16	16	25	20	23	23	27	25	23	25	23	23	23	25	25	27	23	23	5	1	-10	-12	0	- 7	-12	15.6
oar.....	Max	24	31	29	49	50	50	53	44	49	47	39	38	45	43	43	36	36	35	32	28	28	25	30	28	34	12	9	13	- 4	- 1	- 4	39.7
	Min	9	10	7	29	37	33	40	20	36	19	24	20	28	35	31	32	33	32	43	47	42	52	52	52	30	24	20	14	40	21	9	21.6
. Ayr.. .	Max	18	23	35	40	44	42	49	42	49	35	43	43	52	45	40	35	34	32	27	21	21	25	31	30	6	8	14	-10	- 6	- 5	- 9	37.0
	Min.	6	3	6	26	27	32	34	26	35	19	21	23	24	32	28	29	30	27	21	21	21	25	31	49	42	23	34	25	33	32	8	18.5
. Ple's'nt	Max	24	28	20	45	41	50	45	44	50	40	37	38	40	43	45	38	37	37	37	36	40	50	49	51	42	23	34	25	33	32	8	37.7
	Min	5	5	0	20	24	28	20	14	25	18	17	18	20	25	24	25	25	24	24	21	24	25	28	31	6	0	7	-11	- 6	- 6	- 8	14 4
. V. (H.)	Max	24	29	33	44	46	43	46	43	45	30	38	34	34	38	38	34	29	30	26	26	22	26	30	29	4	3	12	- 9	- 4	- 9	-12	34.0
	Min	4	5	4	23	28	25	35	23	33	23	22	27	25	29	31	30	32	32	26	38	39	42	38	41	21	18	21	7	28	20	0	18.4
wH'pton	Max	20	21	23	35	32	36	38	40	38	28	31	30	31	35	34	32	32	26	26	38	39	42	38	41	21	18	21	7	28	20	0	29.3
	Min.	1	- 2	-1	18	18	20	30	19	25	16	22	20	24	28	29	26	26	25	16	15	10	26	27	20	-1	-1	7	-12	- 6	-11	-15	13 5
wton....	Max	...	...	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
	Min	4	3	1	26	26	25	31	23	28	16	21	18	24	28	30	30	29	26	22	24	23	26	31	24	4	4	9	-12	- 5	- 8	-13	16.7
orthwood	Max.	21	26	29	40	35	42	41	38	41	24	34	35	32	40	37	33	32	30	33	40	42	49	42	42	11	21	21	0	30	9	1	30.7
	Min.	5	3	1	19	15	17	24	17	23	8	18	20	19	24	17	25	25	23	17	18	17	24	27	10	-3	-2	- 1	-12	- 8	-11	-16	11.7
lebolt	Max	18	21	36	40	38	48	45	43	43	29	40	41	49	46	36	31	35	35	52	45	49	57	48	48	21	29	24	7	39	25	7	36.3
	Min	0	0	0	24	20	23	29	29	27	12	20	20	21	28	28	27	29	28	20	30	20	30	25	21	2	3	6	-12	- 2	- 9	-11	15.7
gden.....	Max.	19	25	30	35	44	44	44	43	44	30	43	35	48	39	37	36	33	32	41	45	48	54	47	50	34	29	26	15	39	31	25	36.9
	Min.	3	- 1	-4	20	23	22	30	25	29	12	18	20	22	28	37	38	33	33	32	34	43	43	47	44	49	14	25	23	3	- 9	-12	15.5
in.....	Max	20	25	27	42	40	43	45	40	45	32	35	33	36	28	28	32	31	30	31	27	27	22	26	30	30	5	2	- 9	- 9	- 5	-11	32.2
	Min.	6	6	3	8	27	20	32	20	31	25	23	25	28	53	49	39	33	35	35	48	48	51	57	50	51	24	30	25	10	42	16	17.2
naha.....	Max.	19	26	36	45	44	45	50	42	46	28	46	49	31	32	30	28	32	30	25	32	31	32	29	17	9	13	6	- 8	6	- 5	- 7	38 0
	Min.	11	5	14	28	29	34	33	50	42	42	30	46	46	57	54	37	35	36	40	56	50	53	53	51	49	21	33	27	12	42	28	14	40 1
nawa.....	Max	22	28	38	43	45	52	22	22	26	14	18	24	23	30	23	27	30	28	20	28	21	25	23	19	4	9	7	-10	- 2	- 8	8	15.7
	Min	8	0	0	19	23	24	50	47	50	26	44	40	51	49	38	34	33	30	44	48	49	54	53	51	21	30	29	6	40	7	9	37.2
sceola....	Max	18	25	37	43	44	44	32	34	25	34	18	21	21	26	28	30	31	30	25	23	23	32	25	31	32	6	6	15	-10	- 3	- 6	- 9	18.6
	Min.	6	4	2	27	26	32	44	53	47	51	24	45	40	49	45	45	37	34	30	35	51	52	57	55	54	25	33	35	8	40	14	13	38.5
vid	Max.	20	29	37	45	48	27	27	29	23	29	19	22	20	25	25	29	30	30	27	25	24	20	25	28	20	8	6	8	- 9	- 3	- 4	- 9	17.4
	Min.	5	4	2	27	27	32	37	36	35	39	27	34	27	32	35	35	33	31	29	27	39	40	43	39	42	20	20	20	4	28	12	1	29.2
sage.....	Max.	21	25	24	37	32	37	36	28	18	25	11	20	11	21	25	26	25	24	11	13	11	23	25	20	-3	-3	3	-14	-10	-12	-17	11.6
	Min.	4	2	-1	21	15	16	28	18	25	11	20	11	21	25	26	25	24	24	34	34	46	48	55	48	53	20	25	31	10	32	22	9	36.3
skaloosa..	Max	19	26	36	45	45	45	46	49	44	50	28	40	37	44	38	41	36	34	26	24	24	18	25	28	26	6	3	10	-10	- 4	- 5	-10	12.7
	Min.	5	5	-1	26	24	25	29	18	28	18	21	18	24	30	29	29	30	26	24	24	18	50	57	51	56	32	28	33	16	36	9	9	39.5
ttumwa...	Max.	20	30	39	65	48	46	48	50	51	31	40	41	44	41	46	45	39	32	30	35	45	50	57	51	58	44	28	38	26	30	10	- 6	20.2
	Min.	9	9	5	29	29	30	35	22	37	21	10	21	29	31	32	33	33	35	32	30	36	45	47	42	40	12	22	30	12	35	5	-10	32.5
ella.....	Max	12	20	30	40	42	43	40	38	55	30	16	26	20	18	27	29	24	36	35	40	44	48	55	42	42	22	31	20	6	33	6	-14	15.1
	Min	- 8	5	0	20	22	27	22	22	30	16	26	20	18	27	29	24	34	32	30	35	40	44	48	55	42	22	31	20	6	33	6	-14	34 4
lover.....	Max.	25	20	38	40	38	48	40	44	46	30	38	30	42	46	40	34	25	30	29	12	27	24	28	22	30	2	1	16	-13	- 6	-10	10	15.8
	Min.	0	3	3	17	18	32	30	19	37	18	20	18	20	22	30	40	45	30	33	50	60	35	55	50	45	45	25	45	15	25	10	10	37.5
rimghar..	Max.	25	25	30	31	45	48	50	55	30	26	47	40	42	26	25	25	25	25	25	30	35	25	35	30	30	-2	-3	-12	-15	- 3	-13	-16	16.6
	Min.	10	9	0	15	22	23	25	28	25	6	32	26	26	25	55	43	40	41	38	46	55	54	56	58	55	31	37	30	15	36	30	20	42.7
ted Oak...	Max	28	32	40	50	48	49	58	41	53	30	52	51	52	29	29	27	33	32	27	20	27	24	28	29	28	10	12	8	- 8	3	- 2	- 5	20 5
	Min	10	7	8	27	27	35	33	30	29	24	27	28	29	33	35	37	31	35	33	35	45	42	45	42	43	36	24	28	7	27	10	9	38.3
ridge way.	Max.	28	27	33	38	36	40	43	43	41	34	38	31	33	27	28	30	28	28	27	16	21	14	30	27	35	0	-4	5	-12	- 9	-12	-16	15.5
	Min.	- 7	5	3	23	20	20	33	19	34	19	24	22	27	47	43	38	43	35	37	47	43	47	53	46	46	27	29	23	7	38	6	7	34.5
Rockwell C	Max.	19	20	21	34	35	33	43	45	42	33	40	43	20	22	22	24	22	29	24	12	28	25	27	26	21	3	5	23	6	-13	- 4	-10	13.2
	Min.	- 3	- 2	-1	0	20	19	21	30	22	10	17	20	39	42	35	36	33	31	32	51	45	48	56	45	48	25	4	6	-13	- 4	- 9	-12	35.8
Sac City....	Max.	20	20	35	38	36	47	44	44	43	30	40	40	19	28	27	28	26	29	28	18	31	24	29	24	24	2	4	24	14	37	33	6	15.7
	Min	4	0	-3	21	19	22	32	25	28	10	20	40	39	46	43	38	35	33	32	45	43	46	52	46	47	32	26	24	-11	- 2	- 7	-10	36.9
Scranton ..	Max.	18	21	33	41	45	42	44	43	44	31	22	20	25	28	27	29	30	28	16	31	25	29	27	31	-1	15	25	15	3	33	10	10	35.4
	Min.	5	2	2	23	22	23	32	26	30	14	38	37	38	55	41	34	27	30	34	34	49	41	48	51	45	18	10	-2	5	- 1	-15	- 7	-12	-15	14 6
Sheldon....	Max.	...	20	50	49	50	48	39	39	41	22	7	16	17	20	25	27	24	28	19	24	30	21	30	28	19	-2	5	29	21	4	32	18	6	34 2
	Min.	...	15	20	20	19	18	27	27	22	28	37	34	55	50	33	29	32	38	53	44	50	52	28	16	17	-3	0	0	-16	- 6	-14	-17	10.9
Sibley	Max	19	20	31	33	33	50	45	38	40	24	4	14	16	18	22	25	21	26	23	23	28	22	28	55	52	53	45	27	32	20	35	34	9	38.9
	Min.	1	- 9	-8	12	7	19	25	20	45	50	42	40	35	42	42	41	35	33	33	35	46	49	25	31	34	8	3	13	- 9	- 3	- 5	-10	18.6
Sigourney..	Max	21	27	35	48	49	44	50	36	19	34	20	21	19	23	30	30	32	30	28	27	26	48	50	44	42	16	25	22	3	21	14	5	32 9
	Min	6	6	4	27	25	27	36	19	34	20	29	38	37	54	39	33	31	35	35	49	42	48	50	44	42	11	-3	9	0	-15	- 4	-13	-14	-14	13.8
Sioux Cen.	Max	17	19	33	34	31	48	40	39	41	29	9	19	19	23	23	27	24	29	24	32	25	28	21	46	44	18	29	16	4	38	6	9	35.6
	Min.	1	- 4	3	16	14	25	28	24	24	40	35	41	42	60	35	32	31	35	40	56	45	52	59	46	44	15	2	9	5	-12	16	- 9	-11	-11	17.6
Sioux City..	Max.	19	22	35	37	38	52	45	42	42	26	12	23	27	25	30	29	27	27	27	25	32	25	30	25	15	18	20	15	5	33	15	5	32.5
	Min	8	0	8	15	20	29	33	28	42	49	27	37	31	48	41	35	28	34	34	50	47	47	23	31	14	-2	1	6	4	-15	- 5	-12	-16	-12	12.1
Spirit Lake	Max.	20	17	31	37	39	48	27	21	23	4	14	14	24	23	28	22	28	25	23	24	25	47	54	43	45	13	27	21	5	35	23	5	33 9
	Min	- 5	4	2	6	15	23	43	41	41	27	40	38	47	45	34	31	31	28	33	49	43	33	24	31	23	13	0	6	0	-14	- 3	-10	-14	-14	14.5
StormLake	Max.	17	20	32	38	36	22	29	24	27	9	18	17	23	26	27	25	28	23	23	33	40	37	39	48	40	27	28	25	15	20	20	10	34 1
	Min	4	- 2	3	20	16	35	45	42	45	38	35	42	40	47	42	40	35	34	30	45	49	33	30	24	20	5	6	4	-12	3	-10	-12	11.8
Stuart	Max.	18	23	35	36	35	20	27	25	8	20	24	20	25	26	25	28	26	25	43	48	46	54	51	53	18	29	18	14	43	29	13	37.9
	Min.	- 1	- 1	5	10	41	42	45	49	40	47	30	44	47	57	47	42	34	36	34	20	26	22	25	28	24	10	12	14	- 5	2	- 2	- 4	19.2
Thurman..	Max	20	25	35	41	42	45	49	40	47	30	44	47	57	47	42	34	36	34	36	20	26	22	28	50	50	24	28	18	14	32	18	12	36 6
	Min	10	4	5	28	25	27	29	27	28	22	25	25	24	30	29	29	31	30	36	33	48	44	48	21	26	29	6	16	5	- 9	- 5	- 6	- 8	17 1
Villisca ...	Max	20	24	32	40	40	44	50	46	48	33	44	48	48	46	40	38	36	32	30	35	36	36	53	49	58	40	31	37	17	30	28	12	37.7
	Min	- 5	- 4	8	10	21	25	24	22	33	22	21	24	28	29	31	30	32	34	34	35	36	36	53	49	58	40	31	37	17	30	28	12	37.7
Wapello ...	Max	27	30	35	49	48	43	53	43	52	33	33	34	42	33	43	37	31	31	32	31	29	24	29	29	31	13	8	15	- 5	0	0	- 6	21 0
	Min	8	9	5	25	29	28	33	23	23	26	25	26	29	32	32	31	34	33	33	36	47	48	53	48	54	21	26	32	6	33	9	9	35.6
Washingt'n	Max.	23	30	35	47	46	45	50	43	48	28	38	35	41	35	38	30	30	30	28	27	24	20	26	30	22	6	3	10	-11	- 5	- 5	-11	17.2
	Min.	3	5	3	25	27	25	23	19	28	20	20	23	23	30	30	30	31	33	30	30	43	45	49	43	48	31	23	13	6	33	5	7	32.2
Waterloo...	Max.	23	25	31	40	36	41	41	41	41	29	39	31	36	39	36	30	28	28	24	18	19	15	25	29	31	3	2	5	-10	- 3	- 8	-12	16.0
	Min.	5	5	1	24	24	20	30	21	29	19	22	22	24	38	35	33	34	31	32	41	42	46	40	20	25	2	2	8	-10	- 2	- 8	-12	31.0
Waverly...	Max.	21	24	27	38	32	38	40	39	40	27	37	30	34	24	28	31	28	29	26	19	17	15	27	29	45	23	20	24	7	35	0	5	15 6
	Min.	4	4	-2	24	21	25	30	19	30	18	18	31	36	39	34	32	33	30	31	40	43	43	47	44	29	20	2	0	5	-14	- 7	-11	-15	-15	13.6
Whitten ...	Max.	20	20	29	37	33	40	40	40	43	29	33	33	15	20	28	28	27	28	24	23	20	26	28	26	21	40	20	30	23	29	30	6	35.7
	Min.	-10	0	-4	22	22	19	23	20	26	13	43	34	34	37	38	40	35	33	36	35	45	43	45	27	29	32	8	3	12	- 8	- 1	- 4	- 8	20.1
Wilton Jc..	Max.	20	28	30	44	43	42	47	42	47	37	25	23	28	29	31	32	31	31	33	30	44	47	49	52	48	50	19	29	28	12	28	10	9	35.4
	Min.	6	9	3	22	21	31	36	21	37	48	29	43	39	48	36	39	34	33	30	44	47	49	22	26	26	35	6	7

DAILY AND MONTHLY PRECIPITATION FOR JANUARY, 1900.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Albia	T					T			.11		T	T					.20															
Algona	.03								T		.05	.20			.25		.10															
Alta	.02								.16	02					.24	.01													T			
Alta (near)								.18		T					.20																	
Amana	T								.37		.02	.06	.02	.02			.17	.06														
Ames (near)									.20	.03		T					.05															
Ames	T								.33			T			T	T	05												T			
Atlantic									.35								.05															
Audubon									.27								.10									T			T			
Bancroft	T								T		.10	.20		T	.20														T			
Batavia											T						.06										T		T			
Baxter						T			.16		.05	.05		T	T	T	T													T		
Bedford									.32								T	T											T			
Belknap	T					T	T		.10	.18							.15	.31	.06													
Bonaparte									.37								1.17												T	T		
Britt	T					.01						.10	.30	T	.22									T			T					
Buckingham																		.40														
Burlington									.33				.08				.99	25	03		T	T							.02			
Bussey	T								.15		T						23													T		
Carroll	.05							.13									T										T					
Carson									.77								.02															
Cedar Rapids								T	.20	T		.15		T	T	T	.26							T					T			
Centerville										.30						T		T	T													
Chariton	T								.05	T							.10												T			
Charles City						T			.03	T	T	.20	T		.25	T	.10							T	T		T					
Chillicothe									.32								.40															
Clarinda									.39		T						.10															
Clear Lake											T	.10	.05		.20		.20															
Clinton							.07		.13			.11			T			1.00														
College Springs								T	23																				T			
Coon Rapids						T			.16		T			T		T	.10															
Corning									.25																							
Council Bluffs								.05	.14																							
Cresco								T	.10			.12	.03		.30	T	.22	.02							T			.01		T		
Cumberland									T								.10															
Danville						T			.45			.05					.50	.15														
Davenport	T					.01	T		.14				.14	.02	T		.55	.40	T					T		T			05		.01	
Delaware									.17			.11			13		22		.11										T			
Decorah	.05								.13		T		.10		.45		.34	T						T					T			
Denison						T		.15	T		T	T				T		.05											T			
Des Moines	.01					T	T		.18	T	T		T		T		.01	T	T						T		T		T			
De Soto									.13	T	.02					T	.05									T		T	T			
Dows											T	.05		.10	.10		.10										T		T			
Dubuque	T	T				T	T		.22		.01	T	.15		.34	.04	.28	.11							T		T	T	T	T	T	
Eldon	.03								.19		T	T					.32	.03												T		
Elkader						T			.09		T	.08			.25	T	.31										T					
Emerson								.23	T							.06																
Emmetsburg									.13						.23																	
Fairfield									.25			T					.58													T		
Fayette	T								.14		.01	.12	T		.22		.39													T		
Ft. Dodge										T		T			T		10												T			
Ft. Madison						T			.50			T					1.50	T	T										T			
Fonda										.50	.15			.20										T								
Forest City	T								.30			.15			.20	T		T	T								T					
Galva									T	T				T										T			T		T			
Glenwood	T					.01						.10	.30	T	.22																	
Gilman																T													T			
Gladbrook		T	T	T	T			T	.40	T		.10			.25	.10	T			.50	T									.02		
Grand Meadow						.04					.02		.08		.25		25															
Greene									.03			.16	.07		.17		.12										T	T	T			
Greenfield						T		T	.29								.04												T			
Grinnell									.28								.26													T		
Grinnell (near)	T					T			.32		T	.05		T	T		.28	.04	T										T			
Griswold									.34								T												.01			
Grundy Center								.02				.20				.20																
Guthrie Center															T																	
Hamburg	T																T															
Hampton																																
Harlan	T					T		.07			.05		.04	.15			.16															
Hawkeye						12			.32		T			T	T		.03	T											T			
Hedrick						T			.09	.10		.20		T			.40												.05			
Hopeville	T								T		T	.08					.16	.03														
Hoprig									.11								.06															
Humboldt											T	.10			.15																	
Independence									.10		T	T	.04	T	.13																	
Indianola									.02		.01	.20			.01		.10															
Iowa City	.05					T			.27		.01	T				T	.06		T	T	T	T				T			T			
Iowa Falls						T			.18		T	.12		T				43											T			
Keokuk	T								.06		T	.15		.05	.05	T	.15	T											T			
Keosauqua	T								.72	.02		.04	.02				1.46	.20	T					T			T		T			
Lacona	T					T		T	.15	10							.72	.03							T					T		
Lamoni									.12								T												T			
Lansing									.12			T					.11															
Larchwood	T								.02	T	T	T		T	.49	T	.44	T									T		T		T	
Larrabee								.17		T					.03	T																
Le Mars								T							.16	.02														T		
Lenox									.39		T				.20										.04							
Le Claire						T	T			.13			.13				T															
Lockridge												.10					.06	.81	.02										.01		1.16
Logan									.20								.05															.15
Maquoketa						T			.23		T		.13	.04		.43	T	T														.20
Mason City									.40			.10			.20														T			.83
Marshalltown	.15	.20				.25			.20		.01	.05	T		.02		.20															.70
Monticello						T			.05	.10	.02	T	.10		.05		.41												T	T	T		1.08
Mooar									.73	.02		.03	.04				1.48	.17														.73
Mt. Ayr									.19								.05															2.47
Mt. Pleasant						T			.26			T					.97												T			.24
Mt. Vernon (near)						.01			.28		.04	.14		T	.01	.01	.40	T	T					T					.02			1.23
New Hampton									.52				.10		.40		.20															.91
Newton									.21								.16															1.22
Northwood									.15						.50		T												T			.37
Odebolt								T		T																T						.65
Ogden	.02								.16		T					T	T	.13														T
Olin	T					T			.31		.02	08		T		T	.40						T									.31
Omaha (Neb.)	T					T	T	T	14	T	T					T	.01									T						.81
Onawa								T	.22		.02				.02																	.15
Osceola	.08					T			.11					T			T															.26
Ovid	.02								.15		.01						.07												T			.19

DAILY AND MONTHLY PRECIPITATION FOR JANUARY, 1900—CONTINUED.

ATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
									.20	...	T	.10	.05	.02	33	...	.20	T	...	...	..	...	..	T	..	..	...	..	.03	....	..	.93
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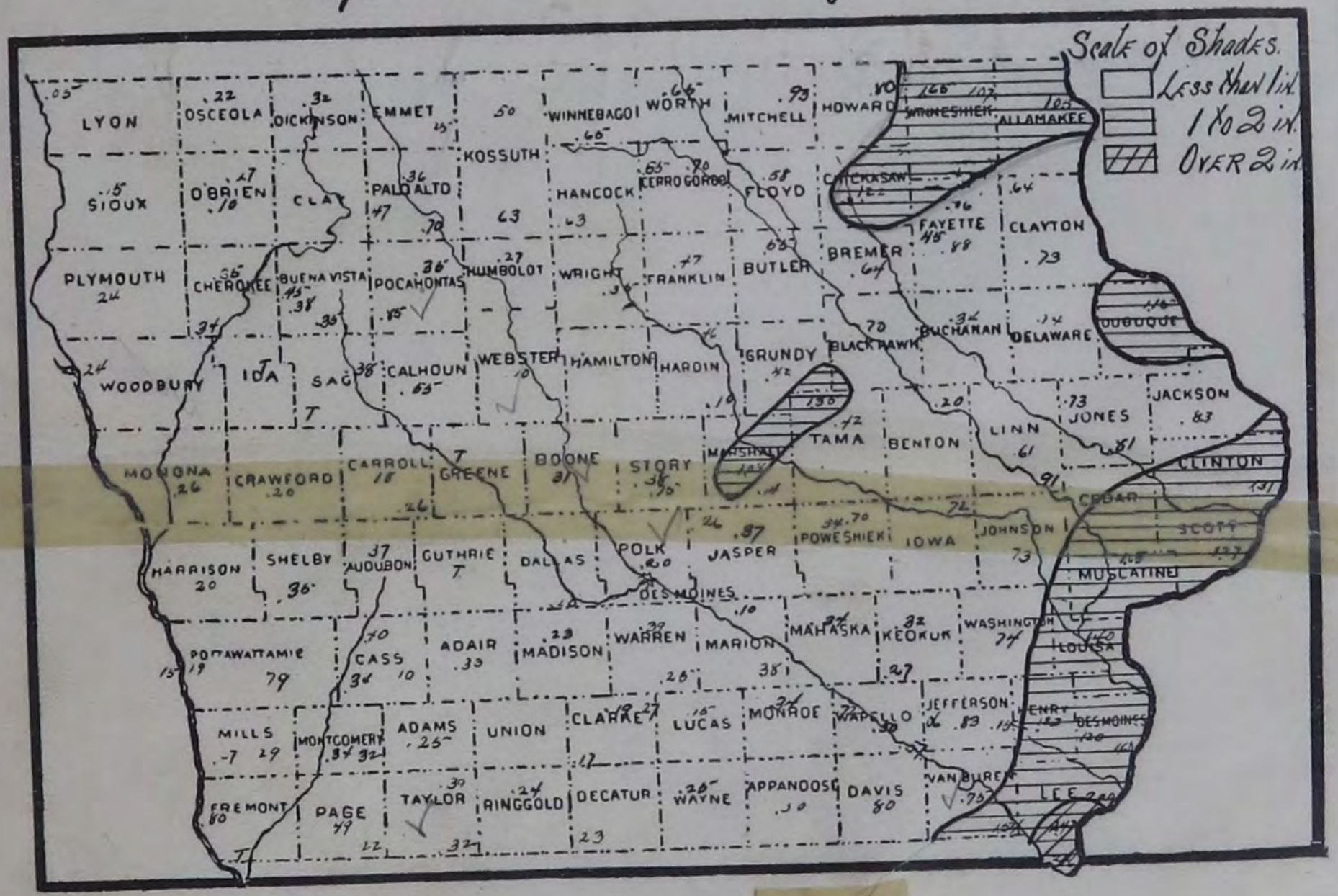
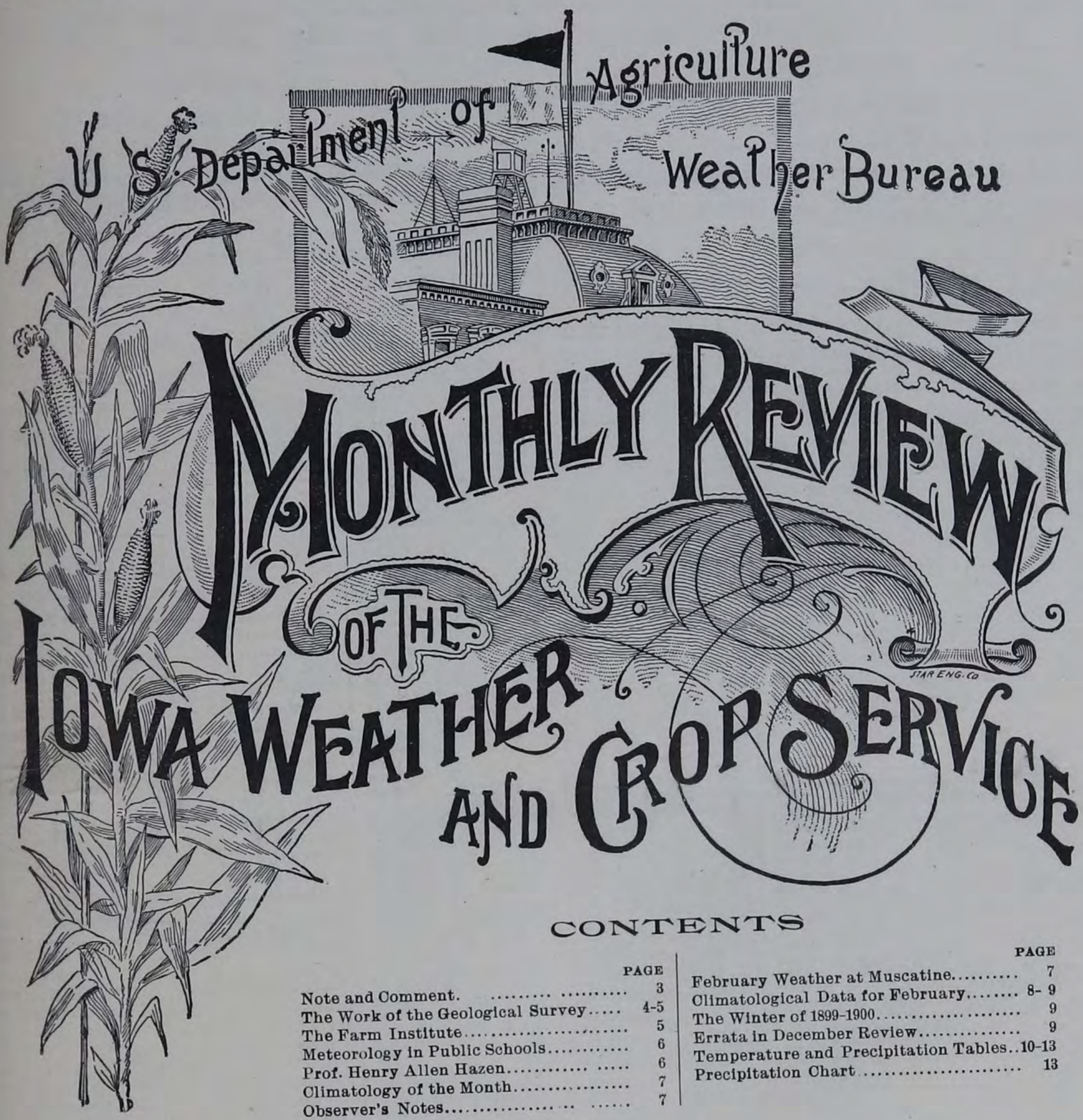
Precipitation Chart January 1900.



Vol. XI. FEBRUARY, 1900. No. 2.



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1899.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW
OF THE
owa Weather and Crop Service.

VOLUME XI. FEBRUARY, 1900. No. 2.

NOTE AND COMMENT.

A Franch naturalist asserts that if the world should become dless man would not inhabit it after nine years' time, in te of all the sprays and poisons that could be manufactured the destruction of insects. The bugs and slugs would nply eat up orchards and crops.

* * *

Near Berlin a systematic study of the upper atmosphere is be made—day and night when possible—at heights of two three miles, kites and kite balloons being made to take up gistering apparatus that will record automatically the pres- re, temperature, humidity and wind velocity.

* * *

The first number of the series of CLIMATE and CROP BUL- ETINS of the Iowa section, for the season of 1900, will be sued on Tuesday, April 10th. Cards will be mailed to crop porters in due time, with a circular of instruction as to dates mailing, etc. We trust that all who receive cards will be ble to serve during the coming season.

* * *

A remarkable investigation by Professor Dewar and others as thrown doubt on the common idea that disease epidemics ıay be checked by freezing weather. A great number of isease germs were cooled by liquid air to 190 degrees centi- rade below zero, but the microbes survived twenty hours of ven this great cold and were afterward as active as ever.—*Ex*

* * *

The Colorado experiment station has been testing the value f windbreaks in lessening the evaporation from the surface. The windbreak used in this test was a sod wall and close board fence 4 feet high, running east and west. North of the vall was an ordinary sod soil and south the ground was levoted to millet. North of the wall the effect seems to be he greatest about three rods from the wall. During the test of 62 days, 633 tons per acre of water were evaporated at three rods, while 10 rods from the wall evaporation amounted to 710 tons per acre. On the side devoted to millet the evaporation was least within one rod of the wall and gradually increased as the distance from the wall became greater. This is in line with experiments made in other parts of the United States, showing that a properly constructed windbreak tends to lessen evaporation.

* * *

In attempting to photograph lightning flashes at Dover, Eng., Sydney Webb has stumbled upon a very curious phenomenon. The field of the camera included a number of arc lights, and on developing the pictures it was found that an irregular luminous line passed from each lamp to the ground whenever a flash occurred in the clouds. On one occasion, he has since succeeded in seeing, with the unaided eye, a stream of electricity descending from an arc lamp. The pictures have interested Sir George Stokes, who notes that the iron lamp posts may have had some effect by attracting atmosphere electricity, and that the discharges may have been influenced by an underground high tension electric cable toward which they seemed to pass. He thinks this may be a case of nature's wireless telegraphy. The resisting air about the lamp seems to act like the coherer of the telegraphic receiving apparatus, a difference of electrical condition or potential between the lamp and some other point may take the place of the battery current that is held in restraint by the coherer, and the electromagnetic waves from the flash may open a path for the current through the air as in the coherer.—*Ex.*

* * *

Statistician Snow, in his March report, estimates the stock of wheat in farmers' hands, 164,000,000 bushels, against 204,000,000 bushels a year ago. Corn in farmers' hands 862,000,000 bushels, against 711,000,000 bushels a year ago. Oats in farmers' hands 322,000,000 bushels; last year 281,000,000 bushels. The consumption of corn the last year has been the largest ever known; and that is the brightest feature of the present agricultural situation.

* * *

The level of the Dead sea is steadily falling on account of the large volume of water tributary to it which is now absorbed by irrigation enterprises. The sea was formerly much larger than at present, as in shown by the old beaches stretching at various altitudes around the whole basin. Since the middle of the century its level has been very slowly rising till quite recently, but now it is falling again. The phenomenon is not due to natural causes, but to the steadily increasing quantity of water that is taken from the Jordan river for irrigation purposes. There are other smaller streams flowing into the sea and they, too, are being utilized by the increasing number of farmers, who are diverting all the water they can get to the lands and are relieving the monotonous aspect of the former arid and lifeless region with many verdant fields. —*Ex.*

* * *

The former official estimate of the wooded area of the United States, placed at 26 per cent, has been raised to 37 per cent by the latest computations of the division of geography and forestry of the United States geological survey. That office has issued a bulletin containing new figures on American forests, some of which tend to prove the national timber resources greater than is supposed.

The two latest states to be examined are Oregon and Washington. The former is estimated to contain 234,653,000,000 feet, B. M., in standing timber; the latter, 114,778,000,000 feet. Destruction by fire has been exceedingly serious in Washi[illegible]on. On the assumption that the burned areas contained on an average as much timber as the untouched portion, 40,000,000,000 feet have been destroyed since lumbering began. This amount would supply all the sawmills of the United States for two years, and at a value of only 75 cents a thousand, means a dead loss to the state of $30,000,000. The amount actually logged in the same period has been 36,000,000,000 feet, making the estimate by the same comparison of areas. Oregon has suffered less from both fire and lumbering, owing to the smaller facilities for marketing the product.—*Ex.*

WORK OF THE GEOLOGICAL SURVEY.

The geological survey in the year 1899 has been very active, as is shown by the report submitted by State Geologist Calvin January 1st. From this report the following paragraphs are taken.

The corps of investigators engaged upon the work of the survey during the past year has been somewhat larger than heretofore. In addition to the state geologist, the assistant state geologist and the secretary, the force has included Dr. S. W. Beyer, Dr. J. B. Weems and Mr. Ira Williams of the State college at Ames; Prof. W. H. Norton of Cornell college, Mount Vernon; Dr. T. H. Macbride of the University of Iowa, Iowa City; Prof. J. A. Udden of Augustana college, Rock Island; Prof. Benj. L. Miller of Penn college, Oskaloosa; Mr. Frank Wilder of the West Des Moines high school; Prof. T. E. Savage of Western college, Toledo; and Mr. H. R. Mosnat of Belle Plaine. In addition Mr. Stewart Weller of the University of Chicago, spent a short time at Burlington, and Prof. A. V. Sims of the University has kindly undertaken some special tests. Mr. Frank Tate and Miss Charlotte King have each spent some time in preparing illustrations for the reports.

During the year the survey has directed its attention chiefly to the work of mapping the various unsurveyed counties and to the preparation of reports on the physiography, geology and resources of the areas so mapped. In all eight counties have been mapped this season and partial mapping has been done in two more. Revision work was carried on in three counties which had been essentially completed during the preceding season.

In the following table there is given a list of the counties in which mapping has been done. The names of those completed within the year are set in italics, and the names of two, begun during the year, but not yet completed, are set in capitals. In all nearly 24,000 square miles have been so far surveyed, an area which embraces almost half the state. The remaining area will require less work than the portion of the state already surveyed.

COUNTIES SURVEYED AND MAPPED.

	Area sq. miles.		Area sq. miles.
Allamakee	658	Linn	720
Appanoose	576	*Louisa*	407
Boone	576	*Lyon*	587
BREMER	432	Madison	576
Buchanan	576	Mahaska	576
Carroll	576	*Marion*	576
Cedar	576	Marshall	576
Cerro Gordo	576	Montgomery	432
Dallas	588	Muscatine	437
Decatur	576	*Osceola*	400
Delaware	576	*Page*	557
Des Moines	415	Plymouth	860
Dickinson	404	Polk	585
Dubuque	601	Scott	455
Guthrie	593	*Sioux*	769
Hardin	576	Story	576
HENRY	433	Van Buren	484
Humboldt	432	Warren	569
Johnson	618	Washington	655
Jones	576	Woodbury	873
Keokuk	576	*Worth*	402
Lee	512	Total	23,903

At the close of the last field season some 18,936 square miles had already been mapped. It was found impossible, however, to prepare reports on Cedar, Hardin, and Dubuque counties in time for publication in volume IX, and they were accordingly left over for the present volume. This gave an opportunity for a certain amount of revision both in the field and office, and the reports have gained in value as a result of the delay. This delay has been especially advantageous in the case of Dubuque county, as it will now be possible to incorporate in the report the important results of the mining development of the past season. It also makes it possible to use, as a base for the map, the topographic sheets covering this area, prepared by the United States geological survey. Indeed it was mainly to render this possible that the work was held over, for without a good topographic base map, the detailed geological mapping of a region as rough and broken as the driftless area would be altogether impossible. The expense involved, however, in making such a map is far beyond the resources of the Iowa survey.

The work in Dubuque county was undertaken jointly by the director and the assistant state geologist. I took up the stratigraphical and general geological problems, while the assistant investigated the economic phases of the subject. Accordingly Mr. Bain has devoted much time to the study of the problems presented in the mining areas of the county, and particularly to watching the development of the zinc mines which, under the stimulus of his suggestions, are now opening up with prospects of greatly increased success. Further details will be found in his administrative report.

In Cedar county, the work begun by Professor Norton last year, was carried to completion. Cedar county contains some of the largest and most important quarries in the state, and is the seat of an important lime industry. The stone industry of this country in 1898 amounted to $113,502, and Professor Norton's work confirms the fact that there are large opportunities for expansion. The clay interests of the region are worthy of further development.

In Hardin county Dr. Beyer has devoted considerable attention to the clay interests. There is a very wide variety of clays to be found in the county and the quantity present is all that could be desired. While there are now several plants in operation the clay industry has not been developed to anything like the extent which the character of the material and the commanding position of the county should render possible. The stone industry may also be expected to develop largely. These and the other mineral resources of the region are fittingly discussed in the report upon the county now in preparation.

The new work taken up this year was widely scattered and served to close some of the important gaps in our earlier mapping. Much attention was paid to the western portion of the state, the mapping in the northwest being extended to cover Lyon, Sioux, Osceola and Dickinson counties. The work in the two counties first named was done by Mr. Frank Wilder with the assistance of Mr. Bain. Preparatory to it a general reconnoissance trip was made through several of the adjoining counties. Mr. Wilder's studies have been of great importance in bringing out the facts that the Hawarden beds, heretofore referred to the Ft. Pierre, really belong to the Inoceramus beds as developed in Iowa, and are not to be correlated with the Niobrara farther west. They represent instead that portion of the Fort Benton sub-stage exposed in the "Oyster Shell Rim" of the Black Hills. Mr. Wilder has also shed much light upon the vexed question of the age of the drift of the northwestern part of the state. His conclusions, while differing somewhat from those previously held by the survey, are founded on careful study and seem worthy of every confidence. Probably a final opinion on the subject can not be rendered until more of the region shall have been investigated.

Mr. Wilder shows in his report upon the two counties that the Dakota sandstone, which in South Dakota is such a common source of artesian water, is an important aquifer throughout the region, though not yielding flowing wells

report is now in the final stages of preparation and will btless be ready for publication in this volume.

In Osceola and Dickinson counties Professor MacBride has ended his studies which he made the year before in Humdt county. The Osceola-Dickinson area is one of very eptional interest. Here connected with the drift, are logical problems of highest import. Morainic knobs and nes and undrained marshes, set in level expanses of beautiprairie land, appear at first sight to be distributed lawlessly r the region, but the difficulties of their peculiar distribun yield to the careful questioning of the trained investitor, and at length something like order is evolved from the ming confusion. They have all been developed in accordce with definite laws governing the transportation and position of material in connection with the movements of ciers. In this region too, are found the principal lakes of wa, charming sheets of water, surrounded usually by swell- knobs of the glacial moraine which in places is forested d in places grass-covered to the water's edge. Lake and rest and grassy slope unite to form a landscape of rare tural beauty but seldom equaled. The genesis of the lake sins, not less than the genesis of the other topographic feares of the region, has long been an attractive problem to the an of science; in the opportunities for rest, for recreation, for e quiet, joyful stimulation and exereise of the æsthetic sense hich the lakes and their delightful surroundings afford, the neral public has found the same region one of great attracveness. Professor MacBride tells the interesting history of e region in a manner at once clear, comprehensive and comehensible; and it is to be hoped that his suggestions for prerving it with what is left of its natural beauty, and convertg it into a resort where Iowa's citizens may, for all time, ave an opportunity to come in touch with nature at her best, here physical health and mental tone can be restored to all ho are worn and weary from over-exercise of hand or brain, ill receive the attention which they deserve.

In the southwest the work left unfinished by the death of Mr. Lonsdale, has been resumed. After some field conferences with members of the survey corps, and after revising and completing the work in Dubuque, I began the survey of Page ounty. The thickness and succession of the strata composing he upper coal measures in southwestern Iowa, and the relations of these strata to the pub'ished sections of Nebraska and Missouri on the one hand, and to those of Iowa on the other, have long been recognized as questions which deserve thorough nvestigation As a result of the work in Page county it is shown that, compared with the basal portion of the upper coal measures, Missourian stage—as developed in Madison county for example—the deposits here contain less limestone and relatively more of shale and shaley sandstone. This means that shallow water and marginal deposits are more abundant, and that the conditions for the accumulation and preservation of coal were more favorable in Page county than in regions where the earlier portions of the Missourian stage are exposed. Limestone ledges are here comparatively thin and far apart, while clay deposits reach an unusual development. It is also shown that there are two distinct coal horizons separated by about 130 feet of strata embracing a few feet of limestone and nearly 120 feet of shales and shaly sandstones.

The rather indefinite line along which the eastern loess and the Missouri river loess meet is found near the western border of Page county, lying chiefly, however, in Fremont. The drift of Page county is in places very thick, and it has suffered much more than the average amount of erosion seen in areas south of the Iowan border. The principal stream valleys average nearly 200 feet in depth, cut mostly in the drift, and the sides of the valleys, back to the divides, have been carved into an intricate and branching series of ravines and ridges which cover the whole surface, leaving no part of it in the condition of an uninvaded plain or plateau. The soils are unsurpassed anywhere for the production of corn and other field crops. The coal seams are rather thin, but they are remarkably persistent, and the mining industry is capable of greater development than it has yet attained. With better knowledge of the position of the coal seams the work of prospecting can be carried on more intelligently, and the top works can be located so as to operate the mines with a minimum of expense.

In the central portion of the state Prof. Benj. L. Miller, who has had considerable experience in geological work in connection with the university geological survey of Kansas, undertook the mapping of Marion county. His map and report are now in hand and show that the work has been executed with great care. Marion county is located near the central part of the coal field, and while mining is not now as extensive as in certain of the neighboring counties, the coal measures appear particularly rich. With improved railway facilities in the southern portion of the county it may confidently be predicted that valuable mines will be opened up. It is to be expected that Professor Miller's report will prove of material assistance in bringing this about.

Early in the season Professor Udden took up the work in Louisa county, extending over it the survey which he had, the previous season, made in Muscatine county To the south he connected with Dr. Keyes' mapping of Des Moines county, on the north with my own in Johnson county, and on the west with that of Mr Bain in Washington county, and Professor Savage, who was working in Henry county. In Louisa county, aside from many interesting problems of general geological interest, Professor Udden made a careful study of the gas field near Letts, which has for some years yielded heat and light to a number of the citizens. He made a careful test of the pressure in wells, and studies of the source of the gas. While his results are discouraging to those who expect high pressure gas to be found by deep drilling, they serve to show that the field may be of some considerable local importance, and that the supply is steadier than is usual in the case of drift-supplied wells.

In addition to the areal work a considerable amount of subject work has been taken up. Investigations were carried on to determine the possibility of the manufacture of Portland cement from local material, with promising results. Much attention was devoted to the iron deposits now being developed in Allamakee county, and the clay investigations already announced were carried on vigorously. Numerous artesian wells were put down under survey advice and other matters of similar character took up the time of the various members of the survey force.

THE FARM INSTITUTE.

The past few years have witnessed the development of an educational factor in agriculture in the shape of the farm institute, which has been a most marked success. From somewhat crude beginnings, the farm institute has evolved into one of the most important and well attended gatherings held by the people of the several counties of the western states. So far as we know, in no other country do the farmers ever assemble for a two or three days' session for the purpose of discussing matters pertaining to their business. The field covered by the papers, addresses and discussions at these institutes takes a wide range and touches not only the business side of farm life, but includes the schools, the home, the family, the social and intellectual side of life on the farm. These meetings also bring out not a little musical and elocutionary ability which

would otherwise remain secluded in country homes. The interest taken in meetings increases year by year, and the work accomplished so becomes more valuable as it reaches a wider field. It is perhaps still too true that the class of farmers who would be most benefited by attending the institutes fail to attend them, but the leaven is working, and they will be on hand before long.—*J. S. Trigg, in Rockford Register.*

METEOROLOGICAL OBSERVATIONS AT PUBLIC SCHOOLS.

In an address before a teachers' institute in California several years ago the writer urged that every schoolhouse be provided with instruments and weather observations be taken. This opinion has been strengthened by the publication recently of a circular by the Department of Agriculture entitled "A German Common School with a Garden," from which the following extracts are taken:

"In most instances this garden is used solely as a source of income and pleasure to the teacher. Occasionally, however, some specially active and wide-awake teacher sees in the garden a means of instruction. Here plants can be watched in their development from seed to flower and fruitage; the curled leaves on a choice plant may show where some insect has made its home; a heavily-laden apple tree may suggest the value of pruning; a few pansies or a rose bush rightly placed may awaken ideas of beauty. * * * Pupils working among these flowers, pruning trees, or gathering berries from vines planted and tilled by themselves, may acquire an interest in nature and husbandry which will remain with them throughout their after life."

It is for the same good of the scholar that weather observations should be taken at every schoolhouse A wide awake teacher with a maximum and minimum hermometer and a rain gauge can soon develop such an interest in a practical way that the lessons in physical geography, instead of being dull, will become intensely interesting and the scholars will have demonstrated to them in practice what the geographies teach theoretically.

The Weather Bureau has been doing a work of education since its organization, but notwithstanding the hundreds of thousands of weather maps and other publications that are disseminated annually, comparatively few people receive them. It has undertaken to cover the country with its regular stations of observation, supplemented by the co-operating voluntary observer. This in whole amounts to about 3,035 points of observation and covers not only the United States proper but points in the West Indies and bordering on the Caribbean sea and Alaska. Deducting the West Indian service and Alaska we have one station for about every 1,175 square miles.

Of course the larger number of observations are made in the more thickly populated parts of the country. California, as an instance, with its 158,360 square miles has 318 observing stations, or one for about every 500 square miles, while Texas with 265,780 square miles has but one station for every 2,550 square miles. It is impracticable for the general government to so cover the country as to bring out local climatology, now much needed. The study of climatology was never so closely followed as now. Meteorology has never been connected with so many subjects as at present. The weather influences every process of life, every plant, and every animal. It is the commonest topic of conversation, the subject considered in connection with more plans than any one thing; and yet but one observer for every 1,175 square miles, approximately, and very few people apply the facts given each day in any practical way. It is so commonplace, in fact, as to be generally neglected.

With a class of people in our schools interested in the science of meteorology an intelligent knowledge of the movement of storms and climatology will soon attain, and the great service of the Weather Bureau made of increasing value. Every section has its peculiarities of temperature and precipitation, but because of the lack of obser vation nothing is known of these peculiarities. The general government makes exhaustive experiments in the growth of plants. We are told just what kind of a soil or climate is best adapted to the successful cultivation of nearly every useful plant, and the people should avail themselves of this knowledge by more completely studying the local conditions as related to te mperature, precipitation, humidity, etc., and applying one to the other.

A plan of work by which this idea might be carried into effect would at best be tentative. It must be elastic enough to admit of its adoption under many and varying conditions and yet reach the same general result. The most feasible plan is thought to be that of having the teacher responsible in person for the work, but through her the scholars perform the actual work, her participation being more in the nature of an instructor and not as an observer. There is frequently some scholar in a school who is fond of investigation or who takes more than a passing interest in the weather. Such would make a good observer The scholar should be taught to apply personal observation and connect present conditions with those following as well as those past and in this way note the rotation of storms. The blackboard in the schoolroom affords a simple means of interesting the entire school by placing each day's observation thereon. The permanent records should be maintained in a book kept for that purpose. As the record grows daily it will become more interesting. The problem of small attendance at school on certain days, or the mental depression and consequent lack of satisfactory progress in studies and many other equally interesting problems will find solution — *H. E Wilkinson, Section Director, Mississippi Climate and Crop Service.*

PROFESSOR HENRY ALLEN HAZEN.

By a sad accident on the evening of Monday, January 22, 1900, the U S Weather Bureau lost one of its most prominent officials, and the National Geographic society one of its active members. Professor Hazen, while riding on his bicycle, hastening to his night work at the Weather Bureau, at Washington D C., collided with a pedestrian and was dashed to the ground. He received injuries from which he died twenty-four hours later.

Professor Hazen was born January 12, 1849, in Sirur, India, about 100 miles east of Bombay, and was the son of Rev. Allen Hazen and Martha Chapin, his wife, missionaries of the Congregational church. He came to this country when 10 years old and was educated at St. Johnsbury, Vt., and at Dartmouth college, where he was graduated in 1871. For some years he was instructor in drawing in the Sheffield scientific school, New Haven, and later was assistant in meteorology and physics under Prof. Elias Loomis. He received an appointment in the Weather Bureau in May, 1881, being assigned to special duty on such problems as the investigation of the psychrometer and the proper exposures of thermometers, the study of thunderstorms, and other important questions. At a later period Professor Hazen was assigned to duties of a broader aspect, including weather forecasting and occasional editorial work on the *Monthly Weather Review*. In addition to his official work in the Weather Bureau, Professor Hazen was a frequent contributor to meteorological and other scientific journals He was one of the supporters of *Science* during the years 1882–1889, and of the *American Meteorological Journal*, 1884–1886. Among his larger publications are the "Reduction of Air Pressure to Sea Level," and the "Climate of Chicago."—*National Geographic Magazine.*

CLIMATOLOGY OF THE MONTH.

February was colder than usual, with somewhat more than average number of stormy days. The mean pressure of atmosphere was 30 12 inches; the highest pressure observed 30.64 inches at Cresco, on the 9th; lowest, 29.28 inches at buque on the 8th; range for the state, 1.36 inches.

Temperature.—The monthly mean for the state, as shown by orts of 126 stations, was 14 8°, which is about 6.9° below mal for February. The mean for the northern section was °; central section, 14.9°; southern section, 18°. Compared h February 1899, the month was 2.6° warmer. The lowest an for the month was 7°, at Spencer; highest mean, 22.7° at okuk. The maximum temperature reported was 60°, at okuk, on the 7th; minimum reported, 27° below zero, at nison, on the 15th The average monthly maximum was 8°; average monthly minimum, 14.6° below zero. The eatest daily range was 52°, at Humboldt and Plover; average greatest daily ranges, 40.2°.

Precipitation.—The average precipitation for the state, as duced from records of 145 stations, was 1.30 inches, which about .24 of an inch above normal. The average of the rthern section was .97 of an inch; central section, 1.25 inches; uthern section, 1.69 inches. The largest amount reported as 4.57 inches, at Danville. The least amount reported was of an inch, at Griswold. The greatest daily amount reported as 1.50 inches, at Ft. Madison, on the 28th; the average num- r of days on which .01 inch or more was reported, was 6.

Wind and Weather.—Prevailing direction of the wind, N. W.; ghest velocity reported, 50 miles per hour from the N. W., on e 8th, at Sioux City. There were 10 clear, 8 partly cloudy, id 10 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES. Highest reduced barometer.	Date.	Lowest reduced barometer	Date.
Davenport	30.07	30.48	9	29.40	8
Des Moines	30.15	30.54	17	29.63	7
Clarinda	30.15	30.63	17	29 58	11
Cresco	.....	30.64	9	29.76	8
Dubuque	30 09	30.49	9	29.28	8
Omaha, Neb	30.12	30 59	17	29.57	7
Keokuk	30.08	30.49	9	29.51	7
Sioux City	30.18	30.61	17	29.56	11
Means	30.12	30.64	9	29.28	8

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,998	36	W	8
Des Moines	6,227	31	NW	24
Dubuque	6,183	36	NW	28
Keokuk	6,359	36	W	24
La Crosse, Wis	4.811	30	NW	8,23
Omaha, Neb	7,442	42	NE	23
Sioux City	8,779	50	NW	8

OBSERVERS' NOTES.

ALGONA—*C. D. Pettibone.* The first real blizzard of the season occurred on the 8th.

ALTA—*David E. Hadden.* A severe blizzard raged from evening of the 7th, to early morning of 8th. High northwest wind drifted snow to depth of three to four feet, and business was nearly suspended on the 8th.

BANCROFT—*E. G. Bailey.* Genuine blizzard on morning of 8th; heavy gale, and snow filling air; wind high on 23d; was a cold, stormy and disagreeable month; hard on stock.

BONAPARTE—*Hon. B. R. Vale.* A solid winter month; more than usual amount of precipitation; several quite severe storms on stock.

CHARLES CITY—*C. O. Schmidt.* Blizzard night of 7th, and 8th. High winds on 23d and 24th.

CLINTON—*Dr. Luke Roberts.* The temperature averaged lower than the February normal; in other respects the month was a fair average. In 1885 the February minimum was 33° below zero, but the mean for the month was 33.5°. This year the mean is 17.1°, while the lowest was only 10° below zero. Total movement of the wind, 3,880 miles; maximum velocity, 20 miles an hour.

CRESCO—*Gregory Marshall.* February 8th, worst blizzard of the winter; on 9th, temperature fell to 23° below zero, the coldest of the season. On February 24th, dust blizzard all day, very penetrating.

KEOSAUQUA—*J. H. Landes.* Thunderstorms on 3d and buildings reported struck by lightning.

LOGAN—*Mrs. M B Stern.* The month was quite wintry, but no bad storms; ground mostly bare at close of month.

MONTICELLO—*C. E. Heisey.* Storm on 24th blew down E. J. Noble's steel windmill tower, and damaged trees, etc.

OLIN—*Nathan Potter.* Worst storm of the season on 24th, with drifting snow.

RIDGEWAY—*Arthur Betts.* Altitude of station 1,175 feet. Month changeable. On 8th and 24th gales with drifting snow; average depth of snow at end of month, 5 inches; there were 183 hours of sunshine, or 62 per cent; mercury fell below zero on 13 days; month warmer by 3° than February, 1899.

WEST BEND—*Ph. Dorweiler.* Month cold and disagreeable; snow drifted badly.

BELATED REPORTS.

KNOXVILLE.—January. Mean temperature, 29°; highest, 55° on the 22d; lowest, 8° on the 31st; greatest daily range, 38° on the 29th; total precipitation, .15 inch; greatest in 24 hours, .10 on the 17th; total snowfall, trace; number of clear days, 18; partly cloudy, 7; cloudy, 6; rainy, 2. Prevailing direction, northwest.

TOLEDO.—January. Mean temperature, 24.6°; highest, 54° on the 22d; lowest, 12° on the 31st; greatest daily range, 48 on the 28th; total precipitation, .33 inch; greatest in 24 hours, .15 inch; prevailing direction, northwest; number of rainy days, 3.

TOLEDO.—December. Mean temperature, 23.2°; highest, 49° on the 1st; lowest, 8° on the 31st; greatest daily range, 45° on the 20th; total precipitation, 1.70 inches; greatest in 24 hours, 1.50 inches on the 11th and 12th; number of clear days, 12; partly cloudy, none; cloudy, 19; rainy, 3.

FEBRUARY WEATHER AT MUSCATINE.

[Mrs. J. P. Walton, in Muscatine Journal]

The maximum temperature of February, 1900, was 51°, the minimum, 7° below zero, the mean 19.64°. The mean temperature for February for sixty years is 25 39°, the highest being 36.42°, in 1882, the lowest 10 10° in 1875. The highest range of the barometer was 29.70 inches, the lowest 28 80 inches. The rain and melted snow was 2.65 inches; the mean for February for sixty years is 1.72 inches.

Old weather prophets always tell us that "an open winter is generally followed by a cold, late spring." The mean temperature of the winter just closed, December, January and February, is 25.29°. The mean for winters for sixty years is 22.93°. The warmest winter was that of 1877–78, the mean having been 33.82°; the coldest one was that of 1884–85, with a mean of 13.28°.

It has been claimed that our winters are getting warmer, but actual figures disprove this assertion. The mean temperature of the first twenty years of the sixty was 23.56°; the next twenty years 22.57°, and the last twenty years 22.50°, 1.06° colder mean than the first twenty years.

CLIMATOLOGICAL DATA FOR FEBRUARY, 1900.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIPITATION, INCHES.				Number rainy days	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Algona*	Kossuth	1,500	7	11 0	-8.1	38	11	-20	9	.....	1.15		.30	11 5	5	5	17	6	NW
Alta	Buena Vista	1,519	8	10.8	-7.4	38	6	-16	15, 16	40	1 38	+.28	.40	16.4	9	8	12	8	NW
Alta (near)	Buena Vista	.....	..	.....	.....	.....	.....	.....	.....	.....	1.25	+.62	.30	12.5	6	...	...	...	.....
Bancroft	Kossuth	.....	..	11.1	...	39	11	-22	9	33	.90	.....	.30	9 0	5	9	11	8	NW
Britt	Hancock	1,230	..	11 4	....	39	11	-24	9	37	.50	.....	.27	4.8	5	1	24	3	NW
Charles City	Floyd	1,012	8	11.1	-6.5	36	7	-22	9	46	1.16	-.18	.73	11.0	3	1	17	10	NW
Clear Lake	Cerro Gordo	984	..	10.6	....	38	11	-24	9	41	1.10	.....	.40	11 0	5	17	6	5	NW
Cresco	Howard	1,280	27	8.2	-7.7	37	7, 11	-23	9	39	1.15	+ 22	.70	11.5	4	6	7	15	NW
Decorah	Winneshiek	900	6	11.0	-6.5	38	7, 11	-16	9	41	1.16	+.39	.76	4.0	....	...	...	...	.....
Dows	Wright	.....	...	11 1	.....	38	11, 22	-21	9	46	.50	.....	.30	5.0	3	15	1	12	NW
Eagle Grove †	Wright	.....	....	10.4	....	....	.....	.....	.....	.....	...	...	...	...	...	...	...	...	.....
Elkader	Clayton	.....	19	14.7	-4.4	42	11	-17	6	51	1.45	+.35	.75	7.0	4	12	7	9	NW
Emmetsburg	Palo Alto	....	....	...	...	.. ....	.....	.....	.....	.....	.62	.....	.31	.....	4	...	...	...	.....
Estherville	Emmet	.....	....	10.8	.....	40	11	-25	9	49	.49	... ...	.30	5.9	7	7	11	10	NW
Fonda	Pocahontas	1,237	....	9.6	....	41	5	-21	8	51	2.31	.. ....	.85	18.0	6	19	3	6	N
Forest City	Winnebago	1,220	....	10.8	....	36	11, 22	-24	9	43	.65	....	.35	6.5	4	15	1	12	NW
Grand Meadow *	Clayton	.....	8	13 0	-6 7	38	11	-10	9, 16	.....	1.35	+.30	.90	5.0	5	10	6	12	NW
Greene	Butler	943	....	13.2	....	38	11	-19	9	51	.91	....	.49	11.0	4	7	6	15	W
Hampton	Franklin	1,240	9	12.2	-5.8	40	22	-17	9	39	93	-.24	.45	10.8	4	5	17	6	NW
Hawkeye	Fayette	.....	6	.....	.....	.....	.....	.....	.....	..	1.15	-.18	.40	10.5	4	...	...	...	.....
Humboldt	Humboldt	1,082	6	13.0	.....	38	11, 12	-20	9, 15	52	.55	-.09	.32	.....	5	14	10	4	NW
Lansing	Allamakee	.....	....	14.9	.....	41	7	-13	1	40	1.14	.....	.88	2.6	2	5	12	11	.....
Larchwood	Lyon	.....	....	13.9	.....	40	6,21, 22	-16	16	40	.22	.....	.15	2.2	3	16	2	10	NW
Larrabee	Cherokee	.....	8	11.4	-9.1	43	11	-21	15	49	1 25	+.65	.35	12 5	6	6	16	6	NW
Le Mars	Plymouth	1,221	..	13 1	.....	42	6	-16	9	51	1.10	.....	.35	12 0	4	13	10	5	N
Mason City	Cerro Gordo	1,130	5	10 4	-6.3	37	11	-22	6	49	.20	-.34	.20	2.0	1	...	...	...	.....
New Hampton	Chickasaw	1.166	...	11 5	.....	37	7,11, 12	-18	9	34	.60	.....	.30	6 0	3	6	9	13	NW
Northwood	Worth	1,210	..	10.4	....	34	7,11, 22	-23	9	40	1.50	.....	.80	15.0	4	19	1	8	NW
Osage	Mitchell	1,178	8	10.1	-5.9	38	11	-23	9	36	1.33	+.16	.60	13.3	5	2	10	16	NW
Plover	Pocahontas	.....	.. .	13.0	....	40	6, 11	-18	15	52	1 10	.....	.50	11.0	5	10	8	10	N
Primghar	O'Brien	.....	....	8 8	....	36	5	-20	15	35	.60	.....	.40	6 0	2	18	0	10	NE
Ridgeway	Winneshiek	.....	...	13.8	.....	40	7	-20	9	34	1.52	.....	.75	7 8	11	5	16	7	NW
Ruthven	Palo Alto	.....	....	9.0	.....	47	7	-22	15	34	1.00	.....	.40	10 0	4	9	9	10	SW
Sheldon	O'Brien	1,406	....	10.3	....	37	11	-21	9	45	.75	.....	.30	7.5	7	12	2	14	N, NW
Sibley	Osceola	1,506	6	10 8	-7 2	38	22	-20	9	45	.45	+.07	.20	2.5	5	6	15	7	NW
Sioux Center (a)	Sioux	.....	..	12 5	....	39	22	-15	15	40	.95	.....	.30	9 5	5	12	6	9	SE
Spencer	Clay	.....	....	7.0	....	38	11	-24	9	34	.....	.....	.....	.....	..	9	11	8	N
Spirit Lake	Dickinson	.....	5	10.6	-8.7	40	27	-19	9	35	.65	+.37	.30	6 5	3	14	6	8	SE
Storm Lake	Buena Vista	.....	10	11 1	.....	37	6, 11	-15	16	43	.85	+.17	.20	11 9	9	8	14	6	NW
Washta	Cherokee	.....	..	.....	.....	.....	.....	.....	.....	..	1.30	.....	.50	13.0	5	11	14	3	N, S
Waverly	Bremer	942	....	14 1	....	41	7	-15	6	46	1.24	.....	.80	8.6	5	5	8	15	NW
West Bend *	Palo Alto	.....	6	11.0	-8.7	38	11	-21	15	.....	1 10	+.18	.40	11.0	4	8	9	11	NW
West Union	Fayette	1,105	.	....	....	....	.....	.....	.....	.....	.20	.....	.10	2.0	3	12	0	16	NW
Average		.....		11.4	-7.1	38.8		-19.5	....	42.4	97	+0 16	.....	8.7	5	10	9	9	NW

CENTRAL SECTION.

Amana	Iowa	.....	23	16.8	-4.0	45	7	-9	16	32	1 61	+.34	.80	7.1	8	6	13	9	NW
Ames	Story	936	19	.....	.....	...	... . ..	-12	15	.....	.45	- 47	.24	6.1	4	10	3	15	.....
Audubon	Audubon	....	6	15.3	-4.7	45	3	-15	9	39	1.25	+ 36	.60	12.5	3	3	15	10	NW
Baxter	Jasper	.....	....	15.2	....	45	22	-14	14	37	1 15	.....	.30	10.5	9	4	17	7	NW
Belle Plaine	Benton	840	9	15.6	-6.9	40	11	-13	16	35	2.17	+1.05	.75	11.2	9	8	15	5	NW
Buckingham	Tama	....	....	.....	.....	.....	.....	.....	....	.....	1.37	.....	.55	13.7	6	9	9	10	.....
Carroll	Carroll	....	9	13.0	-7.7	44	6	-18	15	46	1.28	+.25	.65	13.5	6	16	1	11	.....
Cedar Falls	Black Hawk	841	8	12.4	-7 3	40	12	-19	24	40	.....	.....	.....	.....	....	...	...	...	N
Cedar Rapids	Linn	744	17	16.4	-5.3	45	7, 11	-10	16	36	1.03	-.64	65	7 4	4	11	5	12	NW
Clinton	Clinton	609	8	17.1	-5 6	49	7	-10	16, 17	43	2 78	+1.08	.97	1.45	10	13	3	12	W
Coon Rapids	Carroll	....		15.2		42	12	-15	9	38	.75	....	.40	7.5	5	10	9	9	NW
Davenport	Scott	615	27	18.0	-7.0	53	7	-7	15	42	2 45	+.84	.80	13.8	15	11	4	13	NW
Delaware	Delaware	1,084	8	13.4	-4.7	40	11, 12	-15	6	42	1.42	+.64	.51	7.0	9	9	8	11	NW
Denison	Crawford	1,192	6	13.4	-9.1	43	22	-27	15	37	.45	-.41	.32	5 0	3	16	7	5	N
Des Moines	Polk	867	21	17.0	-6 0	45	11	-10	15	39	.50	-.64	.13	7.8	6	6	8	14	NE
De Soto	Dallas	868	....	16.8	...	46	11	-10	15	39	1 17	.. ....	.59	9.0	7	11	6	11	NW
Dubuque	Dubuque	655	26	15.4	-8.0	45	11	-10	16	36	2.13	+ 66	1.02	12.9	13	9	7	12	NW
Fort Dodge	Webster	.....	....	12.2	.....	45	11	-22	9	40	.60	.....	.40	6.0	3	14	4	10	NW
Galva (b)	Ida	.....	6	14.6	-5.4	40	6, 23	-17	15	34	.80	+.47	.50	.....	3	18	5	5	NW
Gilman	Marshall	1,035	...	.. ...	....	....	.....	.....	.....	....	.61	.....	.45	T	3	15	4	9	N
Gladbrook	Iowa	.	...	.....	.....	.....	.....	.....	....	.....	.53	....	.15	5.0	6	..	....	....	.....
Grinnell	Poweshiek	1,011	9	16 2	-7.0	48	5	-10	15	33	1 23	+.46	.75	.....	4	9	9	10	N
Grinnell (near)	Poweshiek	.....	....	15.2		43	7	-12	15, 16	38	1.47	.....	.63	14.5	7	7	5	16	NW
Grundy Center	Grundy	966	8	12 2	-7.8	40	11	-13	15	43	.75	+.05	.30	12 0	6	9	9	10	NW
Guthrie Center	Guthrie	1.269	....	16 0	.....	43	11	-18	15	40	1 05	.....	.50	9.6	3	14	5	9	N
Harlan	Shelby	.		14.8		43	5, 11	-23	15	39	1.49	.....	.64	14 9	5	6	11	11	NE, NW
Independence	Buchanan	921	37	12.4	-7.9	38	11	-13	6	41	70	+.34	.35	7.0	4	14	5	9	NW
Iowa City	Johnson	644	9	17 0	-7.9	48	11	-12	16	33	2.20	+ 95	.80	10 5	6	10	7	11	NW
Iowa Falls	Hardin	.....	6	12.2	-5 0	39	11	-15	15	43	1.35	+ 52	.65	7.0	5	6	6	16	NW
Le Claire	Scott	.		...	.....		.....	.....	....	...	2.09	.....	.61	9.3	10	....	....	....	.....
Logan	Harrison	928	34	13 6	-10 5	47	6	-24	14	39	1.30	+.12	.80	13 0	3	11	7	10	N
Maquoketa	Jackson	.....	6	17 4	-7.9	49	11	-12	16	42	1 10	- 68	.62	12.5	7	15	4	9	NW
Marshalltown	Marshall	898	7	16.0	-5.7	42	11, 12	-14	15	34	1.37	+.65	.80	10.0	6	9	4	15	NW
Monticello (a)	Jones	800	45	13 4	-8.0	44	11	-13	16	42	1.76	+.05	.94	8.0	8	....	....	....	NW
Mt. Vernon*	Linn	858		15.1	.....	46	11	-14	16	...	.....	.....	.....	....		...	...	...	.....
Mt. Vernon (Hubbard)	Linn	.....	....	15 2	.....	45	11	-12	16	33	1 90	.....	.74	13.2	11	10	5	13	NW
Newton	Jasper	958	12	15.0	-6 7	43	11	-13	15	38	1.36	-.87	.80	7.0	6	10	8	10	NW
Odebolt	Sac	.....	....	14 8	.....	42	6	-19	15	44	1.19	.....	.60	11.5	5	13	7	8	.....
Ogden	Boone	1,109	....	13.9	.....	41	11	-22	15	40	1.09	.....	.70	10.0	3	18	0	10	NW
Olin (a)	Jones	.		16 0	.....	45	11	-15	15	41	1.56	.....	.93	10.0	6	10	10	8	NW
Onawa	Monona	.....	...	16.1	....	44	1	-14	16	46	1.09	.....	.50	14 3	7	17	3	8	NW
Rockwell City	Calhoun	1,219	....	13 3		48	22	-14	16	35	1.05	.....	.40	10.5	6	14	3	11	.....
Sac City	Sac	900	20	13 2	-6 5	42	6	-17	15	43	1.08	+ 02	.40	10 8	5	10	7	11	NW
Scranton	Greene	.....		15 2		40	11	-14	16	39	.72	....	.27	10.5	3	15	5	8	NW
Sioux City	Woodbury	1,122	10	13.8	-5.0	47	6	-12	9	51	.62	+.06	.27	...	7	7	11	10	NW
Toledo	Tama	.....	5	15 4	-6.6	43	22	-13	16	39	.98	+.36	.70	.....	4	4	9	15	NW
Vinton *	Benton	800	9	16.0	-5 9	41	11	-10	15	....	85	- 11	.40	8.5	4	19	2	7	NW
Waterloo	Black Hawk	862	20	13.2	-8 7	40	11	-11	6	43	1.19	+ 08	.80	6.0	4	8	12	8	NW
Webster City	Hamilton		6	15 4	-3.9	40	11, 20	-13	9	37	.92	-.13	.45	9.2	4	9	10	9	NW
West Branch	Cedar	.. .	..	16 0	.....	45	11	-12	17	28	1.06	... .	.64	2 2	4	10	7	11	NW
Whitten	Hardin	....	....	12.2	....	40	11	-16	15	38	.60	.....	.20	6.0	5	9	6	13	NW
Wilton Junction	Muscatine	.....	..	17.8	...	47	7, 11	-9	25	43	2.89	.....	1.25	15.0	8	14	2	12	NW
Average		.....	....	14.9	6 6	43.7	.....	-14.2	.....	39 1	1 25	+.16	.....	9.9	6	11	7	10	NW

CLIMATOLOGICAL DATA FOR FEBRUARY, 1900—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days	Number partly cloudy days.	Number cloudy days.	
on	Union			19.4		41	11	-9	15	37	1.51	.....	.80		7	6	9	13	NW
la	Monroe	945		18.2		47	7	-10	15	44	2.10	.....	.65	13.5	8	7	10	11	SW, NW
antic	Cass		8	15.5	-7.4	44	11	-21	15	43	1.30	+.39	.40	13 0	7	8	9	11	NW
avia	Jefferson	640									1.60	.....	.80	16.0	5	...	...	...	.....
lford	Taylor			18.6		49	11	-12	15	44	1.21	.....	.62	7.0	6	11	9	8	NW
knap	Davis	857		18 1		51	7	-7	1	37	3 09	.....	.80	15.5	12	11	10	7	N
llington ‡	Des Moines			23.2		55	7	-4	15	44	4.27	.....	1 01	.....	12	...	..	..	.....
naparte	Van Buren		8	19.5	-5.9	55	7	-8	15	37	3 65	+2.03	1.16	14.0	5	...	..	..	.....
sey	Marion										2.02	.....	.72	13 0	9	....	....	....	.....
son	Pottawattamie	1,013	6	18.6	-4.1	54	6	-8	15	37	2.00	+.82	.40	6.8	6	....	....	....	.....
terville	Appanoose	1,030		18.1		52	7	-9	15	40	1.85	.....	.25	16 0	10	7	14	7	NW
ariton	Lucas	645									2 80	.....	.61	12.0	12	10	8	10	NW
llicothe	Wapello	1,069	9	18.7	-6.2	49	11	-10	15	42	-1.25	+.19	.75	16.0	8	....	....	....	.....
rinda	Page	1,127	7	17.0	-8.2	45	11	-11	15	39	1.23	+.40	.58	9.4	7	13	4	11	NW
rning	Adams		8	18.3	-8.1	46	11	-13	15	36	1.10	+.18	.55	5.0	3	8	7	13	NW
llege Springs	Page	969		17.0		47	11	-11	8	37	.25	.....	.39	10.4	6	18	1	9	NW
uncil Bluffs	Pottawattamie										.35	.....	.20	25.0	2	19	1	8	N
mberland	Cass										4 57	.....	.31	6.2	5	10	6	12	N
nville	Des Moines	715		13.7		44	11	-10	15,16,17	38	.17	.....	1.25	17.0	9	11	8	9	.....
agonal	Ringgold			19.0		55	7	-11	15	41	2.73	.....	.10	....	7	5	14	9	NW
don	Wapello										.56	.....	.69	17.4	11	12	3	13	NW
nerson	Mills										4.50	+2.56	.18	...	5	....	....	..	.....
. Madison	Lee	516	51										1.50	23.5	9	9	3	16	NW
enwood	Mills	979	29	18.3	-5.4	49	11, 12	-12	9, 15	40	.50	-.30	.20	5.0	3	5	16	7	NW
eenfield	Adair		8	16.4	-6 6	47	11	-12	15	41	.88	-.29	.23	7.2	8	13	7	8	N
iswold	Cass										18	.....	.08	.....	5	6	1	21	N
amburg	Fremont	912									.95	.....	.30	9.5	4	8	5	15	W
edrick	Keokuk			17.4	...	55	7	-10	15	39	1.66	.....	.65	9.0	9	16	3	9	NW
opeville	Clarke		8	16.8	-7.0	47	7	-10	15	38	1.20	+.32	.67	.....	9	5	14	9	N, NW
idianola	Warren	618	7	17.8	-7.2	45	11	-12	15	39	.79	+.09	.20	5 9	8	10	6	12	NW
eokuk	Lee		28	22.7	-5.0	60	7	-2	17,23,24	45	3.24	+1.60	1.05		13	12	4	12	NW
eosauqua (a)	Van Buren		7	20.8	-5 8	55	7	-5	15	35	3.74	+2 52	1.15	16 5	11	...	...	...	.....
noxville	Marion		6	18 2	-6.0	48	7	-9	15	40	1.11	+.12	.46	10.2	8	14	3	11	NW
acona	Warren										2.25	.....	.50	14.5	8	11	9	8	....
enox	Taylor			16.8	.....	45	11	-12	15	41	.56	....	.15	4 9	9	15	5	8	NE, NW
ooar	Lee			19.8		59	7	-4	9	39	2.80	.....	1.00	...	3	16	7	5	NW
lt. Ayr	Ringgold	1,236	6	17.5	-9.0	48	7	-10	15	40	1 70	+.56	.70	13.8	8	10	6	12	E, SW
lt. Pleasant	Henry	725		16 4	.....	54	7	-11	1, 25	45	2.64	.....	.91	5.0	10	14	10	4	NW
urray	Clarke	1,183									1.00	.....	.30	10 0	5	1	21	6	.....
maha (Neb.)	Douglas	1,113		18.0	-7.2	45	11	-9	15	35	.81	+.02	.44	.....	6	8	13	7	NE
sceola	Clarke	1,123		16.6	.....	48	7	-10	15	39	1 67	.....	.65	...	11	6	9	13	NW
vid	Wayne		6	18.0	-6 8	52	7	-10	15	44	2 56	+1.21	.74	13.2	9	13	3	12	NW
skaloosa	Mahaska	850	16	16.4	-6.0	46	7	-12	15	40	1.71	+.64	67	8.3	9	8	7	13	NW
ttumwa	Wapello	630	5	21.4	-3.8	53	7	-2	24	37	.76	-.37	.20	7.6	6	14	4	10	NW
acific Junction	Mills	960		17.0	.....	49	11	-17	15	41	88	... ...	.40	8 8	6	8	14	6	NE
ella	Marion			16 2	....	38	4, 20	-12	15	28	.48	.....	.25	4.5	6	9	12	7	NE
ed Oak	Montgomery	1,033		21.6	....	50	3, 11	-9	15	41	.84	.....	.38		6	11	2	15	NW
igourney	Keokuk			18.4	....	52	7	-10	15	39	1.98	.....	.80	10.0	7	10	13	5	NW
tuart	Guthrie			15.3	....	42	6	-12	8	37	.60	.....	.30	6.0	4	10	12	6	.....
hurman	Fremont	1,058	6	18.3	.....	49	11	-14	15	38	2.53	.....	.60	24.3	9	9	5	14	NE
illisca	Montgomery	578		20.1	-4.4	48	6	-12	15	42	2.43	+1.58	.60		9	7	11	10	NE
apello (c)	Louisa	738	9	18.0	.....	47	11	-6	26	33	2.79	.....	.76	10.8	6	....	....	...	NW
ashington	Washington		8	16.3	-9 1	52	7	-11	15	39	2 03	+1.03	.90	9.5	5	....	..	...	NW
interset	Madison			17.2	-6.4	45	11	-10	15	37	1.30	+.41	.40	13.0	7				.....
oodburn	Clarke										2 01	...	.97	13.0	10	10	4	14	.....
Average				18.0	-6.4	49.0	.....	-10.1	... ...	39 3	1 69	+.74	.....	11.1	7	10	8	10	NW
Av. for the state				14 8	-6.7	43 8	.....	-14.6	.....	40 2	1.30	+.35		9.9	6	10	8	10	NW

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

THE WINTER OF 1899–1900.

This has been about an average winter as to temperature, the mean of the three months—December 1, 1899, to March 1, 1900—being 21° for the state at large. The daily average was 4.3° warmer than the three corresponding months in 1898–1899. There have been less than the usual number of stormy days and days on which the temperature registered below zero. February was the coldest month, and brought the greater number of cold waves. On the whole, it will rank as a fairly mild and favorable winter season, making somewhat less than usual drafts upon the stores of grain and forage for stock, and fuel for household use.

ERRATA IN DECEMBER REVIEW.

Atlantic.—Mean temperature of 26.6° recorded on pages 5 and 16, should have been 22.6°.

Bonaparte.—Mean temperature of 26.6° recorded on pages 5 and 16, should have been 26.7°.

Charles City.—Total precipitation of .94 inch recorded on pages 4, 8 and 20, should have been 1.84 inches.

Dows.—Total precipitation of .91 inch recorded on pages 4, 8 and 20, should have been 1.02 inches.

Murray.—Total precipitation of 1.56 inches recorded on pages 5, 8 and 21, should have been 1.83 inches.

Pacific Junction.—Total precipitation of 1.39 inches recorded on pages 5, 9 and 21, should have been 1.40 inches.

Onawa.—Maximum temperature recorded 52° on the 1st, on pages 4 and 14, should have been 58° on the 23d.

Rockwell City.—Maximum temperature recorded 47° on the 8th, on page 4, should have been 50° on the 23d.

Wilton Junction.—Mean temperature recorded 24.9° on pages 4 and 17, should have been 24 8°.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR FEBRUARY, 1900.

STATIONS.		DATE.																											
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Mean.
Afton	Max	34	33	38	30	38	34	36	20	18	36	44	39	29	20	7	14	11	32	35	35	32	40	29	20	19	25	24	30	29.9
	Min	- 3	4	15	10	16	6	18	0	- 8	7	25	20	12	- 2	- 9	- 8	- 8	5	11	16	24	13	18	- 4	- 6	- 5	5	14	10.2
Albia	Max	37	33	40	35	40	35	47	37	17	32	45	42	27	14	9	15	14	25	35	41	37	40	37	25	19	21	25	32	30.6
	Min	- 7	3	7	11	15	7	15	4	- 7	5	23	24	0	5	-10	- 7	- 7	4	10	17	23	10	15	- 5	- 8	- 2	4	15	5.9
Alta	Max	33	30	29	26	26	38	29	1	7	28	36	24	0	3	2	4	14	18	26	26	32	38	23	7	8	16	24	28	23.5
	Min	- 6	0	13	4	10	- 3	10	- 7	- 4	1	21	16	-14	- 4	-16	-16	-11	-1	6	8	15	9	16	- 9	-10	- 3	7	10	1.1
Amana	Max	26	23	35	28	32	31	45	33	13	35	44	40	22	10	6	2	12	16	28	38	35	36	33	15	14	18	26	29	28.0
	Min	- 6	4	17	15	12	2	26	3	- 5	6	28	22	- 1	5	- 8	- 9	- 5	0	12	19	29	13	15	- 4	- 7	3	6	18	7.6
Ames	Max	...	..	..	...	...	...	37	19	12	38	42	41	...	..	...	...	...	..	..	..	..	..	..	...	...	..	..	..	...
	Min	- 4	3	15	11	12	1	18	- 1	- 2	5	16	16	- 6	1	-12	- 9	- 6	2	11	16	26	11	16	- 6	- 6	- 2	5	18	5.2
Atlantic	Max	36	33	35	34	40	39	38	14	20	35	44	33	15	6	10	5	19	31	31	30	32	40	34	13	12	25	24	24	26.9
	Min	- 7	3	19	11	15	1	15	- 3	-14	2	30	15	0	3	-21	- 8	- 8	-9	13	18	22	1	14	- 3	- 3	-19	11	18	4.1
Audubon	Max	36	32	45	31	40	39	38	14	18	34	42	36	16	5	4	2	12	25	28	38	30	38	32	14	14	18	24	25	25.1
	Min	- 3	4	17	10	12	1	15	- 7	-15	5	27	18	- 3	0	-14	-14	-10	1	10	15	24	15	13	- 5	- 6	-10	10	15	4.6
Bancroft	Max	24	24	26	27	28	34	35	15	6	26	39	30	10	5	4	6	16	20	28	27	32	38	35	8	14	20	26	27	22.8
	Min	- 9	-4	13	3	9	-12	15	-13	-22	-2	21	8	-15	- 5	-15	-16	- 6	-7	10	10	18	7	7	-10	-10	- 1	7	10	-0.2
Baxter	Max	32	30	33	34	31	37	39	6	14	42	43	32	10	10	13	5	16	24	29	37	33	45	32	9	16	24	21	32	26.0
	Min	1	8	9	17	1	9	2	- 7	- 3	12	28	- 3	- 1	-14	-12	- 8	1	9	10	16	10	20	-5	- 8	0	3	9	17	4.8
Bedford	Max	37	38	30	38	42	37	41	18	19	42	49	38	22	12	16	9	19	37	39	41	38	48	34	21	18	30	26	30	31.0
	Min	- 7	5	6	10	17	15	19	- 2	- 9	6	27	16	- 5	3	-12	- 9	- 9	2	18	21	18	9	18	- 4	- 3	- 3	8	15	6.1
Belknap	Max	30	35	45	37	35	42	51	11	20	38	47	32	17	14	10	9	10	25	25	41	42	41	20	8	15	20	25	30	27.7
	Min	- 7	7	10	15	16	11	30	9	- 1	12	25	32	3	3	- 6	- 3	- 5	5	10	11	29	15	14	- 3	- 6	1	1	10	8.5
Belle Pl'ne	Max	28	18	34	32	33	32	38	12	15	34	40	33	10	14	- 6	- 3	- 5	5	10	11	29	15	14	- 3	- 6	1	1	10	8.5
	Min	- 7	2	15	12	21	0	32	6	- 7	5	20	29	- 4	4	-10	-13	- 7	0	10	15	25	10	17	- 4	- 5	0	5	10	6.5
Bonaparte	Max	34	29	40	25	33	32	55	32	28	38	48	38	25	15	10	4	12	23	32	38	34	34	35	20	14	18	24	27	28.5
	Min	- 3	6	16	18	12	13	32	10	0	10	27	25	5	9	- 8	- 2	- 5	0	12	32	28	18	20	- 1	- 4	1	5	19	10.5
Britt	Max	22	25	30	26	20	31	25	16	13	23	39	32	10	2	2	5	15	16	28	28	32	35	30	10	18	21	23	26	21.8
	Min	-13	-5	15	5	14	13	15	- 7	-24	3	22	12	-14	- 4	-16	-16	-10	-9	10	10	22	4	8	-11	-10	- 5	5	11	0.9
Carroll	Max	39	38	30	33	38	44	42	10	15	35	40	25	5	4	5	3	12	22	28	29	33	41	25	10	5	22	21	27	24.3
	Min	- 7	-2	15	6	20	- 2	10	- 5	-14	5	15	14	- 8	- 2	-18	-16	-10	-3	7	11	11	5	24	- 7	- 9	-11	6	14	1.8
Cedar Falls	Max	2	22	29	31	26	30	35	37	20	18	39	40	29	4	4	4	- 3	13	13	29	33	33	38	29	8	13	17	24	22.0
	Min	- 3	-1	16	9	15	-10	12	5	-11	-9	16	28	- 8	- 5	-11	-12	-13	-5	4	11	25	8	23	-19	- 1	- 3	5	14	2.9
Cedar Rap	Max	24	25	35	30	32	35	45	36	15	37	45	39	20	8	7	4	11	16	27	36	34	36	33	13	13	17	24	28	25.9
	Min	- 5	3	20	11	9	- 1	27	1	- 5	8	29	19	- 1	4	- 8	-10	- 5	0	10	18	27	13	11	- 3	7	4	5	17	5.8
Centerville	Max	30	31	40	33	32	54	37	35	15	42	43	40	22	13	9	6	14	29	32	39	40	38	35	8	20	22	20	28	23.9
	Min	3	7	12	19	12	22	6	- 2	6	15	15	20	3	7	- 8	- 3	- 4	5	13	22	20	22	15	- 2	- 5	10	5	7	8.3
Chariton	Max	37	32	40	34	36	33	52	28	17	38	45	40	21	10	11	4	13	25	34	38	35	41	34	19	15	21	22	31	28.8
	Min	- 3	5	18	9	17	6	20	2	- 4	8	27	18	1	2	- 9	- 6	- 4	5	12	19	25	12	17	- 3	- 6	- 2	2	17	7.4
Charles Cy	Max	19	22	28	22	22	26	36	27	0	25	37	35	16	4	2	3	14	12	25	29	30	30	31	13	10	16	22	26	20.9
	Min	- 8	-2	18	- 6	12	-20	20	0	-22	-1	17	15	-11	- 3	-12	-16	- 9	-7	8	15	25	8	11	- 8	-11	0	5	19	1.4
Clarinda	Max	39	37	40	35	41	40	39	17	24	41	49	38	16	10	10	4	15	37	38	35	34	44	34	13	17	27	26	28	29.6
	Min	- 3	7	21	12	19	7	17	- 5	- 8	11	27	16	- 1	2	-10	- 8	- 6	5	19	22	24	12	12	- 1	0	- 1	11	18	7.8
Clear Lake	Max	22	25	28	25	28	28	37	20	5	25	38	32	10	8	4	6	17	18	25	31	32	30	30	9	12	19	21	28	21.9
	Min	-10	-5	15	3	12	-13	17	- 7	-24	-4	17	11	-15	- 5	-18	-17	- 9	-9	8	10	22	5	7	-10	-13	5	5	17	-0.6
Clinton	Max	18	21	38	31	33	34	49	48	15	37	47	40	27	14	10	9	15	18	26	39	32	35	39	12	13	15	29	27	27.5
	Min	- 6	2	13	12	17	20	32	5	- 2	6	26	25	4	6	- 7	-10	-10	-5	2	14	25	7	10	- 9	- 9	1	0	19	6.7
College Sps	Max	35	35	39	31	40	36	39	18	24	36	46	38	22	22	6	3	13	34	36	35	32	38	32	20	16	25	24	27	28.0
	Min	- 1	9	21	11	20	8	18	- 1	- 6	11	23	22	- 2	1	-13	- 9	- 9	3	18	22	22	10	20	- 2	- 1	0	12	16	8.4
Coon Rap	Max	36	32	33	31	40	39	41	21	12	33	41	42	20	8	6	3	14	21	28	30	33	39	38	21	11	18	24	25	25.1
	Min	- 2	4	18	8	15	1	15	- 5	-15	3	29	15	- 6	- 1	-13	-13	- 7	-3	10	13	23	10	14	- 8	- 6	-10	10	15	4.3
Corning	Max	35	33	41	31	36	35	41	20	19	34	45	39	20	11	7	4	11	28	32	33	32	38	35	21	15	21	23	25	27.0
	Min	- 4	5	19	11	20	9	18	- 2	- 7	11	28	18	- 1	0	-11	- 8	- 8	4	8	19	24	2	19	- 4	- 4	-10	10	18	6.4
Co. Bluffs	Max	42	38	37	37	39	45	34	6	30	39	47	30	16	7	9	6	18	33	31	29	34	45	32	15	17	23	23	33	26.5
	Min	6	12	13	13	8	8	-1	-11	- 7	11	29	3	3	- 9	-10	- 6	- 4	9	9	20	15	14	0	- 1	2	1	13	13	5.2
Cresco	Max	15	18	24	18	27	23	37	6	3	24	37	27	- 2	3	- 9	-10	- 6	- 4	9	9	20	15	14	0	- 1	2	1	13	13	5.2
	Min	-13	-7	12	3	6	-16	24	-10	-23	0	25	8	-12	- 6	-13	-17	-10	-9	4	13	22	7	2	-11	-14	- 5	2	15	-0.5
Davenp'rt	Max	20	23	38	24	33	36	53	45	17	38	47	38	20	13	8	2	11	16	27	39	35	33	36	9	11	14	25	27	26.4
	Min	- 3	5	19	15	12	14	36	3	- 1	12	31	20	3	8	- 7	- 4	- 5	2	10	18	27	17	9	- 3	- 5	4	6	20	9.5
Delaware	Max	17	20	30	36	27	27	39	36	9	31	40	40	25	6	6	2	10	14	24	32	31	34	33	13	13	15	22	26	23.4
	Min	-10	-2	11	11	9	-15	23	1	- 9	9	25	23	- 4	1	-13	-14	-10	-6	5	13	25	12	13	- 8	-10	0	0	14	3.2
Decorah	Max	15	18	29	20	28	28	38	30	8	29	38	37	10	5	3	6	10	12	27	35	32	30	32	- 4	10	17	23	28	21.9
	Min	-10	-4	13	4	10	-13	12	- 1	-16	0	27	10	-10	- 3	-14	-10	- 8	-6	5	13	25	10	2	-11	-11	- 4	2	13	0.8
Denison	Max	40	32	32	34	30	35	25	3	25	33	40	27	10	4	7	5	13	21	25	22	32	43	26	8	8	14	22	25	22.9
	Min	- 2	14	20	14	12	1	15	- 5	-11	15	28	13	- 7	- 6	-27	-17	- 7	-5	5	12	8	15	18	- 6	- 6	-14	6	16	3.4
Des Moines	Max	37	34	35	32	34	33	41	16	17	37	45	38	15	10	8	4	13	22	30	36	35	38	36	12	10	17	24	31	25.7
	Min	- 2	6	20	12	15	6	16	0	- 5	7	30	15	4	2	-10	- 6	- 4	8	12	20	27	11	12	- 2	- 3	- 1	7	18	7.9
De Soto	Max	37	30	35	29	43	36	39	17	18	36	46	40	16	7	6	2	12	27	32	35	32	40	31	9	20	21	27	30	26.6
	Min	- 2	4	19	10	17	4	17	- 1	- 7	7	31	16	- 1	2	-10	- 8	- 4	0	11	17	21	13	12	- 2	- 5	- 4	11	18	6.3
Diagonal	Max	33	32	36	27	37	40	41	5	20	30	44	20	10	4	6	1	6	32	33	35	30	38	33	15	12	22	20	28	24.2
	Min	2	4	10	10	7	13	3	- 6	- 5	5	10	-2	- 2	-10	-10	- 7	-10	10	16	21	12	12	-4	- 5	- 6	- 5	10	18	3.5
Dows	Max	19	22	28	27	28	30	35	24	5	30	38	35	15	2	2	0	12	14	26	28	30	38	35	8	10	15	20	25	21.7
	Min	-11	7	18	5	12	-16	17	- 5	-21	-2	25	12	-12	- 3	-18	-16	-12	-8	8	12	23	5	5	-10	-12	- 5	4	18	0.0
Dubuque	Max	16	19	33	26	27	33	42	36	12	34	45	39	19	8	8	3	12	17	26	34	32	36	32	8	13	12	24	27	24.7
	Min	- 7	3	17	11	8	5	33	0	- 8	7	30	19	0	1	- 4	-10	- 3	3	7	17	26	18	8	- 8	- 6	1	2	18	6.9
Eldon	Max	26	31	39	34	35	36	55	35	20	38	50	42	24	13	10	5	12	25	34	41	37	39	35	22	12	23	25	30	29.0
	Min	- 5	5	9	18	15	11	28	5	- 2	7	29	22	4	7	-11	- 5	5	0	12	21	28	10	20	- 5	- 6	- 8	0	19	8.0
Elkader	Max	17	25	32	30	30	34	40	19	12	32	42	34	11	10	13	13	14	21	34	36	33	41	33	- 2	18	20	25	35	25.1
	Min	- 8	-1	14	9	10	-17	24	0	-10	7	20	18	- 4	1	- 7	-10	- 5	-3	8	15	27	15	10	- 7	- 7	2	2	18	4.3
Estherville	Max	26	29	27	25	25	35	34	10	5	30	40	30	10	7	7	6	18	20	29	25	32	36	30	8	12	20	25	28	23.5
	Min	11	-2	9	1	2	-14	9	- 8	-25	-1	29	10	-14	- 5	-15	-12	- 7	-3	10	12	14	4	5	-10	-10	-12	11	8	-0.9
Ft. Dodge	Max	30	28	32	28	30	35	35	15	10	32	45	25	1	4	4	5	16	18	30	32	35	40	24	8	10	17	25	27	22.9
	Min	-10	-4	16	5	13	10	14	- 4	-22	9	[illegible]	12	-10	- 2	-16	-13	- 8	-9	10	22	15	5	13	- 6	- 9	-13	7	16	1.5
Fonda	Max	33	30	31	34	41	31	23	12	10	24	37	20	10	6	2	14	16	18	23	26	32	33	21	10	8	10	22	32	21.8
	Min	3	6	5	-16	-10	- 6	-12	-21	- 1	4	6	-14	-11	-16	-19	-14	- 2	4	8	20	4	18	-8	-10	-10	- 9	7	20	-2.6
Forest City	Max	20	26	29	26	24	30	34	22	2	22	36	33	15	4	3	5	15	26	27	30	31	36	30	9	12	16	21	26	21.8
	Min	- 7	-5	15	2	12	-13	16	- 5	-24	-4	18	11	-15	- 6	-15	-17	- 7	8	7	11	21	6	6	-11	-12	- 2	5	12	-0.1
Galva	Max	23	29	30	30	29	40	30	10	14	30	39	...	...	4	4	21	15	25	27	25	33	32	40	27	17	20	30	30	27.1
	Min	- 4	3	6	5	5	12	10	- 5	-15	5	28	...	...	- 4	-17	-12	- 8	5	10	10	13	9	0	- 7	- 9	-11	10	12	2.9
Glenwood	Max	40	36	37	35	40	44	38	19	14	38	49	49	21	11	9	2	18	34	33	30	33	14	38	24	17	22	25	28	28.5
	Min	1	7	22	10	20	4	18	- 4	-12	12	31	20	0	2	-12	- 8	- 8	5	17	20	22	11	23	2	2	- 1	13	11	8.1
Greene	Max	21	26	29	27	30	35	37	26	7	32	38	36	16	5	4	3	15	15	28	33	31	36	31	15	13	22	25	28	23.7
	Min	- 9	-3	18	6	18	-16	22	- 1	-19	1	22	16	-10	- 2	-15	-15	- 8	-7	11	13	25	5	14	- 7	-10	0	5	18	2.6
Greenfield	Max	37	32	39	29	34	37	43	16	20	38	47	38	18	10	10	7	13	36	35	35	33	42	34	14	23	25	27	29	28.6
	Min	- 5	0	10	9	12	3	13	- 5	-11	6	26	16	- 4	- 1	-12	-11	- 8	4	9	14	24	11	14	- 5	- 7	- 8	8	19	4.3
Grinnell	Max	28	26	34	28	48	31	42	29	30	32	40	40	18	8	6	5	12	17	27	34	33	33	34	7	17	15	22	28	26.9
	Min	- 5	2	16	11	18	4	24	2	- 6	6	26	16	- 2	2	-10	- 9	- 7	2	10	16	26	12	14	- 4	- 6	- 1	6	16	5.6
Grin'l (nr.)	Max	29	26	34	28	30	33	43	29	14	33	38	37	21	10	6	4	12	17	29	35	33	30	30	18	13	20	22	29	25.1
	Min	- 9	-1	14	11	16	1	21	0	- 6	5	24	20	- 2	0	-12	-12	- 8	-1	9	16	27	11	18	- 5	- 8	1	3	16	5.4
Grundy C'r	Max	24	25	31	26	31	33	36	21	9	34	40	35	14	0	5	2	14	12	29	32	33	34	30	7	13	21	25	29	23.0
	Min	-10	-2	14	6	13	-10	20	- 4	-12	5	25	-12	- 9	- 2	-13	-12	- 9	-4	7	17	21	11	5	- 8	- 9	0	2	13	1.8
Guthrie C'r	Max	37	34	33	31	41	39	38	20	13	35	43	39	20	7	2	3	12	23	20	40	32	39	38	20	12	19	24	26	26.4
	Min	- 3	2	20	9	21	3	18	- 1	-10	12	30	19	- 3	- 4	-18	-11	- 5	0	10	13	23	10	20	- 4	- 5	-12	10	12	5.6
Hampton	Max	23	26	30	30	31	32	37	0	8	33	39	28	2	4	5	3	15	15	29	32	32	40	37	5	15	21	24	28	24.3
	Min	- 8	-2	15	7	13	- 7	19	- 6	-17	3	28	8	-11	- 3	-14	-15	- 8	-5	9	13	23	12	6	- 8	- 9	- 1	5	14	2.2
Harlan	Max	35	32	32	32	43	40	37	15	19	33	43	33	18	4	3	3	11	33	32	29	31	40	35	18	15	22	26	27	26.5
	Min	- 4	2	17	9	15	1	14	- 7	-17	3	25	17	- 5	- 1	-23	-14	-11	1	11	15	22	4	17	- 6	- 5	-12	9	13	3.2
Hedrick	Max	33	26	38	32	35	35	55	30	16	35	46	38	23	13	8	4	12	20	32	38	35	35	34	18	13	18	24	29	27.7
	Min	- 6	3	15	15	15	7	25	3	- 3	7	25	21	2	4	-10	- 6	- 6	2	9	18	28	12	17	- 4	- 7	- 1	5	18	7.1
Hopeville	Max	35	31	36	32	34	32	47	19	18	37	44	31	15	7	7	1	10	27	33	34	32	39	34	14	14	21	22	29	26.2
	Min	- 3	6	20	11	18	9	19	- 2	- 5	11	27	15	- 2	1	-10	- 7	- 6	6	14	20	25	14	14	- 3	- 5	- 3	7	17	7.4
Humboldt	Max	29	17	30	26	31	35	36	18	8	30	38	38	16	4	3	4	16	18	28	28	32	37	34	12	18	25	28	34	24.0
	Min	- 9	-3	14	6	13	-17	16	- 4	-20	6	26	15	-11	- 2	-20	-13	- 8	-6	10	12	22	3	14	-10	-13	7	16	8	1.9
In'pend'ce	Max	20	22	33	26	27	28	37	11	10	31	38	31	6	4	5	1	11	12	26	33	30	33	25	- 1	10	16	22	29	20.6
	Min	- 9	-1	12	8	12	-13	19	3	-10	5	23	27	- 6	0	- 9	-12	- 8	-4	8	14	25	11	18	- 8	- 9	1	3	16	4.1
Indianola	Max	36	32	35	32	36	36	42	22	16	38	45	42	23	11	7	3	11	23	32	36	34	43	36	29	14	22	22	33	28.3
	Min	- 3	8	19	11	18	7	20	1	- 6	7	28	22	- 1	1	-12	- 7	- 6	5	10	17	26	11	20	- 3	- 6	- 1	6	16	7.4
Iowa City	Max	25	23	36	30	33	36	46	35	12	37	48	41	31	21	7	7	12	17	29	40	35	36	30	24	14	19	25	29	27.8
	Min	- 7	3	15	16	7	3	15	4	- 4	6	29	31	0	5	- 9	-12	- 7	-3	9	17	27	13	12	- 8	- 8	4	5	13	6.3
Iowa Falls	Max	25	25	31	25	31	30	36	20	11	31	39	33	12	3	2	3	14	15	27	31	31	34	30	7	15	20	25	28	22.6
	Min	- 9	-3	15	7	12	-13	20	- 5	-14	7	25	10	- 9	- 2	-15	14	-11	-5	10	14	22	7	3	- 7	- 9	- 4	4	13	1.8
Keokuk	Max	30	29	45	39	39	40	60	53	23	42	51	41	28	19	13	7	13	27	31	42	37	36	39	23	13	16	27	26	31.9
	Min	0	10	20	23	18	18	36	8	2	16	32	28	8	11	9	2	8

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR FEBRUARY, 1900—CONTINUED.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Mean.
sauqua	Max	34	31	40	33	33	35	55	37	20	39	50	44	31	...	11	7	14	26	35	41	35	35	37	23	15	21	25	28	30.6
	Min	- 1	7	15	21	14	14	33	10	0	10	28	25	7	..	- 5	- 2	- 4	5	14	23	29	17	21	0	- 4	- 3	4	15	10 9
oxville..	Max	37	32	34	30	36	34	48	24	18	39	45	33	20	10	8	3	12	23	33	38	34	42	31	18	16	21	24	31	27 8
	Min	- 3	7	18	12	20	10	24	3	- 3	8	29	20	0	2	- 9	- 7	- 4	6	11	18	27	14	18	- 3	- 5	2	8	18	8.6
sing....	Max	27	21	32	30	28	28	41	36	8	28	36	38	28	9	12	9	11	20	30	36	34	55	34	23	21	16	23	32	25.9
	Min	-13	-2	14	6	10	- 8	23	7	-11	2	15	18	- 7	- 1	- 5	- 9	- 3	0	4	15	17	15	16	- 7	- 6	0	1	18	3 9
chwood	Max	33	29	31	35	27	40	38	14	8	29	39	31	20	14	10	9	23	19	29	28	40	40	36	16	8	4	28	30	25 3
	Min	- 5	-2	12	- 2	11	0	12	-11	-12	-3	23	13	12	- 3	-12	-16	9	-3	8	15	10	12	14	- 9	- 7	- 4	12	-4	2.5
rabee...	Max	35	35	32	28	25	42	35	8	10	28	43	32	7	3	7	7	19	24	26	27	34	38	32	13	12	20	33	27	24.4
	Min	- 7	-2	15	- 1	4	- 7	5	- 7	-20	-2	22	4	-17	- 4	-21	-16	-11	-2	6	9	14	5	7	-10	-13	- 8	9	7	-1.5
ox.....	Max	34	33	37	29	38	34	43	19	18	36	45	43	22	10	7	5	11	30	33	33	32	39	34	21	15	22	22	25	27.5
	Min	- 7	7	18	10	17	7	18	- 1	- 8	10	27	21	- 5	1	-12	-11	-10	1	14	19	23	10	20	- 6	- 6	- 6	8	14	6.2
Mars....	Max	36	33	32	29	23	42	36	15	12	27	38	32	16	7	7	7	20	22	28	29	32	39	32	15	11	20	28	25	21.8
	Min	- 7	7	18	10	17	7	18	- 1	- 8	10	27	21	- 5	1	-12	-11	-10	1	14	19	23	10	20	- 6	- 6	- 6	8	14	6.2
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oar.....	Max	21	25	34	35	31	34	42	15	18	35	45	34	11	12	14	6	16	22	29	35	35	43	32	2	15	23	23	31	26.7
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V. (H.)	Max	21	25	34	35	31	34	42	15	18	35	45	34	11	12	14	6	16	22	29	35	35	43	32	2	15	23	23	31	26 7
	Min	- 8	2	13	13	9	1	22	0	- 7	6	26	3	- 3	4	- 8	-12	- 6	1	9	14	25	13	5	- 6	- 8	2	8	16	4.7
. Ayr..	Max	35	33	37	32	34	31	48	23	20	36	44	38	19	11	8	4	11	32	33	34	32	39	33	20	16	21	21	28	27 6
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Red Oak...	Max	43	45	50	41	44	40	40	20	24	42	50	38	24	15	4	- 9	- 5	- 5	9	18	23	24	11	24	0	2	- 2	12	18	10.3
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Ruthven ..	Max	...	27	26	24	27	27	47	12	0	24	38	20	5	-16	-18	-22	-19	-15	-9	5	12	17	34	21	4	- 8	-14	- 9	23	-1.8
	Min	...	-7	-4	- 4	8	17	12	- 8	-20	-10	20	5	32	14	4	7	3	12	19	26	27	32	34	35	16	7	16	23	27	23.8
Sac City....	Max	35	31	30	28	29	42	38	20	10	30	38	28	14	-10	- 2	-17	-14	- 9	-3	7	9	19	7	16	- 8	- 9	- 8	8	13	2.6
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Scranton ..	Max	35	35	31	30	36	38	37	17	12	33	40	28	18	- 5	0	-12	-14	- 6	4	9	14	24	10	20	- 5	- 6	15	25	16	5.6
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Toledo. ...	Max	29	30	32	35	29	36	41	30	25	39	30	30	33	- 4	3	-11	-13	- 7	-2	10	11	27	12	0	15	28	28	29	31	35	31.5
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Villisca....	Max	22	32	40	38	36	48	38	38	38	40	36	30	29	- 5	- 5	-12	-11	-10	2	15	20	37	36	35	35	19	15	20	27	26	28.0
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	Min	- 4	3	5	20	...	...	..	6	2	10	39	49	36	16	14	11	1	13	21	31	37	17	25	10	- 5	-10	1	5	11	5.7
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Waverly...	Max	21	23	30	24	30	31	41	28	- 1	-13	6	28	17	- 8	0	- 8	-11	- 7	-3	12	28	40	32	35	22	22	20	20	24	24 2
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Winterset .	Max	35	31	34	31	38	37	38	6	18	36	45	28	28	- 1	4	-10	- 8	- 5	4	12	16	18	24	34	22	2	- 8	2	8	28	23.0
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W. Branch.	Max	28	24	22	32	30	34	38	16	28	36	45	30	28	2	6	-

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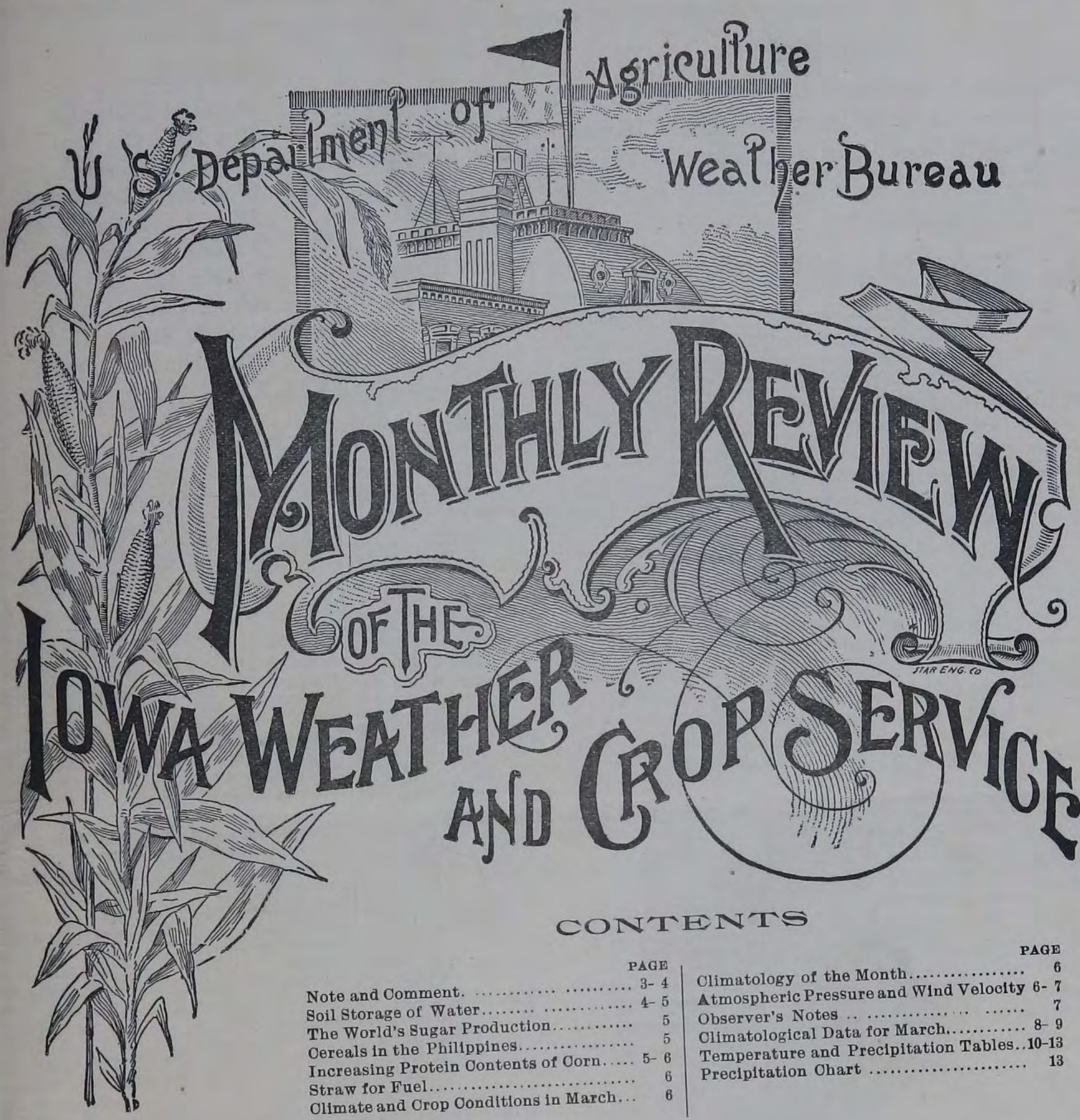

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LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

ALLIED PRINTING TRADES UNION LABEL COUNCIL DES MOINES

DES MOINES:
F. R. CONAWAY, STATE PRINTER
1899.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

owa Weather and Crop Service.

VOLUME XI. MARCH, 1900. No. 3.

NOTE AND COMMENT.

A fair quality of news and wrapping paper is being manutured from bagasse pulp, the woody fibrous residium of shed sugar cane. And the time is not far distant when the ody portion of corn stalks will be utilized for the same pur-se, thereby checking the destruction of valuable forests.

* * *

The maize crop in Buenos Ayres has been seriously injured fierce heat with scorching winds. The wheat crop in gentina was somewhat better than in the previous year.

* * *

As a result of experiments at the Vermont station, it has en discovered that the flow of sap in maple trees during the gar season is both upward and downward. It moves freely both directions with the grain of the wood.

* * *

The veracious editor of the Rockford *Register* says:

A real curiosity in fruit growing is to be seen at Forest City, owa, being a very thrifty product of a wealthy cion grafted on willow root. The graft was made in this way: The end of a oot from a willow tree was exposed in plowing a garden, and n this root was placed the cion. It grew and did well. The uestion is, does this apple derive its nutriment from the willow ystem of roots? If it does, there might be a point here worth onsidering.

Another query arises—Will the fruit from this tree be of the villow twig variety?

* * *

The total rainfall for the year 1899 at Hacienda Perla, in Puerto Rico, was 140.06 inches. The highest temperature recorded at that station during the year was 95° on July 31st. The lowest temperate reported on the island was 49° at Adjuntas, on December 24th.

* * *

The Colorado Experiment station has issued a bulletin giving results of culture experiments of variety and seed tests, and of competitive tests in growing sugar beets on a commercial scale in that state. The director states that "in the light of these experiments there can be no doubt that sugar-beet seed can be grown in the United States fully equal to the best imported seed." And in quality the beets grown in this country are fully equal to the products of Germany and France.

* * *

The development of swine and cattle raising in the United States presents features of peculiar interest. The United States has easily achieved a unique position among swine raising countries, with a total of more than one-half of the world's supply of swine. This development within the country has consisted chiefly in a movement from the east to the west, following the broad course of the corn belt, and this westward movement has been to a still greater extent true of the horned cattle of the country The great growth of our swine raising industry has been of the utmost importance to the farmers of the country, since it has furnished them an outlet, otherwise difficult to obtain, for their surplus corn. The hog has become not only a converter, but a condenser of values, and as such has sought out eastern and European markets in cases where it would have been quite unprofitable to transport corn. The United States is now the world's greatest producer and exporter of meats, which forms one of the most important features of our export trade. In 1887 the total exportation of provisions and live animals was $102,774,910, and in 1899 their total was $207,105,637, having thus doubled meantime and forming in 1899 17.2 per cent of the total exports of that year.—*Wall Street Summary.*

* * *

Field experiments with corn, at the Indiana Experiment station, show the following results: In general, planting corn early in May gave the best returns. The greatest yields of ears on stalks were obtained when single stalks stood twelve to fourteen inches apart, in rows three and one-half feet apart. Thick planting reduced size of ears and percentage of grain, but in dry seasons it produced the heaviest yield of stalks. Cultivating one, two and three inches deep, gave about equal results; and cultivating four inches deep considerably reduced the yield. There was practically no difference in planting corn in hills or drills.

* * *

Among the largest private forests to come under government supervision is a tract of 126,000 acres in Polk and Monroe counties, Tenn., owned by Senator George Peabody Wetmore, of Rhode Island. Senator Wetmore has availed himself of the offer of free assistance to the owners of woodlands made by the division of forestry, and has asked that the tract be inspected with a view of making a working plan by which the merchantable timber can be cut and the forest still be preserved in good condition.—*Ex.*

* * *

One of the long-range weather prophets reads in the stars a direful prophecy of the coming of a very severe drouth this year. That prediction is likely to be fulfilled, but unfortunately the stars are not very specific as to the exact locality or district that is doomed to suffer. That's the trouble with those planetary predictions—they deal in generalities, and leave us in doubt as to the section that is going to be desicated. And in view of the fact that every season brings a severe drouth to some section in our broad domain, there is not much advantage in that sort of general forecast. But the drouth will strike somewhere. And some sections will be flooded and swept by fierce storms. That's a sure thing.

* * *

Observations of the temperature of hydrant water have been made during the past winter at the house of the section director. The water is pumped a distance of about two miles, and the supply pipe is about six feet below the surface. The average temperature in January was 44°; February, 42°; March, 41°; and on April 1st it was 40°, which may be regarded as about the minimum for the season. In April, 1899, the minimum was 38°.

A rival of cottonseed oil, as a substitute for olive oil, is promised in corn oil. This is one of the by-products of corn. On every kernel of this grain there is a little fleck of yellow, known by the experts as the "germ." Before corn may be shipped for export this germ must be removed, else rancidity is almost certain to set in, and the cargo is in danger of being destroyed. The process for the removal of this germ is known as degerming, and its prosecution results in the production of an oleaginous substance, the only use for which hitherto was as a substitute for linseed oil in the manufacture of paints and for lubricating purposes. Efforts have been made from time to time to utilize it as food-stuff, but failure to deprive it of its unpalatable qualities has rendered these futile. It is now announced in the west, however, that a process has been devised which is warranted to clarify, deodorize, and make palatable this corn oil without material loss, and at the inconsequential cost of 10 cents a gallon. There are now 5,000,000 gallons of crude corn oil turned out annually from the American mills, and as it has only been in connection with corn shipped for export that the degerming process has been used, the quantity may be increased indefinitely. Experimenting chemists are quoted by the Chicago papers as claiming that the corn oil is far more digestible than any of the oils now used for culinary purposes. Nevertheless, it will probably masquerade on the market as olive oil.—*New York Evening Post.*

* * *

The Rockford *Register* uses the term "dead line," as applied to that invisible and somewhat irregular line of longitude, from Manitoba to the Gulf, east of which it is safe to plow up and cultivate the soil with assurance of a crop to harvest, and west of which it is not. The *Register* says: "The presence of the buffalo grass very accurately determines when a man gets west of this line. This grass is the Almighty's signboard that the soil in which this grass grows is not suited for cultivation and that its uses are limited to grazing purposes. There is a belt of territory about seventy-five miles wide on this dead line where the buffalo grass of the plains and the blue joint grass of the well-watered prairie regions blend and intermingle; this territory is debatable ground, sometimes producing good crops and sometimes not. West of it lies failure; east of it success. Look out for the 'dead line.'"

* * *

J. S. Trigg says that on every quarter section farm within the corn belt where stock is kept to eat it the sum of not less than $200 of clean profit can be secured by cutting up and using corn fodder grown on the farm. To fail to so use it is to throw this nice sum of money to the dogs.

SOIL STORAGE OF WATER.

[H. W. Campbell in Nebraska Farmer.]

To the average farmer this subject may seem most remote from his possible control, but it is not so. One of the most important conditions for best results in this line is to keep the soil moist as near the surface as possible. In touching upon subjects of this nature, I have reference to the general formation of soil found on the prairies of the so-called semi-arid belt. The fact that water when applied to dry surface soil in quantities will not readily soak in, but will remain for a time on the surface, is known to every observing farmer or gardener who has watered plants or small fruit. The further fact, that after the first application of water has soaked down and a second application is made while the surface is still moist, that this water will immediately disappear, is also commonly known. In these two facts are found some very important scientific principles involved in getting water down into the soil for storage as in a reservoir, to be drawn upon during some long dry period, which is not only liable to occur in the semi-arid belt but in almost any part of the United States. New York, Pennsylvania and the New England states all suffered last year from short crops, the result of a prolonged period without rain in the early summer, and unfortunately the usual soil formation of that country will not allow of the storage of any great surplus of soil water. The soil of this western belt of country could not be better for holding moisture. Let me here quote from the report of 1897 from the United States Department of Agriculture, by Prof. Milton Whitney, chief of the division of soils, the following:

"In the eastern states we have on the average about forty inches of rainfall annually. Half of this is leached down through the soil, and runs off into streams and so is lost to vegetation. There is thus left about eighteen or twenty inches of rainfall available for crops. There are large areas in the west where eighteen or twenty inches of rainfall is ample. Not only so, but if this rain all fell in the winter months, and the ground becomes well moistened, it is possible to mature crops without any rain during their period of growth if the soil is frequently and properly cultivated so as to prevent an excessive use of water through evaporation. In the east, rain is needed on an average about every three or four days, or for two or three successive days, followed by an interval of ten days of fair weather. The latter is the more usual condition. If the period of fair weather is prolonged to three weeks, crops suffer as a rule, and if the drouth continues for four or five weeks, no matter how much rain has fallen up to the beginning of this period, it means usually disastrous drouth and failure of the crop. Contrast this with the ability of the soil of some of our far western states to support vegetation in an active condition for two or three months without rain, and one will see that soils have the power of conserving the water and holding it at the disposal of crops for a very long period; so that, if we can only understand and control the conditions, instead of fearing drouth, the opposite will be true." In this Professor Whitney is quite correct, and there are many others who begin to see it in the same light.

The usual subsoil of this belt will take in and hold water in sufficient quantities to be raised by capillary attraction for twenty and sometimes forty, fifty, and sixty feet. This very remarkable fact that water will rise by capillary attraction for many feet to supply the demands of the plants during a prolonged rainless period of two to three months is the very thing that makes this western land valuable, and when the majority of our farmers grasp the principles and theory involved in soil storage of water the great value of our western soil and climate will be realized.

The soil water is held in the soil in quite large quantities because of the fineness of the soil particles. Water does not remain in the soil by filling the small spaces between the soil particles, but by enveloping each little particle with a thin film of water which will not diminish beyond a given thickness by percolation and is only lost by capillary movement to the surface and evaporating.

The soil mulch is indispensable in successfully carrying out the work of getting the rain waters into the soil. The observing farmer has already noticed that when he has kept a soil mulch two inches in depth of fine, loose, dry soil that just beneath and immediately at the top of the firm soil there is all the moisture the soil will retain. Soil in this moist condition will take in the rainwater very rapidly, just as we have shown regarding the quick percolation of the second application of water, in the case of watering plants in the garden. As the rain begins to descend, the two inches of dry soil mulch soon becomes wet down to the moist soil below and as soon as the water comes in contact with this soil it goes on down very

ily until it reaches dry soil below, when it will slowly
s its way down, and each little particle is enveloped in its
film of water until the water is all used up. When the
shower comes the same action follows, water going down
n to dry soil and again distributed over more dry particles.
his manner a sufficient amount of water can be stored after
ngth of time of careful work to carry any crop, properly
ted, over our usual dry periods in a perfectly healthy con-
on.

THE WORLD'S SUGAR PRODUCTION.

[Wall Street Summary.]

The transfer of sugar production from the plantations of
tropics to the farms of the temperate zone is illustrated by
ie figures just published by the Treasury Bureau of Statis-
. They show that 95 per cent of the sugar crop of the
·ld was in 1840 supplied by sugar cane, a tropical product,
but 5 per cent from beets, a product of the temperate zone;
ile in 1899 but 34 per cent of the world's sugar supply was
m cane and 66 per cent from beets. How much of this is
to the disappearance of slave labor, which existed in all
e producing territory at the beginning of the period under
iew, is left to the consideration of economists and socioli-
ts; but it is a fact that the world's cane sugar crop of 1899
uld little more than supply the demands of the United
tes alone, after deducting the home consumption of the
ntries in which it is produced.

The total cane sugar crop of the world, as estimated by
llett & Gray, of New York, is given as 2,862,000 tons, and
th a few exceptions "includes local production for home con-
nption wherever known," while the figures of the Treasury
reau of Statistics show that the total sugar importations of
e United States in the calendar year 1899 were 1,964,170 tons,
that if all the cane sugar product of the world in 1899 were
assed together and the local consumption of the countries of
production deducted, the remainder would little more than
ual the importations of the United States alone in that year.

It is not to be understood from this statement, however,
at the United States does in fact import all of the world's
rplus of sugar. On the contrary our consumption of beet
gar is steadily increasing and was in the fiscal year 1899
eater than that of any preceding year in our history, with
e single exception of 1897, when the imports were abnormal
reason of expected changes in the tariff law. The total
nports of beet sugar in the fiscal year 1899 were 723,336,352
unds out of a grand total of 3,517,950,689 pounds, so that
eet sugar, having captured the markets of Europe, is now
pplying one-fifth of the imports into the United States,
espite the proximity to the United States of so large a pro-
ortion of the cane sugar producing territory of the world.

The following table shows the production of cane and beet
ugar in the principal producing countries of the world in the
ugar year 1899–1900:

CANE SUGAR PRODUCTION.		BEET SUGAR PRODUCTION.	
Countries.	1,000 tons	Countries.	1,000 tons.
Java	*722	Germany	1,780
Cuba	400	Austria	1,120
Hawaiian Islands	275	France	960
Brazil	175	Russia	885
Mauritius	150	Belgium	290
Australia	140	Holland	170
Louisiana	132	All others	275
All others	868		
Total	2,862	Total	5,480

*Exports

The following table shows the world's production of beet and cane sugar at decennial periods from 1840 to 1900 and the percentage which beet supplied of the total world's product at each period named:

YEAR.	Cane sugar production.	Beet sugar production.	Total sugar production.	Per cent supplied by beet.
	1,000 tons.	1,000 tons.	1,000 tons.	
1840	1,100	50	1,150	4.35
1850	1,200	200	1,400	14.29
1860	1,510	389	1,899	20.43
1870	1,585	831	2,416	34.40
1880	1,852	1,402	3,254	43.08
1890	2,069	3,633	5,702	63.70
1900	2,862	5,575	8,437	66.08

CEREALS IN THE PHILIPPINES.

[American Elevator.]

The only cereals grown in the Philippines are rice and corn. Of these, rice is by far the more important, being the staple food of the native population, as well as of the inhabitants of other oriental countries A scarcity of rice always brings hardship and suffering to the people.

Several varieties of rice are grown, differing from each other more or less in color, size and flavor of the kernels. The "mismis" is the best. The "malagquit" is unusually glutinous and flour is much used for making pastry. By planting a quick and a late maturing variety, two crops may be harvested in one year.

The ordinary price of rice in the husk is about 60 cents and 65 cents per bushel, while that of shelled rice is about 90 cents or $1 per bushel. The annual production of rice in the Philippines averages about 36,000,000 bushels. This amount is far below the actual requirements of the population. In fact, the islands do not produce enough food for the consumption of their own inhabitants. In order to supply the home demand it has been the custom to draw upon the product of other rice-growing countries, the French colony of Cochin-China being the principal source of supply. In some years the quantity of rice imported into Manila from Saigon has exceeded 3,200,000 bushels, worth nearly $2,000,000.

In several provinces of the Philippines, as for example in Cayagan and La Isabela, on the Island Luzon, the inhabitants subsist chiefly on Indian corn, which is grown together with tobacco. As a rule, corn is not consumed so largely in other parts of the archipelago, although in years when the rice crop has been deficient this grain has formed an indispensable supplement dietary of the native population. Several varieties of corn are grown. The early varieties are generally preferred, because their use permits the harvesting of two crops in one year. The annual production is about 4,250,000 bushels. It is sold at about 18 cents to 23 cents per bushel of shelled grain.

INCREASING THE PROTEIN CONTENT OF CORN.

[Louisiana Planter.]

This wonderful plant, corn, that can so nearly supply all the food required for man and beast, bids fair to do still better in the early future. While it is now the dominant crop in American agriculture it seems to promise even higher food values in the future and to thus hold in hand even more tightly the kingly scepter.

It is, of course, well known that corn stands supreme as a fattening food and is the basis of the fat cattle and hog crops of the country. Immense amounts of corn are fed, and, especially, by the farmers themselves, to work animals, and analyses show that corn contains sufficient protein to make it a reasonably good food for work animals, but not nearly so good as oats, which is the typical food for work animals because of its high protein content.

Professor Hopkins, of the Illinois Agricultural Experiment station, who has been investigating the protein content of corn during some four years, has found that corn of even the same variety will vary largely, and some kinds of corn show double the protein content of others. He has found corn with as high as 14.92 per cent protein, and as low as 7.76 per cent protein. This nitrogenous organic matter lies chiefly in the corn germ, hence the physical size of the germ indicates in a rough way the protein content of the corn. While corn with small cobs is the favorite of producers and consumers it is found that corn with larger cobs is the strongest in protein.

It is well known that western corn, grown for some years in the Gulf states, gradually acquires a longer period of growth and also a cob larger in proportion to the size of the ear. As our planters generally think that home grown corn is the best for work animals we may here have the secret of this excellence in its gradual acquisition of protein.

STRAW FOR FUEL.

[Hay Trade Journal]

The Planters Compress company of Boston has recently made tests of fuel straw or straw baled to a high density by the Lowry press and used as a fuel instead of coal. We quote from the scientific report of this test:

"The test was made on the 8th of March, 1900. The straw which came to us in square bales had a density of about thirteen pounds per cubic foot and was made into Lowry bales of a density of fifty pounds to the cubic foot. The straw was rebaled three days before the fuel test There was comparatively no expansion of the Lowry bale after the wires were cut. The test began at 9:50 A. M. and ended at 4 P. M. The quantity of straw used was 2,000 pounds. It was fired in bunches of about twenty-five pounds each The fires were kept up easily but required a little more careful attention than with coal. No sparks escaped from the stacks, only a light blue smoke. A pressure of seventy-eight pounds was kept up throughout the run. This pressure was more easily raised than with coal. Compared with coal the value of straw to coal for heating qualities is in the ratio of about eleven to twelve."

This gratifying test proves that straw which now has no market value in most districts, but which is destroyed by farmers, can be made into a valuable fuel by the aid of the Lowry press. Millions of tons of straw are at present destroyed in the west and northwest and in Canada and at points where fuel is most costly.

It is believed that the fuel problem will, within measurable time, be revolutionized in the sections named, by the substitution of pressed straw for coal.

CLIMATE AND CROP CONDITIONS IN MARCH.

March was generally unfavorable for farming operations, though it was possible to do some preparatory work in the fields during a portion of the second and third decades. In some favored localities in the central and southern sections a beginning was made in sowing wheat, clover and timothy seed. The heavy storms of snow, sleet and rain that prevailed in all sections from the 26th to the 29th, effectually stopped all field work during the last week. The abundant supply of moisture brought by that storm, however, fully compensated for the delay, and at the close of the month the soil was in fine condition for the opening of the crop season. Though the season was somewhat backward at the opening, yet all conditions of weather and soil were much more favorable than during the corresponding period in 1899.

CLIMATOLOGY OF THE MONTH.

Barometer.—The mean pressure of the atmosphere for the month was 30.11 inches; highest pressure observed, 30.56 inches, at Clarinda on the 31st; lowest pressure, 29.44 inches, at Davenport on the 19th; range for the state, 1.12 inches.

Temperature.—March was colder than usual, except in the Missouri valley, where the temperature averaged about normal. In the Mississippi valley and eastern half of the state the deficiency in temperature ranged from 1° to 4°. The mean for the state, as deduced from reports of 120 stations, was 30.7°, which is about 2 5° below the normal for March. The mean of the northern section was 28°; central section, 30.6°; southern section, 33.5°. The highest monthly mean reported was 37.8°, at Red Oak; lowest mean, 23.5°, at Cresco. The highest temperature reported was 81° at Wapello, on the 22d; lowest, 13° below zero, at Osage, on the 16th. The average monthly maximum was 64.3°; average monthly minimum, 4 8° below zero. Greatest daily range 61°, at Primghar; average of greatest daily ranges, 40.8°.

Precipitation.—Average for the state, as deduced from 136 observers' reports, was 2.06 inches, which is about .31 of an inch below normal. The average of the northern section was 1.95 inches; central section, 2.50 inches; southern section, 1.73 inches The largest amount reported was 5.15 inches at Fonda; least amount, .45 of an inch, at Whitten. The greatest daily amount was 3 inches, at Primghar, on the 29th. Average number of days on which .01 inch or more of precipitation was reported was 5.

Wind and Weather.—Prevailing direction of wind, northwest; highest velocity, 50 miles per hour, at Sioux City, on the 19th, from northwest. There were 12 clear days, 9 partly cloudy and 10 cloudy.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.08	30.50	3	29.44	19
Des Moines	30.12	30.50	21	29.56	19
Clarinda	30.14	30.56	31	29.59	18
Cresco	.....	30.53	4	29.52	19
Dubuque	30.10	30.50	7	29.45	19
Omaha, Neb	30.09	30.45	31	29.56	18
Keokuk	30.10	30.52	3	29.53	19
Sioux City	30.13	30.46	31	29.61	19
Means	30.11	30.56	31	29.44	19

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
venport	7,039	36	NW	19
Moines	7,461	32	E	27
buque	7,182	36	NW	19
okuk	7,246	34	NW	6
Crosse, Wis	6,157	26	NW	19
aha, Neb	8,098	36	NW	19
ux City	11,310	50	NW	19

ERRATA IN JANUARY REVIEW.

Greenfield.—Mean temperature recorded 26.3° on page 9, ould have been 26.8°

Scranton.—Maximum temperature recorded 47° on the 24th, pages 8 and 11, should have been 52° on the 22d.

OBSERVERS' NOTES.

ALBIA—*R. Moore.* A month of variable weather; twice the ermometer was below zero, and twice up to 65°.

ALTA—*David E. Hudden.* Heavy sleet and snowstorm on th-28th; snow all gone before end of month.

AMANA—*Conrad Schadt.* Many fishes floated down river dur- g the month; at first live and then dead ones, polluting the ater so much as to make it unfit for use for any purpose.

ATLANTIC—*J. W. Love* Lightning on 3d; thunder storm on 7th-28th; robins and larks observed on 10th.

BANCROFT—*E. G. Bailey* On 21st thermometer fell 47°; reatest change during twenty-four hours in more than a year lonth ends with ground covered with snow and filled with rost.

BONAPARTE—*Hon. B. R. Vale.* A seasonable month; some arm work done last half of month. Indications of an early pring.

CARROLL—*Moses Simon.* Heavy thunder and lightning on ight of 27th; first robins observed on 20th.

CLINTON—*Dr. Luke Roberts* On the 6th rain, sleet and snow, with heavy crust, making good sleighing till 9th; on 27th and 28th a similar storm of about same depth and density of snow, but warmer; three lunar and one solar halo observed; mean temperature was 3.5° below normal; rain, .74 inch above normal.

COON RAPIDS—*Downs & Co.* Some small grain sown the latter part of week ending the 24th; no seeding during the last week.

ELKADER—*Chas. Reinecke.* Ice went out of the Turkey river on the 10th.

FONDA—*H P. Barron.* The heaviest sleet storm in several years occurred on 26th; some wheat had been sown.

FORREST CITY—*J. A. Peters.* Robins came on 10th; some wheat sown 8th to 10th.

FORT MADISON—*Miss L. A. McCready.* A cold, backward month; farmers have sowed some oats.

GRAND MEADOW—*F. L. Williams.* Month ended as it began, with ground still frozen, and snow in patches in the woods; roads very muddy; stock looking well.

GRUNDY CENTER—*Geo F. Ellis.* On night of 26th, at 9:30 o'clock, rain began falling, turning to sleet and snow; during night sharp lightning and heavy thunder, while snowing hard.

HEDRICK—*J. T. Brooks* On night of 27th-28th it rained and about 3 A M. turned to sleet, with heavy lightning and thunder; at 5 A. M the residence of Frank Wheeler, two miles north of Hedrick, was struck and badly damaged by lightning. This is the third time in four years, and the fourth time in twenty years the buildings on that farm have been struck and badly damaged.

MT VERNON—*Rev J. W. Hubbard.* Temperature departure from normal 3° below record for eleven years; precipitation 78 inch above eleven-year normal. Elevation of station, 835 feet.

OSCEOLA—*A. W. Lewis.* First robins noticed on 9th; first oats sown on 21st.

OVID—*H. C. Miller.* First ducks observed 8th; robins 9th; blackbirds and larks 11th; wild geese 23d; oats sown 23d; a few soft maples in bloom the 31st; ground very dry below surface.

RIDGEWAY—*Arthur Betts.* A fine March, 4.5° warmer than same month last year. At the end of the month there is no snow but in drifts; mud, mire and water in abundance, and roads nearly impassable; 221 hours of sunshine for the month, or 60 per cent. On the 9th a beautiful meteor was seen in broad daylight.

STORM LAKE—*Prof M. L Fuller.* Maximum temperature, 69° on the 12th; minimum, 10 5° below zero on the 16th, making a range of 79 5° in the four days Ice all out of the lake on the 26th, which was almost one month earlier than last year. In 1898-99 the lake froze over November 22d and remained closed five months During the past winter the lake remained partly open till February 5th, and then was nearly closed one month; ice all went out between March 5th and 26th.

TOLEDO—*Lulu G. Bookwalter.* Frost about out of ground; cherry buds are unhurt; peach buds are injured some.

WEST BEND—*Philip Dorweiler.* Up to 23d the month was fair and farm work had just begun and some wheat was sown; at close of month ground was covered with snow and roads were bad

MUSCATINE—*Mrs J. P. Walton in Journal.* The maximum temperature for the month was 58°, minimum, 2°, mean, 32.11°. In the past sixty years the month has been warmer thirty-eight times, and colder twenty-two times. The mean temperature for March for sixty years is 34 43°. The warmest March was that of 1878, with a mean temperature of 46.3°; the coldest, that of 1843, with a mean of 15.5°. The highest range of barometer for the month was 29 74 inches; the lowest, 28.80 inches. The rainfall was 3 86 inches; the average rainfall for March for fifty years is 2.61 inches. The largest rainfall in March occurred in 1852, with 8.60 inches; the smallest in 1861, with .25 inch.

CLIMATOLOGICAL DATA FOR MARCH, 1900.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIPITATION, INCHES.				Number rainy days	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Algona*	Kossuth	1,500	7	27.9	-2.8	58	12	-10	16	....	2.50	+.87	.60	17.0	5	8	15	8	NW
Alta	Buena Vista	1,519	8	28.4	-1.2	68	12	-10	16	36	1.96	+.07	.84	6.8	9	11	13	7	NW
Alta (near)	Buena Vista	....	....	....	....	....	....	....	....	....	1.24	....	.59	9.0	5	....	....	....	....
Bancroft	Kossuth	....	....	28.2	....	60	12	- 9	16	47	2.40	.....	.60	16.0	8	13	10	8	.....
Britt	Hancock	1,230	....	27.2	....	60	12	- 9	16	55	1.66	....	.70	12.2	9	6	13	12	NW
Charles City	Floyd	1,012	8	26.0	-4.5	55	22	-10	16	41	1.94	+.36	.50	12.0	6	8	16	7	NW
Clear Lake	Cerro Gordo	984	....	26.6	....	57	22	-10	16	42	1.65	....	.50	16.5	7	16	6	9	NW
Cresco	Howard	1,280	27	23.5	-2.3	46	22, 31	-11	16	36	1.38	+.05	.50	13.2	9	10	8	13	NW
Decorah	Winneshiek	900	6	24.9	-7.1	50	21	- 9	16	43	2.20	+.72	.52	17.4	8	....	....	....	.....
Dows	Wright	....	....	28.5	....	63	12	- 8	16	44	3.13	.....	2.00	5.8	6	14	5	12	N
Elkader	Clayton	....	18	28.4	-2.5	60	22	- 5	16	43	1.96	+.18	.75	11.5	5	13	8	10	NW
Emmetsburg	Palo Alto	....	....	....	....	....	....	....	....	....	1.25	.....	.75	....	6	....	....	....	.....
Estherville	Emmet	....	....	26.4	....	63	22	-10	16	45	1.43	.....	.40	12.8	10	10	14	7	NW
Fayette	Fayette	1,000	9	26.1	-4.8	54	22	- 8	16	36	2.74	+.64	.86	13.0	8	12	10	9	NW
Fonda	Pocahontas	1,237	....	29.8	....	71	12	- 8	15	40	5.15	.....	2.72	5.8	11	11	11	9	NW
Forest City	Winnebago	1,220	....	26.8	....	58	22	-10	16	45	1.43	.....	.70	12.5	7	17	3	11	W, NW
Grand Meadow*	Clayton	....	8	26.2	-4.9	48	22	- 6	16	.....	1.79	-.26	.60	15.0	6	8	14	9	NW
Greene	Butler	943	....	28.4	....	60	22	- 8	16	36	1.57	.....	.41	....	7	10	7	14	W
Hampton	Franklin	1,240	9	28.0	-1.0	63	22	- 8	16	43	2.97	+.96	1.02	17.2	8	6	16	9	NW
Hawkeye	Fayette	....	6	....	....	....	....	....	....	....	2.80	+.70	1.80	28.0	6	....	....	....	.....
Humboldt	Humboldt	1,082	6	30.2	....	66	12	- 8	16	44	2.23	+.71	1.70	6.0	6	19	5	7	NW
Lansing	Allamakee	....	....	29.6	....	56	24	- 5	16	35	1.69	.....	.45	16.9	5	12	7	12	.....
Larchwood	Lyon	....	....	31.0	....	70	10	-10	16	44	1.07	.....	.37	10.5	5	15	5	11	NW
Larrabee	Cherokee	....	8	29.6	-1.0	67	10, 12	-11	16	50	1.55	- 33	.40	3.4	8	....	....	....	NW
Le Mars	Plymouth	1,221	....	32.0	....	70	12	- 8	16	47	1.35	.....	1.00	2.5	4	20	4	7	S
New Hampton (*b*)	Chickasaw	1,166	....	26.5	....	53	22	- 9	16	33	1.45	.....	.60	14.5	7	....	....	....	NW
Osage	Mitchell	1,178	8	25.8	-2.7	52	22	-13	16	37	2.00	+.55	.40	17.7	11	7	7	17	NW
Plover	Pocahontas	....	....	29.6	....	67	12	- 8	16	37	1.30	.....	.40	9.0	7	15	5	11	NW
Primghar	O'Brien	....	....	30.4	....	76	12	-10	16	61	4.00	.....	3.00	.....	3	20	0	11	W
Ridgeway	Winneshiek	....	....	27.3	....	52	10, 11	-11	16	37	3.20	.....	.82	16.9	12	8	14	9	NW
Ruthven	Palo Alto	....	....	25.8	....	60	10	-12	16	45	1.74	....	.80	17.0	4	2	2	27	W, NW
Sheldon	O'Brien	1,406	....	28.8	....	66	10, 12	-10	16	44	1.24	.....	.65	8.4	10	13	8	10	S
Sibley	Osceola	1,506	6	29.0	-1.4	69	12	-12	16	55	1.41	+.24	.45	11.7	7	13	10	8	NW
Sioux Center	Sioux	....	....	30.2	....	66	12	-10	16	47	1.17	.....	.27	6.5	6	15	6	10	NE, W
Spencer (*b*)	Clay	....	....	28.1	....	65	12	0	16	52	1.00	.....	.45	7.5	3	16	7	8	W
Spirit Lake	Dickinson	....	5	26.0	-5.7	62	22	-11	16	50	1.10	+.27	.40	11.0	5	17	2	12	NW
Storm Lake	Buena Vista	....	10	29.0	....	69	12	-10	16	38	1.96	+.59	1.10	7.1	8	14	9	8	NW
Washta	Cherokee	....	....	....	....	....	....	....	....	....	1.36	.....	.60	3.5	6	16	9	6	N
Waverly	Bremer	942	....	28.8	....	59	22	- 7	16	35	2.97	.....	1.10	17.8	12	9	12	10	NW
West Bend*	Palo Alto	....	6	27.6	-2.3	59	22	- 8	16	.....	1.94	+.24	.60	11.0	7	10	11	10	NW
Average		....	....	28.0	-3.2	61.1	....	-8.9	....	43.1	1.95	+.39	....	11.7	4	12	9	10	NW

CENTRAL SECTION.

Amana	Iowa	....	23	30.8	- .3	63	22	- 3	16	35	2.96	+ .98	1.05	4.5	11	13	8	10	NW
Ames	Story	936	19	....	....	....	....	- 4	16	.....	2.81	.....	1.90	2.6	5	12	10	9	.....
Audubon	Audubon	....	6	32.6	-1.4	69	12	- 6	16	41	2.05	+.19	1.40	....	4	5	17	9	NW
Baxter	Jasper	....	....	31.2	....	67	22	- 5	15	37	3.44	.....	1.30	.....	9	9	16	6	NW
Belle Plaine ‡ (*a*)	Benton	840	9	30.0	-2.4	63	21	- 4	16	45	4.64	+2.57	2.01	9.7	10	....	....	....	NE
Carroll	Carroll	....	9	30.2	-1.0	72	12	-10	17	58	2.97	+.49	1.95	2.0	5	21	2	8	.....
Cedar Rapids	Linn	744	17	30.3	-2.5	64	22	- 3	16	34	2.37	+.11	1.50	5.5	5	12	3	16	NW
Clinton	Clinton	609	8	29.2	-7.5	60	22	0	17	52	3.24	+.69	1.10	15.5	8	8	12	11	W, NW
Coon Rapids	Carroll	....	....	32.6	....	68	12	- 7	16	38	3.53	.....	1.93	T	6	16	8	7	NW
Davenport	Scott	615	27	30.8	-4.0	60	22	0	16	32	2.92	+.67	1.14	5.9	9	10	6	15	NW
Delaware	Delaware	1,084	8	27.1	-3.8	58	22	- 5	16	35	2.36	+.55	.64	9.7	9	9	13	9	NW
Denison	Crawford	1,192	6	32.7	+ .6	80	11	- 9	16	44	1.80	+.06	1.25	T	5	20	5	6	S
Des Moines	Polk	867	21	33.1	-1.0	68	22	- 4	16	37	3.07	+1.56	1.90	7.8	7	7	17	7	N
De Soto	Dallas	866	....	33.2	....	66	22	- 3	16	38	2.64	.....	1.00	2.6	6	14	11	6	SW
Dubuque	Dubuque	655	26	28.4	-5.0	59	22	- 4	16	29	1.84	-.37	.57	10.8	12	9	10	12	NW
Fort Dodge (*b*)	Webster	....	....	30.6	....	70	12	- 6	16	40	4.20	.....	2.00	.....	3	....	....	....	SW
Galva	Ida	....	6	30.3	-3.5	70	12, 21	- 8	16	35	1.13	-.14	.58	.....	3	19	5	7	NW
Gilman	Marshall	1,035	....	....	....	....	....	....	....	....	2.29	.....	1.10	T	5	12	11	8	E
Grinnell	Poweshiek	1,011	9	30.7	-2.4	61	22	- 4	16	34	3.38	+1.80	1.80	.....	5	8	12	11	N
Grinnell (near)	Poweshiek	....	....	30.4	....	64	22	- 5	16	40	3.00	.....	.85	4.0	8	8	9	14	NW
Grundy Center	Grundy	966	8	28.5	-3.6	63	22	- 8	13	42	2.34	+1.01	.80	17.0	7	14	9	8	W
Guthrie Center	Guthrie	1,269	....	33.0	....	67	23	- 3	16	46	1.88	....	.90	.4	5	18	8	5	N
Harlan	Shelby	....	....	32.5	....	72	12	- 7	16	45	1.99	.....	.91	.3	7	9	12	10	NW
Independence	Buchanan	921	37	27.0	-3.4	60	22	- 7	16	37	1.02	-.72	.25	9.3	9	13	9	9	W, NW
Iowa City	Johnson	644	9	30.5	-4.7	63	22	- 3	16	36	3.32	+.93	1.66	2.0	6	14	6	11	NW
Iowa Falls	Hardin	....	6	27.7	-4.0	62	22	- 7	16	43	2.80	+1.54	1.73	....	9	12	9	10	NW
Le Claire	Scott	....	....	....	....	....	....	....	....	....	3.35	.....	1.30	.....	12	....	....	....	.....
Logan	Harrison	928	34	33.0	-1.0	70	10, 22	- 6	16	40	1.95	+.08	.80	2.0	6	16	2	13	NW
Maquoketa	Jackson	....	6	30.1	-5.6	63	23	- 2	16	41	2.34	-.10	.88	10.5	7	14	6	11	NW
Marshalltown	Marshall	898	7	31.3	- .6	65	22	- 5	16	38	3.78	+2.24	1.72	13.0	10	14	8	9	NW
Monticello	Jones	800	45	29.0	-2.9	....	....	- 2	16	35	2.49	+.10	.94	11.0	6	9	10	12	NW
Mt. Vernon*	Linn	858	....	29.2	....	58	22	- 3	16	.....	2.50	.....	1.00	.....	4	....	....	....	.....
Mt. Vernon (Hubbard)	Linn	....	....	29.4	....	64	22	- 5	16	35	2.90	.....	.92	8.4	9	10	6	15	NE
Newton	Jasper	958	12	31.3	-3.1	65	22	- 6	16	35	3.55	+1.20	1.20	11.0	6	10	16	5	NW
Odebolt	Sac	....	....	31.8	....	71	12	- 7	16	44	1.50	.....	.84	2.5	6	18	6	7	.....
Ogden	Boone	1,109	....	31.7	....	66	12	- 6	16	40	2.09	.....	1.06	3.0	7	19	0	12	NW
Olin (*c*)	Jones	....	....	30.4	....	61	22	- 3	16	37	3.14	.....	1.33	14.5	6	15	9	7	NW
Onawa	Monona	....	....	34.3	....	76	12	- 6	16	50	1.40	.....	.40	3.8	8	23	2	6	NW
Rockwell City	Calhoun	1,219	....	32.6	....	68	12	- 7	16	38	1.81	.....	1.05	2.0	5	20	3	8	.....
Sac City (*a*)	Sac	900	20	30.0	-1.2	70	12	- 8	16	40	1.61	+.00	.92	.....	5	10	6	15	NW
Scranton	Greene	....	....	32.5	....	67	12	- 5	16	35	2.82	.....	2.55	1.0	4	15	10	6	NW
Sioux City	Woodbury	1,122	10	32.9	+3.0	71	12	- 8	16	44	1.53	+.34	.72	.....	7	12	11	8	NW
Buckingham (Traer)	Tama	....	....	....	....	....	....	....	....	....	3.20	.....	1.12	....	8	9	12	10	.....
Toledo	Tama	....	5	29.2	-5.8	68	22	- 5	16	56	1.72	+.39	.75	.....	7	13	4	14	S, SW
Vinton*	Benton	800	9	28.6	-3.8	61	22	- 5	16	.....	1.57	-.12	.97	.....	6	17	2	12	NW
Waterloo	Black Hawk	862	20	28.8	-4.1	62	22	- 6	16	36	2.86	+1.48	.80	13.0	10	12	11	8	NW
Webster City	Hamilton	....	6	29.2	-1.9	54	10	- 5	16	32	....	.....	.....	.....	....	10	11	10	NW
West Branch	Cedar	....	....	29.6	....	60	23	0	16	30	1.74	.....	.60	.....	6	15	8	8	SW
Whitten	Hardin	....	....	28.0	....	62	22	- 8	16	43	.45	.....	.20	5.5	4	13	8	10	NW
Wilton Junction	Muscatine	....	....	30.2	....	61	22	1	16, 17	34	4.57	.....	2.10	13.0	5	17	5	9	NW
Average		....	....	30.6	-2.8	65.2	....	-2.9	....	38.9	2.50	+.58	....	6.3	5	13	8	10	NW

CLIMATOLOGICAL DATA FOR MARCH, 1900—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
...n	Union	....	....	33.6	.....	67	11	- 5	16	40	2.52	.....	1.00	T	6	8	16	7	NE, NW
...s (b)	Monroe	945	....	33.6	.....	65	11, 21	- 3	15	44	1.13	.....	.75	3.5	4	...	...	...	NW
...ntic	Cass	....	8	32.6	- .8	69	11,12,26	- 4	16	37	2.04	+.19	.97	.8	6	11	8	12	NW
...avia	Jefferson	640	....	....	.....	..	.....	.....	.....	.....	.71	.....	.60	6.0	3	...	...	...	.....
...ford	Taylor	....	....	35.2	.....	72	8, 22	- 2	16	51	1.49	.....	.77	.....	5	11	12	8	NW
...knap	Davis	857	....	32.8	.....	67	22	- 1	16	47	1.54	.....	.57	5.5	6	13	13	5	NW
...aparte	Van Buren	....	8	33.3	-5.1	66	22	1	16	37	1.86	-1.02	1.30	.5	4	...	...	...	.....
...sey	Marion	....	....	.....	.....	....	.....	.....	.....	.....	1.95	.....	1.55	2.0	3	...	...	...	.....
...son	Pottawattamie	....	....	.....	.....	....	.....	.....	.....	.....	1.19	.....	.84	.5	3	...	...	...	.....
...terville	Appanoose	1,013	6	33.4	-7.3	67	22	- 1	16	31	1.30	- .65	1.00	T	2	12	5	14	SW
...riton	Lucas	1,080	....	33.5	.....	68	22	- 3	16	43	2 23	.....	1.07	3.5	8	7	17	7	NW
...llicothe	Wapello	645	....	.....	.....	....	.....	.....	.....	.....	3.10	.....	1.35	.....	5	...	...	...	.....
...rinda	Page	1,069	9	35.6	+ .7	77	11	- 3	16	44	1.07	- .64	.47	1.2	5	20	2	9	NW
...ning	Adams	1,127	7	34.0	-2.7	67	11, 12	- 4	16	38	1.55	- .17	.72	1.5	4	15	7	9	NW
...lege Springs	Page	.....	8	34.8	-2.5	69	11, 12	- 4	16	44	.94	- .86	.43	.....	5	21	3	7	NW
...ncil Bluffs	Pottawattamie	989	....	35.0	.....	77	12	- 4	16	45	1.12	.....	.85	.....	3	23	2	6	S
...nberland	Cass	....	....	.....	.....	....	.....	.....	.....	.....	2.12	.....	1.03	T	4	14	6	11	N
...nville	Des Moines	715	....	33 8	.....	68	22	- 1	16	35	1.94	.....	.90	.5	5	...	...	...	.....
...on	Wapello	....	....	.....	.....	....	.....	.....	.....	.....	1.58	.....	.95	2.2	8	13	5	13	W
Madison	Lee	516	51	.....	.....	....	.....	.....	.....	.....	1.75	-1.02	1.25	.....	3	4	10	17	NW
...nwood	Mills	979	29	36.7	+3.4	73	22	- 4	16	42	90	- .47	.55	T	2	6	18	7	NE, NW
...enfield	Adair	....	8	33.0	-1.0	66	11, 12	- 6	16	43	2.19	- .21	.72	1.6	8	...	...	...	.....
...swold	Cass	....	....	.....	.....	....	.....	.....	.....	.....	1.19	.....	.58	.....	5	9	0	22	S
...drick	Keokuk	....	....	32.4	... ..	66	22	- 2	16	37	1.83	.....	.90	3.2	8	...	...	...	NW
...peville	Clarke	....	8	33 2	.....	67	11	- 4	16	40	1.33	.....	.67	.....	4	4	19	8	NW
...lianola	Warren	....	....	34.3	.....	70	22	- 4	16	35	2.90	.....	1.10	.6	9	...	...	...	NW
...okuk	Lee	618	28	34.1	-4.0	64	11	3	16	36	1.43	- .93	.84	.....	8	11	12	8	NW
...osauqua	Van Buren	....	....	33.8	.....	67	22	2	16	36	1.71	.....	1.29	3.5	6	...	...	...	.....
...oxville ‡	Marion	....	6	33.4	-3.6	69	22	- 3	16	37	1.44	+.17	.52	T	6	15	8	8	NW
...cona	Warren	....	....	.....	.....	....	.....	.....	.....	.....	1.97	.....	.70	.....	7	9	14	8	.....
...nox	Taylor	....	....	33.4	.....	68	11	- 6	16	38	1.49	.....	.79	.6	7	19	4	8	NW
...oar	Lee	....	....	33.2	.....	65	22	2	3, 16	37	1.64	.....	.92	.....	8	16	10	5	NW
...Ayr	Ringgold	1,230	6	33.8	-2.6	67	11, 22	- 5	16	41	1.75	- .38	.85	.5	8	6	18	7	NW
...Pleasant	Henry	725	....	29.9	.....	70	22	0	3	44	1.30	.....	.53	.....	5	12	15	4	NW
...rray	Clarke	1,183	25	.....	.....	....	.....	.....	.....	.....	1.37	.....	.88	3.0	5	12	19	0	.....
...naha (Neb.)	Douglas	1,113	..	36 0	+1.0	77	12	- 6	16	38	1.48	- .02	.87	.5	7	12	12	7	NE
...ceola	Clarke	1,123	....	33.0	.....	69	22	- 4	16	40	1.80	.....	.61	T	6	6	16	9	NW
...rid	Wayne	....	6	33.4	-4.0	70	11	- 3	16	43	1.78	- .41	1.06	1.2	11	11	2	18	NW
...kaloosa	Mahaska	850	16	32.0	-2.3	68	22	- 2	16	37	2.32	+.34	.64	2.3	8	13	5	13	NW
...tumwa	Wapello	630	5	34.4	-4.5	65	11, 22	1	16	32	1.30	- .80	.50	3.0	3	10	15	6	NW
...cific Junction	Mills	960	...	34.6	.....	73	12	- 4	16	44	.96	.....	.30	.1	6	12	11	8	NW
...lls (b)	Marion	....	...	30.2	....	58	10, 12	- 2	16	28	.....	.....	.....	.....	...	...	...	...	SW
...ed Oak	Montgomery	1,033	....	37.8	.....	78	10	- 2	16	49	1.31	.....	.50	.....	5	18	1	12	NW
...gourney	Keokuk	....	...	32.7	.....	68	22	- 3	16	39	3.40	... .	1.43	2.5	9	11	15	5	NW
...uart	Guthrie	....	....	28.8	....	63	11	- 7	16	37	2.12	.....	1.00	2.8	5	...	...	...	W
...hurman	Fremont	....	....	35.2		70	11, 12	- 2	16	38	.90	.....	.30	.....	4	13	8	10	SW, NW
...illisca	Montgomery	1,058	6	35.0	-1.2	78	11	- 4	16	49	1.71	-.43	.67	.....	4	18	7	6	NW
...apello	Louisa	578	....	31.5	.....	81	22	1	17	55	3.13	.....	1.05	. ....	8	13	11	7	NW
...ashington	Washington	....	9	30.1	-5.1	66	22	- 5	16, 17	44	3.48	+1.23	1.75	.....	5	...	...	...	NW
...interset	Madison	....	8	32.2	-2.0	64	10, 11	- 3	16	39	2.81	+ .98	1.49	6.5	7	...	...	...	.....
...oodburn	Clarke	....	....	.....	.....	....	.....	.....	.....	.....	1.74	.....	.73	1.5	6	12	9	10	.....
Average		....	....	33.5	-2.4	66.5	.. ..	-2.6	.....	40.4	1.73	- .30	....	1.9	6	12	10	9	NW
Av. for the state		....	..	30.7	-2.8	64.3	.....	-4 8	.....	40.8	2.06	+ .22	.....	6.6	5	12	9	10	NW

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR MARCH, 1900.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max.	35	25	40	34	30	37	37	45	49	62	67	65	60	37	22	16	40	51	49	30	49	63	59	59	51	51	48	36	35	44	51	44.8
	Min.	14	21	16	25	18	13	14	24	28	24	44	32	30	19	7	-5	0	24	28	10	49	63	59	59	51	51	48	36	35	44	51	44.8
Albia	Max.	40	40	41	45	45	35	37	45	49	59	65	62	60	43	20	40	53	49	35	45	65	62	51	33	33	27	31	31	29	28	23	42.5
	Min.	6	13	31	18	17	15	11	21	29	28	24	30	29	20	-3	-2	18	26	10	10	21	31	30	..	..	28	28	30	29	28	29	46.6
Alta	Max.	38	33	36	20	18	20	38	48	40	66	60	68	68	20	18	6	35	44	32	26	53	62	50	46	40	44	32	32	32	38	52	39.6
	Min.	8	13	17	13	13	8	6	27	29	31	40	32	28	14	5	-10	0	17	21	4	8	31	25	24	30	26	28	28	25	18	23	38.1
Amana	Max.	32	32	35	35	27	31	35	42	44	53	56	46	43	32	21	16	34	48	39	28	45	63	52	43	44	40	36	34	36	39	49	39.0
	Min.	9	24	9	24	18	18	11	23	34	29	32	30	32	21	10	-3	2	21	28	12	10	35	32	30	33	31	29	30	31	27	26	22.5
Ames	Max.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Min.	7	23	17	22	17	15	11	21	33	29	39	31	31	19	9	-4	4	12	26	10	12	34	29	33	31	32	30	30	29	26	27	22.1
Atlantic	Max.	38	38	40	35	27	24	40	48	52	66	69	69	52	32	21	15	40	51	39	28	51	69	56	40	54	53	34	34	33	44	53	43.4
	Min.	26	20	19	23	20	13	16	28	31	29	33	33	19	15	7	-4	5	17	25	11	9	34	29	28	28	25	28	32	30	27	19	21.8
Audubon	Max.	39	34	42	34	23	23	38	48	48	64	64	69	62	50	19	15	41	49	40	26	51	65	50	40	49	48	35	34	34	43	51	41.8
	Min.	16	18	18	21	17	12	13	28	31	32	42	36	30	15	6	-6	-2	27	21	9	10	32	35	32	32	27	30	31	30	27	20	22.3
Bancroft	Max.	36	36	39	34	23	23	38	44	41	56	51	60	55	27	17	9	32	44	36	24	53	59	44	53	41	36	35	32	37	38	45	38.6
	Min.	14	15	18	12	13	8	-1	25	26	27	38	33	25	13	6	-9	2	10	19	7	6	31	18	23	32	30	30	27	27	16	12	17.8
Baxter	Max.	34	33	38	29	25	27	40	46	45	60	61	62	47	30	24	16	41	50	38	29	50	67	56	39	43	48	34	32	33	41	53	41.0
	Min.	17	14	20	16	14	10	22	30	27	37	29	30	18	8	-5	-3	15	27	9	8	27	30	32	31	30	28	30	28	26	25	31	21.3
Bedford	Max.	39	39	39	34	33	33	40	50	52	65	72	69	58	40	26	19	40	52	52	32	52	72	68	57	55	62	48	41	39	51	57	48.0
	Min.	15	19	18	26	19	15	21	25	32	26	32	32	25	20	6	-2	2	20	28	12	18	21	28	33	34	28	32	32	27	28	18	28.3
Belknap	Max.	30	34	36	38	33	32	38	44	47	59	62	57	66	32	22	5	41	53	42	28	40	67	59	43	54	49	48	39	38	43	56	43.1
	Min.	7	10	9	32	19	17	14	22	33	28	38	31	32	22	10	-1	0	26	24	12	12	20	35	33	35	30	32	31	30	38	25	22.5
Bonaparte	Max.	34	33	35	38	31	31	35	42	45	53	61	51	48	34	24	20	41	54	45	32	43	66	60	47	52	46	45	47	40	45	53	43.0
	Min.	3	19	6	25	20	20	14	23	33	26	35	29	33	24	13	1	4	25	32	15	13	35	34	33	36	32	32	21	31	30	25	23.6
Britt	Max.	34	33	39	32	21	17	36	46	37	55	52	60	45	20	15	16	30	42	30	22	57	59	44	53	38	36	36	34	44	35	42	37.5
	Min.	10	18	13	14	13	6	0	23	29	25	33	28	24	12	5	-9	-1	11	17	6	2	29	21	24	31	28	25	27	26	16	14	16.8
Carroll	Max.	45	39	40	22	20	22	42	50	49	59	69	72	28	18	15	24	40	50	34	54	48	68	54	48	48	50	34	31	32	45	54	42.1
	Min.	5	16	20	18	15	10	8	7	30	29	36	32	20	4	5	18	-10	20	25	-4	18	30	26	30	32	28	30	24	19	22	22	18.4
Cedar Rap.	Max.	29	32	35	38	28	30	37	43	44	54	54	43	44	31	20	14	32	49	37	27	46	64	50	44	43	40	38	37	33	41	46	38.8
	Min.	8	25	10	20	17	18	13	24	32	29	30	29	30	19	10	-3	3	22	24	12	12	36	29	28	31	31	28	28	29	28	24	21.8
Centerville	Max.	30	33	39	41	35	30	32	42	46	61	52	60	50	46	29	20	40	43	45	28	45	67	63	56	48	55	47	42	40	45	55	44.0
	Min.	10	15	13	22	20	15	15	22	32	31	30	30	32	22	10	-1	10	26	22	13	16	36	36	33	28	32	20	30	30	30	23	22.7
Chariton	Max.	33	32	35	35	31	31	35	42	49	65	66	62	52	36	24	16	44	54	48	30	47	68	61	48	55	51	41	36	36	47	54	44.0
	Min.	9	22	14	26	18	15	14	25	35	30	39	30	30	20	8	-3	1	25	28	11	11	35	31	32	34	27	32	32	30	29	24	23.0
Charles Cy	Max.	28	30	36	32	18	20	34	39	39	48	46	41	45	30	16	10	26	39	32	23	44	55	47	45	40	36	35	35	32	39	42	34.9
	Min.	6	19	3	12	13	11	-7	7	26	25	30	30	30	16	7	-10	0	9	21	10	7	33	26	24	30	28	25	27	27	27	22	17.2
Clarinda	Max.	41	39	39	35	32	28	41	52	57	68	77	74	56	37	24	18	46	57	52	31	55	73	57	39	55	60	45	39	40	51	59	47.6
	Min.	11	21	21	27	21	13	17	26	33	30	36	33	28	16	7	-3	3	32	28	12	11	33	32	35	35	29	35	34	27	29	19	23.6
Clear Lake	Max.	22	33	36	32	18	14	38	42	37	52	51	52	50	25	15	8	24	40	35	24	46	57	54	48	40	35	32	33	35	44	40	35.9
	Min.	8	19	12	14	11	9	-2	22	28	24	34	30	25	12	5	-10	..	12	16	7	4	32	24	22	29	27	25	25	25	20	12	17.4
Clinton	Max.	31	35	38	38	31	32	33	43	41	47	49	43	42	31	22	13	32	50	41	31	40	60	52	49	35	39	39	35	35	43	43	38.4
	Min.	7	22	4	16	15	17	7	15	29	24	26	26	30	19	10	1	0	21	26	12	10	32	27	26	31	30	27	27	30	30	20	19.9
College Sps	Max.	37	37	39	34	32	31	37	48	54	66	69	69	54	37	27	14	44	54	49	28	57	68	55	47	55	56	43	40	42	49	55	46.0
	Min	11	20	21	25	20	11	17	26	32	32	42	36	29	15	6	-4	3	27	28	12	13	32	35	34	35	27	35	35	27	27	22	23.6
Coon Rap	Max.	28	42	41	37	26	26	39	47	45	65	62	68	61	37	24	20	40	50	46	32	50	64	53	45	46	45	42	36	34	42	50	43.5
	Min.	11	16	21	20	16	10	12	28	38	50	42	34	29	17	6	-7	2	23	25	8	15	33	29	32	25	28	29	30	29	26	24	22.0
Corning	Max.	35	36	45	34	30	34	35	45	52	64	67	67	61	40	24	18	41	52	50	35	51	68	56	50	54	52	45	42	38	45	52	45.7
	Min.	3	20	20	25	19	12	15	22	34	30	36	33	30	20	5	-4	3	22	29	10	13	32	30	33	34	27	32	32	28	28	20	22.4
Co. Bluffs	Max	46	45	44	29	29	27	44	55	53	73	70	77	53	30	25	17	48	57	40	30	57	73	58	40	55	57	39	39	39	50	48	46.7
	Min.	19	21	25	22	12	12	23	31	34	39	37	32	24	8	-2	-4	16	21	13	13	20	32	36	38	30	30	34	31	30	35	25	23.4
Cresco	Max.	29	27	35	20	15	18	33	40	37	43	42	40	40	18	14	2	23	38	28	21	38	46	37	42	33	35	36	32	33	38	46	31.6
	Min.	5	11	6	14	11	5	-3	20	24	21	30	29	25	10	0	-11	-5	11	15	8	4	31	24	24	28	24	19	27	26	25	20	15.4
Davenp'rt.	Max.	29	33	34	36	31	31	33	43	45	50	54	43	47	31	19	14	34	50	44	29	39	60	53	41	42	40	39	32	35	40	39	38.8
	Min.	13	23	12	17	16	18	14	25	33	29	33	28	31	18	13	0	2	27	23	14	14	35	33	29	32	32	30	28	31	30	26	22.9
Decorah	Max.	30	28	39	29	23	20	37	34	42	47	43	42	34	22	17	3	25	39	35	22	50	42	37	47	35	36	40	35	37	42	50	34.3
	Min.	4	17	3	10	11	10	-6	12	18	22	22	29	21	4	-1	-9	2	12	15	8	31	25	22	21	29	26	19	28	25	27	22	15.5
Delaware	Max.	28	32	35	32	21	22	35	39	42	48	50	40	39	30	17	12	28	45	37	26	41	58	49	44	38	35	34	32	32	40	43	35.6
	Min.	8	23	10	18	13	14	5	20	31	25	31	26	29	15	6	-5	-1	17	23	9	6	32	27	22	29	27	23	24	26	23	20	18.6
Denison	Max.	45	48	50	24	32	31	45	53	57	74	80	78	50	25	22	9	36	28	29	28	52	72	40	44	53	55	33	33	33	48	53	43.9
	Min.	15	18	20	20	26	10	11	27	33	34	36	40	30	15	10	-9	8	12	9	10	20	32	24	26	27	25	30	31	29	26	23	21.5
Des Moines	Max.	37	36	38	36	28	25	37	46	49	64	63	66	49	29	23	11	40	51	42	29	48	68	54	42	47	47	36	36	36	44	52	42.2
	Min.	14	24	20	24	19	16	16	26	34	32	38	32	29	16	11	-4	3	26	21	12	13	36	33	34	34	33	32	31	31	29	26	23.9
De Soto	Max.	38	36	42	35	36	25	39	48	46	65	63	64	55	30	23	14	41	51	37	36	48	66	53	44	50	45	35	36	37	44	51	43.0
	Min.	12	22	18	24	19	15	14	28	32	31	38	36	30	17	9	-3	3	24	22	12	12	36	31	35	34	31	32	31	31	28	24	23.5
Dows	Max.	32	35	35	32	20	20	35	41	42	45	55	63	57	32	17	12	30	43	39	49	62	52	45	46	38	37	35	34	32	35	44	38.5
	Min.	2	20	12	12	14	10	5	23	24	27	36	30	28	15	7	-8	0	13	21	5	30	25	26	26	30	28	27	26	25	19	16	18.5
Dubuque	Max.	30	32	35	33	23	24	34	40	47	49	48	39	40	28	17	6	26	46	37	26	41	59	47	44	34	36	36	34	34	44	47	36.0
	Min.	11	24	9	15	15	16	9	21	31	27	31	27	28	15	6	-4	2	24	18	13	12	35	32	28	32	29	26	26	28	31	28	20.8
Eldon	Max.	33	35	38	38	32	33	36	46	49	58	60	55	50	39	25	20	42	55	47	33	46	68	63	51	54	49	47	39	40	45	56	44.6
	Min.	6	23	3	25	18	19	12	23	32	25	31	30	32	22	10	-1	3	24	31	12	13	36	32	38	36	32	32	31	31	29	25	22.9
Elkader	Max	34	33	42	33	21	25	43	47	49	55	55	37	40	25	19	5	29	45	33	27	44	60	50	48	35	39	42	35	37	47	52	38.3
	Min.	10	20	8	18	13	16	0	21	28	25	25	29	28	15	6	-5	1	17	18	12	9	32	24	21	30	26	21	28	29	25	25	18.5
Estherville	Max.	40	38	39	32	19	21	39	42	38	61	52	61	50	21	12	6	31	40	32	22	53	63	43	40	40	42	38	34	33	38	44	37.2
	Min.	10	12	10	12	9	7	-3	8	23	26	40	32	20	10	2	-10	1	12	12	6	8	27	11	17	28	28	27	26	25	23	19	15.4
Fayette	Max.	28	30	36	28	20	20	37	42	42	47	47	40	38	28	15	5	24	41	35	23	43	54	45	47	36	35	35	35	34	41	46	34.7
	Min.	8	20	5	18	12	14	1	21	30	23	29	28	28	15	5	-8	-1	15	17	10	8	33	26	27	27	18	21	25	26	21	22	17.5
Fonda	Max.	38	33	37	21	20	18	37	47	48	64	60	71	38	23	22	16	34	47	34	28	54	63	49	51	49	44	34	31	33	46	52	40.0
	Min.	19	18	16	8	10	5	22	34	28	32	33	30	18	7	-8	2	14	20	6	6	14	25	26	30	28	29	28	26	29	24	38	19.6
Forest City	Max.	31	33	36	33	16	20	38	43	36	54	52	54	52	27	13	7	22	40	38	22	49	58	54	48	40	34	34	34	32	38	42	36.4
	Min.	10	19	12	13	12	8	0	13	27	26	32	30	22	13	5	-10	0	8	16	6	4	31	24	23	29	28	26	26	25	28	26	17.2
Ft. Dodge	Max.	39	37	39	36	22	30	39	47	40	61	60	70	65	30	20	7	35	..	40	28	50	65	60	48	..	47	38	30	33	38	52	41.6
	Min.	3	20	17	18	12	20	7	27	33	25	33	30	30	18	8	-6	2	..	15	8	10	33	25	27	..	30	25	28	27	20	21	19.5
Galva	Max.	40	30	40	35	20	20	40	50	49	42	64	70	57	35	15	12	21	35	37	39	70	52	53	45	45	46	39	34	33	43	54	40.5
	Min	10	15	12	15	15	10	8	25	30	32	49	35	27	10	5	-8	5	10	12	10	39	32	27	20	30	28	29	32	28	23	24	20.1
Glenwood	Max.	43	43	42	38	27	29	41	54	55	71	72	71	67	41	26	20	46	57	49	33	55	73	62	51	55	50	39	50	58	57	62	49.6
	Min.	15	21	23	24	21	10	18	27	34	32	43	36	31	19	6	-4	4	22	30	12	14	34	34	35	29	33	33	30	21	33	19	23.8
Greene	Max.	32	31	38	33	19	22	40	45	38	52	49	47	46	31	17	11	28	43	38	24	47	60	52	50	41	39	34	33	35	41	48	37.5
	Min.	8	22	9	18	14	11	4	20	32	26	33	30	29	17	7	-8	1	15	22	10	17	33	25	23	30	27	23	26	27	26	15	19.2
Greenfield	Max.	37	35	43	43	27	27	40	48	49	64	66	66	51	31	30	21	42	33	27	51	64	59	54	44	53	55	37	35	34	45	53	44.0
	Min.	10	19	19	24	16	12	13	25	34	30	36	33	30	15	5	-6	-1	19	9	10	32	31	33	34	32	33	30	31	30	27	21	22.1
Grinnell	Max.	30	33	35	33	25	28	34	41	42	54	57	55	52	32	21	16	34	46	40	30	44	61	56	44	43	40	38	34	32	38	48	39.2
	Min.	12	23	14	23	16	16	13	23	23	30	40	30	31	20	9	-4	0	24	25	11	12	34	31	32	31	30	29	30	29	24	27	23.2
Grin'l (nr.)	Max.	34	32	38	30	24	28	37	44	42	55	57	57	50	32	23	17	36	50	40	32	47	64	55	42	44	45	33	33	32	37	38	39.9
	Min.	8	23	10	22	16	16	9	21	33	28	35	30	31	19	8	-5	-1	19	27	9	7	33	32	32	31	29	28	30	30	22	25	21.0
Grundy C'r	Max.	32	30	34	33	22	24	34	45	49	51	54	57	48	32	27	5	31	38	43	34	47	63	48	45	40	37	34	32	33	38	42	38.1
	Min	17	14	9	17	13	11	5	21	20	23	25	29	25	18	16	-8	0	15	17	16	5	32	27	31	29	28	26	25	26	25	29	18.9
Guthrie C'r	Max.	39	38	41	34	26	26	39	46	48	62	62	65	59	38	23	12	40	49	38	31	49	66	67	58	58	46	43	33	32	42	50	43.9
	Min.	11	21	20	23	13	13	14	23	36	33	44	33	30	20	8	-3	3	24	29	10	10	34	21	34	11	29	30	30	30	26	23	22.0
Hampton	Max.	33	31	39	24	19	23	39	44	39	54	55	57	40	23	18	7	30	44	32	25	50	63	52	48	38	38	34	30	36	41	47	37.2
	Min.	10	20	14	18	14	10	5	25	30	27	34	30	25	14	4	-8	1	17	17	9	7	34	26	25	30	27	26	25	26	23	21	18.9
Harlan	Max.	41	40	43	34	24	21	38	48	49	68	67	72	59	35	19	19	42	51	36	27	52	67	55	45	51	50	42	35	34	44	53	43.9
	Min.	9	17	17	21	17	12	12	25	34	29	37	35	29	15	3	-7	0	19	26	8	7	31	31	33	32	26	31	31	29	27	20	21.1
Hedrick	Max.	36	35	38	36	30	31	30	43	45	56	60	52	50	33	23	25	39	52	47	30	45	66	57	45	52	45	39	38	37	44	52	42.2
	Min.	18	20	9	23	17	17	15	20	32	27	35	30	31	20	9	-2	2	23	29	11	11	34	31	32	33	30	29	30	30	28	25	22.5
Hopeville	Max.	34	34	35	34	32	30	36	44	50	63	67	65	55	33	20	15	41	50	48	27	48	57	59	44	52	42	39	36	35	45	53	42.7
	Min.	13	22	18	25	19	15	16	26	34	32	43	32	31	20	7	4	1	27	23	11	13	35	34	33	34	28	32	32	30	29	24	23.7
Humboldt	Max.	38	37	38	37	20	21	38	44	44	58	55	66	64	30	20	12	34	44	43	28	52	62	53	48	38	43	36	33	36	37	49	40.6
	Min.	5	21	16	18	16	12	6	26	30	28	37	31	30	18	8	-8	2	18	23	8	8	34	25	26	32	31	28	28	27	17	17	19.1
In'pend'ce.	Max.	27	29	35	23	19	21	35	40	41	49	51	41	37	24	18	4	28	44	42	23	44	60	49	47	37	38	34	30	33	40	43	35.0
	Min.	12	23	10	20	13	14	5	20	33	26	31	27	29	18	7	-7	-1	17	21	9	7	33	27	23	29	27	24	25	26	20	25	19.1
Indianola	Max.	39	35	37	34	29	29	37	45	63	65	66	60	60	51	32	17	39	52	43	30	49	70	65	53	49	49	51	36	34	45	54	45.7
	Min.	13	22	18	26	18	5	15	27	31	43	31	..	30	19	9	-4	0	26	29	11	13	35	30	33	33	30	31	30	30	27	25	22.9
Iowa City	Max.	31	33	36	36	31	34	36	43	46	53	53	44	43	32	22	15	34	48	42	28	45	63	56	48	44	41

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR MARCH, 1900—CONTINUED.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
kuk....	Max.	33	34	36	40	31	35	33	45	44	54	64	54	48	32	28	7	41	54	44	28	43	63	59	46	53	47	51	39	40	44	53	42.7
	Min.	10	22	7	27	23	20	17	21	35	28	38	30	34	26	14	3	5	30	33	17	18	35	39	34	38	33	32	32	32	30	28	25.5
sauqua	Max.	32	34	34	38	31	32	33	43	49	54	63	53	49	33	26	21	41	55	45	31	45	67	62	47	54	48	45	38	39	44	56	43.4
	Min.	4	20	6	27	21	20	15	24	34	27	32	31	35	24	13	2	5	27	30	15	14	36	32	34	37	32	33	32	32	30	24	24.1
sing....	Max.	33	33	41	39	22	20	39	46	51	53	52	40	42	34	20	14	1	26	42	40	28	42	53	53	56	46	40	43	41	37	48	53	39 6
	Min.	9	26	8	17	12	11	34	22	37	22	28	29	29	15	6	- 5	1	15	22	12	8	36	28	28	29	27	20	28	30	30	24	19 6
rabee...	Max.	43	35	42	33	18	19	42	53	42	67	57	67	43	34	19	8	37	48	33	27	57	58	48	48	43	43	42	32	38	42	55	41.6
	Min.	8	11	18	9	13	8	4	28	28	28	37	33	23	10	5	-11	-1	15	15	4	7	26	24	24	30	27	28	27	25	14	18	17.6
ox.....	Max.	36	35	36	34	31	31	35	44	51	62	68	65	58	38	22	17	41	50	48	31	49	66	57	47	53	52	46	38	35	45	53	44.3
	Min.	11	20	20	25	18	12	14	25	33	32	38	32	32	19	5	- 6	01	25	28	10	11	33	33	33	33	26	31	31	27	28	21	22.6
Mars....	Max	48	42	39	37	20	18	41	53	49	68	64	70	61	40	20	14	37	48	40	26	62	60	30	20	26	32	27	30	30	28	24	24	43 8
	Min.	14	17	23	16	14	8	7	24	31	32	39	36	28	16	-3	- 8	3	16	20	6	15	70	50	48	53	48	50	39	39	43	48	20.2
an.....	Max	49	44	45	34	25	37	41	53	52	70	69	60	50	41	20	10	24	54	26	21	48	30	30	31	32	29	31	33	26	27	32	43.9
	Min.	12	17	20	26	17	14	14	24	36	38	33	38	26	16	4	- 6	3	19	10	9	18	58	63	50	45	48	41	40	37	46	44	23.2
quoketa	Max.	38	35	40	38	28	36	35	45	49	53	51	45	43	39	27	21	38	51	45	38	44	44	63	56	45	48	41	40	40	26	19	42 3
	Min.	5	4	8	19	14	19	8	9	19	20	27	21	30	19	10	- 2	0	11	20	12	10	28	22	25	35	32	26	26	29	29	19	17 9
rsh'l.t'n	Max.	32	34	38	33	26	25	40	45	46	54	61	59	55	34	22	16	34	46	44	30	49	65	54	43	40	43	38	34	39	43	52	41.1
	Min.	11	23	12	23	16	15	9	24	23	29	34	31	32	19	9	- 5	1	19	27	10	11	34	29	32	32	30	29	29	28	25	24	21.5
nticello.	Max.	29	33	35	30	33	34	35	38	45	50	52	54	40	23	23	14	28	35	50	45	..	..	..	47	35	43	43	40	43	48	52	38.5
	Min.	12	23	5	25	15	16	7	10	28	26	27	25	26	20	9	- 2	10	32	30	10	16	13	20	32	29	27	29	26	21	19	18	19.5
ar	Max.	31	34	36	38	32	30	37	45	44	55	63	54	40	24	7	- 5	10	32	30	16	44	65	60	46	53	43	52	40	40	41	50	42.4
	Min.	6	18	2	23	24	20	9	20	35	29	36	30	33	29	13	2	3	30	29	16	18	34	39	28	35	28	32	30	31	30	28	23.9
Ayr.. .	Max.	32	34	37	34	31	32	16	25	32	30	42	33	31	18	7	- 5	0	41	53	30	49	67	59	47	54	55	44	39	33	46	54	44.5
	Min.	11	21	19	27	19	14	16	25	32	30	42	33	31	18	7	- 5	0	25	29	11	11	81	84	33	33	27	32	32	29	29	23	23.2
Ple's'nt	Max	37	36	38	40	31	31	33	41	49	51	52	47	48	43	26	20	41	53	46	38	43	70	56	51	50	45	46	39	38	44	52	43.1
	Min.	1	4	0	18	12	13	5	16	26	20	21	21	25	17	5	6	16	16	26	8	4	26	25	25	28	25	20	23	24	22	19	16 7
Vernon	Max.	28	31	34	33	22	29	39	42	45	56	59	42	42	28	22	5	33	47	35	29	44	64	59	44	40	42	32	32	34	43	53	38.3
	Min.	10	21	10	20	15	16	10	20	32	26	31	27	29	21	8	- 5	3	20	25	10	9	33	29	26	29	29	28	29	28	27	22	20.6
wH'pton	Max.	27	28	35	35	17	18	33	38	39	46	49	..	41	29	15	5	- 9	-3	14	20	6	..	36	26	23	29	26	23	27	27	28	26	18.5
	Min.	10	23	10	16	12	11	0	19	31	24	32	..	29	15	5	22	14	35	48	39	27	47	65	53	42	45	46	37	33	34	45	51	40.8
wton....	Max.	32	34	37	33	28	28	36	43	45	59	61	60	55	32	22	14	- 6	0	19	25	10	12	34	31	33	32	30	30	29	29	26	25	21.8
	Min.	11	22	13	23	16	15	11	22	32	28	39	30	31	17	8	- 6	15	37	48	43	29	54	65	53	47	46	49	43	34	32	43	54	43.4
ebolt	Max.	41	40	38	36	21	20	40	50	44	68	64	71	67	35	19	3	- 7	1	19	25	7	10	30	27	29	32	28	30	18	29	25	21	20 3
	Min.	8	14	19	17	11	10	7	29	31	30	35	35	39	16	3	15	36	50	43	50	50	68	56	44	40	42	37	34	34	43	52	42.0
den.....	Max.	37	33	39	32	24	26	38	44	44	62	62	66	43	34	25	15	36	50	43	50	50	31	30	31	31	30	30	29	28	25	23	21.4
	Min.	13	21	29	21	15	12	9	24	33	28	35	31	30	15	8	- 6	-2	17	23	18	10	61	52	41	38	38	37	32	34	41	42	39.3
in.....	Max.	..	..	..	35	28	24	34	43	43	50	53	42	30	22	9	- 3	..	20	27	11	9	24	28	26	31	30	28	27	29	29	18	21 6
	Min	8	..	..	30	16	17	9	17	27	27	30	28	52	35	20	12	46	54	43	29	57	71	55	44	52	55	42	38	36	48	55	46.1
naha.....	Max.	51	38	42	37	28	24	41	55	50	72	69	77	39	34	11	5	- 6	9	25	23	12	20	36	37	37	36	30	34	34	31	30	30	26.0
	Min.	18	21	28	23	19	11	22	32	38	41	45	39	48	26	24	14	42	56	38	35	61	73	62	45	54	56	37	37	35	52	59	46.8
awa.....	Max.	52	44	43	38	24	27	43	56	53	72	69	33	34	28	16	4	- 6	6	16	28	9	11	29	30	35	34	24	31	33	29	26	21	21.8
	Min	12	16	23	20	18	9	13	28	35	32	33	40	44	27	15	6	25	38	35	22	44	52	44	45	40	36	36	36	33	39	46	34.5
age.....	Max.	28	29	36	32	16	20	34	41	40	47	33	28	26	13	5	-13	-3	13	16	8	7	32	22	21	29	26	23	27	26	21	24	17.2
	Min.	7	20	9	14	10	9	8	21	29	22	65	66	65	48	31	22	7	41	52	40	27	47	69	58	40	52	50	37	34	35	44	56	42.4
ceola....	Max.	34	34	37	34	30	25	37	47	51	65	66	65	48	31	22	7	- 4	1	26	30	11	12	35	31	38	34	28	30	31	30	29	24	23.5
	Min.	11	22	17	23	18	14	15	26	35	32	46	32	31	20	7	- 4	1	26	30	11	12	35	31	33	34	28	30	31	33	37	44	54	41.7
kaloosa..	Max.	36	34	38	32	24	30	37	45	48	60	63	58	48	38	24	14	40	53	37	24	47	68	57	36	51	46	37	33	37	44	54	41.7
	Min.	3	21	7	24	17	16	11	21	31	48	59	65	50	51	50	35	23	42	53	39	38	47	65	60	47	51	50	33	34	32	31	21	27	24.1
tumwa...	Max.	32	34	36	37	38	32	35	47	44	55	63	54	50	36	23	7	40	52	44	28	44	65	60	46	53	43	52	40	40	41	50	42.4
	Min.	5	25	10	30	19	20	15	22	28	28	36	30	33	29	13	2	3	30	29	16	18	34	39	28	35	28	32	30	31	30	28	23.9
vid	Max.	34	36	39	24	32	18	15	15	24	32	29	39	30	29	20	8	- 3	0	24	27	11	55	70	57	43	54	54	39	39	37	49	52	44.9
	Min.	8	21	13	24	18	15	15	15	24	32	29	39	30	29	20	8	- 3	0	24	27	11	55	70	57	43	54	54	39	39	37	49	52	44.9
cific Jct.	Max.	42	28	42	28	27	26	42	52	54	71	70	73	53	30	23	11	45	54	44	29	55	70	57	43	54	54	39	39	37	49	52	44.9
	Min.	15	21	21	25	21	21	17	27	34	29	37	37	30	20	7	- 4	4	18	29	42	42	56	48	35	37	38	35	..	32	33	46	38.3
alla.....	Max.	32	34	40	32	25	30	33	39	52	58	56	58	45	30	25	10	38	..	29	42	25	36	29	32	31	30	29	..	30	26	25	22.1
	Min.	12	22	20	18	15	16	12	22	28	28	28	30	23	18	13	- 2	16	..	1	25	40	60	54	60	46	44	38	34	36	54	44	40.0
lover.....	Max	40	34	40	32	18	20	40	48	40	60	54	67	40	34	20	4	34	44	36	25	40	60	54	60	46	44	38	34	36	54	44	40.0
	Min.	10	10	18	16	14	10	3	25	35	30	40	35	30	18	7	- 8	-3	15	22	6	5	22	29	30	30	26	24	28	28	15	28	19.3
rimghar..	Max.	35	35	43	40	45	27	32	40	45	50	70	76	46	20	20	10	15	16	20	4	8	30	25	27	25	36	28	27	30	15	30	19.1
	Min.	12	15	20	26	25	12	5	22	25	28	38	15	13	5	5	-10	18	48	58	38	33	65	73	60	63	56	60	42	40	41	54	63	50.5
ed Oak...	Max.	42	43	42	37	32	32	44	53	62	78	76	75	62	45	30	18	7	25	30	15	12	16	30	34	35	36	30	34	34	30	30	24	25 0
	Min.	16	21	24	28	22	15	20	29	35	38	45	35	31	17	9	- 2	10	25	41	36	30	42	50	46	43	36	38	38	34	35	45	50	36.8
idgeway .	Max.	31	32	38	31	20	27	38	42	47	52	52	40	41	31	20	4	-11	-5	15	15	8	5	32	24	21	28	25	20	27	27	28	24	17.8
	Min.	8	24	12	17	12	13	1	21	30	24	32	30	27	14	4	22	17	38	41	42	29	52	60	52	53	40	44	38	34	35	38	51	43.5
ockwell C	Max.	40	38	41	35	20	21	38	49	49	61	58	68	61	35	22	7	- 7	0	19	19	7	15	35	36	23	32	29	29	30	28	20	24	21.6
	Min.	13	19	17	18	15	11	9	19	39	41	48	33	29	15	7	11	11	32	41	24	25	51	56	42	39	31	38	32	30	29	33	45	34.8
tuthven ..	Max.	33	34	35	27	14	18	31	42	39	60	58	63	29	29	11	5	-12	-1	12	19	4	6	31	23	24	35	28	26	9	20	11	28	16.7
	Min.	10	13	11	12	9	8	4	25	25	29	35	32	26	12	5	-12	12	36	48	38	27	50	63	52	43	41	44	40	34	32	42	52	40.3
ac City....	Max	38	35	38	34	21	19	40	49	43	..	65	70	28	16	7	- 8	2	18	23	7	10	31	27	28	31	28	30	29	28	24	23	19.6
	Min	8	15	19	17	15	10	8	28	33	..	30	23	67	62	34	19	15	37	48	30	40	50	65	60	44	44	45	41	34	30	29	25	25	22.5
cranton ..	Max.	38	37	39	34	22	31	45	45	42	63	60	41	34	30	18	8	- 5	2	21	9	16	25	34	29	30	32	30	30	34	33	33	35	51	39.1
	Min.	11	19	19	21	17	12	12	27	36	31	57	66	50	26	17	7	37	44	31	25	57	60	45	46	38	35	34	34	27	25	18	17	18.4
heldon....	Max.	45	35	37	34	17	15	40	50	45	66	37	34	25	10	6	-10	1	14	19	4	13	29	24	25	32	28	28	32	32	32	41	52	41.2
	Min.	11	11	22	13	11	6	4	30	27	30	63	58	69	53	30	16	12	33	45	41	26	57	61	52	50	41	40	25	27	25	24	16	14	16.7
ibley.	Max	49	42	37	37	17	17	43	53	45	23	27	33	32	25	11	4	-12	0	12	18	2	2	29	21	23	30	47	42	35	36	44	54	43.5
	Min.	13	12	20	11	9	7	4	30	45	47	59	62	54	50	37	23	20	39	53	47	30	47	68	66	48	50	32	31	28	30	30	26	25	21.9
lgourney..	Max.	37	34	39	37	28	31	38	45	22	33	26	34	29	31	20	9	- 3	0	22	28	11	10	35	30	30	45	40	42	37	33	33	36	51	40.7
	Min	4	22	6	25	17	17	10	52	46	64	59	66	53	33	11	12	35	45	38	26	58	60	51	25	27	32	27	29	29	26	29	24	19.8
Sioux Cen.	Max.	47	37	39	36	19	17	41	52	28	28	32	37	37	28	10	3	-10	2	16	18	4	11	34	25	27	50	46	36	35	33	46	57	42 4
	Min.	15	12	22	12	13	7	8	28	56	46	70	66	71	45	25	17	7	39	50	32	27	63	62	34	29	29	28	27	32	28	25	26	23.4
Sioux City..	Max.	51	38	40	27	20	9	18	31	33	43	46	36	29	15	2	- 8	18	22	23	8	19	34	46	44	38	36	38	42	46	..	..	50	38.5
	Min.	22	15	25	17	16	35	38	40	38	63	53	65	45	28	20	34	32	24	31	26	54	21	22	26	26	25	24	20	..	..	18	17.7
Spencer....	Max	34	38	36	10	24	18	10	15	20	25	32	33	31	28	24	18	4	0	12	14	12	3	4	55	62	47	62	35	42	33	30	35	47	49	38.6
	Min.	12	10	14	10	38	23	37	42	38	42	62	53	48	32	22	17	6	30	34	41	25	5	28	22	36	31	28	28	23	24	15	16	13.4
Spirit Lake	Max	34	36	39	8	10	3	2	2	10	13	23	20	18	19	10	2	-11	1	4	5	34	25	51	61	48	42	39	42	37	33	30	36	50	38.9
	Min	8	9	8	35	34	17	17	37	46	41	65	59	69	45	30	17	10	35	45	21	5	13	30	25	25	31	27	29	28	25	21	23	19.1
StormLake	Max.	37	39	35	17	14	14	9	4	27	30	29	40	32	28	14	6	-10	-3	15	39	27	56	45	50	25	37	45	50	38	32	32	43	45	37.8
	Min.	8	14	17	14	14	9	4	27	40	47	60	63	50	45	27	22	12	15	39	27	56	45	50	25	37	45	50	38	32	28	27	29	19.8
Stuart.....	Max.	32	40	39	28	25	25	39	40	47	60	63	50	45	27	18	2	- 7	-4	2	5	20	25	20	19	34	30	35	30	29	28	27	29	19.8
	Min.	15	11	13	14	17	11	12	20	25	32	43	38	20	18	2	22	20	44	55	53	33	53	68	55	48	54	53	48	40	38	48	54	46.8
Thurman..	Max.	40	39	39	37	28	28	39	50	54	69	70	70	62	40	22	7	- 2	6	19	25	13	12	32	30	36	35	29	35	34	27	30	20	23 6
	Min.	14	22	23	23	22	12	18	28	32	29	34	36	32	19	7	- 2	5	31	50	37	28	49	68	55	41	40	41	34	34	36	45	54	40 2
Toledo. ...	Max.	31	33	39	34	22	28	40	45	47	58	61	56	47	30	20	8	- 5	1	17	16	10	6	12	27	25	27	30	28	28	28	25	23	18.3
	Min.	9	24	7	6	16	3	8	13	35	26	33	30	32	18	8	- 5	1	48	55	47	33	53	69	63	55	58	55	51	41	43	51	50	47 4
Villisca....	Max.	33	29	32	33	26	33	44	46	56	65	78	68	55	47	32	20	4	5	24	28	20	11	11	20	32	31	33	28	33	33	28	29	20	22.5
	Min.	26	22	20	14	18	11	14	25	28	35	35	35	28	24	5	- 4	4	20	29	11	42	81	57	43	45	43	40	36	30	32	39	50	40 1
Wapello ...	Max.	18	34	32	37	30	32	39	39	43	49	54	43	33	23	14	3	1	20	30	14	15	26	32	31	34	32	30	34	33	35	44	54	40.2
	Min.	7	22	7	20	17	22	13	22	34	28	29	30	47	31	22	7	39	51	33	30	44	66	57	40	47	44	30	28	28	29	27	25	20 0
Washingt'n	Max	32	33	35	37	31	26	36	44	45	56	83	27	29	19	8	- 5	-5	24	25	10	9	28	31	29	30	38	38	34	33	34	45	44	37.4
	Min	4	20	5	18	15	15	9	20	30	24	53	52	48	41	32	20	8	30	46	35	27	45	62	56	47	30	28	24	27	22	20	19	20 1
Waterloo...	Max.	26	31	37	28	21	23	36	41	44	32	27	30	30	31	20	8	- 6	2	17	23	10	9	35	38	45	48	40	38	35	34	41	44	37 1
	Min.	16	17	11	20	15	16	7	21	45	42	50	49	44	47	30	17	10	29	45	37	25	45	59	45	48	40	38	29	27	27	26	19	20 4
Waverly...	Max.	32	31	37	34	20	15	24	38	45	32	27	32	31	30	17	8	- 7	3	16	22	11	10	34	35	40	40	40	34	36	34	34	30	44	36.1
	Min.	15	24	9	19	14	15	6	23	32	45	54	48	44	34	34	30	20	35	34	44	32	32	34	30	28	30	34	29	28	26	24	22.3
Webster C.	Max.	35	35	30	32	38	18	11	24	34	27	30	38	30	31	19	10	- 5	3	15	18	10	14	49	58	60	44	40	38	32	34	33	40	50	37.1
	Min.	22	22	20	18	18	25	22	32	40	45	52	56	40	36	34	22	12	22	40	42	20	28	34	32	26	31	30	26	28	28	32	26	22 1
W. Branch.	Max.	30	33	35	32	22	12	10	20	25	26	28	30	22	24	22	10	0	2	28	32	25	47	62	49	44	37	38	35	33	32	34	51	37.5
	Min.	5	21	5	22	33	22	22	35	41	41	55	55	57	44	24	18	9	28	45	12	8	4	31	28	28	31	27	28	26	25	24	19	18.5
Whitten ...	Max.	30	34	37	33	17	14	12	6	21	29	26	32	30	20	11	6	- 8	-1	35	48	41	29	40	61	56	44	43	42	40	35	35	40	48	39.8
	Min.	8	21	12	37	24	32	34	43	44	49	55	41	43	34	27	17	17	1	22	17	12	10	33	34	28	32	32	28	28	30	28

DAILY AND MONTHLY PRECIPITATION FOR MARCH, 1900.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Afton	....	....	T	.15	1.00	....	....	....	....	....	....	....	....	T	....	T	..	..	....	....	....	....	....	.30	.50	....	.39	.18	....	T	....	
Albia	....	....	....	..	.25	....	....	....	....	....	..	....	....	T	T	....	....	....	....	....	....	....	.03	....	....	.75	.10	....	....	....	....	
Algona	.05	....	.05	....	....	.60	..	....	....	....	....	....	....	....	T	..	T	....	T	....	....	....	....	.25	....	....	....	1.55	....	....		
Alta	..	....	05	T	.34	....	....	....	....	....	..	..	..	.02	.01	....	T	....	.01	....	..	....	....	....	.21	....	.44	84	.04	..	....	
Alta (near)	....	....	T	....	.10	..	..	....	....	....	..	..	....	....	..	..	....	....	....	....	....	....	..	..	.15	..	.30	.59	.10	....	....	
Amana	.02	....	....	.16	.75	.07	..	....	..	..	....	....	....	T	....	.03	....	....	T	..	....	....	....	.14	.09	....	.41	1.05	.12	.12	....	
Ames	T	....	.20	T	.54	T			....	T	....	....	....	T	T	T	....	..	T	....	....	....	....	T	T	T	1.90	.12	.05	....	....	
Ames (near)	T	....	.25	....	1.10	.	....	..	..	....	....	....	....	....	....	T	....	..	....	..	....	....	....	.16	....	....	....	2.05	.10	....	....	
Atlantic	....	....	T	..	.97	....	....	..	..	....	....	....	..	.08	T	T	....	..	....	....	....	....	....	.11	.17	....	.66	.05	T	....	....	
Audubon	..	....		....	.15	....	..	..	..	....	....	....	..	T	T	....	....	....	T		....	..	....	.25		.25	1.40	....	T	....	....	
Bancroft	T	....	.50	.10	.30	.20	..	..	....	....	..	....	..	....	T	....	.10	....	T	....	....	....	....	....	.30	T	....	.60	.30	....	....	
Batavia	....	....	..	....	.60	..	..	....	....		..	....	....	....	04	....	....	....		....	....	....	T	....	.07	T	....	....	....	..	....	
Baxter	....	....	.15	.10	.30	....	..	..	....	....	....	....	....	....	.01	..	....	..	.05	..	....	....	....	.23	..	....	.90	1.30	.40	....	....	
Bedford	....	....	T	....	.77	..	....	..	....	....	....	..	....	T	..	..	..	..		....	....	....	..	.19	.25	....	.16	.12	....	....	....	
Belknap	....	....	..	.14	.25	.57		..	....	....	....	....	....	T	T	T	..	T	..	....	....	....	..	..	..	....	T	.48	.04	.06	....	
Bonaparte	....	....	..	....	1 30	....	....	....	....	....	....	....	....	....	....	....	....	....	..	....	....	....	....	.16	..	....	....	.35	..	.05	....	
Britt	.03	..	..	.11	.20	.10	....	....	....	....	....	....	....	....	T	....	T	....	T	....	....	....	....	T	.23	.06	.08	.70	.12	.06	....	
Buckingham	.10	....	.28	..	.75	....	....	....	....	..	....	....	..	..	.10	..	..	..	....	....	....	....	....	..	.20	....	.50	1.12	.15	....	....	
Bussey	....	....	....	....	.20	..		....	....	..	..	....	..	..	T	....	....	..	....	....	....	....	....	.15	..	....	....	1.60	....	....	....	
Carroll	....	....	....	.10	..	..	.50	..	..	....	..	..	T	....	....	....	....	..	T	....	....	....	....	....	.23	....	..	1 95	.19	..	....	
Carson	..	T	.05	T	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.84	.30	T	....	....	
Cedar Rapids	T	....	.02	T	.57	....	....	T	T	..	....	....	....	T	T	....	....	....	....	T	....	....	....		T	.15	T	T	1.50	.13	....	
Centerville	....	....	....	..	1.00	..	..	....	....	....	....	....	.	T	T	T	....	..	..	....	....	....	....	T	T	....	T	.30	T	....	....	
Chariton	....	....	....	.11	1 07	..	....	....	....	....	....	....	....	T	T	T	....	..	..	T	....	....	..	.05	.06	....	.36	.48	.07	.03	..	
Charles City	.05	....	T	.35	47	..	..	..	..	....	....	....	..	T	T	T	T	T	T	T	....	....	..	..	.20	....	T	.50	.37	..	....	
Clarinda	....	....	.10	....	.47	....	..		....	....	....	....	..	.01	....	..	..	T	..	..	....	....	....	....	.44	..	.05	....	....	....	T	
Clear Lake	.10	..	..	.15	.30	.20		....	....	....	..	..	....	....	....	..	T	....	T	....	....	....	....	....	.10	..	T	50	.30	....	....	
Clinton	T	....		....	....	....	1.16	..	....	....	....	....	....	..	T	.05	T	..	T	..	....	....	....	.23		....	1.10	.49	....	.21	..	
College Springs	....	....	T		.43	....	....	..	....	....	....	.	....	....	..	..	....	....	....	....	....	....	.05	.08	.25	....	.13	....	....	....	..	
Coon Rapids	....	....	.30	....	.25	....	....	....	....	....	....	..	....	T	....	....	..	....	T	..	....	....	....	T	.20	....	.75	1.93	.10	....	....	
Corning	....	....	..	....	.72	..		....	....	....	....	....	....	T	....	..	..	....	....	..	....	....	....	.08	....	....	.67	.08	T	....	....	
Council Bluffs	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	....	....	....	....	.09	.18	..	.85	....	....	....	....	
Cresco	.02	....	.21	.14	.50	..	..	....	..	....	....	.	....	T	.02	T	.03	..	..	T	....	....	....	....	.17	....	....	.20	.09	....	....	
Cumberland	....	..	T	..	1.03	.	..	....	..	..	..	..	....	T	T	T	..	..	..	..	..	....	..	T	.29	....	.62	.18	T	T	....	
Danville	T	..	..	.20	.90	..	..	..	....	....	....	..	....	T	T	....	....	T	....	..	..	....	..	..	T	....	.19	.60	T	.05	..	
Davenport	T	T	..	05	.78	.24	T	....	T	....	..	..	....	T	T	.03	T	..	T	T	....	....	..	T	.21	T	.15	1.14	26	.06	....	
Delaware	.02	....	....	.31	.64	..	....	....	....	....	....	....	....	....	.01	..	..	..	.02	..	..	....	....	....	.20	....	.50	.40	.26	..	....	
Decorah	T	.03	T	.43	.52	.22	....		....	....	....	....		....	....	..	..	.05	..		..	..	..	....	.35	..	....	..	.39	.21	....	
Denison	..	....	....		.25		..	....	..	..	..	..	....	T	....	....	....	....	..	..	..	..	..	.10	....	..	1.25	.10	.10	....	....	
Des Moines	....	....	T	.12	.91	03	..	....	T	....	..	..	..	.02	T	T	....	....	T	T	..	....	....	T	.02	..	.96	.98	T	T	..	
De Soto	..	....	T	.12	.76	....		....	....	....	....	..	....	T	....	T	....	....	....	....	..	..	..	T	.20		1.00	.50	.04	.02	..	
Diagonal	..	....	....	..	....	....	....	....	..	....	....	....	..	....	..	....	....	....	....	....	....	....	..	....	....	....	....	....	....	..	....	
Dows	T		.20	..	.50	.	....	....	..	....	..	.	..	....	....	T	T	....	T	....	....	....	....	T	.18	....	.15	2.00	.10	..	....	
Dubuque	T	T	....	.22	.20	.39	..	..	T	T	..	..	..	....	T	T	.01	.01	.01	T	T	....	....	T	.33	.01	02	.17	.44	.03	..	
Eldon	....	..	T	T	.95	.05	....	....	....		....	....		T	..	T	....	....	..	....	....	....	..	.06	.01		.04	.39	.02	.05		
Elkader	T	....	.38		.75	.	..	..	....	..	..	..	....	T	..	.	..	....	....	....	..	....	..	....	.30		....	.43	.10	..		
Emmetsburg	....	....	....	.20	..	....	..	....	..	....	....	..	..	....	....	....	....	....	.05	..	..	....	....	....	.05	..	....	.75	.15	.05	..	
Estherville	.01	T	.01	.08	.22	.14	..			....	..	T	..	T	T	....	T		.02		....	....	....	T	.05	T	.40	.30	.20	..	..	
Fayette	.05	....	.50		.86	....	..	..	..	....	....	..	..	..	....	....	..	..	..	....	....	....	..	..	.27	..	.08	.56	.31	.11	.	
Ft. Dodge	....	....	..	T	.20	....	....	....	....	....	....	.	....	....	....	....	..	..	T	....	....	....	....	....	..	....	T	2.00	2.00	..	..	
Ft. Madison	....	....	....	..	1 25	....	....	....	....	....	....	....	....	....	T	T	..	T	T	..	....	....	....	T	.20		..	.27	T	T	..	
Fonda	....	..	.03	.17	.46	T	....	..	....	....	.	.02	T	T	T	T	..	..	.03	..	....	..	..	.22	.18	.34	2 72	.34	.64	..	....	
Forest City	T	....		.20	.20	.20	....	..	..	..	....	..	....	..	T	T	..	....	T	....	..	..	....	....	.07	..	.06	.35	.35	....	....	
Galva	..	....	T		.05	....	..	....	....	....	....	..	T	....	....	..	..	....	T	....	....	....	....	T	....	....	.50	.58	....	....	....	
Glenwood	....	....	T	....	T	....	..	.	....	....	..	..	T	T	....	....	....	....	....	....	....	....	....	.35	T	....	T	....	....	.55	..	
Gilman	T	....	.22	..	..	.76	..	....		....	....	....	....	....	T	....	....	....	T	....	....	....	....	.04	....	..	....	1.10	.10	....	....	
Grand Meadow	.05	..	..	.30	.60	....	..	....	..	..	..	....	T	..	T	T	T	....	.05	..	....		....	..	.39	....	....	....	.30	....	....	
Greene	T	....		.33	33	T	....	..	....	..	....	....	....	T	....	....	T	....	T	..	..	..	..	..	.15	....	.06	.41	.26	.03	....	
Greenfield	....	....	.06	.08	.72	T	....		....	....	..	....	....	T	T	.01	....	T	T	....	..	..		T	.23	T	.70	.35	.04	T	..	
Grinnell (near)	..	....	.16	....	.80	..	....	..	....	....	..		..	T	T	.01	....	....	....	....	....	....	....	....	.20	..	.70	.85	.10	.18	..	
Grinnell	.06	..	1.15	....	1	....	..	..	....	....	....	..	....	T	T	....	....	....	T	..	....	.	..	.35	....	....	1.80	....	T	.02	....	
Griswold	....	....	..	.	.37	....	..	....	.	....	....	....	....	.02	....	....	....	....	....	..	....	....	....	.12	....	....	.58	.10	....	....	..	
Grundy Center	.05	..	..	..	.56	....	....	....	....	....	....	....	....	....	T	....	..	..	....	T	....	....	....	T	.20	.33	.80	.20	.20	..	....	
Guthrie Center	....	....	.	.01	.03	....	....	....	..	..	.	....	..	....	....	.	..	..	....	....	....	....	....	....	....	....	.81	.90	.03	....	....	
Hampton	.12	....	.36	T	.52	T	....	....	..	....	....	..	....	....	T	....	T	....	T	..	....	....	....	.25	....	....	1.02	.35	.15		.20	
Harlan	....	....	.10	....	.25	T	....	..	..	....	....	....	....	.03	T	1	....	..	T	T	....	....	....	.08	.23	....	.39	.91	T	T	....	
Hawkeye	.10	....	....	.25		1.80	....	....	T	..	....	....	....	....	....	....	....	.20	....	....	....	....	....	....	.15	....	....	....	.30	....	....	
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Hopeville	....	....	.12	....	.67	....	..	....	....	....	....	....	....	T	....	T	....	T	....	....	..	..	....	....	.17	....	....	.37	T	T	....	
Humboldt	....	....	....	T	.14	....	..	....	....	....	....	....	....	....	....	....	....	....	....	..	....	....	....	....	.17	....	.20	1.70	.01	..	.01	
Independence	.06	....	....	.08	.15	....	....	....	T	....	....	....	....	....	T	.02	T	....	T	....	....	....	....	.01	.18	..	.20	.25	.07	..	....	
Indianola	....	....	T	.10	.55	.02	....	....	....	....	....	....	....	T	T	.02	..	....	....	....	....	....	....	.01	1.10	....	.68	.37	.05	T	....	
Iowa City	T	....	.03	....	1.26	..	..	..	....	....	....	....	....	....	....	T	....	....	....	....	....	....	....	....	.23	....	..	1.66	.14	....	....	
Iowa Falls	.05	....	.25	T	.40	....	....	....	T	....	....	....	....	....	T	....	.05	....	.10	....	....	....	....	T	.10	....	....	1.73	.12	....	....	
Keokuk	....	....	....	.03	.84	.20	..	..	....	....	....	....	....	T	..	T	....	T	..	T	..	....	....	.08	.08	....	T	.07	.10	03	....	
Keosauqua	....	....	....	.03	1.10	.19	....	....	....	....	....	....	....	....	T	T	....	....	....	....	....	....	....	.09	....	....	T	.27	T	03	....	
Lacona	....	....	.15	..	.70	....	..	..	....	....	....	....	....	....	....	....	....	....	T	....	....	....	....	.05	....	.02	.54	.46	05	....	....	
Lansing	T	T	....	.34	.30	.45	....	....	....	....	....	....	....	....	T	T	T	....	T	T	....	..	....	....	.31	T	....	....	.29	T	....	
Larchwood	....	....	....	....	.10	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.37	....	.35	.20	.05	....	....	
Larrabee	....	....	....	....	.14	....	....	....	....	....	....	....	....	.05	T	....	T	..	T	....	....	....	....	....	.30	.20	.40	.20	.16	....	.10	
Le Mars	....	....	....	T	T	....	..	....	....	....	....	....	....	.05	....	....	....	....	T	....	..	....	....	1 00	.	..	.20	.10	T	....	....	
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Le Claire	.06	.01	....	.02	.01	1.30	....	....	....	....	..	....	....	....	....	.04	.01	....	....	....	T	....	....	....	.05	.02	....	1.30	.40	.13	....	
Logan	....	....	..	..	.10		....	....	....	....	....	....	....	.10	....	....	..	....	....	....	..	....	.80	....	....	.40	.52	.03	..	....	....	
Maquoketa	....	....	....	....	.54	.09	....	.	....	....	....	....	....	..	....	T	....	....	....	....	....	....	....	....	.29	....	.14	.88	.34	.06	....	
Marshalltown	.05	....	....	.18	.90	.12	..	....	....	....	....	....	....	....	....	T	....	....	....	....	....	....	....	.01	.20	....	.36	1.72	.15	.09	....	
Monticello	T	....	....	.29	..	.60	....	....	T	....	....	....	....	T	T	T	....	..	T	....	....	....	....	T	.20	T	.94	T	.35	.11	....	
Mooar	....	....	....	.04	.92	.19	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.10	.10	....	....	.22	.04	.03	....	
Mt. Ayr	....	....	.07	....	.85	....	....	....	....	....	....	....	....	T	....	.03	..	T	....	....	..	..	T	.03	.05	....	.14	.53	T	.05	....	
Mt. Pleasant	....	....	....	....	.53	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.20	....	....	.15	.40	.02		..	
Mt. Vernon (Hub)	T	T	....	....	.92	....	....	T	T	....	....	....	....	....	....	.	....	....	.02	.01	T	....	....	.13	.10	....	.60	.90	.15	.07	....	
Mt. Vernon	....	....	....	....	....	....	....	....	.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.28	....	.42	1.00	.80	....	....	
Murray	....	....	.10	....	.30	....	....	....	....	....	....	....	....	T	....	....	....	T	....	..	....	....	.03	....	....	....	.88	.06	T	....	..	
New Hampton	.10	....	....	.20	.60	.10	....	....	..	....	....	....	....	....	....	T	T	..	T	....	..	..	....	....	.10	....	....	.05	.30	....	....	
Newton	....	....	....	..	.20	.98	.	..	....	T	....	....	....	....	T	T	T	....	....	....	....	....	....	....	.15	....	....	1.20	.95	.07	..	
Odebolt	....	....	....	..	.17	....	....	....	....	....	....	....	....	.04	....	....	....	....	T	....	....	....	....	T	.15	....	.23	.84	.07	....	....	
Ogden	....	....	T	.10	.42		....	....	....	....	....	....	....	....	....	.01	....	....	....	....	....	....	....	T	T	....	.42	1.06	.05	.03	..	
Olin	....	....	....	....	1.10	T	..	....	T	....	....	....	....	T	T	.05	....	....	T	T	..	....	....	....	.26	T	1.33	....	.40	....	....	
Omaha (Neb.)	....	....	T	....	.33	.02	....	....	....	....	....	....	T	.05	....	T	....	....	..	..	....	....	T	.01	.20	....	.61	.26	T	T	....	
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Osceola	....	....	.30	.	.61	....	....	....	T	..	....	....	....	T	T	....	....	T	....	....	....	....	....	T	.07	....	.44	.33	....	.05	..	
Ovid	..	....	.09		1.06	.05	....	....	....	....	....	....	....	.01	....	01	..	T	.03	....	....	....	....	.14	....	....	.13	.23	.01	.02	....	
Osage	.03	....	.31	.10	.40	.40	..	....	..	....	....	....	..	T	T	.06	.04	T	.05	....	....	....	..	....	.27	....	T	.12	22	....	....	
Oskaloosa	....	....	T	.03	.64	....	....	....	....	....	....	....	....	....	....	.03	....	....	....	....	..	..	..	03	.12	....	.50	.92	.05	....	....	
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Pacific Junction	....	....	T	.30	....	....	....	....	....	....	....	....	T	.01	....	....	....	....	....	....	....	....	....	.16	.24	....	.19	.06	....	....	....	
Plover	T	.15	....	....	.30	....	....	....	....	....	....	....	....	....	....	T	....	..	T	....	..	....	....	.10	.10	....	.15	.40	.10	....	....	
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DAILY AND MONTHLY PRECIPITATION FOR MARCH, 1900—CONTINUED.

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sway	.03	....	....	.60	.48	.48	...	....	....	...	...	..	..	.04	.01	.09	....	.06	.02	...	....	....	....	....	.53	...	....	.04	.82	....	....	3.20
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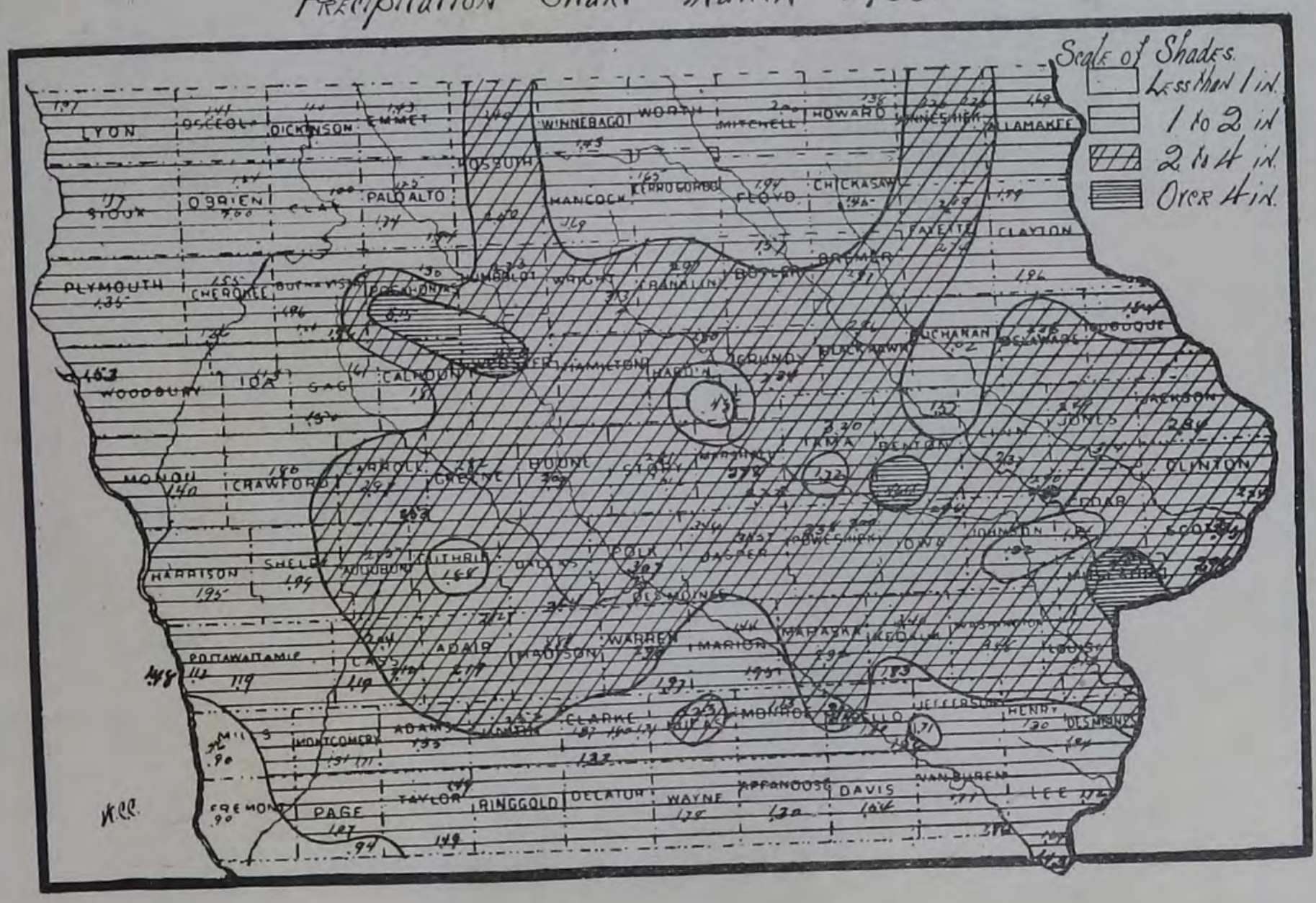
Precipitation Chart March 1900.



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U. S. Department of Agriculture Weather Bureau

MONTHLY REVIEW OF THE IOWA WEATHER AND CROP SERVICE

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Central Station, Des Moines, Iowa.

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DIRECTOR.

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U. S. WEATHER BUREAU, ASS'T DIRECTOR.

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1899.

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Algona.....C. D. Pettibone.
Alta.....D. E. Hadden.
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Clinton.....Luke Roberts.
College Springs.....A. M. Finley.
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Council Bluffs.....J. B. Rishel.
Cresco.....Gregory Marshall.
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Elkader.....Chas. Reinecke.
Emerson.....Agent C. B. & Q. Ry.
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Fayette.....R. Z. Latimer.
Fort Dodge.....C., R. I & P Agent.
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Fonda.....H. P. Barron.
Forest City.....J. A. Peters.
Galva.....Miss Ida Ackert.
Gilman.....Jas. L. Wylie.
Gladbrook.....Agent C. G. W. Ry.
Glenwood.....J. P. Jackson.
Grand Meadow (Postville P. O.)..F. L. Williams.
Greene.....J. L. Cole.
Greenfield.....J. G. Culver.
Grinnell.....Prof. S. J. Buck.
Grinnell (Near).....A. O. Price.
Griswold.....W. L. Roberts.
Grundy Center.....Geo. F. Ellis.
Guthrie Center.....Clam Holden.
Hamburg.....Agent C., B. & Q. Ry.
Hampton.....E. C. Grenelle.
Harlan.....C. A. Reynolds.
Hawkeye.....Miss Beatrice Kirkendall.
Hedrick.....J. T. Brooks.
Hopeville.....M. T. Ashley.
Hoprig.....O. N. Young.
Humboldt.....H. S. Wells.
Independence.....E. F. Wulfke.
Indianola.....Prof. J. L. Tilton.
Iowa City.....Prof. A. A. Veblen.
Iowa Falls.....J. B. Parmelee.
Keokuk.....*Fred. Z. Gosewisch.
Keosauqua.....Prof. J. H. Landes
Knoxville.....Casey & Belville
Lacona.....Agent C., B. & Q. Ry.
Lansing.....G. H. Markley.
Larchwood.....Syndey Clarke.
Larrabee.....H. B. Strever.
Lenox.....J. L. Hurley.
Le Mars.....Dr. T. E. Cole.
Logan.....Mrs. M. B. Stern.
Maquoketa.....Dr. A. B. Bowen.
Mason City.....Norman Dinsmore.
Marshalltown.....Branch S. Jones.
Melrose.....Agent C. B. & Q. Ry.
Monticello.....C. E. Heisey.
Mooar.....F. G. Thomas.
Mount Vernon.....Prof. A. Collin.
Mount Vernon.....Rev. J. W. Hubbard.
Mt. Ayr.....A. F. Beard.
Mt. Pleasant.....Dr. Frank T. Stevens.
Murray.....Agent C. B. & Q. Ry.
New Hampton.....R. H. Gurley.
Newton.....A. Lufkin.
Northwood.....Dr. J. H. Davey
Odebolt.....E. Starner.
Ogden.....E. Sayre.
Olin.....Hon. Nathan Potter.
Omaha, Neb.....*L. A. Welsh.
Onawa.....C. G. Perkins.
Osceola.....A. W. Lewis.
Ovid.....H. C. Miller.
Osage.....G. D. Pattingill.
Oskaloosa.....Jos. Boyd.
Ottumwa.....Dr. J. F. Herrick.
Pacific Junction.....Agent C., B. & Q. Ry.
Pella.....B. A. Viersen.
Pioneer.....A. W. Hawley.
Plover.....J. S. Smith.
Primghar.....P. R. Bailey.
Red Oak.....William Boll.
Ridgeway.....Arthur Betts.
Rockwell City.....C. M. Randall.
Ruthven.....C. E. McGlasson.
Sac City.....J. A. Sodestrom.
Scranton.....E. A. Olive.
Sheldon.....J. B. Frisbee.
Sibley.....H. G. Doolittle.
Sigourney.....Mrs. K. F. Ashbaugh.
Sioux Center.....Jacob de Ruyter.
Sioux City.....*U. G. Purssell.
Spencer.....S. Gillespie.
Spirit Lake.....W. C. Drummond.
Storm Lake.....Prof. M. L. Fuller.
Stuart.....H. E. Boatright.
Thurman.....C. R. Paul.
Toledo.....Grace Bookwalter.
Vinton.....T. F. McCune.
Villisca.....C. E. Matteson.
Wapello.....Geo. W. Schofield.
Washington.....Wm. A. Cook.
Washta.....H. L. Felter.
Waterloo.....M. L. Newton.
Waverly.....H. S. Hoover.
Webster City.....Louis Frank.
What Cheer.....Hon. J. C. Beem.
Whitten.....Dr. Frank P. Butler.
Wilton Junction.....J. M. Rider.
Winterset.....W. W. McKnight.
West Bend.....Phil. Dorweiler.
West Union.....J. M. Lisher.
West Branch.....A. A. Madson.
Woodburn.....Agent C. B. & Q. Ry.

*U. S. Weather Bureau.

WEATHER-CROP OBSERVERS.

Reporting for the Weekly Bulletin.

Agency.....J. H. Van Zant.
Albia.....Wm. Mercer.
Algona.....J. H. Zanke.
Allerton.....James Piper.
Alta.....Jonas Cushman.
Battle Creek.....E. G. Preston.
Blairstown.....T. H. Weil.
Burt.....R. Jain
Cedar Rapids.....Hon. A. J. Fuhrmeister.
Centerville.....Henry Galley.
Charles City.....W. B. Towner.
Chariton.....C. C. Burr.
Clarksville.....F. M. Russell.
Correctionville.....Hon. W. B. Chapman.
Corwith.....Wm. Oxley.
Clermont.....Chas. Larrabee.
Council Bluffs.....L. Prouty.
Creston.....M. V. Ashby.
Danville.....Sherman Matthews.
Dunlap.....Hon. B. F. Roberts.
Estherville.....E. Dawson.
Emerson.....D. B. Nims.
Farlin.....Jesse Johnson.
Fontanelle.....Hon. L. M. Kilburn.
Ford.....J. C. Richards.
Fort Dodge.....R. W. Blaine.
Geneva.....Wm. H. Thompson.
Hesper.....G. E. Dillingham.
Humeston.....Hon. S. H. Moore.
Independence.....Geo. H. Wilson.
Ireton.....J. H. Sherman.
Le Mars.....Hon. Henry Schrooten.
Lockridge.....John F. Farman.
Madrid.....Geo. Swisher.
Manson.....J. D. Skinner.
Marshalltown.....Hon. S. B. Packard.
Mapleton.....A. Lamb.
Mt. Pleasant.....W. S. Wright.
Milton.....Hon. E. C. Holland.
Moravia.....J. F. Powell.
Mount Vernon.....Robert Smith.
Nevada.....Geo. C. White.
Osage.....E. W. Stacy.
Orange City.....H. J. VandeWaa.
Owen.....Hon. J. W. Bird.
Paton.....A. B. Condit.
Pittsburg.....G. C. Duffield.
Rock Rapids.....D. E. F. Merrill.
Rossville.....T. B. Wiley.
Rowley.....L. Maxson.
Sageville.....Hon. F. N. Knoll.
Seymour.....L. B. Sager.
Shenandoah.....Reuben Mullison.
State Center.....E. P. Thompson.
Stuart.....W. W. Bailey.
Unity.....Edw. Hummer.
Van Horne.....Spencer Smith.
Van Wert.....J. I. Walker.
Winterset.....H. A. Kinsman.
Wall Lake.....T. E. Wilcox.
West Union.....H. B. Blackman.
Wilton.....Thos. Boot.
Wiota.....I. S. Coomes.

U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XI. APRIL, 1900. No. 4.

NOTE AND COMMENT.

On Monday, April 16, about 3 P. M., a small sized tornado ted the outskirts of the town of Hamburg, Fremont county, sing considerable damage to three houses and other prop- y within a small area, but fortunately resulting in no serious ury to persons. A local paper, from which a clipping has n received, states that it was partly cloudy and showery ring the early part of the day. The air at noon was close l oppressive, and about 3 o'clock there was a heavy down- ur of rain and a dash of hail, but that was all the disturb- ce noted in the business districts of the town. Observers y they saw a funnel-shaped cloud east of town, which was used, they thought, by the collision of two clouds, one from rtheast to northwest and the other from southwest to north- st. The direction of the storm after the funnel was observed as toward northeast. It gradually grew lighter in color and as violent as it moved from the town. As it passed through grove the pathway of the tornado was about 50 feet de. During its short career the storm damaged property the amount of probably $3,000. One child was hurt by a ying brick, but not seriously.

* * *

The consumption of sugar in the United States in 1899, cording to the *Sugar Trade Journal*, amounted to 2,094,610 ons, an increase of 91,708 tons as compared with the consump- on in the year 1898. The consumption of 1899 consisted of 160,- 00 tons domestic cane sugar, 79,368 tons domestic beet sugar, ,000 tons maple, etc., which gives a total of 249,968 tons of omestic production and 1,560,764 tons of foreign cane sugar, 72,943 of foreign raw beet sugar, and 5,935 tons of foreign efined.

* * *

Weeds are useful plants, undoubtedly, but out of place growing in cultivated fields. The best use to make of them is o plow them under to add humus to the soil.

* * *

C. A. Reynolds, voluntary observer at Harlan, writes a brief account of a notable series of electric storms occurring in that section on the 24th, 25th, 26th, and 27th. High winds and hail accompanied the storm on the 25th from 6:30 to 7 P. M., and the barn of H. A. Escher was struck by lightning, killing a horse and considerably damaging the building. On the 26th there were two distinct storms, one from 7 to 9 A. M., from the south, and the other from 3 to 5 P. M. During the latter storm, Mr. John Inlow, while digging post holes in the field, was struck by lightning and severely injured. During the storm on the 27th, 3:30 to 4:30 P. M., a singular fatality occurred. Messrs L. P. Danforth and L. N. Rogers were riding homeward in a carriage, sitting side by side, when a discharge of lightning instantly killed Mr. Danforth and one of the horses of the team they were driving. Mr. Rogers suffered only a slight shock.

J. S. Trigg in *Rockford Register:* In 1872 a native in a breech clout told the American consul at Bahia in Brazil that up in the wild country where he lived there grew an orange tree which bore fruit without seeds. The consul procured six shoots from this tree which were sent to the Agricultural Department at Washington; two of these died and no care was taken of the others. A woman—Mrs. Tibbetts, of Riverside, Cal.—asked the department for specimens of semi-tropical fruits and was given the four little trees. After they were planted in California a cow ate up one of them and another died. Two lived. When these two trees began to bear, orange growers in that state went wild. The buds from these trees sold for $1 each. From this small and uncertain beginning has grown the navel orange of to-day with a product in 1899 of over 4,000,000 boxes, for which the consumers have paid $12,000,000. These facts make up a romance in fruit culture never before equaled.

* * *

The "celestial globe" is described to be one of the greatest novelties of the Paris exhibition. It is an immense sphere, 150 feet in diameter, resting upon four solid masses of masonry and piling. On its surface are the signs of the zodiac, the objects whence they take their names, the principal constellations and other illustrations of the heavenly chart. At night the elaborate design is brought out vividly by electrical devices. Within the great globe is a smaller one, thirty feet in diameter, representing the earth and automatically exemplifying its diurnal rotation. An ingenious mechanical instrument gives the illusion of the moon in her nightly promenade. The machinery presents a complete sidereal picture and story, with at certain moments the phenomena of eclipses. Electric elevators carry passengers up through the interior. They can alight upon the earth and contemplate a cosmic spectacle of extraordinary charm, and not without scientific accuracy. The idea of the celestial globe was obviously taken from the famous astronomical clock of Strasbourg.

* * *

The rainless region of Peru is in five degrees south latitude, near the city of Payta and on the coast. It did rain for twenty-four hours in February, 1899, says the *Engineering News*, but this was the first rainfall in eight years, and the average duration between showers is seven years. Fogs are quite frequent, and the flora is poor, seven out of nine plants found being annuals. The seeds of the latter sometimes remain in the ground for seven years before germinating. The Peruvian cotton grows, as with its long roots it can go without water for seven years. It furnishes abundant and profitable crops and supports the people.—*Ex.*

* * *

An interesting experiment was carried on during the year just past by Sir W. Thiselton Dyer, who tried to ascertain the effect of exposing seeds to a temperature of —415° F. or the temperature of liquid hydrogen. The seeds selected were

mustard, peas, vegetable marrow, musk (for its extremely small size), wheat, barley, and the samples used in the experiments were of the best quality, selected by expert seedmen. The seeds were then sent to Prof. Dewar, who in the first instance sealed them in glass tubes, cooled them first in liquid air, and then transferred them to the hydrogen, where they remained for more than an hour. The seeds were then planted and germinated as usual. In another experiment seeds were immersed in liquid hydrogen for six hours, being actually soaked in the liquid, and when planted germinated without showing the slightest effect of the treatment to which they had been subjected.—*New York Evening Post*

* * *

This office has been placed under obligations to Charles B. Murray, editor of the Cincinnati *Price Current*, by the receipt of his statistical annual for 1900. It is a compendium of valuable information, adapted to the wants of students of statistics as well as producers and consumers.

* * *

The *Australasian Pastoralists' Review* of March 15th says: The arrival of the Ides of March without any general rains makes matters pastoral look very black almost throughout Australia, excepting Victoria and costal New South Wales. Every week's further delay now means serious loss. Western Queensland is, so far, the worst sufferer, but Western New South Wales is bad enough, and South Australia is on the verge of another drought.

* * *

There are 400,000,000 people in the Chinese empire, 40,000,000 in Japan and 300,000,000 in India. This is the swarming Asiatic hive which faces the Pacific coast of the United States, with an open highway between. Then there are the Russian Asiatic territory at the north and the rapidly developing Australasian states at the south. Our position on the hither side of the Pacific and our established foothold in the Philippines, Hawaii and the South Seas have opened up to us wonderful political, industrial and commercial possibilities. It is not beyond the range of probability that the end of the coming century will find the American continent the controlling centre of the trade of the world, doing as large a business with the populations of Asia as we now do with the populations of Europe.—*Philadelphia Record.*

* * *

Are we utterly dependent upon coal, so that the wheels of industry will stop and the forests be consumed for fuel when coal gives out? Of course not. It is an idle fear. Already we have the beginnings of a new method of utilizing natural energy which will prove enormously more effective than coal ever has been, and will be practically inexhaustible, to whatever extent industry may expand. Electrical energy, developed by water power, will run the world's industries, furnish its light and heat, and be the universal substitute for all forms of combustion methods. Water power is practically unlimited, and it will be utilized more and more in proportion as the need for it arises and as its use becomes, at different places and at successive periods, cheaper than coal. The substitution will proceed gradually until, when the coal supply finally is exhausted, nobody will have anything more than a curious or academic interest in the matter, and probably not a wrinkle will be produced in the steady onward flow of the world's industry. As the use of water power to develop electrical energy increases to the point of formidable competition with coal, electrical students and inventors will doubtless bring out improvements making it possible to store the power or conduct it long distances at small cost, until our factories, railroads and ships can be operated by it, our houses lighted and warmed and food prepared, all at even less expense than is possible to-day with coal.—*Ex.*

* * *

The air of furnace heated rooms has been shown by R. De C. Ward to be drier than that of many desert regions. The mean relative humidity of the room tested was 30 per cent for three weeks in November, and the mean relative humidity in the open air for the same time was 71 per cent. The lowest open air annual mean known in the United States is 42.9 per cent for Yuma, Ariz , that for Sante Fe, N. M., being 44.8 per cent. A mean of 23 per cent was found for five summer months in Death Valley, Cal.—*Ex.*

AN AGRICULTURE EMPIRE.

SECRETARY WILSON'S VIEWS CONCERNING THE PRODUCTS AND RESOURCES OF THE LOUISIANA PURCHASE STATES.

[Washington Special.]

"The surplus products of the states composing the Louisiana purchase furnish the food supply for the United States and for the great nations of Europe. An exposition of the products and resources of this wonderful region—the most wonderful in the world from an agricultural standpoint—would undoubtedly afford an interesting object lesson."

This was the comment of Secretary of Agriculture Wilson upon the project to hold a world's fair in St. Louis in 1903 to commemorate the centennial anniversity of the Louisiana purchase. Secretary Wilson comes from Iowa, one of the most thickly settled and productive states carved out of that grand domain acquired from Napoleon by Thomas Jefferson. The secretary is an enthusiast upon the subject of the marvelous resources of this remarkably fertile territory. Through the position which he occupies he has become more fully acquainted with the great agricultural capacity of this section of the United States than probably any other man in the country and he is ever ready to discourse upon the development and the promise of the states included in what he is pleased to term "the great food supply center of the world."

"The future great Americans—the men who are to be the mainstay of the United States—will come from the great states of the Louisiana purchase and those states which adjoin upon the east side of the Mississippi river, forming the Mississippi valley," coutinued the secretary. "That these men shall meet the full measure of what they ought to be it is necessary that they be men of education. It is just as essential for his success that the farmer should be educated as it is for the lawyer. Whenever the agriculturists of the United States are educated up to the same standard of lawyers and men of other professions they will command an equal respect. Much is now being done for the education of the agriculturists of the country through the agricultural colleges, but undoubtedly a great exposition such as is proposed to be held in St. Louis would be helpful to their education. The people of the Mississippi valley are, in my judgment, the most cosmopolitan people in the world, and the bringing of them together would be both interesting and delightful. There is no clannishness among the people of the great states of the Mississippi valley. Perhaps if you were to look for clannishness in other sections of the country you might find it; but it can't be found in the great west.

"The Louisiana purchase states, through the opening up of new markets for their surplus products in South America, Europe and in the countries of the orient, are now enjoying an era of unexampled prosperity, and their prospects are brilliant. The opening up of new markets for the surplus products of the

grain-producing states of the west is certain to benefit ntire country. As the surplus products of the west find outlets in foreign markets agriculture in the eastern s will experience a revival owing to the increase in prices, h will be the logical result of an increased demand.

During the war with Spain all the horses and mules and ne beef used by the army of the United States came from Louisiana purchase states, and this section is now furnish- Great Britain with most of the horses and mules which she ing in her South African campaign, in addition to supply- her people at home with their food supplies These two s have undoubtedly done much to exploit the Louisiana chase states throughout the world."

THE MOON AND THE WEATHER.

BELIEF THAT OUR SATELLITE INFLUENCES WEATHER CONDITIONS IS A FALSE ONE.

A belief that the moon has a potent influence on weather nges is well nigh universal. The moon's appearance goes ough such marked changes each month that it would be y natural to attribute weather changes to these. In this y undoubtedly such sayings as these have arisen: "The ather won't change till the moon changes;" "If the moon s so water cannot run out, we shall have a drought;" "A t moon is one upon which a huntsman can hang his horn," . Diligent inquiry at one time as to the popular belief garding this question brought out the view, more persistent an any other, that more rain will occur at the new than at e full moon. Singularly enough, in Connecticut, on Long land sound, there does seem to be such a law, but it does hold in the interior of the country, and a test on the acific coast showed, if anything, exactly the opposite. At ondon, where observations have been made for more than a ntury, a careful computation for the whole period has shown o effect. If we reflect that the moon is dead and does not ave any air even upon it; that it always shows the same ace to the earth; that its changes are simply due to changes n its position as respects the earth and sun, and that its ppearances are all borrowed, we see how absurd the notion s that the moon does influence our weather. There is, however, another argument that appears quite valid at first sight. f the moon can raise a tide of sixty feet in the ocean, why nay it not raise a tremendous tide in the extremely tenuous air, 800 times lighter than water, or a tide of about 48,000 feet, and, if so, it seems easy to see that such a commotion would affect our weather enormously.

The tide of sixty feet (the highest in the world) is experienced only in the bay of Fundy, and is due to the configuration of the Atlantic coast. In the open Pacific the tide is only a little over a foot. Most careful observations of a lunar atmospheric tide have been made at St. Helena, in mid-ocean, and have shown a tide of a little more than .001 of an inch. Since ordinary weather changes affect the tide a thousand times as much, we see how insignificant the moon's total effect must be.

There is a common saying, "the full moon has power to drive away clouds," and some computations seem to bear out this idea. If any one will look to the east as the rising full moon shines through the clouds, he will often see the clouds disappear. There is a natural explanation for this, however, and in no wise dependent upon the moon. A long series of observations has shown a diurnal range of cloudiness, with a minimum point, or time of least clouds, from 6 to 9 P. M., hence we see that, as the full moon rises and advances in the sky during this period, there will often appear a diminution of clouds. Lord Rosse turned his big reflecting teleseope (so big that a tall man walking erect in it could carry a spread umbrella) toward the moon, and found that, if anything, the earth received just a little chilling from the full moon. More recently the bolometer, an instrument which can measure less than one-millionth of a degree of temperature change, has shown that the earth receives a tiny bit of heat from the full moon. The evidence is cumulative and overwhelming that no weather changes can be ascribed to the moon."—*Prof. H. A. Hazen, in Popular Science.*

UNNECESSARY ALARM DURING THUNDERSTORMS.

[Extracts from U. S. Weather Bureau Bulletin No. 197, 1899.]

Just in advance of thunderstorms, weather because of the varying electrical potential of the air, or of the changing condition of temperature, humidity, and pressure, and failure of the nervous organization to respond quickly, or to whatever cause it may be due, it cannot be denied that there is much suffering from depression, etc., at these times. It is, perhaps, possible that these sufferings may be alleviated. Apart from this, many people suffer greatly from alarm during the prevalence of thunderstorms, somewhat unnecessarily, we think. Grant even that the lightning is going to strike close in your vicinity. There are many flashes that are of less intensity than we imagine, discharges that the human body could withstand without permanent serious effects. Voltaire's caustic witticism "that there are some great lords which it does not do to approach too closely, and lightning is one of these," needs a little revision in these days of high potential oscillatory currents. Indeed, the other saying, "Heaven has more thunders to alarm than thunderbolts to punish," has just so much more point to it, as it is nearer the truth. One who lives to see the lightning flash need not concern himself much about the possibility of personal injury from that flash.

Finally, if you should be in the vicinity of a person who has just been struck by lightning, no matter if the person struck appears to be dead, go to work at once and try to restore consciousness. There are many cases on record proving the wisdom of this course; and there is reason for believing the lightning often brings about suspended animation rather than somatic death. Try to stimulate the respiration and circulation. Do not cease in the effort to restore animation in less than one hour's time. For an excellent illustration of a case of severe lightning shock and recovery, due, it would seem, to prompt action by the medical gentlemen present, all who are interested may consult the *Medical News* August 11, 1888. A number of cases corroborative of this view are on record in various medical journals.

No matter which method for respiration you use, it is important to maintain the warmth of the body, by the application of hot flannels, bottles of hot water, hot bricks, warm clothing taken from bystanders, etc.

Firmly and energetically rub the limbs upward so as to force the blood to the heart and brain. If an assistant is present let him attend to this. Remember, above all things that nothing must interrupt your efforts to restore breathing.

When swallowing is established a teaspoonful of warm water, wine, diluted whisky or brandy, or warm coffee should be given. Sleep should be encouraged. In brief:

First.—Make the subject breathe by artificially imitating the respiratory movements of the chest.

Second.—Keep body warm.

Third.—Send for a physician.

BEES THAT MAKE GLUCOSE HONEY.

[Mail and Express.]

"People buy comb honey," said a man from the country, "believing that the fact that it is sealed by the honest little bee precludes the possibility of fraud. The fact is that the bees of many professional 'honey' raisers do nothing the live-long summer but pack glucose into their hives from an open barrel that is left standing close by. The bee will not search fragrant flowers the live-long day for a trifling amount of honey when he can get glucose. The honey men see that there is plenty of glucose handy, and instead of one pound of pure honey, they aid the bees in putting ten pounds of glucose on the market."

"Human ingenuity has not devised a way for making and sealing the honeycomb, or the bee would be dispensed with altogether. In handling the glucose, the bees give it a honeyish flavor, and if you complain to the bee man that it is not as sweet and sticky as it should be he will tell you that it is the early crop and that the heavy rains make it thin.

"I know a man who keeps fifty hives of bees on the roof of his store in the city, and by hustling up plenty of glucose he gets enough 'honey' out of the buzzing slaves to do a wholesale business in honey. Why, his bees never saw a flower, and would shy at a honeysuckle if they happened to come near one. He will not even let the poor things have a recess to get a drink of water, but keeps a pan of fresh water near the hives for them to drink."

CLIMATE AND CROP CONDITIONS IN APRIL.

April was an unusually favorable month for farming operations, and for the healthful germination and growth of cereals, grasses and fruits. The first decade brought ideal April weather, with abundant sunshine and soil conditions favorable for seeding, in which line of work very considerable progress was made. The second decade brought warm showers and an ample supply of moisture to quicken the germination of early-sown grain, and give a vigorous start to the grass crop in meadows and pastures. The temperature of the last decade was above the normal, and nearly every working day was well improved in plowing and preparations for planting a large acreage of corn. In numerous localities in the central and southern sections corn planters were started as early as the 27th and 28th of the month. At the close of the month there had been a very satisfactory growth of small grain, and the grass in pastures is sufficiently advanced to afford ample forage for stock. In the central and southern sections all the earlier varieties of fruit trees were in full bloom on the 30th, and in the northern section the full blooming period was close at hand. In respect to general farming operations, the growth of cereals and grasses, foliage and blossoms, the season was fully up to the average of recent years.

CLIMATOLOGY OF THE MONTH.

Barometer.—The mean pressure of the atmosphere for April was 30.01 inches; highest observed, 30.57 inches, at Davenport, Dubuque and Keokuk, on the 5th; lowest observed, 29.48 inches, at Dubuque, on the 17th; range for the state, 1.09 inches.

Temperature.—The climatic conditions in April were very nearly normal for the state at large. The mean temperature as shown by records of 123 stations, was 52.2°, which is about 2.7° above the normal. The mean of the northern section was 50.7°; central section, 52.2°; southern section, 53.8°. The highest monthly mean was 55.4°, as shown by the records at Ottumwa. The lowest mean for the month was 49°, at Spencer. The highest temperature recorded in the state was 89°, at Hampton and Red Oak, on 27th and 28th; lowest temperature was 19°, at Mt. Pleasant, on the 1st. The average monthly maximum was 81.6°; average monthly minimum, 24.7°. The greatest monthly range was 51°, at Northwood; average of monthly ranges, 40°.

Precipitation.—Average for the state, as shown by records of 140 stations, 2.67 inches. Average for the northern section, 2.39 inches; central section, 3.02 inches; southern section, 2.61 inches. The largest amount reported at any station was 6.62 inches, at Thurman; lowest amount, .43 of an inch, at Batavia. The greatest daily amount was 2.82 inches, at Delaware, on the 17th. The average number of days on which .01 or more of precipitation was reported was 6.

Wind and Weather.—Prevailing direction of wind, southeast; highest velocity reported, 45 miles per hour, at Sioux City, on the 24th. There were 12 clear days, 9 partly cloudy, and 9 cloudy.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.02	30.57	5	29.54	17
Des Moines	30.02	30.56	5	29.57	17
Clarinda	30.02	30.56	5	29.59	17
Cresco	.....	30.56	4	29.60	17
Dubuque	30 04	30.57	5	29.48	17
Omaha, Neb	29.96	30.45	5	29.60	17
Keokuk	30.01	30.57	5	29.52	17
Sioux City	30.03	30.47	4	29.72	8
Means	30.01	30.57	5	29.48	17

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,985	33	NE	8
Des Moines	6,666	31	E	9
Dubuque	5,285	34	NW	29
Keokuk	5,817	30	W	18
La Crosse, Wis	4,974	24	NW	29
Omaha, Neb	6,625	38	NE	10
Sioux City	10,369	45	SE	24

ERRATA IN FEBRUARY REVIEW.

CHARLES CITY—Maximum temperature recorded 36° on the 7th, on pages 8 and 10, should have been 37° on the 11th.

CUMBERLAND—Total precipitation of .35 inch, recorded on pages 9 and 12, should have been .73 inch.

KNOXVILLE—Total precipitation of 1.11 inches, recorded on page 9, should have been 1.51 inches.

WOODBURN—Total precipitation of 2.01 inches, recorded on pages 9 and 13, should have been 2.33 inches.

ERRATA IN MARCH REVIEW.

GUTHRIE CENTER—Total precipitation of 1.88 inches, recorded on pages 8 and 12, should have been 1.78 inches.

BRITT—Total precipitation of 1.66 inches, recorded on page 8, should have been 1.69 inches.

RUTHVEN—Maximum temperature recorded 60° on the 10th, on pages 8 and 11, should have been 63° on the 12th.

THURMAN—Total precipitation recorded .90 inch, on pages 9 and 13, should have been .84 inch.

ILTON JUNCTION—Total precipitation recorded 4.57 inches, ages 8 and 13, should have been 4.17 inches.

BELATED REPORTS FOR MARCH.

EDAR FALLS—Mean temperature, 29°; highest, 64°, on the ; lowest, -7°, on the 16th; total precipitation, 1.50 inches; l snowfall, trace; prevailing wind direction, south; num- of clear days, 14; partly cloudy, 1; cloudy, 16; rainy, 3.

AIRFIELD—Mean temperature, 32.7°; highest, 67°, on the lowest, zero, on the 16th and 17th; greatest daily range, total precipitation, 1.81 inches; greatest in 24 hours, .83 , on the 5th; number of clear days, 16; partly cloudy, 11; dy, 4; rainy, 7.

NORTHWOOD—Mean temperature, 27.2°; highest, 62°, on the ; lowest, -10°, on the 16th; greatest daily range, 39°; total cipitation, 1.43 inches; greatest in 24 hours, .51 inch, on the ; prevailing wind direction, northwest; number of clear 's, 22; partly cloudy, 1; cloudy, 8; rainy, 5.

OBSERVERS' NOTES.

BANCROFT—*E. G. Bailey.* On the 4th wheat sowing com- nced; seeding small grain completed, and much corn ground wed before close of month.

FONDA—*N. P Barron.* Some corn planted the last four days of month.

FOREST CITY—*J. A. Peters.* Season about ten days earlier than last year; plum trees in blossom, and cattle on pasture at close of month.

RIDGEWAY—*Arthur Betts.* Seventy per cent of sunshine during month; on fourteen days, 100 per cent; warmest of last three Aprils; mirages observed on 30th.

STORM LAKE—*Prof. M. L. Fuller.* Season a week or more in advance of last year; an excellent month for farming.

CLINTON—*Dr. Luke Roberts.* Mean temperature, normal; plum trees in bloom on 29th; rainfall, .67 inch below normal.

GRUNDY CENTER—*Geo. F. Ellis.* Some corn planted the last week in April; cherry trees blooming.

BONAPARTE—*Hon. B. R. Vale.* The month rates better than the average; much farm work done; soil in excellent tilth.

OVID—*H. C. Miller.* Brown thrush and whip-poor-wills appeared on 18th; wild plum trees blooming the 26th; peach bloom on 27th; pear and apple trees in bloom on the 30th.

CLIMATOLOGICAL DATA FOR APRIL, 1900.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.						PRECIPITATION, INCHES.				Number rainy days	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Algona*	Kossuth	1,500	7	51.8	+3.8	78	26, 27	28	11, 12	.....	2.12	-1.82	1.30	2.0	6	11	11	8	SE
Alta	Buena Vista	1,519	8	51.4	+4.0	82	28	23	12	41	2.19	-1.85	.81	.5	11	11	11	8	SE
Alta (near)	Buena Vista	.....	...	...	.....	....	.....	.....	.....	.....	1 80	.....	.50	1.0	10	...	...	...	.....
Bancroft	Kossuth	.....	...	50.5	....	80	27	24	12	41	1.50	.....	.80	1.0	4	15	4	11	SE
Britt	Hancock	1,230	..	50.6	.....	84	27	25	4, 10	41	1 56	.....	.56	1 2	10	10	15	5	E
Charles City	Floyd	1,012	8	50 2	+3.3	83	29	25	10	39	2.78	- .60	1.57	2.0	8	12	14	4	NE
Clear Lake	Cerro Gordo	984	...	50.6		80	26, 27	25	4,10,12,13	37	2 25	.....	1.00		4	13	12	5	SE
Cresco	Howard	1,280	27	49 7	+5.3	80	27	25	11	39	2.14	- .45	1.25	2.5	4	13	6	11	SW
Decorah	Winneshiek	900	6	50 2	+1.0	82	27, 28	23	12	41	2 32	-1.00	1.40	3.0	5	..	...	...	.....
Dows	Wright	.....	....	51.9		82	27	26	4	40	1.56	.....	.60	.2	6	13	11	6	E
Elkader	Clayton	.....	18	50.8	+2.8	83	28	23	4	45	3.28	+ .32	1.88	3.0	3	13	13	4	SE
Estherville	Emmet	...	...	50 2	.....	80	26	24	4,12,13	43	1.71	.....	.69	4 0	9	9	14	7	SE
Fonda	Pocahontas	1,237	..	52.0	.....	81	27	24	10	38	4.73	.....	1.43	1.1	10	14	7	9	NE
Forest City	Winnebago	1,220	.	50 8	....	82	27	26	4,10,11,12	39	1.55	.....	.93	.5	7	14	7	9	NE
Grand Meadow *	Clayton	...	8	49.9	+2.7	80	29	26	11	....	2.74	- .84	1 53	2.0	4	10	11	9	NE
Greene	Butler	943	....	52 0	.....	85	27, 28	25	4, 10	40	2.19	.....	1.20	.....	10	16	5	9	E
Hampton	Franklin	1,240	9	52 3	+5.5	89	27	26	4	39	2.21	-1.92	1.04	1.0	6	11	13	6	NE
Hawkeye	Fayette	....	6	...	....	....	.....	.....	.....	.....	4.11	+1.14	....	4.5	10	....	..	...	.....
Hoprig	Emmet	....	.	....	....	....	.....	.....	.....	.....	1.24	.....	1.00	1.0	3	16	3	11	E
Humboldt	Humboldt	1,082	6	52.6	....	81	27	25	12	38	2 75	-1.28	1.42	....	8	18	3	9	SE
Lansing	Allamakee	....	....	51.8	.....	83	28	25	4, 5	44	2.84	.....	1.76	3.4	3	10	12	8	.....
Larchwood	Lyon	.....	...	51 6	.....	78	19	24	11	41	2.80	.....	1.00	.....	6	17	2	11	SE
Larrabee	Cherokee		8	49.6	+1.1	83	27	21	1	. .	2.67	-1.16	1.30	.1	6	13	10	7	SE
Le Mars	Plymouth	1,221	....	51.3	.....	76	25, 27	23	11	44	4.16	.....	1.30	T	10	10	11	9	S
Mason City	Cerro Gordo	1,130	5	49.6	-0 6	82	27	23	4, 5	46		.....	....	T	....	...	...	...	.....
New Hampton (a)	Chickasaw	1,166	....	50.7	.....	79	27, 28	24	10	40	2.35	. .....	1.50	2 0	4	13	9	8	NW
Northwood	Worth	1,210	....	52.9		85	19	25	10	51	2 15	.....	.93	T	10	14	6	10	E, SE
Osage ‡	Mitchell	1,178	8	49.5	+4.7	80	27	23	10	40	1 71	-1.19	.70	1 5	9	12	5	13	NW
Plover	Pocahontas	.....	..	51 8	....	85	27	20	11	44	1.60	.....	.85	.8	8	14	3	13	SE
Primghar	O'Brien	.....	....	53.4	.....	84	26	20	10, 11	35	2.35	.....	1.00	1.0	7	14	0	16	SE
Ridgeway	Winneshiek	.....	....	51.2	....	81	27, 28	25	10, 11	41	2.74	.....	1.30	3 6	10	12	12	6	NE, SE
Ruthven	Palo Alto	.....	....	49.2	.....	78	27	24	12	36	1 41	.....	.60	....	4	10	6	14	NE
Sheldon	O'Brien	1,406	...	50 4	.....	76	28	24	11	36	2.05	.....	.70	1.1	13	12	7	11	E, SE
Sibley	Osceola	1,506	6	50.6	+2.4	80	28	23	12	41	2.19	-1.29	.91	.....	10	11	12	7	SE
Sioux Center	Sioux	...	...	51 0	.. .	75	19	25	11	34	3.95	.....	1.93	1.0	9	15	6	9	SE
Spencer	Clay	.....	....	49 0	... ..	78	26, 27	20	12, 14	36	1.81	.....	.98	1.0	6	10	12	8	W
Storm Lake	Buena Vista	.....	10	51.5	.....	78	27	24	11, 12	31	2.33	- .16	.86	.7	11	14	7	9	E
Washta	Cherokee	...	...	.....		.....	.....	.....	.....	....	2.52	.....	1.20	....	9	13	9	8	SE
Waverly	Bremer	942	..	51 6	...	81	27	27	5	38	2.40	.....	1.91	.....	9	....	..	...	.....
West Bend*	Palo Alto	.....	6	50.2	+4.0	81	28	27	12	...	1.67	-1.75	.90	1.0	8	10	9	11	E, NW
Average	.....	.....	....	50.7	+3.1	81.0	... ..	24.1	.....	40.0	2.59	-0.92	.....	1 5	7	13	9	8	SE

CENTRAL SECTION.

Amana	Iowa	.....	23	52.2	+3.8	80	29	27	4	36	3.57	+ .63	1.70	T	7	13	6	11	SE
Ames	Story	936	19	.....	... .	82	30	27	12	....	2.61	.....	.82	.....	8	14	8	8	.....
Audubon	Audubon	....	6	52.2	+2.4	80	27	23	12	35	2.95	- .99	1.18	.....	6	2	12	16	SE
Baxter	Jasper	.....	...	53.2	....	82	29	26	11	43	4.06	.....	1.63	...	5	9	11	10	NE, SE
Belle Plaine	Benton	840	9	52.0	+2.4	84	30	26	4	44	4.10	+1.56	1.75	2.0	7	7	20	3	SE
Buckingham	Iowa	.....	.....	.....	.....	..	.....	.....	.....	.....	3.32	.....	2.34	.....	8	9	14	7	.....
Carroll	Carroll	....	9	52.5	+3.7	82	27, 29	20	5	49	4.50	+ .63	1.35	....	10	11	5	14	.....
Cedar Falls	Black Hawk	844	8	51.4	+1.8	81	29	24	1	35	2.95	- .54	1.25	T	4	14	6	10	SE
Cedar Rapids	Linn	744	17	54.2	+10.4	84	27,28,29	28	11, 12	38	3.62	-1.69	1.78	.....	7	11	10	9	SE
Clinton	Clinton	609	8	50.8	-0.1	86	29	24	5	45	2.24	- .95	1 80	2.0	7	11	11	8	NE
Coon Rapids	Carroll	.....	..	52.0	.....	77	27	23	12	38	3.43	.....	1.10	T	10	13	7	10	SE
Davenport	Scott	615	27	52.6	+3.0	81	29	28	12	34	2.10	- .72	1.03	T	10	10	7	13	NE
Delaware	Delaware	1,018	8	49 9	+3.2	80	29	24	4	36	4.42	+1.01	2.82	2 0	7	9	15	6	NE, S
Denison	Crawford	1,192	6	54.0	+4 7	79	26	23	11	46	2.83	-2.34	.55	T	11	15	5	10	S
Des Moines	Polk	867	21	54.4	+3.0	80	27	28	12	35	3.82	+ .78	2.18	.1	10	9	15	6	SE
De Soto	Dallas	866	..	54.0		84	27	25	5	41	2 88	.....	1.45	.3	10	12	11	7	SE
Dubuque	Dubuque	655	26	51 6	+3.0	80	29	27	12	35	2.39	- .69	1.13	3.5	6	10	15	5	NE
Fort Dodge	Webster	.....	....	51.8	.....	81	27	22	5	40	4.04	.....	2.00	T	6	15	6	9	SW
Galva	Ida	.....	....	52.7	.....	83	27	23	11	38	2.20	.....	1 33	.....	9	12	12	6	SE
Gilman	Marshall	1,035	..	....		..	.....	....	.....	.....	1.84	.....	1.40	T	5	14	10	6	E
Gladbrook	Iowa	...	..	.....	.....	...	.....	....	.....	....	1.62	.....	1.15	.8	4	...	....	....	.....
Grinnell	Poweshiek	1,011	9	52 8	+2.1	77	27,29.30	28	12	36	2.88	- .85	2.40	.....	5	10	8	12	E, SE
Grinnell (near)	Poweshiek	.....	....	52.6		80	27, 28	27	4, 12	38	2.53	.....	2.05	1.0	9	12	6	12	SE
Grundy Center	Grundy	966	8	51.1	+2.3	82	26	25	5,10,12	42	3.63	- .37	2.65	2 0	5	14	7	9	E
Guthrie Center	Guthrie	1,269	....	52.6	.....	79	28	21	5, 12	39	1 92	.....	.92	....	3	11	10	9	N, SE
Harlan	Shelby	...	..	52.4	.....	81	27	23	11	40	4 67	....	1.35	T	12	5	11	14	E, SE
Independence	Buchanan	921	37	50.0	+2 8	78	27,28,29	24	10, 21	41	3.37	+ .93	1.70	4.0	7	17	8	5	SE
Iowa City	Johnson	644	9	53.2	+2.4	83	29	27	5	43	3.31	+ .13	1.50	1.5	7	9	14	7	N
Iowa Falls	Hardin	.....	6	51.2	+4.2	83	27	26	4	35	1 61	-2.61	.68	.....	6	14	8	8	NE
Le Claire	Scott	.....	..	.....	.....	....	.....	.....	.. ...	.....	3.24	.....	2.05	....	7	...	....	.	.....
Logan	Harrison	928	34	51.2	-0.7	78	27	23	11	46	3.50	+ .52	.70	.....	12	10	10	10	NE
Maquoketa	Jackson	.....	6	51.4	+3.1	80	28	20	1	43	1.90	-1.32	.74	3.5	6	15	6	9	SW
Marshalltown	Marshall	898	7	53.6	+4.5	82	27, 29	27	4, 12	40	2.83	- .80	1.22	.....	8	15	8	7	SE
Monticello	Jones	800	45	53.0	+4.7	82	30	19	2	43	3.23	+ .55	1.80	2 5	3	13	6	11	NE
Mt. Vernon*	Linn	858	..	52 8	.....	83	29	28	11	.....	3.25	.....	1.55	.....	4	...	....	....	.....
Mt. Vernon (Hubbard)	Linn	.....	....	52.9		85	28	24	10	38	2 90	.....	1.80	2.8	9	11	5	14	NE
Newton	Jasper	958	12	52 8	+4.2	81	27	23	8	38	2.79	- .71	.86	1.5	9	12	12	6	SE
Odebolt	Sac	.....	....	53.4	.....	82	27	24	11	43	2.35	.....	.90	.2	8	16	4	10	.....
Ogden	Boone	1,109	...	53.4	.....	80	27	26	13	39	3.49	.....	1.75	.....	8	19	1	10	SE
Olin (a)	Jones	..	..	50.6	.....	82	29	26	1, 5	41	3.27	.....	1.42	2.0	5	17	6	7	N, NE
Onawa	Monona	.....	...	54 0	.....	84	27	26	12, 13	42	3.22	.....	.73	....	13	16	6	8	NE
Rockwell City	Calhoun	1,219	....	52.2	.....	80	27	25	11	35	2.15	.....	1.25	0.5	4	21	1	8	.....
Sac City	Sac	900	20	52.4	+2.7	80	27	24	11	35	1.85	-1.52	.62	.....	11	15	7	8	SE
Scranton	Greene	.....	....	52.5	.....	78	27	26	11	36	4 58	.....	2.20	T	6	13	10	7	SE
Sioux City	Woodbury	1,122	10	52.9	+2.0	78	27	26	11	36	3.80	+ .69	1.26	.....	10	10	9	11	E
Toledo	Tama	.....	5	52 7	+1.8	83	29	26	1, 4, 5	41	2 96	- .46	1.42	.....	6	16	5	9	SE
Vinton *	Benton	800	9	51.8	+2.9	78	27,28,29	29	11	.....	.....	.....	.....	.....	....	21	0	9	SW, NW
Waterloo	Black Hawk	862	20	51.5	+1.2	80	27,28,29	25	10	40	2.79	+ 31	1.17	...	7	13	8	9	SE
West Branch	Cedar	.. .	....	52.4	.....	84	29	22	4	48	3.59	.....	1.26	3.0	6	14	6	10	SW
Whitten	Hardin	.....	....	50.6	.....	78	27	25	12	42	3.85	.....	2.10	T	3	14	12	4	NE, SE
Wilton Junction	Muscatine	.....	....	51.8	.....	83	29	26	5	39	2.23	.....	.95	T	4	18	5	7	E
Average	.....	.....	....	52.2	+3.0	81.1	.....	25.0	....	38.7	3.02	- .34	.....	1.2	5	13	8	9	SE

CLIMATOLOGICAL DATA FOR APRIL, 1900—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
ton	Union			54.2		83	27	23	12	44	3.39		1.66	T	5	6	10	14	SE
bia	Monroe	945		52.8		82*	29	21	5	41	3.04		1.46	1.0	7	9	9	12	SE
lantic	Cass		8	52.6	+3.6	82	27	24	11, 13	42	2.33	-1.20	1.00		6	5	13	12	E
tavia	Jefferson	640									.43		.11	1.0	8				
dford (b)	Taylor			53.6		84	26, 27	25	12, 13	46	2 68		1.35		5	9	15	6	SE
lknap	Davis	857		51.2		82	29	27	11, 12	42	2.65		.94	3.0	7	16	11	3	E
naparte	Van Buren		8	53.7	+1.7	84	29	27	12	42	2.16	-1.64	1 00	2.0	4				
ssey	Marion										2.79		1.60		4				
nterville	Appanoose	1,013	6	54.3	+0.9	81	29	25	12	40	1.30	-3 18	.81	1.0	5	13	11	6	SW
ariton	Lucas	1,080		53.7		79	29	24	12	38	2.95		1 93	T	10	13	11	6	SE
illicothe	Wapello	645									2 10		1.10		4				
arinda	Page	1,069	9	55.2	+3 2	84	27	26	12	45	2.48	- .76	.83	T	8	13	5	12	SE, S
rning	Adams	1,127	7	53.1	+2.0	81	27	22	10	40	1.79	-1.77	.52	T	6	11	6	13	SE
llege Springs	Page		8	54.4	+3.7	82	27	24	12, 13	43	3.75	- .31	1.60		9	14	9	7	SE
uncil Bluffs	Pottawattamie	989		54.5		81	26, 27	26	10	35	3.03		.63		7	17	2	11	S
mberland	Cass										1.91		1.29	T	4	13	4	13	E
anville	Des Moines	715									3.01		1.80	.1	4	15	4	11	
don	Wapello			54 8		86	29	25	5	42	2.61		1.24	1.8	8	14	3	13	E
merson	Mills										2.23		50		7				
irfield	Jefferson	767	13	54.0	+4 9	82	29	27	12	39	3.79	+ .74	1 74	2.0	9	11	14	5	
t. Madison	Lee	516	51								2.13	-1.09	.90	1 0	5	7	11	12	NE
lenwood	Mills	979	29	54.8	+6.0	80	27	25	11	37	2.87	+ .34	.80	T	8	2	20	8	SE
reenfield	Adair		8	54.1	+3.3	87	27	23	12	39	2.26	-1.34	1.69	T	6	18	3	9	
amburg	Fremont	912									4.58		1 12		6	10	7	13	SW
edrick	Keokuk			54.2		85	29	26	4	40	3 20		1.63		5	16	6	8	E
opeville	Clarke			54.0		80	27	23	12	37	2.50		1.06		6	8	13	9	SE
ndianola	Warren			54.8		81	27	27	4	39	1.98		1 33	0.1	11	7	12	11	SE
eokuk	Lee	618	28	51.6	+3.0	82	29	28	12	34	2.10	-1.15	1 08		9	14	8	8	E
eosauqua	Van Buren			54.0		84	29	26	5, 12	42	2.74		1.19	4.0	5				
acona	Warren										2.28		1.70		8	9	13	8	
enox	Taylor			53 8		80	27	24	12	38	2.14		1.12	T	7	11	11	8	SE
lelrose	Monroe	850									1.75		1.00		2	24	0	6	
looar	Lee			50.3		82	7	23	5	45	1.72		1.00		4	17	7	6	NE
lt. Ayr	Ringgold	1,236	6	54.2	+2.0	82	26, 27	24	12	38	1.92	-1.84	1.35	T	7	5	15	10	E
lt. Pleasant	Henry	725		51.8		85	29	19	1	49	1.20		.94	0.2	4	11	11	8	NE
lurray	Clarke	1,183									1.82		1.30		3	16	14	0	
maha (Neb.)	Douglas	1,113	25	56.0	+4.6	79	27	27	12	33	3 43	+ .30	.79		12	4	17	9	SE
sceola	Clarke	1,123		53.8		80	26, 27	23	12	42	2.64		1.94	T	7	9	6	15	SE
skaloosa	Mahaska	850	16	53.4	+3 2	81	29	26	4	42	2.79	+ .05	1 05		11	14	8	8	E
ttumwa	Wapello	630	5	55.4	+1.9	80	27	29	12	35	2 38	-1.50	1.00	0.5	6	13	6	11	NE
vid	Wayne		6	54.4	+1.8	81	27	22	12	42	3.15	- .49	1 49	T	11	13	15	2	SE
Pacific Junction	Mills	960		53.7		81	27	25	11	38	3 44		.93		11	9	12	9	E
Pella (c)	Marion										2.55		1.84		3				
Red Oak	Montgomery	1,033		56 6		89	28	28	12	40	2.46		1.17		8	12	5	13	S
Sigourney	Keokuk			54 4		88	29	25	4	43	3.83		1.78	1.0	7	18	11	1	NW
Stuart	Guthrie			50.4		84	27	25	12, 13	38	2.73		1.10	T	3				SE
Thurman	Fremont			53.6		79	27	26	11, 12	37	6.62		1.42		10	5	8	17	SE
Villisca	Montgomery	1,058	6	54.9	+2.9	87	27	24	12	43	2.72	-1.02	.76		11	10	11	9	S, SE
Wapello	Louisa	578		53.6		84	29	29	12	40	2.20		1.05	1.2	6	16	8	6	E, SE
Washington	Washington		9	52.4	+0 1	86	29	24	4	42	2.50	- .21	.99	3.0	8				SE
Winterset	Madison		8	54.4	+3.0	83	27	24	12	37	2.32	-2.11	.90		5	6	9	15	
Woodburn	Clarke										2.39		1.96	.1	10	11	8	11	
Average				53.8	+2.9	82.6		24.9		40.2	2.61	- .96		0.1	7	11	10	9	SE
Av. for the state				52.2	+3.0	81 6		24.7		40.0	2 67	- .74		0 9	6	12	9	9	SE

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR APRIL, 1900.

STATIONS.		DATE.																													Means.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Afton.....	Max....	59	53	62	57	70	76	77	79	62	47	47	41	61	66	67	77	62	62	76	74	72	73	63	74	75	81	83	80	77	70	
	Min	35	30	32	26	28	36	44	48	39	31	29	23	29	35	45	49	47	42	32	44	50	42	54	55	54	52	57	50	53	40	
Albia.....	Max....	59	59	62	54	66	75	78	76	60	41	41	45	58	64	70	70	65	64	72	73	64	72	67	73	74	80	79	78	82	73	
	Min	28	29	34	25	21	34	42	42	36	27	27	24	29	30	40	47	52	42	36	43	47	47	53	55	52	48	51	48	49	38	
Alta.....	Max....	51	54	57	54	66	74	74	73	46	45	37	45	60	58	50	53	45	60	73	76	75	73	69	67	68	78	81	82	68	71	
	Min	33	28	34	28	28	31	42	48	36	28	24	23	29	35	43	45	40	34	38	43	48	45	54	54	54	56	50	50	48	38	
Amana.....	Max....	54	55	58	52	63	73	75	65	52	46	41	36	54	64	67	63	60	62	70	71	63	70	70	71	71	74	77	78	80	71	
	Min	35	32	33	27	28	37	39	43	38	29	29	28	31	35	47	49	52	45	35	39	53	52	53	55	53	51	51	45	45	42	
Ames.....	Max....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	..	63	75	72	70	72	68	71	63	78	80	72	75	82	
	Min	37	32	35	28	28	36	42	46	38	30	20	27	32	32	47	49	46	42	39	41	49	47	55	55	53	51	51	49	52	41	
Atlantic...	Max....	59	60	61	58	68	73	71	78	55	47	43	43	64	63	65	70	54	63	71	75	75	74	62	70	70	78	82	75	75	71	
	Min	35	28	29	28	26	33	35	48	40	32	24	26	24	31	46	49	45	41	30	36	46	41	55	56	56	53	58	49	53	33	
Audubon...	Max....	52	55	54	55	66	73	73	75	53	48	42	43	59	51	68	65	57	60	69	73	71	78	64	70	69	76	80	77	74	68	
	Min	34	31	31	28	31	39	51	56	32	36	24	23	28	31	44	43	42	40	36	39	46	43	53	54	55	53	54	52	53	39	
Bancroft...	Max....	47	57	54	55	65	67	73	69	50	46	40	46	59	65	59	53	48	61	74	75	72	71	71	72	73	78	80	79	74	72	
	Min	32	30	34	28	29	30	35	34	34	28	28	24	28	30	40	40	42	36	33	40	42	48	45	52	50	48	50	48	50	37	
Baxter.....	Max....	57	60	62	57	68	72	78	77	49	50	38	42	61	63	66	65	57	62	74	73	69	72	67	70	69	78	80	78	82	73	
	Min	30	33	27	30	40	44	45	34	28	28	28	28	31	45	47	47	42	38	44	50	39	52	54	51	49	53	49	53	38	47	
Bedford...	Max....	60	65	63	60	72	70	77	77	64	58	58	42	62	52	62	72	60	60	70	..	..	75	65	74	65	84	84	80	82	76	
	Min	28	35	29	30	28	30	31	49	42	30	23	25	25	32	42	40	38	40	30	..	..	41	55	55	55	65	53	52	58	42	
Belknap....	Max....	61	59	64	57	67	76	80	78	56	55	34	28	57	69	68	69	64	77	73	65	72	73	63	75	71	81	80	80	82	71	
	Min	37	31	34	28	30	34	43	46	39	32	27	27	32	33	34	49	50	44	40	47	55	55	52	55	52	52	52	50	50	42	
B'l'e Plain'	Max....	55	53	58	50	63	73	75	65	48	45	35	38	50	60	66	63	58	60	70	74	63	76	70	70	72	73	78	78	82	84	
	Min	32	39	35	26	29	33	40	45	38	27	29	28	30	36	40	53	50	43	35	43	50	49	50	51	52	50	52	48	50	40	
Bonaparte.	Max....	62	59	62	53	66	77	81	76	50	45	35	40	60	68	65	63	64	71	74	68	57	70	62	70	72	76	78	78	84	72	
	Min	34	31	35	28	30	35	42	48	39	31	28	27	31	33	50	55	45	38	45	46	51	52	53	56	53	55	50	47	51	43	
Britt.....	Max....	45	51	53	52	62	72	76	68	52	46	34	46	56	68	60	54	48	60	72	74	72	74	73	73	73	78	84	78	74	76	
	Min	30	30	32	25	27	33	38	44	34	25	27	26	29	30	38	44	41	36	31	37	38	48	54	52	50	49	50	47	51	36	
Carroll.....	Max....	56	61	61	57	69	75	73	72	50	49	41	55	64	62	63	67	46	63	73	74	76	74	65	70	70	78	82	75	82	75	
	Min	32	28	29	26	20	43	42	47	37	30	22	24	27	35	45	46	44	36	37	42	42	44	54	51	54	49	53	47	49	37	
Cedar Fa'ls	Max....	45	43	53	47	53	74	75	70	62	50	48	33	51	55	67	66	69	56	61	73	73	66	70	71	70	73	75	79	81	77	
	Min	24	30	34	27	31	38	40	41	34	26	28	27	29	32	44	45	46	42	37	45	50	44	49	54	53	50	50	49	52	51	
Cedar Rap.	Max....	50	57	56	55	68	77	79	63	50	46	37	39	53	67	71	68	62	64	75	76	65	74	79	76	78	80	84	84	84	74	
	Min	31	36	34	29	30	39	41	46	37	29	28	28	32	35	47	48	51	44	39	42	54	52	54	54	53	52	52	51	50	42	
Centerville	Max....	55	63	63	56	70	76	78	78	58	47	45	39	62	62	68	69	60	65	73	69	62	70	62	76	70	80	79	77	81	70	
	Min	37	30	32	27	30	39	45	50	40	32	27	25	31	35	49	50	53	44	39	49	52	46	52	56	53	51	56	50	57	43	
Chariton...	Max....	63	60	62	56	68	76	76	78	59	47	42	40	61	61	68	68	62	64	71	70	61	71	64	71	70	78	78	77	79	71	
	Min	36	30	35	26	30	40	46	47	37	30	28	24	30	34	46	49	51	43	37	45	51	48	54	55	53	47	56	48	52	39	
Charles Cy	Max....	49	53	53	52	61	73	73	62	52	46	42	39	54	64	59	52	50	60	72	73	65	71	72	67	72	74	80	79	83	73	
	Min	31	30	27	26	27	35	36	42	35	25	29	27	30	31	39	44	46	42	33	37	44	50	46	53	52	50	52	45	47	40	
Clarinda...	Max....	62	66	67	62	72	78	77	80	62	50	46	43	67	62	65	71	60	64	76	74	77	76	63	73	75	82	84	75	78	74	
	Min	34	33	35	30	27	34	39	51	44	35	27	26	29	34	47	50	42	43	34	42	48	42	57	56	55	53	56	56	55	41	
Clear Lake	Max....	48	55	54	53	62	68	75	65	55	48	37	41	58	67	58	55	48	60	74	76	70	72	72	71	71	80	80	72	75	72	
	Min	32	29	30	25	32	38	38	44	34	25	28	25	25	33	39	44	42	36	38	40	44	50	42	51	45	51	45	50	52	38	
Clinton....	Max....	55	56	57	49	63	73	78	60	51	45	35	38	47	67	70	61	65	63	71	74	63	72	73	75	75	78	81	81	86	73	
	Min	26	30	27	26	24	30	33	43	31	26	28	25	30	25	43	46	53	43	34	35	50	45	45	51	41	57	46	42	46	41	
College Sps	Max....	60	62	65	57	63	75	76	76	60	46	54	46	66	63	64	68	59	62	76	73	74	73	65	69	72	78	82	73	77	70	
	Min	34	29	38	32	30	40	40	52	44	35	25	24	24	41	44	45	43	41	37	46	48	47	56	48	54	54	55	56	54	40	
Coon Rap..	Max....	53	54	58	54	65	70	71	70	61	48	42	45	58	61	63	64	58	58	69	70	71	72	69	63	67	76	77	71	71	68	
	Min	35	30	29	28	27	43	44	49	35	28	25	23	30	29	46	49	43	40	39	46	46	41	54	55	55	52	55	48	55	41	
Corning....	Max....	60	57	52	52	66	74	73	77	63	48	43	41	62	62	67	69	59	62	71	70	73	71	66	70	72	77	81	75	77	70	
	Min	35	29	33	29	26	39	41	50	42	22	28	24	27	36	46	50	43	43	37	45	45	41	52	55	54	53	56	52	53	40	
Co. Bluffs.	Max....	59	62	63	62	69	75	70	77	57	50	44	47	66	61	62	65	50	64	72	74	75	76	62	72	72	81	81	68	72	73	
	Min	32	33	32	32	36	41	43	42	36	26	27	29	33	45	48	49	43	43	42	48	50	53	57	56	56	57	56	56	43	46	
Cresco.....	Max....	48	51	50	51	60	72	74	58	50	44	33	37	50	66	58	49	48	60	71	73	68	70	71	68	73	73	80	79	77	72	
	Min	30	29	30	26	30	37	39	42	33	28	25	27	29	32	47	43	46	40	32	40	46	44	48	51	51	48	51	50	47	36	
Davenp'rt.	Max....	57	56	57	49	62	74	77	61	48	43	33	34	49	64	65	62	62	63	70	69	59	71	69	72	71	70	77	78	81	71	
	Min	37	33	36	30	32	43	43	47	37	29	29	28	33	34	49	64	65	62	62	63	70	69	59	71	69	72	71	70	77	78	
Decorah....	Max....	52	54	51	54	63	74	77	62	55	48	38	34	57	68	62	49	51	62	73	77	67	73	75	72	77	74	82	82	80	72	
	Min	30	27	28	24	27	37	37	43	33	25	27	23	27	29	40	42	41	41	32	36	44	45	47	50	47	50	54	44	42	37	
Delaware..	Max....	50	55	55	51	63	74	76	69	49	46	39	36	48	64	64	58	55	59	69	71	61	68	70	69	70	72	77	76	80	70	
	Min	28	28	29	24	27	36	38	45	33	25	25	26	30	31	40	42	49	40	34	39	49	48	46	51	46	46	45	45	47	40	
Denison....	Max....	64	72	60	65	78	77	77	75	58	46	42	47	62	69	62	64	56	61	72	74	75	74	67	70	68	79	78	73	70	70	
	Min	32	26	32	31	36	27	41	52	40	32	23	26	29	30	46	49	42	38	40	42	44	42	55	55	54	55	56	54	54	40	
Des Moines	Max....	57	58	60	53	68	75	74	72	49	47	38	42	61	61	65	67	60	64	72	78	68	71	68	70	68	79	80	79	76	72	
	Min	39	34	40	31	33	42	50	48	38	31	29	28	33	37	48	49	45	44	41	43	55	48	57	56	55	53	58	54	53	43	
De Soto....	Max....	56	52	51	54	66	75	75	73	50	48	36	41	52	65	65	72	58	62	72	75	72	73	65	73	71	80	84	82	76	76	
	Min	39	32	30	30	25	43	46	49	42	32	30	29	30	32	47	50	46	44	37	48	51	49	57	57	57	52	60	52	50	42	
Dows.....	Max....	47	53	56	52	65	76	75	65	53	49	40	43	57	66	61	57	54	62	73	73	70	71	72	70	70	77	82	80	75	72	
	Min	31	28	33	26	27	36	41	45	34	28	28	25	27	31	42	45	44	38	35	38	44	46	49	52	50	48	62	49	50	36	
Dubuque..	Max....	52	56	53	52	63	74	77	58	49	44	33	37	48	61	64	56	59	62	71	72	60	70	70	72	71	74	78	78	80	71	
	Min	31	34	31	30	29	40	42	43	35	28	28	27	36	34	46	45	51	44	39	42	53	49	48	53	49	49	50	48	50	45	
Eldon.....	Max....	62	61	65	58	69	79	82	79	59	49	41	40	60	67	70	68	70	65	74	72	63	74	65	74	73	81	81	81	86	75	
	Min	33	31	33	27	25	35	40	42	39	31	27	28	32	33	49	49	54	45	35	40	52	50	55	56	54	54	51	47	43	43	
Elkader...	Max....	57	62	52	58	67	77	80	60	52	49	34	41	53	68	64	52	54	63	75	79	65	76	75	72	75	75	82	83	82	75	
	Min	29	29	25	23	24	35	35	44	35	24	27	29	33	28	40	44	38	41	30	35	39	47	43	54	48	48	49	40	41	39	
Estherville	Max....	45	51	53	52	63	73	73	70	56	45	33	53	59	58	58	54	44	60	74	75	77	70	70	72	72	80	75	78	67	70	
	Min	32	31	32	24	29	44	44	44	33	28	27	24	24	25	37	44	40	33	40	43	39	38	39	50	53	59	46	47	45	40	
Fonda.....	Max....	52	53	58	58	66	80	76	64	58	48	36	46	66	64	62	60	44	65	73	75	74	73	71	70	70	80	81	78	73	72	
	Min	31	33	29	28	36	42	44	36	28	24	25	25	28	36	44	42	36	38	40	42	46	52	53	54	50	54	60	55	35	40	
Forest City	Max....	47	54	56	52	63	73	73	65	52	43	38	44	56	66	57	54	49	60	74	76	69	71	70	69	71	76	82	79	72	73	
	Min	32	30	35	26	30	37	40	45	34	26	28	26	29	32	40	44	42	36	35	40	45	50	44	51	51	48	51	49	52	37	
Ft. Dodge..	Max....	50	57	60	58	55	75	76	75	55	50	43	45	60	60	58	64	65	63	72	74	74	75	71	72	70	79	81	80	76	73	
	Min	35	30	31	28	22	40	41	38	33	27	27	26	28	26	45	43	44	38	32	37	39	49	50	54	52	51	55	45	43	34	
Galva.....	Max....	51	52	58	59	68	76	74	75	56	57	52	47	49	57	59	60	49	62	73	76	76	75	69	70	71	77	83	76	68	70	
	Min	43	31	32	34	30	50	44	45	38	26	23	24	26	28	49	46	41	35	37	44	41	41	54	55	55	52	50	52	54	37	
Glenwood..	Max....	60	60	63	59	64	75	71	77	70	52	45	45	65	60	62	67	62	64	74	73	76	74	69	70	73	77	80	75	74	70	
	Min	36	29	36	36	32	40	40	53	42	36	25	26	28	37	48	50	44	42	38	43	46	45	56	56	53	55	57	55	57	43	
Greene.....	Max....	50	58	55	60	66	75	78	72	54	49	40	39	59	67	64	55	52	62	74	78	70	78	74	71	73	78	85	85	77	75	
	Min	31	28	30	25	27	35	40	45	34	25	28	27	23	30	39	44	43	40	34	38	46	50	44	52	50	48	50	46	48	39	
Greenfield.	Max....	60	58	61	57	68	74	76	80	56	53	46	54	62	60	69	74	50	62	72	76	74	72	62	76	76	82	87	81	79	70	
	Min	25	27	30	28	29	36	40	51	38	32	26	23	26	37	44	49	44	44	38	48	43	44	53	58	57	50	56	55	49	37	
Grinnell...	Max....	53	53	58	51	63	73	74	68	55	45	42	37	55	60	64	63	61	60	68	70	66	68	66	69	70	75	77	76	77	77	
	Min	37	32	39	28	33	44	50	49	38	28	28	28	30	34	46	49	48	42	41	49	50	45	53	54	52	50	54	50	55	41	
Grin'l (nr.).	Max....	54	55	58	54	66	74	76	70	56	40	40	36	57	62	66	63	61	61	72	70	65	73	67	73	70	79	80	80	79	70	
	Min	35	29	37	27	29	36	44	45	37	28	28	27	29	32	45	49	50	41	36	43	51	43	53	55	51	50	54	49	53	40	
Grundy C'r	Max....	45	52	57	56	65	75	76	62	49	47	39	38	55	67	68	60	54	63	73	75	67	78	73	72	71	82	81	80	81	73	
	Min	29	30	31	30	25	33	37	43	32	25	27	25	28	29	42	45	44	41	33	39	48	45	45	51	49	48	44	47	48	39	
Guthrie C'r	Max....	50	55	60	55	65	74	75	72	62	46	44	44	62	69	64	65	63	60	70	72	72	71	67	67	69	72	72	79	78	79	
	Min	31	31	29	28	21	40	42	42	40	31	26	21	30	29	44	49	45	42	39	38	49	44	54	55	55	54	52	44	47	54	
Hampton..	Max....	47	55	58	55	66	78	77	66	48	51	34	43	57	68	63	54	51	62	75	76	75	74	74	73	74	78	84	83	80	76	
	Min	31	31	35	26	30	39	45	46	34	28	28	27	30	35	43	45	43	39	38	40	41	49	45	53	51	47	50	47	50	40	
Harlan	Max....	55	57	60	56	67	74	73	77	52	48	43	44	61	65	65	67	58	60	71	76	73	74	67	71	70	78	81	71	72	68	
	Min	31	28	33	28	29	35	36	52	40	32	23	26	29	32	32	48	48	39	31	40	44	42	55	54	53	53	57	54	56	39	
Hedrick ...	Max....	59	57	61	54	67	75	79	73	54	46	38	39	58	68	79	78	60	62	72	73	72	73	68	72	75	79	80	79	85	71	
	Min	35	30	35	26	27	35	45	46	37	29	27	27	32	53	47	47	52	44	36	43	50	50	53	55	51	52	51	48	46	40	
Hopeville.	Max....	60	59	61	56	67	73	75	77	57	46	39	41	62	61	67	69	62	62	72	76	67	70	65	70	70	79	80	78	77	72	
	Min	35	31	35	29	30	39	49	51	38	32	28	28	32	31	49	49	46	44	38	46	51	45	55	55	55	54	58	51	53	40	
Humboldt.	Max....	48	54	57	54	66	76	76	70	53	49	40	47	60	66	64	62	55	62	74	74	72	72	72	73	72	80	81	80	76	73	
	Min	34	30	33	28	28	40	42	48	36	27	27	25	28	30	40	46	43	36	38	40	44	48	50	54	52	50	53	48	55	38	
In'pend'ce.	Max....	47	54	56	52	64	73	75	60	53	48	29	36	51	66	67	59	54	60	71	75	61	69	73	70	73	74	78	78	78	70	
	Min	34	39	31	25	27	32	26	46	33	24	25	27	29	29	40	44	48	42	35	40	24	39	46	52	51	46	48	47	49	40	
Indianola..	Max....	58	61	62	57	69	78	77	73	64	48	44	40	61	61	67	68	61	68	75	72	68	72	69	70	70	79	81	79	78	72	
	Min	39	31	35	27	30	41	40	52	40	30	30	28	31	37	47	49	53	43	42	44	52	50	54	56	53	50	57	52	55	40	
Iowa City..	Max....	56	58	59	55	67	75	78	65	55	50	39	36	54	66	71	65	61	63	73	73	63	73	72	74	75	77	80	82	83	71	
	Min	33	32	33	28	27	36	39	43	38	28	29	28	31	32	47	48	56	45	30	39	52	51	52	53	51	51	50	49	47	42	

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR APRIL, 1900—CONTINUED.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
a Falls.	Max.	44	51	55	52	57	75	75	53	48	47	33	41	56	65	63	59	53	62	71	75	69	74	73	74	74	78	83	81	78	73	63.4
	Min	32	32	33	26	30	40	40	44	35	27	28	27	29	32	43	46	43	39	36	37	46	47	47	53	50	48	50	45	49	39	39.1
kuk....	Max	61	60	62	53	65	75	79	76	49	43	34	38	58	64	62	67	66	64	71	67	57	68	62	70	72	76	77	79	82	70	64.2
	Min	40	34	38	31	34	44	45	51	41	32	30	28	32	36	49	50	56	46	46	49	51	52	54	57	55	55	56	52	56	46	44 9
sauqua	Max	63	62	62	57	68	78	82	75	59	46	35	38	60	65	67	60	64	65	74	69	58	69	63	72	72	80	79	79	84	73	65 9
	Min	36	32	31	29	26	37	43	43	40	31	28	26	32	35	49	49	53	46	40	42	52	52	56	57	54	56	51	46	47	45	42.1
sing....	Max	55	60	58	55	65	76	80	76	54	48	45	42	53	67	65	61	56	62	74	78	68	72	73	72	73	76	80	83	61	80	65.6
	Min	29	28	28	25	25	32	38	48	34	28	28	30	35	31	42	45	45	42	32	36	48	44	49	46	44	46	50	45	45	40	37.9
chwood	Max	45	51	53	54	66	75	63	71	58	47	50	48	61	65	57	51	49	69	78	75	70	74	70	69	67	75	72	76	64	71	63.1
	Min	30	27	35	30	32	49	42	49	34	29	24	27	27	33	42	43	37	33	37	41	52	44	51	54	51	48	50	63	53	35	40.1
rabee...	Max	42	56	56	54	67	67	78	67	60	49	37	48	57	62	57	48	40	32	35	43	40	42	51	50	50	55	54	63	45	34	37.1
	Min	21	26	31	24	28	38	42	46	35	27	23	23	24	30	43	38	49	60	70	74	72	75	70	72	76	74	76	72	65	70	64.5
Mars....	Max	48	56	69	57	68	74	74	75	69	49	42	47	60	60	56	55	49	60	70	72	74	72	70	72	76	74	76	72	48	45	64.5
	Min	21	26	31	24	28	38	42	46	35	27	23	23	24	30	43	38	55	49	60	70	74	72	75	70	72	76	74	76	72	48	64.5
nox.....	Max	48	56	69	57	68	74	74	75	69	49	42	47	60	60	56	55	49	33	39	45	45	50	54	45	54	49	52	48	45	37	38.1
	Min	30	28	29	27	29	30	40	50	39	30	23	27	27	27	45	42	35	33	39	45	42	45	50	45	54	49	52	48	45	37	38.1
gan.....	Max	59	58	62	56	68	74	74	76	63	47	42	42	61	61	66	69	59	61	71	70	70	71	69	70	72	79	80	77	77	70	65.8
	Min	30	28	29	27	29	30	40	50	39	30	23	27	27	27	45	42	35	33	39	45	42	45	50	45	54	49	52	48	45	37	38.1
aquoketa	Max	59	58	62	56	68	74	74	76	63	47	42	42	61	61	66	69	44	43	37	50	49	41	54	55	55	57	55	52	55	41	41.9
	Min	30	28	29	27	29	30	40	50	39	30	23	27	27	27	45	42	35	33	39	45	42	45	50	45	54	49	52	48	45	37	38.1
rsh'l.t'n	Max	59	58	62	56	68	74	74	76	63	47	42	42	61	61	66	69	49	44	43	37	50	49	41	54	55	57	55	52	55	41	41.9
	Min	35	29	34	27	30	40	43	50	40	32	28	24	25	37	46	60	47	65	70	74	70	66	60	74	70	72	78	74	71	37	39.4
ason City	Max	58	60	62	56	65	76	72	74	58	48	44	42	64	62	60	60	38	40	44	38	40	44	40	50	52	53	58	56	55	37	39.4
	Min	32	38	33	28	32	30	38	40	41	28	23	24	29	39	40	38	40	44	38	40	44	42	40	50	52	53	58	56	55	37	39.4
onticello.	Max	51	58	56	54	64	75	78	67	53	50	42	40	51	67	69	59	64	64	71	74	64	72	71	74	74	76	78	80	80	74	65.1
	Min	32	38	33	28	32	30	38	40	41	28	23	24	29	39	40	38	40	44	38	40	44	42	40	50	52	53	58	56	55	37	39.4
oar	Max	38	62	49	59	63	76	82	49	50	44	31	29	28	35	49	49	53	46	40	42	52	52	56	57	54	56	51	46	47	45	42.0
	Min	30	36	32	35	23	40	38	40	42	31	29	28	35	35	49	49	53	46	40	42	52	52	56	57	54	56	51	46	47	45	42.0
t. Ayr....	Max	60	59	62	57	69	74	76	77	64	46	41	40	53	63	62	62	70	62	62	72	74	78	68	72	73	76	80	83	61	80	65.6
	Min	34	30	34	29	31	40	45	52	40	30	30	24	28	39	48	50	48	43	39	44	49	49	53	55	55	57	55	50	51	40	37.9
t. Ple's'nt	Max	61	59	61	53	64	75	78	74	64	50	35	40	58	67	65	61	56	62	74	78	68	72	73	72	73	76	80	83	61	80	65.6
	Min	19	25	28	20	21	26	32	45	35	26	26	24	27	36	54	64	68	63	65	75	45	75	69	72	75	77	82	85	82	75	66 0
t.V'n (H.)	Max	53	60	60	63	65	74	79	64	49	51	34	36	36	29	32	44	44	55	49	60	71	74	66	71	72	..	..	73	48	75	39.8
	Min	32	31	35	25	32	36	44	46	34	24	26	36	53	65	60	60	55	49	60	71	74	66	71	72	..	..	73	50	46	50	62.9
ewH'pton	Max	51	54	53	53	62	74	74	66	66	47	41	41	43	53	51	40	43	44	41	34	40	48	47	46	71	70	79	81	78	80	38 5
	Min	35	30	28	25	35	34	40	50	34	24	30	40	38	60	62	66	65	58	62	72	73	70	72	69	71	70	79	81	78	80	65.3
ewton....	Max	56	57	62	53	66	75	76	69	53	47	40	28	26	30	32	46	48	50	44	38	44	46	48	53	53	69	72	76	80	81	40.3
	Min	36	30	38	27	28	37	42	23	37	29	28	35	44	70	68	64	50	49	64	85	78	74	76	73	69	51	50	42	50	46	66.1
orthwood	Max	49	59	58	66	71	75	77	64	62	50	29	27	29	29	40	44	41	38	31	36	34	50	49	49	70	71	79	82	77	74	39 7
	Min	32	29	34	38	53	38	39	45	34	25	49	43	46	64	61	62	65	55	62	75	77	78	76	69	51	55	52	55	39	37	66.7
debolt	Max	53	59	62	56	68	75	75	75	69	45	30	24	26	26	32	44	48	42	36	37	44	40	42	54	67	70	55	67	78	80	40.1
	Min	33	29	30	28	25	44	47	48	45	48	41	42	62	62	66	61	60	63	73	73	73	73	70	55	55	53	50	53	52	34	65.3
gden.....	Max	56	58	60	55	68	77	75	69	51	37	37	35	26	32	46	48	48	45	40	36	42	47	70	72	72	73	77	78	82	71	41.4
	Min	34	28	35	29	31	37	42	48	37	30	35	40	56	66	69	61	48	60	64	70	..	61	..	50	52	49	49	43	45	39	62 9
lin.....	Max	48	54	56	49	61	72	75	61	44	37	27	27	32	29	44	46	49	44	34	38	..	..	78	65	72	74	80	84	72	64	38.2
	Min	26	29	30	28	26	31	35	44	80	53	52	42	50	68	64	58	66	46	66	76	78	46	78	57	56	54	54	56	54	58	67 3
nawa.....	Max	58	67	69	61	70	78	74	80	53	52	20	26	26	34	46	48	42	36	36	44	46	46	71	60	56	71	71	80	80	78	39 40.8
	Min	32	27	29	29	28	42	42	42	41	34	37	40	62	67	69	63	64	72	68	72	69	68	71	54	53	56	53	50	58	49	72 65.8
sceola....	Max	61	59	56	54	70	74	76	77	56	47	37	29	23	33	35	47	49	50	43	40	43	51	72	65	71	72	78	78	79	81	53 42.1
	Min . ..	37	30	34	29	30	32	48	49	39	32	39	38	60	64	68	68	63	64	73	72	62	52	50	54	55	56	52	51	51	47	40 41.4
skaloosa..	Max	60	58	61	56	68	77	78	72	78	46	46	28	27	29	34	48	49	52	44	34	43	52	71	65	70	72	79	80	79	83	72 65 6
	Min	36	29	35	26	26	37	43	46	36	28	45	40	39	58	63	68	68	66	73	71	62	54	55	57	57	55	56	55	53	63	45 45.3
ttumwa...	Max	61	56	63	58	61	78	79	74	51	30	32	29	34	37	48	50	51	63	66	74	75	50	47	53	73	71	80	81	78	80	67.5
	Min	39	35	39	31	30	43	57	50	39	50	38	41	64	68	69	63	52	43	61	72	45	75	77	60	53	55	52	48	55	52	41.2
vid	Max	66	69	69	57	69	77	78	79	49	33	31	25	22	30	34	48	48	52	43	37	45	75	77	60	55	70	73	77	81	69	65.2
	Min	36	28	33	28	27	37	46	49	76	59	49	45	45	64	59	63	58	50	61	72	75	45	44	55	54	54	54	57	58	56	42 2
acific Jct.	Max	59	59	63	60	70	74	73	55	44	36	25	26	30	34	46	46	51	45	43	32	40	77	74	76	73	80	85	82	76	77	66.2
	Min	38	27	37	31	32	38	35	68	50	55	44	46	56	64	69	63	55	56	62	76	39	41	43	46	49	52	49	47	55	39	37.4
Plover.....	Max	46	55	54	58	64	80	77	48	38	22	20	22	28	35	40	43	41	35	64	76	75	75	58	70	70	54	78	84	78	65	65.2
	Min	28	30	35	23	21	37	40	75	72	55	45	46	40	68	69	68	58	45	64	76	45	49	54	55	54	56	60	65	63	55	35 41.4
Primghar..	Max	60	60	60	55	65	75	38	40	51	28	20	20	28	25	35	42	42	56	67	76	75	80	76	67	71	72	82	89	74	75	69.6
	Min	40	28	35	30	32	77	75	77	60	54	52	45	70	68	67	70	56	46	44	57	39	47	49	71	56	72	60	62	52	41	43.7
Red Oak...	Max	65	68	70	60	70	43	42	42	66	53	35	34	28	30	42	47	60	46	44	57	76	75	71	72	67	72	81	81	80	76	64.0
	Min	35	33	36	32	32	75	77	66	53	50	35	35	40	53	31	37	62	50	44	40	43	46	46	44	48	49	50	50	74	47	38.3
Ridgeway .	Max	56	59	56	55	64	30	38	43	46	33	25	25	28	31	61	63	64	58	42	73	70	75	76	71	73	76	81	80	79	73	65.0
	Min	30	30	32	25	30	60	75	76	73	55	53	35	45	61	64	63	47	42	60	31	30	34	56	52	54	50	48	55	47	73	39 4
Rockwell C	Max	53	54	58	53	60	38	40	42	42	37	29	25	29	28	43	43	53	48	36	69	71	65	68	58	52	55	78	74	76	37	59 5
	Min	34	29	35	26	52	62	72	73	56	47	42	42	43	57	53	54	42	49	33	40	68	46	47	45	38	51	48	49	78	73	38.9
Ruthven ..	Max	40	51	49	52	29	31	42	44	48	25	25	26	24	26	34	41	63	54	62	73	75	78	74	69	69	69	78	80	73	71	64.9
	Min	31	27	35	29	31	42	42	44	48	25	25	26	24	26	34	41	63	54	62	73	75	78	74	69	69	69	78	80	73	71	64.9
Sac City....	Max	53	55	58	55	67	76	75	44	49	38	30	24	26	26	30	..	48	42	36	40	44	42	43	53	55	54	52	54	49	72	40.0
	Min	34	29	31	28	25	42	44	49	72	56	48	24	26	26	30	63	62	58	60	68	71	74	71	66	69	68	74	78	74	75	63.6
Scranton ..	Max	53	53	57	28	29	43	43	48	72	56	48	42	46	61	64	63	48	42	36	40	44	42	43	53	55	55	67	67	74	77	41.4
	Min	35	31	33	28	52	65	73	71	71	50	46	35	40	64	60	62	51	46	59	74	74	71	72	68	67	67	70	74	76	73	61.5
Sheldon....	Max	45	51	54	52	28	65	73	37	48	35	28	24	25	33	37	40	40	46	47	62	38	77	77	40	68	70	52	79	48	80	39.2
	Min	31	28	33	28	30	40	37	48	71	50	46	35	40	64	60	62	46	42	33	63	63	73	36	42	52	53	70	78	48	50	63.9
Sibley.	Max	47	53	54	56	67	75	75	69	49	60	49	39	24	23	25	50	60	25	27	67	33	63	75	36	42	52	50	74	52	78	37 4
	Min	30	27	33	28	28	39	38	49	74	54	51	39	38	60	67	70	47	63	53	44	63	36	73	75	50	74	52	55	70	50	67.8
Sigourney..	Max	60	60	67	58	69	78	80	74	46	37	28	28	38	47	62	57	51	46	63	73	46	73	75	46	72	45	74	51	71	46	41.0
	Min	37	30	40	25	23	37	41	71	75	50	48	38	42	62	66	49	47	40	36	36	42	47	45	73	70	55	56	52	74	55	63.3
Sioux City..	Max	51	58	58	57	69	76	71	46	46	42	36	38	48	54	58	49	48	47	36	65	73	46	70	73	45	72	47	71	70	55	42.5
	Min	28	31	31	32	33	46	46	78	69	56	45	54	52	48	54	58	46	47	65	73	70	54	50	70	54	50	70	48	47	48	63.1
Spencer	Max	48	53	58	60	27	65	72	78	38	32	24	30	20	26	34	48	49	52	38	36	34	38	72	74	54	73	78	74	72	51	35.7
	Min	15	33	32	27	25	36	42	70	70	56	47	40	45	60	68	64	58	53	39	59	36	75	73	46	72	45	74	51	54	68	61 8
Sioux Cen.	Max	47	52	54	54	64	74	78	43	50	38	29	25	27	29	34	46	48	42	36	36	44	46	46	57	53	54	71	75	78	69	40.2
	Min	31	29	32	29	30	40	43	72	73	55	47	38	45	59	58	59	55	50	60	71	42	45	45	53	54	53	51	51	51	54	62.3
StormLake	Max	49	54	56	52	64	73	44	45	50	37	28	24	24	29	36	43	45	41	35	42	45	72	69	71	68	70	79	84	79	75	40.7
	Min	35	29	32	29	33	58	67	65	56	45	35	45	60	56	65	57	58	62	37	36	38	49	50	50	48	50	47	51	50	50	62.2
Stuart.....	Max	56	50	52	58	55	35	32	45	33	32	27	25	25	33	37	37	51	62	70	72	73	74	67	69	72	77	79	72	72	70	65.1
	Min	32	32	30	29	33	72	69	73	65	48	45	44	64	59	61	66	51	49	41	33	43	46	44	56	55	54	55	56	56	55	42.1
Thurman..	Max	59	59	63	57	68	32	35	38	50	44	35	26	26	28	35	47	51	56	65	75	76	63	76	69	71	71	76	78	80	81	65.6
	Min	36	27	35	30	32	68	77	79	65	50	48	33	36	61	65	68	60	47	53	42	37	35	50	41	52	54	53	50	82	87	39 8
Toledo. ...	Max	58	61	63	57	26	26	40	43	43	36	27	28	27	29	34	46	72	68	70	71	72	78	70	68	73	75	82	87	82	68.0
	Min	26	28	32	26	26	40	43	43	43	36	27	28	27	29	33	46	65	38	69	68	50	45	43	66	70	72	76	77	79	77	41 8
Villisca....	Max	63	67	62	57	53	75	78	80	55	51	48	46	52	63	65	68	38	45	43	42	52	58	56	54	56	70	73	73	79	77	65.8
	Min	28	32	30	29	30	32	35	56	43	36	28	24	29	33	38	39	68	63	66	76	70	61	76	63	70	54	54	53	51	47	65.8
Wapello ...	Max	60	58	61	52	66	79	81	67	58	49	35	38	55	66	69	68	63	66	76	38	44	32	49	54	71	73	76	79	81	86	73 64 8
	Min	36	31	35	30	28	39	42	48	32	30	30	29	33	35	48	49	52	46	38	44	70	58	72	69	52	52	52	50	48	50	39.9
Washingt'n	Max	61	49	64	55	67	77	78	66	51	47	36	37	57	65	66	45	47	51	42	36	44	60	50	52	73	71	74	75	80	80	64.4
	Min	33	29	35	24	28	35	40	48	32	28	25	25	39	56	68	66	58	54	63	73	74	65	70	44	46	52	51	49	50	46	38.6
Waterloo...	Max	49	58	57	52	65	75	76	65	51	49	42	49	28	28	29	32	41	45	47	43	33	39	50	64	72	74	71	74	75	81	63 8
	Min	30	30	31	26	26	35	38	44	33	25	47	40	39	55	68	67	56	56	62	74	75	64	72	74	71	73	75	76	78	78	39.5
Waverly...	Max	49	54	54	54	64	74	74	63	51	47	28	28	28	30	33	38	45	46	43	34	42	76	61	64	70	72	71	73	76	84	65.4
	Min	31	31	31	28	27	36	36	45	36	28	52	40	54	63	70	60	64	62	61	68	48	50	56	54	48	50	49	53	58	56	39.4
W. Branch.	Max	58	56	60	68	72	77	80	50	52	52	32	28	30	28	34	30	46	54	32	69	71	66	70	70	69	70	75	78	77	70	42.1
	Min	30	32	28	23	28	36	32	34	34	32	41	35	39	65	64	66	59	58	60	34	40	49	49	49	52	50	47	51	49	44	65.5
Whitten ...	Max	47	51	55	51	73	71	73	54	50	34	27	27	25	29	44	45	45	41	40	69	62	60	73	74	73	77	73	78	77	83	64.0
	Min	31	29	34	26	35	29	43	38	62	53	45	40	38	51	65	68	66	62	55	46	38	48	47	50	53	47	47	48	46	49	39.7
Wilton Jc..	Max	57	57	58	50	62	72	76	39	45	36	27	28	27	29	31	46	48	55	46	63	74	71	70	73	62	71	71	80	83	80	79	73	65.9
	Min	33	29	32	30	26	35	39	75	75	52	47	39	42	62	62	67	70	61	50	42	57	42	54	48	54	55	54	50	57	50	53	39	42.8
Winterset .	Max	59	58	61	55	67	76	75	49	39	31	30	24	30	34	45	49	50	42	..	..	..	..	..	..	..	..	..	..	..	..	....
	Min . ..	37	31	34	28	30	43	47	49	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
.....		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
.....		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
.....		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....

DAILY AND MONTHLY PRECIPITATION FOR APRIL, 1900.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total.
Afton	....	....	....	....	....	....	..	....	....	..	....	T	....	.04	..	1.66	1.04	..	....	....	..	....	.39	....	..	....	.26	....	....	....	3.39
Albia	.12	..	....	....	..	....	..	....	....	....	.10	T	....	T	....	1.46	1.02	.08	....	....	T	.	.78	.08	....	....	....	....	....	....	3.04
Algona	..	..	....	..	....	....	....	.05	....	....	....	.20	....	.02	....	....	1.30	..	..	..	....	....	....	.25	....	....	.30	..	....	....	2.12
Alta	.02	..	....	....	....	....	..	....	....	....	....	.08	..	.03	15	.60	.81	..	....	..	..	....	.34	.01	T	T	.05	..	.10	....	2.19
Alta (near)	....	....	....	....	....	....	..	....	....	..	.10	....	....	.15	.08	.40	.50	....	....	..	....	....	.20	.16	....	.08	.08	....	.07	..	1.80
Amana	.07	....	..	....	..	....	....	....	....	....	.06	.07	..	.	....	1.39	1.70	.13	..	..	....	....	..	.15	....	T	....	..	T	..	3.37
Ames	....	..	....	....	..	....	....	....	....	....	.10	T	....	T	.60	.48	.82	....	....	....	..	....	.30	....	..	.22	....	....	..	..	2.61
Ames (near)	....	..	....	....	..	..	....	....	.	..	....	.05	....	..	.20	.80	1.85	....	....	....	....	....	..	.20	..	.18	....	....	..	..	3.28
Atlantic	T	..	....	....	....	.	..	....	T	....	....	....	....	....	30	1.00	....	..	....	.	..	..	.43	T	.22	.31	.07	..	T	..	2.33
Audubon	....	..	..	....	....	....	....	....	....	....	T	..	....	.44	T	1.18	.12	....	....	....	..	..	.41	....	T	.45	.35	..	....	....	2.95
Bancroft	..	....	....	....	....	..	..	..	T	....	T	10	....	..	T	.50	80	..	....	....	....	....	T	.10	..	T	T	..	....	....	1.59
Batavia	.01	..	..	..	..	..	....	....	....	....	..	.10	..	.	.11	.07	.02	.07	....	..	.01	..	.04	..	..	....	....	..	....	..	.43
Baxter	..	....	....	....	....	....	....	....	....	....	.10	....	....	T	1.22	1.63	.81	....	....	..	T	....	.30	....	..	....	....	..	T	..	4.08
Bedford	....	....	..	..	.	....	..	....	....	....	....	....	....	T	....	1.35	T	..	..	....	..	....	.54	..	.65	.11	.03	....	..	..	2.68
Belknap	.05	....	....	....	..	....	..	..	....	....	.25	.05	T	T	....	.94	.81	.27	....	T	T	....	T	.28	..	....	....	..	....	..	2.65
Belle Plaine	.10	....	....	....	....	..	.	..	....	....	.10	.10	....	..	.20	1 50	1.75	....	..	....	T	....	..	.35	....	....	....	..	....	..	4.10
Bonaparte	T	..	....	..	..	....	..	..	....	..	.21	....	....	.	1.00	.75	..	....	....	....	.	..	.20	....	....	....	....	..	....	....	3.16
Britt	04	....	....	..	....	.	..	....	.05	....	.03	.08	....	....	.02	.56	.30	....	..	..	....	....	.01	.10	..	....	.37	..	..	....	1.53
Buckingham	....	..	..	..	....	..	....	....	.09	....	.57	.04	....	..	.01	.14	2 34	....	....	....	....	....	....	.09	..	....	....	....	....	.04	3.32
Bussey	..	....	....	....	....	....	..	..	..	..	....	....	..	..	..	1.60	90	.07	....	..	..	....	.22	....	....	....	....	....	....	..	2.79
Carroll	.07	....	..	....	....	....	..	..	....	....	....	..	....	..	.32	.40	.70	.72	....	..	....	..	.05	.30	T	1.35	....	.35	.04	..	4.50
Cedar Falls	....	....	....	....	..	....	..	....	....	.60	T	T	T	T	..	1 00	1.25	..	....	....	..	....	....	.10	..	....	..	....	....	..	2.95
Cedar Rapids	.07	....	....	....	..	....	....	T	....	....	.01	.03	..	T	T	1.78	1.59	T	..	T	....	....	.06	07	....	T	....	....	....	....	3.62
Centerville	....	....	....	....	....	....	..	....	....	..	.04	T	..	.	T	.81	.20	.04	....	....	T	T	.30	..	....	....	....	....	T	....	1.39
Chariton	T	..	....	..	.	....	....	....	....	....	.02	.03	..	T	.17	1.93	.35	.10	..	....	.07	..	.16	.10	.02	....	....	..	....	..	3.95
Charles City	.08	..	....	....	....	..	....	T	....	....	.03	.10	....	T	T	.77	1.57	.05	..	..	T	..	....	.10	....	....	....	....	.08	..	2.78
Chillicothe	..	..	....	..	..	....	....	..	....	....	.10	....	....	....	....	1.10	.80	.10	....	....	....	....	....	....	....	....	....	..	....	....	2.10
Clarinda	....	..	....	..	..	....	..	....	....	....	....	T	....	....	.83	.15	.25	....	....	..	....	....	.53	..	.05	.60	....	..	.07	....	2.48
Clear Lake	..	....	....	..	..	.	..	....	T	..	T	1.00	....	....	....	.40	.75	....	..	.	..	..	....	..	....	....	....	..	10	....	2.25
Clinton	.09	....	.02	....	..	....	....	..	.01	..	.20	.	....	....	....	..	1.80	.10	..	.	.02	..	....	..	..	..	....	..	....	....	2.24
College Springs	..	..	....	....	..	....	..	....	....	....	....	....	.	04	.35	1 60	36	..	....	..	.	....	.57	T	.07	.6	.08	06	....	....	3.75
Coon Rapids	.03	....	..	....	..	....	....	....	..	....	T	..	..	.10	.33	.35	1.10	.05	....	....	..	....	.20	.13	T	.37	.87	..	..	..	3.40
Corning	....	....	....	....	....	....	....	....	....	....	..	T	....	T	.33	.52	..	....	..	....	..	....	.40	.	.42	.06	.06	T	T	....	1.79
Council Bluffs	....	....	....	..	....	....	....	....	.	....	....	....	....	....	.50	.45	..	....	....	....	..	....	.63	.48	.32	.4	..	.25	....	....	3.03
Cresco	....	..	T	....	....	....	..	..	T	..	25	....	..	T	..	.62	1.25	.02	....	....	.	..	..	T	..	....	..	..	T	..	2.14
Cumberland	....	....	.	..	....	....	..	....	....	..	....	T	..	T	T	1.29	....	..	....	..	....	..	.40	....	.20	.02	T	T	T	....	1.91
Danville	..	....	....	....	....	....	....	..	....	....	.01	....	..	....	T	1.80	1.10	..	....	..	.10	T	T	....	....	....	....	....	....	....	3.01
Davenport	.01	....	..	....	..	.	..	....	T	....	11	.08	.01	....	T	1.03	.78	.02	..	..	.01	.01	..	.01	....	....	T	....	....	....	2.10
Delaware	.03	....	....	....	....	....	..	.15	..	..	.20	.10	....	....	.06	1.06	2.82	....	..	..	....	..	....	....	....	....	....	....	....	..	4.42
Decorah	..	....	....	....	....	....	....	....	....	.20	.10	....	....	....	....	.60	1.40	.02	..	....	..	..	....	....	....	....	....	....	T	....	2.32
Denison	....	..	....	....	....	....	....	....	....	....	....	T	....	....	.45	.25	.60	.02	..	....	....	....	.35	.02	.38	.06	.55	.10	.05	....	2.83
Des Moines	.06	....	....	....	....	....	..	....	..	..	T	01	....	T	.40	1.32	1.89	.01	..	....	T	....	.04	.03	T	T	.02	....	.01	....	3.82
De Soto	.02	....	....	....	....	....	..	....	..	..	.02	.01	..	.08	.22	.73	1.44	..	....	..	..	....	.18	.16	....	.02	..	....	....	....	2.88
Dows	T	....	....	....	....	....	....	....	....	....	.25	..	....	....	....	.60	.33	..	....	..	....	....	....	.1	....	....	.12	....	.14	....	1.56
Dubuque	....	..	..	..	..	..	..	....	.02	....	.21	.18	T	....	....	.84	1.13	T	....	....	T	..	....	....	..	....	....	....	....	.01	2.39
Eldon	.02	..	....	....	..	....	....	..	T	....	.05	T	....	T	T	1.07	1.24	.04	..	..	.02	....	.07	.10	....	....	..	....	....	..	2.61
Elkader	..	.	....	....	....	....	..	....	..	..	.30	....	..	T	....	1 88	1.10	.	..	..	....	....	....	....	....	....	....	....	....	..	3.28
Emerson	....	....	....	....	....	....	....	....	..	..	....	....	..	....	.09	33	.20	....	..	..	....	....	.50	.45	.31	35	....	....	....	..	2.23
Esterville	..	....	....	....	....	.	....	....	T	..	.03	02	..	.02	T	.60	.69	.01	....	....	..	T	T	T	....	.30	.02	..	.0?	....	1.71
Ft. Dodge	....	....	..	.	....	..	..	..	..	....	T	T	....	....	2.00	1 25	.06	..	....	..	....	....	.11	.12	..	....	.50	....	....	..	4.04
Ft. Madison	....	....	....	....	..	..	..	....	....	....	..	.10	T	.80	..	18	.90	T	..	..	.15	....	T	....	....	....	....	....	....	..	2.13
Fonda	....	..	....	....	..	....	....	..	....	....	.14	....	....	.03	.48	1.04	1.12	....	..	....	....	..	.34	.03	.05	1.43	T	.02	T	..	4.13
Forest City	....	....	....	....	....	....	..	....	..	....	.13	.07	....	....	T	.52	.41	..	....	..	....	..	..	.14	....	....	.11	.17	....	..	1.55
Galva	....	..	....	....	....	..	..	....	....	....	....	T	..	..	T	..	1.33	.01	..	..	.	....	.21	.17	.07	.07	19	.09	.06	..	2.20
Glenwood	T	....	..	.	....	....	....	..	....	....	....	T	....	T	.80	.15	..	.16	..	.	....	T	.85	..	.46	T	.30	.10	.05	..	2.87
Gilman	....	..	....	..	....	....	....	....	....	....	T	T	.10	..	T	.17	1.40	.02	T	....	T	.15	....	....	....	....	....	....	....	..	1.84
Gladbrook	....	....	....	....	....	....	....	..	....	..	.05	.02	..	....	..	1.15	.40	.	....	....	....	....	....	....	....	....	....	....	T	....	1.62
Grand Meadow	....	....	T	....	....	....	....	....	T	....	25	....	....	11	....	85	1.53	..	..	..	....	....	....	....	..	T	....	..	T	..	2.74
Greene	.13	....	....	..	..	..	..	..	.20	....	.03	.08	....	.03	.02	.34	1.20	....	....	..	.06	....	....	.10	....	....	....	..	....	..	2.19
Greenfield	....	..	..	....	.	..	.	....	....	....	T	T	..	T	.02	.78	.91	.02	....	....	..	T	.41	.10	T	.02	..	..	....	....	2.26
Grinnell	.05	....	....	....	....	....	....	....	....	....	.	.	....	....	.20	2 40	..	.	..	....	..	..	2.0	..	....	..	..	..	.03	....	2.88
Grinnell (near)	.06	..	.	....	.	....	....	....	....	....	.05	.05	.	....	.10	1.00	1.05	..	..	....	..	..	.10	.10	....	....	....	....	.02	....	2.53
Grundy Center	....	....	....	....	....	....	....	....	.01	....	.20	....	....	....	T	.54	2.65	....	....	....	..	..	.23	T	....	..	..	....	T	..	3.63
Guthrie Center	....	....	....	....	....	....	....	....	....	....	....	....	....	.85	....	.92	.15	..	....	....	....	..	..	....	....	....	..	....	....	....	1.92
Hamburg	....	....	....	....	....	....	....	....	....	....	....	....	..	..	T	1.12	..	....	..	..	....	....	.97	.80	....	.40	.29	1.00	..	..	4.58
Hampton	.	....	..	....	....	....	....	..	....	....	....	....	..	..	....	1 04	.33	....	....	....	....	....	....	.12	....	....	....	....	....	..	2.21
Harlan	.03	....	....	....	....	....	....	.55	..	....	.13	T	....	.04	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	4.67
Hawkeye	.12	....	....	....	.30	....	.	.15	..	....	....	.15	....	....	....	....	....	3.31	..	...	T	....	.36	1.35	1.20	.69	.13	T	.02	....	4.11
Hedrick	....	....	....	....	..	....	..	....	....	....	10	..	..	....	.07	1.63	1.15	....	....	....	..	....	.25	....	....	....	....	....	T	..	3.20
Hopeville	....	....	....	....	....	....	....	....	....	....	....	..	....	T	1.06	.72	.15	....	....	....	.05	....	.47	....	....	.05	..	....	....	....	2.50
Hoprig	....	....	....	....	....	....	....	....	....	....	....	.10	....	..	....	....	1.60	..	....	..	..	....	....	.14	....	..	....	....	T	....	1.24
Humboldt	....	....	..	....	....	....	..	..	.07	....	....	.07	..	....	....	.50	1.42	.07	....	..	....	....	24	14	....	....	.24	....	....	..	2.75
Independence	.10	..	....	....	....	....	....	....	.15	....	.20	.10	....	....	....	1.00	1.70	....	..	....	T	....	T	T	....	....	....	....	.12	..	3.37
Indianola	.03	T	....	....	....	....	....	....	....	....	.04	.01	..	.04	.08	1.33	.22	.01	....	....	.03	....	.16	.03	T	T	..	....	T	....	1.98
Iowa City	....	..	....	..	....	....	....	T	....	..	.12	.65	....	....	....	1.45	1.50	.	....	....	.04	....	....	.15	....	....	....	....	....	..	3.31
Iowa Falls	.10	....	....	....	....	....	....	..	T	....	....	....	....	....	T	.61	.68	..	..	..	T	..	....	.15	....	....	....	....	....	..	1.61
Keokuk	.04	..	....	..	....	....	....	....	....	....	.05	01	..	T	.08	.49	1.08	..	....	..	.09	.	.16	.10	....	T	....	....	..	..	2.10
Keosauqua	T	....	....	....	....	....	....	....	....	....	.40	T	....	....	....	1.19	.91	....	....	..	.10	....	.14	....	....	....	....	....	....	....	2.74
Lacona	.02	....	....	....	....	....	....	....	....	.02	T	T	..	.02	.02	1.70	.10	....	..	....	.10	....	.30	....	....	....	....	....	....	....	2.28
Lansing	..	....	T	....	....	....	....	....	....	....	T	.34	T	T	....	.74	1.76	T	....	....	....	....	....	....	....	....	....	....	T	....	2.84
Larchwood	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	.32	.68	....	....	....	....	....	....	34	.32	1.00	.14	..	..	....	2.80
Larrabee	....	....	....	....	....	....	....	....	....	....	.11	....	.	....	..	.16	1.30	.54	....	....	....	....	.20	..	....	.36	....	....	....	....	2.67
Le Mars	....	....	..	....	....	....	....	....	T	..	T	....	..	....	.02	1.00	1.80	....	....	..	..	T	.55	.25	.60	.28	.03	.12	.01	....	4.16
Lenox	....	.	....	....	....	....	....	....	....	....	....	T	..	T	.36	1.12	..	.07	....	....	....	....	.39	.02	.15	.03	....	T	T	....	2.14
Le Claire	....	T	....	.	..	.	....	....	.09	....	..	.15	.03	....	..	.69	2 05	.21	....	....	.02	....	..	....	T	.	....	....	....	..	3.24
Logan	....	....	....	....	....	....	....	....	T	....	....	....	.22	.48	.58	.52	.08	..	....	....	....	.41	.12	.13	.08	.10	.70	.08	..	..	3.50
Maquoketa	....	....	....	..	....	....	....	..	.08	....	.10	.13	....	..	....	.74	.66	.19	....	....	..	T	....	..	..	....	....	....	....	....	1.90
Marshalltown	.10	....	....	....	....	....	....	..	.03	....	.11	.10	....	....	.15	.95	1.22	T	....	..	..	..	T	.17	....	....	....	..	T	..	2.83
Melrose	....	....	....	..	....	....	....	..	....	....	....	....	..	....	.75	..	1.00	....	....	..	..	....	....	....	..	..	..	..	....	....	1.75
Monticello	T	....	....	..	....	....	....	....	....	T	.28	..	....	....	....	1.80	1.15	....	..	....	T	....	..	....	..	T	....	....	....	....	3.23
Mooar	....	....	....	....	....	....	....	....	....	....	T	T	..	T	1.00	.24	.20	....	..	....	T	..	.28	....	..	....	....	..	..	..	1.72
Mt. Ayr	.02	..	....	..	..	....	....	..	....	....	....	....	....	.04	....	1 35	.02	.07	..	..	T	....	.36	.06	....	T	....	T	..	..	1.92
Mt. Pleasant	....	....	..	....	....	....	....	....	....	....	.02	T	....	....	.23	.94	....	....	....	....	.01	..	T	..	..	....	....	....	....	..	1.20
Mt. Vernon (Hub)	....	....	T	....	....	....	....	....	....	....	.15	.12	..	T	.20	.50	1.80	10	....	....	.01	..	T	.01	....	.01	..	.	....	..	2.90
Mt. Vernon	..	..	....	....	....	....	....	....	....	....	.25	....	....	....	....	1.40	1.55	....	....	....	..	..	..	.05	....	....	..	..	....	..	3.35
Murray	....	....	....	....	....	....	....	....	....	....	....	....	T	..	..	1.30	....	.52	....	....	....	....	....	..	....	....	..	..	....	....	1.82
New Hampton	....	. .	....	....	..	....	....	....	....	..	T	.20	..	.01	....	.64	1.50	..	....	....	....	....	....	..	....	....	..	..	....	....	2.35
Newton	.13	....	....	....	....	....	....	....	....	..	.12	T	....	.22	.27	.80	86	.09	....	....	....	....	....	....	....	....	....	..	....	..	2.70
Northwood	....	....	....	....	....	....	....	T	.18	....	.07	T	..	.03	.01	.55	.93	..	....	....	....	....	.20	.10	T	T	....	....	....	..	2.15
Odebolt	..	....	....	....	....	....	....	....	....	....	T	.03	..	T	.27	.50	.90	..	....	....	....	.02	....	.06	....	....	.24	....	.06	....	2.35
Ogden	....	....	..	....	..	....	....	....	....	....	....	.06	....	T	.20	.40	1.75	.06	....	....	....	....	.16	.12	T	....	.16	.21	....	....	3.49
Olin	.07	....	..	....	....	....	....	T	....	..	....	.23	....	....	....	1.36	1.42	.19	....	....	....	....	....	.10	....	....	.76	....	....	....	3.27
Onawa	..	....	....	....	....	....	....	....	.02	..	....	02	....	.03	.45	.73	.73	..	....	....	....	....	.40	T	....	....	....	....	....	....	3.22
Osceola	T	....	....	....	..	....	....	....	....	....	T	T	....	T	.04	1.94	.12	.01	..	....	.11	....	.27	.19	.20	.05	.02	.27	.10	....	2.64
Ovid	.01	....	....	....	....	....	....	....	....	....	.04	....	....	.02	.86	1.49	.30	08	....	....	.01	....	.22	.15	T	T	....	....	....	....	3.15
Oskaloosa	.15	....	.	....	..	....	....	.15	....	....	.02	02	....	.03	.30	1.05	.75	T	....	....	T	.10	.18	.08	....	....	....	....	.04	....	2.79
Ottumwa	....	..	....	..	....	..	....	....	....	....	.05	....	..	....	1.00	.70	.20	.10	....	....	....	....	.33	.04	....	....	....	....	....	....	2.38
Pacific Junction	T	....	....	....	....	....	....	....	....	....	T	....	....	T	.21	.47	.07	.11	....	....	....	....	.30	.53	.47	.93	.03	.29	.03	....	3.44

DAILY AND MONTHLY PRECIPITATION FOR APRIL, 1900—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total.
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....	....	.05	....	....	....	....	....	....	....	..	.30	.42	....	....	....	.65	1.25	..	....	....	....	....	.20	....	..	....	.15	....	....	....	2.15
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....	..	....	..	..	..	....	....	T	..	..	.12	.05	....	T	.09	1.78	1.71	.03	....	....	T	T	.05	T	....	....	....	....	....	..	3.83
T	....	....	....	....	....	..	....	T	T	..	T	T	....	T	.08	.76	1.26	....	..	....	....	....	.23	35	.20	.56	T	.11	.23	..	3.86
.02	..	....	....	....	....	....	....	....	....	....	.08	....	..	....	T	.98	.30	....	....	..	..	....	.16	....	....	.21	T	....	.08	....	1.81
.07	....	....	....	....	....	....	....	T	....	....	..	.10	..	T	.09	.64	.45	....	..	....	....	....	.22	28	1.93	....	....	T	.17	....	3.95
.04	....	....	....	....	....	....	....	..	....	....	.03	.06	..	.02	.18	.64	.86	....	....	....	....	....	.18	.21	T	T	.07	.07	.04	..	2.33
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....	..	....	..	....	..	..	....	T	T	....	T	T	....	T	.30	1.42	T	.10	..	....	..	..	1.07	.82	1.30	.78	.33	.42	.08	....	6.62
T	....	....	....	....	....	..	....	....	....	....	.05	.07	..	.02	....	1.05	1.42	....	..	....	....	..	....	.35	..	....	....	....	T	..	2.96
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.03	....	....	....	....	....	....	....	....	....	....	T	T	....	....	.15	.18	1.20	....	....	..	....	T	.15	.15	.41	.05	.12	....	.11	....	2.52
....	..	....	..	....	....	....	....	....	.28	....	T	.14	....	....	T	.97	1.17	.02	..	....	T	..	....	.11	....	....	....	....	T	..	2.79
.10	....	....	..	..	....	....	....	....	.10	....	.06	.09	....	..	....	.90	1.01	.03	..	....	..	....	....	.10	..	....	....	....	.01	....	2.40
.10	....	....	....	....	....	....	....	....	....	....	T	T	..	T	T	1.00	2.10	T	..	....	....	....	T	....	T	....	....	....	..	..	3.85
.75	....	....	....	....	....	....	..	..	....	....	.30	.05	..	....	....	.95	.93	....	....	....	T	..	....	T	....	....	....	....	....	....	2 23
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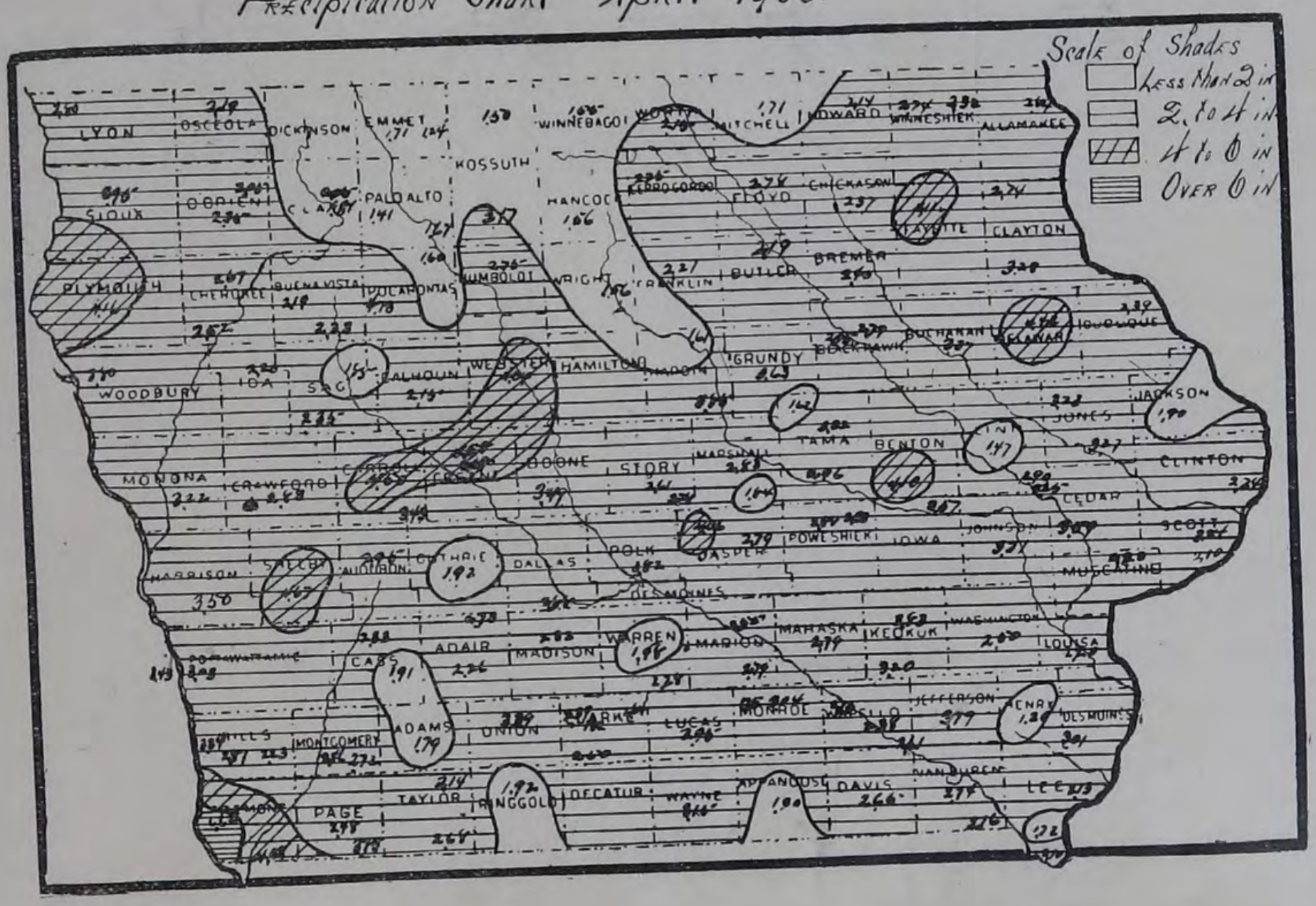
.03	....	..	....	....	....	....	....	..	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Precipitation Chart April 1900.



ol. XI. MAY, 1900. No. 5.

U. S. Department of Agriculture
Weather Bureau



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

STAR ENG. CO

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Central Station, Des Moines, Iowa.

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DIRECTOR

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LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

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1899.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XI. MAY, 1900. No. 5.

IOWA CROP REPORT, JUNE 1, 1900.

TOTAL NUMBER OF ACRES AND AVERAGE CONDITION OF STAPLE CROPS.

CONDITION OF FARM ANIMALS.

Reports of county and township correspondents show the following results as to the number of acres and condition of staple farm crops of the state:

Corn.—The total number of acres planted appears to be 3,660, an increase of 158,140 acres as compared with the area harvested in 1899. Average increase about 1.8 per cent. The average condition of the crop was estimated by the reporters one 101 per cent. Last year at the corresponding date it was and 76 per cent, and on July 1st was 83 per cent.

Winter Wheat.—The reports show a large decrease in the area seeded to winter wheat last fall, as compared with the acreage sown in the fall of 1898. The present acreage is roughly estimated to be 76,080 acres, and the condition is 90 per cent. The figures as to this crop are subject to revision.

Spring Wheat.—The acreage of this crop is placed at 1,416,550 acres, a decline of 122,840 in acreage, as compared with the area harvested last year. The condition June 1st was estimated at 94 per cent.

Oats.—Acreage sown, 3,991,690 acres. Decrease compared with last year, 77,860 acres. Average condition of the crop June 1st, 101½ per cent.

Barley.—Area sown, 501,740 acres. Decrease compared with last year, 55,850 acres. Condition, 98 per cent.

Rye.—Area sown, 103,680 acres. Condition of crop, 93 per cent.

Flax.—Area sown, 108,850 acres. Condition of the crop, 78 per cent.

Potatoes.—Area planted, 149,680 acres. Condition, 107 per cent.

Cultivated Hay.—The present area of timothy and clover meadows, millet, etc., is estimated to be 2,548,910 acres. The condition of meadows is 93 per cent.

Pastures.—The condition of pastures June 1st was rated 97 per cent. The acreage in pastures last year was reported by assessors to be 7,460,920 acres. It is probable there has been an increase within the past two years in the area devoted to pasturage, but reliable figures as to that class of lands are difficult to obtain. The state census taken in 1895 placed the acreage at 8,104,230 acres. The correct figures are probably considerably above that amount, if all the lands devoted to grazing are included in the estimate.

Prairie Hay.—Area cut for prairie hay, as shown by assessors' returns, 1,198,340.

Condition of Fruit.—According to figures compiled by Secretary Wesley Greene, of the State Horticultural society, the condition of fruit June 1st was as follows: Apples, 81 per cent; pears, 43; plums, 77; cherries, 58; peaches, 50; grapes, 42; red raspberries, 36; black raspberries, 49; blackberries, 31; strawberries, 63.

Condition of Live Stock.—Cattle, 102; sheep, 99; hogs, 98; spring pig crop, 80; horses, 97; foals, 96 per cent.

Corn in Farmers' Hands.—The crop reporters estimate the amount of corn in the hands of farmers June 1st at 15 per cent of last year's crop, or a total of about 45,000,000 bushels. This would show an average reserve of only 225 bushels per farm.

According to reporters' estimates, the season is about five days earlier than the average of the past decade.

CLIMATE AND CROP CONDITIONS IN MAY.

The weather conditions throughout the larger part of May were very nearly perfect for progress in farm operations and for the germination of seed and normal growth of all crops. The average temperature for the state was about 3.5° above normal. The average rainfall for the state was a little below normal for May, but there was sufficient moisture in the larger part of the state for the needs of vegetation. The coldest weather occurred from the 3d to 5th, and reports of frosts and formation of ice were received from stations in all sections. Fortunately fruits and vegetation generally were not sufficiently advanced to suffer serious injury by the low temperature, and the aggregate damage was quite small. The first week was very favorable for plowing, and a fair beginning was made in planting corn and potatoes, but the weather was not sufficiently warm to excite much activity in that line. The week closed with copious and well distributed showers, which were needed to quicken germination and facilitate plowing. From the 7th to the 14th there was an average daily excess of temperature ranging from 4° to 8°, with brisk winds and more than the average percentage of sunshine. The weather during that week was favorable for planting, and by the middle of the month a very large part of the corn acreage had been planted, with the soil in excellent tilth to insure normal germination. The third week was somewhat cooler than usual, with an excess of cloudiness and frequent showers that retarded farm work in the larger part of the state, the weather conditions being more favorable for grass and small grain than for field work. The balance of the month was warmer than usual, with light and scattered showers, affording good conditions for finishing planting and beginning cultivation in early planted fields. The time was well improved, and on the last day of May the condition of all crops was generally satisfactory, giving promise of a highly productive season.

IOWA CROPS, 1900—NUMBER OF ACRES BY COUNTIES.

COUNTIES.	Winter wheat, acres.	Spring wheat, acres.	Corn, acres.	Oats, acres.	Rye, acres.	Barley, acres.	Flax, acres.	Potatoes, acres.	Tame hay, acres.
Adair	.....	11,180	100,530	43,940	.....	350	.....	1,680	27,110
Adams	1,980	7,840	71,320	23,020	150	170	.....	880	22,920
Allamakee	1,800	4,870	51,360	41,980	450	5,770	350	1,610	34,880
Appanoose	1,330	.....	44,890	10,590	320	.....	.....	510	40,790
Audubon	.....	19,520	89,640	36,240	.....	3,230	.....	1,180	15,070
Benton	.....	2,810	121,940	70,790	720	13,410	.....	1,750	38,430
Black Hawk	.....	560	94,810	58,450	2,780	6,070	.....	1,590	30,640
Boone	.....	7,760	108,650	51,250	1,140	820	.....	1,340	16,520
Bremer	.....	830	62,550	51,590	830	2,350	.....	1,370	21,030
Buchanan	.....	610	86,320	47,170	1,060	3,010	.....	1,480	34,350
Buena Vista	.....	17,410	112,160	57,930	520	7,480	1,140	2,050	15,840
Butler	.....	5,310	99,150	68,580	2,130	4,320	810	1,390	19,380
Calhoun	.....	15,320	104,610	50,710	1,230	3,960	1,080	1,310	10,840
Carroll	.....	25,520	120,820	54,210	780	3,530	240	2,120	16,220
Cass	.....	26,640	108,780	39,010	.....	410	.....	2,920	23,180
Cedar	1,140	850	101,650	42,350	1,060	6,230	.....	1,140	47,040
Cerro Gordo	.....	5,930	87,110	66,510	1,310	7,450	3,820	1,530	21,970
Cherokee	.....	38,480	107,280	49,960	210	8,750	320	1,540	16,840
Chickasaw	.....	2,420	57,180	60,810	460	4,230	6,180	1,570	29,490
Clarke	820	270	58,330	19,490	820	.....	.....	880	35,450
Clay	.....	14,840	80,440	43,960	1,210	19,290	2,060	1,240	14,530
Clayton	1,440	5,280	76,060	60,180	2,750	4,080	.....	1,930	37,530
Clinton	1,210	1,620	118,370	56,580	2,410	1,870	.....	1,580	48,560
Crawford	.....	50,180	124,290	42,550	460	4,140	.....	1,960	23,610
Dallas	2,320	6,360	91,130	32,260	570	780	.....	1,070	20,310
Davis	3,890	.....	60,880	17,730	750	.....	.....	490	44,120
Decatur	4,710	220	65,650	17,610	490	.....	.....	790	40,890
Delaware	.....	950	90,930	47,430	840	4,820	.....	1,490	36,820
Des Moines	3,220	280	55,270	30,190	830	.....	.....	1,610	18,910
Dickinson	.....	21,090	30,280	23,890	1,210	15,610	6,710	650	5,960
Dubuque	.....	530	65,720	51,860	4,060	1,780	.....	2,350	36,910
Emmet	.....	22,780	39,710	22,490	480	10,110	5,310	480	6,890
Fayette	.....	3,040	89,220	62,630	1,680	6,690	1,790	1,920	47,370
Floyd	.....	3,360	81,430	68,740	1,760	4,780	3,160	2,510	20,470
Franklin	.....	8,810	100,230	76,780	830	3,420	2,730	1,280	18,200
Fremont	2,680	9,620	109,330	11,710	210	720	.....	630	11,840
Greene	.....	5,090	103,680	54,030	650	2,480	370	1,230	15,520
Grundy	.....	6,760	96,570	60,450	760	12,360	240	2,030	22,590
Guthrie	540	13,660	97,430	45,210	570	1,470	.....	1,420	26,180
Hamilton	.....	9,150	105,140	56,020	230	1,690	340	1,280	18,080
Hancock	.....	20,270	72,440	63,960	1,640	9,830	6,730	1,190	15,180
Hardin	.....	11,450	92,150	57,490	420	2,750	.....	1,260	20,990
Harrison	.....	40,920	104,710	15,180	920	770	.....	1,490	9,490
Henry	2,320	110	71,010	27,850	890	210	.....	950	24,310
Howard	.....	3,320	51,490	52,820	230	7,380	6,340	1,120	34,100
Humboldt	.....	24,500	63,730	31,410	210	2,580	1,910	890	11,660
Ida	.....	21,550	102,910	35,910	190	4,220	.....	1,150	19,820
Iowa	.....	1,390	87,470	40,780	2,170	3,590	.....	1,230	37,750
Jackson	940	1,160	76,090	43,230	6,170	1,510	.....	1,640	40,210
Jasper	570	14,050	117,060	46,150	580	1,180	.....	6,080	34,830
Jefferson	1,420	260	57,640	23,280	1,310	.....	.....	760	34,860
Johnson	1,640	1,290	99,540	47,610	3,440	1,820	.....	1,550	43,080
Jones	.....	760	82,580	30,770	2,350	1,420	.....	1,070	42,030
Keokuk	2,130	1,130	97,270	41,320	1,610	870	.....	1,410	40,150
Kossuth	.....	45,730	114,910	76,840	530	14,060	7,910	2,980	14,960
Lee	6,180	.....	49,410	14,920	1,240	.....	.....	1,240	32,910
Linn	.....	1,170	105,260	50,430	2,530	1,890	.....	2,120	42,580
Louisa	1,810	450	57,140	24,420	1,450	.....	.....	590	18,760
Lucas	1,130	.....	51,760	17,580	780	.....	.....	570	40,800
Lyon	.....	85,760	59,380	35,630	610	45,180	810	1,520	5,630
Madison	1,660	7,120	84,630	25,930	1,230	890	.....	1,210	35,270
Mahaska	2,640	2,510	87,320	32,370	980	1,140	.....	1,670	30,900
Marion	2,410	6,420	91,360	30,110	1,210	810	.....	1,680	23,980
Marshall	.....	16,850	98,820	48,320	320	1,670	.....	1,760	30,730
Mills	910	17,370	99,180	14,510	190	260	.....	1,210	16,990
Mitchell	.....	5,860	55,440	49,770	910	14,250	9,620	1,980	33,620
Monona	.....	31,280	119,910	14,040	820	4,510	.....	1,130	7,710
Monroe	1,820	180	44,950	10,760	520	.....	.....	490	29,680
Montgomery	2,140	18,160	97,780	16,880	270	.....	.....	1,010	16,160
Muscatine	1,580	1,620	63,320	25,520	1,710	3,780	.....	1,820	22,940
O'Brien	.....	35,910	92,920	45,340	.....	35,710	1,050	1,350	12,340
Osceola	.....	33,290	43,710	26,710	350	4,320	.....	890	7,930
Page	4,140	12,580	124,790	22,510	910	720	.....	1,320	28,110
Palo Alto	.....	11,870	68,510	49,690	680	6,360	3,980	1,030	6,250
Plymouth	.....	102,210	129,830	43,550	540	9,210	370	2,210	10,150
Pocahontas	.....	14,530	91,670	52,740	820	7,080	4,950	2,090	9,470
Polk	240	14,940	102,860	33,240	510	210	.....	3,450	21,350
Pottawattamie	.....	63,050	217,430	39,020	930	960	.....	3,830	28,080
Poweshiek	240	3,390	107,290	48,970	610	3,350	.....	1,270	39,380
Ringgold	1,150	210	91,360	26,590	150	340	.....	970	40,610
Sac	.....	17,530	120,740	45,140	660	6,810	570	1,280	20,170
Scott	3,040	7,390	71,690	24,930	1,900	23,980	.....	5,410	25,730
Shelby	.....	46,540	123,970	30,440	530	5,620	.....	1,880	23,650
Sioux	.....	103,610	110,280	58,420	460	27,520	490	1,270	6,120
Story	.....	5,890	105,760	48,260	860	840	.....	1,150	21,130
Tama	.....	11,830	115,380	52,480	710	27,480	.....	1,690	32,020
Taylor	2,230	420	87,960.	23,140	570	560	.....	1,810	35,020
Union	220	570	61,310	24,990	520	280	.....	930	34,220
Van Buren	2,010	140	36,240	15,910	930	.....	.....	580	40,160
Wapello	1,940	.....	58,610	20,830	890	.....	.....	910	31,620
Warren	450	7,130	87,760	28,730	1,030	330	.....	1,760	34,410
Washington	980	360	90,020	40,890	1,680	460	.....	950	40,260
Wayne	660	1,850	43,730	14,580	340	.....	.....	930	50,410
Webster	.....	13,560	116,060	60,950	1,220	4,830	1,790	1,350	12,480
Winnebago	.....	26,650	44,060	36,440	180	3,360	3,370	940	9,850
Winneshiek	370	9,490	71,710	64,110	8,150	10,280	8,930	1,370	40,910
Woodbury	.....	82,190	147,450	31,180	720	4,910	350	1,940	8,860
Worth	.....	6,980	38,320	47,980	270	7,150	9,210	1,130	16,560
Wright	.....	16,050	86,740	58,080	410	4,890	3,750	1,180	13,750
Totals for state	76,080	1,416,550	8,618,660	3,991,690	103 680	501,740	108,850	149,680	2,548,910

NOTE AND COMMENT.

has been well said that corn brings the best price when lriven to market, or carried in a butter tub.

* * *

ıring the volcanic eruption in the Hawaiian islands last ıer, the smoke rose to a height of between five and six , and then drifted away to the northeast. At a distance 0 miles from Hawaii it settled upon the surface of the sea, was then carried back by the northeast wind to its place igin, where it arrived a fortnight after its original depart- and covered the entire group of islands with its heavy —*Philadelphia Times.*

* * *

n the evening of May 25th Mr. Martin Wilde, a farmer g five miles west of Forest City, was instantly killed by tning.

* * *

ın the afternoon of May 28th a phenomenal local storm loped suddenly, and was first observed about 2 o'clock a t distance northeast and east of the central station. A erate wind from southwest and west had been blowing ng the day. The clouds were very dark in the north and with vivid lightning, and reports of distant thunder were rd in that direction. Suddenly the wind shifted to the and the mass of clouds moved rapidly over the city, bring- a very heavy downpour of rain. The total amount regis- d was 1.40 inches, of which amount 1.20 inches fell in 22 utes and .56 of an inch in 5 minutes. The storm then ved from this station to the eastward, and reports show siderable amounts of rain at stations in some of the cen- l counties. The peculiarity of the storm was its sudden elopment without the usual appearance of large clouds in west or southwest, and the fact that it came upon this tion from the eastward with the force of a brisk summer ıall.

* * *

The most prodigious fall of snow in the mountains corded of late occurred at Ruby, a coal camp in Gunnison unty, Colorado, during the winter of three years ago. In e month's time 239 inches fell, and during the winter 780.5 ches, or sixty-five feet, were precipitated. This latter ıount means 93.21 inches of water.—*Ainslee's Magazine.*

* * *

A very heavy thunderstorm passed over Fort Dodge on the ening of May 29th, and serious damage was caused by light- ng. The residence of Thomas Ferguson was struck and iss Jennie Ferguson was severely shocked, while another ıughter in an adjoining room was shocked and a lamp ctinguished. The house was badly damaged. The same bolt ırned out the generator and wires at the power house of the ight and Power company, which caused a loss of over $5,000.

* * *

Professor Jaffa, of the University of California, has pre- ared a chart showing the chemical substances abstracted om the soil by different crops. A crop of 16 tons of beets rown on an acre of ground would draw from the soil 193½ ounds of potash; 112 pounds of lime; 58 pounds of phosphoric cid and 86¼ pounds of nitrogen. Of these amounts the eaves contain 167½ pounds of potash; 104 pounds of lime; 40 ounds of phosphoric acid and 66½ pounds of nitrogen. By eturning the tops to the soil the greater part of the loss is estored. A comparison shows that alfalfa extracts much nore of these substances than beets extract, exclusive of tops, ınd so of potatoes.

During a severe thunderstorm on the night of May 31st, lightning struck the Catholic church at Vincent, in Webster county, and burned it to the ground. Loss about $2,500.

* * *

On May 14th William Kleeman, a farm hand employed in Richland township, Franklin county, was killed by lightning. He was in a barn which was struck; and his employer was stunned by the same discharge, but revived. A barn that is not well protected by rods is not a safe place of shelter during a thunderstorm, though probably safer than the shelter of a tree or exposure in an open field.

* * *

A Washington press special, of the 13th inst., says: Realizing the great value of the storm warnings of the Weather Bureau in the saving of life and property, the Secretary of Agriculture has adopted an improved method of issuing warning signals from marine ports. With the co-operation of several important manufacturing establishments, a new iron storm-warning tower has been constructed. Near the top of the tower are two powerful lamps, and above the lamps is the flagstaff from which day signals are to be displayed. The old inferior marine lantern, displayed from wooden staffs, will be discarded. These new signal towers will be distributed as equally as possible between the lake and sea ports, as only one-half of the service can be equipped this year.

* * *

A Dubuque special says Frank Besler, who liver near Dyersville, was struck by lightning on the morning of the 14th. He was harrowing in the field. The team was killed, but Mr. Besler may recover.

* * *

An umbrella trust has been formed, and of course its stock will be watered.

* * *

Thirty-five years ago the farmers of our country sowed every year over 1,000,000 acres of buckwheat. Since then the crop has sometimes been larger, sometimes smaller, but, on the whole, the acreage and yield have been almost steadily decreasing. In 1898 the acreage was 678,332, only a little more than half that of thirty-five years ago, and the yield was only 11,700,000 bushels, which was just about one-half the yield at the close of the civil war. No explanation of this great decline in buckwheat raising has been made. It is probable, however, that the unreliability of the crop, which is sometimes large and sometimes small, without any apparent reason for the variation, has discouraged a great many farmers. Another reason for the decline may be the larger use within the past few years of cereal preparations, especially wheat, all of which come under the general designation of hygienic foods. These preparations have probably won many persons from their allegiance to buckwheat cakes.—*N. Y. Sun.*

* * *

The Brooklyn *Chronicle* of May 25th says: "The farmers in the vicinity of Grinnell last week delivered to buyers in that town 25,000 pounds of wool, for which they received 22 cents per pound. Last year they received 17 cents for wool, and the year before 12 cents."

* * *

Sac City has a canning factory, and contracts have been made with farmers in that vicinity to raise about 800 acres of sweet corn. The corn will bring from $10 to $12 per acre, and the producer has the fodder which is worth about enough to pay for the labor of producing the crop. It is an excellent soiling crop for milch cows, and it is ready to feed at the time when pastures are usually short.

As the result of twenty-nine years of experiments at Rothamsted, England, it is shown that in the winter months more than half of the amount of rain that falls penetrates into the soil and becomes available for the supply of springs, while in the summer only one quarter of the rainfall is absorbed by the soil. In this country, and especially in Iowa, a similar result would not be obtained from like experiments. Here the soil is frozen and impervious a considerable portion of the winter months, while in England there is alternate freezing and thawing, with conditions favoring absorption of moisture by the soil. And in that country the heavy clay loam becomes impacted and less receptive of rainfall in summer months. By the process of cultivation the soil in Iowa is made porous and receptive of moisture, so that a much larger percentage of the copious spring rains penetrate the earth and help to carry our prodigious crops through the hot and dry period of midsummer.

* * *

A wind squall, with a velocity of 40 to 50 miles per hour, does not seriously injure sound and healthy trees or substantial buildings; but it plays havoc with the weaklings of the orchards and groves, and the frail structures of man's construction. There is a survival of the fittest amid the ordinary storms and tempests of the year.

BENEFITS AND INJURIES DUE TO STORMS.

We hope that some one will have the patience to make out a balance sheet showing the good and evil done by storms throughout the whole United States. We notice that one of the severest storms, most disastrous in the Eastern States, is said to have been of untold benefit to the ranges of New Mexico and Colorado. The large amount of snow that falls in the mountains may avert a water famine during the coming summer. Again, we often notice that the winds which bring heavy rains to the Pacific coast bring droughts to the interior, and the winds that destroy vessels on the Atlantic coast bring rains to the interior of the Atlantic states. The cold waves that injure the vegetation of the Gulf States dissipate the yellow fever. No matter how much man complains of the weather, it would seem after all to be very satisfactory to the human race in general; it would seem to be a case where man grumbles at the blessings that are showered upon him, and we believe that a careful review of every aspect of the question would tend to make us better content with existing arrangements. Every newspaper paragraph enumerating the injury done by a storm should be paralleled by one enumerating its blessings.

A certain snowstorm is said to have cost the Chicago & Alton Railway company over $25,000; the wages paid to the snow shovelers, the diminution of freight and passenger business, the extra cost of handling traffic, the spoiling of delicate freight, the double heading of engines, the expense of the snow plows and all counted as a loss to the railroad; but the farmer welcomes the snow for the good it does to the crops in ground, and the railroad will doubtless find its losses in the winter more than balanced by its gain in business during the summer.—*Monthly Review U. S. Weather Bureau.*

DIMINUTION OF STREAM FLOW.

The watershed of Rock river, in northern Illinois, will soon be the subject of an investigation by the Division of Forestry, in order to determine the cause of the diminution of the stream. This is supposed to be due to the denudation of the forests along its headwaters and to excessive artificial drainage for commercial and agricultural purposes. The decrease in volume of water has become alarming and, in response to the agitation of citizens in that locality, their representative in congress, Hon. R. R. Hitt, has applied to the secretary of agriculture for an investigation. G. Fred. Schwarz, field assistant in the division, will proceed to Rock river in a short time to study the conditions and report what action he finds advisable.—*The Forester.*

There is nothing singular or exceptional in the diminution of the Rock river, that it should be made the subject of a special investigation, and it would therefore be well to extend the scope of scientific inquiry to include numerous other tributaries of the upper Mississippi, that show a similar decrease in volume. In matter of fact, all of the minor streams that have their source within and flow through the cultivated lands of this valley, show a steady decrease in volume since the era of the first settlement of this region. Quite likely a thorough investigation by a competent scientist will result in the conclusion that the diminution of these streams has not been caused by the denudation of the forests along their headwaters, for the reason that the said forests were notably absent in the greater part of the area through which the streams flow. The scientist will also determine from the records that the decrease in the volume of water has not been caused by a change of climate, or a gradual diminution in the amount of the annual and seasonal rainfall in this region.

The most tenable theory relating to this matter is that the decrease in flowage of streams and the gradual drying up of sloughs and shallow lakes in recent years, resulted from breaking up the impacted and almost impervious surface of the divides, the deep tillage of the soil, and the production of immense crops of cereals and grasses in place of the scant herbage of the original prairies. There is no forest floor that will absorb and retain more rainfall than the well-tilled grain fields of this valley. But the growing crops in midsummer use up and emit in form of vapor a larger percentage of soil moisture than would be consumed by forests.

THE SOLAR ECLIPSE, MAY 28.

The total eclipse of the sun on the morning of May 28th was one of the most noted astronomical events of the 19th century. In fact, from the scientific standpoint it may be regarded as the most important event of the century, occurring as it did under conditions so highly favorable for accurate observation of all the phenomena connected therewith. The weather was all that could be desired at every point within the belt of totality where parties of scientists were stationed with instruments for taking observations. A large amount of money had been appropriated, and elaborate preparations were made in advance to secure the best possible results for the benefit of science. Reports of the observations made under such favorable conditions will be awaited with much interest by the general public.

The following press dispatch from Denver indicates that at least one of the astronomical observers made a somewhat unlooked for discovery. The dispatch said:

While Prof H. A. Howe was waiting about 2 o'clock in the Chamberlain observatory for the sun to rise and the eclipse to begin he made one of the most important observations of the year, the rediscovery of the planet Eros. This small planet, which was discovered only two years ago at the Berlin observatory, has been looked for since last September, the time when, according to calculations, it should emerge from behind the sun. Astronomers all over the world have been scanning the skies for it, but without success. Professor Howe discovered the planet near the first point of Aries. Eros is the smallest of all planets, and the nearest in all the heavens to the earth. By this planet the distance of the earth from the

and a great many other abstruse and important calcula-
s can now be made with a degree of accuracy never before
ined.

WHAT A CLOUDBURST IS.

[T. C. Knowles in Ainslee's Magazine.]

"The most destructive form of mountain storm is the
alled cloudburst, when the rippling brook suddenly
omes a roaring river, carrying death and destruction in its
h. The noise made by a cloudburst has no parallel.
ove the rumble and roar of a mass of rushing water is
rd a grinding, groaning sound of falling trees, of slipping
th and rolling boulders, while the banks of the stream far
ove the danger line tremble as if in an earthquake. The
ses are numbed by the awful cataclysm, and it seems to the
ctator, although he is on the high banks and out of actual
nger, as if the very foundations of the earth had burst and
dgment Day was come. The flood tosses about mighty
es and rocks as if they were straws, the banks of the
eam seem to dissolve before his eyes, and a feeling of awe
the irresistible power of nature steals over the observer.
ce witnessed, a cloudburst is never forgotten.

"In point of fact, however, there is no such thing as the
rsting of a cloud. The term 'cloudburst' is a convenient
xpression by which the result of a very heavy rain is desig-
ted. Nearly all the surface of the earth in the mountain
gion is made up either of rocks or adobe soil. The latter,
most cases, has never been broken to cultivation, and is
most impervious to a sudden heavy downpour of rain. The
onsequence is that the mountains are cut up with arroyos,
ullies and water courses, and in the course of unnumbered
ges into mighty canyons which astound the tourist. In an
nusually heavy rainfall, the great mass of water spread over
large area, instead of sinking into the ground, is quickly
ccumulated in the beds of the streams, which rise many feet
n a short time. When this accumulation is rapid enough, and
he 'lay of the land' is just right, the water rushes down the
ed of the stream in a solid wall, and is called a cloudburst.
The same precipitation in an open country, or in one in which
the soil has been broken up by cultivation, would be called a
heavy rainfall, and would do no damage unless continued long
enough for the streams to rise out of their banks and flood the
country.

"One of the most destructive storms of this nature, so far
as its manifold consequences are concerned, took place in the
spring of 1864, when a cloudburst occurred at the headwaters
of Cherry creek. This is a small stream, dry most of the year,
but notorious for its eccentricities. It flows through Denver
and empties into the Platte river, within the confines of the
city. Just at nightfall the water swept down this dry creek
in a wall said to have been ten feet in height, carrying every-
thing before it. Many people were drowned, and many build-
ings were washed away. All night long the creek flowed
bank-full of water that was thick with wreckage. People
were rescued during the night on rafts and improvised boats.
The most serious loss was the city hall, which was swept
away by the water, together with all the records on file there.
These records included not only those of the state and city,
but also the United States land filings. The flood was followed
by an era of land-jumping, and a good many of the present
fortunes in Denver date from that event. The safe of the city
hall was never found, although some relics of the flood,
including a portion of the press of the *Rocky Mountain News*,
are now in the rooms of the State Historical Society."

BIG ARTESIAN WELL.

[Belle Plaine Union.]

The five-inch artesian well which T. F. Prill has been drill-
ing for Walter Thomas on his sixty-acre garden, just south of
the river, was completed last Wednesday, the water spouting
up to a height of nine feet above the ground. It pours forth
3,700 gallons of water per minute and throws up large quanti-
ties of sand and gravel, and stones weighing from two to four
pounds The sound of the water roaring through the pipe
could be heard a mile away. Some difficulty was experienced
in putting on the gate valve, which, though it weighs 150
pounds, was not easily put in place against the force of the
water. The well is 162 feet deep, and goes through, first, six
feet of soil and clay, then thirty-eight feet of sand, and the
rest of the way, 118 feet, is through blue clay. Mr. Thomas
will use the water to irrigate his garden in dry seasons.

FIRST BLOOM OF FRUIT TREES.

Secretary Greene, of the State Horticultural society, has
compiled some interesting data as to the first bloom of fruit
trees this season. By "first bloom" is meant the opening of
one-fourth of the flowers. We copy his report below:

In tracing the first bloom of the Oldenburg across the state
it was about as follows:

April 26th and 27th.—Lee, Van Buren, Jefferson, Davis, Wap-
ello, Appanoose, Marion and Mills counties.

April 28th and 29th.—Des Moines, Louisa, Muscatine, Mahaska,
Polk, Dallas, Page, Fremont, Pottawattamie, Harrison and
Monona counties.

April 30th, May 1st.—Scott, Linn, Johnson, Iowa, Benton,
Tama, Poweshiek, Monroe, Lucas, Clarke, Adams, Shelby,
Greene, Carroll and Woodbury counties.

May 2d and 3d.—Allamakee, Clayton, Dubuque, Black Hawk,
Grundy, Kossuth, Plymouth, Sioux and Lyon counties.

May 5th and 6th.—Fayette, Howard, Winnebago, Clay and
Dickinson counties. The Whitney bloomed about one day
earlier than Oldenburg. The English Morello cherry and
native plums bloom at the same time as the Oldenburg. Japanese
and European plums and the Early Richmond cherry bloom
three days before the Oldenburg.

An average increase of one degree in temperature seems to
advance the time of blooming about one day. The mean tem-
perature of April, 1899, was 48.7°, in 1900 it was 52.2°,
or 2.5° warmer than last year, and the bloom as reported
this year shows an advance of three to five days.

CLIMATOLOGY OF THE MONTH.

Barometer.—The mean pressure for May was 29.95 inches.
The highest barometric reading was 30.36 inches at Sioux City,
Cresco and Clarinda, on the 9th; lowest, 29.60 inches at Omaha,
Neb., on the 12th; range for the state, .76.

Temperature.—The mean temperature, as deduced from
records of 121 stations, was 63.2°, which is about 2.5° above the
normal for May. Villisca reported 66.8°, which is the highest
monthly mean for the state; lowest mean, 59.8° at Estherville.
The highest temperature reported was 98°, on the 23d, at
Toledo; lowest temperature, 22°, at Sibley, on the 3d. By sec-
tions, the means were as follows: Northern section, 62.5°; cen-
tral section, 63.7°; southern section, 64.4°. The average
monthly maximum was 90.2°; average monthly minimum, 29.8°;
greatest monthly range, 46°, at Mooar; average of greatest
daily ranges, 37.5°.

Precipitation.—The average amount of rainfall for the state, as determined from records of 143 stations, was 3.31 inches, which is about .66 of an inch below normal. By sections, the average amounts were as follows: Northern section, 2.72 inches; central section, 3.32, southern section, 3:90 inches. The greatest amount reported was 6.98 inches, at Maquokata; least amount, .96 of an inch, at Le Mars. The greatest daily amount was 4 30 inches, at Larrabee, on the 31st. Average number of days on which .01 inch or more of precipitation was reported was 8.

Wind and Weather.—Prevailing direction, southwest; highest velocity reported, 53 miles per hour, from northwest, on the 31st, at Sioux City. There were 14 clear days, 10 partly cloudy, and 7 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.94	30.29	9	29.70	2
Des Moines	29.96	30.32	9	29.74	12
Clarinda	29.97	30.36	9	29.68	6
Cresco	.....	30.36	9	29.74	1
Dubuque	29.96	30.29	9	29.68	2
Omaha, Neb	29.91	30.31	9	29.60	12
Keokuk	29.95	30.29	9	29.74	7
Sioux City	29.97	30.36	9	29.62	13
Means	29.95	30.36	9	29.60	12

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	4,827	26	NW	14
Des Moines	6,078	36	SW	11
Dubuque	5,180	30	N	9
Keokuk	4,939	25	SW	6
La Crosse, Wis	4,341	30	SE	14
Omaha, Neb	6,107	32	N	2
Sioux City	9,099	53	NW	31

BELATED REPORTS.

BURLINGTON—April. Mean temperature, 55 4°; highest, 83°, on the 7th and 29th; lowest, 27°, on the 12th; total precipitation, 3.78 inches; greatest in 24 hours, 2.68 inches, on the 17th; number of rainy days, 8. Total snowfall, trace.

CARSON—April. Total precipitation, 2.22 inches; greatest in 24 hours, 1.08 inches, on the 16th; number of rainy days, 5.

ERRATA FOR MARCH.

MT. VERNON—The total precipitation, recorded on pages 8 and 12, should have been omitted, as the record was not complete.

COUNCIL BLUFFS—The total precipitation, recorded on pages 9 and 12, should have been omitted, as the record is not considered complete.

PRIMGHAR—Total precipitation of 4 inches, recorded on pages 8 and 12, should have been 4.13 inches.

ERRATA IN APRIL REVIEW.

MT. AYR—Mean minimum temperature, recorded 42° on page 11, should have been 42 3°. Mean temperature, recorded 54.2° on page 9, should have been 54.4°.

ONAWA—Minimum temperature, recorded 26° on the 12th and 13th, on page 8, should have been 20°, on the 11th.

OSCEOLA—Mean maximum temperature, recorded 65.8° on page 11, should have been 65.5°.

OTTUMWA—Maximum temperature, recorded 80° on the 27th on page 9, should have been 83°, on the 29th.

PRIMGHAR—Mean temperature, recorded 53.4° on page 8, should have been 53.3°.

VINTON—Precipitation data, recorded on page 13, should not have been used; considered incorrect.

WILTON JUNCTION—Total snowfall, recorded trace on page 8, should have been 5 inches.

CEDAR FALLS—Total precipitation, recorded 2.95 inches on pages 8 and 12, should have been 2.5 inches.

DOWS—Mean temperature, recorded 51.9° on page 8, should have been 51.4°.

ESTHERVILLE—Total precipitation, recorded 1.71 inches on page 8, should have been 2.06 inches.

INDEPENDENCE—Mean temperature, recorded 50° on page 8, should have been 50.1°.

INDIANOLA—Mean temperature, recorded 54.8° on page 9, should have been 55°.

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* On 13th, heavy thunderstorm, heavy rain, wind and hail; 31st, very heavy rain.

AMANA—*Conrad Schadt.* Hailstorm on 28th caused considerable damage to crops along the northern line of Iowa and Johnson, and southern line of Benton and Linn counties.

AMES (near)—*Isaac Young.* On the 6th my barn was struck by lightning, the bolt going down a rafter and post into the ground, passing within four feet of a horse, and seven others near by, without injury to an animal.

BANCROFT—*E. G. Batley.* On morning of 3d ice formed one-half inch thick, and plums were destroyed. Corn planting began in earnest on the 9th.

BEDFORD—*E. H. Griffin.* On the 30th 1.56 inches of rain fell in less than one hour. There was but little wind.

BONAPARTE—*Hon. B. R. Vale.* A very seasonable month; rainfall sufficient and well distributed; no severe storms; farm work and crops fully a month earlier than last year in this corner of Iowa.

CLINTON—*Dr. Luke Roberts,* May was above normal in temperature and rainfall. Storms were mild and the ground received the full benefit Mississippi river low.

COON RAPIDS—*Downs & Co.* Corn well up and a good stand; pastures in the best of condition and stock doing well.

DOWS—*A. C. Fuller.* Thunderstorm on the night of the 6th, from southwest; on the afternoon of 14th, from southwest; on night of 31st, from the northwest.

ELDON—*T. Madden.* Thunderstorms on following dates: 6th, in morning; 7th, morning and evening; 14th, in evening; 15th, in evening; 28th, in evening.

ELKADOR—*Chas. Reinecke.* Thunderstorms on 7th, 11th, 14th, 27th and 28th.

FAYETTE—*R. S. Latimer.* Frost observed on mornings of 3d, 4th, 5th, 9th, 10th and 20th, but no serious damage resulted. Thunderstorms on 7th, 14th, 25th and 28th.

FONDA—*H. P. Barron.* Corn is two weeks ahead of average; small grain rank; pastures good.

FOREST CITY—*J. A. Peters.* Very dry month; June grass headed and 4 to 6 inches high; rainfall 1.25 inches below normal; crops suffered from shortage of moisture.

GUTHRIE CENTER—*Clem. Holden.* Month very warm; fruit and grain crops look fine.

HARLAN—*C. A. Reynolds.* On the 3d a hard frost, but not much damage. Mean temperature of the month, 3° warmer than last year; monthly range, 11° greater; rainfall, 1.3 inches less.

HOPRIG—*O. N. Young.* Very dry; good stand of corn in early planting; late planting too dry to germinate quickly.

COSAUQUA—*John H. Landes.* May was a model month in section; field crops and fruit never more promising.

ARRABEE—*H. B. Strever.* A destructive hailstorm on night 1st, at 8:40 o'clock, formed about one and one-half miles t-southwest of station and traveled east-northeast. The h of destruction was a mile wide and crops were badly dam- d; drifts of unmelted hail were found on second day after storm.

LE MARS—*T. E. Cole.* Heavy wind, thunder and lightning 11st, at 8 o'clock P. M.

LOGAN—*Mrs. M. B. Stern.* Month remarkable for changes n hot to cold, but all crops are doing well so far.

MT. VERNON—*Jos. W. Hubbard.* Temperature above nor- l, 4.7°; precipitation below normal, .45 of an inch; observa- ns eleven years.

OLIN—*Nathan Potter.* Heavy thunder on night of 6th-7th; thunderstorm on night of 14th; eclipse of sun, on morning of 28th, visible, though somewhat cloudy.

OVID—*H. C. Miller.* Large acreage of oats and corn got in early and a good stand; good prospect for fruit.

RIDGEWAY—*Arthur Betts.* Warmest May in three years; 336 hours of sunshine. Heavy thunder gales on 13th and 14th.

STORM LAKE—*Prof. M. F. Fuller.* Month unusually fair and dry; but three drier Mays on record, viz.: In 1884, with 1.12 inches; 1894, with 1.24 inches, and 1897, with 1 29 inches; normal from records of seventeen years, 3.62 inches.

WEST BEND—*Ph. Dorweiler.* Ample supply of rain came at end of month, following a dry period.

CLIMATOLOGICAL DATA FOR MAY, 1900.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIPITATION, INCHES.				Number rainy days	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
Algona*	Kossuth	1,500	7	64.1	+5.7	92	27	41	2	....	1.04	-2.56	.40	....	5	8	18	5	SE
Alta	Buena Vista	1,519	8	62.8	+5.2	91	11	27	3	34	3.00	-1.22	1.63	....	8	16	9	6	S,SW
Alta (near)	Buena Vista	....	..	....	....	....	.....	.....	.....	.....	2 50	.....	1.39	.....	7	...	...	...	.....
Bancroft	Kossuth	....	....	61.3	....	91	27	25	3	38	1.15	.....	.43	.....	5	20	1	10	S
Britt	Hancock	1,230	..	61.3	....	93	27	25	3	40	2 99	.....	2.13	.....	7	12	18	1	SW
Charles City	Floyd	1,012	8	62 4	+5.1	90	27	29	3, 5	41	2 87	- .90	2.06	.....	5	15	11	5	SE
Clear Lake	Cerro Gordo	984	..	62.8	...	93	27	28	3	40	3 30	.....	2.00	....	4	18	10	3	SW
Cresco	Howard	1,280	27	60.6	+4.1	88	27	26	3	41	4.72	+1.15	2.34	.....	7	20	3	8	NW
Decorah	Winneshiek	900	6	61.5	+1.7	89	13	30	3	45	3 34	+ .14	1.74	.....	7	....	....	....	.....
Dows	Wright	....	....	62.2	..	90	27	25	3	38	4.75	.....	1.91	....	7	18	9	4	S
Elkader	Clayton	.....	18	63.4	+2.8	94	27	29	5	43	4.13	+ .42	1.95	.....	9	18	8	5	NW
Emmetsburg	Palo Alto	....	..	.....	.....	....	.....	.....	.....	..	2.52	.....	1.31	.....	4	....	....	....	.....
Estherville	Emmet	....	....	59 8	....	92	27	28	3	37	2.06	.....	.66	.....	5	11	18	2	S
Fayette	Fayette	1,000	9	61.3	+4.5	90	27	26	5	42	1.95	-2.03	.96	.....	7	15	7	9	NW
Fonda	Pocahontas	1,237	..	64.2	....	93	27	26	2	34	4.73	....	1 31	.....	8	....	....	....	SW
Forest City	Winnebago	1,220	....	62 0	.....	89	27	26	3	42	2.47	.....	1.28	.....	5	19	5	7	W
Grand Meadow*	Clayton	....	8	60 8	+3.3	86	13	34	4	.....	2.53	-1.68	1.05	.....	8	10	16	5	SW
Greene	Butler	943	....	63.4	....	93	27	31	5	42	1.26	.....	.70	....	4	18	10	3	SW
Hampton	Franklin	1,240	9	63.2	+6.2	95	27	29	3	38	2.47	+1.29	.63	....	8	12	14	5	SW
Hawkeye	Fayette	.....	6	.....	....	....	.....	.....	.....	.....	3 71	- .09	1.25	.....	7	....	....	....	.....
Hoprig	Emmet	.....	....	....	.....	....	.....	....	.....	.....	1.05	.....	.36	.....	4	16	9	6	NE,NW
Humboldt	Humboldt	1,082	6	63.4	.....	91	11, 13	28	3	38	2.38	-1.20	.75	.....	8	20	7	4	SE
Lansing	Allamakee	.....	..	63.4	.....	97	27	29	4, 5	38	4.35	.....	1.20	.....	8	9	15	7	.....
Larrabee	Cherokee	....	8	63.4	.....	92	13	28	3	44	6.30	+2.43	4.30	.....	6	11	16	4	SW
Le Mars	Plymouth	1,221	....	63.2	....	89	11, 13	28	3	41	.96	.....	.28	.....	7	16	10	5	S
Mason City	Cerro Gordo	1,130	5	60.3	+2.1	90	27	24	3	43	2.90	-1.48	1.00	.....	6	....	....	....	.....
New Hampton (a)	Chickasaw	1,166	....	61.2	....	88	27	27	3	37	2.29	.....	1.23	.....	6	17	6	8	NW
Northwood	Worth	1,210	....	62.2	....	88	27	29	3	40	2 31	.....	1 65	.....	6	20	6	5	NW
Osage	Mitchell	1,178	8	60 8	+4.7	88	13	28	3	40	2.98	-1.11	2.20	.....	7	9	11	11	SW
Plover	Pocahontas	.....	....	64.0	.....	95	27	24	3	43	2.69	.....	.97	.....	5	20	5	6	S
Primghar	O'Brien	.....	....	65.8	.....	92	11, 26	35	2	35	2.75	.....	1.25	.....	5	16	6	9	E
Ridgeway	Winneshiek	.....	....	62.7	.....	93	27	29	3	37	6 55	.....	3.96	.....	12	20	8	3	S
Ruthven	Palo Alto	.....	....	62.6	.....	90	27	26	3	39	1.78	.....	.60	.....	4	13	6	12	SW
Sheldon	O'Brien	1,406	....	61.4	.....	89	11	27	3	36	1.09	.....	.40	.....	6	18	4	9	S
Sibley	Osceola	1,506	6	62 2	+5.4	93	27	22	3	41	1.29	-2.07	.54	.....	6	14	17	0	SW
Sioux Center	Sioux	.....	....	64 3	.....	93	11	30	3	37	2.20	.....	.62	.....	8	18	8	5	E
Storm Lake	Buena Vista	.....	10	62.7	... ..	87	27	29	3	36	1.47	-2.00	.79	.....	7	19	7	5	NE, SW
Washta	Cherokee	.....	....	.....	.....	.....	.....	.....	.....	.....	2.81	.....	1.45	.....	9	12	11	8	S
Waverly	Bremer	942	....	63.4	.....	91	27	31	3	38	1.35	.....	.35	.....	10	12	12	7	E,S
West Bend*	Palo Alto	.....	6	62.9	+4.5	93	27	33	3	....	2.34	- .47	.65	.....	6	10	13	8	S
West Union	Fayette	1,105	....	.....	.....	....	.....	.....	... ...	.....	2.29	.....	.94	.....	5	23	0	8	SW
Average		.....	....	62.5	+4.2	91.1	.....	28.1	.....	39.3	2.72	- .83	.....	.....	6	15	10	6	SW

CENTRAL SECTION.

Amana	Iowa	.....	23	63 8	+4.2	90	27	34	3, 5	35	4.18	- 02	.97	.....	12	13	12	6	NE
Ames	Story	936	19	64.4	+5.4	90	12, 27	33	3	36	4.35	+ 52	1.10	.....	11	14	12	5	.....
Audubon	Audubon	....	6	62.4	+2.9	87	29	29	3	34	3.48	- .18	1.35	.....	6	7	14	10	SW
Baxter	Jasper	.....	....	64.4	....	91	28	29	2	34	5.29	.....	1.30	.....	12	8	17	6	SE
Belle Plaine	Benton	840	9	63.1	+4.9	90	28, 30	33	3	38	1.67	-2.37	.55	.....	7	10	19	2	SE
Buckingham	Iowa	.....	....	...	.....	....	.....	.....	.....	.....	2 08	.....	.70	.....	9	14	11	6	.....
Carroll	Carroll	.....	9	64.3	+5.8	90	13, 31	26	3	39	1.90	-2.43	.65	.....	10	21	2	8	.....
Cedar Rapids	Linn	744	17	65.7	+6.7	93	27	35	3	37	3.13	-1.35	.84	.....	11	18	8	5	SE
Clinton	Clinton	609	8	63.0	+2.1	90	13, 27	31	5	40	4.77	+ .63	1.17	.....	11	13	7	11	NE
Coon Rapids	Carroll	.....	..	64.0	.....	89	13	32	3	32	2.99	.....	1.00	.....	8	13	13	5	SW
Davenport	Scott	615	27	64.0	+3.0	89	27	37	3	28	4.68	+ .25	.81	.....	15	9	9	13	SW
Delaware	Delaware	1,048	8	61.8	+3.9	89	27	31	4, 5	36	2.25	-1.57	.76	.....	8	9	16	6	S
Denison	Crawford	1,192	6	63.7	+3 7	89	11	29	3	39	2.37	-1.87	.96	.....	8	23	3	5	S
Des Moines	Polk	867	21	64.1	+3.0	89	11	35	3	30	4.76	+ .02	1.40	....	14	9	16	6	SW
De Soto	Dallas	866	....	65 9	....	91	14	35	3	36	4.14	.....	.99	....	12	13	11	7	SW
Dubuque	Dubuque	655	26	63.2	+3.2	89	27	53	4	33	4 75	+ .55	1.74	.....	11	14	10	7	NW
Fort Dodge	Webster	.....	....	62.9	....	92	27	28	3	40	4.57	.....	2.00	.....	6	20	5	6	SW
Galva	Ida	.....	6	63.8	+3.6	96	27	29	3	42	3.54	- .01	1.05	....	7	13	14	4	SW
Gilman	Marshall	1,035	...	... ..	...	....	.....	.....	.....	.....	2.50	.... ..	.98	....	6	13	12	6	E
Gladbrook	Iowa	.....	....	.....	.....	....	.....	.....	.....	.....	1.50	.....	.40	....	6	....	....	....	.....
Grinnell (near)	Poweshiek	.....	....	63.0	.....	89	13	31	3	30	4.94	.....	1.60	....	12	10	7	14	NE
Guthrie Center	Guthrie	1.269	....	63.3	.....	88	14, 27	30	3	39	3.34	... ...	.79	.....	5	12	15	4	SW
Harlan	Shelby	.....	....	63.6	...	89	26	27	3	39	3.09	.....	.62	....	11	8	14	9	NE,SW
Independence	Buchanan	921	37	61.6	+2 2	89	27	30	3	39	1.74	-2.27	.48	.....	8	17	7	7	SW
Iowa City	Johnson	644	9	64.1	+4.5	90	27	35	3, 5	39	4 31	+ .16	1.79	.....	11	13	10	8	W
Iowa Falls	Hardin	.....	6	63.2	+4.2	92	27	27	3	39	1.79	-1.89	.68	....	6	18	8	5	NE
Le Claire	Scott	.....	....	...	...	...	.....	.....	.....	.....	4.56	.....	.95	.....	13	...	..	..	.....
Logan	Harrison	928	34	63.0	+2.2	90	28	27	3	40	1.97	-2.42	.54	.....	10	14	12	5	S
Maquoketa	Jackson	.....	6	61.2	+ .5	87	13	30	5	38	6 98	+3.03	1.75	.....	14	16	6	9	NW
Marshalltown	Marshall	898	7	64.7	+6.1	92	27	31	3	36	3.08	-1.37	.68	.....	12	16	9	6	S
Monticello	Jones	800	45	61.5	+2.3	90	27	30	6	45	2.75	-1.12	.58	....	9	17	8	6	NW
Mt. Vernon*	Linn	858	..	64.0	.....	89	31	38	8	....	4.35	.....	1.80	.....	12	...	..	....	.....
Mt. Vernon (Hubbard)	Linn	835	....	64.0	....	92	30	32	3	39	4.22	.....	1.70	.....	14	19	5	7	SW
Newton	Jasper	958	12	64.0	+3.5	89	28	32	3	37	4.03	- .47	1.65	.....	14	12	12	7	SE
Ogden	Boone	1,109	....	63 8	.....	89	27, 28	27	3	41	4.82	.....	1.08	....	11	19	2	10	NE,SE
Odebolt	Sac	...	....	65.2	.....	94	27	26	3	44	1 57	.....	.56	....	6	24	4	3	.....
Olin	Jones	.....	..	61.8	.....	88	28	32	5	36	3 08	.....	1 05	.....	11	13	12	6	SE,S
Onawa	Monona	.....	...	65.8	.....	92	13	30	3	40	3.66	.....	2 13	.....	8	24	6	1	SE
Rockwell City	Calhoun	1,219	....	63.2	.....	93	27	26	3	43	1.78	....	.47	.....	6	25	5	1	.....
Sac City	Sac	900	20	63.0	+4.0	90	11	28	3	39	1.52	-2.66	.77	....	7	18	10	3	NE,SE
Scranton	Greene	.....	....	64.2	.....	90	13	32	2	33	2.83	.....	.64	.....	7	14	15	2	S,NW
Sioux City	Woodbury	1,122	10	64.0	+4.0	91	13	29	3	42	1.87	-1.84	.84	....	8	13	11	7	SE
Toledo	Tama	.....	5	65.2	+3.6	98	23	32	3, 5	44	2.57	- .57	.60	.....	7	21	2	8	E
Vinton*	Benton	800	9	63.2	+4.4	90	27	39	3	....	1.68	-2.04	.42	.....	9	20	0	11	SW
Waterloo	Black Hawk	862	20	63.6	+ .1	93	27	31	3	41	1.37	-2.23	.32	.....	12	19	3	9	S
Webster City	Hamilton	.....	6	63 0	+5.7	85	27	30	2, 3	24	5 72	+2.36	1.65	.....	7	17	7	7	SE
West Branch	Cedar	.....	....	63.6	.....	93	27	30	5	43	3.91	.....	1.33	.....	8	17	6	8	NE
Whitten	Hardin	.....	....	62.4	.....	90	27	27	3	37	1.48	.....	.53	... ..	5	17	7	7	S
Wilton Junction	Muscatine	.....	....	63.3	.....	89	27	34	3	34	4.59	.....	1.43	.....	8	14	9	8	SW
Average		.....	...	63.7	+3.7	90.3	.....	28.7	.... ..	37.4	3.32	- .78	.....	.....	9	15	9	7	SW

CLIMATOLOGICAL DATA FOR MAY, 1900—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.	
...on	Union	....	....	64.4	.....	90	13, 31	33	3	35	4.42	.....	1 20	....	10	9	14	8	NE
...la	Monroe	945	...	63.2	.....	89	27	34	3	40	4.38	.....	.75	.....	11	9	10	12	SE
...antic	Cass	....	8	63.2	+4.8	88	11	25	3	42	2.35	-1.97	.94	.....	8	5	16	10	NE
...tavia	Jefferson	640	....	....	....	....	....	....	....	....	3.41	.....	1.10	....	6	..	..	..	.....
...lford	Taylor	857	....	64.8	.....	94	30	28	3	42	5 40	.....	1.60	.....	8	7	20	4	SW
...lknap	Davis	....	....	63.8	.....	87	13, 27	35	3	31	5.94	.....	1 31	.....	10	19	8	4	.....
...rlington	Des Moines	....	....	....	....	....	....	....	....	....	....	.....	....	....	..	..	..	..	.....
...naparte	Van Buren	.. ..	8	64.1	+1.8	87	13, 14, 27	35	3	33	3.66	- .39	96	...	9	...	..	....	.....
...ssey	Marion	....	....	....	....	....	....	....	....	....	2.88	.....	.71	....	8	..	....	...	.....
...rson	Pottawattamie	....	....	....	....	....	....	....	....	....	2.01	.....	.63	....	4	...	....	....	.....
...nterville	Appanoose	1,013	6	64.6	+2.6	90	27	35	3	33	4.83	+1.40	1 05	....	11	17	8	6	S
...ariton	Lucas	1,030	....	63.3	.....	86	28	32	3	33	3 47	.....	.73	.....	14	11	16	4	SW
...illicothe	Wapello	645	...	....	....	....	....	....	... ..	....	5.10	.....	2 50	.....	5	...	....	..	.....
...arinda	Page	1,069	9	65.0	+4.2	92	11	32	3	39	4.46	- .13	2.07	....	13	18	4	9	SE
...rning	Adams	1,127	7	62.8	+2.5	88	13	30	3	35	3.97	- .68	1.16	.....	10	14	6	11	SW
...llege Springs	Page	....	....	65.1	....	95	30	30	3	36	3.85	.....	1.33	.....	10	19	3	9	SE
...uncil Bluffs	Pottawattamie	989	...	65.4	....	91	11, 12, 13	32	2	34	2 93	....	.99	.....	7	20	2	9	S
...mberland	Cass	....	...	....	.....	....	.....	.....	.....	....	2 78	.....	.55	.....	8	20	5	6	N
...anville	Des Moines	715	...	....	.....	....	.....	.....	.....	....	4.22	.....	.95	....	9	12	13	6	.....
...don	Wapello	....	....	65 2	.....	91	27	35	5	38	5.74	.....	1 74	.....	11	17	9	5	S
...merson	Mills	767	13	64.0	+4 9	88	27, 28	35	3	33	2.18	.....	.76	....	6	16	4	11	N
...irfield	Jefferson	516	51	....	....	....	.....	.....	.....	....	5.31	- .71	1 28	....	13	9	18	4	.....
...Madison	Lee	979	29	64.7	+4 8	89	13	31	3	35	3.93	- .46	.75	....	11	8	9	14	SW
...lenwood	Mills	....	8	64.4	+4.8	92	30	28	3	37	2.40	-2 70	.63	....	6	5	21	5	SW
...reenfield	Adair	912	....	....	....	....	.....	.....	.....	....	2.99	-1.44	1 01	....	7	15	9	7	.....
...amburg	Fremont	....	....	63.2	.....	90	27	32	3	36	3 09	.....	.87	....	6	14	8	9	W
...edrick (a)	Keokuk	....	....	63.0	....	88	13	32	3	32	4.53	.....	1.90	...	10	14	10	7	NW
...opeville	Clarke	....	....	64.6	....	88	13, 28	31	3	27	4.64	.....	1 23	....	10	7	15	9	S
...ndianola (a)	Warren	612	28	65.5	+3.0	87	13	38	3	34	4.17	.....	.98	...	11	9	10	12	SW, NW
...eokuk	Lee	....	....	65.7	.....	90	27	36	3	42	4.56	-1.20	1.25	....	10	14	12	5	SW
...eosauqua	Van Buren	....	6	65.8	+3.0	91	27, 28	40	4	....	3.61	.....	1.78	....	12	...	....	....	.....
...noxville	Marion	....	....	....	.....	....	.....	.....	.. ....	....	3.55	- .28	.75	...	10	14	6	11	NE, SW
...acona	Warren	....	....	63.0	.....	86	13	29	3	34	3.38	.....	.95	.....	10	..	....	....	.....
...enox	Taylor	850	....	....	....	....	.....	.....	.....	....	5.71	.....	1.83	....	13	17	6	8	S
...elrose	Monroe	....	....	62.3	....	87	12	35	9	46	1 32	.....	.50	.....	5	21	4	6	SE
...looar	Lee	1,236	6	64 0	+1.8	89	28	30	3	38	6.50	.....	1 80	....	7	16	10	5	SW
...lt. Ayr	Ringgold	725	..	63.6	.....	92	28	34	3	38	4.11	-1.66	1 47	...	12	10	13	8	N, E
...lt. Pleasant	Henry	1,183	....	....	....	....	.....	.....	.....	....	4 80	.....	2.52	.....	11	12	14	5	N
...lurray	Clarke	1,113	25	66.3	+4.6	89	12	40	3	27	5.67	.....	....	....	..	17	9	5	.....
...maha (Neb.)	Douglas	1,123	..	64.0	.....	92	12	32	3	31	2.24	-2.13	1.25	....	7	11	15	5	SW
...sceola	Clarke	850	16	63.6	+3 7	88	13	32	3	35	3 96	.....	1 01	.....	10	6	13	12	S. SW
...skaloosa	Mahaska	630	5	66.6	+3.6	89	13, 27	38	3	29	3 07	- .64	.75	.....	11	15	6	10	SW
...ttumwa	Wapello	....	6	63.1	+1.8	86	13, 28	30	3	35	6 20	+1 33	1 50	.....	10	14	6	11	SE
...vid	Wayne	960	...	64.0	.....	90	13	28	3	39	5.75	+2.32	.80	....	14	12	4	15	SW
...acific Junction	Mills	....	....	65 2	.....	92	28	34	3	34	2.07	.....	.75	.....	6	11	16	4	S
...ella (d)	Marion	1,033	....	65 4	....	89	13	33	3	40	2.29	.....	.82	.....	6	..	..	....	SE, NW
...ed Oak	Montgomery	....	...	65.5	.....	92	13	33	3	43	2.56	.....	.71	.....	7	13	5	13	S
...igourney	Keokuk	....	...	64 6	.....	89	31	33	2	40	4 62	.....	1.96	.....	10	13	13	5	W
...tuart	Guthrie	....	...	65.6	....	89	28	31	3	34	3.84	.. ....	.83	....	8	7	15	9	N
...hurman	Fremont	....	...	66 8	+5 4	92	13	31	3	43	2.81	.....	.74	. .	7	12	8	11	SW
...illisca	Montgomery	1,058	6	65.1	....	92	31	28	3	35	4.22	+ .34	1.57	....	12	17	5	9	SE, S
...apello	Louisa	578	....	62.8	+1.8	88	27	32	3	34	3.89	.....	.77	....	16	13	15	3	SE
...ashington	Washington	....	9	64.5	+4.1	90	13	32	3	36	2.80	- .73	1.50	.....	9	..	....	....	SW
...interset	Madison	....	8	....	....	....	13	....	....	....	4.34	- .22	.80	....	12	..	....	....	... .
Average		....	...	64.4	+3 5	89.3	.....	32.5	.....	35.9	3.90	- .46	.....	....	9	13	10	8	SW
Av. for the state		....	...	63.2	+3.8	90.2	.....	29.8	.....	37.5	3 31	- .69	..	....	8	14	10	7	SW

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

MONTHLY REVIEW OF THE
DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR MAY, 1900.

STATIONS.		DATE.																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean
Afton	Max.	77	68	64	67	73	72	72	75	70	77	87	88	90	87	65	64	60	65	65	75	81	70	79	85	87	84	86	79	87	84	90	76.8
	Min.	48	49	33	41	41	53	59	56	48	42	54	58	61	63	52	49	51	53	44	44	47	47	55	58	57	64	58	59	61	58	60	52.4
Albia	Max.	78	67	64	70	70	72	78	74	69	72	84	85	87	84	87	65	59	55	65	72	77	80	78	83	86	85	89	88	81	83	86	76.6
	Min.	43	49	34	37	38	45	53	52	44	41	44	50	54	61	54	52	51	43	44	40	46	49	58	53	57	58	57	60	60	61	62	49.2
Alta	Max.	76	56	67	65	69	65	66	73	71	79	91	88	90	80	60	70	69	60	70	78	82	79	78	81	81	88	90	86	83	79	82	75.9
	Min.	44	36	27	37	42	53	54	54	40	46	57	63	64	55	52	46	46	42	44	47	53	53	50	54	58	59	59	50	42	58	53	49.0
Amana	Max.	78	68	61	61	68	69	70	74	64	72	84	85	88	84	79	64	59	53	65	73	77	76	73	80	84	85	90	83	79	87	85	74.8
	Min.	46	54	34	43	34	50	55	55	44	44	49	61	63	66	60	56	53	45	46	39	49	53	58	55	53	63	59	62	61	64	64	52.8
Ames	Max.	73	60	64	65	72	69	76	76	70	75	88	86	88	85	55	56	53	48	46	45	48	54	56	57	52	61	60	61	59	60	60	70.8
	Min.	37	43	25	42	42	54	60	56	40	46	58	62	65	64	53	49	53	48	45	33	38	50	57	57	51	63	52	53	61	57	57	52.4
Atlantic	Max.	73	59	63	62	69	73	77	74	61	74	85	84	86	83	64	65	63	55	65	72	74	72	76	79	80	84	85	85	87	79	82	73.9
	Min.	43	40	29	40	41	51	58	53	44	45	56	60	63	60	52	47	49	45	44	41	53	51	54	55	55	60	58	56	57	57	57	50.7
Audubon	Max.	76	69	54	60	69	69	65	71	69	79	89	89	90	85	65	63	61	61	70	77	82	79	73	82	86	85	91	85	82	80	80	75.4
	Min.	46	34	25	35	40	50	50	47	40	43	54	50	59	62	52	46	42	41	40	39	48	48	46	52	56	55	58	55	51	57	52	47.2
Baxter	Max	78	61	62	66	66	70	69	74	69	74	87	86	87	87	70	69	61	52	68	83	76	74	76	84	84	87	90	91	79	87	86	75.9
	Min.	49	29	41	38	50	55	57	42	44	52	61	64	66	60	51	51	46	46	44	50	57	55	57	59	61	58	63	57	60	59	54	52.8
Bedford	Max.	80	65	62	73	76	74	74	80	80	72	91	88	89	84	65	64	60	55	62	76	84	70	82	89	88	91	91	91	93	94	88	78.4
	Min.	52	48	28	42	43	56	58	50	42	42	49	58	63	67	54	53	53	46	54	37	42	50	54	52	56	58	52	57	58	57	58	51.3
Belknap	Max.	77	63	61	55	71	71	72	74	64	74	80	85	87	81	73	65	60	50	63	71	72	76	75	81	85	85	87	86	82	81	85	73.9
	Min.	57	54	35	40	42	54	54	55	48	44	54	62	60	65	59	53	58	45	44	40	51	52	58	55	60	63	60	60	61	62	63	53.8
B'l'e Plain'	Max.	78	60	63	60	70	68	70	75	64	72	84	86	87	88	68	62	65	49	58	73	79	78	78	80	85	85	86	90	89	90	85	75.3
	Min.	40	40	33	40	56	40	51	52	42	43	51	60	62	65	60	45	48	45	46	43	49	54	55	55	55	58	60	59	53	58	59	50.9
Bonaparte	Max	77	67	60	63	70	70	73	74	65	71	83	85	87	87	85	69	63	54	62	73	77	77	74	81	84	85	87	83	83	81	81	75.2
	Min.	46	55	35	41	40	53	60	53	49	42	50	60	60	62	57	58	54	45	47	41	48	53	52	53	58	59	62	63	60	63	63	53.0
Britt	Max.	77	58	59	64	71	67	68	72	70	77	89	88	90	85	61	69	65	57	70	74	82	78	79	86	85	88	93	77	85	81	88	76.9
	Min.	39	39	25	33	32	49	50	49	37	38	49	53	52	60	51	47	45	44	42	40	42	52	49	49	56	56	55	56	50	55	55	46.7
Carroll	Max.	74	61	67	65	70	73	75	76	71	77	89	88	90	82	90	82	58	67	70	79	80	75	73	83	80	87	80	87	88	89	90	77.7
	Min.	40	39	26	37	38	51	60	55	41	47	57	65	66	67	55	46	44	43	45	40	45	48	55	54	59	58	59	68	57	59	57	50.9
Cedar Rap.	Max.	79	68	59	64	72	73	72	75	68	75	88	90	91	89	79	66	62	56	67	79	80	80	74	80	87	88	93	80	82	92	89	77.3
	Min.	50	50	35	42	36	50	54	57	45	46	53	64	65	67	60	57	51	46	47	42	53	54	57	57	56	67	63	62	59	66	64	54.6
Centerville	Max.	77	70	60	64	74	69	71	73	70	70	83	84	86	86	77	62	59	54	64	75	78	75	75	82	85	85	90	88	85	80	85	75.5
	Min.	48	54	35	41	41	54	60	54	46	43	56	63	64	64	57	54	53	45	45	44	50	55	57	55	60	60	60	62	54	63	64	53.6
Chariton	Max.	76	61	62	64	69	70	71	76	66	71	83	84	85	81	70	63	59	54	65	74	78	74	77	83	82	83	84	85	83	83	85	74.3
	Min.	46	50	32	39	39	55	58	54	44	43	50	61	60	63	55	50	52	44	45	41	49	57	56	55	59	62	58	61	60	60	62	52.3
Charles Cy	Max.	78	67	55	60	70	70	67	70	75	76	87	88	89	86	64	65	63	63	67	77	80	77	79	83	85	83	85	82	80	86	85	75.2
	Min.	43	46	29	32	29	49	49	56	38	43	49	61	63	62	58	48	46	46	44	46	45	54	57	56	54	55	57	59	60	61	62	49.7
Clarinda	Max.	78	63	67	73	75	75	77	79	72	80	92	89	91	88	62	69	60	56	60	73	80	68	81	86	87	88	89	90	89	89	89	77.9
	Min.	41	44	32	44	47	57	58	57	45	41	55	60	64	62	53	51	51	45	45	40	44	54	56	59	54	61	54	58	60	60	60	52.0
Clear Lake	Max.	76	65	55	64	70	70	65	72	70	75	86	86	88	85	64	68	67	55	70	80	85	78	86	85	85	88	93	80	84	86	87	76.3
	Min.	46	42	28	34	34	47	48	54	39	47	54	65	62	57	52	45	45	45	42	40	52	50	52	51	65	59	63	55	48	58	53	49.4
Clinton	Max.	81	71	60	61	70	73	73	74	69	72	85	87	90	85	85	77	61	52	67	75	77	79	75	80	84	87	90	75	78	88	86	76.4
	Min	43	43	34	37	31	47	48	54	42	37	44	61	60	64	58	57	50	42	45	35	47	46	56	56	51	53	59	61	57	60	60	49.6
College Sps	Max.	76	63	64	70	73	73	74	77	70	76	88	88	90	85	65	63	60	65	60	73	79	71	79	86	88	88	88	89	90	95	86	77.2
	Min.	40	40	30	40	47	57	60	56	45	42	55	60	65	63	55	52	51	55	44	45	49	56	55	59	58	63	56	63	61	60	61	53.0
Coon Rap	Max.	71	65	64	62	70	70	73	73	66	75	87	87	89	85	67	65	64	57	66	73	78	72	75	81	83	84	88	87	82	79	83	74.9
	Min.	47	41	32	40	44	53	60	56	44	47	59	64	66	61	53	48	51	49	45	44	50	55	56	57	57	63	63	64	62	60	57	53.2
Corning	Max.	75	67	64	66	72	71	73	75	67	75	87	86	88	85	60	65	59	55	64	72	76	67	75	82	83	81	85	85	82	83	85	74.6
	Min.	41	43	30	38	42	52	59	56	44	44	57	62	63	64	52	50	52	46	45	37	45	54	55	57	57	63	63	64	62	60	57	53.2
Co. Bluffs	Max.	73	60	68	69	76	71	70	78	73	79	91	91	91	84	60	72	65	58	68	72	78	73	78	84	82	88	87	88	88	85	88	77.0
	Min.	49	32	34	49	50	58	56	47	45	52	61	65	69	59	53	52	52	47	40	48	52	59	60	62	66	62	62	64	64	62	60	53.9
Cresco	Max.	79	59	58	59	69	73	62	72	64	73	84	86	87	82	69	65	62	52	67	77	78	76	68	77	84	85	88	72	78	84	81	73.2
	Min.	43	40	26	32	28	46	46	47	37	41	50	60	63	57	54	50	48	44	43	45	47	55	55	49	54	61	55	57	50	58	50	48.1
Davenp'rt	Max.	77	67	56	60	68	68	70	71	63	69	82	84	86	81	82	69	61	51	64	73	75	76	71	78	82	84	89	76	78	83	84	73.5
	Min.	51	45	37	42	43	50	53	56	45	47	54	65	64	65	63	60	47	44	46	45	53	54	58	56	59	62	66	65	60	65	65	54.4
Decorah	Max.	79	63	62	60	72	74	63	72	66	75	83	88	89	84	72	63	64	65	72	77	80	79	68	78	84	87	88	75	77	82	83	75.0
	Min.	44	43	30	29	27	42	46	52	40	38	53	62	64	60	55	51	48	43	42	38	45	52	56	48	50	59	57	57	48	59	50	48.0
Delaware	Max.	80	68	57	59	67	67	66	71	61	71	84	86	87	80	75	62	61	56	67	74	78	75	67	75	81	82	89	76	76	84	83	73.1
	Min.	45	48	32	31	31	44	51	56	41	41	51	61	62	66	60	55	52	45	44	38	48	52	55	55	53	59	59	57	50	61	61	50.5
Denison	Max.	72	65	68	64	71	71	73	74	69	77	89	87	88	82	68	68	67	58	68	76	77	75	75	79	79	84	85	86	83	80	83	75.5
	Min.	45	39	29	40	47	58	60	55	42	48	57	63	65	64	53	46	44	47	45	39	44	54	58	55	59	63	60	59	59	61	56	51.9
Des Moines	Max.	76	63	62	63	68	70	69	75	66	74	89	86	88	84	65	63	61	54	66	73	78	71	73	83	82	81	84	84	77	82	84	74.0
	Min.	48	45	35	43	45	54	60	58	47	47	59	65	65	64	54	52	53	47	47	43	50	57	57	59	62	62	61	63	62	61	63	54.4
De Soto	Max.	79	58	65	65	73	73	77	75	67	76	87	87	90	91	68	64	61	53	70	77	83	79	79	85	88	80	89	89	82	84	85	76.7
	Min.	47	46	35	42	43	56	61	59	47	54	58	65	67	68	55	52	55	47	46	43	47	55	59	62	59	62	60	62	73	61	61	55.1
Dows	Max.	78	68	58	61	68	64	67	72	68	75	88	87	88	87	63	65	65	58	67	75	82	76	70	82	83	82	90	77	81	89	85	74.8
	Min.	42	43	25	37	33	48	50	54	40	44	50	60	60	60	52	46	45	46	47	40	47	51	55	64	57	59	56	59	51	58	58	49.6
Dubuque	Max.	78	65	55	60	67	70	67	71	64	69	83	85	86	80	79	62	60	54	68	76	79	75	63	79	81	83	89	73	78	86	86	73.2
	Min.	51	46	38	33	37	49	53	53	44	46	53	64	66	64	62	55	53	45	48	43	52	55	58	58	57	62	64	58	55	62	65	53.2
Eldon	Max	79	73	63	68	72	73	76	76	71	73	85	87	90	86	85	68	61	55	67	77	83	80	78	83	87	87	91	88	83	85	88	78.0
	Min.	43	51	36	39	35	54	59	53	49	41	49	60	61	63	58	56	54	45	47	40	45	53	58	55	59	59	58	61	61	62	62	52.5
Elkader	Max.	82	63	59	64	72	70	70	76	69	76	87	90	91	87	80	63	65	54	73	82	83	80	68	83	87	87	94	77	82	91	89	77.3
	Min.	42	43	31	33	29	43	48	54	38	37	50	65	65	60	59	54	50	46	44	39	45	50	57	53	52	64	56	57	50	59	59	49.6
Estherville	Max.	75	70	57	60	69	69	60	70	67	80	90	89	89	82	62	69	85	59	69	75	82	80	79	83	84	85	92	80	82	76	80	75.1
	Min.	45	36	28	30	33	49	50	53	37	45	55	65	62	60	50	44	42	42	42	46	55	60	50	52	55	55	55	55	46	44	53	44.4
Fairfield	Max.	77	71	61	63	72	73	78	70	65	72	82	84	85	85	85	67	67	52	65	73	77	79	70	81	85	85	88	88	80	84	87	76.1
	Min.	49	55	35	37	37	51	59	52	47	39	49	57	59	61	57	57	52	44	46	45	48	51	57	52	56	59	60	60	59	61	61	52.0
Fayette	Max.	77	64	56	60	68	70	66	72	65	74	84	87	88	85	71	64	63	58	70	76	80	74	66	79	83	83	90	75	79	87	85	74.2
	Min.	41	45	29	29	26	45	47	52	38	38	51	61	63	61	57	51	48	45	43	35	44	53	56	50	49	59	58	57	49	60	61	48.4
Fonda	Max.	70	58	66	64	70	65	65	70	68	80	92	90	91	83	65	70	70	60	64	77	87	79	78	82	86	89	93	89	83	87	..	76.4
	Min.	41	26	35	40	53	54	55	45	44	56	66	64	60	52	40	42	42	45	46	46	53	57	52	56	62	67	70	65	55	57	..	51.5
Forest City	Max.	77	68	55	61	78	78	68	72	66	76	88	86	88	83	59	64	69	55	69	76	80	75	74	83	82	86	89	79	79	81	84	75.1
	Min.	44	41	26	35	36	49	48	52	40	44	50	60	62	61	53	45	46	44	44	45	48	52	50	53	57	58	55	57	49	58	56	49.0
Ft. Dodge	Max.	74	70	60	65	67	68	70	73	68	77	89	88	89	89	64	67	68	93	70	80	80	77	74	83	82	84	92	90	82	82	85	76.3
	Min.	42	37	28	36	34	48	53	56	47	40	55	63	64	60	53	45	42	48	46	40	44	50	54	57	56	58	55	56	55	56	56	49.5
Galva	Max.	73	64	69	66	63	69	67	73	75	79	90	90	90	84	66	72	67	59	71	79	80	78	81	82	80	85	96	86	86	78	85	76.9
	Min.	54	37	29	37	42	53	56	51	39	47	56	73	76	58	52	45	44	45	45	41	38	52	49	56	57	56	58	60	56	58	55	50.8
Glenwood	Max.	73	67	66	68	74	72	75	76	71	77	88	88	89	85	66	67	63	58	63	74	78	72	76	82	82	86	84	85	86	83	86	76.1
	Min.	46	46	31	46	48	57	61	57	46	49	60	64	67	64	54	51	53	48	45	38	34	54	57	58	56	63	56	59	60	63	60	53.3
Greene	Max.	79	66	58	64	63	69	69	72	72	77	90	90	90	88	65	68	66	58	73	81	85	80	80	85	87	90	93	77	86	88	91	77.4
	Min.	44	46	28	36	31	48	48	56	37	45	52	61	62	60	56	48	45	45	43	39	46	53	55	53	55	29	57	59	48	59	55	49.3
Greenfield	Max.	77	63	65	65	73	76	81	76	65	74	87	87	88	87	61	67	65	53	65	69	71	76	81	84	80	84	86	87	89	92	89	76.2
	Min.	45	41	28	39	40	44	54	52	43	45	55	64	63	60	58	48	54	43	43	49	49	52	60	59	61	60	61	66	64	66	65	52.5
Grin'l (nr.)	Max.	75	60	59	60	67	68	70	73	67	75	82	82	89	85	70	60	59	53	63	72	77	73	70	78	80	81	86	81	75	82	84	72.8
	Min.	49	53	31	42	40	50	58	54	42	45	53	62	65	67	56	53	53	45	46	45	52	53	55	56	60	64	61	60	53	63	61	53.1
Guthrie C'r	Max.	70	69	64	62	69	70	75	73	65	74	84	86	82	88	69	66	65	64	65	74	80	72	75	83	84	81	88	85	79	80	82	74.9
	Min.	41	44	30	40	43	52	43	56	42	46	49	62	65	49	54	49	58	43	45	40	67	52	58	57	54	60	71	70	65	42	56	51.7
Hampton	Max.	80	60	60	67	71	66	69	74	70	78	90	90	89	89	63	68	69	53	72	81	84	78	75	85	85	85	95	82	85	88	90	75.4
	Min.	47	43	29	39	36	48	49	56	41	47	52	60	64	61	53	49	41	46	47	45	52	54	55	55	58	62	61	59	51	60	58	50.9
Harlan	Max.	73	64	66	63	74	74	80	73	68	75	86	86	88	87	67	70	65	58	66	74	79	75	81	84	84	89	86	88	84	79	85	76.5
	Min.	41	42	27	42	43	54	58	51	43	41	52	58	63	61	53	48	50	48	45	38	43	51	56	55	53	61	56	58	63	57	57	50.6
Hedrick	Max.	78	65	61	64	72	74	76	74	67	71	82	84	87	85	80	66	58	53	65	73	80	79	75	..	86	84	90	89	80	84	88	75.7
	Min.	46	34	32	38	37	51	56	48	47	40	49	61	59	62	56	54	51	44	46	40	48	54	57	..	50	60	59	61	60	62	62	50.8
Hopeville	Max.	76	60	63	65	70	69	70	74	64	73	86	85	88	82	65	60	53	50	62	70	77	66	74	79	80	79	82	83	80	70	83	72.8
	Min.	48	48	32	43	42	55	58	57	47	45	54	62	63	63	53	51	47	45	45	44	51	56	56	59	59	61	60	64	61	61	64	53.2
Humboldt	Max.	78	69	62	64	68	65	65	73	70	78	91	88	91	84	64	67	69	62	71	78	81	78	78	84	83	87	90	89	84	80	86	76.7
	Min.	44	41	28	38	36	45	52	55	42	45	55	64	64	60	54	45	43	46	47	40	45	52	50	56	59	59	60	59	54	57	56	50.0
In'pend'ce	Max.	76	59	57	60	67	68	67	72	64	72	85	87	88	87	72	60	63	55	68	75	77	75	67	78	82	81	89	76	79	82	85	73.3
	Min.	46	49	30	37	33	46	50	53	39	40	46	59	61	64	59	53	53	45	44	38	48	52	55	53	52	58	54	59	51	62	59	49.9
Indianola	Max.	78	70	63	64	70	70	68	74	68	75	86	86	88	85	66	62	59	54	66	74	81	75	75	84	84	85	87	88	..	83	85	75.1
	Min.	41	49	31	41	47	56	60	58	45	49	58	65	64	54	54	53	46	46	45	51	58	57	59	62	56	61	67	..	63	61	54.0
Iowa City	Max.	77	69	57	63	74	72	77	74	65	72	84	86	89	86	78	68	61	53	68	75	81	78	78	78	86	84	90	83	80	88	88	76.2
	Min.	42	56	35	42	35	50	52	55	44	41	47	62	60	63	58	57	56	44	47	70	48	51	52	57	53	62	58	60	59	64	62	52.0
Iowa Falls	Max.	76	60	59	63	73	66	72	73	69	76	89	87	88	89	66	67

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR MAY, 1900—CONTINUED.

STATIONS.		DATE.																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
...uk....	Max.	76	67	58	62	69	68	76	74	62	70	82	84	87	86	85	70	71	49	62	71	76	77	73	78	82	83	86	82	82	85	80	74.6
	Min.	52	59	38	46	46	56	60	58	50	48	56	64	68	68	64	60	55	45	45	44	52	55	58	58	60	62	64	67	63	63	65	56.4
...sauqua	Max.	80	66	62	67	72	69	74	74	64	73	83	86	87	86	86	68	62	55	63	73	79	77	74	82	84	87	90	86	83	85	86	76.3
	Min.	48	56	36	45	38	56	61	56	52	44	53	64	63	65	62	58	54	46	48	42	50	68	60	56	59	63	63	64	61	66	65	55.1
...xville.	Max.	82	70	71	76	73	74	68	75	73	75	87	87	89	87	70	62	58	53	67	73	82	84	76	84	87	87	91	91	84	83	90	77.2
	Min.	49	54	55	40	41	55	60	56	45	46	45	61	64	65	58	53	53	45	46	45	50	58	56	56	60	63	59	60	63	65	63	54.5
	Max.	82	74	58	63	71	75	75	77	68	76	85	89	90	86	76	67	51	64	73	72	80	76	74	83	83	88	97	86	80	90	86	77.3
...sing....	Min.	44	44	33	29	29	43	49	57	42	38	50	68	58	62	62	53	49	46	45	40	50	50	58	47	53	60	63	58	50	56	52	49.6
	Max.	74	71	69	70	72	66	69	71	71	83	93	97	98	80	81	73	70	63	70	77	70	80	75	80	81	85	88	84	84	75	78	77.4
...chwood	Min.	43	33	25	39	42	50	60	48	39	48	56	65	63	57	50	46	46	46	44	39	50	48	49	48	45	48	52	58	54	67	55	48.2
	Max.	69	64	68	66	68	64	67	72	71	82	90	90	92	81	65	68	67	63	70	82	82	81	87	87	87	89	89	87	89	79	87	77.5
...rabee...	Min.	43	36	28	35	42	52	54	47	38	44	55	63	62	57	51	42	42	42	43	38	45	49	50	49	57	54	58	56	52	54	50	49.3
	Max.	74	66	69	66	74	71	69	70	70	80	89	88	89	84	74	72	70	64	70	72	80	79	72	78	70	88	87	87	85	80	83	76.5
...Mars....	Min.	41	37	28	37	45	54	59	51	40	48	58	62	64	62	61	44	43	42	46	36	44	53	53	52	50	59	53	59	56	57	55	50.0
	Max	74	67	63	65	71	70	70	74	64	73	84	83	86	83	65	61	58	54	61	71	75	69	73	79	81	80	82	84	79	80	82	72.9
...ox.....	Min.	46	50	29	41	43	54	59	56	45	45	54	61	63	65	52	50	51	46	45	43	51	57	55	60	61	61	57	63	60	60	62	53.1
	Max.	64	59	70	68	72	70	79	76	74	79	88	89	87	74	76	68	68	60	58	78	80	78	82	84	86	89	89	90	88	84	88	77.2
...gan.....	Min.	48	43	27	44	47	52	59	50	43	45	54	60	52	46	42	46	48	44	41	37	40	42	48	53	58	60	57	54	56	53	56	48 9
	Max.	77	72	58	61	68	70	74	54	42	40	45	58	60	64	60	56	43	43	44	70	78	82	76	76	84	85	86	92	89	83	86	73.5
...quoketa	Min.	44	50	33	24	30	69	72	76	68	76	89	88	89	88	72	65	64	58	70	48	43	47	54	56	56	57	61	60	61	57	61	49.0
	Max.	79	71	60	65	70	49	48	56	42	45	53	63	64	67	56	52	54	47	69	76	81	75	72	80	82	85	90	81	78	80	83	77.2
...rsh'l.t'n	Min.	46	51	31	40	35	71	70	66	72	66	76	88	87	88	83	66	65	65	54	69	76	81	75	72	80	82	85	90	81	78	80	73.8
	Max.	78	58	51	51	71	24	45	48	54	36	42	53	61	63	58	53	45	43	44	42	48	46	50	53	50	53	57	53	53	45	50	52	46.8
...son City	Min.	35	43	24	30	24	53	67	68	80	83	82	84	87	88	86	80	68	60	50	58	60	68	70	72	68	85	89	90	84	88	87	89	74.9
	Max.	83	75	70	52	53	48	30	37	40	42	39	39	59	57	56	60	55	44	44	37	38	42	50	52	49	50	55	60	62	60	65	52	48.0
...nticello.	Min.	63	42	39	38	48	73	64	72	73	64	71	68	87	85	77	84	73	58	55	42	45	48	36	46	58	57	59	58	59	61	65	51	58	52.2
	Max.	78	64	60	52	53	73	72	58	35	48	54	72	66	67	60	49	55	59	54	59	71	77	67	79	85	85	83	88	89	86	83	87	75.2
...oar	Min.	43	47	42	41	43	57	37	58	35	48	54	72	66	67	60	49	55	59	54	59	71	77	67	79	85	85	83	88	89	86	83	87	75.2
	Max.	77	79	63	67	71	72	70	72	65	75	85	85	88	82	69	60	59	52	45	45	45	52	56	55	60	60	61	59	61	60	59	63	52.7
...t. Ayr...	Min.	46	41	30	42	41	53	60	57	55	41	54	58	62	64	52	50	50	62	54	65	69	73	77	79	81	85	88	89	92	78	86	86	76.8
	Max.	78	69	60	62	71	72	79	76	75	69	83	85	89	88	89	73	57	55	41	42	48	55	50	41	51	52	56	57	56	57	59	59	50.4
...t. Ple's'nt	Min.	48	52	34	40	35	50	57	51	45	38	47	55	59	61	55	57	55	53	49	72	81	82	80	77	87	88	86	91	80	82	92	91	77.5
	Max.	76	65	62	67	73	74	78	78	71	73	80	86	88	86	81	69	68	63	70	82	82	81	87	87	87	89	89	87	89	79	87	77.5
...t Vernon.	Min.	48	40	32	38	38	47	50	55	40	42	47	60	57	60	58	55	53	44	43	42	49	50	49	57	54	58	56	52	54	50	49.3
	Max.	76	64	55	59	69	71	66	70	65	72	84	85	87	81	67	67	64	51	69	..	77	74	52	55	52	55	55	57	57	50	60	57	49.1
...ewH'pton	Min.	44	45	27	32	32	47	46	55	48	42	47	59	63	58	58	70	62	60	52	68	75	80	75	74	82	85	84	88	89	80	85	88	75.7
	Max.	77	72	62	66	69	69	70	75	67	75	87	86	88	88	63	53	52	51	45	45	43	49	55	55	55	59	61	59	62	58	62	62	52.4
...ewton....	Min.	40	51	33	42	39	50	58	55	42	44	58	63	62	80	62	65	64	61	69	75	78	74	80	83	84	84	88	88	74	79	81	83	74.2
	Max.	77	56	55	61	72	73	64	70	70	77	87	87	87	87	58	54	54	47	52	43	44	50	50	52	55	59	59	61	63	61	59	53	50.1
...orthwood	Min.	41	43	29	33	32	47	48	54	39	42	50	60	62	92	85	74	77	74	63	75	83	84	86	83	85	86	90	94	93	89	85	87	80.5
	Max.	75	70	69	70	75	73	70	76	72	80	92	90	92	65	63	54	42	39	45	45	39	43	53	52	53	56	60	59	58	56	58	87	50.0
...debolt	Min.	40	38	26	38	39	53	56	53	47	46	56	63	87	88	87	65	66	67	58	68	80	72	72	79	83	84	87	89	89	82	83	87	75.8
	Max.	78	61	63	63	68	70	74	72	67	75	87	53	53	63	66	56	48	50	48	45	39	55	56	56	66	57	60	57	58	59	57	58	51.7
...gden.....	Min.	43	45	27	39	39	53	55	56	42	43	53	82	84	87	84	80	67	68	56	67	72	75	76	69	75	81	83	73	77	86	83	74.1
	Max.	77	65	58	60	67	70	73	72	73	69	47	48	51	52	50	45	47	44	44	47	44	48	55	57	52	62	64	56	54	61	62	49.5
...lin.....	Min.	46	54	34	39	32	48	69	74	51	56	74	70	78	88	89	88	80	64	69	64	56	51	64	73	76	77	71	75	81	79	85	87	75.3
	Max	70	59	67	69	74	51	58	60	58	52	53	63	66	68	58	55	53	55	72	64	73	80	82	78	81	81	78	86	88	88	83	87	57.3
...maha, N.	Min.	52	45	40	48	76	71	75	75	76	76	81	91	90	92	79	64	75	72	48	50	47	40	48	54	53	57	60	60	62	60	62	61	78.5
	Max.	74	60	74	72	76	44	49	57	64	66	63	56	49	66	63	56	49	68	63	56	68	75	79	78	70	79	83	85	87	77	80	82	53.0
...nawa.....	Min.	44	42	30	44	44	57	61	53	44	65	75	86	87	88	83	65	66	63	56	68	75	79	83	59	59	55	54	47	58	51	73.9
	Max.	74	65	57	58	70	72	65	69	65	75	86	87	88	83	58	55	44	45	44	41	42	45	51	54	59	59	61	55	54	47	83	86	47.8
...sage.....	Min.	44	43	28	32	30	46	47	54	36	42	49	60	62	58	55	44	62	60	54	66	72	78	66	76	82	82	83	85	85	81	60	63	74.5
	Max.	76	61	62	64	70	70	69	76	65	74	86	92	87	81	66	54	51	53	46	46	45	53	56	56	57	59	61	58	62	61	60	63	53.4
...sceola....	Min.	49	52	32	40	40	54	60	55	45	44	55	61	64	64	64	75	61	59	56	65	72	77	78	73	80	85	87	87	87	66	84	86	74 9
	Max.	79	63	62	64	71	71	83	75	64	73	84	86	88	86	75	57	53	51	44	45	48	45	57	53	59	61	57	62	62	78	82	84	52.4
...Oskaloosa..	Min.	44	47	32	39	37	51	57	51	45	64	72	79	86	89	71	63	55	57	45	63	74	78	76	74	84	84	86	89	75	74	63	66	75.5
	Max.	79	66	65	66	70	75	68	75	57	49	50	64	69	66	71	63	55	57	45	47	46	49	60	58	59	65	69	82	85	86	80	84	57.8
...Ottumwa...	Min.	53	59	38	45	43	54	55	57	72	68	71	83	84	86	81	71	61	58	50	61	76	77	74	77	82	82	82	85	58	61	59	61	73.9
	Max.	78	65	62	65	70	69	70	72	59	53	42	54	58	61	63	54	51	53	45	44	41	49	54	56	81	81	83	84	84	84	85	83	52.3
...Ovid	Min.	45	54	30	40	39	52	59	52	53	53	42	54	58	63	65	68	63	55	61	71	75	42	70	75	81	81	83	84	55	61	63	60	74.9
	Max.	71	58	67	68	75	73	75	75	68	68	77	87	89	90	66	67	55	51	55	50	44	37	52	58	58	55	62	55	92	86	86	88	53.2
...Pacific Jct.	Min.	41	52	28	48	49	56	61	50	48	48	58	63	76	..	88	78	68	60	53	64	..	82	58	78	84	88	86	..	68	70	68	70	74.2
	Max.	74	62	58	60	68	..	60	74	70	77	85	55	42	..	70	68	58	58	47	47	..	62	42	58	70	84	93	95	82	88	80	85	56.1
...Pella.....	Min.	48	58	34	40	38	..	52	60	52	51	55	92	91	93	80	60	75	73	58	73	80	85	86	85	88	60	54	55	60	58	52	55	78.3
	Max	78	70	60	64	70	65	70	70	74	80	43	52	60	90	67	50	45	43	42	45	55	42	55	58	60	84	78	92	90	87	85	82	49.6
...Plover.....	Min.	40	38	24	38	36	50	52	55	40	43	80	92	90	90	85	68	75	72	68	74	82	82	77	80	82	52	60	78	78	60	52	52	79.9
	Max.	75	65	65	69	60	60	62	71	75	40	50	55	59	65	60	56	45	50	45	44	45	50	80	71	78	82	86	88	87	88	88	86	51.7
...Primghar ..	Min.	45	35	36	38	45	50	48	50	40	75	79	79	82	89	86	75	70	64	61	65	80	80	45	56	58	52	59	58	56	59	63	62	77 8
	Max.	79	64	69	69	74	74	76	80	54	45	47	57	63	65	65	55	52	54	49	47	40	45	76	69	80	81	86	93	74	78	85	82	52.9
...Red Oak...	Min.	45	44	33	41	38	57	59	54	69	77	84	90	89	83	70	66	63	57	71	79	80	55	54	76	56	52	56	62	60	59	52	63	75.3
	Max.	81	67	59	63	72	73	65	71	55	37	43	51	60	63	60	56	52	49	45	44	44	75	83	80	80	84	85	87	93	89	85	80	50.1
...Ridgeway .	Min.	47	42	29	32	35	44	44	74	72	67	78	85	89	89	89	67	70	69	60	69	41	46	53	52	54	57	62	54	57	55	55	56	77.1
	Max.	77	64	66	65	68	68	74	60	55	46	43	46	54	62	52	44	45	46	40	66	74	81	78	76	82	83	86	90	54	83	84	76	49.2
...Rockwell C	Min.	44	40	26	38	38	53	52	65	50	79	88	89	86	84	75	66	67	63	66	42	39	42	52	51	50	58	56	60	58	55	50	52	78.0
	Max.	77	69	54	61	65	64	59	29	45	42	55	65	62	62	47	49	68	67	61	69	76	80	77-	77	83	81	84	89	88	82	78	84	47.3
...Ruthven ..	Min.	42	35	26	31	38	34	68	68	74	69	78	90	87	89	82	69	68	67	61	44	45	40	47	58	52	54	84	56	60	58	59	58	76.0
	Max	75	65	67	65	67	39	53	55	55	38	47	58	53	65	63	53	43	65	62	56	67	75	80	72	88	84	83	59	62	61	60	59	50.0
...Sac City....	Min.	44	38	28	38	39	53	55	73	71	69	76	88	87	90	86	64	65	62	56	67	46	45	50	55	56	59	59	62	61	61	60	57	75.8
	Max.	74	65	65	64	69	71	58	56	44	46	56	63	65	62	51	47	50	49	61	68	75	79	78	76	79	79	85	87	82	83	76	78	74.4
...Scranton ..	Min.	47	42	32	40	40	54	58	56	44	46	80	89	85	87	77	65	70	68	61	44	45	40	43	52	47	50	56	49	56	56	53	58	48.3
	Max.	75	64	66	55	69	61	67	69	68	38	46	56	61	63	61	50	45	43	44	61	71	79	83	81	78	83	83	91	93	83	86	79	77.8
...Sheldon....	Min.	40	34	27	33	43	50	55	48	73	73	83	94	90	91	84	69	73	69	61	71	79	83	51	45	50	53	48	51	56	51	56	53	46.5
	Max.	76	67	63	64	72	64	75	73	37	43	56	60	61	59	46	42	41	41	54	72	82	84	81	80	85	91	87	92	92	84	90	92	78.9
...Sibley.	Min.	38	34	22	35	39	50	55	46	76	69	75	81	88	90	89	80	56	55	53	44	46	39	48	54	57	53	55	59	58	61	58	12	52.1
	Max.	82	65	62	67	74	74	77	76	50	44	42	56	62	61	64	64	70	73	72	63	72	79	83	81	77	83	78	90	87	86	82	77	77.0
...Sigourney..	Min.	46	54	33	41	37	50	67	67	70	72	82	93	87	91	82	62	52	49	48	45	48	45	52	54	51	51	59	57	62	87	85	54	51.6
	Max	75	66	65	65	72	45	55	55	51	41	52	56	61	66	62	52	49	48	45	48	78	78	75	77	79	76	85	87	87	59	59	61	75.6
...Sioux Cen.	Min.	56	36	30	39	45	73	66	70	73	72	80	89	86	91	86	76	64	74	69	61	69	78	78	50	55	53	56	56	56	60	59	58	52.5
	Max.	71	55	71	65	73	66	70	73	55	45	56	64	67	66	61	55	49	49	48	48	40	75	77	74	75	79	77	83	87	83	80	78	74.0
...Sioux City..	Min.	45	39	29	38	45	50	56	55	45	56	64	76	86	84	86	82	66	67	66	69	45	43	51	57	53	54	60	58	61	62	55	58	51.4
	Max.	73	64	65	62	68	66	65	73	68	76	86	84	64	65	60	52	46	44	43	45	45	43	51	74	79	86	82	85	89	60	64	60	75.5
...StormLake	Min.	54	36	29	38	42	54	54	54	39	49	58	86	88	83	84	65	65	65	59	68	70	74	79	79	86	87	85	87	61	64	86	84	53 6
	Max.	70	51	57	68	75	68	72	74	73	85	54	63	61	62	50	64	67	62	47	45	50	48	76	55	84	82	83	85	87	86	86	88	76.5
...Stuart	Min.	50	31	42	50	48	52	60	55	75	70	79	87	88	89	85	64	56	52	54	50	46	38	49	76	52	60	64	65	56	59	61	63	54.6
	Max.	70	63	65	71	74	74	75	75	58	49	60	63	67	64	56	52	54	50	46	38	49	77	74	77	98	87	86	89	94	90	85	91	78.2
...Thurman..	Min.	44	50	31	47	49	58	62	58	77	71	70	88	88	89	88	72	67	61	57	69	81	80	74	48	56	54	55	57	60	60	56	61	52.3
	Max.	77	66	61	68	70	70	69	77	55	68	45	53	63	64	66	60	53	54	46	50	37	74	73	77	89	87	86	89	91	91	89	92	79.1
...Toledo. ...	Min.	45	52	32	39	32	49	48	78	78	82	86	89	90	89	72	52	54	72	66	65	68	42	43	78	45	77	58	55	64	55	60	61	54.4
	Max.	72	67	68	72	75	76	55	54	56	42	43	48	60	65	52	54	52	48	46	54	61	73	78	77	77	79	83	79	92	78	79	82	75.8
...Villisca....	Min.	42	44	28	44	46	55	54	74	74	69	76	87	89	89	79	85	68	63	54	45	47	41	50	54	76	75	80	84	84	88	86	84	54.4
	Max.	82	67	68	68	69	68	74	61	56	57	45	52	63	64	64	60	60	53	45	49	65	72	77	76	75	80	84	84	88	86	84	85	74.7
...Wapello ...	Min.	47	54	32	44	40	52	68	73	73	64	71	84	85	88	83	82	67	58	49	42	43	39	48	53	54	54	55	62	58	61	58	61	50.9
	Max.	79	66	61	63	70	68	48	55	52	42	40	50	59	60	63	57	55	50	64	60	71	79	80	76	69	76	80	85	82	93	80	81	76.3
...Washingt'n	Min.	45	44	32	41	36	68	69	68	75	67	75	88	89	90	88	75	65	52	51	46	45	40	47	51	76	70	80	84	84	91	80	80	51.0
	Max.	79	70	59	62	68	33	48	52	56	38	42	47	65	62	57	52	65	70	58	52	67	77	81	76	70	80	84	84	91	56	61	80	75.6
...Waterloo...	Min.	45	49	31	40	62	71	68	68	72	62	76	88	90	90	88	70	65	52	49	48	45	41	46	55	56	78	82	84	85	80	80	82	51.3
	Max.	78	68	57	62	71	33	50	50	57	50	44	52	62	64	63	58	52	64	75	80	75	81	78	79	78	78	82	84	85	72	70	64	70.5
...Waverly...	Min.	45	42	31	39	33	50	50	55	65	68	74	88	90	84	67	49	48	56	61	61	68	55	57	58	60	74	75	90	93	86	80	90	55.5
	Max.	55	48	47	45	48	34	45	44	49	48	47	56	60	70	86	88	82	64	56	46	48	54	60	78	80	82	88	90	54	58	60	56	76.7
...Webster C.	Min.

DAILY AND MONTHLY PRECIPITATION FOR MAY, 1900.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Afton	...	...	...	....	....	.81	.34	..	....	...	..	...	....	.30	1.20	.09	.34	.55	.90	....	....		.14	....	....	.25	....	..	...	T	...	
Albia	.04	....	..	...	....	.74	.67	..	...	....	..	....	...	.07	.75	.10	.40	.66	.63	....	....	T	....	....	....	..	...	T	.28	.04	...	
Algona	....	..	T	...	.02	...	.40	....	....	....	T	..	....	.25	....	...	....	....	....	....	....	....	....	....	....	....	....	....	.32	.05	....	
Alta	..	...	....	....	....	.10	.05	....	....	....	...	....	....	.77	..	....	..	....	.07	..	...	...	.08	....	..	..	....	....	.30	....	1 63	
Alta (near)	...	..	....	...	...	.17	.08	....	....	....	...	.	....	1.39	....	....	...	..	.10	..	....	....	...	.17	....	....	....	....	.35	....	.24	
Amana	..	....	....	.07	..	.37	.97	.05	..	....	...	....	...	.14	.20	.49	.16	.69	.19	....	....	T	.03	..	....	....	....	.82	....	...	....	
Ames	...	....	....	...	.90	1.10	.15	..	..	...	...	....	....	.47	.14	....	.52	.17	...	...	...	...	...	..	.10	....	....	.13	.54	....	.14	
Ames (near)	....	....	....	....	...	1.55	.50	...	....	....	....	....	...	.27	.12	..	....	.86	....	....	....	....	..	....	..	.02	....	.01	....	.32	....	
Atlantic	....	.	...	....	...	.94	.05	....	....	....	....	....	..	.34	.26	..	.26	.21	.15	....	....	....	....	....	....	..	....	....	.14	....	....	
Audubon	...	....	..	..	T	.20	.46	...	..	....	....	....	..	1.35	.40	..	T	.32	....	....	....	..	....	....	....	....	....	....	..	.75	..	
Bancroft	..	....	T	..	T	T	.43	....	...	....	....	....	...	.20	....	....	....	....	....	..	...	..	....	.10	....	....	....	....	....	.20	.22	
Batavia	...	....	...	....	1.10	.85	.01	....	....	...	....	...	....	...	.85	50	.10	...	...	...	....	....	..	..	....	...	....	T	T	..	..	
Baxter	....	....	....	....	.56	1.30	.42	....	..	....	..	..	..	.33	.48	.05	.71	.06	....	....	....	.15	..	.14	....	..	....	.87	.22	..	T	
Bedford	..	....	..	...	...	.80	.42	....	..	..	....	..	....	.54	1.40	..	.11	.49	.04	..	T	...	..	....	....	..	....	....	....	1.60	....	
Belknap	...	T	..	....	T	.85	.25	.76	....	...	....	..	..	...	.55	1.07	.10	1.31	.59	...	...	..	.05	....	....	....	....	..	.41	..	..	
Belle Plaine	...	....	.02	...	..	.55	.45	.10	....	..	...	....	....	T	.35	.10	.10	....	....	....	...	....	...	....	....	....	....	T	...	....	....	
Bonaparte	....	....	....	...	..	.82	.44	....	...	....	....	....	..	..	..	.15	.96	.11	.36	...	...	30	....	..	...	..	...	.32	....	.20	....	
Britt	....	....	.03	....	T	..	.69	....	....	..	...	...	...	2.13	.03	..	....		..	....	....	..	....	..	T	.02	....	.01	....	.08	T	
Buckingham	..	....	.10	..	....	.43	.27	....	...		.	..	....	.05	31	..	....	.07	....	...	...	.12	.70	....	...	....	....	....	....	.04	...	
Bussey	.09	...	....	....	.71	..	.64	..	....	....	....	...	...	.18	.22	....	....	.40	40	..	..	.24	...	....	..	..	....	....	....	....	....	
Carroll	....	....	....	...	...	.15	.05	.05	...	....	....	....	....	.65	.20	....	.14	.15	....	....	....	....	....	.04	....	.10	....	....	....	.37	..	
Carson	....	....	...	...	..	....	.52	.48	....	..	....	....	....	.63	.38	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
Cedar Falls	....	....	..	.10	.20	.20	.20	.05	....	....	....	....	..	.70	.10	T	.08	..	....	....	....	.18	....	....	....	T	....	....	....	....	T	
Cedar Rapids	T	..	.21	..	T	.38	.36	.07	..	...	....	....	....	.11	.60	T	.84	.45	T	....	..	.03	.04	....	T	....	T	.04	....	..	T	
Centerville	....	.02	....	...	T	.95	1.05	....	....	....	....	....	....	.30	.98	.10	.30	.25	.85	....	....	....	....	....	....	....	....	.01	....	.02	..	
Chariton	...	....	....	....	.05	.73	.47	..	....	..	....	....	....	.27	.15	.15	.40	.22	.44	..	....	.06	....	....	....	.02	....	.38	.12	.01	....	
Charles City	....	....	T	....	...	T	.45	06	....	....	....	....	....	2 06	.28	02	T	..	....	..	....	....	..	..	T	..	T	T	..	....	....	
Chillicothe	..	....	....	..	....	.90	1.10	...	..	.	....	....	....	50	..	..	.	2.50	....	....	....	....	....	....	..	....	..	....	.10	....	....	
Clarinda	..	....	....	..	....	.47	06	...	....	....	....	....	....	2.07	.42	....	.10	.40	.13	....	....	.02	.01	....	....	....	....	....	.73	.05	....	
Clear Lake	....	....	....	T	...	.20	.50	.60	..	..	....	....	....	2.00	T	.	.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
Clinton	...	.49	....	....	....	....	.61	.20	....	....	....	....	..	....	.46	.05	.24	.93	.33	....	..	....	.50	....	....	....	.05	.91	....	..	..	
College Springs	....	....	....	....	....	.47	.29	...	....	..	....	....	....	.24	.82	.08	.20	.25	.07	....	....	T	....	....	....	....	....	....	.10	1.33	....	
Coon Rapids	....	..	....	....	....	.16	.14	...	....	..	....	....	....	.90	.25	...	.06	.28	.20	....	....	....	....	....	..	T	....	....	....	1.00	....	
Corning	...	T	....	....	....	.60	.30	.07	....	....	....	....	....	.10	1.16	T	.20	.70	....	....	....	T	T	....	....	.42	....	....	.22	.20	....	
Council Bluffs	....	....	..	....	....	.95	....	..	....	....	....	....	....	.99	.23	..	.18	.19	....	..	....	....	T	.02	..	....	....	....	.06	....	.31	
Cresco	....	....	.14	....	..	....	1.78	.11	..	....	....	....	....	2.34	.13	...	....	....	..	....	....	....	.10	....	....	..	T	.12	....	....	....	
Cumberland	....	....	....	....	....	.44	T	.	....	..	....	....	....	.54	.55	....	.07	.38	.10	..	....	....	....	....	.20	....	....	....	....	.50	....	
Danville	...	....	..	..	....	.65	.95	T	....	..	....	....	....	..	....	....	.75	.50	.10	....	....	....	.02	....	..	....	....	.10	.75	.4	....	
Davenport	.	.01	..	.40	....	.06	.56	.42	T	..	...	....	....	.27	.53	.13	.16	.81	.51	..	....	....	.22	T	....	..	T	.58	....	.01	.01	
Delaware	...	...	.14	....	...	...	.76	....	....	....	.	....	....	.15	.16	....	.35	....	....	....	....	....	.24	....	....	....	....	.42	....	.03	....	
Decorah	...	....	.18	....	....	....	1.74	....	.16	..	....	....	....	.67	.16	....	....	....	....	....	....	....	.10	....	....	....	....	.33	....	....	....	
Denison	....	....	....	....	....	.10	.45	....	....	....	....	....	..	T	.21	..	.07	..	.12	....	....	....	..	.42	T	..	....	..	....	.96	.04	
Des Moines	....	...	T	...	T	.10	.70	.01	....	....	....	....	....	.19	.74	.04	.24	.52	.18	....	....	.03	.02	....	....	.33	....	1.40	T	.26	....	
De Soto	....	....	T	....	....	.94	.51	.14	....	....	....	....	....	.10	.60	.04	.04	.41	.23	....	....	....	.01	..	....	.99	....	.13	....	....	....	
Dows	....	T	T	.08	....	.24	1.91	.13	....	....	..	..	....	.72	.14	....	..	....	....	....	....	....	....	....	....	....	....	..	.11	....	1.50	
Dubuque	....	....	....	....	...	...	1.74	.38	....	..	T	....	....	.24	.37	.54	.01	30	T	....	....	....	.07	..	....	....	.07	95	....	....	....	
Eldon	...	....	....	....	...	1.10	1.74	.03	....	....	..	....	....	.02	1.16	.36	.76	.06	.19	....	....	....	.02	..	....	....	..	T	.28	.04	..	
Elkader	...	....	.18	....	....	...	.65	.10	..	....	.05	....	....	1.95	.40	.02	....	....	..	....	....	....	.08	....	....	....	..	.70	....	....	..	
Emerson	..	....	....	....	.76	.19	..	....	....	....	..	....	....	.20	.29	....	.36	..	....	....	....	....	....	....	....	....	..	....	....	....	.38	
Emmetsburg	...	...	..	....	....	.50	.40	..	....	..	..	..	....	....	...	...	....	..	....	....	..	....	....	....	..	....	....	....	....	...	....	
Estherville	..	....	T	....	T	T	.38	.03	..	..	....	..	....	.83	..	..	..	..	..	....	..	....	....	....	....	....	....	....	.31	....	1.31	
Fairfield	...	.02	..	...	..	.66	1.26	.01	....	....	....	..	....	.38	1 28	.27	.15	.20	.26	....	....	T	.01	..	....	T	....	....	....	.66	.16	
Fayette	...	...	.09	....	....	....	.24	.25	....	..	T	....	....	.57	.39	.21	..	T	....	....	....	....	.20	....	T	....	....	....	.53	.28	..	....	
Ft. Dodge	....	....	....	....	....	2.00	1.25	..	....	..	..	....	....	1.00	.05			....	.17	....	....	....	....	....	....	....	....	....	....	....	....	
Ft. Madison	...	T	....	....	T	.75	.04	T	....	....	....	....	..	....	.20	.50	.05	.62	.70	....	....	T	.25	....	....	....	....	....	....	.10	....	
Fonda	T	...	..	T	.58	.91	.34	T	...	.	...	...	.86	.23	.16	T	.31	....	....	....	....	....	....	..	....	..	..	.18	.26	.38	....	
Forest City	...	.	....	.03	...	..	1 07	.21	....	....	....	....	....	.09	1 07	....	....	....	....	....	....	....	..	..	....	..	..	T	1.34	T	..	
Galva	..	....	..	..	..	.10	.05	.	....	..	....	....	....	.94	....	....	..	....	.07	....	....	....	..	75	....	....	....	.43	15	1.05		
Glenwood	T	....	....	..	..	.63	.22	..	....	..	..	....	....	.45	.28	....	T	.45	T	..	..	....	..	....	....	....	....	.37	T	..		
Gilman	..	T	T	....	....	.95	.14	....	....	....	....	....	....	..	62	....	.09	.48	..	..	....	....	.19	....	....	....	....	....	T	T	....	
Gladbrook	...	..	.31	....	...	.30	.10	....	....	..	..	..	..	.40	.30	.20	T	..	..	....	....	....	....	....	....	....	....	....	....	.20	....	
Grand Meadow	..	..	....	....	..	.01	40	..	....	....	....	....	..	1.05	.03	.22	....	....	....	....	....	..	T	....	..	..	.06	.45	..	..	....	
Greene	...	..	....	....	..	.5	.23	....	....	....	....	....	..	.70	.12	.	....	....	..	..	....	....	....	....	..	....	....	..	....	..	....	
Greenfield	T	...	..	....	..	....	....	....	....	....	....	....	....	..	1.01	.02	....	.33	.47	....	....	....	....	....	....	....	....	....	....	.43	....	
Grinnell (near)	...	..	T	.03	T	1.06	.35	.03	....	....	....	....	....	T	.43	.11	..	.60	.20	....	..	.28	.22	....	..	..	....	1.60	....	.03	....	
Guthrie Center	....	....	....	..	....	.79	....	.62	....	..	....	....	..	....	.52	..	.72	....	....	....	....	....	....	....	....	....	....	....	.69	..	
Hamburg	..	..	....	....	....	.84	..	..	....	....	....	....	....	.57	.31	.20	.30	....	....	..	....	....	..	....	....	..	....	....	.87	....	
Hampton	..	....	.10	....	..	.19	.47	.50	..	..	....	....	....	.63	.12	....	....	T	....	....	....	....	.10	....	....	....	....	....	.04	....	.08	
Harlan	....	....	..	....	T	.59	.52	.05	..	..	..	....	....	.51	.42	..	.01	.18	.05	....	....	....	....	.08	..	.06	..	....	T	.62	T	
Hawkeye	.08	..	..	....	T	..	..	.87	....	....	....	....	....	....	1.25	1.23	....	.08	....	....	....	....	.15	05	..	..	T	....	....	....	....	
Hedrick	....	..	....	....	....	.70	1.90	.08	....	....	....	....	..	.05	.31	.30	.74	.08	.15	....	....	T	....	..	....	....	....	.22	....	....	..	
Hopeville	..	..	....	....	....	.28	.27	....	..	....	....	....	..	.60	1.23	..	.30	.38	.90	....	....	.03	....	..	....	.45	....	.04	....	.16	..	
Hoprig	...	....	....	..	...	...	.25	..	..	..	....	....	....	.2	..	..	....	....	....	....	....	....	....	....	....	....	....	....	.36	....	.16	
Humboldt	..	..	....	..	..	.60	.18	....	..	.01	....	....	....	.60	.13	....	....	....	.08	....	....	....	....	....	....	....	....	....	....	.75	.03	
Independence	....	..	..	.25	T	T	.35	.12	....	....	....	....	..	T	.15	.12	..	48	..	....	....	....	.25	..	....	....	.02	T	..	....	....	
Indianola	....	..	T	....	.14	.98	20	T	....	..	..	....	....	T	.80	T	.26	.50	.25	....	....	.01	.14	..	..	.89	....	T	..	....	....	
Iowa City	..	T	....	.14	..	.29	1.79	.05	....	....	....	....	....	.14	.70	..	.07	.61	.41	....	....	.07	.04	..	....	....	....	T	....	....	....	
Iowa Falls	....	....	T	....	....	.68	.41	..	....	....	....	....	..	.45	....	....	T	.21	....	....	....	.02	..	..	....	....	....	....	.02	....	....	
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Keosauqua	T	....	....	T	....	1.00	.78	.02	....	..	....	....	....	....	30	.05	.50	.19	.33	....	....	T	.15	T	....	....	....	.14	.10	.05	....	
Knoxville	..	T	..	T	T	.59	.75	T	..	..	....	....	....	T	.60	.13	.18	.43	.37	....	....	.26	.11	....	....	....	....	07	....	..	..	
Lacona	....	....	....	....	.05	.95	.50	.	....	....	....	..	....	.10	.45	.20	20	.33	.45	..	....	T	T	....	....	.15	..	T	T	T	....	
Lansing	...	..	T	.27	....	....	1.20	.29	..	..	T	....	T	1.00	.50	08	..	....	....	....	....	.	.05	.	....	....	....	.96	....	....	....	
Larrabee	..	..	..	....	....	.22	.54	....	....	....	.	....	....	.08	..	....	.	..	....	.	....	....	.15	....	....	..	....	....	1.01	....	4.30	
Le Mars	...	...	....	....	....	.28	.21	.07	....	....	.	....	....	....	..	....	.	..	....	.	..	....	....	....	....	....	....	....	....	....	....	
Lenox	..	..	....	..	..	.34	.41	.05	....	..	....	..	.02	..	....	..	....	....	....	..	....	....	....	.17	..	....	....	....	.05	....	.16	
Le Claire	..	.	.01	.41	..	.	T	.95	.19	....	....	....	....	.36	1.46	T	.25	.79	.14	.01	....	T	....	..	....	.05	....	.33	1.50	.02	....	
Logan	...	..	..	..	..	.54	.49	.01	....	....	..	.33	.22	..	.51	.31	.03	.53	.91	.02	..	....	.21	.02	..	....	....	....	.46	....	....	
Maquoketa	....	.0	.	.44	....	....	1.75	.71	..	....	....	..	..	..	.07	..	....	....	....	....	....	....	.06	....	..	.06	....	....	.15	....	.04	
Mason City	...	....	T	.	...	.30	.20	.30	..	.	...	....	1 00	.70	.88	.11	.33	.36	.51	....	....	..	.24	.03	....	.82	.02	.76	..	..	.08	
Marshalltown	...	...	....	T	...	.68	.53	05	..	....	....	....	....	.03	.40	..	....	..	....	..	..	....	....	....	..	....	..	....	....	....	....	
Melrose	....	T	...	.	50	.09	.50	...	....	....	.	..	...	.10	.23	.24	...	.44	.03	....	..	.02	.13	....	...	..	....	....	....	.66	.04	
Monticello	....	....	T	.36	T	...	.36	.58	....	....	....	....	....	.23	T	T	.13	T	....	....	....	T	....	....	....	....	....	....	....	....	....	
Mooar	....	T	..	....	....	....	1 80	T	....	..	....	....	....	..	.23	.48	.24	.21	....	....	....	.16	..	....	....	....	..	.13	....	....	....	
Mt. Ayr	..	..	...	...	.13	.35	.59	...	....	....	....	....	....	.15	T	T	.98	.44	.24	.	....	....	..	....	....	....	....	....	.48	.86	....	
Mt. Pleasant	....	..	..	....	..	.74	.47	....	....	..	....	..	....	.01	1.47	.20	.20	.34	.46	..	..	.05	....	....	....	....	....	....	.04	.03	....	
Mt. Vernon(Hub)	....	.01	.37	....	T	.07	1.70	.06	....	....	....	....	....	.25	.02	.31	.33	....	.30	....	....	T	....	.05	....	....	....	1.38	1.14	.05	..	
Mt. Vernon	....	..	.15	.22	....	.07	1.80	....	....	....	....	....	....	.13	.36	.02	.72	.56	T	....	....	.02	.05	....	....	.01	....	.02	....	....	....	
New Hampton	...	.12	..	..	..	.	1.23	03	....	....	....	..	....	.60	.40	.17	.60	.35	.30	.	....	....	.11	....	....	....	....	.05	....	....	..	
Newton	...	...	T	...	T	1.65	.19	.01	....	....	..	..	...	.37	.12	.	....	....	....	..	....	..	....	....	.19	....	....	....	....	....	....	
Northwood	....	....	.06	....	....	....	38	.05	....	....	....	..	....	1.65	.38	.05	.20	.41	.18	....	..	.20	T	.15	....	.08	....	.11	....	.05	T	
Odebolt	....	....	....	..	....	....	.25	....	....	....	....	....	....	.10	.14	....	....	....	....	....	.03	....	....	....	....	....	....	....	....	....	..	
Ogden	...	....	....	....	....	1.05	.10	.35	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.42	....	....	....	.09	....	.56	.15	
Olin	..	...	.45	....	...	T	.43	.02	...	..	....	....	....	1.08	.15	....	.20	.45	....	..	....	....	....	....	.08	....	....	.06	.22	1.08	....	
Omaha (Neb.)	....	T	....	....	T	.61	.08	....	....	....	....	....	....	.13	.45	....	.17	.33	.72	....	....	....	.20	....	....	....	.13	.05	....	....	....	
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Oskaloosa	....	.02	....	....	T	.75	.31	...	....	....	....	....	....	.63	.20	T	.44	.08	.28	....	....	.22	.07	....	....	T	....	.07	T	T	....	
Ovid	....	.06	....	....	.33	.44	.68	....	....	....	....	....	....	.64	.51	.22	.69	.80	.76	....	....	.02	....	....	....	T	....	.27	.30	.03	....	

DAILY AND MONTHLY PRECIPITATION FOR MAY, 1900—CONTINUED.

ATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
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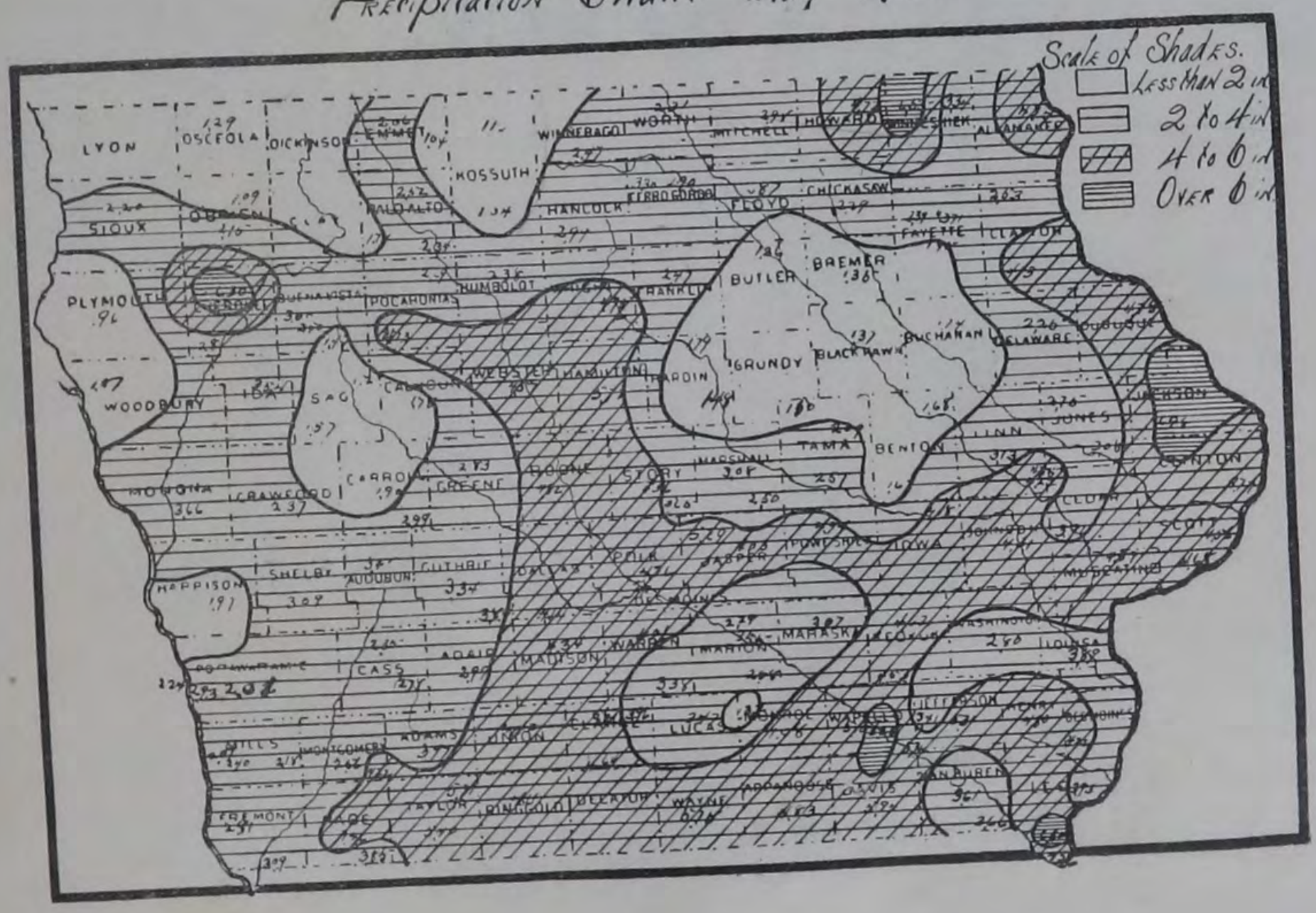
Precipitation Chart May 1900



Vol. XI. JUNE, 1900. No. 6.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

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Central Station, Des Moines, Iowa.

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DIRECTOR.

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LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER
1899.

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Albia.....R. Moore.
Algona.....C. D. Pettibone.
Alta.....D. E. Hadden.
Alta (Near).....W. J. Minard.
Amana.....Conrad Schadt.
Ames.....Exp. Station.
Ames (6 miles s. e.).....Isaac Young.
Atlantic.....J. W. Love.
Audubon.....F. P. Hooker.
Bancroft.....E. G. Bailey.
Batavia.....Agent C. B. & Q. Ry.
Baxter.....Agent C. G. W. Ry.
Bedford.....Prof. E. H. Griffin.
Belknap.....A. W. Rankin.
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Britt.....G. P. Hardwick.
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Burlington.....Prof. Maurice Ricker.
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Carroll.....Moses Simon.
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Cedar Falls.....Prof. Jennie E. Curtis.
Cedar Rapids.....Electric Light & Power Co.
Centerville (Walsh P. O.).....J. W. Tanner.
Chariton.....Hon. S. H. Mallory.
Charles City.....Chas. O. Schmidt.
Cherokee.....Hon. L. W. Beal.
Chillicothe.....Agent C. B. & Q. Ry.
Clarinda.....A. S. Van Sandt.
Clear Lake.....John Cobb
Clinton.....Luke Roberts.
College Springs.....A. M. Finley.
Coon Rapids.....Downs & Co.
Corning.....Jerome Smith.
Council Bluffs.....J. B. Rishel.
Cresco.....Gregory Marshall.
Cumberland.....Agent C., B. & Q. Ry.
Danville.....Agent C. B. & Q. Ry.
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Denison.....Prof. W. C. Van Ness.
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Dubuque.....*E. H. Bowie.
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Emerson.....Agent C. B. & Q. Ry.
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Fayette.....R. Z. Latimer.
Fort Dodge.....C., R. I & P Agent.
Ft. Madison.....Miss L. A. McCready.
Fonda.....H. P. Barron.
Forest City.....J. A. Peters.
Galva.....Miss Ida Ackert.
Gilman.....Jas. L. Wylie.
Gladbrook.....Agent C. G. W. Ry.
Glenwood.....J. P. Jackson.
Grand Meadow (Postville P. O.)..F. L. Williams.
Greene.....J. L. Cole.
Greenfield.....J. G. Culver.
Grinnell.....Prof. S. J. Buck.
Grinnell (Near).....A. O. Price.
Grundy Center.....Ed King.
Guthrie Center.....Olam Holden.
Hamburg.....Agent C., B. & Q. Ry.
Hampton.....E. C. Grenelle.
Harlan.....C. A. Reynolds.
Hawkeye.....Miss Beatrice Kirkendall.
Hedrick.....J. T. Brooks.
Hopeville.....M. T. Ashley.
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Keosauqua.....Prof. J. H. Landes
Knoxville.....Casey & Belville
Lacona.....Agent C., B. & Q. Ry.
Lansing.....G. H. Markley.
Larchwood.....Syndey Clarke.
Larrabee.....H. B. Strever.
Lenox.....J. L. Hurley.
Le Mars.....Dr. T. E. Cole.
Logan.....Mrs. M. B. Stern.
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Marshalltown.....Branch S. Jones.
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Rockwell Citv.....C. M. Randall.
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Stuart.....H. E. Boatright.
Thurman.....C. R. Paul.
Toledo.....Grace Bookwalter.
Vinton.....T. F. McCune.
Villisca.....C. E. Matteson.
Wapello.....Geo. W. Schofield.
Washington.....Wm. A. Cook.
Washta.....H. L. Felter.
Waterloo.....M. L. Newton.
Waverly.....H. S. Hoover.
Webster City.....Louis Frank.
What Cheer.....Hon. J. C. Beem.
Whitten.....Dr. Frank P. Butler.
Wilton Junction.....J. M. Rider.
Winterset.....W. W. McKnight.
West Bend.....Phil. Dorweiler.
West Union.....J. M. Lisher.
West Branch.....A. A. Madson.
Woodburn.....Agent C. B. & Q. Ry.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

owa Weather and Crop Service.

VOLUME XI. JUNE, 1900. No. 6.

IOWA CROP REPORT, JULY 1, 1900.

Reports of county and township crop correspondents on the ıdition of staple farm crops, July 1st, have been received and ›ulated, and following is the summary for the state at large: The condition of spring wheat is rated at 91 per cent, show- ; an average decline of three points since June 1st. Winter ıeat is placed still lower, the present estimate being 83 per ıt; but the acreage is too small to affect materially the total ›ld. The condition of the corn crop is estimated at high ures in nearly all parts of the state, and after a conservative duction of some of the apparently extravagant estimates the erage is 104 per cent. It is certain that if the season in the ture is as favorable for corn as it has been since the crop was anted, the output will more than justify the estimate here ven. Barring some general calamity, in form of hot winds, ›structive storms or untimely frosts, the crop will fully equal ıe best the state has harvested within the past twenty years. he condition of other crops is rated as follows: Oats, 92 per ›nt; rye, 89; barley, 94; hay, 73; pastures, 84; millet, 93; flax, 92; room corn, 93; potatoes, 98; sweet potatoes, 94; sorghum, 96; pples, 76; pears, 60; plums, 68; peaches, 67; grapes, 65.

On the corresponding date in 1899, the same correspondents ated the crops as follows: Corn, 83 per cent; spring wheat, 3; oats, 96; rye, 80; barley, 97; flax, 94; hay, 82; pastures, 98; ıillet, 97; potatoes, 100; sweet potatoes, 96; broom corn, 85; orghum, 87; apples, 60; plums, 65; grapes, 43.

CLIMATE AND CROP CONDITIONS IN JUNE.

The month of June was very nearly normal in respect to temperature and rainfall. As usual, however, there was con- siderable inequality in the distribution of the rainfall, the sta- tion reports showing a range from .67 of an inch to 12.35 inches. The driest portions of the state during the month were the eastern counties of the Mississippi river districts. The north central and central districts were generally liberally watered by showers, well scattered through the month, and in four-fifths of the state there was but little injury to crops from effects of deficient moisture. For the cultivation and rapid growth of corn the weather conditions have never been more nearly perfect in any previous June of which we have any records. The bulk of the corn acreage was planted early, and by the first of June a good stand had been secured, the soil was in excellent tilth, and cultivation was in progress. And throughout the month there was steady advancement of that great staple crop, with practically no serious check to its growth or hindrance to cultivation. The loss of acreage by flooding, washing out or other causes, was a very small per- centage of the area planted. At the close of June a very large portion of the crop was laid by in extra good condition, giving promise of more than an average yield. In the early part of the month the weather was too dry for meadows, spring wheat, oats and barley in northern and western districts. As a result the hay crop has been somewhat lighter than usual, and small grains were short in straw and below the average in more than half of the state. At the end of the month haying was well begun, rye was ready to cut, and bar- ley was nearing maturity. The potato crop, and garden truck generally, were doing remarkably well. Apples began to show signs of decline in condition during the latter part of June, and the yield of berries was somewhat below expecta- tions. But on the whole the crop outlook was very promising.

DOES THE RAINFALL CHANGE?

[Rockford Register.]

We are asked whether, with the removal of the timber of the country and the cultivation of the soil, the average rainfall of a given territory shrinks? No, it does not. The rainfall will, of course, vary from year to year as it has always done, but the average precipitation will remain the same. It is true that with the removal of the timber and the cultivation of the soil, drought periods probably become more marked, this caused by the more rapid removal of the water from the surface into the artifical ditches and water ways, and also by the greater amount evaporated from the soil by growing crops. These two agencies account for the drying out of the large areas of wet lands all through the west. The rainfall of the Mississippi valley comes not from moisture evaporated from the soil of the valley itself, but almost wholly from the water pumped up by the sun from the gulf of Mexico. This being the case, it fol- lows that so long as the gulf remains and the sun keeps at work, there can be no visible change in the rainfall of the val- ley itself. The lesson which needs to be learned under the changed condition is how best to conserve the rainfall, for that undergoes no change.

The beet has been so much improved by cultivation, notably in Germany, that it now contains about three times as large a proportion of saccharine matter as it did a century ago. And this development of the beet, and the vast increase in the out- put of beet sugar, have been accomplished in direct competi- tion with the cheap labor and easy production of cane sugar in the tropical islands.

* * *

John Wilson, Esq., of Walker, Iowa, one of the efficient crop reporters of this service, sends the following account of a cas- ualty by lightning: "On the afternoon of Tuesday, July 3d, a thunderstorm, with strong wind and heavy rain, came from the south-southwest. There were several hard strokes of lightning, one of which killed 18 head of cattle, 15 of which were dairy cows. They were standing with heads against a wire fence. It looked pitiful to see so many fine cattle killed for lack of foresight in the construction of the fence by grounding the wires."

STORY OF A DECADE.

IOWA'S CLIMATIC RECORDS AND FARM PRODUCTS FOR 10 YEARS—JAN. 1, 1890, TO JAN. 1, 1900.

The climate and crop table published herewith, which has been compiled from records of the Iowa Weather and Crop Service since the date of its establishment in 1890, presents a striking exhibit of the important climatic features and vast resources of soil of this leading agricultural state. We will briefly note some of the salient features of this tabulated exhibit.

The average annual temperature of the decade was 47.4°, which is practically the average of all past years of record for the state at large. The warmest year was 1894, with a mean of 49.7°, and the year following (1895) was the coldest, with a mean of 45.5°. The average temperature of the six crop months—April 1st to October 1st—was 67°,and of the three summer months, 71.7°. The coldest crop season was in 1891, with an average of 63.8° for the six crop months, and 68.9° for the summer months. The warmest crop season was in 1894, when the average of the six months was 67°, and of the summer months, 74.7°.

The average annual precipitation for the decade was 30.11 inches, which is substantially the average of all the years of general record for the state. The yearly average of the last five years was .52 of an inch greater than the average of the first five years of the decade. So it appears that the records do not disclose any facts to sustain the theory that this region is gradually drying up, or undergoing any climatic change.

The most notable feature of these weather records is the fact that more than two-thirds of the yearly precipitation has fallen in the six crop months—April 1st to October 1st. The average rainfall of the crop season has been 21.36 inches, which is 70.9 per cent of the annual precipitation. And the average of the three summer months has been 11.16 inches, or 37 per cent of the yearly average. So it appears that the copious rainfall and almost tropical heat of the crop growing months have been the prime factors in the production of the enormous crops that place Iowa in the first rank among the agricultural states of the Union.

During the decade there has been considerable variableness in the yearly output of the soil, but the total products of even the poorest crop seasons have brought ample rewards to the industrious toilers of the state. The leanest season would be regarded as fatness in many other sections of the country.

A study of the climatic records of the crop months will indicate some of the conditions that have caused variableness of production. In 1890 the average yield of corn and other cereals was light, compared with the average of the decade. The rainfall in June was 7.76 inches—over 3 inches above the state normal—which retarded the work of cultivation. This was followed by a severe drought with hot winds, which condition was not relieved before the close of the season. The rainfall in July was only 1.98 inches for the state, with a mean temperature of 75.6°. Under these adverse conditions the average yield of corn was 28 bushels per acre, and of oats 29 bushels; and the total cereals were 343,000,000 bushels; which was remarkably large under the circumstances.

The year 1891 gave us one of the best all-around crop seasons of the decade, the corn crop yielding an average of 38 bushels per acre, and oats 40 bushels, with total cereal crops exceeding 485,000,000 bushels. Though the mean temperature for that season was below normal, yet there was ample heat to perfect the crops, and the rainfall was timely and well distributed. The months of April and May were warm and dry, though with sufficient moisture to insure germination and growth. June brought an average of 5.39 inches, with about normal temperature; and July added 4.22 inches to the summer's quota of moisture. That distribution of rainfall through the midsummer period proved to be just right for the development of a "bumper" corn crop. The season of 1892 was quite unfavorable, with a total of nearly 28 inches of rain in the crop months. There were heavy floods in April and May and considerable excess of miosture through most of the season of planting and cultivation. The corn yield was 29 bushels, and oats 25 bushels per acre.

The season of 1893 was fairly good as to conditions and results; though the latter part was dry, being the beginning of the droughty period that continued through the larger part of 1894. This great drought, which culminated in the summer of 1894, served as the supreme test of the productive capabilities of Iowa soil. The total precipitation for the year was only 21.95 inches, and the total for the summer was 4.88 inches. The month of July was almost entirely rainless, and destitute of dewfall, in the larger part of the state; and the average temperature was 76.4°, with the maximum ranging from 95° to 104°, intensified by high winds and a minimum of humidity. With all these adverse conditions it seems marvelous that the state harvested 256,000,000 bushels of corn and other cereals, and had an abundance of food for man and beast, though much less than the usual amount for export.

The ideal season of the decade was in 1895, with a corn crop of 38 bushels per acre, oats 48 bushels, and aggregate cereal products 521,638,000 bushels. The soil and subsoil were thoroughly dried out during the drought of the preceding year, and the surface was in perfect condition to absorb and retain the spring and summer rains, which came in sufficient amount and at the right time to start the crops early and carry them forward to perfection. The early spring was dry and warm, the rainfall of April being only 2.62 inches, and May 3.19 inches; but the summer months brought 12.15 inches of rainfall, with seasonable temperature. It was a year of great productiveness, as the crop records show. But in that period of general business depression the December 1st farm prices were too low to make a satisfactory exhibit of the value of the year's products. At the farm prices current at this time the cereal output in 1895 would have been doubled in value.

The greatest annual and seasonal precipitation in the decade fell in 1896, the annual being 37.45 inches, and the amount in the crop season 29 33 inches. It was altogether too much of a good thing, as will be seen by noting the marked shortage in the small grain crops of the season. It was excessively wet in April and May, and also in July, causing a muddy seed time and a "catchy" harvest. There was an enormous growth of straw on rich lands, but about half the crop was destroyed in the fields, and never reached the granaries. June was drier than the other months, and that gave time to dry off the corn fields and get the crop planted and laid by before the midsummer downpours came to ruin the grain in shock and stack. There was more than an average yield of corn in bulk, but the last of August and the first half of September were too wet and cold to bring the crop to perfect maturity, and a very large per cent was soft and in poor condition to crib. At the low prices prevailing that year the aggregate value of the crops was below any year in the decade.

The crop season in 1897 was drier than usual, except the month of April, which received an excessive amount of rainfall, causing much delay in seeding and plowing. The dry summer checked the development of corn at the critical stage, and the average yield per acre was 29 bushels, with a total of 239,452,150 bushels.

Very nearly normal conditions as to temperature and rainfall prevailed in the crop seasons of 1898 and 1899, and the

ults are shown in the very satisfactory output of the har-
ts. The enhanced farm prices give a brighter color to the
ancial exhibit for these latter years of the decade.
The figures in this table furnish ample material for study
l comparison. They utterly disprove the pessimistic theory
t the state is being desiccated, and that there is a continual
cline in its productiveness. The cereal products of the last
e years of the decade were 587,000,000 bushels greater than
the first five years, or an average increase of 117,000,000
shels per year. In all lines of production we note the
sults of improved methods of culture. Drainage and culti-
tion have improved the condition of the soil, so that fair
turns are secured in extremes of wet or dry seasons.

The figures as to the total value of farm products are based upon the prices current at the farms on the 1st of December in each year, and do not include the increment of value resulting from feeding stock and converting corn, grain, and forage into beef, pork, horses, dairy products, etc. Making due allowance for this increase year by year, the total value of Iowa's soil products for the decade exceeds $2,000,000,000, or an average of more than $200,000,000 per year. In view of these facts and figures it is easy to understand why there has been a steady advance in the selling prices of Iowa farms. Iowa climate and soil afford a safe basis for the investment of capital.

IOWA'S CLIMATE AND CROPS FOR THE DECADE—1890–1900

TEMPERATURE DATA.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	Averages for decade.
Annual mean temperature—degrees	47.7	47.4	47.5	45.7	49.7	45 5	48.5	46.7	47.6	47.6	47.4
Highest temperature and date—degrees	July 13:110	Aug.7-9:106	July 11:104	July 13:104	July 26:109	July 16:104	July 3: 104	July 23:106	Aug.20:103	Sept. 6:104	105.2
Lowest temperature and date—degrees	Jan. 27:-27	Feb. 4:-31	Jan. 19:-38	Feb. 4:-28	Jan. 25:-37	Feb. 1: -33	Jan. 4: -20	Jan. 25:-30	Dec. 25:-25	Feb. 4:-40	-30.9
Mean temperature—April—degrees	51 8	50.6	45.4	45.5	51.7	54.2	54.5	47.9	48.1	48.9	49.8
Mean temperature—May—degrees	57.7	58.3	54.0	56.6	61.1	61.7	65.5	59.6	59.6	60.2	59.4
Mean temperature—June—degrees	72.7	69.1	69.2	71.2	73.2	69.7	69.1	69.1	71.4	70.7	70.5
Mean temperature—July—degrees	75.6	68.6	73.0	75.0	76.4	72.1	73.6	75.6	73.4	73.1	73.6
Mean temperature—August—degrees	68.4	69.1	71.4	69.4	74.6	71.9	71.7	68.9	71.2	74.4	71.1
Mean temperature—September—degrees	59.3	67.3	64 7	64.7	65 1	66.8	58.5	70.9	65.3	62.5	64.5
Average temperature for six crop months—degrees	62.2	63.8	62.9	63.7	67.0	66.0	65.4	65.3	64.8	64.9	64.6
Av. temperature for three summer months—degrees	72.2	68.9	71 2	71.8	74.7	71.2	71.4	71.2	72.0	72.7	71.7
RAINFALL DATA.											
Average precipation per year—inches	31.12	33.13	35.74	27.31	21.95	26.63	37.45	26.99	31.69	29.10	30.11
Rainfall in April—inches	1.78	2.15	4.75	4.21	3.07	2.62	5.02	5.35	2.56	2.40	3.39
Rainfall in May—inches	3.56	3.18	8 77	3.45	1.87	3.19	6.69	1.92	4.67	6.23	4.35
Rainfall in June—inches	7.76	5.39	5.19	3 91	2 67	4.32	3.11	3.81	4.72	5.04	4.59
Rainfall in July—inches	1.98	4.22	5.29	3.33	0.63	3.40	6 90	3.26	2.98	3.07	3.50
Rainfall in August—inches	3 41	4.24	2.24	2.32	1.58	4.43	3.52	1.86	3.44	3 68	3.07
Rainfall in September—inches	2.97	1.33	1.53	2 34	3.57	3.03	4.09	2.04	2.69	0.93	2.45
Rainfall for six crop months—inches	21.46	20.51	27.77	19.56	13 39	20.99	29.33	18.24	21.06	21.35	21.36
Rainfall for three summer months—inches	13.15	13.85	12.72	9.56	4.88	12.15	13.53	8.93	11.14	11.79	11.16
STAPLE FARM CROPS FOR DECADE											
Spring wheat yield per acre—bushels	12	16	14	12.4	12.8	19	13	13.4	14 8	12.7	14
Wheat, total yield—bushels	19,041,000	27,586,000	7,534,952	11,385,899	9,470,306	14,346,000	10,398,785	14,613,054	22,321,268	19,900,830	15,660,000
Corn, yield per acre—bushels	28	38	29	35.7	14.8	38	39	29	34.5	36.3	32 2
Corn, total product—bushels	239,675,156	335,031,598	173,867,354	214,804,758	129,104,930	285,000,000	313,692,210	239,452,150	289,214,850	306,852,710	252,664,170
Oats, yield per acre—bushels	29	40	25	28	24	48	26	30	32.5	34.5	31.7
Oats, total product—bushels	80,002,735	115,810,800	83,485,150	100,742,852	107,691,460	201,600,000	73,450,000	132,571,155	139,915,346	140,647,309	117,591,714
Barley, total product—bushels	3,664,368	4,528,669	14,049,072	11,437,666	8,635,604	18,678,000	15,881,618	14,076,850	14,138,346	14,719,311	11,781,680
Rye, total product—bushels	1,608,960	2,051,400	1,536,270	1,785,202	1,624,073	2,014,000	1,891,716	3,490,344	3,852,561	2,061,169	2,148,868
Flax, total product—bushels	2,979,081	3,154,016	5,188,104	2,263,861	1,371,165	2,310,000	1,946,720	2,498,600	2,376,604	1,597,797	2,563,112
Potatoes, total product—bushels	8,832,352	25,620,350	8,729,160	6,172,257	7,869,321	21,200,000	14,814,795	10,051,919	12,238,411	15,252,934	13,058,149
Hay (tame) total product—tons	4,991,335	5,582,890	6,288,200	4,569,341	1,901,038	2,610,000	3,376,440	3,362,287	3,852,560	3,852,940	4,038,033
Corn and small grain—bushels	343,992,190	485,008,467	280,472,798	340,472,798	256,526,373	521,638,000	415,314,231	404,203,553	469,172,371	483,717,957	400,051,870
Total value of farm products	$204,375,000	$207,841,000	$175,727,940	$161,207,464	$137,804,000	$168,235,420	$133,664,728	$151,084,069	$187,455,376	$194,605,706	$172,350,250

- Below zero.

A HAWKEYE VIEWS THE SOLAR ECLIPSE.

Among the many scientists who made observations of the recent solar eclipse within the narrow belt of totality, was Prof. David E. Hadden, of Alta, Iowa, one of the voluntary observers of this service, whose "sunspot observations" have been published in the Iowa MONTHLY REVIEW. He selected Wadesboro, N. C., as his "point of view," and set up his tabernacle and instruments within the camp of the party of scientists representing the Princeton college and the British Astronomical association. It was in every way a desirable location in respect to altitude and range of vision. Under the caption, "Fifteen Hundred Miles in Quest of a Shadow," Mr. Hadden has published in the Alta *Advertiser* brief notes of his journey southward, and of the great spectacle he "trekked" so far to witness. We copy the following relating to the impressive phenomenon:

Sunday was a quiet day, nearly every preparation was finished, and with the exception of occasional final observations for time, accurate positions, etc., the day was passed in anxious expectation of the morrow. In the afternoon some light cirrus clouds swept athwart the heavens—forerunners of coming weather changes. Our fears increased when an old-time weather prophet assured us that a dense fog would envelop us by night but would likely clear off by eight o'clock the next morning. The officials of the Weather Bureau were more hopeful, and sent us a special bulletin announcing that the chances for clear skies in the morning were never better in any eclipse, so we thanked the forecaster and again took courage. When night came on we again examined some of the myriads of tiny stars and blazing suns which were seen with even greater grandeur under southern skies.

The morning of the 28th dawned amid perfect atmospheric conditions. Not a cloud dimmed the blue vault of heaven. A very gentle, cooling breeze from the west came up at intervals, birds were singing, and all nature contributed to make the heart of the astronomer happy. The town was astir at 5 A. M., and by 6 o'clock we were all at our places in camp.

A few final adjustments of the instruments, plate holders for the cameras at hand, and all was ready.

About half past seven the alarm was given that first contact would soon occur, and at 7:36:08 the edge of the moon was detected and the eclipse began. Slowly the great black disc of the moon passed eastward across the face of the sun, obscuring in its transit some small sun spots which were present.

I noted at 8:10 A. M. the perceptible change in the color of the light. Mocking birds in trees near by were singing their morning songs, cattle and poultry feeding, apparently oblivious to all the changes and intense interest around them; ten minutes later and the landscape was rapidly darkening, peculiar colors everywhere. We asked ourselves, "is it really morning or is the day drawing to its close?" Are we still on earth, or is this some other planet? We thought of Milton's lines:

> "Now came still evening on, and twilight gray,
> Had in her sober livery all things clad."

The scenes were changing fast, objects on the ground had an orange tint and faces of persons bore a strange, pallid tinge. The swallows, "birds of sunset and its purple clouds"—appeared and flew around with plaintive twitterings. We were all busy taking notes of the gathering gloom.

At 8:35 o'clock the intensely deep purple sky in the west and northwest, and pale light gray in east and southeast were noted. Birds were chirping slowly, cows near by feeding intermittently and hugging the fence, and a suggestion of chill crossed the air. A brilliant crescent of the sun was still visible; the wind had gone down, all sounds were hushed. It was night and yet not night. One seemed to see and yet not to see the hills and forests in the distance. A sense of uneasiness was gradually stealing over all life. Darker and darker grew the landscape; in the zenith the color was deep blue purple, and light purplish gray in the far horizon.

At 8:44 the shadow bands were observed on a white sheet stretched on the ground, appearing as faint, dark, narrow bands, and thought to be due largely to atmospheric influence. The last thread of sunlight was almost gone and just before disappearance I was fortunate in seeing it broken up by numerous dark points, known as Bailey's beads, from the name of the discoverer who first called attention to them. We watched for the quickly advancing black shadow which was speeding toward us at the rate of over 1,000 miles an hour, but it was not apparent because for some seconds before totality the bright corona was visible, and at the critical moment it flashed out so brilliantly as to modify the change in light while we were passing into the shadow. The supreme moment had come and totality had begun.

Words cannot describe the solemn grandeur of the scene now. The colors in all directions were surpassingly beautiful. Above, the sky was deep purplish black, while along the distant horizon rose rings of gray and orange, reminding one of a summer sunset; but the grandest scene of all was the great, inky black lunar globe covering the sun's disc, around which flashed that marvelous, soft, silvery-white, mysterious radiance known as the corona. It was of beautiful form, roughly resembling an arrow head—a fish tail appearance on the west and extending outward to a point on the east side, nearly parallel with the sun's equator; while circling the poles were delicately curved streamers which were exquisitely beautiful when viewed through the telescope. Prettier still were several magnificent rose pink prominences which projected beyond the chromosphere probably 20,000 or 30,000 miles. But only ninety seconds were allotted to us to view this grand phenomenon, and from the moment that totality was announced and the time keeper watching the great seconds pendulum swinging back and forth called out each passing precious second, every observer was alert, carrying out his or her pre-arranged program—exposing plates in cameras of all descriptions, photographing the spectrum of the corona, sketching with pencil the naked eye view, measuring the heat of the corona, searching for intra-mercurial planets, and many other delicate observations.

Never did the time seem to fly faster, and before we supposed the one and a half minutes were half gone, suddenly as a lightning flash a ray of actual sunlight struck the landscape, the corona disappeared, the shadow bands reappeared and the total phase was ended. The moon slowly traveled eastward across the sun, daylight rapidly returned, and in an hour or so the eclipse of 1900 was over.

Several months will elapse before all the photographic plates will be developed and the results discussed and published, but it is confidently hoped that our knowledge of the great luminary of our solar system and its appendages will be greatly advanced, and many problems settled. Whatever its cause and meaning, the corona must always absorb the deepest interest and attention during total eclipses. Many theories have been advanced as to its nature, but none satisfactorily explains it. During totality I exposed two photographic plates, one of which exhibits the inner corona and polar rays and part of the outer streamers very beautifully on a small scale.

The effect of witnessing a total eclipse will never pass away from one's memory. The impression it leaves is vivid and quieting for many days afterward, and can never entirely pass away. One is brought nearer to the great open book of the firmament and sees the name of the Creator emblazoned on every page. Certainly no one can view nature's grandest phenomenon, a total solar eclipse, without a feeling of reverential awe in the presence of the Maker of the Universe, of suns and worlds.

CASUALTIES BY LIGHTNING.

At Sioux City, on the afternoon of June 20th, a boy named Clarence Whisler was killed by lightning. With a number of others the boy had taken refuge in a barn, which was struck and consumed. The other persons were shocked, but escaped without serious injury. Four horses, valued at more than $12,000, were burned, and the total loss of property was $15,000. The storm was accompanied by severe hail in Sioux City and vicinity. The *Journal* says:

During the storm there was a wonderful electrical manifestation in the vicinity of the combination bridge. The lightning played along the superstructure of the big bridge, and as it ran along from one span to another streaks of fire would dart off and strike the surface of the water in the river, causing a splash. The steam would arise as though a bar of red hot iron had been soused into the water.

On the afternoon of the 21st, Mr. James Christianson, residing four miles south of Rolfe, was killed by lightning. He was in the barn during a light shower when the bolt struck the

e, passing through a hay mow to a post against which he leaning, causing instant death. The electric current ted the case of his silver watch, but did not stop the works; so extracted the nails and eyelets from his shoes.

)n the evening of the same day lightning struck and killed eight-year-old boy named Ray Locke, son of a farmer living r the town of Kent in Union county. Numerous farm mals were also killed in that vicinity during the same storm.

Geo. H. Wilson, of Buchanan county, writes: On the 21st a n was plowing; a thunderstorm came up; lightning killed horse and tore the plow to pieces, without harm to the n or the other horse.

William and Ross Busby, sons of John Busby, aged 24 and respectively, were killed by lightning at their home, ten les east of Oskaloosa on the 27th. The two had gone to the rn to close the doors and prepare it for the storm, when a lt struck the building, killed them both, and set the barn on e.

The Indianola *Herald* of June 28th, contained the following m:

Emrie Harvey had the misfortune to lose five head of steers, lled by lightning, Wednesday morning, the 27th. They were sured, but insurance will not cover the loss.

The Lohrville *Enterprise*, of June 29th, contained the follow- ig interesting item:

During the storm Wednesday morning, June 27th, Miss Sadie ond, residing with her parents four and one-half miles north- est of town, was struck by lightning, while standing near the ook stove, and her shoes were literally torn from her feet. The lightning came down the brick flue until it struck the tove pipe, when it seemed to have divided, part going down hrough the pipe and stove into the floor near where Miss Bond vas standing. She was knocked down and rendered unconcious y the shock, and a number of blisters were found on her feet. The young lady sustained no lasting injury, and after she ecovers from the soreness which follows a shock of this kind, will be in her usual health.

On the 9th during the night, lightning struck and burned the barn of J K. Ball in Washington township, Story county. Stock was saved; barn nearly new.

A press dispatch from Whiting, Monona county, dated June 28th, gave the following item:

Six children were injured, one fatally, and a house wrecked by the most peculiar and destructive freak of the storm two miles south of here this morning. The scene of destruction was on the Ed Bullard farm at the home of Harvey Queen. Lightning struck the house, but no fire was started, and the building collapsed as if blown up with dynamite. Every win- dow light and door was blown out and joists were torn away and scattered over the field. The six children, who were in the lower rooms, were stunned and some were buried in the debris. Vernie Queen, 15 years old, was buried deep in the mass of ruins, and when her body was recovered she was still alive, but cannot survive. One shoe was burned from her foot and the waistband of her skirt was burned when she was found. One of her legs was fractured.

A special from Carroll, dated June 28th, to the *Times-Repub- lican*, related the following:

Wednesday forenoon Carroll was visited by a fierce electri- cal storm. In Roselle township, on the farm of Wolfgang Fisher, two of his sons were plowing corn, and a bolt of light- ning struck Bernard, one of the boys, killing him instantly, but doing no harm to his brother and not injuring either team. It would seem that Mr. Fisher's farm was at the mercy of the lightning, as two or three years ago his large barn was struck and several head of live stock, also grain and machinery stored there was all entirely burned up.

Times-Republican special, Essex, June 28th:

A barn belonging to Sam Bingston, who resides two miles north of Essex, was struck by lightning Wednesday morning at 8:30 and was soon consumed by fire. The barn, a corn crib, shed and several hundred bushels of corn were destroyed. Loss, about $600. Insurance, $250. Mr. Bingston's two sons were standing about four feet from where the bolt struck, but were not injured.

VALUE OF LIGHTNING RODS.

[Chicago Tribune]

Commenting upon the statistics of deaths due to lightning, the *Electrical World* discusses the efficacy of lightning rods. Popular prejudice nowadays seems to be against this invention of Benjamin Franklin, and the lightning rod agent is a joke and a byword in the rural districts. Yet the *Electrical World*, which is good authority, says there is "abundant evidence to show that lightning rods protect tall buildings of non-conduct- ing material." The protection given by the ordinary lightning rod is not, however, always the most economical. Instead of carrying a single stout copper rod through insulators from chimney top to the ground that paper says it would be more effective to employ half a dozen uninsulated galvanized iron telegraph wires from the roof to the ground, and to intercon- nect them all on the roof with the idea of providing a conduct- ing network inclosing the house rather than an insulated duct beside the house. There are numerous instances of lightning discharges having been conveyed to the ground from the top of telegraph poles through ordinary iron wire without injury to the wire, and such material is plentiful and economical. These iron wires are declared to be sufficiently good for ordinary dwellings. The modern steel office building is, of course, a lightning conductor in itself.

PRESERVATION OF BIRDS.

[New York Journal of Commerce.]

The expansion of the Department of Agriculture is proceed- ing without very much noise, but with a fair degree of celerity. Attention was called a few days ago to an enlargement of the department's functions in connection with the chemical examination of imported foods and of foods for export. Last week the president approved an act, which attracted little attention during its passage, which confers upon the depart- ment large powers for the preservation of game and other wild birds. "The object and purpose of this act is to aid in the restoration of such birds in those parts of the United States adapted thereto where the same have become scarce or extinct, and also to regulate the introduction of American or foreign birds or animals in localities where they have not heretofore existed." The secretary is to purchase birds, collect and distri- bute information, and issue permits without which no wild animal or bird shall be imported. The importation of the mon- goose, the English sparrow and several other animals and birds, in the discretion of the secretary, is prohibited. The trans- portation of any animal or bird whose importation is prohibited is also forbidden, and the transportation of any bird or animal, or part thereof, killed in violation of a state law is forbidden.

NOTE AND COMMENT.

The earth within the arctic circle supports a considerable population, but the antarctic circle is without trace of human life. Upon 8,000,000 square miles surrounding the south pole the foot of man has never trodden. Dr. F. A. Cook dissents from the general belief that this vast waste offers nothing to repay exploration, and points out that whales, seals and pen- guins are abundant, that immense deposits of guano exist, and that the region is especially adapted to the farming of fur bearing animals. Possible future industries are thus sug- gested. The prospect, however, is a forlorn one to the home- seeker, as beyond the antarctic circle the line of perpetual

snow extends to the seashore, and only an occasional island or cape is bare for a few weeks in summer. The coast is made inaccessible by an almost unbroken ice wall from 50 to 200 feet high. There are no trees or plants except a few mosses and lichens upon rocks too steep to hold snow, yet animal life seems to be well distributed. The average temperature is low, though the extremes are less than in arctic regions. Dr. Cook has experienced 60° above zero in summer to 53° below in winter in the north, while in the south the mercury went to 45° below in winter but did not reach 2° above on any day in summer. The antarctic temperature is less trying than the excessive humidity, and the gales and snowstorms, which are almost continuous through the year.—*Exchange.*

* * *

From the experiments at Sassari, Sardinia, it is estimated that a town of 50,000 inhabitants may be kept free from mosquitoes for $250 a year. The swamps and other breeding spots are covered with petroleum to kill the larvæ, and the mosquitoes are exterminated by means of chlorine and other powerful chemicals. Medical authorities affirm that mosquitoes disseminate the germs of malaria, and if this is true prevention would be vastly cheaper than cure of the disease. And riddance of the pests would add immensely to the sum of human comfort, especially at watering places and summer resorts.

* * *

With an expenditure of much hard labor, and a great amount of suffering, the gold output of Alaska for the year 1900 may reach the grand total of $35,000,000. With much less effort and hardship the corn fodder of Iowa may be made to yield at least $40,000,000, without including the value of the golden ears harvested therefrom. The treasure is in our fields though not in the form of the yellow metal, and by wisely directed labor and economy it may be transmuted into the coin of the realm. The Klondike at home is worth working, and is far richer than the golden sands and rocks in Alaska.

* * *

Rockford *Register:* We know of several prairie towns, now forty or fifty years old, which are to-day literally buried in a forest of shade, the thrifty elms and maples touching tops across the streets. No sunshine falls on the lawns or on the roofs of the homes. This is too much of a good thing. One of the best things the Creator gives to man is sunshine, and it should be allowed to find its way into bedroom, parlor and kitchen. Trees for the birds to nest in and sing from, trees to give some shady corner on the lawn where the hammock may be hung. trees in public parks and by country roadside are all right, but never so many as to shut out all the sunshine from the home and cause the moss to grow green on the shingles. Doctors well understand that they may depend upon patronage from these tree and shade-buried homes.

CLIMATOLOGY OF THE MONTH.

Barometer.—The mean pressure in June was 29.93 inches; highest observed, 30.24 inches at Cresco and Dubuque on the 3d and 19th; lowest observed, 29.52 inches at Omaha, Neb., on the 9th; range for the state, .72 inch.

Temperature.—The mean for the month, deduced from reports of 115 stations, was 69.7°, which is about normal for the state. For the northern section the mean was 68.8°; central section, 69.2°; southern section, 71°. The highest temperature reported was 102°, at Odebolt, on the 26th; lowest reported, 38°, at Larrabee, on the 2d. The highest monthly mean reported was 74.5°, at Pella, and the lowest was 65.4°, at New Hampton. The average monthly maximum was 94.2°; average monthly minimum, 45.9°. The greatest monthly range was 52°, at Lansing; average of greatest daily ranges, 35.1°.

Precipitation.—The average rainfall for the state, as determined from records of 138 stations, was 3.98 inches. The average of the northern section was 4.79 inches; central section, 3 82 inches; southern section, 3.32 inches. The largest amount reported was 12.35 inches, at Mason City; least amount reported, .67 of an inch, at Le Claire, Scott county. The greatest daily amount reported was 8.96 inches, at Thurman, on 16th-17th. Average number of days on which .01 inch or more precipitation was reported, 5.

Wind and Weather.—Prevailing direction of wind, southeast; highest velocity reported, 50 miles per hour, from the southeast, on the 16th, at Sioux City. There were 18 clear, 10 partly cloudy, and 3 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES. Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.92	30.20	19	29.56	21
Des Moines	29.94	30.20	19	29.60	19
Clarinda	29.95	30.22	19	29.58	6
Cresco	.....	30.24	19	29.65	6
Dubuque	29.94	30.24	3	29.58	6
Omaha, Neb	29.88	30.16	2	29.52	9
Keokuk	29.91	30.18	19	29.61	6
Sioux City	29.95	30.22	2	29.66	6
Means	.....	.....	....	.....	.....

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,389	25	SW	27
Des Moines	5,517	44	SW	10
Dubuque	5,012	29	NW	10
Keokuk	4,755	30	NW	27
La Crosse, Wis	4,347	30	N	26
Omaha, Neb	5,391	34	N	1
Sioux City	8,399	50	SE	16

ERRATA IN MAY REVIEW.

ALGONA—Minimum temperature of 41° on the 2d, recorded on page 10, should have been 36° on the 3rd.

GRAND MEADOW—Minimum temperature of 34° on the 4th, recorded on page 10, should have been 32 on the 3d.

GREENE—Mean temperature of 31° on the 5th, recorded on page 10, should have been 28° on the 3d.

MONTICELLO—Mean temperature of 61.5° recorded on page 10, should have been 61.4°.

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* One of the heaviest rainstorms on record at this station occurred on 16th, when 3.75 inches fell in less than two hours.

BANCROFT—*E. G. Bailey.* Evening of 9th severe windstorm and some hail, but little damage.

BRITT—*Geo P. Hardwick.* Severe windstorm at 8:20 P. M. on the 10th; light buildings and windmills injured or destroyed; crops damaged; some stock killed by lightning.

CHARLES CITY—*Chas. O. Schmidt.* Storms with strong winds and lightning occurred on the 1st, 6th, 7th, 22d and 27th; some hail on last date.

LEAR LAKE—*John Cobb.* June was an ideal month, with lamage to crops by storms; crops made rapid growth.

FOREST CITY—*J. A. Peters.* Month was dry, though over 4 nes of rain fell; most of it fell in two showers first half of nth; grass short in pastures and meadows, but corn and er grain crops never looked better.

HUMBOLDT—*H. S. Wells.* No damaging storms; crops look l and are 8 days ahead of average; corn laid by before the of July.

LARRABEE—*H. B. Strever.*—Heavy shower on 16th, 2.30 inches 70 minutes, washed fields considerably; small streams became rents and damaged bridges, etc.

RIDGEWAY—*Arthur Betts.* A delightful June; 414 hours of nshine, or 90 per cent. Last decade warm, the 26th having range of only 7°, the minimum being 85°; 5 days the minimum as not below 70°; there were 17½ hours of falling weather, and 14 inches of rainfall.

SAC CITY—*J. A. Sodestrom.* Severe electric storm on 27th; ghtning struck the college, one dwelling, disabled the tele- hone system, and killed some stock in the country.

CLINTON—*Dr. Luke Roberts.* June was a lovely month; the mospheric conditions were favorable to agriculture, and to uman comfort and health; rainfall light, but timely, and no rops suffered for want of it. At close of month, however, rain as needed, the amount being 2.80 inches below normal. Temperature normal.

GRUNDY CENTER—*E. S. King.* All crops doing well; early rought shortened small grain crops; potatoes doing finely; ay heavier than expected; pastures good.

TOLEDO—*Lulu G. Bookwalter.* A month of fine growing veather, with abundant rainfall. Never for years has there been such a good prospect for corn. Have had several severe hunderstorms, but no heavy wind with rain.

WHITTEN—*Frank P. Butler.* Hail fell on the 6th and 27th. On latter date it was heavy and destructive to vegetation.

ATLANTIC—*J. W. Love.* Windstorm on the 10th broke down many shade trees and uprooted some.

BONAPARTE—*Hon. B. R. Vale.* A seasonable month; all crops well advanced; no severe storms; oats harvest on with fall wheat. Rain, 2.73 inches.

CLARINDA—*A. S. Van Sandt.* On the 12th lightning struck the smoke stack of the electric light plant, knocking the fire- man down. A little later a bolt came in on the wires, destroy- ing an armature. Several people in town were shocked.

FT. MADISON—*L. A. McCready.* A very dry June; gardens drying up and ground very dry; apples are falling off.

GREENFIELD—*J. G. Culver.* The rainfall, though deficient, has been so well distributed that crops have not suffered; no damaging storms have visited us. Corn is unusually clean.

KEOSAUQUA—*J. H. Landes.* An ideal month; no extremes of any kind.

OSKALOOSA—*Jos. Boyd.* June was favorable for all crops. Rainfall, 3.63.

OVID—*H. C. Miller.* Unusual number of thunderstorms during June and several head of farm stock killed by light- ning; telephone service badly injured. Oats lodged; corn a fine crop; hay about two-thirds crop; potatoes extra good.

PACIFIC JUNCTION—*H. H. McCartney.* On the 16th 3.17 inches of rain fell between 4:30 P. M. and 10 P. M. Strong wind and much lightning.

THURMAN—*C. R. Paul.* The wind, hail and rainstorm on the 16th was the heaviest that has visited this section within two years. One house was washed from its foundations; some farm stock drowned.

MUSCATINE—*Mrs. J. P. Walton.* Maximum temperature, 90°; minimum temperature, 51°; mean temperature, 72.12°; mean temperature for 60 years, 69.90°. Highest range of barom- eter, 29.74 inches; lowest range of barometer, 29.02. Rain- fall, 1.57 inches; mean rainfall for 50 years, 4.37 inches; maxi- mum rainfall, 1851, being 14 30 inches; minimum rainfall, 1854, with .66 inches.—*Muscatine Journal.*

CLIMATOLOGICAL DATA FOR JUNE, 1900.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIPITATION, INCHES.				Number rainy days	SKY.			Prevailing direction of wind.	Dates of thunderstorms.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.		
Algona*	Kossuth	1,500	7	70.2	+0.2	94	26	49	2	....	4.87	+1.29	1.40	.....	6	15	14	1	SE	9, 27
Alta	Buena Vista	1,519	8	68.0	-1.1	94	26	41	2	31	6.23	+ .87	4.25	.....	7	19	10	1	S	9, 10, 12, 16, 20, 27, 29
Alta (near)	Buena Vista	.. ..	....	.....	....	..	.....	....	.....	.....	5.20	.....	1.58	.....	7	...	...	...	.....	
Bancroft	Kossuth	....	..	67.1	.....	94	26	44	4	38	5.28	.....	2.25	....	5	17	11	2	SE	1, 9, 10
Britt	Hancock	1,230	...	67.6	.....	94	26	44	8, 11	35	5.25	.....	2.82	....	8	10	20	0	S	10
Charles City	Floyd	1,012	8	67.8	-0.8	94	26	40	19	38	5.53	+ .64	3.40	....	6	16	12	2	SE	1, 27
Clear Lake	Cerro Gordo	984	...	68.8	.....	97	25	45	11	36	6 60	.....	4.00	....	5	22	8	0	SW	
Cresco	Howard	1,280	27	67.0	+0.7	93	26	47	8	33	3.84	- 1 29	2.16	.....	7	22	8	0	NE	1, 6, 9, 21, 26, 30
Decorah	Winneshiek	900	6	68 0	-0.4	94	25, 26	40	18	39	2.76	- 1.59	1.46	.....	3	....	....	....	.....	
Dows	Wright	.....	...	66.8	....	93	26	44	11	38	4.57	.....	1.60	....	6	13	14	3	SE	
Elkader	Clayton	... .	18	69.6	+0.1	98	25	45	9, 19	41	2.53	- 1.36	1.50	....	4	24	6	0	SE	6, 10, 27
Estherville	Emmet	....	....	66.6	.....	94	26	41	11	37	3.96	.. ...	1.40	.....	7	18	7	5	S	1, 9, 16, 27
Fayette	Fayette	1,000	9	67.6	-0.8	95	25	41	2	40	3.14	- 2.96	1.87	.....	5	17	13	0	NW	10, 20, 27
Fonda	Pocahontas	1,237	..	68.3	....	94	26	43	10	46	11.90	... .	3 77	.....	9	18	7	5	SE	1, 9, 16, 21, 22, 27
Forest City	Winnebago	1,220	....	67.3	.....	94	26	47	2, 11	37	4.39	.....	2.00	.....	7	21	7	2	S, W	
Grand Meadow ‡	Clayton	...	8	.....	.....	...	.....	.....	.....	.....	3.57	+1.67	2.55	.....	4	13	16	1	SE, SW	
Greene	Butler	943	...	69.5	.....	99	25	46	11	40	5.49	.....	2 57	.....	7	20	8	2	NE	
Hampton	Franklin	1,240	9	69.3	+1.4	96	26	49	2, 8	35	5.72	+ .75	2.05	.....	6	14	13	3	SE	
Hawkeye	Fayette	....	6	.....	...	...	... .	.....	.....	....	3.81	.....	2.55	.....	3	...	...	...	.....	
Hoprig	Emmet	.....	...	.....	.....	..	.....	.....	.....	.....	6.40	.....	2.36	.....	5	10	19	1	E	
Humboldt	Humboldt	1,082	6	68.8	.....	95	26	45	2	34	4.71	+1.10	2.02	.....	7	23	6	1	SE	
Lansing	Allamakee	.....	...	69.2	.....	97	25	42	23, 24	52	2 03	.....	1.35	.....	3	14	16	0	.....	
Larchwood	Lyon	.....	...	69.4	....	96	26	39	2	38	2.83	.....	1.06	.....	6	16	13	1	E	
Larrabee	Cherokee	...	8	68.0	-1.6	98	26	38	2	40	6.93	+ .77	4.26	.. ..	6	16	13	1	SE	
Le Mars	Plymouth	1,221	....	69.4	....	96	26	43	2, 8, 11	38	3.42	...	1.54	....	6	21	7	2	S	
Mason City (c)	Cerro Gordo	1,130	5	65 8	-2.3	91	26	43	11	40	12.35	+7.65	7 00	....	6	...	..	....	.....	
New Hampton (a)	Chickasaw	1,166	.	65.4	....	91	26	47	11	33	4.47	.....	3.00	.....	4	18	12	0	NW	
Northwood	Worth	1,210	....	68.2	.....	91	26	47	2, 8, 10	32	4.88	.....	2.35	.....	7	24	4	2	S	
Osage	Mitchell	1,178	8	66 2	-0 3	92	26	42	11	36	4 13	- 0.9	2.40	.....	7	11	16	3	E	
Plover	Pocahontas	.....	...	69.4	....	96	26	42	2	44	4 67	.....	2.15	.....	7	23	6	1	S	
Primghar	O'Brien	....	....	65.9	.....	98	25	42	2	30	2.40	.....	2.00	.....	2	21	4	5	NE	
Ridgeway	Winneshiek	....	....	70.0	....	92	26	40	9	39	4.14	.....	2.08	....	9	19	10	1	S	1, 6, 7, 9, 10, 21, 29
Ruthven	Palo Alto	.....	..	67.8	.....	95	26	45	2	36	6.67	.....	3.80	.....	6	12	9	9	SW	
Sheldon	O'Brien	1,406	...	67.7	.....	94	26	41	2	35	3 63	....	1.92	.....	6	16	10	4	S	
Sibley	Osceola	1,506	6	67.8	+0.5	96	26	40	2	37	2.99	- .95	1.49	....	7	14	16	0	S	
Sioux Center	Sioux	.....	....	70.8	.....	100	26	44	2	36	4.42	.....	1.91	.....	7	19	6	5	SE	1, 16, 21
Washta	Cherokee	....	....	....	....	...	.....	.....	.....	.....	3 20	.....	1 00	...	8	20	8	2	S	
Waverly	Bremer	942	....	69.4	....	91	6, 7, 26	50	3, 4	33	5.48	.....	3.28	.....	5	13	17	0	S	1, 6, 9, 10, 21
West Bend*	Palo Alto	.	6	69.0	+0.8	96	26	52	2	.....	2.59	- 1.27	.89	....	7	13	12	5	S	
West Union	Fayette	1,105	...	.....	.....	..	.....	.....	.....	.....	3.51	.....	1.75	.....	3	25	0	5	NE	
.....	.....	.....	...	.....	.....	...	.....	.....	.....	.....	....	.....	.....	.....	....	....	..	....	.....	
Average	.....	.....	...	68.8	-2.8	94.8	... .	43.8	.....	36.2	4.79	+ .43	....	.....	6	18	10	2	S	

CENTRAL SECTION.

Amana	Iowa	.....	23	69.5	-0.4	92	26	48	3, 4	31	3.75	- .72	1.88	....	5	15	15	0	N	10, 13, 21, 27
Ames	Story	936	19	69.4	-0 6	96	26	47	11	34	6.48	+ 2 04	2.95	.....	8	19	10	1	.....	
Audubon	Audubon	.....	6	68.2	-1.3	97	26	41	14	45	2.24	- 1.02	.85	.. .	6	9	18	3	S	
Baxter	Jasper	.....	...	69 4	....	94	7, 26	47	1	43	4.13	.....	1.46	....	6	12	16	2	NE	
Belle Plaine	Benton	840	9	70 6	+0.7	92	26	48	3	38	7 30	+ 3.74	3.85	....	5	12	12	6	SE	
Carroll	Carroll	....	9	68.6	-1.4	96	26	45	11, 18	40	3.88	- .30	1.25	.....	7	19	7	4	.....	1, 10, 13, 16, 20, 27
Cedar Rapids ‡	Linn	744	17	71.0	. ....	94	6, 26	51	4, 11	33	4.22	.....	2.08	.....	8	20	7	3	NE	
Clinton	Clinton	609	8	70.0	-1.5	94	26	45	19	40	1.67	- 3.11	1.05	.....	3	13	10	7	NE	10, 21, 29
Coon Rapids (a)	Carroll	...	...	69.2	.....	95	26	48	2, 11, 14	33	4 58	.....	2.25	...	9	21	8	1	SE	
Davenport	Scott	615	27	70.4	-1.0	90	7	53	4	26	1 01	- 3.05	.61	.....	5	11	14	5	NE	10, 13, 21, 29
Delaware	Delaware	1,048	8	67.4	-1.4	93	26	42	2	33	2.70	- 1.58	1.44	.....	5	14	15	1	NW	
Denison (d)	Crawford	1,192	6	69.1	+0.4	95	21	46	11, 14	43	2.45	- .50	1.28	.....	5	26	2	2	S	7, 9, 12, 16, 27
Des Moines	Polk	867	21	70.1	-1.0	91	26	50	11	29	4.89	- .21	2.37	....	7	12	16	2	SE	6, 10, 12, 13, 16, 17, 20, 21, 27
De Soto	Dallas	866	....	70.4	.....	96	26	49	11	38	4.80	.....	2.47	....	8	19	6	5	SE	
Dubuque	Dubuque	655	26	69.7	+1.0	92	25	51	11	33	2.04	- 2.78	1.03	.....	6	18	10	2	NW	10, 21, 27
Fort Dodge	Webster	.....	...	68 3	.....	92	25	44	11	36	5.34	.....	3.00	.....	5	22	6	2	SW	
Galva	Ida	.....	6	68.2	-1.0	97	26	43	2	35	2 88	- .80	1.14	....	7	15	14	1	N, SW	
Gilman	Marshall	1,035	....	.....	.....	...	.....	....	.....	.....	7.35	.....	2.64	....	5	20	10	0	SE	
Grinnell	Poweshiek	1,011	9	69.2	-1.0	88	7, 26	49	2	27	7.80	+2.82	3.10	....	5	11	13	6	NE	
Grundy Center	Grundy	966	8	67 9	-1.9	90	26	47	2	33	11.44	+7.42	5.60	....	7	20	9	1	SE	
Guthrie Center	Guthrie	1,269	...	68.5	.....	95	26	40	23	39	4.26	.....	1.99	...	6	13	9	8	E	
Harlan	Shelby	.	....	69.6	.....	95	21, 26	44	14	39	1.89	.....	.80	.....	7	11	14	5	SE	1, 10, 16, 21, 27
Independence	Buchanan	921	37	68.0	+1.0	91	25	46	3	34	3.83	- .97	1.50	.. ...	6	23	7	0	SE	27
Iowa City	Johnson	644	9	70.4	-0.8	95	25	47	11	35	2.18	- 1.50	.65	. ....	7	15	14	1	NE	
Iowa Falls	Hardin	.....	6	68.9	+0.2	94	25, 26	45	8, 11	37	5.92	+2.30	1.96	.....	7	21	8	1	SE, S, NW	1, 10, 27
Le Claire	Scott	....	....	....	.....	...	.....	... .	.....	..	.67	.....	.19	.....	6	..	...	...	..... .	
Logan	Harrison	928	34	70.6	-0.5	100	26	43	8	43	1.27	- 4.24	.65	.....	5	23	1	6	S	
Maquoketa	Jackson	.....	6	67.6	-3.5	89	25	46	3, 4, 11, 19	33	2.20	+4.14	1.03	.....	7	23	5	2	NE	
Marshalltown	Marshall	898	7	69.8	+0.7	93	6, 26	47	11	34	7.79	+3.88	3.32	.....	6	22	4	4	S	27
Monticello	Jones	800	45	67.0	-1.8	94	27	39	4	49	1.26	- 2.20	.90	.....	3	17	3	10	SW, NW	
Mt. Vernon (Hub.)	Linn	835	11	69.7	.....	95	25	43	16	42	3.09	.....	1.82	.....	7	22	6	2	N, E	27, 29
Newton	Jasper	958	12	69.4	-1.2	92	7	49	2	31	6.35	+2.29	2.42	.....	8	16	14	0	SE, NW	
Odebolt	Sac	.....	....	71.6	....	102	26	43	8	44	3 20	.....	.93	.....	7	24	4	2	.. ..	
Ogden	Boone	1,109	...	68.9	.....	95	26	44	11	35	6.30	....	1.94	.....	9	22	1	7	SE	
Onawa	Monona	.....	....	71.0	.....	95	26	46	2	32	2.97	.....	1.15	.....	7	26	3	1	SE	1, 12, 20, 27
Rockwell City	Calhoun	1,219	..	68.6	.....	94	26	44	2	33	8.36	.....	3.60	.....	7	22	3	5	.....	
Sac City	Sac	900	20	68.2	-3.5	94	26	44	2	37	6.49	+1.40	1.70	.....	8	22	5	3	SE	27
Scranton	Greene	.....	...	70.0	.....	98	26	47	2	33	4.59	.....	1.33	.....	7	21	7	2	S	
Sioux City	Woodbury	1,122	10	69.8	+ .0	96	26	48	2	39	4 82	+ .43	1.27	.....	9	15	11	4	SE	
Toledo	Tama	.....	5	69.2	-1.3	96	7	40	18	36	6 74	+4.28	2.50	....	5	22	5	3	SE	
Vinton (b) *	Benton	800	9	70.0	+0.1	92	7	57	4, 11, 14	.....	3.87	+ .33	1.10	.....	6	28	1	1	NW	27
Waterloo	Black Hawk	862	20	69.0	-3.8	92	7	47	3	36	5.47	+1.87	1.76	.....	6	18	12	0	SE	
Webster City ‡	Hamilton	.....	6	.....	.....	...	.....	.....	... ...	.....	4 05	+ .42	1.19	.....	6	16	12	2	SE	
Wilton Junction	Muscatine	.....	....	69.0	.....	92	25, 26	45	18	38	1.68	.....	.60	.....	7	19	7	4	E	29
West Branch	Cedar	....	....	70.4	.....	94	6, 26	44	21	46	2.97	.....	1.22	.....	8	13	11	6	NE	
Whitten	Hardin	.....	....	67.8	.....	93	26	46	2	33	.....	.....	3.90	.....	6	18	12	0	SE	6
Average	.....	.....	....	69.2	-0.9	94.0	.....	45.9	.....	34.0	3.82	+ .51	.....	.....	4	18	9	3	SE	

CLIMATOLOGICAL DATA FOR JUNE, 1900—CONTINUED.

SOUTHERN SECTION.

...ATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIPITATION, INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.	Dates of thunderstorms.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.		
.....	Union	.....	....	70 9	.....	98	26	47	2	37	2.02	.....	1.02	.....	6	13	14	3	SE	
.....	Monroe.....	945	....	69.5	.....	93	26	47	2	33	2.52	.....	.97	.....	4	14	12	4	SE	6, 21, 27
.....	Cass.....	.....	8	69.1	+0.7	99	26	40	11	45	2.09	-3.76	.70	.....	7	5	18	7	NE,SE	1, 6, 10, 21, 27
atic	Jefferson ...	640	....	....	.....	..	.....	.....	.....	.....	3.40	.....	1.10	.....	4	...	...	...	.....	
via	Taylor	.....	....	72.8	.....	99	26	.....	.....	51	2.10	.....	.77	.....	6	...	...	...	.....	
ord (e).....	Davis.....	857	....	69.4	.....	89	6, 26	50	2	35	3.15	.....	1.85	.....	5	20	9	1	E	
nap.....	Van Buren	.....	8	70.0	-3 1	91	7	51	3, 11	32	2.73	-1.55	1 01	.....	5	..	..	...	.....	
parte	Tama.....	526	....	.....	.....	...	.....	.....	.....	.....	6.04	.....	2.49	.....	6	16	14	0	.....	
ingham	Marion.....	....	..	...	....	..	.....	.....	.....	.....	3.79	.....	1.40	.....	5	...	..	...	.....	
ey.....	Appanoose..	1,013	6	70.8	-1.2	91	6, 25, 26	50	3, 4	30	3.43	- .41	1 98	.....	5	21	6	3	S	
erville.....	Lucas.....	1,030	...	69.2	....	92	26	46	11, 16	37	2 63	.....	.90	.....	8	9	19	2	E	27
iton.....	Page.....	1,069	9	71.8	-0.1	98	6	46	11	37	3 15	-1 90	1.33	.....	5	19	7	4	SE	12
nda	Page.....	...	8	71.9	+1.1	97	7	48	2	36	2.34	-2.04	1.19	.....	6	25	4	1	.....	
ge Spr'gs (a)	Adams	1,127	7	70.0	-0.4	95	26	43	11	36	1.23	-3.13	.60	.....	6	20	5	5	SE	
ing	Pot'wat'mie	989	...	73.1	....	98	6, 26	50	1,10, 13, 14	39	2.32	.....	1.34	.....	6	22	6	2	S	
ncil Bluffs. ..	Cass.....	.. .	..	.....	....	....	.....	.....	.....	.....	1.89	.....	.61	.....	7	23	2	5	E	
berland.....	Washington	...	....	.....	....	....	.....	.....	.....	.....	2.74	.....	1.80	.....	4	22	6	2	NE	1, 21, 27
vfordsville...	Des Moines.	715	..	....	.....	..	.....	.....	.....	.....	1.78	.....	.70	.....	5	21	4	5	.....	
ville	Wapello	.....	....	71.6	.....	93	6	48	11, 12	40	5.98	.....	4.60	.....	5	22	6	2	S	6, 17, 21, 27
n	Mills.....	...	...	.....	.....	....	.....	.....	.....	.....	3.70	.....	1 43	.....	4	22	6	2	NW	
rson...	Jefferson....	767	13	69.9	-0.2	90	25, 26	49	3, 11	35	3.03	-1.36	1.20	.....	6	15	12	3	.....	
field...	Lee.....	516	31	....	....	....	.....	...	.....	...	2.88	-1.40	.85	....	6	7	13	10	NE	1, 6 10, 13, 21, 23, 27
Madison	Mills.....	979	29	70.6	+0.1	94	6	46	14	33	4.48	+ .01	1.65	.....	7	9	18	3	SE	
nwood	Adair	.....	8	72.2	+1.4	97	26	47	1	31	3.56	-1.65	1.29	.....	8	20	6	4	S	1, 6, 12, 16, 17, 21,27
enfield	Fremont....	912	....	....	....	...	.....	.....	.....	.....	3.81	.....	1.40	.....	5	16	10	4	SW	
nburg.	Keokuk.....	....	....	68.8	.....	....	.....	48	3, 11	.....	6.21	.....	5.10	.....	3	....	....	..	.....	
rick (a)‡.....	Warren	.....	...	70 4	....	93	26	46	5	40	3.93	.....	1.51	.....	7	11	9	10	SE	1, 6, 10, 12, 17, 21, 27
tanola...	Lee.....	618	28	71.9	-0.5	90	28	53	3	28	1.06	-3.01	.38	.....	9	13	11	6	N	
kuk.....	Van Buren.	.....	7	72.1	-1.2	92	7, 26	52	4, 11	30	2 30	-1.64	1.02	.....	6	.	.	..	.....	
sauqua	Marion.....	....	6	71.0	-1.0	95	6, 26	49	11	36	6.24	+2.79	2.19	....	6	19	6	5	NE	
oxville	Warren.....	....	....	.....	.....	..	.....	.....	.....	.....	4.55	.....	2.00	....	4	11	14	5	.....	
ona.....	Taylor.....	....	..	69 9	....	90	25	48	2	33	2.42	.....	.75	....	6	...	...	...	SE	17, 26, 27
ox	Lee.....	....	..	71.6	.....	90	7, 19	48	21	35	1.21	.....	.62	....	3	19	10	1	SE, SW	
ar	Ringgold ...	1,236	6	71.1	+0.1	94	26	49	2	31	1.85	-2.75	.60	....	7	9	18	3	NE, SE	
Ayr.....	Henry	725	....	68.6	.....	92	25, 26	45	4, 11	40	3.19	.....	1.92	....	6	14	15	1	N	
Pleasant.....	Clarke	1,183	..	....	....	..	.....	...	.....	.....	2.65	.....	1.00	....	5	24	6	0	.....	
rray	Douglas. ...	1,113	25	72.8	+1.2	94	26	52	2	26	3.07	-2.60	2.22	....	6	15	12	3	SE	
aha (Neb.)....	Clarke.....	1,123	....	69.6	....	92	27	48	2	32	4.62	.....	1.88	....	5	11	61	3	SE	
ceola	Mahaska ...	850	16	69.4	-0.5	91	26	49	2, 3	32	3.63	- .37	1.87	.....	4	17	10	3	E	
taloosa	Wapello	630	5	73.4	+0.5	90	6	56	2	27	3.60	+ .20	2.00	.....	4	13	11	6	SE	
umwa.	Wayne.....	.....	6	69.6	-1.7	90	26, 28	47	2	36	4.64	+ .81	1.95	.....	8	16	5	9	SE	6, 10, 12, 16,17,21,27
ld	Wayne.....	.....	....	70.1	.....	93	6, 26	46	14	36	4.95	.....	3.17	.....	8	12	18	0	E	
cific Junction.	Mills.....	960	....	74.5	.....	96	26	54	2	23	3.83	.....	1.45	.....	4	....	....	...	NE	12, 13
lla (c)	Marion.....	...	...	72.9	.....	97	26	48	11, 14	35	3.82	.....	2.45	.....	8	20	5	5	S	
d Oak	Montgomery	1,033	....	71.5	.....	98	25	47	3, 11	43	2.68	.....	1.00	.....	6	13	17	0	E	1, 21, 27
ourney.....	Keokuk.....	.....	....	69.8	.....	96	26	48	2	36	3.60	.....	1.50	.....	5	13	14	3	N	
art.....	Guthrie.....	....	...	72.2	....	96	6	45	11	35	10.55	.....	8.96	....	9	18	7	5	SE	16
urman	Fremont....	....	....	....	....	96	27	45	2, 12	42	3 32	-1.57	1.32	.....	6	24	5	1	S, SE	10, 12, 16, 21, 26
llisca.....	Montgomery	1,058	6	72.4	+1.4	98	7	51	3	35	.84	.....	.46	.. ...	4	19	10	1	SE	
apello	Louisa.....	578	....	71.9	.....	94	25	48	2,3,11,15	34	1.52	-1 60	.64	.....	4	..	....	....	E	
ashington	Washington	....	9	69.2	-4.9	92	26	47	11	34	5.33	- .84	1.51	.....	9	....	..	....	.....	
Interset	Madison.....	....	8	70.0	-0.4	93	.....	....	.....	.....	3 13	.....	1.28	.....	5	20	7	3	.....	
oodburn.....	Clarke.....	.....	....	.....	....	....	.....	....	.....	.....	.....	.....	.....	.....	6	17	10	3	SE	
verage.....	.....	....	...	71.0	-0.4	93.8	.....	48.1	.....	35.0	3.32	-1.42	.....	.....	5	18	10	3	SE	
v. for the state.	.....	....	...	69.7	-1.4	94.2	.....	45.9	.....	35.1	3.98	- .16	.....	....						

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined om 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

MONTHLY REVIEW OF THE

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JUNE, 1900.

STATIONS.		DATE.																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Mean
Afton	Max	79	77	80	84	87	93	94	83	91	84	83	80	76	81	84	85	78	82	87	90	92	87	84	87	92	98	80	89	79	89	
	Min	60	47	49	57	52	60	60	54	54	57	48	52	58	48	54	61	57	53	53	56	61	60	60	59	60	61	63	64	62	59	
Albia	Max	84	73	74	79	85	90	88	79	85	79	80	82	79	81	80	84	85	84	80	88	89	76	81	85	89	93	81	85	79	79	
	Min	62	47	49	51	53	57	62	52	53	58	48	52	54	48	53	58	57	51	52	57	61	59	63	59	62	65	62	65	63	62	
Alta	Max	72	70	78	82	82	91	86	78	90	72	79	78	73	77	78	68	73	78	79	84	90	76	81	84	89	94	82	85	72	80	
	Min	57	41	50	55	56	62	60	47	57	53	48	55	52	50	56	58	60	51	52	60	62	62	58	60	61	64	65	56	54	54	
Amana	Max	82	74	75	79	82	89	90	82	82	76	75	81	78	78	80	82	77	80	81	85	83	72	82	86	90	92	88	84	78	80	
	Min	63	52	48	48	51	59	67	52	51	65	49	53	61	53	53	57	60	53	51	54	65	60	63	60	60	69	66	66	61	57	
Ames	Max	78	73	78	82	85	93	84	84	85	80	79	77	74	79	75	81	73	79	79	79	89	75	83	88	92	96	85	86	85	78	
	Min	62	49	50	49	52	59	60	52	51	56	47	51	60	57	58	61	60	54	52	57	64	60	60	61	62	65	63	63	58	57	
Atlantic	Max	78	73	80	82	86	92	95	82	89	79	83	78	78	84	82	80	73	81	87	87	93	79	81	87	94	99	80	91	78	90	
	Min	59	46	45	49	52	64	57	42	59	53	40	47	55	42	53	61	57	51	42	55	66	60	58	54	51	65	70	59	52	61	
Audubon	Max	74	69	75	79	82	88	89	85	86	76	76	77	79	86	82	78	74	80	85	88	93	78	82	90	93	97	93	90	74	86	
	Min	57	47	48	50	52	61	61	48	50	53	44	46	48	41	55	59	58	51	43	54	64	58	60	52	48	61	67	60	59	61	
Bancroft	Max	75	68	78	82	83	90	85	73	80	75	80	77	73	79	83	73	77	81	80	82	89	80	82	88	90	91	85	85	78	72	
	Min	59	44	49	44	53	54	55	44	54	45	47	48	55	47	57	60	59	53	50	57	60	58	55	55	60	60	66	57	52	62	
Baxter	Max	83	83	75	79	84	90	94	78	82	77	81	79	78	78	79	78	74	79	78	84	91	78	82	86	88	94	80	86	86	76	
	Min	47	48	51	53	60	63	51	51	57	50	51	60	51	53	57	60	52	52	57	64	60	61	60	63	68	63	64	64	58	58	
Bedford	Max	..	..	..	..	..	98	98	86	89	80	85	81	83	81	88	89	79	82	88	87	94	82	82	90	94	99	77	93	90	92	
	Min	..	..	..	..	..	47	60	48	45	55	54	69	64	59	44	60	56	54	56	72	62	62	60	60	60	62	65	62	60	60	
Belknap	Max	80	71	73	77	74	89	87	77	83	76	78	81	78	79	82	81	70	77	79	78	86	72	80	84	87	89	79	85	77	78	
	Min	63	50	52	53	56	54	62	59	55	66	52	54	56	54	56	61	61	55	56	60	60	63	62	63	61	68	65	65	65	66	
B'l'e Plain	Max	78	73	75	83	85	91	90	88	90	68	70	80	75	80	74	80	82	80	82	80	85	84	86	84	70	92	91	84	74	75	
	Min	65	50	48	50	55	62	64	50	65	50	55	53	55	51	52	54	55	53	56	53	60	59	57	62	60	64	63	65	60	56	
Bonaparte	Max	82	74	74	77	79	88	91	81	84	78	80	81	80	82	84	82	74	81	82	86	84	72	81	85	89	90	81	88	83	75	
	Min	62	52	51	52	55	61	65	58	52	67	51	53	58	52	52	60	61	52	52	54	54	62	64	62	66	65	65	68	67	61	
Britt	Max	75	74	78	86	83	92	87	75	85	75	78	79	73	78	79	78	78	80	81	80	91	76	83	93	92	94	83	86	72	80	
	Min	55	45	49	55	54	60	52	44	53	52	44	50	55	45	46	55	58	51	49	57	63	56	56	55	59	62	65	66	68	68	
Carroll	Max	87	73	79	81	86	93	83	80	88	73	80	78	79	79	80	73	74	85	84	85	94	78	82	86	94	96	80	87	73	82	
	Min	60	46	59	50	51	53	55	47	54	52	45	49	55	48	58	59	64	45	46	59	57	57	59	54	56	67	64	58	55	58	
Cedar Rap	Max	86	70	77	83	85	94	92	81	87	80	76	82	80	79	84	85	82	81	83	87	85	74	82	83	92	94	85	85	75	79	
	Min	65	53	52	51	55	62	69	55	54	63	51	56	60	55	55	59	61	55	52	58	61	58	63	61	60	70	70	67	62	56	
Centerville	Max	77	73	77	80	81	91	90	80	85	80	75	80	80	82	83	82	75	80	82	86	90	77	79	86	91	91	78	90	86	73	
	Min	60	52	50	50	55	62	62	58	56	65	53	53	64	53	55	61	64	55	55	60	63	63	64	63	65	68	63	67	64	61	
Chariton	Max	82	74	75	79	79	91	90	79	84	80	78	79	78	80	82	80	73	79	79	79	89	75	83	88	92	96	85	86	85	78	
	Min	62	47	50	51	54	54	62	50	56	60	46	51	63	48	52	46	62	56	52	59	64	62	64	61	62	66	61	65	63	63	
Charles Cy	Max	80	70	75	83	84	90	84	72	81	76	74	77	76	74	78	77	78	78	78	81	89	75	83	87	92	94	87	85	77	77	
	Min	61	49	49	52	54	58	57	50	53	57	46	51	59	50	54	58	59	50	40	54	64	59	58	55	60	63	67	60	54	55	
Clarinda	Max	83	78	82	84	88	98	95	87	91	82	83	82	81	85	85	84	78	82	86	88	94	83	82	89	93	96	79	91	82	92	
	Min	60	49	48	50	52	63	60	50	59	59	46	52	57	48	59	61	64	57	51	57	63	62	60	61	60	64	67	64	63	60	
Clear Lake	Max	80	70	79	85	84	91	87	77	83	77	80	79	76	80	78	75	80	84	83	80	92	79	87	92	97	96	86	91	79	78	
	Min	58	47	49	52	54	66	56	47	51	57	45	52	58	48	55	56	57	49	47	57	64	57	56	55	61	68	65	57	51	52	
Clinton	Max	85	68	75	80	85	90	93	76	82	79	78	83	82	82	83	85	83	84	85	89	79	71	84	90	93	94	84	88	79	82	
	Min	63	53	47	48	53	63	65	56	48	64	49	49	62	55	54	54	58	54	45	55	62	61	64	58	59	61	69	64	58	52	
College Sps	Max	80	75	80	82	87	95	97	84	91	80	82	81	78	81	84	86	80	78	87	..	95	82	80	87	89	95	82	94	83	93	
	Min	59	48	51	53	56	67	61	55	59	57	53	54	57	52	57	61	53	59	56	58	64	63	60	60	63	66	68	64	65	63	
Coon Rap	Max	84	69	78	80	84	91	86	77	89	80	78	72	78	76	79	76	73	78	82	89	95	84	82	94	93	98	83	93	85	85	
	Min	60	48	52	52	53	65	58	52	56	50	48	52	57	48	56	61	62	57	48	56	61	59	58	56	60	63	66	68	64	65	
Corning	Max	79	73	77	81	86	93	91	80	89	78	81	78	76	78	82	83	74	79	84	86	91	89	91	89	92	93	81	82	75	76	
	Min	53	47	49	52	53	67	59	46	57	58	43	51	53	47	55	63	62	55	48	59	64	67	61	59	57	64	67	61	63	60	
Co. Bluffs	Max	75	78	83	85	88	98	93	85	91	80	89	87	78	83	87	77	77	83	84	87	94	85	83	90	94	98	79	88	80	92	
	Min	50	53	58	60	63	67	54	63	58	50	59	58	50	50	53	65	60	60	65	66	65	63	63	61	70	73	64	65	63	65	
Cresco	Max	81	69	76	81	81	88	85	70	79	73	72	76	77	74	77	75	78	76	82	81	88	74	83	83	87	92	93	84	82	74	
	Min	59	49	48	51	54	58	56	47	50	56	48	51	56	50	56	56	57	55	51	55	64	58	56	55	60	60	61	57	51	51	
Davenp'rt	Max	82	66	72	76	81	87	90	78	79	77	77	81	79	79	81	82	79	81	80	83	77	69	82	87	89	90	81	87	76	78	
	Min	65	53	53	53	58	68	69	61	54	63	54	56	62	57	55	56	61	56	56	61	65	63	65	63	66	68	72	69	63	56	
Decorah	Max	82	72	77	82	84	89	86	72	80	75	72	78	77	78	79	79	82	79	82	85	85	77	85	90	94	94	85	83	73	72	
	Min	60	49	48	50	52	69	60	49	46	59	48	47	57	49	57	55	60	40	59	50	67	60	59	55	59	60	64	59	53	53	
Delaware	Max	81	68	73	78	79	87	90	79	78	72	72	71	76	75	79	80	80	78	80	85	82	77	82	87	92	93	81	82	75	76	
	Min	63	42	47	48	53	61	65	52	49	61	49	51	59	51	51	51	59	51	47	55	64	56	59	56	59	67	63	57	57	51	
Denison	Max	75	70	77	79	82	90	84	78	88	82	78	78	76	89	80	73	74	79	82	87	95	85	86	82	92	..	..	..	..	88	
	Min	59	47	53	56	58	65	59	47	57	55	46	47	54	46	59	63	61	54	51	60	65	60	56	55	50	67	65	57	59	58	
Des Moines	Max	80	72	75	79	79	90	89	78	84	77	78	78	77	77	79	79	73	79	79	79	91	77	82	86	89	91	79	87	73	77	
	Min	62	51	54	55	57	62	64	54	57	58	50	55	62	56	59	63	64	58	57	60	66	65	62	64	60	68	62	66	62	62	
De Soto	Max	79	72	78	81	85	94	92	77	86	74	79	81	74	76	80	81	74	78	85	85	91	76	81	85	91	96	76	89	74	81	
	Min	63	50	60	51	54	64	63	53	56	63	49	53	61	52	59	65	68	55	51	58	61	65	62	61	53	68	66	67	62	63	
Dows	Max	77	68	75	82	80	88	83	72	85	79	76	78	72	76	77	75	75	78	77	78	89	74	82	86	90	93	89	88	77	75	
	Min	58	45	50	50	50	50	55	45	52	53	44	52	58	48	51	57	57	50	48	55	63	59	58	55	58	64	64	56	55	55	
Dubuque	Max	83	68	72	78	80	86	90	71	77	76	74	78	79	76	80	80	81	78	80	84	77	71	82	89	92	90	84	83	76	78	
	Min	63	52	52	54	58	65	71	58	53	63	51	55	63	55	56	56	58	51	50	55	64	60	62	56	63	69	72	67	62	56	
Eldon	Max	85	81	78	82	85	93	90	86	81	81	88	85	82	85	85	85	79	84	85	88	89	75	86	91	89	92	87	89	84	78	
	Min	62	51	50	50	52	59	64	56	53	65	48	48	62	54	54	60	59	53	54	56	66	61	64	62	65	68	64	62	62	61	
Elkader	Max	87	72	79	85	85	92	92	77	82	80	79	83	83	82	84	85	85	83	86	89	87	75	87	94	98	96	87	86	78	81	
	Min	61	50	47	48	52	58	62	50	45	56	46	47	59	48	54	56	62	47	45	52	67	58	59	54	58	61	65	59	57	54	
Estherville	Max	70	70	78	83	81	90	84	72	86	75	78	79	71	76	70	72	75	79	78	83	90	77	85	87	92	94	84	85	75	78	
	Min	45	42	55	52	54	60	61	44	52	53	41	50	54	45	50	57	57	49	50	50	64	59	61	54	58	58	65	56	52	48	
Fairfield	Max	84	74	76	80	83	89	89	79	84	77	81	85	81	81	82	83	76	81	81	85	88	74	81	86	90	90	81	87	79	77	
	Min	61	50	49	50	52	59	63	54	50	68	49	50	61	52	51	57	60	51	51	54	63	62	62	60	64	66	64	66	65	61	
Fayette	Max	84	71	77	73	83	90	88	73	81	75	74	77	79	78	80	79	81	82	83	85	84	74	85	92	95	94	88	83	73	79	
	Min	60	41	45	46	51	58	60	49	46	58	44	47	57	48	55	55	60	48	44	50	64	59	60	52	58	65	64	69	55	52	
Fonda	Max	84	72	76	81	84	84	93	86	90	87	82	77	78	79	77	72	74	78	78	82	90	86	87	89	91	94	87	88	79	86	
	Min	54	46	54	52	53	58	53	45	44	43	47	52	54	56	54	58	48	50	58	60	60	54	58	60	61	62	57	53	50	53	
Forest City	Max	79	70	75	80	80	87	84	79	82	78	78	76	72	75	75	69	76	80	70	79	89	78	83	88	90	94	85	86	73	76	
	Min	58	47	49	53	53	60	57	45	54	53	47	54	48	49	56	56	58	53	50	58	63	62	56	60	65	63	65	56	52	52	
Ft. Dodge	Max	83	70	80	82	81	90	88	83	88	86	77	79	74	78	78	78	78	82	78	82	90	80	84	90	94	90	86	82	84	80	
	Min	59	45	52	50	50	62	54	48	54	52	44	51	56	46	57	60	49	52	45	58	64	58	57	54	64	66	56	54	55	54	
Galva	Max	75	72	79	81	83	91	86	79	91	83	80	79	74	79	80	75	75	79	83	89	91	80	81	86	91	97	66	89	80	84	
	Min	51	43	51	55	55	63	56	45	59	54	47	53	52	46	56	62	61	55	53	54	58	63	58	56	56	65	44	56	54	55	
Glenwood	Max	81	72	74	80	85	94	91	82	88	86	80	74	78	79	84	80	72	78	82	82	89	81	80	85	89	92	85	85	81	88	
	Min	58	48	53	55	58	65	64	50	63	56	48	55	57	46	56	63	57	57	52	61	68	63	59	60	56	68	70	64	64	62	
Greene	Max	81	77	84	90	90	94	90	78	88	78	78	81	77	82	83	80	81	79	82	85	92	76	87	93	99	97	88	87	82	82	
	Min	60	47	47	50	52	58	56	48	51	55	46	52	58	48	53	55	57	50	48	55	64	57	57	54	60	64	63	58	54	53	
Greenfield	Max	66	70	76	84	89	92	81	85	90	82	79	85	80	79	85	80	77	81	85	85	86	78	85	90	95	97	84	88	86	85	
	Min	47	51	50	68	66	68	65	61	67	63	48	62	50	56	60	61	60	53	57	62	60	58	62	66	70	71	63	64	67	62	
Grin'l (nr.)	Max	79	72	73	77	80	87	88	81	81	78	74	78	75	74	78	78	75	76	76	81	86	77	80	82	87	88	87	82	80	76	
	Min	66	49	52	53	56	62	66	56	54	62	53	54	60	53	55	65	59	54	56	59	63	60	59	60	63	70	63	66	59	57	
Grundy C'r	Max	80	74	76	83	83	89	87	75	82	75	76	78	76	76	78	77	75	77	77	80	86	75	83	85	89	90	86	82	73	76	
	Min	62	47	48	50	53	66	58	48	51	59	55	52	58	49	53	56	57	52	52	56	64	57	60	56	61	64	64	59	55	54	
Guthrie C'r	Max	72	69	70	80	84	89	92	78	86	81	80	80	80	81	81	88	81	81	83	80	85	90	85	85	90	95	80	86	76	79	
	Min	59	48	52	50	50	62	58	49	54	54	41	50	50	46	55	60	50	50	45	54	50	60	60	56	51	69	70	70	60	61	
Hampton	Max	79	75	80	86	87	93	89	74	82	75	78	79	75	82	79	76	80	82	79	81	91	76	88	92	95	96	86	85	75	79	
	Min	60	49	50	51	54	61	60	49	52	55	50	51	59	52	56	56	58	51	50	55	64	59	58	58	63	67	65	62	55	54	
Harlan	Max	77	71	79	80	85	91	93	80	90	81	82	80	77	78	84	80	75	81	84	88	95	81	82	86	91	95	87	90	83	88	
	Min	57	46	48	51	53	63	60	46	57	54	45	53	54	44	55	61	60	52	47	55	63	60	57	57	52	63	66	61	61	61	
Humboldt	Max	76	72	79	82	83	93	86	76	88	82	76	80	74	77	78	74	76	80	80	82	90	76	84	87	91	95	89	87	86	80	
	Min	60	45	51	54	55	63	56	46	54	54	46	50	56	47	58	60	60	52	50	58	64	58	58	55	58	67	66	57	55	65	
In'pend'ce	Max	83	76	75	81	80	89	88	81	80	75	74	77	78	77	80	80	79	78	78	81	82	74	83	89	91	90	82	82	73	76	
	Min	60	48	46	47	52	58	61	53	49	61	47	50	58	50	51	54	56	51	50	55	64	57	59	68	61	67	63	62	56	53	
Indianola	Max	83	75	77	80	86	91	92	86	86	80	80	79	77	79	80	80	75	79	81	80	90	78	80	85	89	93	85	87	79	78	
	Min	63	50	54	53	46	48	66	56	57	59	52	54	62	53	56	62	64	54	55	60	67	62	61	60	61	67	62	66	62	61	
Iowa City	Max	82	74	77	77	85	91	93	78	83	76	78	85	85	81	83	84	80	82	84	86	83	73	85	88	95	93	86	85	79	83	
	Min	64	52	49	50	53	61	63	53	51	64	47	53	60	52	52	56	58	54	49	55	63	61	63	61	60	67	67	66	63	66	
Iowa Falls	Max	79	79	81	86	86	94	87	78	87	75	80	83	75	80	83	84	81	81	84	82	88	75	86	91	94	94	84	87	76	84	
	Min	56	46	49	48	53	59	55	45	50	55	45	50	56	50	56	56	58	51	49	54	63	59	59	56	59	62	64	59	55	52	
Keokuk	Max	82	70	74	77	82	88	89	80	82	79	79	84	79	82	81	81	71	82	83	85	82	72	82	86	89	91	89	90	84	75	
	Min	67	55	53	54	58	68	64	66	56	72	58	56	64	60	55	62	66	56	56	63	69	65	64	64	70	65	67	70	72	60	

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JUNE, 1900—CONTINUED.

STATIONS		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Mean.
uquа	Max....	81	74	79	82	80	90	92	81	83	90	80	83	79	83	85	83	74	81	84	86	85	72	81	85	91	92	79	88	80	71	82.5
	Min	66	59	54	52	56	63	66	61	54	67	52	54	65	56	56	65	63	56	58	59	66	65	65	64	69	71	68	69	69	64	61.7
ville	Max....	84	75	80	84	86	95	92	82	87	79	83	83	77	78	84	83	75	81	83	85	90	75	80	85	82	95	89	87	78	80	83.2
	Min	65	50	52	53	55	59	65	55	60	60	49	55	62	54	56	62	62	55	55	57	57	62	63	61	63	68	62	68	61	61	58.9
ng....	Max....	86	78	76	85	82	90	90	80	88	74	78	80	83	80	80	80	74	89	84	86	86	78	93	94	97	96	90	87	82	79	84.2
	Min	60	53	46	49	52	56	60	52	46	64	46	45	59	50	56	56	64	49	46	50	66	60	42	42	60	60	68	59	57	51	54.1
wood	Max....	73	66	81	81	82	91	83	81	92	80	78	80	74	71	75	75	75	76	79	88	92	62	83	86	90	96	94	88	63	69	82.3
	Min	58	39	53	57	55	56	61	43	63	50	48	50	50	50	63	60	60	53	56	58	64	62	57	59	59	64	63	88	54	84	56 6
abee...	Max....	67	67	80	84	85	89	87	81	92	67	83	80	50	74	63	67	72	82	84	89	91	79	85	90	91	98	88	88	68	84	82 0
	Min	49	38	49	54	55	62	53	41	55	52	47	53	51	45	56	57	61	53	49	60	61	61	55	58	59	67	64	52	54	51	54.1
ars....	Max....	80	72	81	83	84	92	89	81	91	76	80	76	75	77	80	75	76	79	82	93	88	88	82	86	93	96	87	86	73	88	83 0
	Min	57	43	53	57	53	63	53	43	60	53	43	53	50	45	57	62	63	53	51	63	61	63	61	54	68	66	66	54	56	54	55 9
x.....	Max....	78	70	74	78	81	89	88	81	86	58	50	53	58	52	80	63	63	55	55	61	64	62	60	63	66	..	66	63	63	69	80.8
	Min	60	48	51	55	56	63	62	56	93	81	84	80	82	83	80	78	77	85	87	91	95	86	85	92	95	100	91	90	81	94	59.0
n.....	Max....	78	71	86	85	90	95	92	86	55	54	46	52	50	44	48	60	62	49	50	56	64	56	55	57	56	64	67	62	56	60	86.4
	Min	56	47	50	52	53	62	58	43	55	54	74	77	77	78	79	80	79	80	79	83	78	70	81	86	89	88	84	84	79	77	54.8
noketa	Max....	81	66	72	76	79	85	88	82	77	63	46	50	60	52	54	54	54	51	46	56	63	59	63	56	57	64	66	64	59	52	79.5
	Min	62	52	46	46	52	61	65	53	85	79	78	82	78	79	81	82	78	81	80	82	89	77	84	87	91	93	87	84	63	55	55.8
sh'l't'n	Max....	84	76	78	83	85	93	92	80	51	51	60	47	52	61	56	59	58	50	51	78	88	74	82	87	88	91	83	82	76	75	79.0
	Min	64	49	49	50	54	59	63	51	86	75	72	77	72	74	75	73	77	81	78	78	88	58	63	59	58	64	66	61	51	50	86.4
on City	Max....	79	69	75	..	..	..	..	..	46	52	43	50	47	47	53	82	81	82	82	81	86	86	85	86	88	92	93	94	83	85	84.0
	Min	52	50	46	..	..	..	..	..	79	80	80	80	81	82	82	53	55	57	47	44	53	63	58	52	59	58	64	54	53	62	62	50.0
ticello.	Max....	84	79	80	75	89	90	92	78	79	80	80	80	81	82	82	53	50	45	50	53	58	55	54	55	55	88	88	93	88	76	81.1
	Min	50	50	50	39	40	42	54	58	62	48	43	50	49	47	82	72	72	81	82	84	83	73	83	85	88	67	68	54	53	62	62.0
ar	Max....	81	71	73	78	83	87	90	79	81	80	80	83	81	82	82	62	66	63	58	60	84	59	48	59	70	89	94	68	88	83	82.5
	Min	68	54	58	58	57	66	65	64	59	60	60	58	65	60	80	84	86	73	78	84	86	79	88	79	77	84	89	66	65	64	59.7
Ayr..	Max....	77	72	76	80	84	92	91	78	89	82	79	78	78	78	80	84	86	64	63	58	64	63	63	61	62	65	84	86	82	64	84.0
	Min	60	49	52	54	57	62	61	57	58	58	57	54	62	80	64	79	84	84	79	83	84	86	80	79	85	86	92	63	86	59	53.2
Ple's'nt	Max....	85	84	51	45	50	55	59	57	46	46	45	46	46	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Vernon.	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
wH'pton	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
wton....	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
rthwood	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
ebolt	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
den.....	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
naha, N.	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
awa.....	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
age.....	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
ceola....	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
skaloosa..	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
ttumwa...	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
vid	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
acific Jct.	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
ella.....	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
lover.....	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
rimghar..	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Red Oak...	Max	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Ridgeway..	Max.	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Rockwell C	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Ruthven ..	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Sac City....	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Scranton ..	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Sheldon....	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Sibley.	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Sigourney..	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Sioux Cen.	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Sioux City..	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Stuart	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Thurman..	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Toledo. ...	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Villisea....	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Wapello ...	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Washingt'n	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Waterloo...	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Waverly...	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
W. Branch.	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Wilton Jc..	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Whitten ...	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
Winterset .	Max....	86	77	80	86	85	91	94	80	82	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7
	Min	59	49	51	45	50	55	59	57	84	78	82	83	83	93	84	86	85	84	86	85	86	83	71	88	92	95	93	86	86	81	84.7

DAILY AND MONTHLY PRECIPITATION FOR JUNE, 1900.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total.
Afton	.09	....	....	....	...	.26	....	....	...	....	...	T	1.02	....	....	T	.04	....	....	....	.21	...	....	.. .	....	....	.40	....	....	....	
Albia	....	....	..	....	...	.11	....	....	...	....	....	...	T	....	....	....	.73	....	....	....	.71	...	....	....	....	....	.97	....	....	....	
Algona	.60	....	....	....	....	....	....	....	1.40	....	....	1.18	....	...	....	1.36	....	...	....	.06	....	....	....	....	....	....	.27	....	....	....	
Alta	...	...	....	..	...	....	....	....	.65	.25	....	.30	....	...	....	4.25	.02	....	....	.66	.07	....	....	....	....	....	.03	....	....	....	
Alta (near)	1.58	...	....	....	....	....	.. .	....	1.18	....	.02	.72	....	....	....	1.53	..	....	....	.12	....	....	....	....	....	....	.05	....	....	....	
Amana	...	...	...	....	....	...	....	....	....	1.88	....	...	.61	...	...	...	.23	....	....	....	.81	....	....	....	....	....	.22	....	....	....	
Ames	....	....	...	....	...	.08	....	....	.90	....	...	.53	...	....	. ..	2.95	....	....	....	.07	.60	....	....	....	....	....	.39	....	...	...	
Ames (near)	....	....	....	..	....	.12	....	....	....	1.27	....	.67	....	....	...	....	4.16	....	....	T	.23	....	....	....	....	.96	1.70	..	....	....	
Atlantic	.16	....	...	....	....	.13	..	...	...	.15	....	.56	..	....	....	.08	...	....	..	T	.70	...	...	....	....	.. .	.31	....	....	....	
Audubon....	.64	....	....	....	..	....	T	....	....	.85	..	....	.34	....	....	.12	T	....	....	T	.01	T	T	....	....	...	.28	....	....	....	
Bancroft	.76	....	....	....	....	....	....	..	...	2.25	....	....	.15	T	....	1.30	....	....	....	....	....	....	....	..	....	.82	....	....	....	....	
Batavia	....	....	....	..	....	....	....	....	....	..	..	....	....	....	..	....	1.10	....	....	....	.40	1.00	....	....	....	....	.90	....	....	....	
Baxter	...	....	....	..	....	....	....	....	....	.48	....	1.00	...	....	....	1.05	...	....	....	.08	.06	..	....	....	....	....	1 46	....	....	..	
Bedford	....	....	. ..	....	....	.10	....	....	....	..	....	.75	....	....	....	.77	....	....	....	....	.33	.06	...	..	....	....	.09	....	....	....	
Belknap	.24	....	....	....	....	....	.26	....	....	....	....	....	....	....	....	....	1.85	...	..	....	....	.35	....	....	....	....	.45	....	....	....	
Belle Plaine	....	....	...	....	....	....	...	....	....	3.85	....	....	1.55	....	....	....	....	....	.20	....	1.00	T	....	....	....	....	.70	....	....	....	
Bonaparte	...	....	....	....	...	....	.11	....	..	....	..	....	.65	...	..	....	1.01	....	....	....	.61	..	....	....	....	....	....	.85	....	....	
Britt	.87	....	....	....	....	....	....	..	.02	2 82	....	....	.49	....	....	.22	.45	....	....	.05	....	....	..	....	....	....	.33	....	....	....	
Buckingham	....	....	....	..	....	.71	..	....	....	....	....	....	.57	....	....	....	2.49	....	....	.20	.35	...	....	....	....	....	1.72	..	....	....	
Bussey	...	....	....	....	....	....	.68	..	....	....	....	.28	....	....	....	1.40	....	....	....	....	.38	....	....	....	....	..	1.05	....	....	....	
Carroll	1.00	....	...	....	...	....	....	....	....	.75	....	..	.28	....	....	.14	....	....	....	.13	.33	..	....	....	....	....	1.25	....	....	....	
Cedar Rapids	T	....	...	....	...	....	....	....	2.80	.02	..	.45	.06	....	....	.02	T	....	....	.57	.24	T	...	....	....	.06	..	....	....	....	
Centerville	....	...	....	....	....	....	.40	....	....	....	....	T	..	....	....	....	.65	...	..	..	.40	T	....	....	....	....	1.98	..	....	..	
Chariton	...	...	..	T	T	....	.06	.01	...	T	....	T	.17	....	....	....	.70	.02	...	T	.90	03	....	....	....	....	.74	....	....	....	
Charles City	.75	....	....	...	..	.22	....	....	....	3.40	....	....	.40	....	....	T	T	....	....	....	.26	....	....	....	....	....	.50	....	....	....	
Clarinda	..	....	....	...	....	..	....	....	....	....	....	1.25	....	....	....	....	1.33	....	....	....	.50	....	....	....	....	....	.07	....	....	....	
Clear Lake	1.90	....	....	....	..	....	....	....	.10	4.00	....	....	.30	....	...	T	T	..	....	....	....	....	....	....	....	....	.30	...	....	....	
Clinton	.09	...	...	. .	....	....	....	....	....	.58	....	....	.03	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
College Springs	...	....	....	....	....	....	.01	....	....	..	....	.65	..	....	....	.18	1.19	....	....	....	1.05	T	....	.	....	....	T	....	...	..	
Coon Rapids	.30	....	....	....	....	..	....	....	....	.64	....	.10	.38	....	....	.10	.02	....	.15	.64	.30	....	..	....	....	....	.01	....	....	....	
Corning	.12	..	....	....	..	T	..	....	....	.03	....	....	.60	....	....	.10	.30	....	....	....	....	....	....	....	....	....	2.25	....	....	....	
Council Bluffs	.44	....	....	....	T	....	....	....	.09	.12	....	.30	....	....	....	1.34	....	....	....	....	.08	....	....	....	....	....	....	. .	....	....	
Cresco	.06	....	....	....	....	.03	....	....	....	2.16	....	.23	....	..	....	....	.27	....	....	.03	T	....	....	....	....	....	....	....	....	....	
Crawfordsville	....	....	....	....	....	....	....	....	....	....	....	...	.47	....	....	....	.33	....	....	....	.09	....	..	....	....	1.00	....	....	....	....	
Cumberland	.01	....	....	....	....	.34	....	....	....	.16	....	....	.46	....	...	.10	T	....	....	....	1.80	....	....	....	....	....	.14	....	....	....	
Danville	...	....	....	....	....	....	....	....	....	....	....	..	.70	....	....	.20	..	....	....	....	.21	....	....	....	....	....	.61	....	....	....	
Davenport	T	....	....	....	....	....	....	T	....	.19	..	....	.14	....	....	....	T	....	....	.25	.53	T	....	....	....	....	.10	...	....	....	
Decorah	T	....	....	....	....	T	....	....	....	1.46	....	....	.19	....	....	....	....	....	....	....	.61	.01	T	....	....	....	T	....	.06	....	
Delaware	....	....	....	....	....	.02	....	....	....	1.44	....	....	.19	....	....	....	....	....	....	....	....	....	....	....	....	....	1.11	....	....	....	
Denison	1.28	....	....	....	....	....	T	..	....	.45	....	..	.16	....	....	.35	....	....	....	....	.20	....	....	....	....	.85	..	....	....	....	
Des Moines	T	....	....	....	....	.30	T	T	....	.18	....	T	1.59	....	....	T	.31	....	...	.05	.09	....	....	....	....	....	.21	....	..	...	
De Soto	.07	....	....	....	....	....	T	....	...	.74	....	T	1 07	....	....	.06	.01	...	...	.12	.25	....	....	....	....	....	2.37	....	....	..	
Dows	....	..	....	....	....	....	....	....	T	1.22	...	...	.60	....	....	.10	1.50	....	....	....	.20	....	....	....	....	....	2.47	....	....	..	
Dubuque	.35	....	....	....	....	....	....	....	....	1.03	....	....	.06	...	....	....	....	..	....	....	.45	.13	....	....	....	....	.95	....	....	....	
Eldon	....	....	...	....	....	....	.10	....	....	T	...	...	.14	....	....	....	4.60	....	....	....	.41	T	....	....	....	....	.02	....	....	T	
Elkader	...	....	....	..	....	....	....	....	....	1.50	....	....	.18	....	....	....	....	....	....	.05	..	..	....	....	....	....	.73	....	....	..	
Emerson	....	....	....	....	....	....	....	....	.05	....	....	.84	....	....	....	1.43	....	....	....	....	1.38	..	....	....	....	....	.80	....	....	....	
Estherville	.67	..	....	....	....	....	..	....	1.40	.20	....	....	.19	T	...	1.00	....	....	....	.15	....	....	....	....	....	....	....	....	....	....	
Fairfield	T	....	....	....	....	....	.01	....	..	T	....	..	.38	....	....	..	.85	....	....	....	.55	.04	....	....	....	....	.35	....	....	....	
Fayette	T	....	....	....	....	.05	....	....	....	1.87	..	..	.11	....	....	....	T	....	....	.06	T	....	....	....	....	....	1.20	....	T	....	
Fonda	1.35	..	....	....	..	..	....	....	3.12	....	....	.17	....	....	.77	3.77	.12	....	.27	T	2.06	T	....	....	....	....	1.05	....	....	....	
Forest City	1.60	....	....	....	....	....	....	....	.10	1.90	...	....	.42	....	....	.22	....	....	....	....	.05	....	....	....	....	....	.27	T	....	....	
Ft. Dodge	...	....	..	..	..	....	....	....	....	3.00	....	....	.21	....	....	....	.85	....	....	....	1.00	....	....	....	....	28	.10	....	....	....	
Ft. Madison	.23	..	....	....	....	....	....	....	....	.50	....	T	.27	....	....	....	.23	....	....	....	.85	T	....	T	....	....	.80	....	....	....	
Galva	...	....	....	....	....	....	....	....	....	.87	T	.05	.43	....	....	1.14	.05	....	....	....	18	....	....	....	....	....	.16	....	....	....	
Glenwood	.85	..	....	....	....	....	T	....	....	.18	....	.33	..	....	....	1.00	1.65	....	....	....	.34	....	....	....	....	....	....	.13	....	....	
Gilman	..	...	....	..	....	....	....	....	....	1.22	...	...	1.40	..	..	..	2.64	....	....	....	.89	....	....	....	....	....	1.20	..	T	....	
Grand Meadow	....	....	....	....	....	..	..	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
Greene	.25	....	..	...	...	...	....	....	....	2.57	....	....	.48	...	....	.05	.12	....	....	....	.02	....	..	....	....	....	2.00	....	..	....	
Greenfield	.21	...	....	...	....	.04	....	....	....	.10	....	1.08	..	...	....	.20	T	....	....	.43	.21	....	....	....	....	....	1.29	....	..	....	
Grinnell	....	....	....	....	....	....	....	....	....	.63	....	1.50	....	..	....	....	3.10	..	....	....	1.10	....	....	....	....	....	1.47	....	T	....	
Grundy Center	.05	....	....	..	....	.10	....	....	....	5.60	....	....	.76	..	....	....	3.48	..	....	....	.49	....	....	....	....	....	.96	....	..	....	
Guthrie Center	...	....	....	....	..	.26	....	....	....	.68	..	.51	....	....	....	.14	....	....	....	.68	....	....	....	....	....	....	1.99	....	....	....	
Hamburg	....	....	....	....	....	....	....	....	....	....	....	.07	....	....	..	1.40	1.60	..	....	....	.62	....	....	....	....	....	....	.12	....	....	
Hampton	1.00	....	....	....	....	....	....	..	2.05	....	....	.97	..	....	..	.88	....	....	....	....	.04	....	....	....	....	....	.78	..	....	....	
Harlan	.50	....	....	....	..	....	T	..	....	.80	....	.15	.05	..	T	.03	....	....	....	T	.22	....	....	....	....	....	.14	....	....	....	
Hawkeye	....	....	....	.	..	....	....	....	....	2.55	....	....	....	.18	....	....	....	....	T	..	....	....	....	....	....	....	....	1.08	....	..	
Hoprig	.77	...	....	...	....	....	....	....	2.36	....	...	.40	....	....	....	2.30	....	....	....	.57	....	....	....	.	....	....	....	....	....	....	
Humboldt	.71	....	....	....	..	....	..	....	..	2.02	....	..	.58	....	....	.12	.54	....	....	.33	....	....	....	....	....	....	....	....	....	....	
Independence	T	....	..	....	....	T	..	....	....	1.50	....	T	.22	....	....	....	.80	....	....	.50	.01	....	....	....	....	..	.41	....	....	....	
Indianola	....	....	....	....	....	.05	T	....	....	.05	..	T	1.57	....	...	T	.03	....	....	.04	.68	T	....	....	....	....	.80	..	....	....	
Iowa City	....	....	....	....	....	....	.21	....	....	.38	....	....	.65	....	....	..	.18	....	....	....	.60	T	....	....	....	....	1.51	....	....	....	
Iowa Falls	.55	....	....	....	....	....	....	....	....	1.96	..	.38	..	....	T	T	1.15	....	....	.40	.10	T	....	....	....	....	.16	....	....	....	
Keokuk	....	....	....	....	..	....	.06	..	....	.02	...	....	.15	....	..	....	.09	....	....	....	.38	.12	T	.17	....	....	1.38	....	....	....	
Keosauqua	.09	....	....	....	..	....	.22	....	....	....	....	....	.60	....	....	....	.87	....	....	....	1.02	....	....	....	....	....	.05	....	....	.02	
Knoxville	....	....	....	....	T	.11	.39	....	..	T	....	T	1.78	....	..	....	1.34	..	....	....	.43	....	....	....	....	....	.50	....	....	....	
Lacona	....	....	....	....	....	....	....	....	....	T	....	..	.70	....	....	....	.90	....	....	....	2.00	....	....	....	....	....	2.19	..	....	....	
Lansing	...	....	....	....	....	....	.41	....	....	1.35	....	....	....	....	....	....	....	....	....	....	T	....	....	....	....	....	.95	....	....	..	
Larchwood	....	....	....	....	....	....	....	....	1.00	.10	....	.54	...	.03	....	1.06	....	....	....	....	....	..	....	....	....	....	.27	....	..	..	
Larrabee	....	....	....	....	..	..	....	....	2.02	.22	...	.26	..	..	....	4.26	..	..	....	.09	..	..	....	....	....	....	.10	....	....	....	
Le Claire	....	.19	....	....	....	....	....	T	....	.18	T	....	.09	....	....	....	....	....	....	....	.05	.14	T	....	....	....	..	T	....	.02	
Le Mars	1.27	...	....	....	....	....	....	....	.02	.28	.05	...	.26	....	....	1.54	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
Lenox	.35	...	....	....	....	..	....	....	....	....	...	T	.65	....	....	.14	.75	....	....	....	.23	....	....	....	....	....	.30	....	..	....	
Logan	.65	...	....	....	....	....	..	....	....	.18	....	....	....	....	....	.32	....	....	....	....	.07	....	....	....	....	....	.05	....	..	....	
Maquoketa	.19	....	....	....	....	.06	....	T	....	1 03	....	....	.21	....	....	....	....	....	....	....	.53	.13	T	....	....	....	.05	....	....	....	
Marshalltown	...	....	....	....	....	....	....	....	....	1.97	....	...	1.24	....	....	....	.82	....	....	.30	.14	....	....	....	....	3.32	....	....	....	
Mason City	7.00	...	...	...	....	....	....	..	....	4.00	....	.35	....	...	....	....	.10	....	....	....	.30	....	....	....	....	....	.60	..	....	....	
Monticello	.. ..	....	..	....	....	....	....	....	....	.90	....	....	....	....	....	T	..	....	....	.11	.25	....	....	....	....	....	....	....	T	....	
Mooar	....	....	....	....	....	....	T	....	....	....	....	....	T	....	....	....	....	....	....	....	.54	.62	....	....	....	....	.05	....	....	....	
Mt. Ayr	.37	...	....	....	....	T	....	....	....	T	....	.07	.60	....	...	.11	.39	....	..	....	.13	....	....	....	....	....	.18	....	....	....	
Mt. Pleasant	.02	....	....	....	....	....	T	....	....	T	....	....	.65	....	....	....	.42	..	....	....	.25	1.67	....	....	....	....	.18	..	....	..	
Mt. Vernon(Hub)	.01	....	....	....	....	....	T	....	..	1 82	....	....	.23	....	....	....	T	....	....	.10	.32	T	....	....	....	....	.60	....	.01	....	
Murray	. .	....	....	....	....	.72	....	....	....	....	....	.35	....	....	....	.52	....	....	....	.06	....	....	....	....	....	....	....	....	1.00	..	
New Hampton	....	..	....	....	....	....	1.06	....	....	3.00	....	....	.33	....	....	....	.08	....	....	....	....	....	....	....	....	....	....	....	....	....	
Newton	.02	....	....	....	..	.09	....	....	....	.25	....	..	1.28	....	....	....	2.42	....	....	T	.45	.12	....	....	....	....	1.72	....	....	....	
Northwood	.88	....	..	..	....	....	....	....	2.35	....	....	.50	....	....	....	.14	.17	....	....	....	.24	....	....	....	....	....	.60	....	....	....	
Odebolt	.92	....	....	....	....	....	....	....	....	.45	....	T	....	....	T	.90	.20	....	....	T	.06	....	....	....	....	....	.60	.07	....	....	
Ogden	.41	....	....	....	....	....	....	....	....	.54	....	....	1.56	....	....	.02	1.94	.07	...	.37	.02	....	...	....	....	....	1.37	....	....	....	
Omaha (Neb.)	.48	....	....	....	....	....	....	....	....	.26	....	.03	T	....	....	2.22	T	....	....	T	.04	....	....	....	....	....	.04	....	....	....	
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Oskaloosa	....	....	....	....	....	T	....	T	....	T	....	T	.17	....	....	....	1.87	....	....	T	.44	....	....	....	....	....	1.15	....	....	....	
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Ovid	..	....	....	....	....	.39	.04	....	....	.01	....	T	.04	....	....	.01	1.36	....	....	....	.84	....	....	....	....	....	1.95	....	....	....	
Pacific Junction	.66	....	....	....	....	....	....	....	....	.44	....	.30	.04	....	....	2.70	.45	..	..	T	.15	....	....	....	....	....	.19	..	..	....	
Pella	....	....	....	....	.71	....	....	....	....	....	....	....	1.45	....	....	....	....	....	....	....	.80	....	....	....	....	....	.87	....	..	..	
Plover	.77	....	....	....	....	....	....	....	.05	1.00	...	....	.13	....	....	2.10	....	....	....	.34	....	....	....	....	....	....	.28	....	....	....	

DAILY AND MONTHLY PRECIPITATION FOR JUNE, 1900—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total.
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geway	.13		.01							.50		.40				3 60				2.01	.15						.40				8.36
kwell City	.60									1.18			.20			3.80	.49				.60						1.58		.04		6.67
hven										.51	T	T	.12			1.70	.45			.97							1.33				6.49
City	1.12									1.00		T	.16			T	.80			.50	.33						.05				4.59
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ux Center	1.91								.05	.25	T	.35	.03		.01	1.27				.91							1.50				4.32
ux City	1.15									.45			1.00			T	T				.55						.05	T			3.60
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urman	.20					.10	T			2.50			.91				1.18			.29	1.86										6.74
edo					T					.22		1 32				.82	T				.24					.20					3.32
lisca	.52									1.05		.58					1.10			.16	.20						.78				3.87
nton										T			.46				.04				.33	.01									.84
pello	T												.30				.64				.36					.10			.60		1.52
shington									.27	.21			.16				.78			.08							.41				3.20
shta	1.00						.02			1.76		T	.40				1.53				1.35						1.50				5.47
terloo										3.28			.43				.15				.12						.25				5.48
verly								T	.93			.95		T		.19	1.19		T	.54		T					.22				4.05
bster City									.02	.60		T	.24		T	.26	.89			36							.12		.22		2.59
st Bend										1.22			.26				.06			T	.60	T					.85				2.97
st Branch	.41						.08			1 75			T								.60	10					.05		.28		3.51
st Union												.33	.17								.20	1 51					.60	.57			1.68
lton Junction	.15								.12				.96				.68	.19			.19						.89				5 33
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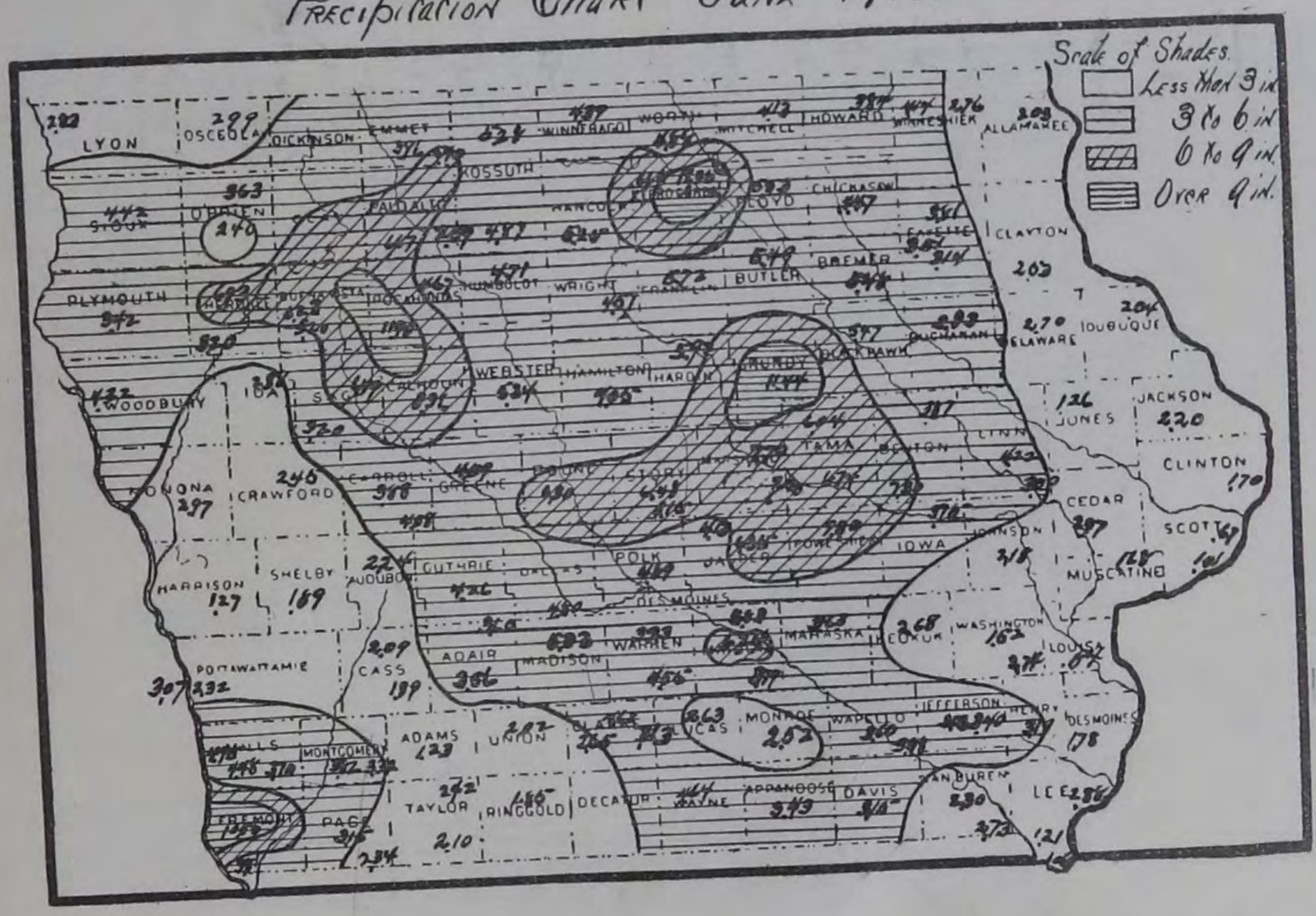
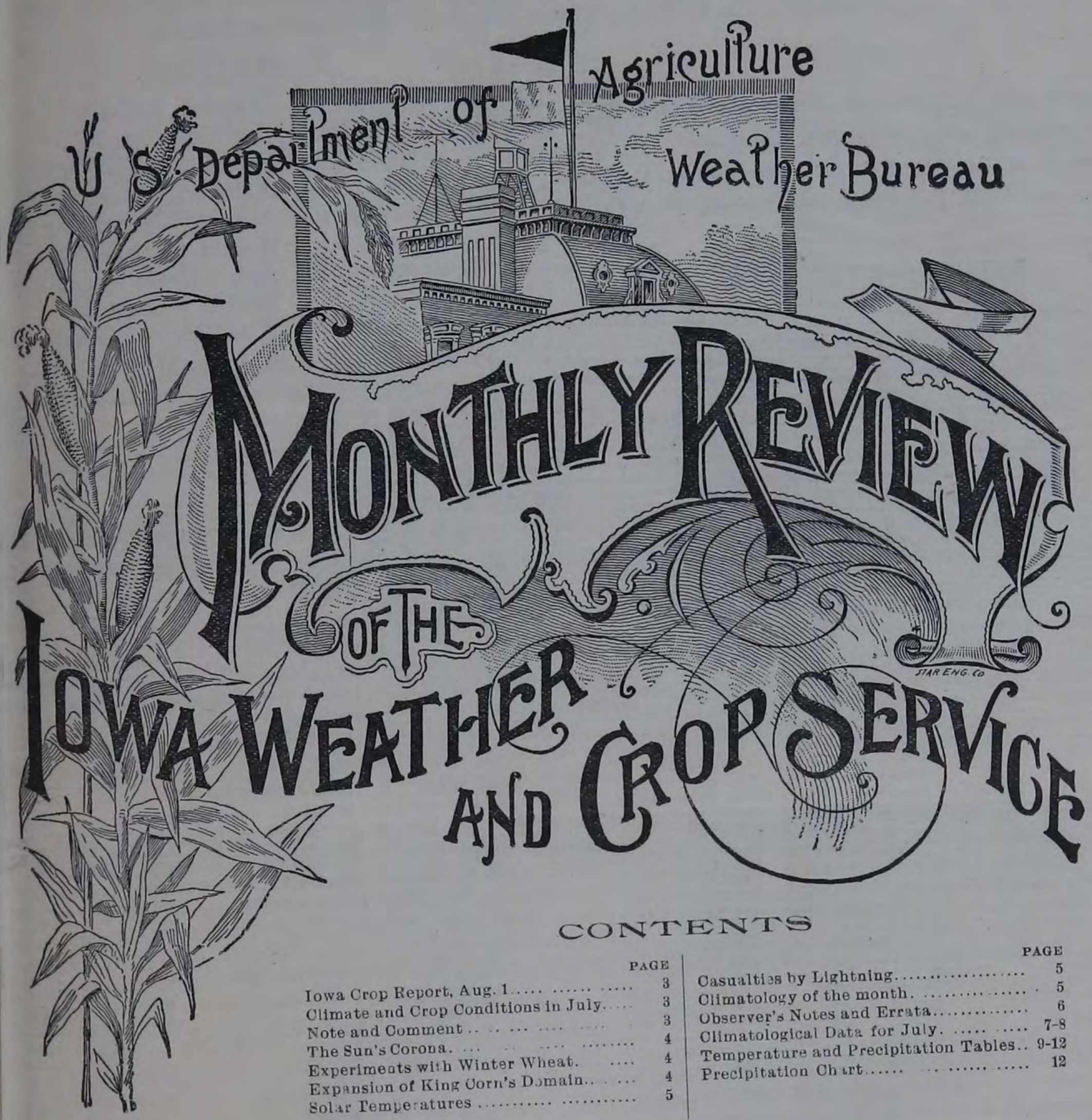
Precipitation Chart June 1900.



Vol. XI. JULY, 1900. No. 7.



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Central Station, Des Moines, Iowa.

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ALLIED PRINTING TRADES UNION LABEL COUNCIL DES MOINES, IA.

DES MOINES:
F. R. CONAWAY, STATE PRINTER
1899.

THE IOWA WEATHER AND CROP SERVICE

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

owa Weather and Crop Service.

VOLUME XI. JULY, 1900. No. 7.

IOWA CROP REPORT, AUGUST 1, 1900.

The regular August crop reports from county and township correspondents show the following averages in condition: Corn, .05 per cent; millet, 98; flax, 95; buckwheat, 91; broomcorn,)4; sorghum, 97; apples, 70; grapes, 71; pastures, 97; potatoes, 95.

In 1899 on corresponding date conditions were as follows: Corn, 90; millet, 94; flax, 95; buckwheat, 90; broomcorn, 88; sorghum, 91; apples, 59; grapes, 48; pastures, 94; potatoes, 100.

CLIMATE AND CROP CONDITIONS IN JULY.

July was about as warm as usual, and in nearly all parts of the state there was considerable excess of rainfall, the average being being about 2.47 inches above the normal The average of the northern section was 3.30 inches greater than the average of the southern section; but the distribution of moisture was more equable than usual, and there was only a small area in the southern and eastern counties that received less than the normal amount.

There was but little complaint of lack of moisture, even from the driest localities at any time during the month. Widely distributed showers fell in all districts on thirteen days of the month, viz: 2d, 3d, 5th, 6th, 7th, 10th, 14th, 15th, 16th, 19th, 20th, 22d and 24th. Rain fell in measurable quantity at some stations, on all days of the month but two. As a result of these frequent showers and general excess of moisture haying and harvesting were greatly retarded during two-thirds of the month, and a very large amount of hay was damaged or ruined, and wheat, rye, oats and barley were materially injured by heavy winds and excessive rains which flattened the grain before it was cut or damaged it in shock. But the copious midsummer showers were very beneficial and timely for the corn crop, potatoes, pastures, millet, berries and garden vegetables, and it is probable that the growth of aftermath in the meadows has been amply sufficient to compensate for the damage to the hay crop. The last week in July brought ideal weather for harvesting, and at the close of the month fair progress had been made in stacking and threshing grain. And, after making due allowance for all losses from excessive rains and heavy winds, the yield and quality of small grain crops will be fairly satisfactory to the producers. The corn crop has never been more promising in Iowa than it was on August 1, 1900.

A press dispatch from Tacoma, August 1st, stated that indications of volcanic activity have been observed above Mt. Rainier, situated near that city. The highest point of the mountain is over 14,000 feet, and if it should become very active it would be worth a trip across the continent to see the exhibition.

NOTE AND COMMENT.

Strong-limbed does Science stand, with fire of youth;
Strong-browed as heaven-dwelling Zeus, whose gaze
Shook sky and earth, self-poised, expectant, meek.
And as the sistine mother, from above,
God's gift receiving, eager-eyed would seek
For fuller vision of eternal love,
So Science hopes, through patient toil refined,
For fuller vision of eternal mind.

—*Irenaeus Lowe in N. Y. Observer.*

* * *

The report of the U. S. Geological Survey on the coal output places Iowa very near the head of the list of coal producing states. The report says: "Iowa for the first time in the history of the state contributed over 5,000,000 short tons to the total coal product of the country. Previous to 1899 the record of maximum yearly production was made in 1888, when the total output was 4,952,440 short tons, but the value that year slightly exceeded that of last year's output. Compared with 1898, the production in 1899 shows an increase of 558,637 tons, or about 12 per cent, and of $1,133,622, or 21.6 per cent in value."

* * *

In answer to a query as to how fast corn will grow, we say that we measured a stalk of corn that was one hundred and four inches high, the product of fifty-four days' growth. This was an average of two inches a day from the time the seed was planted, and as it did not grow above ground for the first week, and made but a slow growth during the cool days of May, it must have grown not less than three inches a day for a part of the time. —*J. S. Trigg.*

* * *

Grasshoppers have been unusually numerous and destructive this season. In some localities in this state they have wrought quite heavy damage to crops and garden truck. The wet weather in July probably lessened the numbers of the pests, and the immense amount of vegetation afforded sufficient food, so that the damage has not been as heavy as it would have been if the midsummer had been droughty. Turkeys have had a protracted feast.

* * *

A considerable area in China received no rain last winter, and the superstitious "boxers" attributed the drought and threatened famine to the influence of the "foreign devils." That is only a degree or two more irrational than some of the theories recently broached as to the cause of droughty conditions in this section

* * *

There is scarcely a thing done on a farm to-day in which patented machinery does not perform the greater part of the labor. The grain is sowed, cut, bound, threshed, sacked, stored and transported by machinery; the corn is planted, cultivated and cut by machinery, while the mower cuts, the tedder spreads, the horserake gathers, the hayloader loads and the

carrier unloads the hay. The potatoes are planted and dug by patented machines or implements, and even the hogs are slaughtered and the chickens hatched by machinery.—*Hay Trade Journal.*

* * *

Among the reports of losses by lightning in July was one from Secretary W. H. Hogan, of the Dubuque County Farmers' Mutual Insurance Association, giving some details of the loss of a cow (or steer) in Prairie Creek township, on the morning of the 13th. The animal was found dead beside the lightning rod on the barn, and the rod was burned in two in two places. That seems to indicate that the rod was defective in some way, and also that it is not safe for cattle to scratch their backs against lightning rods when thunderstorms are in active operation; especially if the rods are not well grounded.

THE SUN'S CORONA.

[Professor F. H. Bigelow in Appleton's Popular Science Monthly.]

There are many existing theories to account for the phenomenon of the sun's bright appendage, called the corona, which is visible only during eclipses, on account of the absorbing effects of the earth's atmosphere on its light. Is it electrical, or is it magnetic? Is it composed of fine stuff ejected from the sun, or of meteoric dust falling upon the sun? Is it merely an optical effect, as some suppose, or is it a portion of the newly discovered radiant matter streaming off to enormous distances into space? The answer to these questions is eagerly sought through observation, photography, and every other possible means, on the occasion of each total eclipse.

The efforts of astronomers have thus far secured a series of pictures of the solar corona, which, when compared together, show very distinctly that the corona, as well as the spots, the protuberances, and the faculae, are going through a series of changes which seem to repeat themselves in the so-called eleven-year period. It has also been proved, with entire distinctness, that the earth's magnetic field, as marked by the changes in intensity of the magnetic elements, in the auroral displays, and the earth's electric currents, shows variations which synchronize closely with those observed on the sun; also that the weather elements of pressure, temperature, precipitation and storm intensity all harmonize with the solar and the earth's magnetism in the same synchronism. All attempts of scientists to detect any variations in the sunshine which falls upon the tropics have been entirely futile. On the other hand, it has been shown that the magnetic forces, having the characteristics just mentioned, impinge upon the earth in a direction perpendicular to the plane of the earth's orbit, just as the sun, being a magnet, throws out a field of force to the surface of the earth, which, by its variation depending upon the internal workings of the sun, produces the changes just enumerated in the earth's atmosphere and in its magnetic field, also throughout the planetary system, being, of course, strongest near the sun.

The belief is gradually growing among scientists that the earth, the sun and the planets are all magnetic bodies, and have these bonds of connection between them in addition to the Newtonian gravitation. This is a most fascinating field of research, and, though full of difficulties, yet attracts the attention of many who are convinced that one of the most pressing duties of the hour is to clear up the problems connected with the transmission of energy from the sun to the earth in other orms than the ordinary or sunlight radiation. It is entirely probable that the secular variations of the weather changes from year to year, and even from month to month, are bound up with these solar forces, and that the solutions of these questions will carry with them much information of practical use to civilized man.

EXPERIMENTS WITH WINTER WHEAT.

A special from Ames to the *Times-Republican* of Marshalltown contains the following matter of interest to Iowa farmers:

"In response to many inquiries received relating to the subject of winter wheat, Professor Curtiss, director of the Iowa experiment station, has issued a bulletin giving the results of investigations during recent years. The experiments conducted in 1900 are reported fully and may be summarized as follows:

"Variety Test—Nineteen varieties were seeded in the fall of 1899. Of this number fourteen survived the winter. Four of these passed through the winter without the slightest injury, the remaining ten being more or less winter-killed. The names and yield per acre are given in the following table:

"Name of Variety	Yield per acre (bushels)
Turkish Red	55.3
Bearded Fife	55.0
Buda-Pesth	53.0
Bulgarian	52.3
Minnesota wheat	42.3
Siberian	31.3
Kentucky Giant	26.0
Canadian Hybrid	20.0
Red Cross	18.3
Dawson's Golden Chaff	16.0
Early Ripe	15.3
Standard	14.0
Red Clawson	12.0
Hybrid Prolific	11.3

"The Turkish Red, Bearded Fife, Buda-Pesth and Bulgarian are very similar in their habits of growth, and may prove to be one and the same variety, although obtained from widely different sources. The milling quality of these varieties is of the highest order, being nearly equal to the best spring wheat.

"Bald vs. Bearded Varieties—There is much demand for a hardy bald variety of winter wheat, although up to the present time there are none on the market. The following table gives the results of a test of the bald and bearded varieties this year:

"Bearded (average six varieties)....47.5 bushels per acre

"Bald (average eight varieties).....17.3 bushels per acre

"Place in the Rotation—On a good upland soil wheat was sown after rape, flax, buckwheat and millet, and the following results were obtained:

"After rape, 59.8 bushels per acre.

"After flax, 58.0 bushels per acre.

"After buckwheat, 55.3 bushels per acre.

"After millet, 54.7 bushels per acre.

"The above experiment indicates that when a soil is in suitable condition for the growth of any of the above crops, it is well suited for the growth of winter wheat.

"Only twice during the last ten years has the winter wheat crop failed on the station grounds, and during this time the yield has never been less than twenty-five bushels per acre, usually yielding between thirty and forty bushels. In general it is found to be much more profitable than spring wheat, giving a decidedly higher yield and furnishing one of the best crops with which to establish grasses and clovers."

EXPANSION OF KING CORN'S DOMAIN.

[From the Inter Ocean.]

Twenty-five years ago Samuel J. Tilden predicted that early in the twentieth century the United States would annually produce and find profitable market for 3,000,000,000 bushels of corn. Europeans who thought corn unfit for human food would learn from American cooks that it was both agreeable and nourishing. He believed that some day this country would

all its own wheat and spin and weave all its own cotton. rope would still demand food, and would find it in American n, for which our capacity for production is unlimited. Thus imately our chief agricultural export would not be wheat, even cotton, but corn.

Were Mr. Tilden alive to-day he would point with pardonable pride to the fulfillment of some parts of his prophecy. The nerican corn crop this year will probably reach 2,400,000,000 shels. We still have plenty of wheat for export, but we are arly exporting less and less raw cotton. The establishment cotton mills near the cotton fields is bringing visibly closer e day when the southern states will cease to export raw tton and send out finished products instead Nearly all of e output of South Carolina's mills, half of North Carolina's, id one-third of Alabama's and Georgia's goes to China, and iat enormous market is scarcely touched.

Meanwhile Europe is learning to eat corn bread and corn roducts of all kinds. The systematic missionary work of our gricultural Department is gradually overcoming European rejudices against corn. Even in Ireland, where the people ssociated American corn with the cholera because both came n the great famine year, corn products are in increasing deiand. Despite the alarming predictions of Professor Crookes, he American wheat area is by no means exhausted, and it will e a great many years before domestic consumption of that grain leaves none for export. And in any event the world can still fall back on corn. An acre of good corn land will feed more men than an acre of the best wheat land.

We no longer hear of American farmers burning corn because it will not pay to haul it to market. Their "leagues of corn" are the strength and pride of great states. Corn often saved the infant colonies which became the United States. Corn sustained Washington's fighters for independence. The soldiers of the Confederacy lived for months and fought and won battles on corn. The soldiers of the Union had the Northern wheat fields at their backs but they, too, marched sturdily and fought gallantly on corn. Tilden's prediction of corn's supremacy, now partially realized, may be viewed with equanimity by every American.

SOLAR TEMPERATURES.

To the Editor—It is a fact that the farmer labors in the sunshine and endures the heat and burden of the day. I think therefore we ought to give more attention to sun temperatures, recognizing them as important as maximum shade temperatures. We should use self-registering maximum thermometers, in the open air, away from all buildings, with bulbs exposed to the direct rays of the sun. This would give the true heat of the world, while the temperature in the shade is not altogether natural. I would recommend the south side of a post, about five feet above ground, for the solar thermometer with a bright bulb; a dark bulb absorbs too much heat. All stations ought to be furnished at once with extra maximum registering thermometers, and in their reports the observers should state whether their stations are located among the hills, valleys, or on elevated prairies. Yours truly,

Arthur Betts,
Vol. Obs , Ridgeway, Iowa.

CASUALTIES BY LIGHTNING.

During the storm on July 3d a farmer named Peter Anderson, residing about eight miles northeast of Hawarden, was killed by lightning while lying in bed.

* * *

At Dubuque, on the 13th of July, during a severe thunderstorm, Miss Nellie McQuillan, aged 16 years, was killed by lightning. The Fourth street railway incline was struck and shattered. It was reported that great damage was done in the country.

* * *

During a heavy thunderstorm on July 13th the barn of Mr. Clarence Thomas, about ten miles north of Anamosa, Jones county, was struck by lightning and consumed. The tenant's wife, boy and girl were in the barn, and were knocked down. The boy recovered and dragged his unconscious mother and sister from the burning barn, thereby saving their lives; they recovered consciousness the next day. Two years ago Mr. Thomas lost his barn by a similar casualty.

* * *

On the evening of July 15th Glenn Craik, the 14-year old son of Mrs. Sarah Craik, of Castana, Iowa, was instantly killed by lightning. He was on horseback, and the animal was killed by the same bolt. The lightning caused a deep indentation on top of the boy's head and a hole about an inch deep over his left breast. The horse was struck in the right flank.

* * *

At Rippey, at 5 A. M., July 10th, a house occupied by Albert Morris was struck by lightning and Miss Jennie L. Van Slyke was instantly killed. The bolt struck a chimney causing considerable damage to the house. Miss Van Slyke was standing at the east door watching the storm.

* * *

On the evening of July 19th a farmer named W. Berger, residing nine miles southwest of Cedar Falls, was killed by lightning. He was driving homeward, and the hired man sitting by his side was uninjured. On the same evening two section men, working three miles west of Winthrop, were killed by a single bolt of lightning. Their names were William Fitzgerald and Frank Gorcke. In company with a gang of laborers they took refuge in a small building, which was struck, but the other men escaped serious injury.

* * *

On the afternoon of the 23d of July a young man named Otis Shrager, aged 20 years, was killed by lightning near his home in the vicinity of Granger, Dallas county. The young man and his brother had been hunting, and were within 150 yards of their home when the stroke occurred. The brother, though only three feet distant, was not injured by the shock.

* * *

In Eagle township, Black Hawk county, on the night of July 28th, a son of Frank Kline, aged 18, was killed by lightning. He was struck while riding to the town of Hudson.

CLIMATOLOGY OF THE MONTH.

Barometer.—The mean pressure for July was 29.93 inches. The highest observed was 30.17 inches at Cresco on the 17th; lowest observed, 29.62 inches at Omaha, Neb., on the 6th; range for the state .55 inch.

Temperature.—The mean temperature of the month as shown by 106 reports, was 73.4°, which is practically the normal for the state. The highest monthly mean reported was 79° at Pella; lowest monthly mean 68.9° at Grand Meadow. The average monthly mean of the northern section was 71.7°; central section, 73.1°; southern section, 75.3°. The highest temperature reported was 102° at Logan, on the 6th; lowest temperature reported, 37°, at Larchwood, on the 22d. The average maximum was 94.5°; average monthly minimum, 50.9°; greatest daily range, 44°, at Bedford and Clarinda; average of greatest daily ranges, 34.6°.

Precipitation.—The average rainfall for the state, as deter-

mined by reports of 127 stations, was 6.15 inches, which is 2.47 inches above the July normal. The average of the northern section was 7.60 inches; central section, 6.54 inches; southern section, 4.30 inches. The greatest amount reported for the month was 18.45 inches, at Primghar, of which amount 13 inches fell in 24 hours, on the 14th and 15th. The average number of days on which .01 inch or more fell was 9. The distribution was better than usual, as there was but a small area in the southeastern counties that received less than the normal amount of rainfall.

Wind and Weather.—Prevailing direction of wind, south; highest velocity reported, 54 miles per hour at Sioux City on the 5th. There were 16 clear days; 10 partly cloudy, and 5 cloudy days.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.93	30.14	21	29.65	7
Des Moines	29.94	30.12	12	29.66	6
Clarinda	29.94	30.13	20	29.72	6
Cresco	.....	30.17	12	29.70	5
Dubuque	29.93	30.16	21	29.66	7
Omaha, Neb	29.88	30.10	31	29.62	6
Keokuk	29.94	30.13	21	29.70	7
Sioux City	29.92	30.08	8	29.67	5
Means	29.93	30.17	12	29 62	6

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,463	30	NW	2
Des Moines	6,062	40	SW	5
Dubuque	5,309	40	SW	2
Keokuk	5,530	34	SW	15
La Crosse, Wis	5,317	30	S	14
Omaha, Neb	6,205	38	SW	5
Sioux City	9,560	54	S	5

OBSERVERS' NOTES.

ALBIA—*R. Moore.* Showery throughout the month; beneficial to corn, potatoes, pastures, but too wet for harvesting.

ALTA—*David E. Hadden.* The rain 14th to 16th was one of the longest heavy storms on record. The rain came almost continuously 48 hours, during which 8.72 inches of water fell. Some damage resulted to hay and grain.

AMANA—*Conrad Schadt.* Month favorable for farming and gardening. Small grain all cut and threshing well advanced at close of month.

ATLANTIC—*J. W. Love.* Terrific storm night of 15th; lightning burned barn on fair ground; fine stallion and a jack killed.

BONAPARTE—*Hon. B. R. Vale.* A pleasant and profitable month, but too dry for best results; no excessive heat or severe storms.

BRITT—*Geo. P. Hardwick.* A wet harvest month; hay, oats, barley, and rye damaged to some extent.

CLINTON—*Luke Roberts.* Mimimum and maximum and mean temperatures were normal; the warmest day (mean) was 84.5°, and the coldest, 63.5°; rainfall, 6.32 inches, or 2.38 above normal. Velocity of wind, 35 miles an hour on the 5th. It was a fine month.

GREENFIELD—*J. G. Culver.* Plenty of rain; hay mostly secured without damage; corn and late potatoes better than average.

ESTHERVILLE—*Leslie Littell.* During thunderstorm on 14th lightning struck a barn in southeast part of town and killed two horses. On the same day, in Jack Creek township a barn was struck and burned with contents, including 3 calves and 40 tons of hay.

GRINNELL—*A. O. Price.* Three inches more rain this month than in July last year; corn much above the average. The month goes into history as most favorable for crops, while the temperature was enjoyable.

KEOSAUQUA—*J. H. Landis.* An ideal month, with no extremes; first half was dry enough for harvest and last half brought good rains in time for corn and pastures.

LOGAN—*Mrs. M B. Stern.* June was very dry, but the rains in July relieved the crop situation and corn is now assured.

NORTHWOOD—*Dr J. H. Davey.* On July 14th a hailstorm damaged corn and threshed grain in fields in a narrow strip.

OSCEOLA—*A. W. Lewis.* On the 23d at 4 P. M., a girl aged 15 years, residing north of town, was struck by lightning and instantly killed.

OVID—*H. C. Miller.* Showers and heavy dews interfered with haymaking; less than the usual amount of timothy seed produced this season; corn very promising.

RIDGEWAY—*Arthur Betts.* Thunderstorms on 13 dates; month was delightful; gale on 28th was severe, breaking down large trees.

WASHTA—*H. L. Felter.* Greatest precipitation this month that we have had for years in any single month.

ERRATA IN MAY REVIEW.

ALGONA—Minimum temperature recorded 41° on the 2d, on page 10, should have been 36° on the 3d.

FAYETTE—Total rainfall recorded 1.95 inches on pages 10 and 14, should have been 2.06 inches.

GRAND MEADOW—Minimum temperature recorded 34° on the 4th, on page 10, should have been 32° on the 3d.

GREENE—Minimum temperature recorded 31° on the 5th, on page 10, should have been 28° on the 3d.

MONTICELLO—Mean temperature recorded 61.5° on page 10, should have been 61.4°.

WEBSTER CITY—Temperature data for Webster City for May should have been omitted.

ERRATA IN JUNE REVIEW.

HEDRICK—Mean temperature recorded 68.8° on page 11, should have been 70.5°.

KEOSAUQUA—Total precipitation recorded 2.30 inches on pages 11 and 14, should have been 3.30 inches.

OSKALOOSA—Minimum temperature recorded 49° on the 2d, and 3d, on page 11, should have been 44° on the 11th.

WAPELLO—Maximum temperature recorded 94° on the 7th, on page 11, should have been 97° on the 28th.

BELATED REPORTS FOR JUNE.

CARSON—June. Total precipitation, 1.57 inches. Greatest in 24 hours, .77 inch on the 12th. Number of rainy days, 3.

EMMETSBURG—Total precipitation, 6.73 inches; greatest in 24 hours, 2.91 inches on the 16th, number of rainy days, 6.

BURLINGTON [j]—Mean temperature 71 3°.

STORM LAKE—Mean temperature, 67 1°; highest 92° on the 26th; lowest, 44° on the 2d, 3d and 8th; greatest daily range, 32°; total precipitation, 6.79 inches; greatest in 24 hours, 3.01 inches on the 16th; prevailing direction, southeast; number of clear days 20, partly cloudy 9, cloudy 1, rainy 7.

MONTHLY REVIEW OF THE

CLIMATOLOGICAL DATA FOR JULY, 1900.

NORTHERN SECTION.

ATIONS.	COUNTIES.	Elevation, feet.	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIP., INCHES.			Number rainy days	SKY.			Prevailing direction of wind.	Dates of thunder-storms.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours		Number clear days.	Number partly cloudy days.	Number cloudy days.		
ta*	Kossuth	1,500	7	73.2	-0.4	92	3	58	17, 23		5 84	+3 61	1.45	11	10	17	4	SE	14, 28.
	Buena Vista	1,519	8	70.8	-1.9	92	13	50	8	32	11.11	+7.51	4.07	10	18	9	4	S	2,3,6,7,9,13,14,15,19,23,23
	Buena Vista										10.95		4.75	10					
(near)											5.44		1.80	16	9	2	20	SW	
	Hancock	1,230		71.0		95	4	45	12	38	4.23	+1.47	.90	14	13	14	4	S	
	Floyd	1,012	8	71.6	-1.8	92	4	50	9	35	4.20		1.50	7	16	9	6	SW	3, 4, 5, 6, 7, 12, 14, 15,
es City	Cerro Gordo	984		72 8		95	31	45	12	36	3 36	- .54	.90	11	18	0	4	SW	19, 22, 28, 30, 31.
Lake	Howard	1,280	27	71.1	+0.2	92	3, 4	44	12	36	4.48	+2.09		12					
o	Winneshiek	900	6	71.8	+1.5	94	4	46	12	36	6.72		3 30	11	8	20	3	S, SW	
rah (e)	Wright			71.2		92	4	47	12	38	8.60	+4.49	2.23	14	14	15	2	SE	2, 3, 6, 7, 10, 12, 14, 19, 28
	Clayton		18	73 0	-0.7	95	4	48	12	39	6.71		1.78	12	16	9	6	SW	2, 3, 19.
der	Emmet			69.9		91	4, 13	45	12	34	8.57		2 46	12	13	14	4	SE	6, 14, 23.
erville	Pocahontas	1,237		71.6		95	3	48	8	31	6 26		2.70	15	18	5	8	W, SW	
la	Winnebago	1,220		70.6		91	3, 4	49	12	33	8 24	+4.60	2.20	13	7	19	5	SW	
st City	Clayton		8	68.9	-1.2	88	3, 4, 14	51	17, 27		5.06		1.25	14	13	12	6	NW	
d Meadow ‡	Butler	943		72.6		95	3, 4	47	12	37	7.96	+3.93	1.78	9	11	15	5	SW	
ne	Franklin	1,240	9	73.0	+1.3	94	3	50	12	36	6 59	+3 89	2.90	10					
pton	Fayette		6								4 04		2 34	6	10	14	7	E. S	
keye	Emmet																		
rig	Humboldt	1,082	6	72.8		94	3	51	9, 12	34	6.52	+3.38	1 71	14	19	5	7	SE	
nboldt	Allamakee			72.3		94	4	49	12	36	5.28		.90	11	5	23	3		
sing(a)	Lyon			71.6		96	31	37	22	38	11.63		3.20	8	15	10	6	SE	
chwood	Plymouth	1,221		72.1		96	3	52	8,16,17,20,21	34	12 00		5.39	13	20	6	5	S	2, 3.
Mars	Chickasaw	1,166		72.4		91	4	51	21	26	3 77		.43	13	10	18	3	NW	
Hampton	Worth	1,210		70 3		90	4	48	12	32	7.02		1 91	14	18	7	6	SW	
thwood	Mitchell	1,178	8	70.6	+0.7	94	4	44	12	36	4.64	+1.24	.96	13	9	14	8	S	3, 14, 15, 19, 23, 28, 31.
ge	Pocahontas			73 2		95	3	49	9, 12	34	8.58		2.94	9	23	4	4	S	
ver (b)	O'Brien			73.8		93	1, 31	49	8	31	18 45		13 00	10	12	2	17	SE	
mghar	Winneshiek			72.6		94	3, 4	53	17, 21, 26	34	3.71		1.07	14	13	13	5	S, W	3, 4, 6, 7, 9, 10, 12, 14,
geway ‡	Palo Alto			72.0		93	4	50	8, 11	32	8.82		2.90	11	18	4	9	SW	15, 19, 23, 28, 31.
hven ‡	O'Brien	1,406		71.0		94	13	50	8	38	16.50		6.40	8	19	4	8	S	
ldon	Osceola	1,506	6	71 0	+0.7	96	13	47	8	37	7.91	+4.91	3.06	13	15	11	5	S	
ley	Sioux			73.2		96	31	51	17	33	12.31		6.53	12	23	4	5	S	2, 3, 5, 6, 13, 14, 15, 16.
ux Center	Buena Vista		10	71.1		90	3	52	8	25	9.16	+5 37	3 74	10	20	8	3	SW	2, 3, 6, 7, 9, 14, 15, 19.
rm Lake	Cherokee										8.21		4.60	10	20	7	4	S	
shta	Bremer	942		72.2		92	4	62	12	31	5 61		.76	13	11	16	4	SE, S	6, 7, 10, 14, 24.
verly	Palo Alto		6	71.6	-0.6	94	13	57	16, 17		5 62	+2.66	2.05	13	12	13	6	S	
st Bend*	Fayette	1,105									5.90		2 08	4	15	0	16	S	
st Union																			
Average				71.7	-0.1	93.3		48.8		34.3	7 60	+3.47		11	14	11	6	W	

CENTRAL SECTION.

mana	Iowa		23	73.6	-0.1	93	3,4,14	51	12	31	5.49	+1.38	1.34	9	17	13	1	S	2, 6, 10, 16, 19, 28.
mes	Story	936	19	73 0	-2.0	95	3	51	8, 21	40	9.14	+4.60	2.47	9	1	11	19		
axter	Jasper			73.2		94	31	54	17, 20	34	5.39		1.10	10	10	18	3	SE	
elle Plaine (b)	Benton	840	9	7.41	+1.3	93	3, 14	50	11	35	6.65	+3.36	2.50	9	10	18	3	SE	
uckingham‡	Iowa										6.63		1.39	10	14	16	1		
edar Rapids	Linn	744	17	7.42	-0.4	96	3, 4	53	12	31	3.74	.01	1 05	11	17	9	5	SW	
linton	Clinton	609	8	73.3	-0.8	98	4	48	21	36	6.32	+2.98	1.53	10	14	13	4	S	
oon Rapids (a)	Carroll			73.4		94	3	53	8	31	5 61		1.75	11	18	9	4	N, S	9, 16, 23.
avenport	Scott	615	27	74.8	+0.	95	4	57	21	27	3.49	-0.13	1.08	9	17	5	9	SW	2, 6, 10, 13, 15, 16, 19, 23.
elaware	Delaware	1,048	8	70.4	+0.	90	31	51	12, 21, 22	32	8 06	+4 76	1.54	12	11	18	2	S	
enison ‡	Crawford	1,192	6	73.0	+0.2	97	3, 6	51	9	36	6.10	+2 35	1.32	12	20	8	3	S	7.
es Moines	Polk	867	21	74.2	-0.1	95	3	54	9	31	5.15	+1.63	1.37	12	11	15	5	SW	2, 5, 6, 7, 9, 10, 12, 14, 15, 16, 19, 20, 23, 24.
									9	37	5.84		2.78	10	18	9	4	SW	
e Soto	Dallas	866		75.0		95	6	54	21	28	8.00	+3.60	1.73	14	14	14	3	S	2,6,7,10,13,14,15,16,19,24
ubuque	Dubuque	655	26	72.8	-1.5	92	4	53	21	36	7.55		2.00	10				SW	
ort Dodge (b)	Webster			71.7		94	3	49	21	35	7.42	+4.00	2.86	12	13	13	5	SW	
alva	Ida		6	72.6	-0.9	93	1,3,13	51	8		5.46		.97	11	23	8	0	S	
ilman	Marshall	1,035								28	5 74		2.26	10	13	10	8	SE	19.
rinnell [near]	Poweshiek			72.9		93	6	55	12, 17, 21	34	7.69	+3.96	2.31	13	20	9	2	S	5, 10.
rundy Center	Grundy	966	8	71.5	-0.3	91	3, 31	51	12		3.14		.70	9	20	7	4	W	
uthrie Center (c)	Guthrie	1,269		73.7		100	21			37	8.33		3 55	12	13	14	4	S	6,7,10,15,16,19,20,23,24,28
arlan	Shelby			73.2		98	6	50	21	31	11.02	+6.73	4.25	10	17	11	3	S, SW	6.
ndependence	Buchanan	921	37	71.1	-0.1	91	4	50	12	35	5.25	+1.12	2.68	9	16	13	2	S, SW	5.
owa City	Johnson	644	9	74.2	+0.3	96	14	61	12	37	5.30	+2.48	.92	12	15	9	7	S	6.
owa Falls	Hardin		6	72.0	-0.3	95	3	48	12		2 99		.81	12					
e Claire	Scott									38	7.39	+2.53	2.20	8	20	5	6	S	
ogan	Harrison	928	34	75.8	+1 0	102	6	51	17	38	8.04	+4.85	2.65	10	21	4	6	SW	
aquoketa	Jackson		6	71.2	-4 5	93	4	40	21	37	7.14	+2.80	2.24	9	17	19	4	S	
arshalltown	Marshall	898	7	73.8	+1.4	95	6	52	12	38	6.49	+2.35	1.95	8	19	11	1	SW	
onticello	Jones	890	45	72.1	-0.8	95	4	48	24	35	6.05		2.39	13	13	12	6	S	
t. Vernon (Hub.)	Linn			72.5		93	31	50	12	30	4.98	+1.79	1.28	8	14	16	1	S, SW	
ewton	Jasper	958	12	73.4	-1.4	93	6	54	12, 18	39	6.67		2.09	11	21	1	9		
delbolt	Sac			74.6		98	3	51	8, 17, 21	33	8.03		2.27	11	20	3	8	SE	15, 16, 19, 20, 23.
gden	Boone	1,109		73.3		94	3, 4	51	8	30	10.34		4.42	9	23	5	3	SE	
nawa	Monona			74.5		97	3	54	17	32	5.65		1.60	11	19	3	9		
ockwell City	Calhoun	1,219		72.6		95	4	52	8	30	5.63	+1.90	1 84	13	23	4	4	SW	
ac City	Sac	900	20	72.3	-3.8	94	3	52	8	30	8.68		3.00	6	19	8	4	S	
cranton	Greene			73.8		96	3	54	8, 21	30	8.72	+5.28	3.74	11	21	5	5	S	
oux City	Woodbury	1,122	10	73.6	+0.	97	31	55	17	33	6 10	+3.51	1.73	7	26	2	3	SW	
nton * (a)	Benton	800	9	72.4	-0.8	91	3	56	17		7.92	+3.94	1.65	12	16	10	5	S	
aterloo	Black Hawk	862	20	72.2	-5 81	93	4	50	12	35	3.97		1.50	7	16	10	5	S	
ilton Junction	Muscatine			73.9		96	14	47	12	36	7 30		1.96	12	15	11	5	SW	2,3,5,6,7,10,14,15,16,23.
hitten	Hardin			71.4		93	3, 4, 31	51	30	38									
Average				73.1	-0.8	94.6		51.1		33.9	6.54	+3.00		10	16	10	5	S	

CLIMATOLOGICAL DATA FOR JULY, 1900—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., INCHES.			Number rainy days.	SKY.			Prevailing direction of wind.	Dates of thunderstorms.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.		Number clear days.	Number partly cloudy days.	Number cloudy days.		
Afton	Union	....	....	75.0	...	98	3	50	8	42	5.67	.. ..	3.53	5	20	8	3	SW	
Albia	Monroe	945		72.8		93	4, 19	51	23	38	5.12	..	1.55	8	14	8	9	S	2, 4, 19, 21.
Atlantic	Cass		8	74.8	+2.0	97	6	50	9, 21	41	8.20	+4.6	5.21	7	11	17	3	S	10, 15, 24.
Batavia	Jefferson	646		..	.....	.. ....					3.69	.....	2.00	3					
Bedford (*e*)	Taylor			76.5	.....	98	3	51	18	44	3.93	.....	2.17	6	8	22	1	SW	
Belknap	Davis	857		74.5		93	3	55	9, 21	31	2.84	.....	1.24	6	24	3	4	S	
Bonaparte	Van Buren		8	75.0	-0.9	96	31	53	9	41	1.95	-1.79	1.25	5	...				
Buckingham	Tama	526		.....		.....		.....	... ...	.....	6.63	.. .	1.39	10	14	16	1	.....	
Burlington (*a*)	Des Moines	....	..	75.7	....	97	4	53	9, 21, 27	33	2.87	.. ..	2.03	4	....	...	..	... .	
Bussey	Marion	....		..	....	..	.....	.....	.....	....	4.30	.....	1.58	8	..	...	...	.....	
Carson	Pot'wat'mie		..	.....	...		.....	.....	.....	.....	6.07	.....	4.98	5	...	...	...	.....	
Centerville	Appanoose	1,013	6	.....	...	92	2	56	25	....	1.97	-3.54	1.00	4	...	...		.....	
Chariton	Lucas	1,030		74.6		94	3, 6	52	9	35	6.29	.....	2.75	15	13	14	4	S	12, 19, 23.
Clarinda	Page	1,069	9	76.4	+0.6	98	6	51	9	44	3.46	- .87	2.50	5	17	10	4	S	
College Spr'gs	Page	....	8	76.4	+2.0	97	6	53	30	39	4.62	- .72	2.60	7	22	9	0	SW	
Corning	Adams	1,127	7	75.8	+2.3	96	3, 6, 13	50	9	40	5.85	+1.82	4.33	5	20	6	5	SW	16.
Council Bluffs	Pot'wat'mie	989	....	76.3	....	101	6	55	16	40	6.47	.....	1.95	11	24	4	3	S	
Crawfordsville	Washington	.....	...	....	....	..	.....	.....	.....	.....	3.15	.....	1.04	9	22	5	4	NW	2, 10.
Cumberland	Cass	.....		....	.....	...	.....	.....	.....	....	4.33	.. ..	2.50	8	18	9	4	SW	
Danville	Des Moines	715	....		.....	.....	.....	.....	.....	.....	1.85	..	1.50	3	20	7	4	.....	
Eldon	Wapello	....	..	75.7	...	96	3, 4, 31	51	21	29	2.17	.....	.91	7	23	4	4	S	19.
Emerson	Mills	.....		.....	.....	...	.....	.....	.....	.....	3.99	.....	2.75	3	26	1	4	W	
Fairfield‡ (*c*)	Jefferson	767	13	74.2	-0.6	94	4, 19	51	21	39	4.35	+1.07	1.60	10	.	.	...	.....	
Ft. Madison	Lee	516	51	.....	.....	.....	.....	.....	.....	....	3.15	- .75	.70	9	9	14	8	SW	2, 7, 12, 15, 19, 23, 24.
Glenwood	Mills	979	29	75.1	+1.0	95	6	52	9	37	3.79	+ .05	2.25	4	9	19	3	SE	
Greenfield	Adair	....	8	75.0	+1.0	96	13	52	8	35	5.33	+ .89	3.31	12	17	9	5	.....	1, 2, 5, 6, 7, 10, 12, 15, 16, 19, 20, 22, 23, 24.
Hamburg	Fremont	912	..		.....	.....	.....	.....	.....	.....	3.09	....	1.89	4	16	7	8	SE, SW	
Hedrick	Keokuk	....	...	73.9	.....	94	14	51	21	35	4.29	...	1.62	9	20	6	5	S	
Hopeville	Clarke	.. ..	....	74.5	...	95	3	56	9	32	7.29	.....	2.44	5	10	17	4	S	
Indianola (*a*)	Warren	....	....	74.8	....	94	3, 6	54	9	35	4.45	.....	1.83	9	15	9	7	SW	2, 5, 6, 9.
Keokuk	Lee	618	28	76.4	-1.0	94	3	57	21	28	2.20	-2.20	.89	9	15	12	4	SW	
Kiosauqua	Van Buren	.. .	7	75.0	-0.4	94	3	54	21	31	3.19	- .63	1.70	6	....	....	...	....	
Lacona	Warren	....	....	.....	.....	.....	.....	.....	.....	.....	4.39	..	1.25	8	13	12	6	....	
Lenox	Taylor	....	..	75.0	.....	94	3, 13	54	9	34	6.34	.....	3.45	5	26	4	1	S	
Melrose	Monroe	850	...	.....	.....	.....	.....	.....	.....	....	3.25	.....	1.00	6	20	11	0	S	
Mooar	Lee	....	..	72.2	.....	96	14	49	23	37	1.80	...	.94	4	20	6	5	SW	
Mt. Ayr	Ringgold	1,236	6	75.9	.....	97	3, 13	55	18	34	4.79	- .04	2.69	8	10	17	4	S	
Mt. Pleasant (*h*)	Henry	725		75.4	+0.2	95	3,4,5,14	51	18	33	1.94	.....	1.32	7	16	13	2	SW	
Murray	Clarke	1,183		.....		....	.. ..	.....	...		6.77	.....	2.70	4	25	6	0	.....	
Omaha (Neb.)	Douglas	1,118	25	75.8	-0.5	97	6	56	17, 20	27	6.86	+2.11	3.37	11	14	13	4	SE	
Osceola‡	Clarke	1,223		75.4	....	95	3, 10	54	18	39	6.04	....	2.00	6	10	13	8	S	23.
Oskaloosa	Mahaska	850	16	73.4	-1.3	93	14	50	9	35	4.41	+ .69	1.06	8	20	3	8	SW	
Ottumwa	Wapello	630	8	76.7	+1.1	93	2,3,4,6,14,31	58	11, 21, 28	35	3.35	- .80	1.95	3	13	8	10	SE	
Ovid	Wayne	....	6	73.8	-1.5	92	6, 31	52	9	35	3.47	- .05	.78	9	18	1	12	SW	2, 5, 6, 12, 15, 19, 23, 28.
Pacific Junction	Mills	960		74.2	.....	95	6	51	9	37	3.81	....	1.76	6	12	19	0	S	
Pella (*e*)	Marion	....	..	79.0	.....	95	3	64	21, 27	25	4.37	.....	1.80	5	....	..	....	SW	
Red Oak	Montgomery	1,033	....	75.6	.....	98	10	52	18	43	4.57	.....	2.60	5	16	9	6	S	
Sigourney	Keokuk	....	...	76.0	.....	97	3	51	21	39	5.01	...	1.41	7	15	16	0	NW	2.
Stuart	Guthrie	.....	..	75.8	. ...	98	31	52	8	36	3.15	.....	2.50	5	17	5	9	SW	
Thurman	Fremont	.....	..	75.7	.....	95	3, 6	52	9	37	4.96	....	2.56	10	16	9	6	SW	
Villisca	Montgomery	1,058	6	75.6	+1.6	101	14	52	21, 25	43	5.45	+ .90	3.55	3	23	4	4	S, SW	15, 19, 23, 28.
Wapello (*b*)	Louisa	578	....	77.8	....	99	6	54	9, 21	35	2.81	....	1.00	8	...	...	..	SE	
Washington	Washington	....	9	73.2	-2.4	93	3, 4, 14,31	50	21	33	2.65	-1.29	1.00	7	....	....	...	SW	
Winterset	Madison	..	8	74.8	+1.4	96	6	52	9, 21	31	7.24	+1.93	2.40	6	...	...	....	....	
Average		.....	...	75.3	+0.3	95.7	.....	52.9	.....	35.6	4.30	+ .66	.....	7	17	10	4	SW	
Av. for the state		...	....	73.4	-0.2	94.5	....	50.9	.....	31.6	6.15	+2.38	...	9	16	10	5	S	

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JULY, 1900.

IONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean.
	Max.	92	93	98	97	89	97	88	83	94	94	87	86	98	95	89	80	77	86	88	77	86	92	89	81	83	87	88	89	87	89	93	88 8
····	Min.	67	69	71	70	70	70	70	50	52	53	63	56	62	69	71	64	57	53	62	58	53	57	65	65	54	57	59	57	59	57	60	61 3
	Max.	82	92	92	93	89	92	89	80	86	88	83	75	91	92	89	82	73	83	93	75	79	87	89	76	86	83	85	87	83	85	90	85.5
....	Min.	63	65	70	71	72	70	72	57	52	54	53	56	58	62	65	69	57	54	55	88	53	58	51	65	57	58	57	58	61	58	58	60.2
	Max.	90	86	91	89	84	88	81	78	84	89	74	79	92	88	67	61	58	53	54	80	71	74	80	86	74	79	82	86	84	84	84	81.7
....	Min.	66	68	68	72	68	60	62	50	53	64	57	51	64	61	61	58	53	54	64	51	52	58	64	61	59	58	62	64	54	56	60	59.8
	Max.	86	92	93	93	88	92	87	79	83	85	80	82	88	93	90	78	73	80	87	72	80	86	88	78	85	81	83	86	82	86	91	84 8
....	Min.	63	71	70	73	74	68	69	57	54	65	59	51	63	71	74	69	58	53	60	60	53	57	60	67	61	56	57	60	62	56	68	63.4
	Max.	84	89	95	91	87	94	84	79	82	91	85	79	92	89	85	71	76	81	80	83	84	89	88	82	84	84	85	81	85	90	94	85.3
....	Min.	65	65	70	68	77	68	64	51	54	59	60	54	63	71	70	64	56	53	56	52	51	57	57	64	61	56	60	61	61	56	54	60.6
	Max.	94	91	92	93	87	97	88	82	91	95	86	91	96	73	73	62	54	56	63	57	50	59	67	66	53	57	62	64	87	87	92	87.2
....	Min.	65	65	70	68	77	68	64	51	54	59	60	54	63	71	70	64	56	53	56	52	51	57	57	64	61	56	60	61	64	58	52	62.5
	Max.	94	91	92	93	87	97	88	82	91	95	86	91	96	73	73	62	54	56	63	57	50	59	67	66	53	57	62	64	87	87	92	85.2
c...	Min.	68	69	80	73	71	69	67	53	50	67	66	61	67	73	87	77	74	79	88	77	81	87	85	82	88	85	84	87	60	57	62	63	61.1
	Max	81	90	93	93	85	92	89	79	88	90	78	78	90	92	66	55	54	60	56	54	58	65	63	58	57	58	61	92	90	88	93	96	90.8
....	Min.	66	66	73	72	68	65	55	55	62	60	51	62	71	62	66	55	54	60	56	76	87	93	93	79	89	94	92	90	88	93	96	62.2
	Max.	90	94	98	94	97	95	97	85	94	96	92	92	98	63	65	70	65	57	51	63	68	52	55	60	63	56	63	54	52	58	53	52	85.0
1...	Min.	64	65	70	70	71	72	70	54	70	75	65	63	90	92	88	84	70	80	88	75	81	85	89	74	83	85	86	87	82	85	90	85	61 0
	Max.	80	92	93	91	88	92	89	80	86	90	85	75	90	71	72	70	69	57	59	61	55	60	65	71	62	60	59	59	64	60	63	61	86.0
p....	Min.	65	68	72	73	73	72	73	60	55	64	59	60	63	93	89	8·	90	90	88	72	75	85	88	78	85	86	84	85	85	86	91	86	62.2
	Max.	85	91	93	92	90	89	..	..	83	83	85	83	65	72	70	65	70	55	54	59	56	56	58	60	65	58	87	85	86	89	85	90	96	87.6
lain.	Min.	60	68	70	72	70	69	..	..	66	65	50	65	72	70	65	70	55	54	59	56	78	84	91	93	75	87	64	60	56	59	67	58	60	62 5
	Max	80	93	95	94	91	94	92	82	88	88	61	58	62	69	50	72	62	54	57	62	49	56	65	80	80	84	85	85	80	86	91	84 3
arte.	Min.	63	68	72	72	72	72	74	58	53	88	76	83	90	91	74	66	80	81	76	77	80	86	81	63	58	52	60	63	52	52	58	58 6
	Max.	85	88	92	95	87	89	82	78	86	63	54	45	63	59	65	57	55	52	60	56	50	58	61	..	80	87	85	87	87	84	86	94	87.3
.....	Min.	62	69	65	72	71	60	61	52	49	80	87	86	84	89	94	92	88	87	76	90	79	82	90	..	70	60	60	53	58	60	61	64.1
	Max.	83	93	96	97	93	95	92	83	80	53	61	65	59	59	71	72	71	68	58	58	59	53	60	..	88	87	85	80	84	89	84	89	94	85.7
g'on	Min	64	73	70	75	74	75	72	59	84	86	74	80	86	95	71	78	72	79	88	73	82	88	88	62	66	62	57	58	62	64	58	66	62.7
	Max.	87	92	96	96	90	92	86	80	58	64	59	53	65	65	71	68	57	55	60	60	55	58	62	66	..	..	..	..	..	..	..	....
Rap.	Min.	62	70	72	75	75	63	67	58	58	64	59	53	..	..	..	..	..	..	..	..	..	..	65	68	60	56	62	56	62	58	61	61	67.1
	Max.	..	..	..	..	..	..	..	..	81	71	80	58	73	80	73	71	59	66	65	61	63	65	68	79	85	83	85	85	84	89	90	85.6
ville	Min.	65	74	73	73	73	73	73	72	87	92	87	74	92	91	86	81	74	80	90	75	80	85	89	79	85	83	60	58	62	60	57	62	63.5
	Max.	80	93	94	92	86	94	91	81	57	52	63	57	64	68	72	67	67	55	64	58	56	60	65	79	65	58	60	83	85	81	88	89	82.7
on...	Min.	65	73	72	72	71	72	71	57	81	89	82	79	84	89	84	70	75	77	76	74	53	57	62	64	56	52	60	63	58	53	62	60.6
	Max.	84	88	90	92	86	90	84	79	55	50	64	56	46	64	70	67	63	53	51	63	54	80	86	92	85	82	90	91	90	91	89	92	96	90 3
as Cy	Min.	63	71	68	74	74	68	66	55	50	64	56	46	64	97	93	90	79	78	87	93	56	52	58	67	67	56	59	59	61	59	54	56	62 5
	Max.	93	94	97	91	87	98	94	65	56	51	67	65	63	65	68	72	62	56	54	64	56	64	81	88	78	84	87	87	90	88	84	90	95	85.3
da...	Min.	67	71	76	71	71	71	71	86	83	87	90	82	81	90	91	77	67	80	81	76	80	54	56	60	65	62	59	51	59	68	55	55	64	60 2
	Max.	85	89	94	94	88	92	86	64	54	54	64	55	45	60	65	63	58	52	54	80	63	90	73	80	88	89	80	86	61	66	82	87	59	86 4
Lake	Min.	60	79	66	64	71	66	96	89	80	86	84	79	83	82	96	95	81	72	80	90	54	54	48	54	61	66	61	58	49	51	62	53	58	60.2
	Max.	91	96	97	98	95	96	64	65	57	50	58	58	49	59	69	71	70	61	59	94	78	94	88	88	82	86	91	87	89	84	88	91	89 2
on....	Min	60	72	68	73	71	89	97	91	85	93	95	88	90	96	93	91	81	88	84	94	57	65	69	60	66	67	57	63	62	63	63	53	58	63.7
	Max.	84	93	95	92	89	70	71	68	57	54	67	67	61	67	69	72	65	55	82	79	72	81	87	85	79	83	84	87	85	89	87	92	84 1
ge Sps	Min.	67	72	72	71	70	85	93	79	77	85	88	83	78	93	91	83	72	72	82	62	57	54	59	65	64	57	59	64	66	59	57	66	62.6
	Max	88	88	94	83	75	72	69	65	53	54	64	60	58	65	71	68	60	55	86	86	76	81	87	85	86	85	88	86	87	85	88	91	87.5
Rap..	Min.	67	72	69	75	92	86	96	90	82	90	95	88	90	96	92	87	78	75	56	54	65	65	54	60	67	65	67	58	65	63	61	53	61	64.0
	Max	90	92	96	92	86	96	90	82	90	95	88	90	96	65	70	73	64	78	85	84	77	83	91	78	82	86	91	88	81	88	90	94	87 9
ing....	Min.	68	74	73	74	92	92	101	87	83	92	91	88	92	97	93	86	69	58	62	57	62	63	66	65	60	63	66	69	58	85	82	87	86	82 8
	Max.	95	93	99	74	72	75	71	59	58	69	65	63	66	70	73	65	69	73	79	77	72	78	84	82	83	83	81	82	85	60	55	51	61	59.4
tluffs	Min.	65	68	92	92	87	91	84	80	83	88	74	80	85	91	67	86	73	69	51	61	54	52	57	62	63	56	49	57	82	86	82	86	93	84.7
	Max.	85	87	92	92	72	87	66	63	57	49	65	55	44	63	65	90	83	68	75	87	73	80	88	90	74	86	80	82	59	64	68	62	66	64.9
co.....	Min.	62	71	69	71	72	92	93	88	80	84	84	80	80	84	93	73	68	62	..	..	..	..	..	67	67	64	61	59	87	87	81	88	88	83.5
	Max.	85	92	94	95	92	76	70	71	59	57	65	63	59	82	74	73	..	..	..	..	71	79	84	80	81	82	81	87	87	84	85	88	62	60.2
sup'rt.	Min.	61	68	71	75	76	70	91	85	79	80	88	75	82	83	88	..	..	..	..	..	51	65	55	62	63	55	77	48	54	56	58	52	62	60.2
	Max.	77	85	90	94	87	87	90	85	79	52	65	56	46	61	68	68	85	78	69	74	82	82	81	82	76	81	52	57	80	84	85	90	80.8
rah....	Min.	62	71	69	72	73	73	68	64	57	52	65	56	46	80	89	85	78	69	74	82	68	55	51	60	63	59	52	57	59	60	53	63	60	60.0
	Max.	85	83	89	89	86	87	80	76	58	52	63	57	51	59	71	68	66	54	52	57	55	75	80	86	82	80	84	86	85	82	86	90	84.8
ware..	Min.	61	69	69	78	73	63	63	82	79	87	90	82	86	93	92	78	66	75	81	81	55	55	59	66	64	54	58	65	66	54	53	60	61.2
	Max.	94	90	97	91	87	97	82	64	54	51	65	55	58	69	71	65	61	53	57	62	83	75	79	85	83	81	87	81	85	86	88	91	84 2
ison....	Min.	68	69	66	60	70	70	70	62	54	51	65	55	58	69	71	65	61	53	57	62	83	75	79	85	83	81	87	81	85	86	88	92	85.2
	Max.	83	88	95	91	86	93	87	80	85	87	78	74	91	89	83	77	74	80	58	63	58	56	62	66	65	62	64	64	62	65	63	58	65	64 2
Moines	Min.	65	73	74	75	72	75	95	86	79	91	89	79	76	92	93	90	74	72	81	82	83	80	87	80	80	84	84	86	86	84	88	92	85.2
	Max.	83	91	94	94	87	95	75	71	58	54	69	60	61	65	75	70	62	59	55	61	58	55	60	68	65	60	61	63	64	63	58	60	64 8
3ete....	Min.	69	76	76	77	77	75	89	82	77	80	82	87	77	89	89	81	68	54	51	62	54	50	57	63	63	57	52	59	63	57	50	63	60	82 5
	Max.	80	88	92	90	85	89	82	77	80	82	87	77	89	67	65	60	54	76	72	76	83	72	77	84	84	79	83	78	80	86	81	86	90	82.5
78.....	Min.	63	70	66	72	72	72	67	64	53	50	57	63	47	63	67	65	60	54	51	62	54	50	57	63	63	57	52	59	63	57	50	63	68	63.0
	Max.	85	90	91	92	89	89	84	78	83	82	75	79	76	90	88	67	57	57	61	58	53	58	63	66	63	54	60	88	88	86	90	96	88.0
buque..	Min.	62	68	72	76	75	67	67	59	56	66	61	54	57	71	70	85	80	80	93	77	82	89	94	75	87	80	88	57	59	65	57	57	63 4
	Max	81	95	96	96	91	95	92	85	89	90	87	83	94	93	91	89	72	60	54	58	62	51	58	62	68	64	61	57	61	59	57	91	94	86.1
on.....	Min.	65	73	71	63	74	75	76	60	52	62	61	59	62	72	74	89	75	75	81	86	75	83	87	87	87	87	87	84	85	89	57	60	52	61	59.9
	Max.	90	85	94	95	89	90	87	83	85	90	76	84	85	94	89	65	65	55	53	58	55	50	53	59	65	58	87	85	85	82	81	89	89	91.9
ader ...	Min.	63	70	70	76	73	65	66	59	50	63	56	48	60	62	68	68	78	80	73	76	80	86	76	79	87	85	50	60	61	52	57	63	60	57.9
	Max.	85	87	90	91	85	87	82	77	80	88	74	79	91	82	62	54	53	55	58	54	53	60	61	52	57	63	85	83	87	83	87	91	86.5
herville	Min.	55	55	63	70	68	61	60	53	50	63	54	45	63	61	62	89	77	89	94	77	82	86	91	78	85	58	54	57	65	57	61	61.8
	Max.	84	92	92	94	89	92	91	80	86	87	87	94	..	..	..	..	70	61	53	55	64	51	57	62	68	62	87	86	84	87	89	94	84.8
irfield...	Min.	62	70	69	70	71	71	72	57	54	60	60	60	..	..	..	73	62	77	80	80	78	80	87	86	88	84	61	63	60	62	57	58	63	58.4
	Max.	85	89	95	93	87	91	83	80	86	90	87	83	85	67	63	58	53	51	60	61	54	50	53	56	60	61	81	83	84	83	79	87	90	81.8
nda.....	Min.	53	70	70	65	63	60	51	48	52	56	55	58	80	89	85	74	69	73	78	71	75	78	84	80	81	60	55	59	59	55	54	61	59 3
	Max.	79	87	91	91	85	87	84	78	81	90	81	55	49	62	65	64	59	53	53	61	55	52	57	65	63	63	84	84	87	85	85	88	92	83.8
rest City	Min.	52	67	66	72	71	61	63	52	54	64	55	76	80	92	90	78	68	76	80	81	75	80	86	78	83	64	56	55	61	64	56	52	59	59 6
	Max.	..	..	94	92	90	91	85	81	81	89	56	50	64	67	62	60	55	52	63	56	49	59	62	67	80	83	88	92	85	84	87	91	84.6
. Dodge..	Min.	..	..	65	70	70	65	63	54	50	65	91	78	82	93	91	73	67	78	82	75	77	81	88	65	63	58	60	63	65	55	56	63	60.6
	Max.	93	90	93	92	90	89	81	78	87	91	57	78	56	66	64	63	59	53	55	59	53	53	58	60	63	59	53	55	58	60	63	84	89	92	86.5
alva.....	Min	67	70	64	67	69	62	65	51	52	89	65	92	88	89	94	92	87	77	75	82	57	65	81	82	88	62	66	89	64	82	55	85	55	62	63.7
	Max.	91	91	94	91	88	95	89	82	56	52	67	64	62	73	73	62	70	60	78	56	57	84	53	83	90	56	84	87	88	84	86	90	93	85 6
enwood ..	Min.	69	66	76	74	72	72	72	64	56	52	85	89	82	84	88	92	84	70	78	56	84	62	51	56	89	62	63	86	59	54	56	57	54	90	91	87.1
	Max.	88	90	95	95	90	90	90	83	80	85	51	65	55	47	61	61	66	60	52	76	80	86	58	88	56	84	64	83	85	61	66	65	70	65	62.2
reene.....	Min.	60	70	68	73	72	68	65	54	51	90	89	84	83	95	96	89	89	80	76	55	61	63	58	60	84	59	60	61	63	82	66	82	85	90	83.6
	Max.	89	89	93	92	93	93	93	68	65	54	55	68	62	54	66	70	87	70	68	83	75	79	83	78	83	60	82	82	84	84	82	88	90	82 5
reenfield.	Min.	64	72	72	71	69	73	93	86	78	91	89	79	76	92	93	90	74	62	59	55	61	58	55	59	60	60	82	60	59	63	57	50	63	59.8
	Max	81	85	88	89	73	69	73	67	56	57	80	60	55	64	73	75	66	73	74	79	56	58	79	85	63	83	58	55	58	60	63	86	81	86	82.5
rin'l (nr.).	Min.	65	70	70	73	69	85	90	83	77	82	85	74	78	87	89	85	73	62	74	54	89	46	81	53	58	63	54	60	63	66	85	58	68	63.0
	Max.	81	86	91	90	85	90	71	62	64	52	52	56	61	94	89	70	68	81	84	89	83	55	100	46	85	60	84	54	91	50	86	55	59	59.5
rundy C'r	Min.	61	72	71	72	71	62	64	54	52	88	88	81	93	94	62	70	89	62	56	89	58	55	55	78	82	87	59	55	89	57	60	84	92	92	84.7
	Max.	89	94	94	93	91	89	79	64	64	64	56	56	68	55	62	90	62	68	77	53	67	74	54	58	63	84	54	85	60	84	53	56	64	91	61 2
uthrie C'r	Min.	56	73	79	73	71	65	52	64	82	90	81	58	80	50	62	89	67	84	59	55	63	82	54	86	89	56	65	78	64	81	54	85	57	60	85.8
	Max.	82	91	94	92	87	90	85	80	55	64	58	83	87	93	66	71	84	70	60	89	53	81	52	84	60	82	54	85	60	84	58	61	57	90	86 2
Hampton..	Min.	62	72	68	73	72	68	65	54	90	90	64	58	83	87	91	66	89	69	77	53	72	56	71	58	64	81	64	77	66	80	59	83	61	61	61.6
	Max	93	91	95	94	70	69	62	65	53	53	64	88	58	60	91	94	89	78	53	77	53	84	52	79	58	81	55	85	67	66	77	60	83	61	84.4
Harlan	Min.	67	67	73	70	69	62	65	53	53	64	88	81	62	83	91	94	89	89	72	56	71	58	64	81	57	62	86	67	64	81	63	64	64	64.6
	Max.	84	93	93	93	91	92	91	73	87	52	61	86	62	78	61	67	89	73	85	78	64	59	69	78	58	64	81	59	83	57	63	89	90	84.1
Hedrick ...	Min.	64	68	69	71	70	72	73	89	80	88	91	68	66	57	64	89	73	75	67	59	66	69	54	74	57	76	65	85	73	83	67	84	62	90	61.6
	Max.	84	91	95	92	87	94	89	68	92	64	93	65	66	69	71	70	61	59	58	71	58	64	81	55	52	75	80	58	54	64	81	63	88	57	61.1
Hopeville .	Min.	69	73	72	73	73	73	92	73	56	81	79	54	87	92	66	65	59	67	66	75	85	68	84	72	90	76	84	63	81	63	88	57	80	62	91	63	53	82	86	84.8
	Max.	85	89	94	91	89	91	83	65	54	51	66	66	56	65	66	69	54	74	57	76	58	62	76	58	54	68	62	71	67	82	62	82	84	87	90	94	84.4
Humboldt.	Min.	65	67	65	73	73	65	88	83	78	54	79	82	80	78	82	60	88	70	52	81	63	88	57	80	62	91	63	75	63	76	58	63	64	64	64.6
	Max.	84	86	90	91	86	88	83	65	56	54	87	62	58	50	60	92	76	84	67	78	54	74	57	76	61	63	81	65	84	61	87	62	90	62	64.1
In'pend'ce.	Min.	60	69	69	72	71	62	65	56	82	87	91	78	83	74	92	84	72	55	74	54	81	63	88	76	62	82	63	76	58	83	57	87	84	88	90	92	86.6
	Max.	83	89	94	92	88	94	73	68	56	54	87	71	65	62	65	90

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR JULY, 1900—CONTINUED.

STATIONS.		DATE.																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Lansing....	Max.	86	87	81	94	92	91	85	81	85	92	86	83	82	92	86	82	80	80	80	75	80	86	85	87	86	82	82	68	85	88	
	Min.	64	..	69	72	76	69	65	59	50	66	60	49	56	72	68	55	55	52	60	55	50	54	61	65	56	50	58	60	61	52	
Larchwood	Max.	93	89	90	90	91	87	78	88	85	88	84	86	96	92	86	82	75	81	83	85	89	91	76	79	86	88	85	80	86	90	
	Min.	64	67	64	52	57	53	51	56	55	54	52	54	61	54	51	54	50	57	60	58	56	37	65	58	58	59	73	63	54	56	
Le Mars....	Max.	92	89	96	91	85	88	80	81	88	90	79	89	94	86	70	66	75	82	74	76	84	89	79	81	84	87	85	81	85	89	
	Min.	69	69	64	58	60	62	62	52	54	61	55	67	70	64	62	52	52	57	58	52	52	63	62	61	57	60	65	61	54	57	
Lenox.....	Max	86	90	94	90	84	93	88	94	88	92	87	86	94	91	84	84	71	90	85	71	78	83	82	78	83	82	83	83	82	86	
	Min.	68	73	72	72	72	73	70	72	54	68	68	61	65	70	72	65	57	57	65	58	57	60	68	66	59	63	63	63	61	60	
Logan.....	Max	95	100	94	92	99	102	86	82	92	91	88	92	80	70	82	95	92	82	85	76	84	93	86	84	87	90	89	88	85	90	
	Min	60	66	67	69	73	76	66	63	64	63	56	73	68	58	51	68	70	51	62	54	58	71	64	58	62	65	59	60	54	60	
Maquoketa	Max.	85	91	92	93	88	91	85	79	80	81	74	80	79	91	90	79	78	77	84	72	78	85	86	79	84	80	81	85	81	86	
	Min	61	68	68	71	72	64	64	59	51	60	57	50	57	70	68	74	60	48	50	56	40	54	32	65	60	54	50	55	61	52	
Marsh'l't'n	Max.	83	91	94	94	87	95	86	80	84	87	81	80	91	94	88	78	74	82	84	77	82	88	88	84	88	84	87	89	86	91	
	Min.	64	71	72	74	73	63	64	57	54	62	59	52	63	71	70	64	56	54	60	57	53	59	63	64	56	55	59	61	59	54	
Monticello.	Max.	85	86	90	95	91	90	90	82	88	84	83	80	83	91	92	93	90	89	88	85	84	85	85	86	86	85	84	87	88	90	
	Min	54	58	60	60	63	63	53	51	50	51	50	50	53	60	63	65	51	50	63	65	63	62	68	48	50	52	52	58	50	60	
Mooar.....	Max.	85	80	94	86	88	88	78	92	90	88	90	82	94	96	84	93	72	80	79	81	75	70	81	76	80	73	78	77	75	74	
	Min.	63	68	77	61	64	63	65	74	63	61	83	63	58	63	54	68	65	58	53	50	52	58	49	68	63	58	61	60	53	53	
Mt. Ayr.	Max.	90	93	97	93	87	95	91	81	91	94	89	88	97	95	86	79	77	84	90	73	83	89	87	77	84	85	88	89	83	91	
	Min	67	74	72	71	71	71	73	56	57	66	69	61	63	69	72	66	56	55	63	59	57	59	67	67	59	63	61	61	61	60	
Mt. Ple's'nt	Max.	89	94	95	95	95	94	94	85	82	92	90	85	91	95	91	90	81	84	88	90	94	88	..	..	..	81	83	86	82	86	
	Min.	58	61	66	68	71	70	66	58	54	61	63	55	61	64	71	70	62	51	58	..	..	..	..	..	..	..	..	57	65	56	
Mt V.(Hub)	Max.	88	88	87	89	85	89	87	80	84	82	80	85	85	90	87	82	74	79	85	79	82	87	91	82	90	84	83	86	85	89	
	Min	58	67	66	70	69	60	64	55	54	60	59	50	60	69	71	66	55	54	57	57	51	57	61	64	59	54	53	57	60	57	
NewH'pton	Max.	83	86	90	91	87	88	83	83	80	86	80	78	83	88	84	71	74	76	76	76	77	83	81	82	82	80	81	85	81	88	
	Min.	62	70	68	73	..	68	67	65	70	62	65	66	63	66	66	63	53	52	61	53	51	55	62	63	59	65	58	64	56	64	
Newton...	Max.	81	89	92	92	81	93	88	80	84	88	80	79	91	92	87	74	73	80	85	73	80	85	85	80	85	83	85	86	83	88	
	Min	64	70	72	73	73	72	68	57	56	64	62	54	64	72	73	65	55	54	61	56	55	59	65	64	59	58	59	62	61	58	
Northwood	Max.	82	82	88	90	84	87	82	78	82	87	75	80	84	85	78	65	74	77	73	73	78	83	79	80	80	79	83	83	79	86	
	Min.	62	70	66	73	72	62	64	54	54	65	53	48	62	63	64	58	53	52	63	55	50	58	65	63	60	53	59	63	56	55	
Odebolt	Max.	96	92	98	96	90	95	82	81	91	94	86	87	94	91	76	66	81	85	83	80	86	94	89	83	87	93	90	88	88	90	
	Min.	67	70	61	73	70	72	63	51	52	67	55	60	66	68	65	60	51	54	63	56	51	58	67	63	56	57	64	65	55	54	
Ogden.....	Max.	90	91	94	94	87	93	83	78	85	90	76	81	93	93	88	71	76	79	80	75	80	85	80	82	86	83	85	85	85	88	
	Min	64	71	67	70	71	64	63	51	52	64	59	54	60	70	66	62	58	56	65	58	55	60	67	64	58	64	62	64	57	57	
Omaha, N.	Max.	90	91	97	89	89	97	86	81	90	90	85	87	94	91	82	68	76	82	80	76	81	88	79	80	84	87	85	79	86	87	
	Min.	71	68	76	75	72	70	70	61	64	67	66	64	74	74	65	60	56	60	62	56	60	65	66	65	61	67	69	68	62	66	
Onawa....	Max.	93	90	97	90	86	93	82	80	90	91	83	91	94	93	77	65	76	82	80	77	82	90	72	80	84	87	85	83	85	88	
	Min.	71	70	69	70	72	67	66	66	58	69	59	63	74	74	67	61	54	58	66	55	56	62	68	64	58	63	65	67	57	60	
Osage.	Max	85	89	91	94	88	92	85	79	84	89	78	80	86	89	83	69	74	79	77	72	79	85	81	81	83	77	81	83	78	84	
	Min.	62	69	66	74	72	64	65	54	50	62	54	44	60	64	64	58	51	50	60	52	50	56	60	61	51	50	59	61	56	56	
Oskaloosa..	Max.	80	90	91	91	86	91	88	78	85	86	80	78	91	93	87	81	71	81	90	76	79	85	82	77	84	80	85	87	81	86	
	Min.	64	72	72	73	73	73	70	58	50	65	60	56	64	72	74	67	57	55	60	60	53	59	62	65	60	59	59	60	62	54	
Ottumwa...	Max.	79	93	93	93	92	93	80	81	86	89	87	78	91	93	90	85	70	73	75	74	73	85	87	76	85	84	86	..	86	86	
	Min.	61	79	80	81	83	73	78	69	64	68	58	71	70	78	77	75	61	64	66	61	58	64	72	70	64	66	64	58	74	67	
Ovid	Max.	79	90	91	90	89	92	91	82	87	91	89	75	90	88	85	82	75	81	90	77	80	85	88	77	87	82	84	86	86	90	
	Min.	65	72	71	71	70	71	72	55	52	63	64	58	62	65	71	64	57	54	62	59	55	69	65	66	57	58	58	61	60	58	
Pacific Jct.	Max.	90	90	94	90	89	95	86	82	88	91	84	88	93	91	88	74	75	91	93	75	82	86	80	80	83	86	83	80	83	86	
	Min	70	66	75	73	70	68	69	55	51	67	62	62	72	73	61	61	55	57	68	56	58	59	68	65	55	58	61	61	55	54	
Pella.....	Max.	..	92	95	90	88	90	88	..	88	90	82	80	90	92	..	86	84	86	92	82	83	..	90	82	88	88	86	90	..	92	
	Min.	..	78	80	75	76	72	72	..	68	70	70	65	72	72	..	68	70	68	67	70	64	..	72	72	74	65	64	67	..	67	
Plover.....	Max.	89	91	95	93	90	90	80	88	90	91	88	87	94	91	..	..	77	83	77	76	81	88	81	80	79	85	86	86	88	88	
	Min.	60	72	66	77	70	65	60	50	49	64	65	49	60	69	64	60	54	52	53	52	57	55	60	62	58	56	60	64	55	63	
Primghar..	Max.	93	88	91	89	88	90	88	80	85	83	85	84	92	90	75	65	78	80	72	80	80	88	82	83	86	88	89	88	88	90	
	Min.	63	68	60	79	68	68	78	49	65	63	65	60	78	65	60	58	58	55	60	53	55	60	68	68	62	60	35	62	60	60	
Red Oak...	Max	90	95	95	95	89	96	95	82	92	98	94	90	95	91	86	78	82	83	88	82	83	88	81	82	90	92	86	89	90	92	
	Min.	68	66	78	72	68	72	72	56	56	55	62	66	63	71	72	63	56	52	64	58	56	61	63	67	57	62	65	60	58	60	
Ridgeway .	Max.	85	85	94	94	88	90	83	84	81	89	78	84	86	87	81	71	73	77	72	74	79	87	79	82	83	80	83	85	84	92	
	Min.	60	72	72	70	75	70	66	57	56	65	61	54	64	72	68	64	53	55	63	55	53	57	65	63	62	53	57	62	58	58	
Rockwell C	Max.	82	90	94	95	85	94	84	78	85	90	77	79	92	92	79	67	78	89	83	74	80	89	81	81	84	85	87	87	85	88	
	Min.	65	71	65	72	72	64	65	52	54	65	57	54	62	67	65	60	58	55	61	56	53	58	65	63	58	55	60	55	54	58	
Ruthven ..	Max.	81	86	91	93	86	87	86	78	88	85	78	91	90	86	87	80	75	81	74	78	81	84	87	79	83	86	81	87	85	83	
	Min.	54	65	70	63	69	60	56	50	65	53	50	65	63	64	65	60	55	58	54	55	57	59	62	62	59	60	66	54	59	57	
Sac City....	Max.	88	89	94	91	85	90	81	79	84	90	79	78	91	90	67	65	75	80	78	74	81	87	79	80	84	87	85	83	85	88	
	Min.	67	71	65	73	70	64	63	52	54	67	58	55	63	66	65	60	56	54	63	55	54	58	66	64	58	59	63	65	55	58	
Scranton ..	Max.	88	89	96	94	90	95	80	80	90	92	77	79	93	92	82	68	71	83	80	73	82	88	82	79	84	87	88	84	85	88	
	Min.	66	72	68	68	66	65	65	54	60	68	60	68	63	71	67	60	56	56	61	56	54	59	65	64	58	61	62	65	59	64	
Sheldon...	Max	93	91	91	90	84	90	85	77	84	84	74	92	94	85	68	65	82	80	70	74	80	84	72	78	82	85	83	82	82	87	
	Min.	68	69	65	70	65	65	60	50	53	62	52	54	60	63	62	57	53	52	60	52	53	62	62	59	59	59	65	64	55	57	
Sibley.	Max.	96	88	92	93	86	88	80	80	86	87	77	82	96	83	69	66	78	84	73	78	84	91	84	81	85	89	86	84	86	90	
	Min.	66	68	62	68	68	59	60	47	50	59	54	49	60	60	60	57	49	49	59	49	51	59	63	58	58	56	63	64	49	53	
Sigourney..	Max.	88	95	97	96	90	94	91	81	89	95	92	89	95	95	92	84	76	85	96	80	87	91	96	82	88	88	89	90	85	94	
	Min.	63	66	69	72	72	72	74	59	53	63	60	52	60	70	74	69	58	53	57	60	51	57	62	66	60	57	59	58	62	55	
Sioux Cen.	Max.	94	90	94	93	83	90	84	83	89	91	84	85	94	86	66	66	74	82	76	79	83	90	83	78	86	89	86	82	88	92	
	Min.	65	69	65	73	71	61	64	53	58	65	58	55	70	65	62	57	51	56	60	53	56	63	63	59	60	62	65	67	58	61	
Sioux City..	Max.	91	89	96	91	85	89	80	80	90	91	81	89	96	87	68	63	76	81	73	77	82	88	72	81	85	89	86	82	87	91	
	Min.	70	69	63	71	70	65	66	56	60	60	63	62	65	67	64	57	55	58	60	56	58	61	63	62	61	65	67	68	57	62	
Storm L...	Max.	86	85	90	88	82	86	79	77	81	88	73	77	88	85	72	65	72	79	72	73	78	84	75	78	82	85	82	82	82	85	
	Min.	67	70	65	74	68	64	63	52	57	66	56	55	65	62	62	57	54	56	62	54	57	62	63	61	60	63	65	62	58	63	
Stuart	Max	89	92	95	92	90	95	87	82	92	93	78	78	95	92	88	75	80	82	85	78	82	90	85	78	80	89	79	91	93	91	
	Min.	66	72	73	70	69	72	65	52	56	68	62	56	63	70	68	65	60	55	68	65	55	57	58	55	58	69	58	72	70	80	
Thurman..	Max.	91	92	95	91	92	95	88	86	89	92	88	88	93	90	87	78	71	84	83	79	83	89	85	83	85	88	86	84	85	88	
	Min.	69	68	75	74	71	73	71	56	52	68	65	63	73	73	72	62	56	57	66	58	53	59	70	65	58	61	67	68	60	67	
Villisca....	Max.	96	98	98	97	94	99	92	93	95	96	90	94	98	101	94	88	85	86	93	90	85	90	86	80	89	88	88	90	88	90	
	Min.	65	66	73	68	70	70	71	67	52	65	62	63	65	70	72	65	62	55	64	58	52	62	63	62	52	61	58	56	56	55	
Wapello ...	Max.	85	95	96	98	96	99	94	90	89	88	90	86	89	96	93	83	77	80	88	86	88	92	94	96	87	87	90	93	92	..	
	Min.	64	73	70	75	75	72	76	61	54	65	69	55	65	74	76	72	63	56	59	66	54	61	65	69	64	61	57	62	68	..	
Washingt'n	Max.	82	92	93	93	90	92	90	81	84	84	82	82	90	93	89	82	68	78	90	75	82	86	90	75	85	81	84	87	83	87	
	Min.	60	70	67	72	72	58	68	56	52	62	60	52	62	70	71	65	58	54	56	58	50	58	62	65	60	56	52	58	62	57	
Waterloo...	Max.	85	89	91	93	87	90	85	80	83	86	75	85	85	91	86	77	75	79	76	75	78	84	84	83	86	82	81	86	84	86	
	Min.	62	70	70	72	72	65	66	56	53	62	58	50	62	64	67	66	55	52	62	55	52	56	61	63	57	52	58	59	60	55	
Waverly...	Max.	84	84	91	92	86	90	83	76	83	86	74	79	83	89	86	72	73	78	74	79	78	83	80	82	83	80	82	85	82	86	
	Min.	63	71	71	74	74	70	66	57	54	64	59	52	65	69	69	65	55	53	63	56	54	58	63	64	58	54	60	62	60	55	
Whitten ...	Max.	83	88	93	93	82	90	80	78	83	84	74	80	90	90	85	72	73	79	79	74	79	85	84	80	84	84	85	86	83	87	
	Min.	63	72	70	72	72	63	63	54	53	60	58	52	62	68	68	53	54	52	62	55	52	58	64	62	57	55	54	58	58	51	
Wilton Jc..	Max.	89	94	94	95	92	93	89	81	81	85	82	83	88	96	93	85	77	80	89	76	82	88	94	84	85	83	83	88	81	84	
	Min.	57	71	67	72	71	66	68	56	49	60	58	47	61	71	73	70	60	55	56	61	53	61	60	67	58	56	53	58	66	52	
Winterset .	Max.	87	93	95	94	87	96	90	80	90	90	86	78	94	93	86	81	77	82	85	75	83	88	85	81	87	84	88	88	85	91	
	Min.	66	73	72	72	70	72	67	54	52	68	58	54	63	70	72	75	57	53	64	58	52	58	66	64	57	60	60	62	58	56	

DAILY AND MONTHLY PRECIPITATION FOR JULY, 1900.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
n	...	...	...	...	...	...	...	...	..	...	....	.61	....	..	T	3 53	....	....	....	.85	...	..	.44	.24	....	..	....	..	..	....	...	5.67
a	.04	1.55	...	....	..	....	....	..	...	..	..	.13	....	..	....	.70	.	....	1 11	..	...	....	1.12	.32	....	...	....	.15	....	....	..	5.12
na	....	.27	.33	..	T	.06	..	...	.03	..	.	..	..	....	....	3.05	..	..	.90	...	..	..	.23	..	..	.05	..	.95	....	....	....	5.84
....	....	.63	.83	....	.06	T	.02	....	.02	..	..	..	....	3.58	4.07	1 07	..	..	.35	...	....	...	.48	..	..	..	..	..	..	....	....	11.11
(near)	...	.50	.97	....	.06	....	.07	....	.02	..	..	....	..	3.08	4.75	.6	..	....	.21	...	....	...	67	...	..	..	....	..	..	....	....	10.95
na	.03	.71	....	....	.	T	.02	.	.	.23	....	..	..	.	.	1.30	...	.	.14	.96	...	..	T	1.34	...	..	....	.05	....	....	...	5.49
s	.30	..	....	..	.23	2.47	...	....	1.90	....	..	..	..	..	.92	.33	..	.61	..	....	...	..	2.33	..	....	..	..	..	.76	...	..	9.14
s (near)	.02	.20	.01	....	....	....	1.30	..	..	.80	...	..	..	T	.	1.37	..	....	..	.67	..	..	.	3 40	....	T	..	..	....	....	....	7.77
ntic	...	.30	....	....	..	1.08	..	..	....	.21	..	..	..	....	4.10	1.11	..	....	.60	.14	..	..	.66	T	..	..	..	..	..	..	..	8.20
via	....	.74	....	..	...	....	....	....	..	..	..	..	..	..	.27	...	....	2.00	...	....	....	....	.92	95	..	..	..	T	..	....	..	3.69
ter	....	1.10	..	...	.32	.16	....	....	....	.12	...	....	..	..	T	.80	..	....	.30	40	..	....	.05	1.00	..	..	....	....	....	....	....	5.39
ford	.06	.03	..	....	....	....	..	..	....	....	.05	.20	....	..	....	2.17	..	....	1.57	....	..	..	....	1.24	..	.	....	....	.23	..	....	3 93
nap.	...	.16	....	...	..	....	..	..	....	....	....	....	..	..	....	28	..	....	....	.73	..	....	....	....	....	..	.10	....	....	....	....	2 84
e Plaine	.20	..	....	..	....	....	....	....	....	1.25	..	....	..	..	.25	.75	..	..	2.50	.85	...	....	.30	.45	....	..	....	....	.11	....	....	6.65
aparte	....	..	....	..	....	....	.22	..	....	....	...	....	..	....	....	.16	....	....	T	.21	....	....	1.25	....	....	..	....	.08	....	..	..	1.95
t	....	.33	.32	....	.09	.04	.02	....	.04	.03	....	..	..	.56	.55	1.80	.05	....	.56	.10	.10	....	.69	.13	..	..	..	..	..	..	..	5.44
kingham	....	.73	....	...	...	1.39	1.10	..	....	.76	..	..	..	.01	..	.64	..	..	1.25	.29	..	..	.20	.26	..	....	..	.	..	..	....	6.63
lington	....	....	..	..	...	....	.31	....	..	....	....	.20	...	....	.04	.47	...	..	....	.06	..	..	...	2 03	....	...	..	....	..	..	....	2.87
sey	...	.37	...	....	.03	..	....	....	T	....	..	..	....	....	....	.96	..	..	....	1.58	..	..	....	1.15	..	....	....	..	..	..	....	4.30
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ar Falls	...	....	....	....	....	....	....	..	T	.37	..	T	..	..	T	.14	.57	T	....	.95	.10	....	....	....	....	....	....	....	....	....	....	....
ar Rapids	T	.22	..	....	.51	.12	..	..	T	....	....	....	..	..	....	.01	1.28	..	.01	.65	1 00	....	....	.06	..	....	..	.12	..	..	..	3.74
terville	.02	....	.45	....	..	....	....	..	....	.01	.	.34	....	....	....	.90	..	..	.25	48	....	....	2 75	.38	.13	....	..	.04	.01	....	T	1.97
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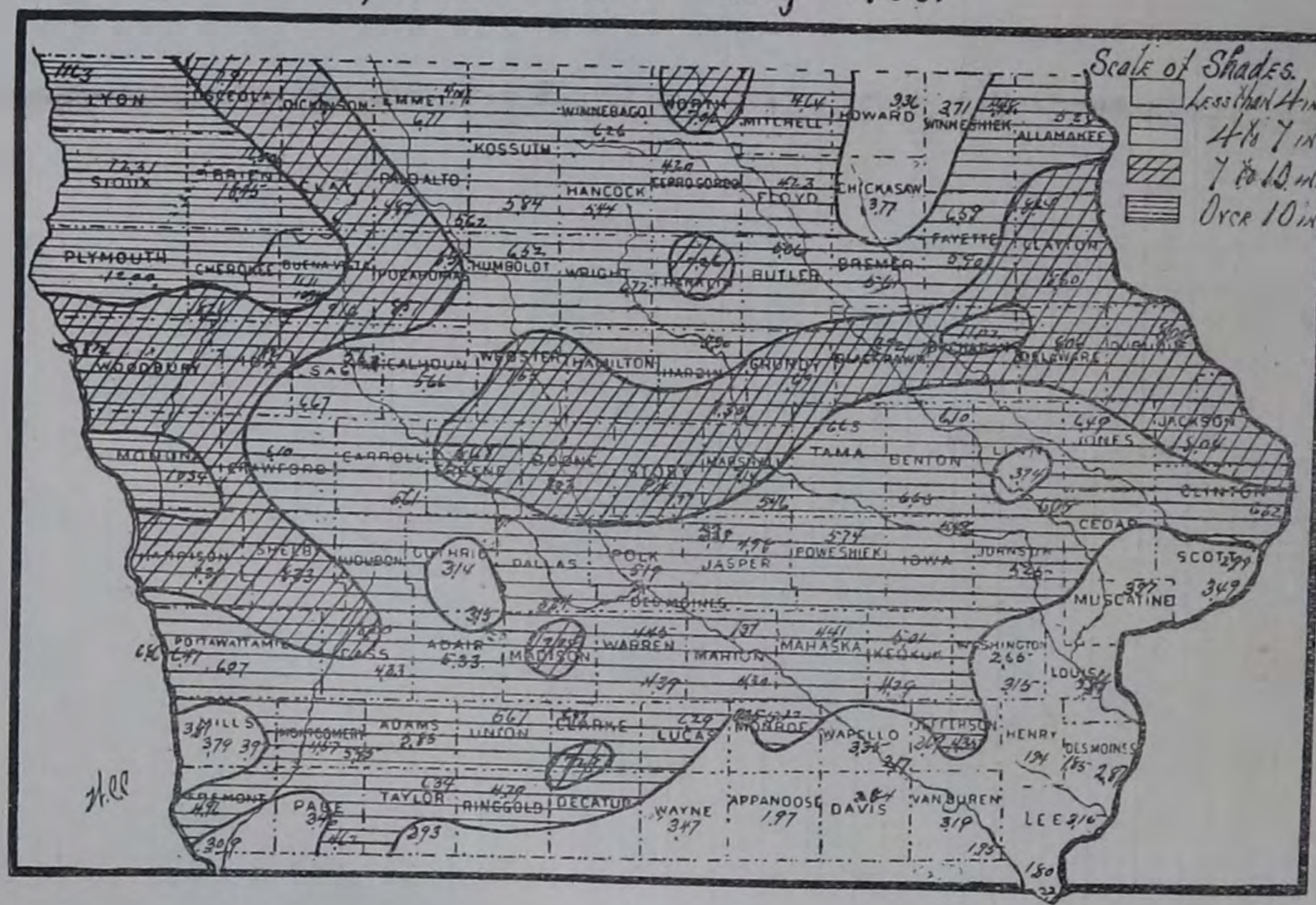
arles City	...	.20	.25	...	.30	.07	.30	..	..	T	.01	....	..	....	....	....	....	....	....	55	..	..	.20	....	....	....	..	T	..	....	..	4.23
rinda	...	.20	....	..	.	.	....	..	..	T	.	....	..	.90	.50	1.53	.10	..	.70	.10	....	....	....	.40	...	....	....	....	....	....	..	3.46
ar Lake	....	T	T	....	....	....	....	....	....	.21	..	....	.22	..	.15	1.53	..	..	1.18	.09	....	....	....	1 03	..	..	..	T	....	....	....	4.20
nton	....	1.10	....	....	.02	.79	..	....	....	.40	..	....	..	..	....	2.60	..	....	..	.45	....	....	.85	.15	..	..	..	....	....	....	....	6.32
lege Springs	.02	.15	....	....	....	....	....	....	....	....	..	..	....	..	.13	1.75	..	..	....	.48	....	....	1 00	48	..	..	..	....	..	....	..	4.62
on Rapids	..	.25	..	....	.02	.25	.62	...	05	.58	..	..	....	..	....	4 33	....	..	.30	37	....	..	.60	.25	....	...	...	T	..	....	..	5.61
rning	...	....	..	.	T	....	....	..	..	....	..	..	..	..	3.55	.45	....	....	.95	.04	..	..	.57	....	....	..	....	....	.04	....	....	5.85
uncil Bluffs	....	.28	....	.04	..	.39	....	..	....	.20	..	..	..	..	.07	.58	....	....	....	.32	..	..	....	.61	..	..	..	....	....	....	....	....	6.47
awfordsville	03	1.04	.20	....	....	....	T	..	...	.26	..	..	..	....	....	....	....	....	....	.30	..	..	.17	....	..	..	..	.24	....	....	..	3.15
esco	....	.10	..	....	.05	....	.46	.	....	.02	....	T	..	.56	.32	.90	..	..	.24	.30	....	..	.17	....	..	..	..	....	..	....	..	3.36
mberland	.01	.25	....	....	....	.40	....	....	....	.01	..	.	..	....	....	2.50	..	..	....	.44	..	..	.30	.42	..	..	....	....	..	....	....	4.33
nville	....	....	....	....	....	....	.25	..	..	.10	..	....	..	..	....	....	....	....	T	.44	..	..	.30	.42	..	..	....	....	..	....	....	1.85
venport	T	.37	.33	..	T	..	T	....	..	.10	.	.24	..	.45	.71	T	..	..	....	T	....	....	..	1.50	....	....	....	....	..	....	....	3.49
corah	...	.12	..	..	.13	.38	.54	..	..	.08	..	.3	....	....	....	....	2.42	..	....	.20	....	....	....	1 08	T	..	..	....	.01	..	....	4.48
laware	...	1.51	....	..	.13	1 42	67	....	T	.19	....	....	.06	.45	..	1.19	..	....	1.52	.60	..	....	27	..	..	..	..	.23	..	....	....	8.06
nison	....	.13	..	..	.11	.20	1 30	....	T	02	.	.19	...	.16	.28	1.25	T	....	.52	.19	..	...	.97	07	...	..	....	.06	....	..	..	6.10
s Moines	T	.40	..	..	T	.25	.03	..	T	.07	.25	.38	....	....	.03	2 78	T	..	.27	.59	....	....	1.37	31	...	T	....	.14	....	....	....	5.15
Soto	...	.50	..	..	T	....	.03	..	T	....	....	....	T	....	.75	1.20	T	..	.58	.50	....	....	.71	.26	..	..	..	....	....	..	....	5 84
ows	...	.50	.15	....	T	.15	.60	....	..	....	....	....	....	....	....	....	....	..	.50	.32	..	....	....	2.30	..	..	..	T	....	....	....	6 72
buque	....	1.16	.04	..	T	.32	.65	....	..	07	..	..	....	1.75	.02	.18	.12	....	.60	1 07	..	..	....	84	..	....	..	....	.02	....	....	8.00
don	.07	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1 13	....	....	T	.81	..	..	.04	.87	..	....	..	....	.05	..	..	2.17
kader	.	1.25	.25	..	.14	1.50	.03	..	..	.25	....	..	....	....	1.40	.04	.32	.02	2 22	05	..	..	....	.98	....	....	....	....	....	....	....	8.60
merson	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.75	..	....	4	..	..	..	.84	....	....	....	....	....	....	....	.02	3.97
stherville	....	.35	.37	....	.20	.16	.03	...	T	....	....	....	....	1 50	1.78	.72	..	....	1 35	....	....	....	11	....	..	....	....	....	....	....	....	6 71
airfield	.10	.01	.50	....	.03	....	..	..	....	....	....	.50	..	....	....	....	..	....	1.60	.50	....	....	T	.95	..	....	....	....	.15	....	....	4 35
onda	..	.30	.42	T	.25	.05	....	..	.25	....	..	....	.06	51	2.46	64	....	1.65	.77	....	....	....	1.21	....	..	....	....	.37	....	..	....	8.57
orest City	....	.16	.20	....	.27	.20	.05	...	T	.06	..	....	....	.55	.98	1.74	.16	..	1.27	.05	...	..	.15	.07	..	....	....	....	....	....	....	6.29
t. Dodge	....	....	65	..	.10	T	2 00	..	....	.10	..	....	....	....	....	1.50	..	....	.25	.20	....	..	.40	.35	..	T	..	T	....	....	....	7.55
t. Madison	T	.70	....	....	....	....	.32	..	....	.50	..	....	....	....	.15	.23	..	....	.40	T	..	..	.35	.20	..	....	..	..	.30	....	....	3.15
alva	..	.80	1.11	..	.15	.	.07	..	.05	....	.	..	....	....	.48	2.86	1.39	.	.05	.10	....	...	.28	.08	..	....	..	....	....	....	....	7.42
ilman	T	.93	..	..	T	.14	.23	....	..	.52	....	....	....	....	....	....	.78	.06	..	.76	.62	..	....	.40	....	....	..	.05	....	....	....	5.46
lenwood	....	1.40	..	T	T	..	....	...	..	T	T	....	....	T	.40	36	2 25	....	.56	....	.52	....	.97	.40	....	....	..	....	....	....	....	3.79
rand Meadow	....	1.99	....	....	T	....	2.20	....	..	.42	....	....	....	T	.58	.18	1.25	24	....	.38	.30	.	....	.62	T	..	..	..	T	..	....	....	8.24
reene	.	.27	.05	....	.14	.58	.40	....	..	15	....	....	.02	T	....	.02	3.51	....	....	.23	.40	.	T	....	.06	....	....	....	.60	....	....	....	5.06
reenfield	.01	.50	..	....	T	.30	02	..	....	.01	....	....	....	....	....	....	.80	..	....	1 40	.86	....	....	....	.26	28	....	....	T	....	....	....	5 32
rinnell (near)	...	1.18	....	..	.06	....	.18	....	..	.07	....	....	....	..	.18	.02	.82	.05	..	.23	.57	..	....	.52	37	..	..	..	..	..	....	....	5.74
runcy Center	..	.13	.24	..	....	2.31	1.40	..	....	.85	..	....	....	..	....	.07	.29	..	..	.22	.70	....	....	.59	..	....	....	....	....	....	....	....	7.69
uthrie Center	..	.33	..	....	....	.59	....	..	....	.25	..	.12	....	..	....	....	1.89	....	..	.65	....	....	....	.25	..	..	..	....	....	....	....	....	3.14
amburg	..	....	....	....	..	....	..	..	..	....	.30	....	....	..	....	....	....	....	..	.74	....	....	1 95	....	....	..	..	....	....	....	....	....	3.09
ampton	..	.30	.07	..	..	1 78	..	..	..	.14	....	....	....	..	06	1.22	1 00	..	....	.34	30	..	1.05	.32	..	..	..	.02	..	..	....	7.26
arlan	..	.33	..	T	.03	3 55	.06	....	....	.20	....	T	..	....	....	.09	2.04	....	....	....	2 00	..	..	....	..	..	..	.76	..	..	....	....	8.33
awkeye	..	.45	..	..	..	....	1.88	....	..	25	....	T	....	.60	....	....	....	.65	..	....	.84	.50	....	.18	.40	.19	....	..	....	..	....	....	6 59
edrick	T	.88	.74	..	....	....	T	....	....	....	..	....	2.04	..	....	.10	46	T	...	....	.50	....	.87	....	..	....	....	....	..	....	....	4.29
opeville	....	.06	....	....	..	..	....	....	....	....	..	....	....	..	....	2.34	2.44	....	....	....	....	....	....	.31	..	....	....	....	..	....	....	7.29
oprig	....	.25	.27	..	.15	....	....	....	....	....	..	....	....	..	....	....	.72	....	....	.50	.20	..	..	.86	.34	....	.05	..	.01	....	....	....	4.04
Humboldt	T	.60	.47	....	..	39	.20	..	....	....	..	....	....	..	.28	.90	1.71	.01	..	....	....	....	....	....	....	....	....	1.25	....	..	..	6.52
Independence	T	.35	....	..	..	1.12	3.13	..	...	.30	..	..	..	..	.60	.40	....	....	2 25	1.12	.	....	....	.50	..	....	....	....	....	....	....	11.02
Indianola	T	.02	...	.	....	.11	T	..	....	T	..	.20	...	....	....	1.83	T	..	....	.75	....	....	....	1.29	..	....	....	....	....	....	....	4.45
Iowa City	T	.77	....	....	....	....	07	....	....	....	..	..	..	....	....	2 68	..	..	....	.38	....	....	.98	02	..	....	....	....	.12	....	....	5 25
Iowa Falls	T	.19	T	..	T	.73	49	..	T	.29	..	T	..	30	.09	92	.03	..	.54	.56	..	....	.64	.63	....	....	..	T	....	..	..	5.30
Keokuk	....	...	.08	....	T	..	.32	...	....	.18	....	....	....	....	.06	.41	..	..	.30	.06	....	....	....	.89	..	....	..	....	.04	..	..	2.20
Keosauqua	.26	....	....	....	T	..	.15	..	....	.04	....	....	....	....	....	.09	..	..	.15	.84	..	..	T	1.70	....	....	....	....	....	....	....	3.19
Lacona	..	....	....	....	T	....	....	..	....	T	....	.50	....	....	....	1.25	....	....	.25	1.00	..	..	1.00	.15	.12	..	....	.12	....	....	....	4 39
Lansing	..	.40	....	T	T	.75	.45	....	....	T	....	....	.08	....	.85	.55	.12	....	.38	90	....	....	2.50	....	....	....	....	....	.30	..	..	5 28
Larchwood	..	.34	2.10	.30	.25	....	....	....	..	....	....	.10	.09	3.20	2 10	..	.19	.43	T	....	.05	.04	..	.81	.14	..	..	....	....	..	..	11 63
Le Claire	....	....	.70	T	.30	04	09	....	....	....	....	....	....	31	....	....	....	....	....	....	....	....	1.66	....	....	....	....	.06	....	....	....	2.99
Le Mars	.	48	.58	.06	.02	03	....	....	....	02	03	....	..	....	1.63	5.39	1.70	....	....	.35	....	....	.95	.64	..	....	....	....	....	....	....	12.00
Lenox	....	T	....	..	..	..	....	..	....	....	T	....	..	....	....	T	3.45	....	....	1.00	.30	..	..	....	....	....	....	....	.25	....	....	6.34
Logan	...	....	.22	....	....	....	1.08	..	....	.47	..	..	.58	1.82	....	....	....	.77	....	....	....	....	2.20	....	....	....	....	....	....	.04	....	7.39
Maquoketa	T	1.18	.19	..	T	.09	1.13	..	....	.18	....	....	.94	..	..	T	3 66	T	..	....	.92	..	....	....	....	....	....	....	....	....	....	8.04
Marshalltown	....	.53	....	....	.03	.06	2.24	....	....	1.21	....	.75	....	....	....	....	1 07	....	....	....	.68	..	....	.79	.53	....	....	....	....	....	....	....	7 14
Melrose	....	.75	....	....	....	....	....	....	....	....	..	..	....	....	....	....	....	....	....	1.00	....	..	....	....	.50	.15	....	..	.10	..	..	....	3.25
Monticello	.28	1 07	..	..	.32	..	1.95	..	..	.14	..	..	....	....	.38	T	....	..	....	....	....	..	....	.21	....	..	..	....	....	..	..	6.49
Mooar	....	T	....	....	....	..	.34	....	....	T	T	T	....	....	....	2.60	..	..	43	.78	..	..	....	.94	....	..	..	....	....	....	....	1 80
Mt. Ayr	T	.03	....	..	....	..	....	....	..	.03	..	..	....	..	T	2 30	.01	..	.50	.15	..	....	1 32	....	....	....	..	....	....	....	....	4.79
Mt. Pleasant	.30	....	..	....	T	....	T	....	..	.20	..	..	....	..	T	2.70	..	..	.94	....	..	....	....	.50	.55	....	....	....	....	....	....	1 94
Mt. Vernon(Hub)	.01	1.20	....	..	.10	.30	.01	....	....	.90	..	..	....	..	....	....	....	....	....	.09	.43	....	....	2.23	....	....	..	....	....	....	....	....	6 05
Murray	....	....	....	....	....	....	....	....	....	.40	..	..	....	..	.33	.11	.40	.35	..	.66	.75	....	....	....	.20	....	....	.20	....	....	....	....	6.77
New Hampton	....	.25	.03	....	....	.70	.28	..	....	....	..	....	....	....	....	T	1.22	....	..	72	.05	....	..	.40	.09	....	..	....	1.91	....	....	....	3.77
Newton	...	.89	....	....	T	.29	07	....	....	....	..	....	....	.73	.91	1 32	.35	..	1.0	.25	....	..	.85	.10	....	....	....	.46	....	....	....	4.98
Northwood	....	.30	.38	..	T	.12	.03	..	..	.01	....	....	....	.14	1.22	2.09	....	..	.25	.58	..	..	70	.55	....	....	....	....	....	....	....	6.86
Odebolt	....	....	....	....	T	.46	93	..	.05	....	....	....	....	....	.23	1.40	.02	....	.50	.26	..	..	1.26	.01	....	....	..	T	..	....	....	8 58
Ogden	....	.20	..	T	T	1 45	2 27	..	T	.38	....	....	....	....	1.29	2.08	....	..	.07	.40	....	....	1 63	.23	....	..	..	....	.50	....	....	10 34
Omaha (Neb.)	..	.22	..	.	.03	.11	.36	..	..	.74	T	....	..	.07	2 04	4.42	..	..	.57	.25	....	..	80	.16	....	....	....	....	....	T	....	4.64
Onawa	..	.48	....	..	T	T	1.00	..	..	....	.	..	..	.42	.37	9	.35	....	.52	.83	.	..	1.48	.12	..	....	....	....	....	....	....	6 04
Osage	..	.05	.11	...	....	T	.08	.	..	.02	....	....	....	....	....	2 00	.	....	.90	.37	....	..	.39	.70	....	....	....	.14	..	....	....	4 41
Osceola	...	T	..	.	T	....	..	....	..	T	....	1.09	...	..	T	1.06	....	....	....	....	....	..	.55	....	....	....	....	....	....	....	....	3.35
Oskaloosa	..	.80	..	....	..	T	..	....	..	.05	..	....	..	..	....	....	....	....	1 95	....	....	..	.77	.27	....	....	....	04	....	....	....	3.47
Ottumwa	....	.85	..	....	....	....	..	....	..	....	....	..	....	....	T	.78	....	....	.38	.40	....	..	.93	....	....	....	....	T	....	....	....	3.81
Ovid	.03	.27	....	..	....	T	T	..	....	.12	.11	....	..	..	T	1.76	....	....	....	.48	....	..	....	....	....	....	....	....	....	....	....	4.37
Pacific Junction	T	.41	..	....	....	....	....	....	....	....	....	....	....	....	....	1.03	..	....	94	....	....	....	1.80	.10	....	..	....	....	....	....	....	8 58
Pella	....	.50	....	....	....	....	....	....	....	....	....	....	....	.33	2.94	1.59	....	....	2.17	....	....	....	.64	....	....	....	....	....	....	....	....	18.45
Plover	..	.13	.51	....	.13	.14	....	....	....	....	....	....	....	7.00	6.00	.70	...	....	2.25	....	....	....	....	.70	....	....	....	....	....	....	....	....
Primghar	..	55	.75	.25	.20	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

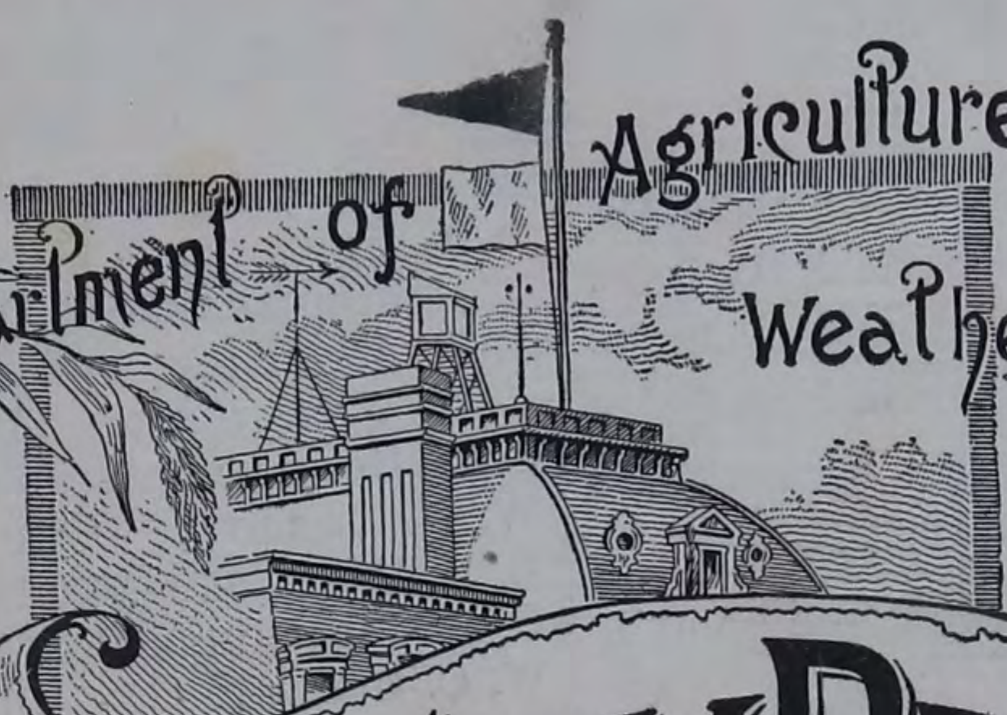
DAILY AND MONTHLY PRECIPITATION FOR JULY, 1900—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Red Oak	T	..	..	..	....	..	...	....	..	.06	...	...	....	...		2 60	....	...	.85	.	....	.. .	.73	.33	. ..	....	....	...	....	....	...	4.87
Ridgeway	....	.23	....	..	.01	.01	.49	....	.01	.01	....	....	....	1 07	.21	.85	.06	..	.17	.32	....	...	.18	....	...	....	....	.08	....	..	....	3.71
Rockwell City	..	.10		...	...	.95	.50	...	.10	...	....	....	. .	.05	1 10	1 60	....	...	.20	.20	...	....	.70	.16	....	....	....	T	....	....	....	5.66
Ruthven	..	.25	.50	..	.18	.11	.05	....	.		....		....	1.30	2 90	.85	..	....	2.10	...	....	..	.10	...	....	....	.48	.	.	....	..	8.82
Sac City	....	.27	.	....	.34	.06	.26	....	.20	.02	. .	.01	...	T	.93	1.84	T	....	.41	.16	....	....	1.00	.13	...	....	....	T	..	....	....	5.63
Scranton	....	....		T	..	T	3.00	....	.86	...	. .	.37	...			2.05	...	....	.55	....	....	....	...	1.85	...	..	....	....	....	....	....	8.68
Sheldon	..	.61	.69	.60	..	..	....	....	....	....	....	....	....	3 00	6.40	.65	..	....	3.40	....	....	....	1.15	....	....	....	....	....	....	....	....	16.50
Sibley	...	.52	.98	....	.15	.05	.03	....	....	..	..	...	.02	1 98	3 06	.32	..	....	.87	..	...	...	.40	..	..	...	....	.01	..	....	.02	7.91
Sigourney	....	1.00	48	...		..		....	T	.14	....	...	...	T	T	1.41	....	...	.21	.50	...	....	T	1.27	....	....	....	....	T	....	....	5.01
Sioux Center	..	.97	.34	....	T	.27	.03	....	.03	....	...	....	.02	1.28	6 53	.37	....	...	1.20	....	....	....	1.22	....	....	....	....	....	....	....	....	12 31
Sioux City	...	.54	.45	....	.04	...	.04	..	.03	....	...	....	T	1.33	3.74	1.14	....	....	T	T	...	....	1.34	.02	..	....	....	.05	....	....	....	8.72
Storm Lake	....	.48	.67	...	.12	....	T	....	.01	...	...	...	....	2.05	3.74	1.22	..	...	.22	.11	....	....	.54	....	....	....	....	T	....	....	....	9.16
Stuart	...	.20	....	....	10	....	....	....	..	.	....	.25	....		...	2.50	....	....	T	....	...	....	.10	.	....	....	....	....	....	....	....	3.15
Thurman	.27	.04	....	....	.02	....	....	....	....	.04	.24	....	....	T	2.56	...	...	...	.18	.78	....	....	.60	.23	....	....	....	T	....	....	....	4.96
Villisca	..		....	..	....	..	..	....	....	T	T	....	...	..	3 55	..	....	...	.95	..	....	...	.95	....	....	....	....	T	...	....	....	5.45
Vinton		1.04		..		1 73	...	....	....	.38	...	. .	....	...	....	.78	..	....	1.54	..	....	...	..	.20	....	....	....	....	....	....	....	6.10
Wapello	.12	.55	.17	..	....	..	....	..	....	.35	....	....	..	....	T	.46	..	...	....	.12	..	....	....	1.00	.04	....	....	.43	....	....	....	2.81
Washington	02	1.00	....	..	....	....	....	....	....	.26	....	....	...	..	....	.28	.28	...	....	.18	...	....	..	.63	....	....	....	....	....	....	....	2.65
Washta	.	26	.72	.10	T	.05	....	..	.03	..	...	....	....	1.41	4.60	.38	....	....	.15	....	....	....	.57	....	....	....	....	T	....	....	....	8.21
Waterloo	....	.21		....	T	.66	1.09	....	..	.16	....	....	...	1.65	.07	.55	05	....	1.38	.05	....	....	....	1 28	....	....	....	.77	..	....	..	7.92
Waverly	....	.29	.03	....	.01	.73	.31	....	...	.43	....	....	....	.76	....	.71	.09	....	.70	.48	....	..	....	.34	....	....	....	.73	....	....	....	5.61
West Bend	....	.14	.31	...	.07	.03	.02	....	.04	...	....	....	....		.44	2.05	.47	...	1.25	.02	...	....	.39	...	....	T	...	.39	....	....	...	5.62
West Union	....			...	T	1.51		....	..	T	....	....	....	....	....	1.70	...	....	....	2.00	....	....	....		....	....	....	.69	....	....	....	5.90
Whitten	....	.30	.02	..	T	1.96	1.75	...	..	.15	..	....	....	.32	T	.61	.10	....	.31	.42	....	....	1.00	.36	....	...	....	....	...	....	T	7.30
Wilton Junction	....	1.30	..	....	T	....	.05	....	...	.10	....	...	....	....	...	.77	.10	....	.15	T	....	....	....	1.50	...	...	....	....	....	....	....	3.97
Winterset	....	...	....	..	....	..	.18	..	..	T	....	2.03	....		....	2.50	.09	.	...	1.24	....	..	....	1 20	....	..	....	..	....	....	....	7.24

Precipitation Chart July 1900.



Vol. XI. AUGUST, 1900. No. 8.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE



STAR ENG. CO

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Central Station, Des Moines, Iowa.

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DIRECTOR

GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

owa Weather and Crop Service.

VOLUME XI. AUGUST, 1900. No. 8.

WHAT IS 100 PER CENT?

One of our most faithful crop reporters raises this question nd requests an answer in these columns. In applying the ercentage system to crop estimates 100 represents the normal r average condition of a particular crop at any time during he growing season. At planting time, when the soil is in ood tilth, and the seed is planted under favorable conditions or making a normal start, it may be rated 100. If adverse conditions follow, checking germination, giving weeds an advantage over the plant, then the condition should be expressed by lower figures on the scale. Nearly all crops fluctuate during the growing season, running the gauntlet of various ills and dangers, and the figures on the scale should be used to indicate probabilities as to the final output, whether it shall be below or above the average yield for a series of years. So 100 does not represent the ideal or "bumper" crop, but the usual results of the harvest in the section where the reporter resides. The matter is very simple when it is fairly understood.

NOTE AND COMMENT.

Farmers who do not cut up their corn and utilize the fodder appear to be satisfied with 60 per cent of a crop. The stalks, leaves and husks that are allowed to go to waste in the fields constitute about 40 per cent of the nutritive value of the corn plant. In some seasons the ears alone do not yield any margin of profit above the actual cost of production. The corn fodder grown in Iowa this year, if cut and properly cared for, would be worth at least $40,000,000 above the cost of labor required to save it. About three-fourths of that amount will be wasted.

* * *

On the night of August 23d the schoolhouse at Stratford, Hamilton county, was struck by lightning and badly damaged. The newspapers say this is the second stroke that building has received this season, and the sixth time it has been struck by lightning since its erection. It would be well to experiment a little with lightning rods on that building, and make sure that the rods are well grounded and properly constructed.

* * *

Relative to the mooted question whether or not the drainage canal at Chicago will lower the level of the lakes to a sufficient extent to be detrimental to commerce, a Chicago paper quotes Prof. Willis L. Moore as saying in a recent interview: "The lakes, I believe, are self-regulating. The body of water which the lakes contain could not be supplied by the water sheds draining into them. What great river system or supply drains into the lakes? Think how contracted their area of watershed is! No, the lakes are fed through the geological strata. Water from very far-off regions comes to the lakes. Water that falls on opposite slopes, percolating through the surface earth, is carried back by the strata and enters the lakes. When the pressure is removed more water bubbles up from these strata; and when the pressure is increased the inflow is proportionately checked. Consequently I believe the water supply of the lakes is automatic, and that their level is not determined either by the increased or diminished outflow from their surfaces."

* * *

The goat population of the United States, it is said, numbers about 500,000, and one-half of these are in Texas. About half the total number are of the Angora fleece-bearing stock. The cost of keeping goats is less than for any other animal. They graze upon coarse herbs that are not eaten by any other stock, such as ironweed, dock, mullen, briars, buds and broken sprouts. The wool of the Angora variety possesses the highest felting qualities. The average fleeces from mature Americanized Angora bucks weigh from six to seven pounds, and those from the ewes from three to four pounds. The flesh of the crosses is accounted superior to most mutton.—*St. Louis Republic.*

* * *

Hot periods occur in midsummer whether the sun's face shows the maximum or minimum number of spots and blotches. All observed facts appear to sustain the scientific conclusion that solar energy is a physical constant. Variability of temperature results from terrestrial conditions, and not from solar perturbations or planetary conjunctions.

* * *

Scientists recently discovered that the germs of malaria are transmitted to the human blood through the bite of a particular species of mosquito. And now it is announced that the disease known as elephantiasis, which is somewhat common in the tropics, is caused by a parasite transmitted by certain species of mosquitoes that are common in regions where the disease prevails. One of these days we shall discover means of extermination of these insect pests.

* * *

On August 10th the town of Skaguay, Alaska, was shaken by earthquake shocks for about seventy seconds, and the tremors were even more severely felt at Dawson. Arrivals at Vancouver from the Stewart river, half way down the Yukon to Dawson, say the mountain there was split in two; one stream was partially dammed up and turned into the newly formed canyon through the mountain.

* * *

Too much wet weather in August caused a decline in the quality of sugar beets in Michigan. There was an increase in tonnage at the expense of the sugar.

* * *

The *London Mark Lane Express* says: "We do not think that potatoes in Great Britain have suffered injury from such

fall of rain as there has been, but in Ireland the rains have been of a flooding description, and serious results are certain over vast areas of low-lying lands."

* * *

According to Prof. L. O. Howard, chief of the Bureau of Entomology at Washington, the honey industry has shown marked development in recent years, and there are to-day more than 300,000 persons engaged in it, the value of the product being $20,000,000. Nor has the limit by any means been reached, as it is estimated that the existing flora in the United States could support with an equal average profit ten times the number of bees now in existence.

* * *

A process by which water may be so used as to effect an immense saving in the consumption of coal has been invented by A. G. Ingalls, a graduate of McGill university, Montreal. Full details are not given out, but, briefly, it may be said that a thin spray of water is spread over a coal flame in such a way and with such auxiliaries that the heat of the flame is wonderfully augmented. The discovery can be applied to gas and other flames. Mr. Ingalls has received letters from prominent scientists proving the value of his invention.—*Exchange.*

* * *

The meteorological service of Japan is well organized and is under the direction of Prof. K. Nakamura, a graduate of the University of Tokio. It includes eighty stations of the first and second orders, and about 900 stations where rainfall or temperature is recorded. At these stations electrical, earthquake, and other phenomena are observed, as well as the usual meteorological conditions, and all vessels belonging either to the imperial or merchant service are compelled to make observations at regular intervals six times daily, and forward the records to the central observatory. There is also regular service of weather telegraphy and storm warnings, and the observations and forecasts are published daily. The success of the forecasts is stated at 82 per cent and of the storm warnings at 70 per cent. Monthly and yearly bulletins are also published, and an English translation of the titles and important phrases is added. The staff and attendants at the central observatory amount to fifty-three in number.—*Exchange.*

THE VALUE OF ONE RAIN.

[Rockford Register.]

The immense value of just one rain was never better illustrated than in connection with the general rainfall of middle July, and the corn crop in the great corn belt, which area was thoroughly covered by the rainfall of that time. This corn crop, which was one of wonderful promise, had arrived at a most critical stage on the 15th of July; of very rank growth, it had pumped out the last drop of moisture from the soil where it was growing, and being just at the ear-forming stage, a continuance of the drouth meant an almost total failure of the crop. At the last moment the barometer went down, the clouds gathered thick, and for three days the west got such a soaking as it had long been a stranger to. Thus the corn crop was saved, and the splendid cornfields of Kansas, Nebraska, Iowa and South Dakota will now be laden with long, full ears, where, without the blessed rain, they would have been naught but a mass of shriveled fodder. The moisture pumped up from the gulf by a tropical sun, was thus borne northward up the great Mississippi valley and distributed like a benediction to all the people, the just and the unjust.

BOMBARDING THE CLOUDS.

Nine years ago congress appropriated $10,000 to produce rainfall by means of explosives. The resolution was introduced into the senate by Charles B. Farwell of this city, and experiments were conducted on the Texas ranch of Nelson Morris, also of this city.

From the fact that after every great battle of the civil war there was a heavy rainfall, the advocates of rain-making argued that, if explosives could be used in dry regions a heavy fall of moisture might be precipitated. In the experiment on the Nelson Morris ranch the explosives were carried high in the air by balloons, and reports were to the effect that the experiments were successful. But the people in the immediate vicinity and in the country at large were skeptical.

In France this American process is being reversed just now and heavy cannon are being used to dissipate hailstorms. An official report made by Consul John C. Convert of Lyons states that fifty-two cannon manned by 104 cannoneers and their chiefs have been distributed over an area of 2,500 acres of rich vineland. The general government appropriated 2,000 francs for the experiment, the departmental government 1,500 francs and the National French Agricultural society 12,000 francs.

A high point in the vineland was selected as the central post of observation and a signal code was adopted. When a shot was heard from the central post all the cannon were to be fired at the clouds, at first twice a minute, and more slowly after the first ten shots. Here follows the report of the first experiment:

> The farmers of Denice were aroused at 1:30 o'clock on the night of June 5-6. The storm was very severe. The artillerists, from forty to fifty strong, fired their guns and stopped the thunder and lightning. In the neighboring communes the people saw columns of flame rise 300 feet above the cannon when the shots were fired.

The experiment was followed by another, and the two were so far successful that the vine growers in France are organizing to attack the hailstorms in all the grape-growing regions. It is said that this experiment of shooting at the clouds was made in France and Italy over a hundred years ago, but never on so extended a scale as this season.

It is undeniable that explosions or heavy artillery fire in time of battle produce rain. It is believed by many sea-going people that water-spouts have been dispelled by firing shot and shell into the point of contact between cloud and water. It is believed also in the west that tornadoes have been broken by the use of artillery. If the use of heavy guns to squelch hailstorms should be successful in France, we may have in this country experiments of the same sort to break both wind and hailstorms.—*The Inter Ocean.*

This is an age of marvelous inventions and discoveries, and we are inclined toward optimistic views as to the possibilities of human achievement in the mastery of nature's forces. But we take cognizance of the fact that human power is limited, and in our opinion we are "up against" the limit when we undertake to control the gigantic forces of the elements that are employed in the production of rainstorms, whether moderate or violent. There have been in all ages many attempts at rain-making and storm-breaking; but up-to-date there has been no credible proof brought forth to sustain the numerous claims that rainfall has been produced, or that storms have been broken up by use of explosives, chemicals, tom-toms, incantations, rain dances, or other means employed by savage or civilized mankind. The *Inter Ocean's* positive affirmation that "it is undeniable that explosions or heavy artillery fire in time of battle produce rain," is not sustained by adequate evidence. It is at most a mooted question, and any jury of men competent to weigh all the evidence afforded would necessarily render the verdict—"not proven."

The same judgment must be entered as to the storm-breaking experiments that are being made in France and other European countries. Convincing evidence of their success has not been brought forth. It may be allowed, however, that, on the basis of ascertained facts relative to the mechanism of hail storms, it appears more probable that their destructive force may be dissipated or warded off by the effects of powerful explosives than that we may induce the formation of rainstorms by the same means. As yet we await proof that explosives are effective either as rain-makers or storm arresters. But speed

xperiments and let's find out. Better bombard the clouds
dangers portend than train your artillery 'gainst fellow
als.
ioot the hailstorms!

CROP REPORTING.

[Cincinnati Price Current.]

t has been fairly well demonstrated that systematic inquiry compilation of returns can afford very satisfactory indica- s of the comparative situation of leading crops. The rer to normal conditions the more accurate are the current mates likely to be. The greater the impairment to the wing crop the more difficult it is to reach reliable conclu- s, partly for the reason that damage conditions are almost formly overestimated, and that the reports are readily avail- e and plentiful from localities which have suffered unusu- , while in other localities where conditions are as good as al or better there seems to be little inclination to say any- ng. This condition is emphasized by speculative agencies, ich are ever alert to introduce surprises in the form of disap- ntments as to indicated results. * * * When all the ıditions attending such work are properly considered, the imates of the Department of Agriculture in the late years ould not be regarded as open to severe criticism. In fact, proximations within 5 or 7 per cent of results suggested by tribution which is calculated largely on estimates and not enumeration, are not to be seriously found fault with. ere is a disposition to expect too much from such service. ıe present management of the statistical division of the partment of Agriculture is deserving of commendation for ithful and intelligent efforts for securing results deserving blic confidence. While the tendency may continue to be in vor of something of underestimate the exhibits are valuable comparisons—and there is little significance to such infor- ation excepting associated with comparisons of a kindred ature.

NTRODUCTION OF HUNGARIAN AND MACARONI WHEATS.

[Crop Reporter.]

In its work of introducing valuable seeds and plants from oreign countries, the Department of Agriculture is now ngaged, among other things, in securing good stocks of the best varieties of European and African macaroni wheats and Hungarian bread wheats.

Formerly all the macaroni consumed in the United States was imported from Europe, but recently macaroni manufac- tories have been established in this country. The manufac- turers have found, however, that consumers prefer the imported product, and it has developed that the European macaronies are made from a peculiarly hard-grained type of wheat which we have not heretofore produced in the United States. American farmers have been growing, of course, the wheats that they could market most advantageously, and these have been the wheats suitable for the manufacture of bread and pastry flours. The macaroni wheats which are now being imported by the department, in experimental quantities will, it is expected, furnish the basis for a great extension of the macaroni manufacturing industry in the United States and will create a demand for the production of the macaroni wheats in those parts of the country to which the experiments now in progress show them to be adapted.

Hungary, it is well known, is the home of the roller process of grinding wheat, which has now been adopted in flour mills throughout the United States. Hungary is also the country in which is manufactured a flour of such shipping and bread-making qualities as to give it, in some of the markets of the world, the highest reputation and price of all export flours. The wheats from which this flour is manufac- tured are not grown in the United States commercially, but the experiments thus far made with them indicate that they will maintain their high bread-making qualities here. Now, a point of special interest regarding these wheats is that they are winter varieties, while the best bread wheats of the United States are spring varieties, the area of whose success- ful production is very limited, and whose yield is compara- tively light. The indications now are that the Hungarian winter wheats can be successfully grown over many times larger an area than our high-grade spring wheats; that the yield per acre, while not at present so great as that of many of our ordinary winter wheats, is superior to the spring varieties, and that the peculiar qualities possessed by these foreign wheats in Hungary are maintained in the United States. The increasing trade of this country in export flour, the enormous possibilities of that increase, the high quality of Hungarian wheats for this class of trade, and the great extension of the area of profitable cultivation need only be mentioned to con- vey an idea of the importance and significance of a successful outcome of the work of introduction.

THE DUST MULCH.

[Vick's Magazine.]

Though so much has been written and said about saving the moisture in the soil, comparatively few gardeners take advantage of it by means of the dust mulch. If the soil of the garden is allowed to bake over the top, forming a hard crust, the evaporation of water will be rapid, while if the surface is stirred and pulverized often the moisture cannot raise above the stirred portion, but is kept down near the roots of the plant, where it can do the most good. The ground may have been thoroughly plowed and harrowed, well fertilized and put in the best possible shape for raising a good crop, but if the moisture is not kept in the soil a small crop will probably be the result. Any mulch will cause the same effect, but one of straw or refuse is not always practicable in a field, and in a garden it is far from ornamental.

The dust mulch makes a very neat appearance, and shows at first glance that the land has had careful attention. The dust mulch cannot be made without thorough cultivation, which also removes weeds, thus answering a two-fold purpose. The theory of the evaporation of water from the soil is not generally understood, but the water rises by capillary action, and as long as the ground is left undisturbed, the air spaces are equal and it rises gradually until it reaches the surface, when it is lost in the air. These spaces must be very small or the water cannot rise, and that is just the condition they are in when the soil is packed down hard.

It can be illustrated in this way. Take a lump of sugar and hold it over a cup of liquid so that the liquid barely touches the bottom of the sugar. The liquid is drawn to the top of the lump by capillary action, but if the air spaces in the top of the lump are made larger the liquid will stop when it gets to them, as the wider the spaces the harder it is for the liquid to fill them up and rise further. In just the same way water in the soil stops when it gets to the dust mulch where the loose earth causes wider spaces.

The work of stirring the surface of the soil should be done at least once a week in a garden, as the mulch thus provided

soon packs down again by the action of the weather. When plants grow large enough to shade the ground somewhat, this stirring can be given up. After a rain, as soon as the soil dries off a little, it should be well stirred with a fine garden rake.

CASUALTIES BY LIGHTNING.

At Austinville, Butler county, on the evening of August 8th, a young man named Charles Palmer, aged 22, was struck by lightning and instantly killed. He was employed in team work at the Illinois Central gravel pit, and was the only person injured by the stroke.

* * *

On the morning of August 22d, Sherman Jackson, aged 35 years, foreman of Peter Hopley's stock farm, southwest of Atlantic, was killed by lightning. He was riding homeward from the field, sitting in the rear end of the wagon, with two men in front; the bolt killed Mr. Jackson and the team, while the other men in the wagon received only a slight shock.

* * *

At Moville lightning struck the stable of Peter Kroeger, killing a horse. Mrs. Kroeger, who was in the house some distance from the stable, was rendered insensible by the shock, and for some time after recovering consciousness suffered paralysis of one leg.

CLIMATE AND CROP CONDITIONS IN AUGUST.

August was characterized by an excess of temperature and rainfall. In respect to temperature it broke all previous records, and it is worthy of note that the average of the northern section was within 2° as high as the southern section. This high excess of both heat and moisture gave a powerful impetus to crop growth and clothed the pastures and meadows with springlike verdure. The first decade was generally quite dry, with daily maximum temperatures ranging above 90°, and a prevalence of brisk southerly winds. The drouthy conditions during this period caused some damage to late planted corn on light or sandy soil but it promoted the rapid development of the bulk of this staple crop. The second decade brought copious and well-distributed showers, effectually breaking the drouth and allaying all apprehensions of further damage from effects of dry weather. The bulk of the month's rainfall came in the seven days from 11th to 17th inclusive. This superabundant moisture was highly beneficial to late corn, pastures and meadows, potatoes and garden truck, but it retarded threshing and stacking of small grain, and caused considerable injury to oats and spring wheat in shock. And the severe windstorms of that period were somewhat damaging to grain in stacks, and to corn in fields exposed to the full force of the squalls. The aggregate of damage to corn was not heavy, but unstacked oats and wheat suffered material injury in portions of the central and northern sections. The closing decade of the month afforded ideal conditions for all unmatured crops and for securing the grain remaining afield. At the close of the month more than half of the corn crop was safe from damage by frost and cutting was in progress, with prospect of saving more than the usual amount of fodder. The copious rains facilitated fall plowing, and a very large acreage was plowed during the month. A good beginning was made in seeding fall wheat. The apple crop suffered heavy damage by severe squalls, and all reports indicate that, while the supply of perishable fruit seems abundant, the crop of late-keeping and winter apples will be light.

CLIMATOLOGY OF THE MONTH.

Barometer.—The mean pressure of August was 29.95 inches. Highest observed, 30.19 inches at Keokuk, on the 8th; lowest observed, 29.50 inches, at Cresco, on the 24th; range of pressure for the state, .69 of an inch.

Temperature.—The mean temperature of the month, as shown by records of 114 stations, was 77.4°, which is 6.3° above the normal for the state. This breaks all records, the next highest mean for August being in 1881. The average of all records for the state is 71.1°. The highest monthly mean was 82.2°, at Keokuk; lowest, 74.2°, at Osage. By sections the means were as follows: Northern section, 76.4°; central section, 77.2°; southern section, 78.5°. A noteworthy feature of the month is the fact that the mean of the northern belt is only about 2° lower than the southern. The highest temperature reported was 103°, at Wapello, on the 3d and 5th; lowest reported, 44°, at Sheldon, on the 28th. The average monthly maximum was 94.9°; average monthly minimum, 57.3°. The greatest daily range was 42°, at Toledo; and the average of greatest daily ranges was 31.6°.

Precipitation.—The month was unusually wet as well as warm. The average rainfall, as shown by records of 131 stations, was 4.65 inches, which is 1.58 inches above the normal for August. The average by sections was as follows; Northern section, 3.18 inches; central section, 5.82 inches; southern section, 4.95 inches. The greatest amount reported for the month was 10.43 inches, at Scranton; least amount, 1.26 inches, at West Union. The greatest daily rainfall reported was 4.49 inches, at Indianola, on the 15th; average number of days on which .01 of an inch or more fell, 6. The bulk of the rainfall of the month came in the period from the 11th to 17th inclusive. At numerous stations rain fell every day during that period.

Wind and Weather—Prevailing direction of wind, southwest; highest velocity reported, 47 miles per hour from northwest, at Sioux City, on the 15th. There were 18 clear days; 10 partly cloudy, and 3 cloudy.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	29.97	30.18	8	29.62	24
Des Moines	29.96	30.12	8	29.54	24
Clarinda	29.95	30.12	1	29.60	24
Cresco	.....	30.13	8	29.50	24
Dubuque	29.97	30.17	31	29.62	24
Omaha, Neb	29.89	30.09	1	29.56	24
Keokuk	29.97	30.19	8	29.64	24
Sioux City	29.91	30.14	28	29.51	24
Means	29.95	30.19	8	29.50	24

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	4,230	40	NW	17
Des Moines	5,612	37	SW	23
Dubuque	3,902	36	NW	12
Keokuk	4,684	34	SW	12
La Crosse, Wis	4,419	30	W	11
Omaha, Neb	5,647	38	N	15
Sioux City	9,825	47	NW	15

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* August was hot and rather dry, though rain was ample for crops and farming operations. A heavy thunderstorm passed near Alta on the 10th, and several of my family, including myself, while driving to town, were momentarily stunned by a thunderbolt that killed a horse in a pasture about five rods from us.

AMANA—*Conrad Schadt.* On the 17th, about 4 A. M., lightning struck and burned a big barn containing about 200 tons of hay. Sixteen years ago a barn on same foundation was struck and burned. During the storm on 17th a house was struck but not materially damaged. None of the buildings had lightning rods.

BANCROFT—*E. G. Bailey.* One of the finest of months for growing and ripening crops; fall plowing and threshing well under way

BONAPARTE—*Hon. B. R. Vale* An excessively high maximum temperature for the month (93.5° mean); precipitation normal.

CARROLL—*Moses Simon.* Heavy wind and thunderstorms on 13th and 16th, but no serious damage resulted.

CLINTON—*Dr. Luke Roberts.* This month was warmer than any August in 22 years; mean temperature, 6.5° above normal, or 3° above the highest previously recorded. The rainfall was 2.32 inches in excess of normal, and much humidity prevailed, although there were 17 clear days, and only 1 cloudy day.

CRESCO—*Gregory Marshall.* Hottest August on record, and very dry at this station; corn ripened too fast.

FT. MADISON—*Miss L. A. McCready.* Month very dry, vegetation drying up, and stock water scarce.

GRAND MEADOW—*F. L. Williams.* Month very warm, with light rainfall fairly distributed; threshing well along at close of month, and corn-cutting in progress.

GUTHRIE CENTER—*Clem Holden.* Crops in fine condition. Corn is estimated to be the largest crop raised in this county for many years.

HUMBOLDT—*H. S. Wells.* Warmest August in many years; late hay crop good; first threshing of flax yields 15 bushels per acre; good progress in threshing, plowing, and cutting corn.

LE MARS—*T. E. Cole.* Heavy hailstorm at 11 P. M. on the 16th; largest stones about an inch in diameter; heavy thunderstorm night of 23d.

LOGAN—*Mrs. M. B. Stern.* Month quite warm, but good rains kept everything growing; pastures look like springtime.

OSKALOOSA—*Jos. Boyd.* Temperature for the month was high, which was favorable for the corn crop. There were five electrical storms.

OVID—*H. C. Miller.* Heavy thunderstorms with high winds on 15th and 16th. At close of month three-fourths of the corn crop was safe from damage by frost; crop unusually good and will average close to 50 bushels.

PACIFIC JUNCTION—*H. H. McCartney.* All rains were accompanied by lightning. That of the 24th was very heavy, with strong wind and dashes of small hail.

RIDGEWAY—*Arthur Betts.* August was a wonderful month. Some farmers say it was the hottest month they ever saw. There were 375 hours of sunshine, or 87 per cent; much south wind and no cloudy days; range of minimum, 62° to 77°; range of maximum, 81° to 98°; minimum was fourteen days in the 70's and seventeen days in the 60's; maximum was fourteen days in the 90's and seventeen days in the 80's. A delightful month to the observer, but not to everybody. There were thunderstorms on ten days, and four days with gales; much hazy weather, with many little whirlwinds.

SAC CITY—*J. A. Sodestrom.* No damage by storms or hail in this locality.

THURMAN—*C. R. Paul.* The electric storm on night of 15th was the worst ever experienced here; it continued all night, with vivid lightning and loud peals of thunder.

TOLEDO—*Lulu G. Bookwalter.* Corn is generally good and is ripening well. On the 17th there was a very heavy fall of rain —2.93 inches in two hours.

WEST BEND—*Phil Dorweiler.* A fine month, and all crops are good; corn is already safe and promises a large yield.

WILTON—*J. M. Rider.* On the 17th, at 5:30 A. M., a terrific storm came from the northwest, with considerable hail; 2.83 inches of rain fell in one hour and ten minutes.

BELATED REPORTS FOR JULY.

CARROLL.—July. Mean temperature 73°; highest 96° on the 3d; lowest 51° on the 8th; greatest daily range 35°; total precipitation 6.95 inches; greatest in 24 hours 2.82 inches on the 7th; number of clear days 23, partly cloudy 5, cloudy 3, rainy 7.

KNOXVILLE.—July. Mean temperature 75°; highest 96° on the 6th; lowest 53° on the 9th; greatest daily range 37°; total precipitation 4.75 inches; greatest in 24 hours 1.47 inches; prevailing wind direction, northwest; number of clear days 15, partly cloudy 10, cloudy 6, rainy 8.

TOLEDO.—July. Mean temperature 72 9°; highest 97° on the 31st; lowest 40° on the 30th; greatest daily range 56°; total precipitation 5.47 inches; greatest in 24 hours 2.66 inches; prevailing wind direction, southwest; number of clear days 18, partly cloudy 7, cloudy 6, rainy 8.

CLIMATOLOGICAL DATA FOR AUGUST, 1900.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIP., INCHES.			Number rainy days	SKY.			Prevailing direction of wind.	Dates of thunder-storms.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.		Number clear days.	Number partly cloudy days.	Number cloudy days.		
Algona*	Kossuth	1,500	7	76.9	*7.6	91	4,6,7,10,19	59	28	.....	4.41	*1.57	1.75	6	20	10	1	SE	
Alta	Buena Vista	1,519	8	74.9	*4.9	92	2	56	25	30	3.64	— .12	1.26	9	18	12	1	S	8,10,12,14,15,16,17,23,31
Alta (near)	Buena Vista	....	....	...	.....	.....	.....	.....	.....	.....	3.94	.....	1.70	9	...	...	...	...	
Bancroft	Kossuth	....	....	75.4	.....	93	2, 20	47	30	39	3.78	.....	1 15	6	17	13	1	S	8, 11, 12, 14, 17, 20, 24,31
Britt	Hancock	1,230		75.2	.....	92	8, 20	50	3	40	4.33	.....	1.43	12	7	24	0	SW	
Charles City	Floyd	1,012	8	76 8	*6.6	96	4	54	29	35	2 65	* .40	.75	7	15	15	1	SE	
Clear Lake	Cerro Gordo	984	....	77.3	.....	95	18, 20	52	26	38	3.75	.....	.85	6	19	9	3	SW	
Cresco	Howard	1,280	27	77.1	*8.5	96	18	53	29	35	1 71	—1.18	.48	9	21	8	2	SW	10, 11, 12, 14, 17, 19, 22
Decorah	Winneshiek	900	6	77.5	*8.0	99	9	49	29	40	2.28	* .90	1.25	6	....	....	....	.....	
Dows	Wright	.....	....	75.7	...	92	2	54	26	31	2.70	.....	.70	7	9	17	5	S	
Elkader	Clayton	.....	18	78.6	*8.4	98	18, 20	54	29	38	3 88	*1 03	1.00	9	18	13	0	SE	1,11,12,14,15,17,23,24,25
Estherville	Emmet	.....	....	75.4	.....	92	10, 20	51	28	35	3.34	.....	1.30	9	17	11	3	SW	6, 11, 12, 15, 22
Fonda (k)	Pocahontas	1,237	...	79 4	....	93	14, 20	66	15, 30	26	....	.....	.....	...	....	....	....	.....	
Forest City	Winnebago	1,220	....	75.3	....	92	2	54	25, 26	31	4.46	.....	2.57	11	22	5	4	S	
Grand Meadow*	Clayton	.....	8	74 7	*6.8	90	18,19,20	60	29	.....	2.23	— .13	.86	9	12	17	2	SW	
Greene	Butler	943	..	77.6	.....	95	6, 7, 18	55	29	36	2.37	.....	.54	9	24	4	3	SW	
Hampton	Franklin	1,240	9	78.0	*9.3	95	2, 6	58	28, 29	33	2.68	— .35	.55	8	20	10	1	SW	
Hawkeye	Fayette	.....	6	...	.....	....	.....	..	.....	.....	2.92	* .36	.85	6	....	....	....	.....	
Humboldt	Humboldt	1,082	6	77.8	.....	94	2	57	28	30	3.32	* .49	2.16	7	26	5	0	SE	
Lansing	Allamakee	.....	....	77.6	....	96	18,19,20	54	29	36	3.02	.....	.67	9	6	24	1	.....	
Larchwood	Lyon	.....	....	75.9	.....	96	3	54	25, 28	32	2.91	.....	1.30	7	22	9	0	SE	
Larrabee	Cherokee	....	8	76.0	*4.8	92	2, 20	55	25, 27, 28	31	2 23	— .96	.90	9	11	20	0	SW	
Le Mars	Plymouth	1,221	...	76.0	.....	95	2	55	13	31	2.85	.....	.78	8	16	11	4	S	23
New Hampton (b)	Chickasaw	1,166	....	76.7	.....	93	2, 5, 20	56	30	31	2.37	... .	.92	7	..	....	....	SW	
Northwood	Worth	1,210	....	75.3	.....	91	2,18,20	56	25	30	3.34	...	1.39	9	15	12	4	SW	
Osage	Mitchell	1,178	8	74.2	*8.1	90	2,6,7,9	54	28, 29	29	3.23	* .49	1.08	10	10	13	8	S	8, 10, 11, 12, 14, 15, 17, 20, 22, 23, 24
Plover	Pocahontas	.....	...	75.8	.....	95	20	54	26, 28	32	2.40	.....	.74	10	23	5	3	S	
Primghar	O'Brien	.....	..	77 4	.....	94	2	60	24	26	1.85	.....	.80	3	24	0	7	SW	
Ridgeway	Winneshiek	..	....	78.5	....	98	2	62	25,28,29	28	2.11	.....	.51	11	21	10	0	S	1, 11, 12, 14, 15, 17, 20, 23, 24, 25
Ruthven	Palo Alto	.....	....	76.0	.....	94	2, 3	48	13	38	4.51	.....	1.55	9	23	5	3	SW	
Sheldon	O'Brien	1,406	....	74.4	.....	93	2	44	28	34	1.85	.....	.65	8	15	4	12	S	
Sibley	Osceola	1,506	6	75.0	*7.4	98	2	51	24	36	6 29	*4.26	2.60	12	14	15	2	....	
Sioux Center	Sioux	..	....	75.8	..	98	2	56	25	34	3.20	...	1.05	9	18	8	5	S	14, 16, 21
Spirit Lake	Dickinson	..	5	77.3	*5.6	97	20	55	28	32	4.31	*1.66	1.25	6	17	13	1	SW	
Storm Lake	Buena Vista	..	10	75.4	.....	91	20	58	13	28	4.58	*1.92	2.04	11	20	8	3	SW	11, 15, 23, 24
Washta	Cherokee	....	...	.....	.....	.....	.....	.....	... .	.....	4.31	.....	1.15	8	17	11	3	S, SW	
Waverly	Bremer	942	....	77.4	.....	93	7,9,19,20	59	28	28	2.33	.....	.95	9	....	....	....	.....	11, 14, 23, 24,
West Bend(a)*	Palo Alto	.....	6	75.4	*6.2	94	2, 20	59	28	.. ..	3.34	* .75	1.09	10	13	13	5	S	
West Union	Fayette	1,105	..	.....	.....	....	.....	.....	.....	.....	1.26	.....	.48	5	21	0	10	SW	
Average	.....	.....	..	76.4	*7.1	94.1	.....	54.8	.....	33	3.18	* .69	....	6	17	11	3	S W	

CENTRAL SECTION.

Amana	Iowa	.	23	77.5	*7.2	93	4,7,9,20	60	27	27	5.35	*1.95	2.42	7	20	9	2	S	11,12,14,15,16,17,22,24
Ames	Story	936	19	76.8	*4.8	94	9	58	26	30	5.46	*2.06	1.10	9	16	15	0	.....	
Baxter	Jasper	...		77.9	.....	95	20	59	25	31	5.06	.....	1.70	9	14	16	1	SE	
Belle Plaine	Benton	840	9	77.0	*7.1	95	5	62	1,25,27,29	27	6.96	*3 93	2.55	7	7	21	3	SE	
Buckingham	Iowa	.....	....	.....	.....	.....	.....	.....	....	.....	3.39	.....	.73	8	18	13	0	.....	
Carroll	Carroll	.....	9	76.7	*6.5	93	20	58	15,25,28	30	9 01	*6.20	2.19	8	25	3	3	.....	13, 16
Cedar Rapids	Linn	744	17	79.4	*7.9	97	5,6,7	62	30	31	4.46	*1.48	1.68	9	24	3	4	S	
Clinton	Clinton	609	8	77.6	*5.5	97	5	58	30	31	5.32	*2.54	2.48	8	17	13	1	S,SW	1, 11
Coon Rapids	Carroll	.....	...	76.7	.....	92	1,2,5,6,7	60	25, 26	26	6.83	.....	1 62	9	21	9	1	S,SW	11, 12, 13, 14, 15, 16, 25
Davenport	Scott	615	27	79.9	*7.0	97	5	63	17	28	4.90	*1.31	1.39	8	12	16	3	SW	11, 12, 13, 14, 15, 17, 22, 23, 24, 25
Delaware	Delaware	1,048	8	75.8	*7.0	93	5, 9	58	26,27,29	29	3.72	* .84	1.13	7	16	15	0	S	
Denison	Crawford	1,192	6	76.4	*5.7	93	20	57	25, 27	31	7 32	*4.32	1.64	9	23	6	2	S	
Des Moines	Polk	867	21	77.7	*5.0	92	5	61	26	27	8.02	*4.61	2.76	9	11	16	4	SW	11, 12, 13, 14, 15, 16, 22, 23, 24
De Soto	Dallas	866	..	78.0	....	95	9	59	1	32	9.30	.....	3.43	10	20	8	3	SW	11, 12, 13, 14, 15, 16, 22, 23, 24, 25
Dubuque	Dubuque	655	26	78 0	*6.3	95	5	59	29	27	3.35	* .29	.98	8	16	13	2	S	1, 11, 12, 14, 15, 20, 23, 24
Fort Dodge	Webster	..	....	76.5	.....	93	18, 20	55	26	35	6 87	.....	1.72	7	20	11	0	SW	24
Galva	Ida	...	6	76.6	*6.6	92	2,7,10,20	57	24	29	6.16	*3.26	1.51	9	11	14	6	SW	
Gilman	Marshall	1,035	....	...	.....	...	.....	.....	.....	.....	4.85	.....	1.45	7	23	6	2	S	
Grinnell (near)	Poweshiek	.....	....	77.0	.....	95	5	62	26, 27	28	7.55	.....	2.13	8	18	7	6	SW	5, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 23
Grundy Center	Grundy	966	8	77.2	*7.4	92	5,9,18,20	58	25, 26	29	3 85	* .86	1.23	9	19	11	1	SW	24
Guthrie Center(a)	Guthrie	1,269	....	78.2	.....	100	18	53	1	38	6.52	.....	2.20	9	19	11	1	S	
Harlan (a)	Shelby	....	....	75.6	.....	94	14	56	26	33	7.99	.....	2.70	7	9	20	2	S	11,12,13,14,15,24,27
Independence	Buchanan	921	37	75.6	*7.5	92	5, 18	58	30	30	3.12	— .02	1.10	6	22	9	0	SW	
Iowa City	Johnson	644	9	78.6	*7.9	99	5	62	3,17,29,30	32	6.27	*3.92	2.25	8	15	12	4	S,SW	
Iowa Falls	Hardin	....	6	75.6	*6.6	91	2,5,6,7	57	26	30	4.42	*1.50	1.63	10	21	6	4	SW	
Le Claire	Scott	.....	....	....	.....	.....	.....	.....	.....	.....	4.37	.....	1.44	11	....	....	....	.....	
Logan	Harrison	928	34	77.5	*5.4	97	7	58	13, 14	32	4.63	*.75	1.60	9	17	10	4	S	
Maquoketa	Jackson	....	6	76 3	*4 7	95	5	57	30	33	4.43	*1.65	.77	9	22	9	0	S,SW	
Marshalltown	Marshall	898	7	78.3	*7.7	95	4,9,18,20	60	26, 29	32	7.31	*4.69	2.19	9	23	5	3	SW	12, 13, 14, 15, 17, 23
Monticello	Jones	800	45	76.3	*6.3	96	5	52	1	41	2.97	— .69	.70	8	17	13	1	SW	
Mt. Vernon (Hub.)	Linn	....	....	78.1	....	96	5	60	29	33	4 06	.....	1.44	9	24	5	2	S	
Newton	Jasper	958	12	76.9	*5.1	93	4,6,9,20	60	26	28	6 11	*2.56	1.48	8	17	14	0	SE	
Odebolt	Sac	....	....	77.4	.....	95	1,2,7,20	56	25	36	6.37	.....	1.75	9	27	4	0	.....	
Ogden	Boone	1,109	..	76.4	.....	92	2	57	26	28	8.34	.....	1.85	10	24	1	6	SE	
Onawa	Monona	....	....	77.3	....	94	3	59	25	28	7.49	.....	1.80	8	22	8	1	SE	
Rockwell City	Calhoun	1,219	..	76.6	.....	93	2	58	25, 28	31	6.53	.....	2.50	8	23	4	4	.....	
Sac City	Sac	900	20	76.4	*3.9	93	20	57	25	30	6.46	*3.14	2.35	9	22	7	2	SE	
Scranton	Greene	....	...	76.3	.....	93	6	59	26	27	10.43	.....	4.16	7	22	3	6	S	
Sioux City	Woodbury	1,122	10	77.0	*5 0	97	2	58	13	28	3 56	* .51	1.06	9	18	10	3	S	
Toledo	Tama	.....	5	77.5	*6.1	96	9	50	2	42	6.89	*4.33	2.93	7	21	7	3	SW	
Vinton*	Benton	800	9	77.0	*7.4	93	9, 18	62	29	.....	2.74	* .50	.80	7	29	1	1	SW	11, 12, 13, 14, 16, 17, 23
Waterloo	Black Hawk	862	20	77.5	*3.1	95	18,19,20	57	29	33	3.48	—.11	1.10	9	22	8	1	S	14, 24
Wilton Junction	Muscatine	.....	...	79.3	....	98	5,6,7,9	60	29	32	7 40	.....	2.83	10	18	11	2	SW	14, 15, 17, 22, 23, 24
West Branch	Cedar	..	....	78.0	.....	100	5	56	3, 27	39	7.49	.....	2.90	9	19	10	2	SW	
Whitten	Hardin	....	....	76.1	.....	96	5	60	24,26,27	29	4.74	.....	1.40	7	21	9	1	SW	11, 12, 15, 16, 17, 23
Average	.....	....	....	77.2	*6.2	94 7	.....	58.3	.....	31	5.82	*2.17	.....	6	19	10	2	SW	

*Is used to indicate the plus sign (+)

CLIMATOLOGICAL DATA FOR AUGUST, 1900—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., INCHES.			Number rainy days.	SKY.			Prevailing direction of wind.	Dates of thunder-storms.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.		Number clear days.	Number partly cloudy days.	Number cloudy days.		
ton (a)	Union	....	....	77.1	....	96	14	56	26	32	4.59	... .	1.17	7	15	14	2	SW	11, 13, 14, 16, 23, 24
bia	Monroe	945	....	77.8	....	95	5,8,9,11	58	26	31	4.24	....	1.97	7	17	8	6	SE	
lantic	Cass	....	8	77.0	*6.4	94	12	54	26	35	4.81	*2.15	1.88	9	13	14	4	S	11, 12, 14, 15, 16, 22, 23, 24
tavia	Jefferson	640	....	.....	.....	.....	.....	.....	.....	.....	2.40	.....	.70	5	....	....	....	.....	
dford	Taylor	....	....	78.5	....	99	20	53	26	40	3.78	.....	1.15	8	15	16	0	SW	15
lknap	Davis	857	....	79.1	....	95	3,5 21	61	26	29	4.54	.....	1.77	6	27	4	0	S	
naparte	Van Buren	....	8	80.8	*6.7	100	5	62	27	32	3.61	— .28	1.30	6	....	....	....	.....	
ssey	Marion	....	....	.....	.....	.....	.....	.....	.....	.....	7.92	.....	3.75	6	....	....	....	.....	
ariton	Lucas	1,030	....	78.1	.....	94	20	58	26	29	4.85	.....	1.70	9	17	13	1	SW	12, 15, 16, 24
illicothe	Wapello	645	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	....	....	....	.....	
arinda	Page	1,069	9	78.2	*4.4	98	20	56	26	37	5.67	*2.32	1.55	7	22	8	1	S	
llege Spr'gs	Page	....	8	77.7	*4.2	96	5	56	26	30	8.07	*5.38	3 00	8	18	13	0	SE	
rning	Adams	1,127	7	77.6	*5.6	93	12,14,20	55	26	30	3.14	* .01	1.60	4	20	8	3	SW	
uncil Bluffs	Pot'wat'mie	989	....	79.1	....	96	17, 20	60	25	29	5.32	.....	1.64	8	22	5	4	S	
awfordsville	Washington	....	....	.....	.....	.....	.....	.....	.....	.....	8.38	.....	3.00	6	25	6	0	SW	13, 15, 23
umberland	Cass	....	....	....	....	....	.....	.....	.....	.....	3.59	.....	1.25	9	22	4	5	S	
anville	Des Moines	715	....	.....	.....	.....	.....	.....	.....	.....	3.45	.....	.75	7	24	7	0	.....	
ldon	Wapello	....	....	80.0	....	99	5	60	1	36	5.46	.....	2.20	7	29	2	0	S	12, 15, 16, 23
merson	Mills	....	....	.....	.....	.....	.....	.....	.....	.....	3.11	.....	1.00	7	23	5	3	.....	
t. Madison	Lee	516	51	.....	.....	.....	.....	.....	.....	.....	3.82	* .17	2.10	6	9	19	3	SW	11, 12, 14, 15, 16, 31
lenwood	Mills	979	29	79.6	*7.5	95	20	63	12, 15	27	3.95	* .58	1.26	6	8	22	1	SW	
lamburg	Fremont	912	....	.....	.....	.....	.....	.....	.....	.....	6.19	.....	2.00	7	14	6	11	SW	
ledrick	Keokuk	....	....	77.4	....	97	8	58	26, 27	32	5.48	.....	2.32	7	21	8	2	S	
lopeville	Clarke	....	....	77.1	.....	93	14	60	26	24	2.83	.....	1.27	6	14	16	1	S	
ndianola	Warren	....	....	77.4	.....	93	5,7,9,20	59	26	28	7.92	.....	4.49	5	15	14	2	SW	11, 12, 13, 15, 21, 23, 24
eokuk	Lee	618	28	82.2	*7.0	98	18	66	26, 27	25	4.21	*1 27	2.94	7	18	13	0	SW	
eosauqua	Van Buren	....	7	81.4	*7.3	97	5,9,12,20	64	30	27	3.34	* .01	2.43	5	....	....	....	.....	
noxville	Marion	....	6	78.2	*5.2	95	1, 5, 7	59	26, 27	30	9.78	*5.88	3.36	7	19	7	5	SW	
acona	Warren	....	....	.....	.....	.....	.....	.....	.....	.....	5.25	.....	3.00	9	10	13	8	... .	
enox	Taylor	....	....	76.5	....	91	20	58	26	24	3.78	.....	1.46	6	24	6	1	S	15, 16
Moear	Lee	....	....	.....	.....	99	7	....	.....	.....	4 49	.....	2.84	5	19	9	3	SW	
Mt. Ayr	Ringgold	1,236	6	78.1	*5.1	96	12	57	26	34	3.12	* .11	1.59	7	13	18	0	S	
Mt. Pleasant	Henry	725	..	78.7	.....	97	11	57	29	34	3.25	.....	.93	7	18	13	0	SW	
Omaha (Neb.)	Douglas	1,113	25	79.0	*5 3	94	20	62	24	25	3.52	* .18	1.06	9	18	12	1	SE	
Osceola	Clarke	1,123	....	78.0	....	94	7,14,18,20	60	26	29	5.29	.....	3.04	4	....	....	....	S	
Oskaloosa	Mahaska	850	16	78.3	*7.2	96	5	60	26, 27	31	5.55	*2.82	3.25	7	21	6	4	SW	
Ottumwa	Wapello	630	8	81.8	*8.0	97	20	61	24	23	6.05	*2 70	2.00	7	18	9	4	SE	
Ovid	Wayne	....	6	78.1	*4 4	96	21	58	26	31	3.39	— .47	1 45	5	21	5	5	SE	11, 12, 13, 14, 15, 16, 21, 23, 24, 25
Pacific Junction	Mills	960	....	76 7	.....	92	20	56	26	28	3.81	.....	1.30	8	16	15	0	S	24
Pella	Marion	....	....	77.4	.....	96	8	57	15	35	5.74	.....	2.10	5	18	10	3	SW	
Red Oak	Montgomery	1,033	....	78.4	....	95	20	58	26	32	3.39	.....	1.05	7	19	4	8	S	
Sigourney	Keokuk	....	....	79.9	.....	99	5	59	26	34	4.02	.....	1.07	6	19	12	0	SW	
Stuart	Guthrie	....	....	77.6	.....	98	2	55	15	31	6.50	.....	1.45	6	22	3	6	S	
Thurman	Fremont	....	....	77.2	....	94	20	58	1, 26	31	7.32	.....	3.16	8	19	8	4	SE	15
Villisca	Montgomery	1,058	6	77.7	*6.7	97	5	55	18, 28	36	4.45	* .03	1.34	8	16	11	4	SW	12,14,16,21,22,23,27,31
Wapello (a)	Louisa	578	....	82.1	.....	103	3, 5	65	27	36	5.69	.....	1.57	8	....	....	....	SW	
Washington	Washington	....	9	78.2	*5.1	98	5	60	27	31	7.22	*4.66	1.93	7	...	....	....	SW	24
Winterset	Madison	....	8	78.1	*6.7	94	4,5,7,9,11 19,20,21	58	26	30	5.53	*1.46	2.75	6	....	....	....	.....	
Woodburn	Clarke	....	....	.....	.....	....	.....	.....	.....	.....	5.91	.....	3 47	6	22	8	1	.....	
Average		....	....	78.5	*6.0	96.0	.....	58.7	.. ..	30.8	4.95	*1.61	.....	5	18	10	3	SW	
Av. for the state		....	....	77.4	*6.4	94.9	....	57.3	.....	31.6	4.65	*1.49	.....	6	18	10	3	SW	

§Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determine from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

*Is used to indicate the plus sign (+).

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR AUGUST, 1900.

STATIONS.		DATE.																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Means.
Afton	Max.	92	92	93	95	95	95	94	94	95	93	95	94	91	96	85	77	93	92	93	94	91	87	94	80	85	85	82	86	90	92	..	
	Min.	64	60	62	65	67	67	67	67	69	67	64	62	62	65	59	63	65	64	65	66	69	61	64	60	59	56	61	60	61	62	64	
Albia	Max.	91	91	92	94	95	93	94	95	95	93	95	92	88	94	85	89	93	93	94	89	92	90	93	82	85	83	82	87	86	88	90	
	Min.	60	62	65	68	68	69	71	69	68	65	69	65	63	64	63	62	67	70	72	72	62	67	60	61	62	58	61	62	62	63	67	
Alta	Max.	90	92	89	89	88	89	90	84	87	89	82	86	86	86	82	74	84	89	89	91	82	82	85	73	83	84	79	80	85	86	86	
	Min.	60	67	62	68	70	72	70	67	70	68	67	59	58	57	61	62	62	67	68	70	70	64	63	60	56	60	64	68	62	62	67	
Amana	Max.	90	91	91	93	93	92	93	92	93	91	91	90	88	81	81	81	88	91	91	93	89	86	90	81	84	83	85	86	86	87	88	
	Min.	66	64	64	67	68	69	71	70	72	66	69	64	66	66	66	67	65	70	73	73	72	68	65	66	64	63	60	63	61	62	65	
Ames	Max.	91	93	91	92	93	93	93	89	94	92	85	89	88	85	84	79	89	93	93	92	86	80	87	87	86	87	82	85	86	86	88	
	Min.	61	68	62	62	66	65	67	70	66	64	68	60	62	64	63	65	67	70	71	73	71	72	69	61	59	58	61	61	62	68	65	
Atlantic	Max.	92	93	91	92	92	93	92	89	92	93	93	94	91	93	88	75	92	92	92	92	91	84	88	78	87	88	81	87	90	90	90	
	Min.	57	68	62	70	70	71	70	69	71	70	68	60	60	63	61	65	67	70	70	74	66	61	63	59	56	54	61	57	59	61	67	
Bancroft	Max.	92	93	90	91	91	92	92	89	91	91	83	85	85	85	84	83	86	91	91	93	87	85	86	79	86	82	74	80	86	86	87	
	Min.	60	69	63	63	71	70	71	68	71	70	65	61	61	61	65	66	66	71	71	71	65	71	65	61	56	60	61	48	50	47	63	
Bedford	Max.	95	95	94	95	96	95	95	92	95	95	95	95	94	97	88	88	95	95	97	99	98	83	94	82	82	90	88	95	95	93	93	
	Min.	55	65	62	65	67	65	67	68	68	65	67	63	63	62	60	62	67	67	67	70	67	63	62	62	58	53	58	60	60	62	64	
Belknap	Max.	93	94	95	94	95	94	94	94	94	92	93	90	89	94	85	82	92	93	93	94	95	86	90	82	87	85	81	84	87	90	91	
	Min.	64	68	68	70	70	75	71	71	70	68	70	68	65	68	65	65	65	72	73	74	72	70	69	63	66	61	62	65	64	64	67	
B'l'e Plain.	Max.	89	91	90	94	95	94	94	93	94	93	92	87	85	78	73	78	86	90	91	92	91	86	89	84	85	82	82	86	86	85	88	
	Min.	62	65	63	68	69	69	70	71	72	66	69	64	64	63	65	65	64	70	71	72	72	69	66	64	62	63	62	63	62	63	67	
Benaparte	Max	97	97	97	98	00	99	97	96	93	97	98	98	92	92	85	84	95	98	97	98	97	93	95	85	87	84	85	88	87	92	93	
	Min.	65	68	66	69	70	72	73	68	70	67	71	68	67	69	66	66	69	70	73	72	72	71	68	66	68	65	62	65	64	65	67	
Britt	Max.	89	91	90	91	90	91	91	92	91	91	88	90	86	86	85	82	90	90	90	92	85	86	86	77	86	84	78	88	86	88	88	
	Min.	61	65	50	65	68	68	68	67	70	69	64	61	59	61	64	65	66	69	70	69	65	67	61	61	54	55	56	57	54	58	56	
Carroll	Max.	92	91	89	91	89	89	91	87	92	91	89	91	89	87	88	76	89	92	91	93	89	81	88	78	88	88	84	87	89	88	89	
	Min.	62	67	65	68	71	72	71	67	67	71	69	61	60	61	58	60	62	67	71	71	70	65	75	60	58	59	63	58	62	62	65	
Cedar Rap.	Max.	94	91	95	95	97	97	97	96	94	96	95	94	92	89	83	83	82	92	95	95	95	87	87	91	81	87	84	84	85	88	89	
	Min.	66	67	69	64	70	71	72	73	73	75	70	72	66	67	64	67	67	67	71	74	72	75	67	66	65	64	65	65	64	62	63	
Chariton	Max.	90	89	90	92	93	93	93	92	93	92	93	93	89	93	86	77	93	92	92	94	93	84	92	80	82	86	80	87	87	89	90	
	Min.	64	68	66	68	69	79	71	69	70	65	67	64	64	66	63	64	78	70	71	73	70	64	67	63	63	58	62	63	63	64	66	
Charles Cy	Max.	90	94	92	96	93	94	94	90	93	93	83	87	85	86	84	80	84	91	91	93	85	82	88	79	85	85	80	84	89	87	90	
	Min.	65	65	62	66	68	68	70	68	70	69	69	65	64	66	66	66	67	71	72	71	70	68	61	62	59	59	60	59	54	63	68	
Clarinda	Max.	96	96	95	95	96	96	96	93	95	95	95	97	93	94	86	87	95	95	94	98	92	87	90	85	82	90	84	89	90	92	87	
	Min.	59	63	60	66	67	68	67	68	68	65	68	62	62	68	62	64	68	66	67	70	70	64	64	60	60	53	60	61	62	63	65	
Clear Lake	Max.	94	94	93	92	92	93	93	93	93	92	86	91	91	91	89	85	86	95	94	95	90	85	93	78	88	90	77	88	91	91	92	
	Min.	64	69	63	62	69	69	68	67	71	70	65	63	64	61	69	65	65	68	72	70	67	68	58	61	59	52	63	54	54	62	64	
Clinton	Max.	85	94	94	96	97	96	96	95	96	95	95	89	87	84	81	83	91	95	93	95	85	88	91	89	86	80	86	88	87	89	91	
	Min.	62	64	63	64	66	67	68	67	67	64	65	67	66	62	66	64	65	69	72	71	70	63	69	65	64	68	60	62	61	58	60	
College Sps	Max.	91	91	91	94	96	95	94	93	93	92	92	94	90	93	90	87	93	91	91	95	91	86	89	80	81	86	80	89	89	90	89	
	Min	61	64	65	67	67	70	68	69	69	65	70	67	64	65	62	62	70	68	68	70	65	62	64	60	60	56	62	63	64	65	68	
Coon Rap	Max.	92	92	91	91	92	92	92	88	91	91	86	89	84	84	80	74	88	90	90	89	85	80	84	75	81	85	83	81	85	86	87	
	Min.	68	70	68	72	74	73	73	70	71	73	69	63	61	63	61	62	65	72	73	75	71	66	63	61	60	60	63	63	61	63	66	
Corning	Max.	91	89	91	91	92	92	91	89	92	91	90	93	90	93	89	76	89	89	70	93	90	83	89	78	80	85	78	84	87	89	89	
	Min.	64	73	67	67	70	69	71	71	72	69	68	67	63	67	61	65	67	78	70	75	65	64	65	61	61	55	63	60	62	67	65	
Co. Bluffs	Max.	93	95	91	93	94	93	93	90	93	93	89	94	91	94	87	77	96	94	94	96	89	91	90	80	85	88	86	89	91	93	90	
	Min.	67	66	69	72	74	71	70	69	70	70	66	65	66	65	66	68	69	70	73	71	65	68	61	62	60	64	63	62	68	70	68	
Cresco	Max.	89	95	92	94	94	94	95	95	94	91	85	88	87	85	82	84	85	95	95	94	87	85	90	81	84	87	86	83	88	89	92	
	Min.	65	67	65	66	67	67	68	68	71	68	67	64	63	65	67	63	66	69	71	71	69	65	63	63	59	58	58	56	53	63	63	
Davenp'rt.	Max.	89	95	94	96	97	95	95	94	95	93	92	89	86	87	82	80	91	95	93	95	89	88	90	85	87	79	84	87	86	88	89	
	Min.	67	71	67	74	76	73	75	75	74	74	68	68	67	63	69	68	63	75	77	76	74	67	71	68	68	69	66	68	67	65	66	
Decorah	Max.	84	95	92	96	95	96	96	95	99	97	90	91	97	97	94	93	97	95	95	96	89	88	91	84	87	89	89	88	89	90	92	
	Min.	61	64	62	60	65	68	66	67	73	70	67	62	61	62	65	62	64	63	70	68	67	64	60	60	58	58	55	50	49	53	60	
Delaware	Max.	84	90	89	92	93	92	92	91	93	91	90	83	86	79	77	78	85	91	91	92	84	82	87	78	84	81	82	81	85	86	87	
	Min.	61	66	60	69	70	71	70	70	71	69	69	65	64	62	65	64	65	68	72	73	71	64	65	61	61	58	58	58	65	58	61	
Denison	Max.	91	92	90	91	91	91	92	88	91	92	85	92	85	88	85	77	88	90	90	93	87	83	85	77	83	84	82	84	86	88	88	
	Min.	65	64	65	70	71	73	71	71	72	69	67	61	59	63	61	63	72	70	70	73	66	65	60	61	57	59	57	60	60	64	70	
Des Moines	Max.	90	91	90	91	92	91	91	88	91	90	88	91	85	79	84	77	90	92	91	92	90	82	88	80	84	88	80	85	87	87	89	
	Min.	65	70	67	71	71	72	72	72	73	71	68	64	63	63	64	64	68	73	74	76	74	69	64	64	64	61	61	65	66	66	68	
De Soto	Max.	91	92	91	92	93	94	93	90	95	92	93	90	85	82	83	77	94	93	89	92	89	85	89	78	86	82	81	82	87	87	87	
	Min.	59	65	66	67	70	69	69	69	77	73	69	66	64	65	62	67	68	72	75	77	74	69	68	66	64	61	63	63	65	68	68	
Dows	Max.	89	92	90	91	91	91	90	88	90	90	85	89	89	87	84	80	86	91	91	91	88	84	88	79	84	84	77	86	87	87	89	
	Min.	60	69	60	60	67	67	68	68	70	67	68	60	59	62	63	65	66	70	71	71	66	68	62	62	58	58	59	58	58	62	65	
Dubuque	Max.	83	88	91	93	95	92	92	91	92	92	90	86	89	85	82	79	87	93	93	94	83	83	88	81	85	83	84	85	86	87	88	
	Min.	61	70	65	72	74	74	75	74	75	72	71	66	64	65	67	67	67	71	76	76	69	66	64	64	66	69	63	66	59	63	64	
Eldon	Max.	96	97	95	98	99	98	96	95	97	96	95	95	90	92	86	85	95	96	97	98	97	90	93	85	88	85	84	89	91	94	95	
	Min.	60	64	62	70	70	71	73	70	70	67	69	63	65	68	65	65	69	70	73	72	71	70	65	65	65	63	61	65	64	62	65	
Elkader	Max	89	95	94	96	97	95	96	96	96	95	94	91	93	90	88	85	87	93	96	98	88	85	92	83	88	89	87	90	92	92	93	
	Min.	63	66	65	64	66	71	67	69	74	70	69	67	63	65	68	64	65	67	71	72	68	64	66	62	62	62	59	63	54	58	59	
Estherville	Max.	89	91	91	90	89	89	93	89	91	92	82	82	87	87	87	82	85	90	90	92	85	84	84	74	80	86	84	86	87	87	88	
	Min.	60	69	66	70	72	72	71	68	71	70	65	59	60	62	64	64	64	71	72	70	64	63	58	60	60	58	54	51	53	60	59	
Fonda	Max.	..	..	..	..	.	..	..	..	..	..	..	91	92	93	91	90	81	80	91	93	92	92	86	85	87	89	90	89	88	89	88	
	Min.	..	..	..	..	..	..	..	..	..	..	..	68	70	67	66	68	70	69	72	74	71	72	67	68	70	74	76	74	68	66	67	
Forest City	Max.	88	92	90	90	90	90	90	91	90	90	83	88	86	86	84	80	85	91	90	91	87	82	87	76	84	85	79	84	85	86	88	
	Min.	63	66	62	66	70	67	67	72	70	66	63	62	61	61	61	65	64	69	71	70	67	68	59	61	54	54	61	57	57	60	66	
Ft. Dodge	Max.	91	92	91	92	92	92	92	87	92	92	86	92	91	88	85	81	88	93	91	93	92	85	88	79	85	84	86	86	88	88	89	
	Min.	56	68	64	68	68	70	69	70	70	70	68	60	58	64	62	63	66	70	70	70	67	67	62	61	56	55	57	57	58	62	67	
Galva	Max.	90	92	90	90	90	90	92	87	91	92	87	87	90	89	87	78	87	90	90	92	88	86	78	84	79	82	85	84	87	87	88	
	Min.	61	69	63	70	72	74	72	69	71	70	64	60	79	64	62	64	63	69	71	70	67	60	61	57	59	62	60	59	62	63	69	
Glenwood	Max.	91	94	92	92	93	92	92	91	93	93	93	91	89	91	87	79	92	92	91	95	90	86	88	89	90	89	91	90	92	89	88	
	Min.	64	70	68	73	71	72	73	73	73	72	68	63	64	66	63	64	69	74	72	76	65	67	65	67	66	66	68	70	71	68	67	
Greene	Max.	93	94	94	93	94	95	95	94	94	94	88	92	91	90	88	90	88	93	93	94	89	84	92	79	87	89	82	88	91	91	93	
	Min	63	67	61	65	67	67	68	68	71	68	68	64	63	64	65	66	66	69	70	71	69	67	61	61	58	58	59	57	55	61	63	
Grin'l (nr.)	Max.	90	92	92	94	95	94	94	90	94	93	90	85	83	80	78	78	85	91	92	93	86	81	86	80	83	84	81	82	82	87	90	
	Min.	64	67	64	67	71	70	71	71	72	66	70	63	64	65	64	65	64	67	72	72	72	70	66	64	63	62	62	66	64	66	67	
Grundy C'r	Max.	89	91	90	91	92	91	91	90	92	91	90	89	88	85	84	80	86	92	91	92	91	81	86	81	85	85	83	85	89	88	90	
	Min.	76	64	61	65	68	67	69	70	73	66	70	61	61	63	69	64	67	70	72	74	68	67	65	63	58	58	73	73	60	63	63	
Guthrie C'r	Max.	..	95	94	94	96	95	95	93	95	94	93	90	86	84	89	88	90	100	98	97	98	87	83	81	94	85	84	89	94	95	94	
	Min.	53	69	62	69	71	71	70	70	72	71	64	60	61	63	61	64	65	70	71	74	69	65	60	59	56	61	60	60	58	60	67	
Hampton	Max.	92	95	94	94	94	95	94	91	93	92	82	92	92	90	89	83	89	94	94	94	90	82	94	80	87	89	78	91	91	90	92	
	Min.	65	69	63	66	69	69	69	69	72	69	69	63	62	64	64	67	66	70	72	72	69	69	64	62	60	59	62	58	58	64	64	
Harlan	Max.	90	91	90	91	90	91	91	90	91	91	88	91	89	94	85	82	91	90	90	91	89	87	87	77	83	85	81	85	88	90	89	
	Min.	57	60	59	65	66	66	68	65	69	66	63	60	59	..	62	62	66	65	67	65	69	63	63	59	57	56	60	63	61	63	66	
Hedrick	Max.	91	92	92	95	95	94	95	97	95	94	95	92	85	88	82	83	92	93	93	93	92	90	92	83	87	82	85	86	87	87	89	
	Min.	60	60	63	66	66	67	59	74	67	64	66	64	63	66	63	64	67	67	70	70	70	68	65	63	62	58	58	63	62	60	63	
Hopeville	Max.	89	89	89	91	92	91	91	87	91	91	91	92	88	93	82	74	90	90	91	92	90	84	90	80	80	84	79	84	86	88	88	
	Min.	66	69	64	68	69	68	69	69	72	70	68	66	64	68	62	63	68	69	70	74	69	64	67	62	63	60	63	65	65	64	66	
Humboldt	Max.	91	94	92	93	93	93	93	86	93	92	88	92	86	86	83	70	86	92	92	93	87	84	88	84	84	84	80	83	87	88	88	
	Min.	61	70	64	69	72	71	71	70	71	72	70	62	60	64	63	63	66	70	72	73	67	70	72	78	66	58	62	57	61	66	64	
In'pend'ce.	Max.	86	90	89	91	92	91	90	90	91	91	88	88	86	84	82	79	87	92	90	91	87	81	87	79	83	82	81	82	82	86	88	
	Min.	65	66	59	66	66	68	67	68	69	65	70	64	64	62	65	61	66	69	70	72	69	65	63	60	61	61	60	61	60	58	63	
Indianola	Max.	91	90	91	92	93	93	93	89	93	92	90	91	87	84	86	76	90	91	91	93	90	81	89	81	82	86	81	87	87	87	89	
	Min.	63	62	66	69	69	70	71	70	72	69	67	63	63	64	63	63	68	72	73	75	72	65	67	63	62	59	64	63	65	65	66	
Iowa City	Max.	92	92	94	96	99	96	95	95	96	95	94	93	89	86	84	84	93	96	93	94	92	90	91	81	87	83	85	88	89	90	91	
	Min.	67	66	62	66	68	68	72	69	72	65	67	66	63	65	66	67	62	69	73	71	73	66	66	64	64	63	62	64	62	62	63	
Iowa Falls	Max.	89	91	89	90	91	91	91	90	90	90	82	87	87	87	85	81	86	90	90	90	88	83	86	77	84	83	80	85	86	87	88	
	Min.	59	68	60	64	66	67	67	69	71	68	68	59	59	60	64	65	66	69	72	71	68	69	64	63	60	57	59	59	57	63	64	
Keokuk	Max.	92	97	96	96	97	96	95	94	95	95	94	95	90	93	86	86	96	98	96	96	95	92	93	90	87	82	85	88	89	91	92	
	Min.	69	74	73	76	75	72	77	75	76	76	76	70	68	68	69	66	72	78	76	78	76	72	73	69	68	66	66	70	67	67	70	
Keosauqua	Max.	94	94	94	96	97	97	96	93	97	96	94	97	93	93	85	86	93	96	96	97	94	90	94	86	86	86	84	87	90	92	92	
	Min.	67	69	73	71	73	73	76	72	73	71	73	70	69	78	67	68	71	74	75	74	75	74	71	67	68	66	66	66	65	64	68	
Knoxville	Max.	95	92	93	93	95	93	95	93	94	93	93	92	88	87	85	80	93	93	92	93	91	82	90	81	84	85	82	86	87	87	89	
	Min.	65	73	75	76	78	69	69	69	70	69	69	65	62	64	63	62	67	69	70	72	73	68	65	62	60	59	59	63	62	62	62	
Lansing	Max.	80	90	92	93	94	94	94	94	95	93	90	90	90	90	85	84	88	96	96	96	89	87	90	84	88	89	89	86	90	91	90	
	Min	60	68	65	63	68	62	69	68	73	72	75	65	62	66	65	64	64	70	70	70	71	65	62	64	64	61	60	60	54	57	60	
Larchwood	Max.	85	95	96	92	89	88	91	84	91	91	87	79	87	..	88	80	85	91	91	94	90	88	80	77	83	88	80	81	87	87	88	
	Min.	62	63	64	70	71	72	69	71	72	67	69	62	56	59	65	62	64	64	69	79	67	65	67	59	54	69	64	54	72	65	69	

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR AUGUST, 1900—CONTINUED.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean.
	Max.	89	92	90	90	89	91	90	88	89	89	87	83	90	91	88	82	87	90	89	92	90	89	88	85	83	85	80	83	86	89	89	87.8
abee...	Min.	62	69	62	69	73	72	72	68	71	69	67	60	65	60	61	67	63	68	68	70	65	63	60	58	55	57	55	55	61	61	60	64 1
	Max.	92	95	91	91	90	90	91	86	90	91	84	80	86	85	84	79	86	90	90	92	85	85	87	76	85	86	82	82	86	87	87	86.8
dars....	Min.	62	67	65	71	73	71	72	70	71	69	69	61	55	61	65	63	63	70	70	70	67	64	61	60	56	61	64	58	62	62	69	65 2
	Max.	88	88	87	89	90	90	89	87	90	89	90	90	87	90	81	77	88	88	88	91	88	81	88	80	77	82	78	83	85	86	87	82 6
ox.....	Min.	65	68	65	65	69	69	71	71	71	68	69	64	64	67	60	64	68	69	71	73	68	65	67	61	71	58	63	64	64	67	91	66.8
	Max.	95	94	95	95	93	95	97	94	93	95	93	94	90	91	87	76	90	93	94	93	89	90	90	76	78	84	82	85	88	90	91	90.0
an.....	Min.	68	65	66	68	70	68	82	70	66	68	68	65	62	64	61	62	64	63	65	70	68	67	63	58	59	60	54	65	66	60	65	65.0
	Max.	85	91	91	93	95	92	93	91	90	92	87	90	89	92	83	81	90	95	94	93	89	85	87	82	85	81	84	88	89	89	61	88.5
uoketa	Min.	60	63	62	60	64	68	67	66	67	64	66	65	65	62	65	64	65	67	72	70	69	64	67	65	61	63	59	61	58	57	92	64.1
	Max	92	94	93	95	95	95	94	94	95	94	94	92	90	86	85	82	91	95	94	95	93	83	89	84	87	87	85	88	89	62	64	90.7
sh'l't'n	Min.	62	67	61	66	69	69	70	71	72	67	70	63	62	64	65	64	67	70	73	74	70	69	66	62	61	60	61	62	60	64	91	65.9
	Max.	93	93	92	93	96	95	94	94	95	95	94	89	90	89	88	89	95	94	93	90	88	89	90	88	87	86	86	89	88	90	91	91.1
nticello.	Min.	52	65	64	65	65	63	62	63	65	62	63	65	65	62	63	60	68	65	60	65	62	65	63	60	58	58	56	56	54	58	54	61 5
	Max.	94	94	96	95	91	98	99	92	89	92	88	91	74	69	86	86	93	95	91	94	96	94	94	90	86	82	82	85	82	85	95	89.6
par	Min.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
	Max.	92	92	92	92	95	93	95	91	95	95	93	96	91	94	86	84	92	91	92	93	94	84	93	80	81	87	82	87	91	93	92	90.6
. Ayr.. .	Min.	62	64	63	68	69	69	69	69	70	69	70	68	64	69	62	64	68	68	69	71	68	62	66	61	62	57	62	62	64	64	65	65.6
	Max.	91	93	93	95	96	96	95	95	96	96	97	93	90	90	85	85	93	95	95	94	93	91	92	88	88	85	88	88	88	90	91	91.8
. Ple's'nt	Min.	61	62	59	68	70	70	71	70	69	65	68	66	66	64	65	65	68	68	68	70	68	64	67	62	62	58	62	62	64	64	65	65.6
	Max.	88	93	94	95	96	96	95	94	94	94	93	94	92	87	84	84	92	95	95	94	92	91	89	87	85	84	88	88	88	87	87	91.8
.V.(Hub)	Min.	64	63	61	65	67	67	70	69	69	66	67	63	63	64	64	66	64	66	66	68	66	64	62	61	59	59	60	61	62	62	64	65.1
	Max.	89	93	91	92	92	93	92	92	91	91	86	86	84	86	79	78	84	84	84	86	84	82	82	79	80	84	83	81	81	84	84	87.9
wH'pton	Min	64	66	66	66	66	66	67	67	70	69	67	64	64	63	65	63	65	65	66	66	64	62	62	61	59	59	60	61	61	61	62	65.5
	Max.	90	92	91	93	93	93	93	93	92	92	91	92	90	91	83	82	91	91	91	93	91	89	90	85	84	84	83	84	84	85	87	87.8
wton....	Min.	64	67	63	69	69	69	69	69	68	68	68	70	66	67	63	63	72	72	72	72	70	67	68	64	62	62	60	61	64	64	66	66 0
	Max.	87	91	89	89	88	90	90	90	89	90	90	91	91	91	81	81	91	91	91	91	91	90	91	87	86	86	84	84	85	87	87	85.7
rthwood	Min	64	68	62	65	72	72	71	71	71	71	71	70	69	68	65	65	70	70	70	70	70	67	67	64	63	63	61	61	64	64	67	64.9
	Max.	95	95	94	94	92	92	93	93	94	94	94	94	91	91	83	82	91	91	91	91	91	89	90	86	85	86	84	85	89	90	91	90.4
lebolt	Min.	65	70	64	58	72	72	71	71	71	69	69	68	67	66	63	63	72	72	72	72	72	70	71	67	66	66	64	64	66	62	62	64.3
	Max.	90	92	90	90	91	91	91	91	91	90	90	90	88	88	81	81	91	91	91	91	91	90	91	87	86	86	84	85	89	90	91	87.1
gden.....	Min.	62	66	64	68	68	68	68	68	68	69	67	67	65	62	63	63	70	70	70	70	70	68	68	64	63	63	61	61	63	63	62	65.7
	Max.	90	92	90	90	90	91	91	91	91	91	91	91	89	89	84	84	91	91	91	91	91	91	91	88	87	87	86	86	87	87	87	88 1
maha, N.	Min.	70	72	70	75	90	74	74	74	73	73	73	72	72	71	65	65	72	72	72	72	72	71	71	68	68	68	67	67	68	68	68	70.0
	Max.	92	94	92	92	92	90	92	92	91	91	91	91	88	88	84	84	91	91	91	91	91	91	91	88	87	87	86	86	87	87	87	87.4
nawa.....	Min.	64	70	66	72	88	74	90	73	71	73	71	72	64	64	61	61	70	70	70	70	70	69	69	66	66	66	64	64	66	66	66	67.2
	Max.	86	90	88	88	88	89	94	90	88	90	88	92	86	86	83	82	93	93	93	93	93	92	93	89	87	87	85	86	89	89	89	84.4
sage.....	Min.	63	64	63	64	64	68	67	66	67	64	66	65	63	63	64	64	65	67	67	67	67	65	65	63	61	61	59	61	62	62	64	63.9
	Max.	91	90	90	92	93	93	94	94	93	94	92	92	89	87	85	84	94	94	94	95	94	93	92	90	89	89	87	88	89	89	89	89.4
sceola	Min.	66	69	64	67	67	69	70	71	71	67	68	68	66	64	64	64	68	68	68	68	68	66	66	64	63	63	61	62	64	64	65	66 5
	Max.	91	91	92	95	95	96	95	95	95	94	94	92	92	90	86	86	92	92	92	92	92	92	92	92	91	91	91	91	92	92	92	89 7
skaloosa..	Min.	60	69	67	69	69	68	70	73	73	72	75	69	69	67	66	66	71	71	71	71	71	68	68	66	65	65	63	64	65	65	65	66.9
	Max.	93	95	94	96	96	96	95	95	94	95	94	94	93	92	91	90	95	95	95	95	95	94	94	92	91	91	89	89	90	90	90	90.8
ttumwa...	Min.	77	80	70	75	93	94	94	93	93	92	93	93	94	92	94	94	92	92	92	94	92	92	92	91	90	90	88	89	90	90	90	73.2
	Max.	93	92	91	94	93	94	94	94	93	93	91	93	94	92	94	94	95	95	95	95	95	94	94	92	91	91	89	90	91	91	91	90.6
vid	Min.	64	67	64	67	67	68	68	68	68	67	68	68	67	64	67	67	68	68	68	68	68	66	66	64	63	63	61	62	64	64	65	65.6
	Max.	88	89	89	89	90	91	90	90	90	90	90	91	90	89	89	89	91	91	91	91	91	91	91	88	88	88	87	88	88	88	88	88
Pacific Jct.	Min.	64	65	64	64	71	71	72	72	72	71	71	71	69	68	68	68	71	71	71	71	71	69	69	67	66	66	64	64	66	66	66	65 0
	Max.	88	90	92	92	95	92	92	91	91	92	90	90	88	87	86	86	92	92	92	92	92	91	91	89	88	88	86	87	88	88	88	88.2
Pella.....	Min.	63	65	64	64	68	68	69	70	70	70	69	68	67	66	65	65	70	70	70	70	70	68	68	66	65	65	63	64	65	65	65	63 5
	Max.	92	93	90	91	92	92	93	93	93	92	92	92	91	90	88	88	93	93	93	93	93	92	92	90	89	89	87	88	89	89	89	87.6
Plover.....	Min.	60	65	63	65	68	68	70	70	70	69	68	68	66	65	64	64	68	68	68	68	68	66	66	64	63	63	61	62	64	64	65	65.2
	Max.	91	94	91	90	90	90	91	90	90	90	90	90	89	89	87	87	90	90	90	90	90	89	89	87	86	86	84	85	87	87	87	87.8
Primghar ..	Min.	65	68	65	70	70	70	71	72	72	70	70	69	68	68	66	66	70	70	70	70	70	68	68	66	65	65	63	64	66	66	66	66 0
	Max	93	92	92	91	92	92	92	92	92	92	92	93	92	90	90	90	94	94	94	94	94	93	93	91	90	90	88	89	90	90	90	90 4
Red Oak...	Min.	62	67	63	70	71	71	72	70	70	70	69	69	68	67	66	66	72	72	72	72	72	71	71	69	68	68	66	67	68	68	68	68.5
	Max.	88	98	92	94	94	95	94	94	94	95	91	92	90	89	87	87	92	92	92	92	92	89	89	87	86	86	84	85	87	87	87	88.0
Ridgeway..	Min.	64	70	68	69	71	71	70	73	72	77	73	70	69	67	64	64	67	67	67	67	67	66	66	64	63	63	61	62	63	63	63	63 0
	Max.	90	93	91	91	90	92	92	92	89	92	92	92	90	92	87	86	92	92	92	92	92	89	89	87	86	86	84	85	87	87	87	87.9
Rockwell C	Min.	62	68	66	66	66	68	68	69	68	71	71	68	69	68	65	65	69	69	69	69	69	67	67	65	64	64	62	63	64	64	64	64.1
	Max.	91	94	94	92	92	92	90	93	90	91	91	88	88	87	86	86	91	91	91	91	91	89	89	87	86	86	84	85	87	87	87	87.3
Ruthven ..	Min.	61	63	70	68	90	90	90	90	91	91	91	85	85	84	88	88	91	91	91	91	91	90	90	88	87	87	85	86	87	87	87	65.5
	Max.	92	92	90	70	70	72	72	72	71	72	71	69	68	66	65	65	69	69	69	71	71	70	70	68	67	67	65	66	67	67	67	86 4
Sac City....	Min.	65	64	70	91	92	92	93	92	92	92	91	91	88	84	84	83	90	90	90	90	90	87	87	85	85	85	84	84	85	85	85	66.2
	Max.	92	92	91	92	92	92	93	92	92	92	91	91	88	88	84	83	91	91	91	91	91	90	90	86	85	85	84	84	86	86	87	85.1
Scranton ..	Min.	65	70	68	68	90	90	89	89	88	88	90	90	88	84	84	83	90	90	90	90	90	88	88	86	85	85	83	84	86	86	88	63.8
	Max	90	93	90	90	90	90	89	89	88	88	88	88	87	87	86	86	92	92	92	92	92	91	91	88	87	87	85	86	88	88	88	88.0
Sheldon....	Min.	62	67	61	70	70	72	72	72	72	72	72	71	70	70	69	69	70	70	70	70	70	68	68	65	65	65	63	64	65	65	65	62.1
	Max.	94	98	94	93	93	91	92	90	92	92	92	93	92	90	87	87	93	93	93	92	92	92	92	90	89	89	87	88	89	89	89	93.8
Sibley.....	Min.	58	60	61	67	67	70	69	72	72	69	69	69	67	64	64	64	68	68	68	68	68	65	65	63	62	62	60	62	62	62	62	66.0
	Max.	95	95	96	98	98	99	97	98	96	97	97	97	97	97	95	95	97	97	97	97	97	96	96	94	93	93	91	92	93	93	93	86.3
Sigourney..	Min.	62	64	63	67	68	68	69	69	70	70	70	69	69	68	64	64	67	67	67	67	67	65	65	63	62	62	60	61	63	63	63	65.3
	Max.	94	98	93	92	92	90	90	90	90	91	91	91	91	91	87	87	91	91	91	91	91	90	90	87	86	86	85	87	87	87	87	87 0
Sioux Cen.	Min.	64	64	65	71	71	72	72	72	73	71	71	71	70	68	66	66	70	70	70	70	70	68	68	66	64	64	63	63	64	64	64	64.0
	Max.	94	97	91	91	91	90	91	91	91	91	91	91	91	91	89	89	91	91	91	91	91	90	90	88	87	87	85	87	88	88	88	87.6
Sioux City..	Min	68	71	68	70	70	74	74	73	73	72	72	73	72	71	70	70	74	74	74	74	74	73	73	71	70	70	68	69	70	70	70	67.0
	Max.	92	92	90	90	90	89	89	88	89	89	89	89	88	87	86	86	90	90	90	90	90	89	89	87	86	86	84	85	87	87	87	84.1
Spirit L ...	Min.	73	70	70	69	73	73	73	73	73	72	72	72	71	70	69	68	72	72	72	72	72	71	71	69	68	68	67	68	69	69	69	66.7
	Max	83	89	87	86	86	86	87	87	87	87	87	87	86	85	84	84	89	89	89	89	89	88	88	86	85	85	83	84	86	86	86	87.4
Storm L...	Min.	68	70	67	67	67	68	68	68	68	68	68	68	67	66	65	65	68	68	68	68	68	67	67	65	64	64	62	63	64	64	64	67 0
	Max.	89	91	90	90	90	91	91	91	91	91	91	91	90	89	88	88	91	91	91	91	91	90	90	88	87	87	85	86	88	88	88	91.3
Thurman..	Min.	58	68	68	73	73	73	73	74	74	74	74	74	73	72	71	71	74	74	74	74	74	73	73	71	70	70	68	69	70	70	70	63.7
	Max.	92	94	92	94	95	94	95	95	95	95	94	94	93	92	91	91	95	95	95	95	95	94	94	92	91	91	89	90	92	92	92	91.8
Toledo.....	Min.	61	53	50	56	58	58	57	57	58	57	57	57	56	55	54	54	58	58	58	58	58	56	56	54	53	53	51	52	53	53	53	63.6
	Max.	93	94	93	94	97	97	95	95	95	95	94	94	93	92	91	91	95	95	95	95	95	94	94	92	91	91	89	90	92	92	92	93.1
Villisca....	Min	60	62	60	67	65	68	66	66	66	67	67	66	65	64	64	64	67	67	67	67	67	66	66	64	63	63	61	62	63	63	63	71.1
	Max.	102	103	101	103	..	100	99	96	101	99	99	99	95	91	87	87	94	94	94	94	94	93	93	91	90	90	88	89	90	90	90	90 6
Wapello ...	Min.	71	67	68	75	98	97	97	96	96	96	96	95	95	94	91	91	93	93	93	93	93	91	91	89	88	88	86	87	88	88	88	91
	Max.	92	95	95	97	98	97	98	96	96	96	96	96	95	94	93	93	95	95	95	95	95	94	94	92	91	91	89	90	91	91	91	65 8
Washingt'n	Min.	62	64	64	68	68	68	68	68	68	68	70	70	70	69	68	68	70	70	70	70	70	68	68	66	65	65	63	64	65	65	65	89.6
	Max.	87	92	91	93	93	93	93	93	93	93	94	94	93	92	91	91	94	94	94	94	94	93	93	91	90	90	88	89	90	90	90	65 4
Waterloo...	Min.	65	64	61	66	66	66	66	66	66	68	71	66	65	65	64	64	67	67	67	67	67	66	66	64	63	63	61	62	63	63	63	88.0
	Max.	88	92	90	92	92	92	93	93	93	91	93	92	92	88	88	88	92	92	92	92	92	91	91	89	88	88	86	87	89	89	89	66.9
Waverly...	Min.	65	66	64	67	69	69	70	71	71	71	72	72	70	70	68	68	71	71	71	71	71	70	70	68	67	67	66	66	67	67	67	93 1
	Max.	94	92	95	98	100	98	99	98	98	98	99	98	94	93	93	93	96	96	96	96	96	95	95	93	92	92	90	91	92	92	92	62 9
W. Branch.	Min.	58	59	56	62	64	66	70	70	70	70	70	70	67	66	65	65	68	68	68	68	68	66	66	64	63	63	61	62	64	64	64	87.5
	Max.	90	92	91	93	96	93	93	91	91	91	91	92	90	88	86	86	90	90	90	90	90	88	88	86	85	85	83	84	86	86	86	64.7
Whitten ...	Min.	63	65	62	66	67	67	67	68	68	70	70	70	68	67	65	65	69	69	69	69	69	68	68	66	65	65	63	64	65	65	65	91.8
	Max.	90	92	91	93	96	93	93	91	91	91	91	92	90	89	88	88	92	92	92	92	92	91	91	89	88	88	86	87	89	89	89	66.8
Wilton Jc..	Min.	63	65	62	66	67	67	67	68	68	70	70	70	68	67	65	65	69	69	69	69	69	68	68	66	65	65	63	64	65	65	65	90.3
	Max.	90	95	95	97	98	98	98	98	98	97	97	97	96	95	94	94	97	97	97	97	97	96	96	94	93	93	91	92	93	93	93	65.9
	Min.	68	63	66	67	70	68	68	68	68	69	69	68	67	66	65	65	68	68	68	68	68	67	67	65	64	64	62	63	64	64	64	...
Winterset .	Max.	93	92	93	94	94	94	94	94	94	94	94	94	93	92	91	91	94	94	94	94	94	93	93	91	90	90	88	89	90	90	90	....
	Min.	63	68	65	68	69	68	68	68	68	68	68	68	67	66	65	65	68	68	68	68	68	67	67	65	64	64	62	63	64	64	64	....
.....		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

DAILY AND MONTHLY PRECIPITATION FOR AUGUST, 1900.

STATIONS.	DATE.																													Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	....	....	....	....	....	....	....	T	...	..	.36	...	.20	...	1 03	1.17	...	...	....	....	.14	....	....	.99	....	....	....	....	....	..	.70	4.59
Albia	....	..	..	..	....	....	....	...	...	..	.24	.23	....	.08	.63	1.97	..	....	....	....	...	...	.53	.56	....	....	....	....	....	..	....	4.24
Algona	....	....	....	....	..	....	....	....	...	...	1.75	.80	....	.66	.10	...	.30	..	T	..	....	T	....	.80	....	....	....	....	....	..	....	4.41
Alta	....	..	....	....	..	..	....	.20	...	T	T	.10	..	.04	.92	.19	1.26	....	....	....	....	..	....	.92	....	....	.01	....	..	....	....	3.64
Alta (near)	....	.	....	....	..	...	....	.05	..	..	...	.15	..	.04	.54	.24	1.70	...	....	....	....	...	.57	.62	..	....	.03	....	..	....	....	3.94
Amana	....	....	....	..	....	....	..	....	....	..	T	.26	.32	.72	.88	.38	2.42	....	....	....	....	T	..	.37	....	....	....	....	..	....	....	5.35
Ames	....	....	....	....	....		..	T	....	..	.30	.30	.28	.78	.98	.53	1.01	....	..	..	....	.18	....	1.10	....	..	....	....	..	....	....	5.46
Ames (near)	....	..	....	....	...	..	....	T	..	..	.30	1.00	..	1.15	.87	.60	.95	..	....	..	....	.05	....	1.88	..	..	....	....	..	..	....	6.80
Atlantic	..	....	....	....		..	....	..	....	....	.38	.26	....	.35	1.38	.42	....	..	....	....	....	.20	.89	83	....	..	.10	....	..	....	....	4.81
Bancroft	....	..	....	..	..	....	..	T	....	....	.55	1.15	....	.65	....	....	.47	....	....	T	....	T	...	.86	..	..	.10	..	..	..	..	3.78
Batavia	....	..	....	..	..	....	...	..	....	....	....	.40	.70	.40	.60	.30	....	....	....	....	....	....	....	....	....	..	....	....	....	....	....	2.40
Bedford	....	....	....	....	....	....	....	....	....	..	.07	..	.20	...	.93	1.15	..	..	....	....	.22	.15	..	.92	....	..	.14	....	..	..	....	3.78
Belknap	....	....	..	..	..	....	....	....	....	..	....	.31	.41	.15	1.50	1.77	....	..	....	....	..	T	....	.40	....	....	....	..	..	..	....	4.54
Belle Plaine	....	..	....	....	....	..	....	....	....	..	.70	...	.40	1.10	.70	1.00	2.55	..	....	....	..	T	....	.45	....	....	..	....	....	....	....	6.90
Bonaparte	....	....	....	..	....	....	....	....	....	..	..	..	.55	.60	.31	1.30	..	..	....	....	....	....	.50	.15	..	..	....	....	....	....	.20	3 61
Britt	..	..	..	..	..	....	....	.04	..	..	1.43	.90	.03	.28	.10	.01	.40	....	....	.20	..	.05	....	.88	.01	....	T	....	....	....	....	4.33
Buckingham	...	....	..	....	....	..	....	..	....	..	..	.23		.73	.59	.22	.36	..	..	....	....	.02	.70	.54	....	....	....	....	....	....	....	3.39
Bussey	....	....	..	....	..	....	....	....	....	..	.79	.90	.25	1.56	3.75	....	....	....	....	....	....	....	.67	....	....	..	....	....	....	....	....	7.32
Carroll	..	..	....	....	..	..	....	....	....	....	....	.18	1.00	1.10	2.19	1.30	.19	....	..	..	....	....	1.50	1.55	....	....	..	....	..	..	....	9.01
Cedar Rapids	....	..	....	..	....	....	..	....	..	..	.20	.21	.62	.42	.18	1.68	....	....	..	.50	..	T	.58	.07	..	....	..	....	..	..	T	4.46
Chariton	....	....	..	....	..	..	..	....	....	....	.15	.53	.22	.03	1.70	1.47	..	....	....	..	T	.07	.24	.44	....	....	....	....	....	....	T	4.85
Charles City	....	....	....	....	..	....	....	....	....	....	.62	.75	.10	.17	.17	....	.35	....	....	..	....	....	....	.49	....	....	....	....	....	....	..	2.65
Clarinda	...	....	..	....	..	....	....	....	.53	..		...	1 34	..	1.12	1.55	..	....	....	..	.18	....	....	.80	....	....	.15	....	....	....	..	5.67
Clear Lake	....	....	....	....	..	..	....	....	..	..	.85	.75	.70	..	.15	....	.50	....	....	..	....	T	....	.80	....	....	....	....	....	....	..	3.75
Clinton	.43	....	....	....	..	..	..	....	....	..	..	2.48	....	...	1.56	....	.05	....	....	....	....	....	....	.78	....	.02	....	....	....	....	....	5.32
College Springs	..	....	....	....		....	....	.18	...	...	.07	3.00	....		.70	2.00	....	....	..	....	1.00	....	....	.90	..	....	.22	....	..	....	....	8.07
Coon Rapids	....	..	..	..	....	....	....		..	....	.38	.60	.52	1 30	1 05	1.20	T	....	....	....	....	.10	.06	1 62	..	....	....	....	....	....	....	6.86
Corning	....	....	....	..	..	....	....	T	. ..	....	T	T	.33	...	.40	1.60	...	..	....	....	T	T	....	.81	....	....	....	....	....	....	....	3.14
Council Bluffs	....	....	....	..	....	..	....	....	....	....	.20	1.08	..	.03	.30	1.76	....	..	....	....	....	....	1.64	.28	....	....	.03	....	....	..	....	5.32
Crawfordsville	..	....	....	..	..	....	....	....	....	..	....	3 00	1.19	.89	2.21	.45	...	....	....	....	....	....	....	.64	..	....	....	....	....	....	....	8 38
Cresco	.02	....	....	..	....	..	....	T	....	....	.48	.35	...	.08	.06	..	.10	..	....	.21	....	T	.41	..	....	....	....	....	....	....	....	1.71
Cumberland	....	..	....	..	....		.01	..	....	....	.01	...	.48	.10	1.25	.38	..	..	....	....	T	.20	....	1.15	..	....	.01	....	....	....	..	3.59
Danville	....	....	....	....		....	....	....	..	....	...	.55	.55	.60	.25	.75	....	..	..	....	....	....	....	.25	.50	....	..	....	....	....	..	3.45
Davenport		..	..	...	....	....	....	..	....	....	.25	.81	.28	1.04	.61	.11	1.39	....	..	....	....	T	....	.41	T	T	T	...	....	....	....	4.90
Decorah	.28	....	..	....	....	....	....	....	....	....	.25	1.25	.07	.08	..	....	....	..	....	....	....		....	.35	T	..	....	....	....	..	....	2.38
Delaware	....	....	....	....	....	..	....	..	....	...	1.13	....	....	.45	.90	.05	.25	....	....	....	....	....	.60	.34	....	....	....	....	....	....	....	3.72
Denison	..	....	..	....	....	..	....	..	....	...	.12	.40	.25	1 32	1.59	1.51	.02	....	....	..	....	....	.47	1.64	..	..	T	....	....	....	....	7.32
Des Moines	....	....	....	..	....	....	....	T	....	..	.11	.25	1.41	1.16	2.60	1 14	T	....	....	....	....	.01	.34	1.00	....	....	....	....	....	....	....	8.02
De Soto	....	...	....	....	....	.	....	T	..	...	.52	.85	1.45	.73	3.43	1.39	....	...	....	....	..	.01	.22	.67	.03	..	T	....	....	....	....	9.30
Dows	....	....	..	....	....	..	....	.10	..	....	.15	T	T	.70	.55	.25	.30	....	....	....	..	....	....	.65	....	....	....	....	....	....	....	2.70
Dubuque	.82	....	..	....	....	....	....	..	....	....	T	.12	.08	.23	.98	.02	.21	..	..	T	....	....	T	.89	....	T	....	....	....	....	....	3.35
Eldon	....	....	....	....	....	....	....	..	..	..	....	.41	.63	.85	.37	2.20	T	....	....	....	....	....	.84	.16	..	....	..	....	....	....	..	5 46
Elkader	.30	....	....	....	....	....	....	....	....	....	1.00	80	..	.33	.10	....	.25	....	....	....	....	....	.40	.25	.45	....	....	....	....	....	....	3.88
Emerson	....	....	....	....	....	....	....	....	....	....	.06	1.00	....	....	.15	.50	.90	....	....	....	....	....	....	1.00	....	....	.20	..	....	....	....	3.11
Estherville	....	....	....	....	....	....	....	.17	....	....	.53	.74	T	.06	.04	....	.46	....	....	....	T	.02	T	1.30	....	.02	....	....	....	....	....	3.34
Forest City	....	....	....	....	....	.04	....	....	.12	..	1.69	.88	....	.08	.10	....	.50	.02	...	.25	....	.09	....	.69	....	....	..	....	....	....	....	4.46
Ft. Dodge	....	..	....	....	..	..	..	T	....	....	.30	...	1.72	.15	1.60	.40	1.23	....	....	..	....	T	T	1.47	....	....	....	....	....	....	....	6.87
Ft. Madison	..	..	....	....	....	....	....	...	....	....	.05	.19	....	.51	.56	2.10	....	T	....	....	....	....	....	.41	....	T	..	....	..	....	....	3.83
Galva	....	..	....	....	....	....	..	T	....	. ..	T	.69	.03	.39	1.51	.32	1.35	....	..	....	....	1.22	.62	..	..	....	.03	....	....	....	....	6.16
Gilman	..	....	....	....	....	....	....	T	....	....	.06	.47	.21	.94	.61	.41	1.45	....	..	....	....	....	.70	..	....	....	....	....	....	....	....	4.85
Glenwood	...	....	....	....	....	....	....	T	....	....	.56	.65	....	..	.28	1.14	....	....	....	....	T	.06	....	1.26	....	....	..	..	....	....	....	3.95
Greene	..	....	....	....	....	....	....	.03	....	....	.34	.54	.07	.40	.25	.02	.32	....	..	....	....	....	....	.40	..	....	....	....	....	....	....	2 37
Grinnell (near)	....	..	..	..	..	..	....	T	..	..	.55	1 83	.37	.82	2.13	.65	.50	..	..	....	..	T	....	.70	....	....	..	....	....	....	....	7.55
Grundy Center	...	....	....	....	....	..	....	..	....	....	.06	.19	.12	1.23	.60	.28	.50	....	....	....	....	.05	....	.82	....	....	..	....	....	....	....	3.85
Guthrie Center	...	....	....	....	....	....	....	....	....	....	2.20	.20	.50	1.65	.95	.52	.07	....	....	....	....	.34	.09	....	....	....	....	....	....	....	....	6.59
Hamburg	...	....	....	....	..	....	....	.10	....	..	.12	2.00	....	1.00	1.25	....	..	....	....	....	1.60	....	.12	....	....	....	....	....	....	....	....	6.19
Hampton	....	. ..	...	...	....	....	....	.16	....	.11	.32	.41	....	.55	.32	.33	..	....	....	..	....	....	.48	....	....	....	....	....	....	....	....	2.68
Harlan	....	..	....	....	....	....	....	....	....	....	1.10	1.60	.10	1.10	1.32	..	..	....	....	....	....	....	T	2.70	....	....	.07	..	....	....	....	7.99
Hawkeye	T	..	....	....	....	....	....	....	....	....	.30	T	.65	.52	.15	T	....	....	.45	....	....	....	....	.85	....	....	T	..	....	....	....	2.02
Hedrick	..	..	....	....	..	...	..	...	....	....	T	2.32	.20	.42	1.12	.87	....	..	..	....	....	....	.40	.15	....	....	....	....	....	....	....	5.48
Hopeville	....	..	....	..	....	....	....	T	....	...	T	...	.05	..	.36	1.27	..	....	..	....	.04	....	..	1.02	....	....	T	....	....	....	.09	2.83
Humboldt	...	..	....	..	....	....	.06	....	..	....	.06	2.16	...	.28	.22	.17	.37	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3.32
Independence	...	....	....	.	...	..	....	..	..	....	.08	.54	....	.40	.80	T	.20	....	....	....	....	T	..	1.10	....	....	....	....	....	....	....	3 12
Indianola	....	....	....	....	..	....	....	....	....	..	1.02	.48	....	T	4.49	1.20	....	....	....	....	T	....	T	.73	....	....	T	..	....	....	....	7.92
Iowa City	....	....	....	....	....	....	....	....	....	....	.43	.33	....	.87	.75	.29	2.12	....	..	....	....	.95	....	.53	....	....	....	....	....	....	....	6.27
Iowa Falls	....	....	....	....	....	....	....	....	....	....	.28	.10	...	1.63	.39	.22	.19	....	....	....	....	.02	.68	.65	....	....	....	....	....	....	....	4.42
Keokuk	....	....	....	....	....	....	....	.26	....	....	....	.40	.07	.30	.46	2.94	..	....	....	....	....	.02	....	.02	T	T	....	....	....	....	....	4.21
Keosauqua	....	....	....	....	....	....	....	....	....	....	....	.22	....	.29	.24	2.43	....	....	....	....	....	....	....	.16	....	....	....	....	....	....	....	3.34
Knoxville	....	....	....	....	....	....	....	....	....	..	.22	1.19	1.12	.40	2.59	3.36	T	....	....	....	....	T	T	.90	....	....	T	..	....	....	....	9.78
Lacona	....	....	....	....	....	....	....	..	....	..	.35	.80	.30	.10	1.50	1.50	....	....	....	....	....	.10	.20	.40	....	....	....	....	....	....	....	5 25
Lansing	.67	T	....	....	....	....	....	....	....	....	.12	T	.65	.09	.30	....	T	....	....	.25	....	....	.19	.35	.40	..	....	....	....	....	....	3.02
Larchwood	....	....	....	....	.30	T	.15	....	....	..	.18	.32	....	.55	..	....	....	....	....	....	.11	....	....	1.30	....	....	....	....	....	....	....	2.91
Larrabee	..	..	....	....	....	....	..	.01	..	.56	....	....	. .	.07	.04	.79	.11	....	.03	....	....	....	....	.55	..	....	.05	....	....	....	....	2 23
Le Claire	...	T	....	....	....	....	....	....	....	....	....	.61	.02	.55	.65	.11	1.44	.02	....	....	....	....	....	.63	.21	.11	.02	....	....	....	....	4.37
Le Mars	....	....	....	....	..	..	....	T	..	....	T	....	.46	.60	.05	.10	.65	....	....	....	T	....	.09	.78	....	....	.12	....	....	....	....	2.85
Lenox	....	....	..	....	....	....	....	....	....	....	.07	....	.06	...	.84	1.46	....	..	....	..	.10	....	....	1.25	..	..	....	....	....	....	....	3.78
Logan	....	....	....	....	....	....	....	....	....	....	....	....	....	.12	.35	.72	.98	.36	.35	....	....	....	.05	1.60	....	..	....	.10	....	....	....	4.63
Maquoketa	.62	....	....	....	..	....	....	....	....	....	.74	.68		.73	.71	.04	.11	....	....	....	..	....	.03	.77	....	....	....	....	..	....	....	4.43
Marshalltown	....	....	....	....	....	....	....	....	....	....	.23	1.08	.73	.75	.80	.45	2.19	....	....	....	....	.06	..	1 02	....	....	....	....	....	....	....	7.31
Monticello	.05	....	....	....	....	....	....	....	....	.	.69	.14	.56	.70	.05	.21	....	....	....	....	....	....	.57	....	....	....	....	....	....	....	....	2.97
Mooar	....	..	....	....	....	....	....	....	....	....	....	....	.28	.25	.46	2.84	....	T	....	....	....	....	....	....	....	..	....	....	....	....	.66	4.49
Mt. Ayr	....	....	....	....	..	....	....	....	....	....	T	T	.20	....	.16	1.59	....	....	....	....	.05	T	....	1.00	....	....	.02	....	....	....	.10	3.12
Mt. Pleasant	..	....	....	....	..	....	....	....	....	....	.55	....	.93	.40	.44	.83	..	....	....	....	....	....	.09	....	.01	....	....	....	....	....	....	3.35
Mt. Vernon(Hub)	...	....	....	....	..	..	....	....	....	....	.31	.20	....	1.30	.30	.20	1.44	....	....	.14	....	T	.01	.16	....	....	....	....	....	....	....	4.06
New Hampton	....	....	....	....	....	....	....	....	....	....	.23	.92	.05	.25	.12	....	.30	..	..	..	....	....	....	.50	....	....	....	....	....	..	....	2.37
Newton	....	....	....	....	....	....	....	....	....	.11	1.00	.96	.56	1.48	1.21	....	....	....	....	....	.02	....	.77	....	..	....	....	....	....	....	....	6.11
Northwood	....	....	....	....	....	T	....	.05	....	....	.75	.23	.09	.11	.10	....	.27	....	....	....	....	T	.35	1.39	T	..	....	....	....	....	....	3 34
Odebolt	..	....	....	....	..	....	....	....	..	....	.11	.75	1.35	.58	1.75	.05	....	....	....	....	....	.18	.22	1.38	....	....	....	....	....	....	....	6.37
Ogden	...	....	....	....	....	....	....	.20	....	....	.40	.45	.32	.70	1.82	1.85	1.10	....	....	....	....	T	1.10	....	.40	....	....	....	....	....	T	8.34
Omaha (Neb.)	....	....	....	....	....	....	..	....	....		.13	.53	.34	...	.22	1 01	..	....	....	....	.06	.02	....	1.06	....	....	.15	....	....	....	....	3.52
Onawa	....	....	....	....	....	....	....	....	....	....	.15	.68	.25	1.45	1.80	1.32	....	....	....	....	....	..	T	1.70	....	....	.14	....	....	....	....	7.49
Osage	..	....	..	....	....	....	..	.04	..	....	.62	1.08	.07	.13	.11	....	.30	....	....	.03	....	T	.07	.78	....	....	....	....	....	....	....	3.23
Osceola	....	....	....	....	..	....	....	....	....	..	T	....	.24	...	3 04	1.15	....	....	....	..	T	....	....	.86	....	....	....	....	....	....	....	5.29
Oskaloosa	....	....	..	....	....	....	....	....	....	....	.52	.77	....	.46	1 95	1.30	T	..	....	....	....	T	.53	....	....	....	....	....	....	....	.02	5.55
Ottumwa	....	....	....	....	....	....	....	....	....	....	1.80	.95	.30	....	.55	2.00	....	....	....	....	....	....	1.00	.25	..	....	....	....	....	....	....	6.05
Ovid	....	....	....	....	....	..	....	....	....	....	.16	....	.15	..	.99	1.45	....	....	....	....	T	....	....	.64	....	..	....	....	....	....	..	3.89
Pacific Junction	....	....	....	....	....	....	....	.10	....	....	.54	.13	.07	T	.60	1.01	....	....	....	....	.06	....	...	1.30	....	....	....	....	....	....	....	3.81
Pella	....	....	....	..	....	....	....	....	....	..	.40	2.10	....	.50	1.20	1.54	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5.74
Plover	....	....	....	....	....	....	....	.05	....	....	.24	.44	....	.15	.13	.07	.45	....	....	....	....	.03	.74	....	..	....	.10	....	....	....	....	2.40
Primghar	....	....	....	....	....	....	....	....	....	....	....	....	....	.50	....	.55	....	....	....	....	....	....	.80	....	....	....	....	....	....	....	....	1.85
Red Oak	....	....	....	....	....	....	....	.10	....	....	.14	.69	....	....	.37	.89	....	....	....	....	T	T	....	1.05	....	....	.15	....	....	....	....	3.39
Ridgeway	.05	....	....	....	....	....	....	.01	....	..	.51	.25	..	.08	.08	..	.12	....	....	.41	..	....	.40	.19	.01	....	....	....	....	....	....	2.11
Rockwell City	....	....	....	....	....	..	..	T	....	....	.05	.35	.15	....	2.50	.48	1.25	..	....	....	....	T	.25	1.50	....	....	T	....	....	....	....	6.53
Ruthven	....	....	....	....	....	....	....	....	.10	..	.94	....	.27	.57	.05	....	.60	....	....	.35	....	....	....	1.55	....	....	.08	....	....	....	....	4.51
Sac City	....	....	....	....	....	T	....	T	....	....	.06	.85	.05	.01	2.35	.30	1.11	....	....	....	....	T	.91	.79	....	....	.04	....	....	....	....	6.46
Scranton	...	....	....	....		....	....	....	..		.43	79	1.68	....	4.16	1.25	.34	....	....	....	....	....	1.78	....	....	....	....	....	....	....	....	10.43
Sheldon	....	....	....	....	T	T	.44	.04	....	T	T	.12	T	.02	..	T	.33	T	....	....	.05	T	.20	.65	....	....	....	....	....	....	....	1.85
Sibley	....	....	....	....	.02	....	.92	.05	....	.14	.22	.25	.	.99	....	....	2.60	.03	....	....	....	.09	T	.89	.09	....	....	....	....	....	....	6.29

DAILY AND MONTHLY PRECIPITATION FOR AUGUST, 1900—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
											T	.74	.96	.47	1.07	.54	....	....	....	....	....	T	T	.24	...	....	....	...	....	...	...	4 02
ourney.....	....	...	....	..	...	....	...	...	...	....	T	.08	...	.28	...	..	.68	...	..	.08	.73	T	1.05	T	....	....	.05	....	....	...	..	3.20
ix Center....	....	....	....	....	T	....	.12	T	....	.13	T	.08	..	.28	..	..	.68	...	..	.08	T	....	.47	1.06	....	...	.08	....	....	....	....	3.56
ix City.....	....	....	....	....	....	....	....	T	....	..	.03	.47	..	.01	.97	.42	.05	...	...	..	T	T	.50	.61	...	....	....	....	....	....	....	4.31
rit Lake	..	...	...	....	....	..	...	T	....	..	1.25	.80	..	.23	....	....	.92	..	..	..	..	T	.67	.54	..	....	.02	...	...	....	....	4.58
rm Lake	..	..	....	....	T	...	....	.02	....	....	.04	.11	.87	.05	.85	.17	2.04	...	...	....	..	....	....	.81	..	..	.33	..	...	....	T	7.32
irman	..	....	....	....	....	....	....	T	...	....	.66	.87	.24	...	.30	3.16	....	....	....	..	.95	...	...	.40	. .	....	....	....	....	....	...	6.89
edo.....	....	....	....	....	....	....	....	....	....	....	....	.12	1 19	.91	.96	.88	2.93	...	...	...	....	...	...	....	....	....	....	....	....	....	.63	4 45
llisca	..	....	....	....	....	....	....	....	....	....	....	30	..	1.20	....	1.34	....	..	....	..	.10	.15	.58	....	...	...	.15	....	....	...	...	2.74
nton.....	....	....	....	....	....	....	....	....	....	....	.30	.20	.80	.65		.16	.34	....	....	..	..	...	.29		....	....	....	...	....	....	...	5.69
pello	...	....	....	....	....	....	..	....	....	....	T	1.57	1.00	.80	1.35	.23	....	....	T	....	..	.63	.07	.04	....	....	....	..	..	.	7.22
shington.....	....	....	....	....	....	....	....	..	....	....	1.83	1.50	..	.71	1.93	.50	....	..	....	....	....	....	...	.75	....	....	....	....	....	....	....	4.31
shta.....	..	....	....	....	....	....	..	T	....	....	....	.20	....	.38	1.12	.33	.68	....	....	..	....	.03	.40	1 15	....	....	.05	...	....	....	....	3.48
terloo	..	....	....	....	....	....	....	....	....	....	.49	.29	.05	.61	.60	.07	.24	....	....	....	....	....	....	1.10	....	....	..	..	..	....	..	2.33
verly.....	....	....	....	....	....	....	....	....	....	....	.30	.16	.06	.38	04	.04	.30	..	..	....	.10	....	.95	..	....	....	....	....	..	..	....	3.34
st Bend.....	..	....	....	....	....	....	....	....	....	....	.17	.57	....	.56	.11	.06	.21	....	....	....	....	.03	...	1.09	....	....	T	....	....	..	..	7.49
st Branch....	....	..	....	....	..	T	...	.03	....	.51	.23	.52	.33	.90	.70	.40	2,90	..	..	....	....	.90	....	.61	....	..	..	..	....	..	..	1.26
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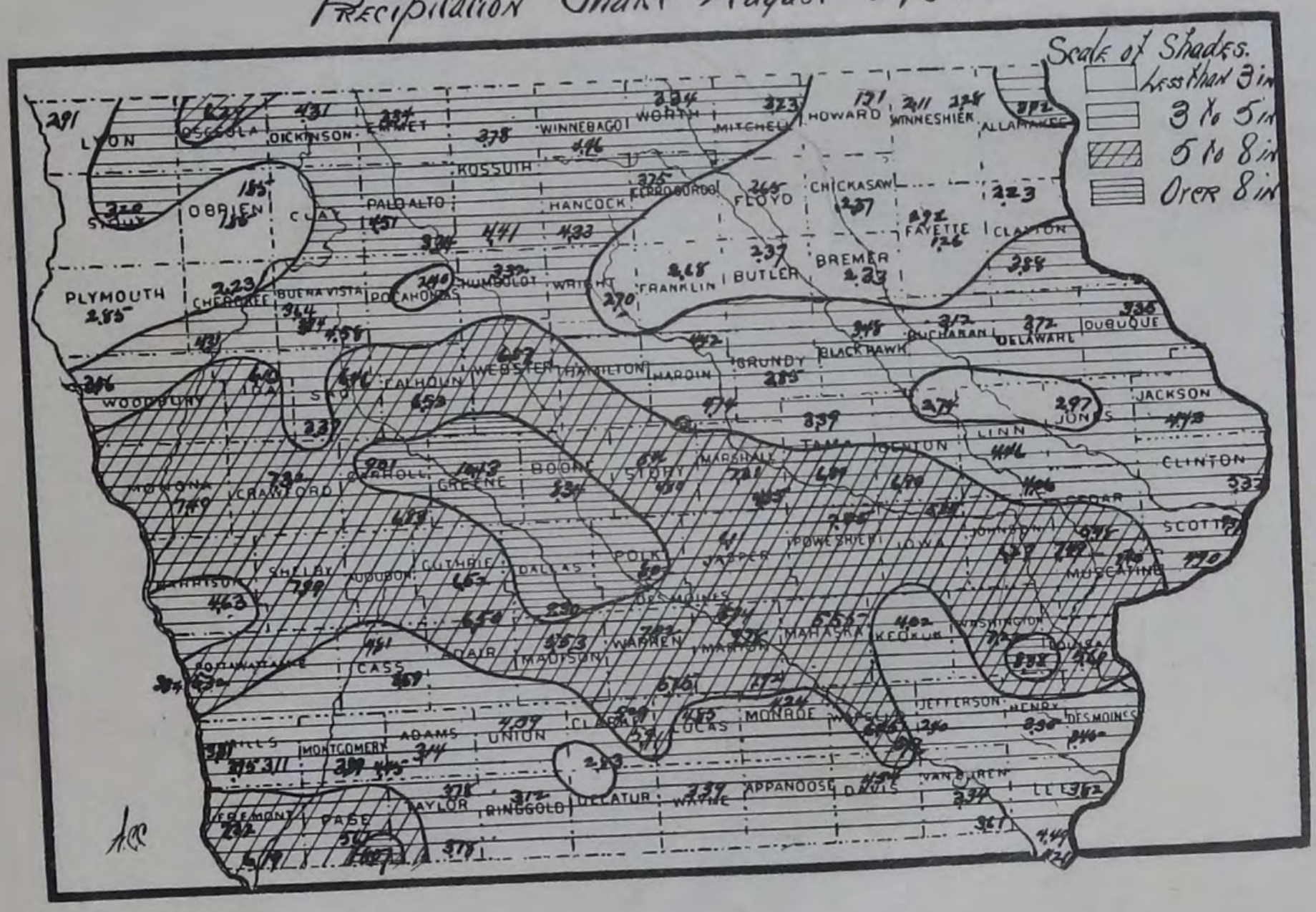
Precipitation Chart August 1900



Vol. XI. SEPTEMBER, 1900. No. 9.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

STAR ENG. CO

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DES MOINES:
F. R. CONAWAY, STATE PRINTER
1899.

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MONTHLY REVIEW

OF THE

wa Weather and Crop Service.

UME XI. SEPTEMBER, 1900. No. 9.

IOWA CROP REPORT, OCTOBER 1ST.

ELIMINARY ESTIMATE OF YIELD OF STAPLE CROPS.

owing is a preliminary estimate of the average yield of arm crops, summarized from reports received October and subject to revision in the final report of the season, sued about December 1st:

N.—The reports indicate an average yield of a little nan 41 bushels per acre for the state. The area planted 18,660 acres, and the total product will be 353,365,060 s, or 18,000,000 bushels above the heaviest yield heretorvested in Iowa. The figures are very conservative, g due allowance for recent damage by winds and wet er.

EAT.—Yield of winter wheat, 16 bushels per acre; wheat, 15 bushels. Total product, 22,465,530 bushels, inst 19,574,792 bushels last year.

RS.—Yield per acre, 35 bushels; total for the state, 139,- bushels.

E.—Average per acre, 17 bushels; total, 1,762,560 bushels.

RLEY.—Yield per acre, 28 bushels; total product, 14,048,- shels.

AX SEED.—Yield, 11 bushels per acre; total, 1,197,350 ls.

ME HAY.—Average yield, 1.4 tons per acre; total, 3,568,- ons.

OTATOES.—Yield per acre, 72 bushels; total output, 3,960 bushels.

ne final report is likely to show increase, rather than ease, in the above figures. This preliminary estimate in- es the total output of cereals (corn and small grain) to be 49,020 bushels, or about 10,000,000 bushels in excess of the est total in any single year in the last decade, and 00,000 bushels above the average yearly output for the ten years.

CLIMATE AND CROP CONDITIONS IN SEPTEMBER.

September was seasonably warm, and excessively wet dur- the last half of the month. Frosts were observed in nearly districts about the 17th and 27th, but the prevalent humid- served to protect even the most tender vines from extensive ury, and at the close of the month the bulk of vegetation wed little, if any, effects of freezing temperature. The rage rainfall was about two inches in excess of the normal September, and the greater portion of it came from the h to the 28th. Corn ripened normally, but the general con- ion of the crop was lowered in a considerable area by severe ndstorms followed by protracted wet weather. But the mage from all adverse conditions has not been sufficient prevent its taking rank as the heaviest crop grown in Iowa thin the past decade. The wet weather was highly favor- e to grass, and the pastures afforded abundant forage for stock at the close of the month. The harvest of wild hay was hindered by the rains, and the quantity of clover seed has been materially lessened. The soil generally was in excellent condition for plowing, and the work was well advanced at the close of the month. Corn gathering was begun somewhat earlier than usual, but mainly for feeding stock on account of unusual shortage in the supply of old corn in the farmers' cribs. The amount of corn cut and put in shock is probably in excess of any former year in Iowa, and there is an abundant supply of forage secured for feeding stock during the coming winter. As a whole the crop season of 1900 has brought forth bountiful returns to the producers of the state.

NOTE AND COMMENT.

Statistics from England, France and Germany show that there is an increase in the per capita consumption of wheat, milk and butter, and that the consumption of rye and potatoes is decreasing.

* * *

Experiments in breeding wheat are being carried on at the Minnesota Experiment station under direction of Prof. W. M. Hays. By crossing and selection he has obtained over five hundred varieties, the most promising of which are being distributed to growers for field use.

* * *

English speaking people are the largest consumers of sugar as well as meats. In relation to the nutritive value of sugar the following extracts from Farmer's Bulletin No 93 are valuable: "Sugar is a useful and valuable food. It must, however, be remembered that it is a concentrated food and therefore should be eaten in moderate quantities. Further, like other concentrated foods, sugar seems best fitted for assimilation by the body when supplied with other materials which dilute it or give it the necessary bulk. Persons of active habits and good digestion will add sugar to their food almost at pleasure without inconvenience, while those of sedentary life, of delicate digestion, or of a tendency to corpulency would do better to use sugar very moderately. It is generally assumed that 4 or 5 ounces of sugar per day is as much as it is well for the average adult to eat under ordinary conditions."

* * *

There are capitalists making money buying up western farms at wholesale and selling them out by the bushel and carload, in form of corn and other cereals. That is to say, they sell the rich stores of fertility in the soil in that manner, following a system of farming that must of necessity impoverish the land and leave it measurably barren for coming generations. That is a species of robbery deserving of severe reprobation.

* * *

The imports of sugar into the United States for the fiscal year ended June 30th, were returned to the general govern-

ment at an invoiced value of $100,250,797, as against $95,000,000 of the year before, and $60,000,000 for 1898. This indicates an increased consumption of sugar per capita, and incites the suggestion that we ought to be making more rapid progress in the production of sugar within our own territory.

* * *

A writer in the New England *Farmer* maintains that thirty acres of good tillage land, devoted to dairying under economic conditions and management, should support a family in comfort, if not in elegance. "Of course," the writer says, "a liberal area should be devoted to fruit and vegetable garden crops for home use at least. One ought not to make the enriching of land the chief aim of life, but rather to make the most of life and at the same time so to manage that the world will be none the worse, but a little better, for our having lived in it."

CASUALTIES BY LIGHTNING.

Hon. Nathan Potter, voluntary observer at Olin, Jones county, reports the following unusual casualty:

"On September 18th, at 9 P. M., 3 miles northeast of Olin, James Jecobe was instantly killed by lightning. He was lying on the floor, near the stove, asleep. His wife was kneeling by his side trying to awaken him, with one hand under his head and the other across his breast, and her face not three inches from his chin, when the shock came. Her wrist was burned as with a hot iron, but otherwise she was not injured. Two other persons in the room were severely skocked in their feet, and a dog lying under the house was killed. Mr. Jecobe was 26 years old."

A special dispatch to the Sioux City *Journal*, from Fort Dodge, dated October 3d, gave the following: "Chas H. Wilson, a traveling man representing the Earl Clagg hide house, was struck and instantly killed by lightning during a brief thunder shower at 5 o'clock this afternoon. Wilson was at the rendering works of his company, and when struck was talking with two men, neither of whom was injured or felt any shock. Nothing but a vivid flash of lightning, and he fell dead. He was married, and was well known throughout northern Iowa."

THE WEST INDIAN HURRICANE OF SEPTEMBER 1–12, 1900.

[By E. B. Garriott, Professor of Meteorology, U. S. Weather Bureau.]

The United States Weather Bureau at Washington will shortly issue a bulletin on West Indian hurricanes, which contains a chronological record of more than four hundred tropical storms. The record begins with a storm which visited the island of Cuba May 19–21, 1494, and describes many of the great hurricanes which have swept the Antilles and the Atlantic and Gulf coasts of North America during the last two hundred years. It is a recital of appalling disasters on land and sea, and presents as its crowning horror the hurricane which caused a loss of more than 5,000 human lives and a destruction of property to the estimated value of $20,000,000 at Galveston, Texas, September 8, 1900. A detailed description of this hurricane can be given only when more complete reports are received from points along its path. Sufficient data are, however, at hand to permit a summary of its more prominent features. The track of the hurricane and the general meteorological conditions which attended it on the mornings of September 5th, 8th, and 11th are shown on the Weather Bureau charts.

The presence of a disturbance in the vicinity of the Windward Islands of the West Indies was indicated by reports of the closing days of August. During the first three days of September this disturbance moved westward over the [illegible] bean sea, and on the night of the 4th recurved northw[illegible] west-central Cuba. By the morning of September 6 [illegible] had reached the southern Florida peninsula. Thus fa[illegible] course the disturbance had followed a normal path, [illegible] only notable feature was excessive rainfalls in Jamai[illegible] eastern Cuba. During September 6th the storm made an [illegible] mal recurve to the westward, increased in intensity [illegible] caused severe gales from the western Bahamas over [illegible] Passing westward over the Gulf of Mexico, the storm [illegible] reached the Texas coast late in the afternoon of Septemb[illegible] where it recurved northward and passed directly over [illegible] ton a fully developed hurricane.

The maximum wind velocity recorded at Galveston [illegible] miles an hour from the northeast at 6:15 P. M., 75th me[illegible] time, and the observer reports a greater velocity fro[illegible] southeast after the anemometer had been blown away. [illegible] lowest barometric reading indicated by the barograph [illegible] 28 53 inches at 8:10 P. M., 75th meridian time, at which no[illegible] vortex of the hurricane passed Galveston The tide, [illegible] came in rapidly during the afternoon and the early part [illegible] the night, covered the entire city to a depth of six to [illegible] feet, and swept the southern and eastern portions of th[illegible] entirely away. The water began to subside slowly at 11 [illegible] of the 8th, and by the morning of the 9th high portions [illegible] city were dry.

Following its northward recurve, the disturbance adv[illegible] northward over Texas, Oklahoma, and eastern Kansas, [illegible] arrived in Iowa the morning of September 11th. During it[illegible] sage over the interior of the country on the 9th and 10th [illegible] storm was unattended by violent winds, and its entire d[illegible] tion was probably averted by the advance of a low baro[illegible] area from the northwest, which recruited its waning [illegible] Thus strengthened, the storm under discussion passed [illegible] ward over the Great Lakes and the St. Lawrence valley, [illegible] thence over Newfoundland, constantly increasing in inte[illegible] It then disappeared beyond the region of observation, h[illegible] described a charted path more than four thousand m[illegible] length.

As satisfying descriptions of storms require a refe[illegible] to the meteorological conditions which appear to cont[illegible] to their normal and abnormal movements and cause the[illegible] ing degrees of intensity exhibited, the following statem[illegible] these conditions, made by the writer some years ago, i[illegible] sented:

The recurve of storms in the West Indies and over the [illegible] of Mexico is dependent on general meteorological condi[illegible] and more especially on the distribution of atmospheric pre[illegible] The anti-cyclonic or high pressure area of the North Atl[illegible] ocean lies northeast of the West Indies, and causes ea[illegible] northeast winds over the Southern Atlantic Ocean and Carib[illegible] Sea. These are the northeast trade winds. The storms [illegible] develop in the region east of the West Indies, and also th[illegible] a more western origin, have a tendency to follow the c[illegible] of the main equatorial current over the Caribbean sea. [illegible] course is doubtless largely influenced by the general dr[illegible] the atmosphere in that region, and, following the anti-cyc[illegible] circulation of winds, the hurricanes skirt the western [illegible] rants of the Atlantic high area, and, carried by main a[illegible] pheric currents, follow paths which recurve north and n[illegible] eastward near the southeastern coasts of the United St[illegible] As a majority of the hurricanes traced have followed [illegible] course indicated, it may be considered the normal cour[illegible] West Indian storms when the usual meteorological condi[illegible] obtain over the Atlantic ocean and the United States. [illegible] of the more important storms of the West Indies have no[illegible] curved northward, but have moved westward over the Gu[illegible] Mexico and dissipated over Mexico or the southwestern st[illegible]

persistent high barometric pressure to the north-
; their normal line of advance has apparently
curve.

n has shown that storms are commonly more
region where they recurve or attempt to recurve
Observation has also shown that when the ad-
rm is obstructed and is held back by an area of
, it acqrires greater intensity on assuming an ab-
e. Among notable storms of this class may be
e hurricane of August, 1886, which totally destroyed
idianola, Texas, and the hurricane of September,
aged with destructive violence over Cuba. These
apparently unable to recurve owing to high baro-
ure to the northward. Forced westward, they
tense energy and dissipated, one on the southeast
Rocky mountains and the other over Mexico.
observed that the storm of September, 1900, made
harp abnormal turns in its course, and that mani-
f increased energy attended these recurves. It
noted that while the storm was most intense on
oast, it exhausted its energy at that point and did
become formidable until after its union with the
rn disturbance. The scene of the first of these re-
the southern Florida peninsula, and the date
ber 6th. A reference to the chart of the morning of
l show that the future course of the storm was not
icated by the conditions thereon presented. The
north Atlantic coast districts were covered by an
rea of high barometer, and an area of low barom-
crossing the northwestern states in an easterly di-
The apparent activity of the northwestern low area
sing pressure east of the Mississippi river indicated
path northward along the Atlantic coast. It was
nt that excessive speed on the part of the northwest
would result in a failure on its part to dissipate the
oast high barometer area and favor a rapid eastward
of the area of high barometer which occupied the
t. It was recognized that these movements would
an opening for the storm along a normal line of
and would cause it to assume a westerly course over
of Mexico. The chart of the 6th shows that the latter
on was the correct one, and the reports of the follow-
ailed to show a favorable opening for a northward
ver the middle Gulf districts.
e morning of the 7th the storm was central south of
th of the Mississippi river, and reports from Gulf
tions furnished evidence of its marked strength and
ent course. But neither these reports nor those of the
of the 8th indicated a co-ordination of storm energies
would overwhelm Galveston island with waves of un-
nted magnitude from both the gulf and the bay.
principal agent of destruction at Galveston was water
e Gulf of Mexico and Galveston bay. The wind, which
ss exceeded a velocity of 100 miles an hour, was chiefly
nt as a cause of the high seas. During the afternoon
8th, the highest tide ever experienced at Galveston
to run in from the gulf *against* the wind. This was a
wave impelled by the advancing hurricane. Simultane-
aves from Galveston bay, driven by a northerly gale,
d the inner side of the island.
m available information it appears that the hurricane
d its maximum intensity and the water its greatest
about 8 P. M., 75th meridian time. After the passage of
rricane center the wind shifted to southeast and south,
torm waves from the gulf began to subside, and the
ved waters of the bay, meeting the shifted wind, were
ed to the place from whence they came.
e geographical position and the topography of Galveston island render it, in the presence of severe storms, peculiarly subject to inundation. In common with all low-lying districts on the coasts of the great bodies of water, it has occasionally been covered by high tides which have been caused either by onshore gales of unusual severity or by waves which have run ahead of the vortex of a hurricane. On September 8th both of these causes contributed to the overflow of the island. The storm wave from the gulf, combined with the influence of the gale which swept over thirty miles of water surface in the bay, heaped water from both the gulf and the bay over the long narrow strip of sand which composes Galveston island. The floods thus produced exceeded by eight or nine feet any previous flood which has visited the city of Galveston, and the almost irresistible force of the enormous waves, together with the strength of the hurricane winds, resulted in a disaster which is without precedent in the history of the United States.

Assuming that the reading of the barometer reported at Galveston the evening of the 8th was approximately correct, the hurricane at that point was of almost unparalleled severity. The future possibility of a like visitation in that locality is extremely remote.—*National Geographic Magazine.*

THE GALVESTON HURRICANE, SEPTEMBER 8TH.

Following extracts are taken from the special report of Isaac M. Cline, L. F. O. and section director, U. S. Weather Bureau, of Galveston, giving details of the hurricane of September 8th.

The hurricane which visited Galveston island on Saturday, September 8, 1900, was no doubt one of the most important meteorological events in the world's history. The ruin which it wrought beggars description, and conservative estimates place the loss of life at the appalling figure, 6,000.

The usual signs which herald the approach of hurricanes were not present in this case. The brickdust sky was not in evidence in the smallest degree. This feature, which has been distinctly observed in other storms that have occurred in this section, was carefully watched for, both on the evening of the 7th and the morning of the 8th. There were cirrus clouds moving from the southeast during the forenoon of the 7th, but by noon only alto-stratus from the northeast were observed. About the middle of the afternoon the clouds were divided between cirrus, alto-stratus, and cumulus, moving from the northeast. During the remainder of the 7th, strato-cumulus clouds prevailed, with a steady movement from the northeast. A heavy swell from the southeast made its appearance in the Gulf of Mexico during the afternoon of the 7th. The swell continued during the night without diminishing, and the tide rose to an unusual height when it is considered that the wind was from the north and northwest. About 5 A. M. of the 8th Mr. J. L. Cline, observer, called on me and stated that the tide was well up in the low parts of the city, and that we might be able to telegraph important information to Washington. He having been on duty until nearly midnight, was told to retire and I would look into the conditions. I drove to the gulf, where I timed the swells, and then proceeded to the office and found that the barometer was only one-tenth of an inch lower than it was at the 8 P. M. observation of the 7th. I then returned to the gulf, made more detailed observations of the tide and swells, and filed the following telegram addressed to the central office at Washington:

Unusually heavy swells from the southeast, intervals one to five minutes, overflowing low places south portion of city three to four blocks from beach. Such high water with opposing winds never observed previously.

Broken stratus and strato-cumulus clouds predominated during the early forenoon of the 8th, with the blue sky visible here and there. Showery weather commenced at 8:45 A. M., but dense clouds and heavy rain were not in evidence until about noon, after which dense clouds with rain prevailed.

The wind during the forenoon of the 8th was generally north, but oscillated, at intervals of from five to ten minutes, between northwest and northeast, and continued so up to 1 P. M. After 1 P. M. the wind was mostly northeast, although as late as 6:30 P. M. it would occasionally back to the northwest for one or two minutes at a time. The prevailing wind was from the northeast until 8:30 P. M., when it shifted to the

east, continuing from this direction until about 10 P. M. After 10 P. M. the wind was from the southeast, and after about 11 P. M. the prevailing direction was from the south or southwest. The directions after 11 P M. are from personal observations. A storm velocity was not attained until about 1 P. M., after which the wind increased steadily and reached a hurricane velocity about 5 P. M. The greatest velocity for five minutes was 84 miles per hour at 6:15 P. M., with two miles at the rate of 100 miles per hour. The anemometer blew away at this time, and it is estimated that prior to 8 P M. the wind attained a velocity of at least 120 miles per hour. For a short time, about 8 P. M., just before the wind shifted to the east, there was a distinct lull, but when it came out from the east and southeast it appeared to come with greater fury than before. After shifting to the south at about 11 P. M. the wind steadily diminished in velocity, and at 8 A. M. on the morning of the 9th was blowing at the rate of 26 miles per hour from the south.

The barometer commenced falling during the afternoon of the 6th and continued falling steadily but slowly up to noon of the 8th, when it read 29.42 inches. The barometer fell rapidly from noon until 8:30 P. M. of the 8th, when it registered 28.48 inches, a fall of pressure of about one inch in eight and one-half hours. After 8:30 P. M. the barometer rose at the same rapid rate that had characterized the fall.

Mr Blagden looked after the instruments during the hurricane in a heroic and commendable manner. He kept the wires of the self-registering apparatus intact as long as it was possible for him to reach the roof. The rain gauge blewaway about 6 P. M., and the thermometer shelter soon followed. All the instruments in the thermometer shelter were broken, except the thermograph which was found damaged, but has been put in working order.

Storm warnings were timely and received a wide distribution not only in Galveston but throughout the coast region. Warning messages were received from the central office at Washingtonon September 4th, 5th, 6th, 7th, and 8th. The high tide on the morning of the 8th, with storm warnings flying, made it necessary to keep one man constantly at the telephone giving out information. Hundreds of people who could not reach us by telephone came to the Weather Bureau office seeking advice. I went down on Strand street and advised some wholesale commission merchants who had perishable goods on their floors to place them 3 feet above the floor. One gentleman has informed me that he carried out my instructions but the wind blew his goods down. The public was warned, over the telephone and verbally, that the wind would go by the east to the south and that the worst was yet to come. People were advised to seek secure places for the night. As a result thousands of people who lived near the beach or in small houses moved their families into the center of the city and were thus saved. Those who lived in large strong buildings, a few blocks from the beach, one of whom was the writer of this report, thought that they could weather the wind and tide. Soon after 3 P. M. of the 8th conditions became so threatening that it was deemed essential that a special report be sent at once to Washington Mr. J. L. Cline, observer, took the instrumental readings while I drove first to the bay and then to the gulf, and finding that half the streets of the city were under water, added the following to the special observation at 3 P. M.: "Gulf rising, water covers streets of about half city." Having been on duty since 5 A. M., after giving this message to the observer, I went home to lunch. Mr. J. L. Cline went to the telegraph offices through water from two to four feet deep, and found that the telegraph wires had all gone down; he then returned to the office, and by inquiry learned that the long distance telephone had one wire still working to Houston, over which he gave the message to the Western Union telegraph office at Houston to be forwarded to the central office at Washington.

I reached home and found the water around my residence waist deep. I at once went to work assisting people, who were not securely located, into my residence, until forty or fifty persons were housed therein. About 6:30 P. M. Mr. J. L. Cline, who had left Mr. Blagden at the office to look after the instruments, reached my residence, where he found the water neck deep. He informed me that the barometer had fallen below 29.00 inches; that no further messages could be gotten off on account of all the wires being down, and that he had advised everyone he could see to go to the center of the city; also, that he thought we had better make an attempt in that direction. At this time, however, the roofs of houses and timbers were flying through the streets as though they were paper, and it appeared suicidal to attempt a journey through the flying timbers. Many people were killed by flying timbers about this time while endeavoring to escape to town.

The water rose at a steady rate from 3 P. M. until about 7:30 P. M., when there was a sudden rise of about four feet in as many seconds. I was standing at my front door, which was partly open, watching the water, which was flowing with great rapidity from east to west. The water at this time was about 8 inches deep in my residence, and the sudden rise brought it above my waist before I could change my position. The water had now reached a stage 10 feet above the ground at Rosenberg avenue (Twenty-fifth street) and Q street, where my residence stood. The ground was 5.2 feet elevation, which made the tide 15.2. The tide rose the next hour, between 7:30 and 8:30 P. M., nearly five feet additional, making a total rise in that locality of about 20 feet. These observations were carefully taken and represent to within a few tenths of a foot the true conditions. Other personal observations in my vicinity confirm these estimates. The tide, however, on the bay or north side of the city did not obtain a height of more than 15 feet. It is possible that there was 5 feet of backwater on the gulf side as a result of debris accumulating four to six blocks inland. The debris is piled eight to fifteen feet in height. By 8 P. M. a number of houses had drifted up and lodged to the east and southeast of my residence, and these with the force of the waves acted as a battering ram against which it was impossible for any building to stand for any length of time, and at 8:30 P. M. my residence went down with about fifty persons who had sought it for safety, and all but eighteen were hurled into eternity. Among the lost was my wife, who never rose above the water after the wreck of the building. I was nearly drowned and became unconscious, but recovered through being crushed by timbers and found myself clinging to my youngest child, who had gone down with myself and wife. Mr. J. L. Cline joined me five minutes later with my other two children, and with them and a woman and child we picked up from the raging waters we drifted for three hours, landing 300 yards from where we started. There were two hours that we did not see a house nor any person, and from the swell we inferred that we were drifting to sea, which, in view of the northeast wind that was blowing, was more than probable. During the last hour that we were drifting, which was with southeast and south winds, the wreckage on which we were floating knocked several residences to pieces. When we landed about 11:30 P. M., by climbing over floating debris to a residence on Twenty-eighth street and Avenue P, the water had fallen 4 feet. It continued falling, and on the following morning the gulf was nearly normal. While we were drifting we had to protect ourselves from the flying timbers by holding planks between us and the wind, and with this protection we were frequently knocked great distances. Many persons were killed on top of the drifting debris by flying timbers after they had escaped from their wrecked homes. In order to keep on the top of the floating masses of wrecked buildings one had to be constantly on the lookout and continually climbing from drift to drift. Hundreds of people had similar experiences.

Sunday, September 9, 1900, revealed one of the most horrible sights that ever a civilized people looked upon. About three thousand homes, nearly half the residence portion of Galveston, had been completely swept out of existence, and probably more than six thousand persons had passed from life to death during that dreadful night. The correct number of those who perished will probably never be known, for many entire families are missing. Where 20,000 people lived on the 8th not a house remained on the 9th, and who occupied the houses may, in many instances, never be known. On account of the pleasant gulf breezes many strangers were residing temporarily near the beach, and the number of those that were lost can not yet be estimated. I enclose a chart, fig. 2. which shows, by shading, the area of total destruction. Two charts of this area have been drawn independently; one by Mr. A. G Youens, inspector for the local board of underwriters, and the other by myself and Mr. J. L. Cline. The two charts agree in nearly all particulars, and it is believed that the chart inclosed represents the true conditions as nearly as it is possible to show them. That portion of the city west of Forty-fifth street was sparsely settled, but there were several splendid residences in the southern part of it. Many truck farmers and dairy men reside on the west end of the island, and it is estimated that half of these were lost, as but very few residences remain standing down the island. For two blocks, inside the shaded area the damage amounts to at least 50 per cent of the property. There is not a house in Galveston that escaped injury, and there are houses totally wrecked in all parts of the city.

supplies not over eight feet above floor were badly
d much was totally lost. The damage to buildings,
and other property in Galveston county is estimated
hirty million dollars. The insurance inspector for
states that there were 2,636 residences located prior
ricane in the area of total destruction, and he esti-
0 houses totally destroyed in other portions of the
ing a total of 3,636 houses totally destroyed. The
hese buildings alone is estimated at $5,500,000.

"EARTH AND AIR."

the appropriate title of a new monthly science jour-
ially devoted to meteorology, published in the inter-
voluntary observers of the U. S. Weather Bureau,
L. Eastman, of Penn Yan, N. Y. Mr. Eastman is an
enthusiastic representative of that class of public-
men whose gratuitous services have contributed so
o the value and efficiency of the National Weather
It is fitting that these generous public servants
ave an organ through which they may receive in-
n and inspiration, and give expression to their views
ing matters relating to their special fields of observa-
he low price of this new magazine—$1.00 per year—
t within the reach of all, and we sincerely hope the
otion list will be ample to enable its enterprising pub-
o maintain the standard of excellence of the initial
. Teachers, students, and all lovers of scientific liter-
may find much of interest and value in *Earth and*

FIGURES ARE SOMETIMES DECEPTIVE.

ures never lie, it has been said; but in the hands of an
or ignorant figurer they may be most wofully decep-
The papers recently gave wide circulation to an exhibit
res showing the agricultural output for the season of
estern states. In this tabulation of products and values
d the following items: Wheat, corn, oats, rye, flax, bar-
ay and grass, butter, cheese, eggs, poultry, milk, cattle,
, sheep, hogs, wool, hides, garden truck, broomcorn, sor-
, fruit, etc., making a total cash valuation of astonishing
rtions. Now, the veriest novice in handling agricultural
tics ought to know that such an array of figures is decep-
if not dishonest, when the aggregate is set forth as the
of a season's products. You cannot eat your cookie and
it. Hay, grass and grain are the raw materials used on
farms in the manufacture of beef, mutton, pork, wool,
products, etc. All that we place to the credit of Iowa,
e output of a single season, are the direct products of the
at the average market value, and to this we may add the
ement gained by converting a large portion of the grains
grasses into the more valuable forms of beef, pork, mut-
dairy products, etc. This matter is too plain and simple
eed argument or further elaboration.

THE WEATHER BUREAU'S EDUCATIONAL WORK.

[From the Year Book of Agriculture, 1899.]

Besides the persistent efforts which in one form or another
e always been made to instruct the officials of the service
heir duties as observers and in their scientific understand-
of the problems of meteorology, a much more extensive
d difficult task has been carried on simultaneously in the
deavor to teach the public to appreciate and appropriate the
sults of this systematic research into the laws controlling
e weather. In spite of discouraging results attending the
tempt to propagate much exact knowledge of this compli-
ted science to a large population, the evidence preponderates
at the work of the government has already been of an enor
mous value to the whole country from an educational point of view. The inevitable failures attending the attempt to fore-cast weather conditions for periods of from twenty-four to forty-eight hours in so unstable a medium as the ever-changing atmosphere, filled as it is with long currents of different tem-peratures, large and small vortices, the sensitive physical processes giving rise to clouds and precipitation, must be ad-mitted as an unavoidable part of the imperfections of this practical work. These errors were formerly used by the press and by critics generally as a ground for complaint against the service, but now it is notable how greatly improved has become the tone of criticism, which recognizes that the successes far outweigh the failures in forecasting. While there has not been any important advance in the amount of instruction given by the universities in the higher theoretical meteorology of late years, yet it should be observed that meteorology is extending rapidly throughout the common schools of the country as a required branch of instruction for every child, and it can be inferred that this process of beginning at the bottom will culminate in producing occasionally an individual who shall attain strength and success in studies embracing the highest reaches of science pertaining to the physics of the atmosphere. These changes have certainly resulted from the persistent propaganda of publications emanating from the Weather Bureau during the past thirty years.

SEVERE LOCAL STORMS.

On the evening of September 25, 1900, a destructive wind-storm struck the northwest portion of the village of Ferguson, Marshall county, Iowa, causing the death of two children and seriously injuring twelve people, and damaging property to the amount of about $5,000. Ferguson is a station on the Chicago, Milwaukee & St. Paul railway and is a small village of about 200 inhabitants, situated on the south bank of South Timber creek. The bank is a gentle slope extending back from 300 to 400 yards from the railroad, which is the northern limit of the town.

The storm was evidently a typical tornado, but owing to the fact that a great deal of debris had been cleared up by the time the writer appeared on the scene—2 P. M. of the following day—no information could be gained from observing the po-sition and general direction of the debris on the north and south sides of the storm track; but as several structures, in-cluding freight cars, were lifted into the air and carried from 50 to 150 feet before falling to the earth, and as the opposite sides of adjoining buildings were damaged, there must have been whirling and strong upward motions of the air. A num-ber of observers who were on the higher or south portion of the town saw the storm cloud after it had passed north of the railroad track, and declare that there was a large round or ball-like cloud suspended from an immense mass of inky black clouds, in which there was a great commotion. On account of darkness they could not observe any whirling motion, but state that "there was a great boiling going on in the clouds."

The first evidence of the storm's contact with the earth was at a farm yard, one and one-half miles south of Haverhill and five miles south of west from Ferguson, where it turned over and turned around a farm wagon. No material damage was done there, nor at any point between there and a short distance southwest of Ferguson, where it blew down and twisted a number of trees. A few hundred yards further on its course it struck and completely demolished the one-story house of Peter Olson, who was the only occupant and who escaped with but a few scratches. Mr. Olson claims that the wind lifted him up in the air and dropped him in a field about 150 feet west of where the house stood. Adjoining the Olson home on the west and about 60 feet distant, was the home of

Mr. Robert Keevan, in which was Mr. Keevan, wife and daughter. This house and contents were reduced to splinters, but the occupants escaped serious injury though badly bruised. The next house in the direct line of the storm was not injured except by having a few shingles blown off the roof. The storm evidently passed over the house but it came down again within a few hundred feet and struck the hotel, a two-story frame structure with a one-story kitchen on the west side. The kitchen was not materially injured, but the main part of the building was completely demolished except the lower floor, which remained on the foundation. At the time the storm struck the hotel the following persons were within its walls, viz: John Lovelady, proprietor, Mrs. Lovelady, their four children, Thomas Pilling, Anton Hasson, and Miss Mamie Holivar, a domestic. Two of the children, Elmo and George, one and three years of age respectively, were killed. Miss Holivar was seriously injured, having her shoulder broken, throat badly cut, and was bruised about the chest and head. Mrs. Lovelady and Thomas Pilling were severely injured, the latter having his leg crushed by falling timbers. Miss Holivar and the two children who were killed were found about 200 feet from the site of the hotel, near the railroad tracks, covered over by broken furniture and other debris from the hotel. Anton Hasson had a shoulder dislocated, Mr. Lovelady received a few slight scratches and two of the children received no injuries whatever.

A barn stood near and a little west of south from the hotel, in which there were three horses. The barn was taken up and blown away. Two of the horses escaped injury, but the third had not been found on the evening of the following day.

Across the street from the hotel a blacksmith's shop was partially moved from its foundation and the sides twisted and slightly blown in. Adjoining the blacksmith's shop on the north the grain office and cribs of L. B. Beale & Co. were totally wrecked. About 200 feet north of the hotel were the railroad tracks and depot. The west two-thirds of the depot was but one story high, and this portion of the building, together with the roof of the east third, which was two stories high, were blown across the tracks and scattered in the adjoining cornfield. The ceilings in the upper rooms in the east end of the depot were also lifted up and blown away. Sixteen freight and flat cars standing on the side tracks were turned over and some of them were torn from the trucks and carried over three lines of cars into the ditch.

The time the storm struck is given all the way from 8 P. M. to 8:30 P. M., but the railroad officials state that it was just 8:15 P. M. when the depot was demolished, and that is probably the correct time. Rain is said to have begun about five minutes before the wind began, and hail fell for about one minute in advance of the storm.

Many people informed the writer that they did not observe anything alarming in the appearance of the approaching cloud, except that it was black, and they expected only a good heavy shower. No unusual noise was heard prior to the storm.

There was no evidence of the storm having touched the earth after it passed north of the railroad tracks. The path of destruction was about 225 feet wide and 400 to 450 feet long.

G. M. C.

A SMALL TORNADO AT SHARPSBURG, TAYLOR CO.

Observer J. L. Hurley, of Lenox, Taylor county, reports a small tornado that swept over Sharpsburg about 7:55 P. M. September 25th. From his report the following details are gleaned: The little town of Sharpsburg is located on the H. & S. railroad, about ten miles southwest of Lenox. The windstorm struck the place at the time above named, as shown by a clock that was blown from a shelf and stopped at 7:55. Several barns were destroyed, two churches were wrecked, and the railroad station was destroyed except a portion of the south wall. The lower story of a two-story building was wrecked while the upper story was but slightly injured and furniture mostly in place, as before the storm. The storm struck the town from the southwest, passing to the northeast. By the side of one of the churches destroyed, and between the two, stands a church uninjured. Buildings were moved in different directions, and the distribution of wreckage indicates that there were fitful and irregular movements of the air, instead of a continuous whirl. The storm was accompanied by heavy rain, and the pathway of the squall (or tornado, if it was of that character) was from 40 to 80 rods wide. But little damage was wrought east of Sharpsburg. Happily no lives were lost, and but one person was injured.

INCEPTION OF A TORNADO.

Observer Leslie Littell, of Estherville, reports the development of a storm cloud near his station, on the 24th of September, forming, as he believes, the inception of the deadly tornado which wrought desolation near Morristown, Minn., on the evening of that date. During the earlier part of the day, Mr. Littell says, the wind blew from the south, carrying heavy stratus clouds. Later in the day the clouds assumed the cumulus form, and immense thunderheads appeared in the southeast, rising higher continually until they seemed like a range of mountains suddenly transported to the southeastern quarter of the heavens. After a short lull in the atmosphere it began to rain, and then a peculiar noise was heard, which was not thunder because there was no lightning, and it was not hail because none fell. In a short time the wind began to freshen and soon carried the storm clouds toward the northeast and out of sight. The peculiar noise, Mr. Littell thinks, was caused by the upward rush of air from underneath the massive thunderheads, and that was the beginning of the Morristown tornado. The upward rush of air also caused the calm, or lull in wind movement, that preceded the strange sounds heard during the passing of the storm.

CLIMATOLOGY OF THE MONTH.

Barometer.—The mean pressure for the month of September was 30.04 inches. The highest pressure observed was 30.48 inches, at Sioux City, on the 27th; lowest, 29.41 inches, at Dubuque, on the 11th; range for the state, 1.07 inches.

Temperature.—The mean temperature was 64.4° or about normal, as shown by reports of 109 stations. The highest monthly mean was 68.6°, at Keokuk; lowest, 60.4°, at Primghar. For the northern section the mean was 62.5°; central section, 64.5°; southern section, 66.3°. The highest temperature reported was 99°, at Wapello, on the 5th. The lowest was 26°, at Sioux Center, on the 29th. The average monthly maximum was 92.6°; average monthly minimum, 33.3°. Greatest daily range, 50°, at Fonda; average of greatest daily ranges, 36.3°.

Precipitation.—Average for the state, as shown by 128 station reports, 4.98 inches, which is about 2 inches above the September normal. The average rainfall by sections was as follows: Northern section, 5.64 inches; central section, 4.76 inches; southern section, 4.54 inches. The greatest amount reported for the month was 8.82 inches, at Spirit Lake. The least amount was 2.48 inches, at Le Claire. The greatest daily amount reported was 5.98 inches, at Spirit Lake, on the 11th. The average number of days on which .01 inch or more precipitation was reported was 9.

Wind and Weather.—Prevailing direction of wind, southeast; highest velocity reported, 70 miles per hour from the southeast, at Sioux City, on the 14th. There were 15 clear days, 8 partly cloudy, and 7 cloudy.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES. Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
port	30.04	30.36	27	29.42	11
oines	30.04	30.44	27	29.43	11
da	30.03	30.41	27	29.57	24
		30.46	27	29.55	11
que	30 04	30.40	27	29.41	11
a, Neb					
k	30.04	30.30	17	29.55	11
City	30.02	30.48	27	29.54	24
Means	30.04	30 48	27	29 41	11

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
enport	5,054	44	SW	11
Moines	5,571	33	SW	24
buque	5,300	42	NW	11
kuk	5,196	46	W	11
Crosse, Wis	4,944	30	NW	11
aha, Neb				
ix City	9,672	70	SE	14

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* First frost of the season on 17th, t little damage resulted even to tender vegetation except in ry low places; precipitation was 3.37 inches above average past ten years.

BONAPARTE—*Hon. B. R. Vale.* First half of month very y, last half equally excessive in precipitation; corn matured efore the rains; fall plowing begun after 18th.

AFTON—*N. W. Rowell.* On the 25th at 8:30 P M., a wind- orm destroyed Miller's farm house and part of the sheds at rick kiln.

FOREST CITY—*J. A. Peters.* First killing frost on the 29th ut all corn was out of danger; pastures good at close of he month as they were June 1st. Precipitation over inches above normal and the greatest during the past six years.

FT. MADISON—*Mrs. L. A. McCready.* On night of 18th lightning burned two barns with valuable contents; one was in Washington township and the other near Denmark.

GRAND MEADOW—*F. L. Williams.* Corn ripened without frost; vegetation still green at close of month.

GRINNELL—*A. O. Price.* Fields green as June; ground in fine condition for plowing; light frost the 17th without damage.

HARLAN—*C. A. Reynolds.* A good fall month, without extremes of temperature.

HUMBOLDT—*H. S Wells.* Corn gathering begun; stock healthy; hay still being put up.

LOGAN—*Mrs. M. B. Stern.* Pastures fine; no frost to kill vegetation; no damage by wind.

MOUNT VERNON—*J. W. Hubbard.* Temperature above normal; rainfall also in excess; seventeen days of south wind.

OSKALOOSA—*Jos. Boyd* A warm month, with plenty of moisture for maturing all crops.

OVID—*H. C. Miller.* Frost on 17th did no damage. On night of 25th a barn in Benton township was struck by lightning and destroyed with contents, including 5 horses; another burned in Warren township with 7 horses.

RIDGEWAY—*Arthur Betts.* A green, frostless September; five days with severe thunderstorms; sunshine, 62 per cent; a few large hailstones on the 25th; October 1st gardens green as in June; pastures fine; forests verdant, except sumac.

STORM LAKE—*Prof. M. L. Fuller.* Precipitation since June 1st, 25.86 inches, or .13 inch above the average annual precipitation for preceding 16 years. For the year to October 1st it amounts to 32 65 inches. Storm lake is higher than for several years.

TOLEDO—*Lulu G. Bookwalter.* No damaging frost; corn is ripening up in the good old-fashioned way, with an average of 3 ears to each hill.

WEST BEND—*Ph. Dorweiler.* A remarkable month; only two light frosts, on the 17th and 27th, and tender vegetation was scarcely hurt; hailstorm 5 miles east on the 13th.

WHITTEN—*F. C. Butler.* Five inches of rain on the 18th; heaviest rain in 20 years.

WAPELLO—*G. W. Schofield.* But one light frost; everything green as in springtime; seeding nearly finished.

BELATED REPORTS FOR AUGUST.

AUDUBON—August. Mean temperature 76.2°; highest 98° on the 6th; lowest 49° on the 1st and 2d; greatest daily range 45°; total precipitation 6.51 inches; greatest in 24 hours 2 inches on the 24th; number of clear days 10, partly cloudy 7, cloudy 14, rainy 8.

CARSON—August. Total precipitation 4 28 inches; greatest in 24 hours 1.68 inches on the 27th; number of rainy days 7.

FAYETTE—August. Mean temperature 75.7°; highest 93° on on the 5th, 9th, 10th and 20th; lowest 56° on the 27th; greatest daily range 31°; total precipitation 2.76 inches; greatest in 24 hours .77 inch on the 11th; prevailing wind, southwest; number of clear days 24, partly cloudy 6, cloudy 1, rainy 10.

FAIRFIELD—August. Mean temperature 78.7; highest 99° on the 10th; lowest 60° on the 3d and the 27th; greatest daily range 35; total precipitation 3 64 inches; greatest in 24 hours .90 inch on the 24th; number of clear days 17, partly cloudy 14, cloudy 0, rainy 7.

GREENFIELD—August. Mean temperature 76.7°; highest 94° on the 6th and 11th; lowest 56° on the 31st; greatest daily range 31°; total precipitation 3 37 inches; greatest in 24 hours 1.02 inches on the 24th; number of rainy days 7.

MURRAY—August. Total precipitation 3.20 inches; greatest in 24 hours 1.80 inches on the 16th; number of clear days 26, partly cloudy 5, cloudy 0, rainy 2.

STUART—August. Mean temperature 77.2°; highest 98° on the 2d; lowest 47° on the 6th; greatest daily range 31°; total precipitation 6.55 inches; greatest in 24 hours 1.45 inches on the 11th; number of rainy days 6.

ERRATA IN JULY REVIEW.

GRUNDY CENTER—Mean temperature recorded 71.5° on page 7, should have been 71.4°.

GUTHRIE—Total precipitation recorded 3 14 inches on pages 7 and 14, should have been 3.16.

SIBLEY—Total precipitation recorded 7.91 inches on pages 7 and 12, should have been 8.41 inches.

PELLA—Minimum temperature readings for Pella should have been omitted, considered inaccurate.

GRUNDY CENTER—Mean maximum temperature recorded on page 9, 72.9°, should have been 82.9°.

ERRATA IN AUGUST REVIEW.

COON RAPIDS—August. Mean temperature of 76.7°, recorded on page 8, should have been 78.2°.

OTTUMWA—August. Amount of precipitation on the 11th, as published on page 12, should read 1 inch instead of 1.8 inches.

CLIMATOLOGICAL DATA FOR SEPTEMBER, 1900.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIP., IN INCHES.				Number rainy days	SKY.			Prevailing direction of wind.	Dates of thunderstorms.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.		
Akron	Plymouth	....	....	64.7	.....	94	8	33	17, 27	41	6.95	.....	5.28		8	13	12	5	S	12, 13
Algona*	Kossuth	1,500	7	62.7	-0 9	89	5	35	27	...	5.42	*3.60	2.15	....	9	9	16	5	SE	
Alta	Buena Vista	1,519	8	62.0	-2.6	89	5	33	17	31	5.34	*3.33	2.60	....	9	15	11	4	S	4, 13, 14, 18
Alta (near)	Buena Vista	.....	....	.....	.....	.....	.....	.....	.....	.....	5.12	.....	1.46	....	8	..	..	..	.....	
Bancroft	Kossuth	.....	...	61.6	.....	90	5	32	27	34	6.82	.....	1 66	...	13	15	5	10	SE	2, 5, 8, 15, 18
Britt	Hancock	1,230	....	61.6	.....	91	5	30	17	34	6.76	.....	2.33	..	11	13	5	12	SE	
Charles City	Floyd	1,012	8	62 4	-1.2	92	5	35	17	30	6.75	*4.47	1.08	....	12	10	15	5	S	2, 11
Clear Lake	Cerro Gordo	984	....	63.7	.....	92	5	38	28	32	4.80	.....	1 50	....	8	10	12	8	SW	
Cresco	Howard	1,280	27	61.0	*1.2	91	5	32	17	30	6 29	*2.65	1.48	....	14	15	5	10	S	1, 2, 14, 25
Decorah	Winneshiek	900	6	62.3	-0.9	95	5	34	18	41	4.00	*1.09	.98	....	13	....	....	....	.....	
Dows	Wright	.....	....	62.9	.....	93	5	30	17	37	5.28	.....	1.55	..	10	12	12	6	SE	14, 18
Elkader	Clayton	.....	18	64.2	*2 0	95	5	33	18	40	3 99	* 08	1.25	..	11	10	16	4	SE	18, 25
Emmetsburg	Palo Alto	.....	..	...	...	...	.....	.....	.....	....	6.08	.....	.....	....	...	...	...	..	.....	
Estherville	Emmet	.....	....	61.4	.....	89	5	30	27	44	7.25	.....	4.60	..	11	13	9	8	SE	8, 13
Fayette‡	Fayette	1,000	9	63.8	*0.2	93	7	31	17	36	3.72	* .89	1 13	....	11	16	6	8	.....	15, 18, 25
Fonda	Pocahontas	1,237	...	63 0	...	98	1	25	16	50	5.51	... ...	2.12	....	6	14	15	1	SE	
Forest City	Winnebago	1,220	....	61.6	....	91	5	34	17	33	6.79	.....	2.33	...	14	13	5	12	SE	
Grand Meadow*	Clayton	.....	8	61 5	-1.5	90	5, 10	38	17	.....	3.19	* .30	.84	....	8	13	8	9	SW	
Greene	Butler	943	....	63.3	.....	93	5	33	17	37	5.16	.....	1.20	...	12	15	4	11	S	
Hampton	Franklin	1,240	9	63 5	*1.1	95	5	35	17	36	6.86	*3.99	1 55	....	9	7	20	3	SE	
Hawkeye	Fayette	.....	6	....	.....	...	.....	.....	.....	....	4.17	*1.51	1.37	..	8	....	....	....	.....	
Hoprig‡	Emmet	.....	....	....	.....	....	.....	.....	.....	....	3.28	.....	1.42	....	4	14	14	2	NW	
Humboldt	Humboldt	1,082	6	63.7	.....	93	5	33	17	32	5.05	*2.95	1.60	....	11	19	5	6	NW	
Lansing	Allamakee	.....	....	65.0	....	95	4	34	17, 18	36	3.55	.....	.72	....	10	6	15	9	.....	
Larchwood	Lyon	.....	....	62.1	.....	90	9	30	17	43	3.80	.....	3 50	...	2	18	5	7	NW	
Larrabee‡	Cherokee	....	8	61.6	-2.9	91	8	29	17, 27	40	6 24	*4.27	4.35	....	9	11	18	1	SW	
Le Mars	Plymouth	1,221	..	63.1	....	90	8	31	17	43	7.01	.....	5.50	..	10	13	14	3	S	
New Hampton (a)	Chickasaw	1,166	..	62.2	.....	92	5	36	29	30	4.16	... .	.88	...	12	....	....	....	NW	
Northwood	Worth	1,210	...	60.6	.....	91	5	34	27	31	5.60	.....	1.88	...	12	8	12	10	NW	
Osage	Mitchell	1,178	8	60 6	*1 3	90	5	34	17	29	5.53	*2.15	1.31	....	12	7	7	16	S	2, 8, 14, 22, 25, 26
Plover‡	Pocahontas	.....	...	63.3	.....	94	5, 9	31	17	46	4.46	.....	1.98	....	8	15	5	10	S	
Primghar	O'Brien	.....	...	60 4	.....	91	5, 9	32	17	37	5.55	.....	4.25	....	4	20	0	10	SW	
Ridgeway	Winneshiek	.....	...	63.4	...	92	5	36	17	27	6.88	.....	1 16	...	20	13	11	6	S	2, 14, 15, 25, 26
Ruthven	Palo Alto	.....	....	62.8	.....	90	5, 10	32	27	42	6.82	.....	3.82	....	7	21	1	8	SW	
Sheldon	O'Brien	1,406	....	61.8	.....	89	5, 9	31	17	37	6.95	.....	5.75	....	7	15	3	12	S	
Sibley	Osceola	1,506	6	61.7	-0.5	91	9	29	27	45	5 91	*3.52	4.00	T	10	10	17	3	S	
Sioux Center	Sioux	.....	....	63.0	.....	89	9	26	29	47	7.22	.....	5.90	..	8	12	7	11	S	13, 22
Spirit Lake	Dickinson	.....	5	62.6	-2.7	91	5	35	17	38	8.82	*6.68	5.98	....	9	12	4	14	SW	
Storm Lake	Buena Vista	.....	10	62.8	.....	88	5, 8, 9	32	17, 27	31	5.33	*2.67	2.41	....	9	14	9	7	S	18, 22
Washta	Cherokee	.....	....	.....	.....	.....	.....	.....	.....	.....	7.47	.....	3.90	....	8	15	11	4	S	
Waverly	Bremer	942	...	63.8	.....	94	5	36	17	31	4.18	.....	1.42	....	13	12	10	8	S	18, 22, 26
West Bend*	Palo Alto	.....	6	61.2	-0.3	92	9	34	27	...	4.55	*2.39	2.85	..	10	11	11	8	S	
West Union	Fayette	1,105	..	...	....	....	.....	.....	.....	....	2.87	.....	.....	..	7	14	0	16	S	
Average		.....	..	62.5	-0.4	91.6	.....	32.9	.....	36.4	5.64	*2.69	....	....	10	13	9	8	S	

CENTRAL SECTION.

Amana	Iowa	.....	23	65.1	*3.2	91	5	37	17	34	4.39	*1.02	1.59	....	11	15	12	3	S	19, 25, 26, 28
Ames	Story	936	16	66.0	*2.4	93	5	36	17	39	6.12	*2.61	3.02	....	7	11	18	1	.....	
Baxter	Jasper	.....	....	64.8	...	93	5	33	16	42	3.68	.....	1.00	....	10	9	19	2	SE	
Belle Plaine	Benton	840	9	64.0	-0.1	91	5	34	17	33	5.12	*2 35	1.75	....	9	6	19	5	NW	
Carroll	Carroll	....	9	63 2	-0.7	93	8	32	17	41	4.65	*2.46	1.52	....	7	21	3	6	.....	
Cedar Rapids	Linn	744	17	66.0	*2.6	95	5	38	17	31	2.83	- .12	1.07	...	12	15	9	6	S	
Clinton	Clinton	609	8	65 5	*0.1	93	2	36	18	33	4.61	*1.62	1.62	....	10	16	8	6	SE	18, 19
Coon Rapids	Carroll	.....	....	63 8	... ..	91	5, 9	36	17	32	6.78	.....	1.90	....	7	18	7	5	SE	
Davenport	Scott	615	27	66.9	*2.0	91	5	38	17	29	3.66	* .58	1.71	....	13	16	6	8	SE	2, 18, 19, 25
Delaware	Delaware	1,048	8	62.9	*1.1	90	5	34	17	31	3.63	* .27	.92	....	11	12	8	10	S	
Denison	Crawford	1,192	6	63.7	-1.6	91	5, 8	30	17	36	3.64	*1 35	1.12	....	7	23	2	5	S	
Des Moines	Polk	861	21	65.4	‡ .0	92	5	40	17	31	3.66	* .65	1.08	....	9	11	7	12	SW	14,15,18,19,22,25,26
De Soto	Dallas	866	...	64.8	...	90	5	38	17	29	3.57	.....	.85	...	9	16	6	8	S	
Dubuque	Dubuque	655	26	65.4	*2.3	92	5	38	18	31	3.34	- .60	1.10	....	12	12	11	7	SE	1, 2, 25, 26, 28
Fort Dodge (a)	Webster	...	...	63 3	.....	92	5, 9	30	17	37	6.00	.....	2.10	....	7	18	9	3	SW NW	
Galva	Ida	.....	6	.....	.....	..	.....	.....	.....	.....	7.04	*5.08	3.30	...	7	13	14	3	SE	
Gilman	Marshall	1,035	....	.....	....	....	.....	.....	.....	.....	3.74	.....	1.16	....	10	17	5	8	S	
Grinnell	Poweshiek	1,011	9	64.4	*1.0	91	1	32	17	36	4.39	*2.35	.91	....	8	13	7	10	SE	
Grinnell (near)	Poweshiek	.....	...	65.2	.....	94	5	38	17	31	4.99	.....	1.45	....	11	17	5	8	SE	1,6,15,18,19,22,25,28
Grundy Center	Grundy	966	8	63.8	‡0.0	91	5, 9	33	17	35	8.54	*5.68	4.55	....	9	19	4	7	S	18, 19
Harlan	Shelby	.....	....	63.6	.....	92	5, 8	30	17	37	3.91	.....	1.08	....	9	11	11	8	S	18, 19, 23
Independence	Buchanan	921	37	63.1	*3.1	92	5	34	17	34	6.15	*1.86	2.00	...	7	20	5	5	SE	
Iowa City	Johnson	644	9	66.2	*1.0	93	5	37	17	34	4.35	*1.65	1.89	....	10	15	9	6	S	
Iowa Falls	Hardin	....	6	62.0	-0.5	92	5	32	17	34	5.17	*2.18	1.70	....	11	12	5	13	NW	
Le Claire	Scott	.....	....	.....	... ..	....	.....	.....	.....	.....	2.48	.....	.90	....	10	....	....	....	.....	
Logan	Harrison	928	34	63.0	-3.3	93	5, 8	31	17	37	4.09	*1.03	2.26	....	8	18	5	7	E,S	
Maquoketa	Jackson	.....	6	64.6	-0.1	91	5	34	18	41	4.62	*1.84	1.32	...	12	19	3	8	NW	
Marshalltown	Marshall	898	7	65.1	*0.2	93	9	34	17	35	5.35	*3.22	1.82	..	11	19	3	8	SE	
Monticello	Jones	800	45	64.2	*2.5	94	5	32	18	41	3.48	- .30	1 12	...	6	16	4	10	SW	
Mt. Vernon (Hub.)	Linn	.....	...	65.0	.....	92	5, 9	33	17	40	3.37	.....	.95	...	11	17	6	7	S	
Newton	Jasper	958	12	64.8	*1.9	92	5	34	17	32	3.73	* .43	1.00	....	9	13	11	6	SE	
Odebolt	Sac	.....	....	64.8	....	95	8	30	17	40	4.21	.....	1.25	....	7	17	7	6	.....	
Ogden	Boone	1,109	....	64.6	.....	92	5	34	17	37	6.86	.....	2 91	....	7	....	....	....	SE	
Onawa	Monona	.....	...	65.6	.....	93	5, 8	36	17	38	6.96	.... ..	4.65	....	8	21	5	4	SE	
Rockwell City	Calhoun	1,219	....	62.8	....	92	5	34	17	33	4 54	.....	1.25	....	7	18	6	6	.....	
Sac City	Sac	900	20	63 2	-5.7	91	5, 9	32	17	40	3.84	* .75	1.56	...	7	19	4	7	S,SW	
Scranton	Greene	.....	....	63.8	.....	91	5	35	17	32	6.58	.....	2.00	....	7	18	5	7	S	
Sioux City	Woodbury	1,122	10	62.8	-2.0	92	8	35	17	35	5.64	*3.91	2.15	...	8	17	9	4	SE	
Toledo	Tama	.....	5	65.8	*1.2	94	5	34	17	42	4.37	*1.26	1.45	....	9	21	2	7	S,SW	
Vinton*	Benton	800	9	63.8	*0.6	93	5	38	17	.....	2.77	* .05	1.08	...	6	24	0	6	SW	
Waterloo	Black Hawk	862	20	64.0	*2.0	94	5	35	17	37	5.48	*1.24	1.58	....	12	13	11	6	S,NW	
Wilton Junct'n(d)	Muscatine	.....	....	65.0	.....	92	5	35	17	36	4.12	.....	1.60	...	9	16	7	7	.....	18, 19
West Branch	Cedar	.....	....	64.7	.....	95	5	33	17	49	4.31	.....	1.26	....	6	19	6	5	SW	
Whitten(d)	Hardin	.....	....	62.4	.....	93	5	33	17	41	8.61	.....	5.00	....	7	....	....	....	S	18, 19, 25
Average		.....	...	64.5	*5.1	92.3	.....	31.9	.....	35.9	4.76	*1.65	.....	....	9	16	7	7	SE	

*Is used to indicate the plus sign (+)

CLIMATOLOGICAL DATA FOR SEPTEMBER, 1900—CONTINUED.

SOUTHERN SECTION.

TATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., INCHES.			Number rainy days.	SKY.			Prevailing direction of wind.	Dates of thunderstorms.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.		Number clear days.	Number partly cloudy days.	Number cloudy days.		
...n	Union		....	65.0	..	92	5, 9	35	17	36	5.96	.....	2.35	10	11	12	7	SW	
...n	Monroe	945	....	64 1	....	92	5, 9	33	17	39	3 92		.96	10	14	11	5	SE	26
...a	Cass	....	8	64.4	-1.3	93	5, 8, 9	29	17	43	3.68	*.88	.73	10	9	15	6	SE	14, 18, 19, 22
...ntic	Jefferson	640	..	....	..	....	.....	....	.....	.....	4.10	.....	1.00	6	....	....	..	.....	
...avia	Taylor	....	....	67.0	....	96	9	30	17	47	3.04	.....	1.03	9	6	22	2	SE	
...ford	Davis	857	..	66.4	....	94	5	36	17	34	3.85	....	1.03	10	.	....	..	S	
...cnap.	Van Buren	....	8	68.2	-0.6	95	5	36	17	40	5.87	*1.47	3.11	8	..	....	..	.....	
...aparte	Tama	526	....	....	....	....	.....	.....	.....	.....	3.79	.... ..	1.41	6	14	13	3	... .	
...kingham	Marion	....	....	....	....	..	.....	.....	.....	....	4.24	.....	1.78	4	....	....	....	.....	
...sey	Lucas	1,030	..	65.5	....	93	5, 9	34	17	34	5 15	.....	1 70	14	12	12	6	SE	26
...riton	Page	1,069	9	66.8	-0.8	96	5, 8, 9	33	17	42	3.64	*1.51	1.59	8	15	9	6	S	
...rinda	Page	....	8	68.1	-0 7	95	9	34	17	37	2.98	*.61	1.15	8	15	6	9	.....	
...lege Spr'gs (*i*)	Pot'wat'mie	989	....	66.0	.. ..	96	5	38	16	39	3.57	.....	.98	8	21	1	8	S	
...ncil Bluffs	Washington	.....	..	...	....	..	.....	...	.....	.....	5 04	.....	2 56	8	21	3	6	SW	
...wfordsville	Cass	.....	..	.....	.....	....	.....	...	.....	.....	4.63	.....	1.87	8	14	9	7	S	
...mberland	Des Moines	715	..	....	.....	...	.....	...	.....	.....	4.69	.....	3 30	5	....	....	....	.....	
...nville	Wapello	....	..	68.0	.....	96	9	38	17	36	3.81	.....	1.02	9	20	2	8	E	1
...lon	Mills	....	....	....	.....	....	.....	....	.....	.....	3 06	.....	.80	6	....	....	....	.....	
...erson	Jefferson	767	13	66.4	*2 3	94	10	33	17	42	4 54	*1.76	1.08	12	18	7	5	.....	
...irfield	Lee	516	51	....	....	....	....	....	.....	.....	3.97	*.12	1.63	8	12	6	12	SW	1, 2, 15, 18, 19, 22
Madison	Mills	979	29	66.0	*3.8	96	5	35	17	36	2 33	*.10	.90	5	7	22	1	SE	
...nwood ‡	Adair	....	8	64.0	-2.1	91	7	33	17	32	4.67	*1 64	1.21	9	....	....	....	.....	1, 11, 14, 19, 22, 24, 28
...eenfield	Keokuk	....	..	65.6	....	93	5	34	17	33	4.49	.....	1.12	8	20	4	6	.....	
...drick	Clarke	....	..	66.1	.. ..	92	5, 9	36	17	31	5 26	.....	2 08	7	12	14	4	SE	14, 25
...peville	Warren	....	..	66.0	.....	92	5	36	17	31	4 03	.....	1.14	11	....	....	....	NW	2, 14, 18, 22.
...dianola	Lee	618	28	68.6	*2.0	92	2, 5	42	17	29	5.02	*1.52	.56	11	15	9	6	SE	
...okuk	Van Buren	....	7	68.2	*0 2	95	5	39	17	35	4.90	- 23	2.09	12	..	..	..	.....	
...osauqua	Marion	....	6	65 3	-1.9	93	5	35	17	34	5.36	*2.01	2 05	10	16	5	9	SE	
...noxville ‡	Warren	....	..	....	....	....	.....	....	.....	.....	5 80	.....	2 50	8	9	11	10	.....	
...acona	Taylor	....	..	66.3	.....	90	9	37	17	30	4 14	.....	1.59	8	17	7	6	S	26
...enox	Lee	....	..	63 5	....	93	10	36	22	40	4.01	.....	1.80	5	12	11	7	NE	
...ooar	Ringgold	1,236	6	67.6	-0 6	96	9	36	17	36	3.61	*.84	1.20	10	13	10	7	S	
...t. Ayr	Henry	725	..	67.2	....	94	5, 10	37	17	35	4.58	.. ..	2.60	8	17	10	3	SW	
...t. Pleasant	Clarke	1,183	....	....	.....	....	.....	.....	.....	.....	5.07	.....	....	....	....	....	....	.....	
...urray	Douglas	1,113	25	66.9	*2 0	94	5	42	17	31	3 60	*.76	1.25	8	12	13	5	SE	
...maha (Neb.) ‡	Clarke	1,123	..	66 4	.....	93	9	36	17	34	6.78	....	3.23	7	....	....	....	S	
...sceola	Mahaska	850	16	65 7	*1 2	94	5	34	17	34	4 37	*1.46	1.29	8	17	4	9	SE	
...skaloosa	Wapello	630	5	67.5	-0.4	94	5	37	17	42	6.15	*2.79	1.50	7	12	9	9	SE	
...ttumwa	Wayne	....	6	66 2	-1.6	95	9	33	17	37	5.40	*1.66	1.44	12	16	3	11	SE	1, 2, 5, 14, 15, 18, 22, 25, 26
...vid	Mills	960	..	65.7	.....	95	5	35	17	36	3.72	.... ..	1 09	7	13	17	0	S	
...acific Junction	Marion	....	..	64.8	.....	93	9	35	16	37	5.07	.....	1 50	8	17	7	6	SE, SW	
...ella	Montgomery	1,033	..	67.8	....	94	5, 8	35	17	39	4 19	.....	1.47	11	13	13	4	S	
...ed Oak	Keokuk	....	....	67.0	.....	97	9	35	17	35	6 71	.....	2.54	8	16	12	2	W	1, 18, 22
...igourney	Fremont	....	....	66.2	....	93	5	37	17	33	2 94	.....	.64	11	18	5	7	SE, NW	
...hurman	Montgomery	1,058	6	67.5	*2.3	98	9	30	17	47	4.03	*1 64	1.05	11	17	9	4	SE, SW	10, 14, 17, 18, 19, 22, 23, 25
...illisca ‡	Louisa	578	....	68.2	....	99	5	38	17	37	4.51	.....	2.59	8	....	....	....	SE	
...apello(*a*)	Washington	....	9	64.6	-2.1	93	5	34	17	37	4.76	*2.14	2.50	10	....	....	..	SW	
...ashington	Madison	....	8	66.2	*0.3	94	5, 9	33	17	40	5.65	*2.55	1.50	9	...	....	....	.....	
...interset	Clarke	....	..	.....	.....	....	.....	....	.....	.....	4.86	... .	1.47	8	17	9	4	.....	
...oodburn		....	..	.....	.....	....	.....	....	.....	.....									
														9	15	9	6	SE	
Average		.....	....	66.3	-0.3	93.9	.....	35 2	.....	.....	36.5	4 54	*1.38	.....	9	15	8	7	SE	
Av. for the state		.....	....	64.4	*1.5	92.6	.....	33.3	.. .. ..	.....	36.3	4.98	..*1 91	....					

§Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a* One day missing, *b* two days, etc.

*Is used to indicate the plus sign (+).

IOWA WEATHER AND CROP SERVICE.

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR SEPTEMBER, 1900.

STATIONS.		DATE.																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Mean.
Afton	Max	86	81	78	91	92	82	84	90	92	91	81	74	85	76	73	60	64	67	71	67	74	74	79	80	80	74	53	56	71	65	76 4
	Min	64	69	50	55	69	64	63	60	65	66	64	49	49	58	54	44	35	49	51	43	44	48	46	66	68	47	42	46	41	42	53.7
Akron	Max	88	82	81	89	91	80	86	94	92	89	72	77	83	87	73	60	66	59	67	65	74	72	79	83	78	59	51	69	80	79	76 8
	Min	67	62	44	60	73	55	55	67	71	68	61	48	59	66	52	45	33	47	49	45	40	58	44	50	50	42	33	45	39	50	52.6
Albia	Max	85	85	78	89	92	82	82	88	92	91	83	74	84	82	82	67	64	64	72	69	72	78	75	80	85	77	57	57	68	75	77 6
	Min	67	66	49	52	53	57	57	59	63	67	65	48	51	54	58	43	33	35	40	42	42	43	47	51	51	52	42	42	43	45	50 6
Alta	Max	86	78	77	86	89	74	81	88	89	82	67	73	79	75	67	57	62	49	65	62	70	63	73	79	62	53	54	58	71	76	71 5
	Min	64	66	46	58	72	56	62	64	67	70	60	48	54	60	52	40	33	44	48	44	42	48	47	64	54	42	34	46	39	48	52 4
Amana	Max	84	85	77	85	91	82	80	86	89	89	79	73	80	82	79	61	64	55	63	67	70	73	71	75	85	75	55	56	68	73	75 1
	Min	70	71	51	51	71	66	59	61	65	69	67	51	47	55	59	47	37	39	50	46	44	50	52	62	70	53	45	51	43	44	55 1
Ames	Max	90	88	82	83	93	88	90	88	90	86	78	76	88	79	71	76	66	58	70	82	75	70	75	80	82	66	58	56	75	76	77.8
	Min	68	70	50	52	71	69	55	60	64	67	62	50	49	55	58	46	36	47	59	46	42	49	49	68	72	48	41	42	38	46	54.2
Atlantic	Max	88	82	84	90	93	81	86	93	93	88	79	79	88	81	74	64	67	63	72	68	78	66	79	82	81	61	56	56	75	78	77.5
	Min	70	56	42	54	72	55	48	65	61	67	57	47	48	62	51	42	29	51	51	42	35	47	45	66	61	46	40	44	33	47	51 2
Bancroft	Max	86	80	73	86	90	75	81	86	88	83	75	73	89	73	71	56	60	59	67	59	73	64	73	80	77	59	55	56	70	76	72 5
	Min	61	58	45	54	73	55	50	52	62	68	59	47	53	53	55	43	33	46	47	44	43	50	43	63	58	47	32	46	36	42	50.6
Baxter	Max	87	82	84	86	93	79	82	88	91	91	74	79	87	80	78	55	68	54	89	69	78	75	72	78	83	83	54	54	74	78	77.5
	Min	72	50	53	59	61	57	56	63	67	67	48	51	54	60	43	33	42	45	44	43	47	48	60	66	49	41	41	41	46	52	52 0
Bedford	Max	89	82	88	94	96	90	91	96	96	93	80	82	91	79	89	62	73	72	81	75	83	81	84	83	84	80	53	55	83	83	82 3
	Min	62	60	46	56	65	62	51	60	62	68	64	47	54	57	52	42	30	50	54	38	33	43	43	65	65	48	43	45	37	43	5 .6
Belknap	Max	85	87	80	89	94	90	84	90	93	91	76	78	85	82	82	62	65	60	75	72	75	78	78	81	86	63	55	58	72	76	78.0
	Min	69	71	54	58	65	62	59	60	65	68	69	52	51	58	60	45	36	44	50	50	46	50	51	52	68	56	44	44	42	44	54.7
B'l'e Plain	Max	86	88	80	83	91	78	80	84	88	90	78	71	80	82	75	61	63	55	63	68	69	70	72	75	83	60	65	55	57	72	74 1
	Min	68	72	53	50	61	63	58	61	63	68	72	50	48	55	59	45	34	43	48	44	44	51	53	58	68	53	43	45	40	41	53.8
Bonaparte	Max	85	92	83	87	95	89	84	89	94	93	72	78	87	86	88	68	67	60	71	74	75	77	75	78	88	76	69	58	73	76	79.3
	Min	68	78	58	59	72	71	59	59	68	68	70	65	47	54	61	48	36	42	51	42	45	51	55	67	73	58	48	51	45	45	57.1
Britt	Max	86	76	79	82	91	79	80	83	84	86	76	74	80	77	70	56	64	53	63	58	70	64	71	77	78	61	57	51	70	75	72.4
	Min	66	66	48	49	73	57	55	61	63	66	58	47	50	59	52	41	30	44	45	43	42	50	41	60	61	44	34	45	37	43	50 7
Carroll	Max	86	81	80	89	92	80	82	93	91	85	71	79	86	80	71	63	67	53	71	63	76	66	76	82	77	57	57	55	76	78	75.4
	Min	62	66	46	48	58	56	49	53	58	68	64	49	53	59	55	42	32	46	50	43	40	54	45	64	71	44	35	37	33	52	51 1
Cedar Rap	Max	85	86	80	85	90	83	81	88	90	91	80	75	85	84	80	61	67	53	64	66	73	73	73	76	87	78	56	57	72	76	76.7
	Min	70	66	55	54	71	66	60	61	65	69	59	52	50	56	56	58	48	40	50	51	46	50	55	63	71	53	46	50	45	46	55.4
Charlton	Max	84	82	81	90	93	83	83	89	93	90	83	77	86	80	80	64	67	61	76	71	71	74	77	77	81	76	54	54	73	76	77.5
	Min	67	67	49	56	70	65	55	60	65	67	64	47	52	57	58	44	34	47	51	45	40	53	46	52	70	50	44	46	40	48	53.6
Charles Cy	Max	85	79	76	81	92	78	80	79	87	87	78	71	79	78	73	57	61	55	59	59	68	64	69	74	80	65	56	52	68	74	71.8
	Min	70	68	47	52	70	61	54	60	64	68	70	48	49	59	59	45	35	40	45	45	41	48	49	60	70	47	36	46	38	46	53.0
Clarinda	Max	90	84	81	93	96	91	89	96	96	88	80	82	90	78	80	67	71	71	78	75	81	74	86	83	84	63	52	57	81	81	80.6
	Min	66	47	47	56	68	64	54	62	64	68	59	49	48	61	55	43	33	54	52	42	41	51	45	66	59	49	46	47	49	46	53.0
Clear Lake	Max	89	81	84	84	92	82	85	82	89	90	77	75	85	78	78	60	65	54	62	55	70	68	65	70	80	78	62	60	52	72	74.5
	Min	66	68	51	53	71	57	52	50	63	66	59	48	55	57	52	42	43	41	45	47	53	56	54	46	60	62	43	38	45	43	52.9
Clinton	Max	88	93	78	83	92	82	80	85	89	92	83	75	81	86	84	63	65	60	65	69	71	74	73	77	88	75	57	62	67	73	77.0
	Min	69	69	54	50	64	67	58	59	61	65	62	49	45	53	57	47	38	36	51	49	43	44	53	57	70	65	47	50	46	42	54 0
College Sps	Max	89	85	84	90	93	86	89	94	95	91	78	78	89	..	..	..	..	.	..	..	..	77	78	85	..	70	54	57	74	77	81.6
	Min	67	68	50	64	69	65	64	64	68	70	61	51	52	62	59	41	34	..	53	43	44	52	52	60	..	48	42	44	40	40	54.6
Coon Rap	Max	85	79	77	87	91	84	80	89	91	84	79	72	80	79	73	58	61	55	66	63	70	65	73	79	77	63	54	54	70	74	73.7
	Min	65	65	50	56	73	60	62	63	65	70	63	57	54	59	56	43	36	45	50	45	43	53	48	65	62	46	38	47	38	54	54.0
Co. Bluffs	Max	91	80	88	92	96	81	90	95	93	88	74	79	87	79	74	62	66	67	75	72	78	69	78	86	78	55	55	64	80	80	78.4
	Min	72	59	51	67	65	57	58	69	70	65	53	54	60	57	45	38	42	53	55	43	44	48	50	70	47	43	43	40	41	52	53.7
Cresco	Max	88	78	74	82	91	78	78	78	86	88	73	70	79	78	69	56	59	49	58	59	68	67	69	73	82	56	55	53	66	73	71.1
	Min	67	57	50	51	70	59	56	59	66	67	58	45	49	58	50	42	34	39	46	44	44	46	50	58	61	45	34	45	37	45	51.0
Davenp'rt	Max	84	90	80	83	91	83	77	83	88	90	81	75	82	84	84	63	66	58	66	69	72	72	73	79	87	77	55	60	68	74	76.5
	Min	71	68	58	59	72	70	60	62	65	68	61	53	54	59	55	46	38	47	52	54	49	53	54	63	74	54	48	51	48	52	57.3
Decorah	Max	90	86	78	83	95	83	79	78	88	91	80	72	80	79	72	53	62	51	58	57	58	68	72	73	82	62	58	53	67	74	72.7
	Min	66	56	44	42	73	62	53	60	68	68	62	52	50	60	53	44	36	34	48	46	47	44	54	57	65	46	38	43	42	44	51.9
Delaware	Max	84	84	75	81	90	81	78	81	87	89	80	72	81	82	81	58	63	52	60	60	69	71	71	71	83	75	54	55	66	71	73.5
	Min	69	66	50	50	69	61	59	58	62	67	60	49	48	55	56	44	34	36	45	45	43	46	54	53	67	49	43	49	41	42	52 3
Denison	Max	86	83	79	87	91	82	84	91	90	83	75	75	83	78	72	59	64	57	69	64	73	65	76	82	76	59	54	60	74	77	74.9
	Min	68	67	44	57	72	56	51	65	68	72	61	46	54	63	54	41	30	45	51	43	37	54	45	56	57	44	37	46	40	50	52.5
Des Moines	Max	85	81	78	87	92	82	80	88	91	87	79	79	83	78	74	61	64	57	72	68	74	70	75	80	80	61	54	55	74	76	75.5
	Min	69	66	54	57	72	66	60	62	66	71	57	53	53	58	53	47	30	49	51	48	45	52	48	67	61	51	44	47	43	50	55.3
De Soto	Max	86	82	75	85	90	82	79	85	88	88	80	71	79	77	73	60	61	59	68	66	69	70	70	80	81	65	55	58	68	73	74.1
	Min	70	65	52	56	74	64	56	64	66	72	60	52	51	60	52	47	38	51	53	48	43	50	49	69	65	50	45	51	40	50	55.4
Dows	Max	87	80	80	85	93	85	80	87	91	87	80	75	82	78	73	58	64	54	66	61	70	65	72	78	82	66	57	52	72	78	74.6
	Min	66	66	43	52	71	55	52	60	64	67	60	45	48	56	55	44	30	40	48	48	38	48	48	63	64	44	34	46	38	44	51.2
Dubuque	Max	84	87	79	80	92	80	79	83	87	89	80	74	83	82	81	58	62	57	62	63	71	72	74	77	88	77	57	57	68	73	75.2
	Min	72	64	55	55	70	66	61	62	65	68	61	52	52	59	53	46	40	38	50	23	47	49	56	59	73	51	46	50	47	50	55.6
Eldon	Max	85	88	83	90	95	87	92	90	96	93	82	78	88	85	84	67	69	61	75	74	76	80	78	80	88	78	59	58	73	78	80 3
	Min	68	73	53	54	71	70	64	59	69	67	66	50	47	52	60	46	38	43	51	45	42	48	54	67	78	57	45	50	43	43	55 8
Elkader	Max	89	84	84	85	95	83	85	85	92	92	80	80	82	85	80	63	70	52	61	65	76	75	75	75	88	67	63	55	73	80	77.3
	Min	69	60	48	46	69	60	52	57	64	66	60	47	46	54	53	41	34	33	47	45	45	43	52	52	70	48	40	47	42	40	51.0
Estherville	Max	88	78	78	83	89	73	82	79	82	85	72	72	80	77	67	55	75	57	67	60	80	67	82	81	75	56	56	63	70	85	73.8
	Min	63	60	47	47	70	55	47	61	61	65	54	47	53	55	45	37	32	42	47	45	40	47	42	61	55	41	30	44	35	45	49.1
Fairfield	Max	84	91	82	88	92	84	83	89	93	94	78	78	86	85	84	65	67	69	72	73	74	77	78	89	88	76	56	59	73	78	79 2
	Min	66	70	54	58	70	66	57	57	63	66	71	47	44	50	54	46	33	40	51	47	40	47	53	53	70	54	46	50	42	41	53 5
Fonda	Max	98	96	84	87	92	93	91	89	91	93	86	87	84	80	72	72	74	60	66	67	75	73	70	72	83	75	76	80	78	81	80.8
	Min	74	46	51	52	54	60	64	66	67	64	42	41	44	41	34	25	35	30	37	36	44	40	45	48	38	31	34	33	40	38	45.1
Forest City	Max	86	76	79	82	91	79	80	83	84	86	76	74	80	76	70	56	64	53	63	58	70	64	71	77	78	61	57	51	70	75	72.4
	Min	66	66	48	49	73	57	55	61	63	63	58	47	50	50	52	41	34	44	45	43	42	50	41	60	61	44	33	45	39	43	50.9
Ft. Dodge	Max	87	..	80	86	92	86	80	89	92	86	80	76	83	79	75	65	65	55	68	65	72	65	81	80	80	63	60	56	74	69	75.5
	Min	66	..	45	50	71	55	48	64	64	70	50	46	50	58	57	45	30	41	48	44	38	49	47	45	62	44	55	47	37	47	51.1
Greene	Max	90	89	81	85	93	85	86	84	90	90	79	75	83	80	71	59	69	53	62	61	72	66	72	76	82	66	58	53	71	77	75.4
	Min	67	65	47	51	70	58	53	58	63	66	61	46	49	55	54	44	33	40	41	44	41	48	48	59	66	46	35	46	38	45	51.2
Greenfield	Max	84	80	76	80	86	87	91	90	86	84	76	74	84	79	73	60	59	62	70	73	71	74	79	69	71	70	54	57	73	75	74.9
	Min	62	56	52	54	59	58	66	67	61	61	58	48	55	60	50	42	33	38	51	52	52	55	50	64	65	46	41	46	41	49	53.1
Grinnell	Max	91	81	75	83	90	84	77	83	87	86	81	71	79	77	75	62	61	54	63	65	68	70	72	76	82	76	58	54	66	72	74 0
	Min	55	71	55	56	70	64	59	60	65	70	65	50	54	58	61	44	32	46	50	47	46	52	50	60	72	51	43	49	43	48	54 9
Grin'l (nr.)	Max	85	82	79	87	94	80	82	87	91	86	77	76	82	80	76	63	64	57	66	61	72	71	72	75	81	82	53	53	68	74	75.2
	Min	70	72	54	57	71	64	60	60	66	70	65	51	51	57	60	45	38	45	50	47	46	50	49	65	59	52	43	49	41	47	55.1
Grundy C'r	Max	86	81	80	85	91	81	83	87	91	88	78	75	84	80	75	62	68	55	64	64	72	70	71	76	83	69	55	55	71	75	75.2
	Min	66	64	47	52	70	57	55	58	63	66	62	48	49	55	57	44	33	42	48	43	41	49	51	62	67	49	39	47	40	46	52.3
Hampton	Max	88	80	85	87	95	80	84	87	91	89	72	77	85	80	70	59	70	49	63	62	74	65	74	75	83	56	61	53	75	79	74.9
	Min	67	61	50	51	71	58	53	60	64	68	56	49	53	56	51	43	35	44	48	45	45	50	45	62	60	45	37	47	42	47	52.1
Harlan	Max	86	80	79	89	92	83	84	92	91	89	76	74	83	79	69	59	65	60	70	65	73	63	78	82	78	61	56	60	73	76	75 5
	Min	65	67	44	57	70	57	53	62	63	67	62	47	50	61	62	41	30	45	51	41	38	52	46	66	60	45	38	46	36	42	51.8
Hedrick	Max	84	87	78	86	93	82	82	86	92	91	75	74	82	83	82	67	64	70	79	69	76	79	79	86	78	57	59	68	74	76	77.9
	Min	66	64	52	53	67	64	56	54	62	66	65	48	46	52	57	43	34	50	47	42	48	56	65	69	52	44	49	41	45	48	53 2
Hopeville	Max	85	84	80	89	92	82	83	89	92	90	80	77	85	80	76	61	64	64	73	69	75	72	76	79	78	75	57	55	72	74	76 9
	Min	69	65	53	57	72	66	59	62	55	70	61	50	54	58	56	45	36	50	53	46	47	52	49	62	71	49	44	47	41	48	55 3
Humboldt	Max	87	81	78	86	93	87	80	88	92	87	78	77	82	78	73	59	63	55	66	63	70	66	73	80	79	64	58	56	72	76	74 9
	Min	67	65	46	54	73	57	50	64	64	67	62	47	54	58	57	45	33	45	48	47	39	50	45	64	63	45	34	48	40	44	52 5
In'pend'ce	Max	82	86	78	81	92	86	80	84	88	89	78	73	81	79	76	59	65	49	60	60	71	68	72	74	84	60	54	53	69	74	73.4
	Min	68	70	48	51	69	60	58	58	63	66	67	48	47	55	57	44	34	39	46	47	42	48	52	57	69	51	40	47	40	44	52.8
Indianola	Max	84	82	80	88	92	85	81	88	91	88	83	76	84	78	78	64	65	61	72	68	74	71	76	79	81	75	54	54	73	76	76.7
	Min	68	69	52	58	72	64	57	62	65	69	64	51	53	58	58	45	36	49	51	46	44	53	47	67	71	49	44	47	43	50	55.4
Iowa City	Max	85	89	81	87	93	84	83	88	92	92	78	76	84	85	81	63	68	58	65	60	73	76	74	75	88	73	58	57	71	77	77.1
	Min	70	72	68	53	68	65	59	60	63	68	72	50	48	53	58	48	37	40	48	48	43	48	51	61	71	58	45	49	43	44	55.4
Iowa Falls	Max	85	79	79	85	92	78	81	86	90	86	76	72	80	79	70	58	62	51	65	63	69	65	71	77	82	63	63	54	69	75	73.5
	Min	63	55	45	52	71	57	51	60	64	67	56	46	47	57	50	41	32	40	48	46	41	46	50	63	61	43	37	46	36	46	50.6
Keokuk	Max	84	92	80	86	92	88	82	88	91	90	82	73	83	85	87	64	65	59	73	75	73	76	75	79	87	73	52	60	71	74	78.0
	Min	70	68	64	64	73	74	62	63	68	70	73	56	54	58	64	50	42	51	54	55	50	54	53	66	68	61	47	50	47	50	59 3
Keosauqua	Max	81	88	84	89	95	86	85	90	94	92	81	79	85	83	86	66	67	60	69	74	75	75	75	77	86	78	58	59	72	76	78.8
	Min	71	73	60	58	73	70	62	60	66	71	63	53	50	54	63	49	39	45	53	52	46	51	55	68	72	58	49	52	48	46	57.7
Lansing	Max	88	84	83	95	82	82	80	88	84	82	80	84	84	82	76	61	66	52	60	60	74	72	74	76	84	82	71	56	70	78	76.7
	Min	68	58	49	70	64	52	60	66	66	64	64	48	48	58	60	45	34	34	50	48	46	42	50	52	72	52	39	41	42	44	53.2
Larchwood	Max	87	85	83	88	84	86	89	87	90	84	83	75	79	73	80	76	79	64	66	66	76	67	74	70	73	76	78	69	76	79	78.1
	Min	60	59	52	47	44	43	48	50	53	67	64	53	50	51	50	43	30	37	47	54	45	32	34	35	37	59	38	40	39	42	46.1

MONTHLY REVIEW OF THE

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR SEPTEMBER, 1900—CONTINUED.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Le Mars	Max	87	75	75	86	89	75	87	90	89	83	75	74	80	78	70	69	62	57	67	64	70	69	76	80	75	62	53	62	74	75	74.3
	Min	65	63	45	43	69	55	61	65	69	71	59	46	58	66	50	42	31	46	49	44	39	55	49	65	50	41	32	42	38	50	51.9
Lenox	Max	88	82	78	87	89	84	83	89	90	87	80	74	82	77	75	63	62	65	72	69	74	70	77	79	78	76	52	55	70	74	77.0
	Min	68	71	51	58	71	67	57	63	69	69	66	49	53	60	58	44	37	51	54	44	48	56	47	67	61	48	44	46	42	50	55 6
Logan	Max	90	84	80	87	93	82	84	93	92	88	71	78	84	78	69	63	59	64	74	66	76	55	75	76	76	56	60	64	72	76	74 7
	Min	65	60	44	58	68	60	58	64	60	70	58	47	50	60	52	50	31	45	54	42	39	45	47	76	53	48	44	58	35	42	51 2
Maquoketa	Max	84	88	82	83	91	84	79	84	88	89	82	77	84	83	82	76	69	57	63	50	43	49	55	74	71	56	54	58	45	40	76 9
	Min	69	70	51	49	50	66	57	59	61	60	65	49	45	52	57	45	38	57	63	41	34	53	50	74	69	46	41	48	40	46	52.2
Marsh'l't'n	Max	88	83	82	87	70	60	54	59	64	66	63	49	47	53	82	59	44	74	75	72	70	72	70	74	79	74	70	74	75	80	76.8
	Min	69	70	49	52	94	85	80	90	88	91	80	84	79	84	57	38	33	32	38	40	44	43	45	82	78	90	87	63	59	58	53.4
Monticello	Max	88	87	86	84	66	62	60	63	65	58	57	47	43	52	78	76	69	66	70	70	72	67	35	50	67	52	50	47	45	43	78.8
	Min	59	60	55	43	83	85	75	79	82	93	79	69	85	82	78	76	69	53	48	47	49	75	80	80	79	75	53	54	74	77	49.5
Mooar	Max	76	78	83	81	58	55	50	55	57	53	52	50	52	55	52	50	62	68	78	72	79	75	80	80	71	49	43	46	42	50	75 8
	Min	52	53	58	55	58	55	85	88	94	96	92	80	78	89	80	78	44	36	51	56	46	48	50	67	88	81	62	62	69	74	51.2
Mt. Ayr	Max	88	89	84	92	94	70	67	62	64	68	66	50	53	58	56	65	65	65	70	72	71	48	53	74	86	70	57	50	45	42	79.4
	Min	66	70	52	59	70	67	87	82	88	94	81	75	84	87	65	37	37	58	50	61	43	48	53	64	73	68	53	53	42	45	55.7
Mt. Ple's'nt	Max	86	83	80	90	94	69	70	87	82	66	65	55	83	84	58	81	55	39	73	52	75	50	76	73	61	68	68	53	42	71	78.8
	Min	66	70	56	54	69	70	82	85	89	92	77	54	49	50	52	85	69	33	43	53	61	67	69	53	73	82	66	58	46	51	55.6
Mt. V.(Hub)	Max	84	86	83	86	92	68	65	..	68	66	54	49	50	52	85	55	39	61	53	59	60	67	69	76	73	63	58	58	46	55	76 8
	Min	63	69	51	55	68	92	..	81	78	90	80	70	79	79	53	44	43	61	53	45	44	42	50	69	53	63	62	54	44	54	53.3
NewH'pton	Max	85	84	75	81	92	70	..	55	59	75	87	68	78	79	79	79	44	64	54	66	67	44	74	53	75	66	63	62	50	42	71.9
	Min	67	66	47	55	70	92	78	80	86	90	87	74	82	74	65	55	44	44	44	48	45	67	49	53	75	79	66	54	53	48	52.8
Newton	Max	85	81	78	86	64	71	64	58	60	65	68	64	70	78	77	65	50	48	60	58	60	58	42	69	58	61	42	54	68	37	74.8
	Min	65	72	52	64	91	76	79	78	85	87	73	70	78	59	51	44	57	35	46	45	44	42	77	83	76	60	43	54	42	75	54.8
Northwood	Max	85	73	75	80	91	71	59	53	60	66	68	60	64	80	59	68	60	68	68	65	53	40	75	54	80	58	40	52	42	74	70 1
	Min	68	65	49	51	71	92	81	86	95	93	87	68	84	88	80	60	55	45	60	50	53	67	72	66	83	66	43	66	55	37	51 2
Odebolt	Max	89	87	85	90	92	72	56	49	64	70	70	64	77	53	77	73	55	53	72	57	44	42	73	58	66	66	43	56	44	58	77.6
	Min	64	67	45	53	72	92	78	88	90	86	78	57	77	57	55	69	57	51	57	45	69	76	72	56	83	62	56	44	38	55	51.9
Ogden	Max	86	81	78	85	92	55	57	62	64	64	70	57	50	60	78	69	57	51	72	54	59	57	65	65	67	56	63	44	55	35	75.9
	Min	66	65	46	55	93	79	61	85	93	90	82	73	63	77	66	57	44	62	50	45	57	44	47	65	73	51	45	60	61	45	53 3
Onawa	Max	88	82	80	88	73	59	61	55	67	70	74	63	75	68	76	75	57	49	67	59	68	74	74	51	64	70	50	48	54	43	52.2
	Min	68	62	50	59	90	80	77	76	83	83	75	59	68	76	75	57	51	43	57	51	44	43	74	79	86	50	41	48	40	46	76.8
Osage	Max	85	76	73	79	50	69	61	54	59	63	67	59	48	86	53	82	63	67	53	49	46	49	51	72	76	86	80	50	58	75	53.4
	Min	65	64	49	90	92	82	89	91	93	91	80	77	86	77	57	44	34	43	49	46	42	49	72	76	86	80	60	58	43	72	78.8
Osceola	Max	85	82	81	90	56	70	67	57	62	64	67	49	47	79	84	82	74	75	72	69	72	70	43	45	48	50	49	44	58	42	49.5
	Min	68	70	57	88	88	94	81	82	88	91	92	80	84	79	82	74	75	72	38	40	44	43	82	78	90	87	63	59	58	60	75 8
Oskaloosa	Max	84	84	80	80	54	71	63	58	59	65	68	63	76	52	57	38	33	32	38	40	44	43	67	82	78	90	87	63	59	58	51.2
	Min	70	66	50	79	86	94	83	81	87	91	90	77	53	52	82	64	38	66	50	70	72	67	35	50	67	52	50	47	45	43	79.4
Ottumwa	Max	79	79	69	65	71	94	72	61	63	69	72	91	79	83	89	82	66	69	63	48	49	75	50	80	80	79	75	49	53	46	55.7
	Min	73	74	84	91	94	90	87	87	93	95	91	79	66	48	50	50	42	33	48	50	46	53	65	75	67	43	62	43	62	42	78.8
Ovid	Max	84	82	84	50	57	70	66	55	59	65	68	68	74	78	73	55	45	62	73	72	73	54	71	77	79	66	57	79	64	46	55.6
	Min	63	70	50	81	90	95	82	86	93	92	85	74	64	75	84	51	55	35	52	54	58	71	73	78	80	67	46	65	55	44	76 8
Pacific Jct.	Max	89	71	45	60	72	87	60	55	67	65	74	80	79	85	78	53	70	68	79	46	48	75	53	80	80	79	75	53	43	46	53.3
	Min	69	87	85	90	87	85	85	84	82	93	90	51	49	54	85	54	35	44	78	72	79	48	75	50	67	71	49	81	57	68	71.9
Pella	Max	90	50	48	54	56	91	88	59	59	58	60	75	73	80	72	58	62	53	69	47	45	60	79	43	67	43	68	53	46	62	52.8
	Min	65	78	80	76	91	71	75	83	89	91	86	60	46	65	68	53	38	32	53	49	48	71	53	79	81	68	53	42	59	46	74.8
Primghar	Max	85	68	65	56	71	90	75	57	65	66	69	77	81	89	79	65	77	59	79	53	57	59	63	68	76	81	70	46	67	44	54.8
	Min	65	86	83	90	94	71	90	88	94	93	89	67	52	53	65	58	74	61	57	59	45	68	46	71	86	70	57	35	47	58	70 1
Red Oak	Max	88	86	83	68	71	65	50	67	69	72	79	56	68	79	77	59	43	36	42	46	61	71	50	74	65	78	68	44	67	47	51 2
	Min	66	59	44	75	82	92	83	78	76	85	86	56	50	53	59	53	43	61	54	68	46	71	65	50	86	78	67	35	69	45	77.6
Ridgeway	Max	88	82	53	55	72	64	57	63	66	66	70	79	74	81	80	52	59	63	54	68	48	71	50	72	65	68	44	67	44	53	75.9
	Min	70	63	77	87	92	81	79	86	90	85	68	59	45	55	37	72	42	34	45	65	44	61	45	72	79	77	69	32	54	45	53 3
Rockwell C	Max	86	83	47	54	72	90	84	87	86	87	90	81	65	75	58	73	55	33	61	65	44	73	66	75	81	76	60	33	55	38	76.8
	Min	66	57	85	88	90	55	52	55	59	63	62	70	78	46	85	59	42	64	32	66	49	73	50	75	66	63	49	64	46	55	54.8
Ruthven	Max	89	86	58	45	53	87	91	80	80	90	91	63	85	78	60	78	59	42	73	48	65	50	68	73	79	66	63	55	43	70	70 1
	Min	61	79	78	87	91	73	56	49	64	68	63	90	68	85	59	73	54	73	58	55	45	65	52	68	80	61	46	55	42	56	51 2
Sac City	Max	86	63	46	55	87	73	56	49	79	89	90	65	69	85	62	74	72	47	78	59	63	45	68	73	75	58	54	46	34	40	77.6
	Min	65	63	76	52	77	91	85	79	89	85	69	89	85	74	72	76	59	44	54	46	48	65	45	73	83	76	60	43	57	34	51.9
Scranton	Max	87	81	76	52	55	87	91	85	79	89	89	65	85	74	72	62	47	78	53	54	46	65	45	73	80	61	42	54	68	37	75.9
	Min	66	55	52	77	87	89	74	55	64	64	89	64	68	53	78	62	79	82	57	59	51	68	52	40	79	62	43	66	48	73	53 3
Sheldon	Max	86	85	77	53	56	87	72	55	51	64	91	63	85	67	78	79	59	42	73	58	67	44	73	58	66	66	43	56	44	58	76.1
	Min	62	57	53	84	89	90	80	82	84	84	62	53	86	52	78	66	55	47	69	50	48	70	49	77	79	64	84	64	83	51	55.1
Sibley	Max	89	76	84	40	53	71	90	80	54	62	97	62	95	67	83	72	50	64	59	70	47	69	49	67	73	49	64	50	74	54	70.0
	Min	76	63	84	92	96	83	66	58	57	62	89	63	89	65	81	57	40	59	44	57	40	60	45	73	76	50	77	45	73	58	51.1
Sigourney	Max	86	90	84	52	52	70	66	82	82	58	87	89	63	89	72	50	75	59	44	60	38	53	40	61	66	47	73	58	75	47	77.2
	Min	67	65	52	74	86	88	70	56	84	56	65	63	72	57	84	62	59	64	59	70	47	70	51	75	82	55	64	48	69	51	55 5
Sioux Cen.	Max	87	80	74	54	59	86	90	76	56	84	92	59	69	89	71	64	78	60	75	59	81	77	51	64	74	52	55	47	63	40	77.4
	Min	67	63	54	78	86	90	76	56	84	59	69	89	71	86	68	78	57	83	58	66	47	73	42	80	75	53	45	58	45	58	54 0
Sioux City	Max	86	76	78	86	52	64	91	56	84	59	89	69	80	71	64	78	75	47	74	49	59	81	57	80	82	70	64	83	63	45	76.4
	Min	67	64	48	85	87	91	70	64	75	84	83	89	86	68	80	71	64	49	74	52	45	62	45	72	75	54	45	64	48	58	76.4
Spirit L	Max	86	81	85	47	67	87	70	57	55	63	65	68	57	74	47	75	59	81	58	56	64	48	71	43	73	42	80	42	75	51	55.9
	Min	65	64	47	77	84	88	73	56	58	64	88	67	71	85	73	58	74	49	73	53	82	75	55	82	75	55	43	69	42	72	78.6
Storm L	Max	84	79	77	84	57	73	93	72	66	65	68	73	65	75	70	81	63	52	61	64	48	72	52	77	79	66	63	78	64	86	53 1
	Min	65	65	48	57	87	93	72	66	57	70	66	73	53	82	47	68	45	73	53	64	42	75	49	72	73	51	45	73	51	72	78.8
Thurman	Max	88	83	78	87	87	59	72	66	57	70	66	93	73	65	75	70	81	52	61	63	48	72	50	75	73	53	75	49	72	52	52.7
	Min	69	68	48	59	94	84	84	85	90	93	93	69	93	70	81	52	75	53	64	45	73	53	75	49	72	54	53	75	49	72	76.2
Toledo	Max	86	82	86	86	71	86	71	60	55	60	65	89	69	84	52	83	48	75	66	73	54	74	38	66	64	52	66	48	62	50	52.9
	Min	69	70	48	46	99	86	93	84	87	88	63	71	90	75	83	53	64	42	53	64	34	57	35	65	64	48	62	46	64	47	75.2
Wapello	Max	94	..	89	58	71	99	72	84	65	63	65	92	71	90	78	81	53	64	42	63	45	59	65	74	73	53	75	43	67	48	52.9
	Min	73	..	61	87	93	68	66	84	81	87	92	62	67	79	48	76	49	73	48	85	54	80	68	79	77	60	63	50	74	52	73.9
Washingt'n	Max	80	88	52	80	54	84	68	66	58	58	62	90	67	89	63	79	60	77	56	85	52	80	63	79	75	61	49	62	50	67	53.6
	Min	66	65	80	84	94	84	84	61	83	85	90	64	68	88	59	81	50	73	48	77	56	45	59	72	76	61	74	76	50	67	80.3
Waterloo	Max	86	84	50	49	70	94	70	61	56	59	64	88	79	73	81	59	76	68	60	64	62	72	74	72	76	74	76	42	84	39	49.1
	Min	66	68	78	84	94	85	80	81	88	88	79	62	50	50	56	55	46	36	41	48	62	64	72	74	72	76	74	76	38	39	72.9
Waverly	Max	86	80	50	53	70	61	57	62	66	93	90	88	77	74	76	68	60	64	62	35	63	38	40	46	58	60	77	82	56	60	51.9
	Min	69	68	50	53	70	61	57	62	66	93	90	88	77	74	76	68	60	64	62	33	63	39	66	67	69	77	82	69	38	56	76 9
W. Branch	Max	90	92	86	80	95	89	90	91	90	93	88	77	62	50	73	50	38	60	62	52	63	48	66	48	51	62	69	87	78	43	53.2
	Min	58	60	48	46	63	60	61	58	60	64	67	89	58	42	41	70	59	42	33	58	70	69	41	72	71	77	87	71	62	51	77.1
Whitten	Max	85	80	76	85	93	91	80	80	90	60	64	67	..	..	..	..	85	82	70	64	58	70	69	42	75	72	54	75	79	81	55.4
	Min	68	60	47	54	52	59	75	60	64	90	..	..	..	..	..	51	56	47	35	36	49	52	43	54	52	60	72	82	61	48	....
Wilton Jc.	Max	84	91	78	87	92	87	81	87	59	65	..	..	..	..	..	51	56	47	63	56	62	72	70	75	79	61	72	52	75	79	....
	Min	63	60	53	51	70	64	58	90	94	90	75	77	87	78	78	63	45	33	48	50	61	42	51	52	58	61	72	48	42	56	....
Winterset	Max	88	80	82	90	94	82	83	56	62	65	68	68	51	56	58	56	45	33	..	..	..	..	..	..	..	..	..	..	..	..	....
	Min	68	68	59	50	70	63	56	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....

DAILY AND MONTHLY PRECIPITATION FOR SEPTEMBER, 1900.

STATIONS.	DATE.																													Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Afton	..	.09	...	...	...	..	..	..	...		.18	..	..	....	1 58	...		.12	.25	...		.21	..	1.02	.02	2 35	....	.14	....	..	5.36
Akron	...	.03		.12	..	..	....	...	...	5.28	....	.15	T	.19	..	....	..	.44		...	.63		.05	....	...	...	T		..	..	6.95
Albia	.07	....	....	....	..	....	....	...	..	...	T	...	..	T	..	....	....	.92	02	...	.	.62	..	.96	.06	.67	.12	.37	..	..	3.82
Algona	....	..	....	...	..	..	...	T	..	...	2.15	..	50	.15	...	..	....		1.20	...	..	.15	..	.52	.65	..	....	T	..		5.42
Alta	....	.	...	T	..	...	....	...	..		2 60	..	.20	.12	..	....	..	1.03	..	..	....	.46	.	.66	24	....		T	....	.	5.34
Alta (near)	....	....	...	..	...	....	..	....	....	1.46	.90	..	.02	.14	....	..	..	.95	....	..	..	.60	..	.77	.28	...	T	T	..	..	5.12
Amana	.04	T	....	....	....		..	....	....	..	.26		..		.15	..	..	.39	1.59	...		.35	....	.67	.02	55	.05	32	..	..	4.39
Ames	...	..	....	...	...	.	....	...	..	..	.54	..	....	.13	....	..	....	3 02		...	..	.69	....	1.40	.61	....		.70	..	....	6.12
Ames (near)	....	....	....	...	.25	.	....	....	....	..	.33	..	..	.03	....	.	....	..	2.70		..	.62	..	1 57	.80	....	....	.18	..	..	6.48
Atlantic	..		...	...	..	....	..	..	....	.07	42	.	....	.14	....	..	..	.73	.73		..	.70	.29	.44		.08	..	.08	..		3 08
Bancroft	..	.20	....	..	.10	....	..	1.50	..	..	1.66	..	.46	.60	.20	....	..	.80	.20	T	....	.25	...	.45	10	.30	..	..	..	..	6.82
Batavia	...		...	....	....	...	....	...	..	..	..	..	..	....	..	..	....	1.00	....	..	...	.30	.80		.70		.50	.80	....	....	4 10
Baxter	....	T	..	..	.06	..	..	..	..	..	20	..	..	.02	...	..	...	.85	1.00	...	....	.20	.50	.28	.42	....		.15	..	..	3 68
Bedford	....	.10	...	....	....	..	....	..	....	..	.40	...	....	.19	..	..	...	....	.14	....	..	.18	..	.92		1 03	.02	.06		..	3.04
Belknap	.10	..	...	..	..	..	....	....	..		T	....	..	..	.16	..	..	.14	.74	....		..	.82	1.03	T	.44	.13	.10	.19	..	3.85
Belle Plaine	.20	.10		..	..	..	....	.	..	..	.20	..		..		...	...	.50	1.12	...	....	.40	..	.75	....	.10	T	1 75		..	5.42
Bonaparte	.45	....	..	....	....	....	....	....	....	..	..	....	....	..	.10	..	....	....	3.11		..	.55	..	1.18	.10	....	.18	.20		..	5 87
Britt	...	.03	..	....	..	....	....	1.12	...		2 33	....	..	...	.24	...	....	.85	.44	.05	....	.54	....	.55	.59	...	....	02	....		6.73
Buckingham	..	.02	....	....	.	..	..	....	....	....	...	....	....	....	....	..	..		1.19	..	..	.38	....	.58	..	1.41	..	.21	....	.	3.79
Bussey	....	..	....	..	....	....	..	...		.	...	....	....	....	..	..	....	.72	..	...		1.02		.72	..	1.78	..	.	..	....	4 24
Carroll	....	....	....	....	..		..	...	....	..	.84	....	....	....	....	....	....	1.52	.74	..	....	.73		62		.20		....	....	..	4 65
Cedar Rapids	.03	T	....	....	..	....	....	....	....	T	.18	..	..	.04	....	..	.03	1.07	T	....	..	.23	.11	.50	.23	.03	.04	.34	....	..	2.89
Chariton	.25	.02	....	....	..	..	....	..		..	.04	....	..	...	.31	..	....	.11	.15		..	.67	.02	1 38	.01	1.70	.05	.40	.04	....	5.15
Charles City	...	.95	...	....	..	..	..	.40	....	..	1.08	..	....	...	.31	..	....	.95	.72	T	..	.23	.23	.85	.63	.28	..	.12	..	..	6.75
Clarinda	..	....	..	....		..	....	..	..	..	....	....	..	.21	....	..	T	....	.72	..	..	..	..	.97	..	1.59	..	15	..	....	3.64
Clear Lake	...	....	..	....	....	....	....	.95	..	....	1 50	....	..	..	20	....	..	.60	.20	T	....	..	..	.30	.95	T	....		.10	....	4.80
Clinton	....	.81	...	..	..	..	....	....	..	....	.07	..	....		.05	.05	...	.77	1.62	..	....	05	....	.52	..	.47	..	.20	..	..	4.31
College Springs	....	....	..	.02	....	..	....	....	....	....	.25	....	....	.41	....	..	....	....	.15	..	....	....	.25	.60	..	1.15	....	.15	..	....	2.98
Coon Rapids	..	....	....	..	..	....	....	....	....		1 00	..	....	..	.15	..	T	1.55	1.90	....	..	.85	....	.88	..	.45	..	T	....	..	6.78
Council Bluffs	....	....	....	..	....	..	....	..	....	.96	.87	....	....	.25	....	..	..	.05	.33	..	..	.98	.03	.10	T	....	..	..	..	....	3.57
Crawfordsville	....	....	....	....	.	.	....	....	....	....	....	....	....		.15	....	....	.23	2 56	..	..	.30	..	.98		.44	04	.34	..	..	5 04
Cresco	.22	1.48	....	...	T	...	....	.35	..	....	1.04	..	....	.35	.25	..	....	.24	.41	.03	....	.05	.	.73	.47	.53	.	.14	..	....	6 39
Cumberland	..	..	..	...	....	....	....	....	....	....	.59	...	..	.15	..	.	....	.38	1.87	....	....	.38	..	.61	.61	...	T	T	.01		4 63
Danville	...	....	..	...	....	..	....	....	....	....	T	....	....	....	....	..	.	T	3.30	..	..	.05	.17	.75	...	T	T	.42	....	....	4.69
Davenport	T	.04	....	...	..	..	..	..	....	....	T	..	..	....	.01	...	..	.20	1.56	.01	..	.05	.05	.61	.02	.44	.12	.54	.01	.	3.66
Decorah	..	....	..	....	.15	..	....	.24	....	..	.98	....	....	.11	.13	....	....	.24	.39	..	T	.09	....	.64	27	50	....	.23	.03	....	4.00
Delaware	.03	.23	....	..	.01	...	..	T	....	..	.13	....	..	..	.	.	...	.90	.44	..	....	.06	....	.92	.02	.53	..	.36	..	..	3.63
Denison	...	..	...	....	....	.	....	..	..	..	.76	...	..	.11	..	....	.	1.12	.14	....	....	.81	..	.30	...	.40	...	T	...	..	3 64
Des Moines	...	T	..	....	....	..	....	..	..	..	.35	..	....	....	.51	..	....	.19	.63	....	....	.33	...	1.08	.01	.49	T	.07	....	..	3 66
De Soto	...	....	..	....	....	....	....		....	....	.43	....	....	..	.20	....	....	.25	.74	..	....	54	....	.85		.43	.03	.10	....	....	3.57
Dows	....	.10	...	...	..	....		.12	..	..	1.08	..	..	....	40	..	...	1.55	.31	...	.38		...	1.07	....	.20	....	.07	..	..	5.28
Dubuque	.09	.11	...	....	..	....	....	..	....	..	.30	....	.	....	.01	....	..	.42	.51	T	....	.10	.01	1.10	T	28	....	.34	.07	...	3.31
Eldon	.45	T	...	....	....	....	....	..	....	....	.02	....	....	..	T	. ..	..	37	.75	....		51	T	1 02	..	.22	.07	.40	T	....	3.81
Elkader	.05	T	..	....	....	....	....	.06	..		.25	..	. ..	.03	.	...		90	.52	.05	..	.08	..	.60	1.25	....	....	.20	....	....	3 99
Emerson	...	....	....	....	....	....	....	..	..	..	.40	....	....	..	.	.	.76	..	....	....	....	.80	50	.10	....		50		....	....	3 06
Emmetsburg	...	.	....	...		..	..	..	..	..	4.00	.10		....	..	..	..	.80	..	....	..		.	.83	.35	.	....	....	..	..	6 08
Estherville		.	...	T	.20	...	...	1.30	...	T	4 60		T	T	.02	..		.30	.10	02	..	25		.40	T	.02	T	.04	....		7.25
Fairfield	.82	..	....	....		....	....	....	....	....	....	T	....	....	.16	..	..	.03	.85	.32	.	.40	.09	1.08	....	.36	.11	.30	.02	....	4.54
Fonda	....	.	....	....	T	....	....	....	....	....	.92	T	....	.04	..	..	....	2 12	T		....	.63	.89	T	.95	T	..	.05	..	..	5 51
Forest City	...	.03	..	..		..	...	1.12	.	...	2.33		....	....	.24	..	..	85	.44	.05	..	.54	.	55	59	....	....	05	..		6 79
Ft. Dodge	....	....	..	....	....	....	..	.	..	....	1 40	...	T	..	05	..	..	2.10	.46	....	....	.52	..	1 27	....		.	.20	....	....	6 00
Ft. Madison	T	.63	..	..	....		....	....	..		....	....	....	....	.10	...	..		1.63	..	..	.43	..	67	....		.14	.37	....	..	3.97
Galva	...	....	..	....	..	..	....	..	....	.05	1.81	..	..	.10	..	..	..	3.30	....	....	..	.50	...	70	..	.58		....	..	..	7 04
Gilman	.12	T	..	....	....	....		....	..		.23	....	....	....	.09	...	..	25	1.16	...	..	.57	.	.91	..	30	.02	.09	..	....	3.74
Grand Meadow	....	....	..	....	..	....	....	....	..	..	.84	....	..	T	..	..	..	.40	.52	.10	....	.10	.	.64	....	44		.15	..	....	3.19
Greene	.03	.58	..	...	...	..	..	.21	..	..	71	..	..	....	.21	....	....	1.20	.53	T	....	.28	.10	75	.16	..	....	.40	....	....	5 16
Greenfield	.26		.	...	...	..	..	....	..	...	.28	....	...	.41		..	..	.10	1.21	..	..	.93	...	.81	.47	T	T	.20	T	..	4.67
Grinnell	....	....	....	....	....		....	....	....	....	.25	....	....	....	.09	..	..	..	1.53	..	..	.52	.	91	..	.64	....	....	45		4 39
Grinnell (near)	.16	.02	....	....		T	....	....	....	..	25	....	....	....	.15	...	..	.44	1.45	..	..	.50	..	.93	....	72	.02	35	..	....	4 99
Grundy Center	....	..	....	.	....	....	....	....	..	.	.32	..	.	....	.07	..	.	4 55	.88	..	..	.40	.03	.73	.	1.35		.21	....	..	8.54
Hampton	.07	.	..	..	..	.		.84	..	....	1.15		..	.56	..	...	..	1.55	.47	..	...	.36	1.10		.71	....	....	.05	..	..	6 86
Harlan	...	....	....	.	...		....	....	....	..	1.08		..	.02	....	..	..	.82	.57	..	...	91	T	.35	T	.09	T	03	.	..	3.91
Hawkeye	.08	...	.15	...		...	....	.	....	..		.80	....	.23	....	....		..	1.87	....		.80	....	..		.53		.21	....	..	4 17
Hedrick	T	...	....	....	....	..	....	....	....		.10		..		....	..	.48	1.00	....	..	.74	..	.65	..	1.12	.10	30	....	....	..	4 49
Hopeville	T	...	....	....	....	..	....	..	....	..	08	....	....	....	2 08	..		T	..	.28	..	.19	....	1.02	..	1.45	T	16	....	....	5.26
Humboldt	.0	.02	....	....	....	....	.01	.	...	..	1.60	..	..	..	.03	....	....	1.05	.62	.	....	.61	.	.74	..	.32		.04	....	....	5 05
Independence	T	.	..	...	T	..	..	..	....	....	.40	T	....	....	....	.	.	2.00	1 05	T		.20	....	.70	1.70		..	.10	....	....	6.15
Indianola	T	.01	....	....	..	..	....	..	...	T	18	T		T	.31	..	...	.12	.59	..	....	.32	.01	.98	T	1.14	.18		.19	....	4.03
Iowa City	.03	..	....	....	..	..	....	..	...	..	.07	..	.	..	.07	..	..	....	2 01	..	..	.41	.	73	....	.60	.04	.31		....	4.35
Iowa Falls	....	.12	..	..	..	....	....	04	....	T	1.00	..	..	....	.34	..		1.70	40	....	....	.34		91	.03	.26	....	.03		....	5.17
Keokuk	.82	.56	..	..	..	..	....	..	....	....	....	..	....	..	.02		.	.20	.51	..	..	.50	.11	.42			.45	.31	.12	...	5.02
Keosauqua	.52	T	....	..	..	..	....	....	....	....	....	..	....	..	.10	....	....	.11	2.09	...	..	.40	.03	.90	.12	30	.10	.19	.04		4.90
Lacona	T	T	....	....	....	....	....	....	....	....	.10	....	....	....	.20	....		.25	.50	..	....	.55	....	1.20	T	2.50		.50	....	..	5.80
Lansing	....	T	.	T	.32	....	....	....	....	....	.72	....	....	..	08	....	....	.14	.40	.10	....		..	.64	.50	.40	..	.25	....	..	3.55
Larchwood	...	..	....	.	...	.	....	....	....	....	3 50	..	..	....	..	..	..	...	..	.	.	.30	....	....	....	....	....	....	....	..	3.80
Le Claire	..	...	07	..	...	.	....	....	....	....	T	.04	..	....	T	..	..	....	.90	.71	....	..	.04	.09	.17	.19	.04	T	.23	.	2.48
Le Mars	...	..	..	...	.20	....	....	....	....	..	5.50	..	.06	....	.04	....	....	.50	..	..	....	45	.	.11	.06	....	....	.09	....	..	7.01
Lenox	....	.01	..	..	....	T	..	..	..	..	.52			T	.10	..	..	.01	.59	..	...	T		1.17	T	1.59	.	.12	..	....	4.14
Logan		..	....	....	....	....	..	..	..	.24	2.26	...	..	.12	..	....	..	.36	.05	..	....	.71	...	.15	..	.20	..	..	....	....	4 09
Maquoketa	.02	.29	..	...		..	....	..	.	.	09	....	..	..	.04	..	.	.33	1.32	.23	..	.07	..	1.14	..	.84	.03	.22	....	....	4.62
Marshalltown	.04	.03	....	..	..	.02	..	..	..	...		.14	..		.07	..	..	.93	.89	..	...	62	..		.69	1.82		.10	..	....	5.35
Monticello	T	T	.03	..		..	..	.	..	....	T	.	..	..	.32	....	..	....	1.12	..	..	T	....	.75	1.00	..	T	.25		T	3.48
Mooar	....	1.80	...	..	....	....	..	..	..		....	....	....	....	....	....	..	.44	T	....	....	....	.38	.50	....	....	....	.89	..	..	4 01
Mt. Ayr	....	.02	....	..	...	....	..	..	..	.02	.20	..		.07	T	...	..	T	.28	...	....	.38	.	1.20	T	1.00	.22	.22	....	....	3.61
Mt. Pleasant	T	.09	....	..	....	..		....	..	....	T	..	....		.14	....	..	T	2.60	....	..	..	.34	.91	T	.25	.05	.20	....	....	4 58
Mt. Vernon(Hub)	T	T	...	..		....	..	....		....	.15	..	....	.05	.05	....	....	.40	.60	...	....	.20	..	.95	.60	.05	.03	.29	....	..	3.37
Murray	..	....	...	...	....	..	.	....	..	1.72	..	..	..		..	....	....	.20	....	..	....	....		3.00	.	..	....	.15	..	..	5.07
New Hampton	.03	.33	..	..	..	..	....	.23	...		.63	....	....	....	.20	..	....	.65	.39	....	....	.14	.15	.88	..	43		.10	..	..	4 16
Newton	....	....	..	..	..	...		....	..	....	.22	....	....	..	.12	....	....	.23	.85	..	....	.50	..	1 00		.61	.04	.16	..	..	3.73
Northwood		.16	..	..	T	..	..	.68	..	T	1 88	..	....		.07	..	....	.75	.24	.05	....	.46	....	.70	.02	.50	..	.09	....	....	5.60
Odebolt	....	....	....	....	..	....	..	....	..	..	1 00	....	....	.50	....	....	....	1.25	.06	..	....	.60	..	.35	....	.45	....	....	..	..	4.21
Ogden	T	....	..	....	....	..	..	....	..	..	1 02	..	....	..	.07	..	....	.10	2 91	..	..	1.66	..	1.00	....	..	.10	....			6.86
Onawa	....	....	....	....	....	....	....	....	....	.05	4.65	....	....	.28	....	....	....	.95	....	..	..	.55	.	.13	.12	.23	T	....	..	..	6.96
Osage	..	41	..	..	..	..	....	.49	..	..	1.31	....	....	....	.31	....	....	.52	.32	.03	....	.16	....	.87	.45	.53	....	.13	....	..	5.53
Osceola	....	....	....	..	..	..	....	....	....	..	.15	....	....	1.27	..	....	....	....	.32	..	..	....	.25	1 33	T	3 23	....	23	....	....	6.78
Oskaloosa	T	T	....	..	....	....	....	....	....	..	T	....	....	.06	..	....	....	.70	.31	....	....	63	.	.80	.04	1 25	....	.58	....	..	4.37
Ottumwa	....	....	....	....	....	....	....	....	....	....	....	....	....	.15	..	....	....	1.50	.50	..	..	.50	1.50		1.50	..	....	.50	....	....	6.15
Ovid	.08	.01	..	....	..	....	....	..	....	..	.07	....	....		85	....	....	.15	.30	....	....	.81	.01	1.44	....	1.02	.15	.51	....	..	5.40
Pacific Junction	....	....	....	....	....		....	..	....	.45	1.02	..	....	.15	..	....	T	T	1.09	....	....	.68	T	T	....	.12	T	.21	....	....	3.72
Pella	....	....	....	....	....	....	....	..	....	....	.32	....	....	....	....	....	....	1.50	....	....	....	.60	.10	1.00	....	1.40	.20	.45	....	....	5 57
Primghar	....	....	....	..	....	..	....	..	....	..	4.25	....	....	....	....	....	....	.65	....	....	.40	....	.25	....	....	....	....	....	....	....	5.55
Red Oak	....	....	....	.04	....	..	....	....	....	..	.38	..	....	.06	....	T	....	.05	1.47	....	..	.28	T	.76	.67	.22	.18	.08	..	....	4.19
Ridgeway	.05	1.00	....	....	.05	....	....	.38	....	..	1.12	.01	....	.17	25	....	....	.30	.57	.14	....	.05	.02	1.16	.60	.68	.02	.27	.04	....	6.88
Rockwell City	....	....	....	....	....	....	....	..	..	....	87	....	....	....	....	....	....	1.25	75	....	....	.36	....	1.06	..	.20	....	.05	....	..	4.54
Ruthven	....	....	....	....	.36	...	....	....	....	....	..	3.82	....	....	....	....	....	1.06	..	....	....	.40	....	.68	....	.42	....	.08	....	....	6.82
Sac City	....	....	....	..	.	....	....	....	....	T	.65	....	....	.05	....	....	....	1.56	.06	....	....	.58	....	.38	..	.56	....	....	....	....	3.84
Scranton	....	....	....	....	....	....	....	....	....	....	1.50	....	...	T	....	....	....	....	2.00	1.07	....	.95	..	.83	.23	....	....	....	..	..	6.58
Sheldon	....	....	...	.12	...	....	....	.10	....	.05	5.70	....	....	....	....	....	....	.45	....	....	....	.38	....	.15	..	....	T	....	....	....	6.95

MONTHLY REVIEW

DAILY AND MONTHLY PRECIPITATION FOR SEPTEMBER, 1900—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total.
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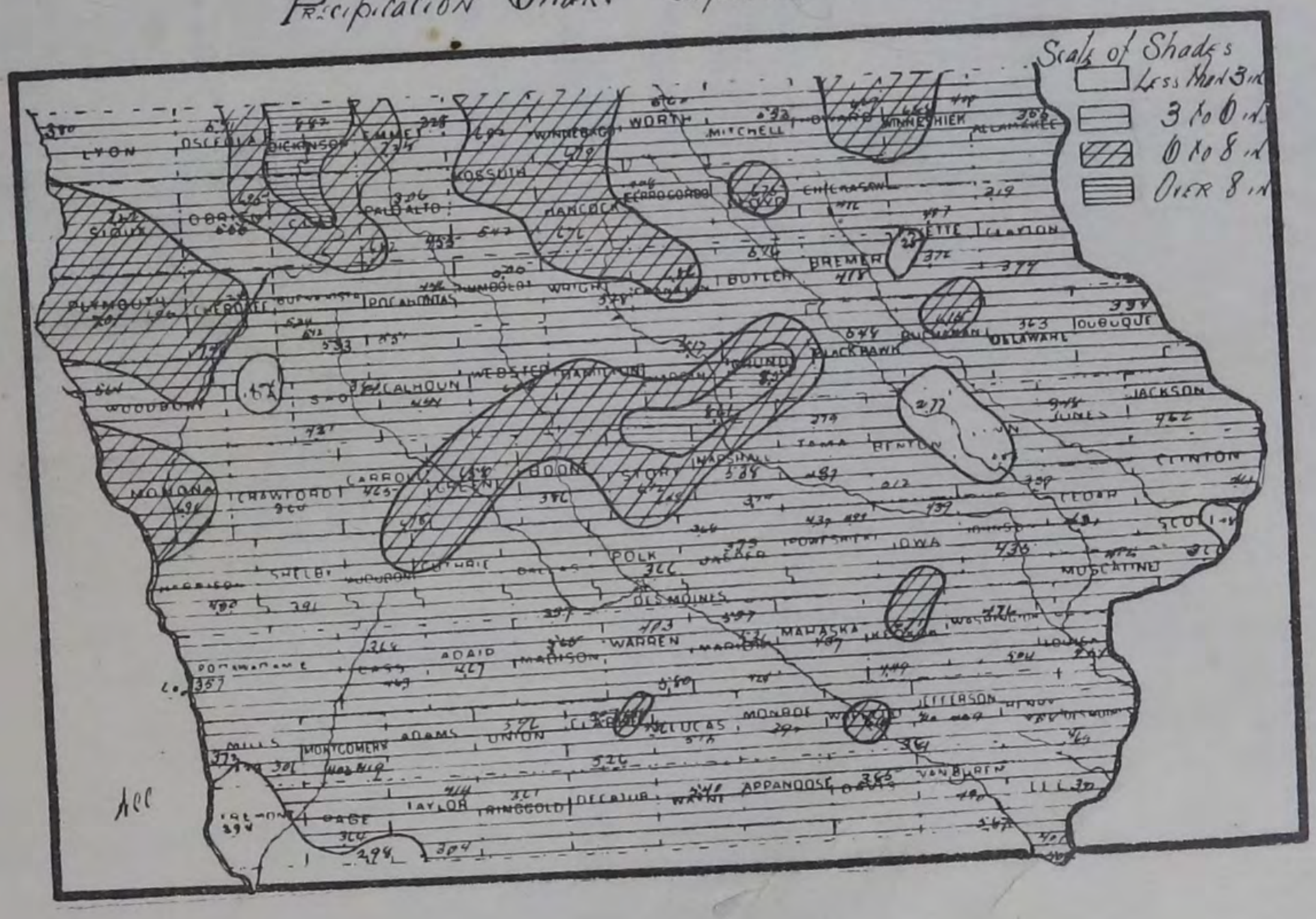
Precipitation Chart September 1900



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Central Station, Des Moines, Iowa.

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DIRECTOR

GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
F. R. CONAWAY, STATE PRINTER
1900.

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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

Volume XI. OCTOBER, 1900. No. 10.

REVIEW OF THE CROP SEASON, 1900.

The winter was mild, with less than the usual number of ere storms, and when spring made its advent it was appar- that the vitality of winter grains, grasses, vines and fruit es had not been materially impaired.

February was the coldest month of the season.

March was slightly colder than usual, and weather condi- ns were generally unfavorable for farming operations, ough some work in the fields was done in the third and urth weeks, and in favored localities a beginning was made sowing wheat, clover and timothy seed. The month closed ith general storms of sleet and rain, which brought an abund- nt supply of moisture to compensate for the delay in field ork.

April was an unusually favorable month for preparing the round and seeding, and for the healthful germination of cere- ls, grasses and fruits. There was an abundance of sunshine nd fair weather for preparing the ground and sowing the eed, and timely rains and warmth to quicken growth and nsure good stands of wheat, oats and barley. In numerous ocalities in the central and southern districts the corn plant- rs were started as early as the 27th and 28th. By the close of he month the pastures afforded ample feed for stock. Early arieties of fruit trees were in bloom on the 30th in the central and southern sections. The season opened a week to ten days earlier than the average.

Well nigh ideal conditions prevailed throughout the larger part of May for progress in farm work and for germination of seed and the normal growth of all crops. The month was from 3° to 5° warmer than usual, and the rainfall, though a lit- tle less than normal, came at timely intervals and generally in sufficient amount for the needs of vegetation. Only small areas of the state suffered loss from deficiency of moisture, or from excessive downpours. From the 3d to the 5th of the month freezing temperature was recorded in all districts, but fortunately very little damage resulted to fruit and vegetation. Very rapid progress was made in plowing, and planting corn and potatoes, and by the middle of the month a large part of the acreage devoted to these crops had been planted. At the close of the month planting operations were practically com- pleted and cultivation was well begun, with a flattering out- look for all crops.

June was very nearly normal in temperature and rainfall. There was, however, considerable inequality in the distribu- tion of the rainfall, the driest portion of the state being the eastern counties of the Mississippi river districts. But in more than four-fifths of the state there was but slight injury to crops from effects of deficient moisture. For the cultivation of corn and the rapid advancement of this great staple crop, the weather conditions were never more nearly perfect in any previous June of which we have the records. There was prac- tically no serious check to its growth or hindrance to cultiva- tion, and at the close of the month a very large portion had been laid by in excellent condition, giving promise of more than an average yield.

As the result of dry weather in the early part of the season, in portions of the state, the hay crop was somewhat reduced in yield, and small grain in some localities was short in straw. The hay harvest was begun during the closing days of the month, and small grain was more advanced than usual.

July was about as warm as usual, and except in a few south- eastern counties there was considerable excess of moisture, the average rainfall for the state being about 2.50 inches above normal. As a result of frequent showers and general excess of moisture harvesting operations were greatly retarded, and hay and grain crops suffered material injury. But the copious mid- summer showers were beneficial to corn, potatoes, pastures, millet, berries and garden vegetables. The corn crop has never been more promising in Iowa than it was on July 31, 1900. And during the last week in July the conditions were quite favorable for work in the harvest fields.

August was characterized by an excess of heat and moisture. It broke all previous records in this state for sustained high temperature, the average monthly maximum for the state being about 95°. The first decade was generally dry and favorable for harvesting; and during this dry period brisk southerly winds prevailed, causing considerable anxiety for the safety of the corn crop. But copious, frequent and widely distributed showers from the 10th to the 18th allayed all apprehensions of damage from drought. The excess of both heat and moisture gave a powerful impetus to the growth of all unharvested crops, and clothed pastures and meadows in springlike verdure. During the period of heavy rains and severe wind squalls threshing and stacking operations were delayed, and grain in shock was damaged to some extent. The closing decade brought ideal weather for ripening the crops, and by the last day of the month more than half the corn crop was practically safe from frost and cutting was in progress.

The first half of September was dry and warm, all conditions being favorable for bringing late planted corn to full maturity. The first frost of the autumn occurred on the 17th, but most of the tenderest vegetation escaped injury till after the close of the month. The last half of September was cooler, with more than the usual amount of rainfall. This was favorable for grass and for the germination of fall wheat and rye. And the soil was in excellent condition for plowing. The corn crop ripened normally in all parts of the state, but its general condi- tion was materially reduced in a considerable area by severe windstorms, followed by wet weather. This was the chief drawback, in the closing weeks of the season, to what promised to be a crop of phenomenal proportions. And yet, after mak- ing due allowance for the damaging effects of windstorms, hail and protracted wet weather, the corn crop of 1900 is likely to take rank as the heaviest ever produced on Iowa soil. The amount of corn cut and put in shock is probably in excess of any former year, and the forage will be needed to make good the shortage of the hay crop.

The month of October has been unusually warm and dry, with an abundance of sunshine, affording highly favorable conditions for harvesting corn, potatoes and vegetables, and general fall work. As a whole the crop season of 1900 has brought forth most bountiful returns to the farmers of Iowa. The pastures are extra good, affording more than the usual amount of fall feed for stock, and fall sown wheat and rye, though limited in area, have made an excellent stand and are well prepared to withstand the coming winter.

NOTE AND COMMENT.

The annual report of Dairy Commissioner Norton, just issued, makes a fairly good showing for the dairy interest of this state, though there has been a slight decrease in the output of the creameries during the year ended May 1, 1900. The number of creameries reported is 994, as against 948 in 1899. The average number of cows per creamery is 781. Total number of creamery patrons, 91,417. Total amount of butter made in creameries for the year ended May 1, 1900, 84,965,062 pounds. Average price of creamery butter per pound, 22 cents. There has been a marked increase in the number of farm separators. The number in use in 1898 was only 904; this year the report shows a total of 3,332. Number of cows in the dairies of the state, 1,295,960, as shown by the auditor's report. The total value of creameries is estimated to be $2,929,000. The number of cheese factories is seventy-two, and their output for the year, $4,212,432. The bulk of the cheese manufactured in Iowa is sold in the state. No figures are given as to the amount and value of the product of farm dairies, and the milk sold in towns and cities. The aggregate value of the total dairy product is very heavy.

* * *

There are thousand of acres of rough land bordering streams all through the west of little value save to furnish a scant pasture when rain is plenty, which could be most profitably used for apple growing, especially all such hills as may have an available north, northeast or northwest slope. The apple likes a stony or rocky soil, and will really do better on such soils than it will on the loamy and richer soils of the flat lands. We know of one orchard, and it is one of the most healthy and productive of which we have knowledge in the state of Minnesota, which is growing on the north slope of a hill so steep that it would not be an easy thing for a team of horses to draw an empty wagon up it.—*Rockford Register.*

* * *

The *Bulletin des Halles*, of Paris, estimates the probable wheat crop of the world for 1900 to be 2,498,594,000 bushels—a shortage of 126,846,000 bushels compared with 1899. In this estimate the United States is credited with 510,786,000 bushels—a decrease of 32,633,000 bushels compared with the crop of 1899.

* * *

A hail storm in western Texas destroyed the grass on over 300,000 acres.

* * *

A St. Petersburg dispatch, dated October 27th, says the grain shortage is not confined to the eastern provinces and Siberia. The provinces richest in cereals are actually suffering on account of poor harvests.

* * *

The question of how sugar is elaborated in the beet continues to be a subject of endless discussion. There can be no doubt but that the saccharine quality of a beet depends upon the number of its developed leaves and the period of the plant's existence. The sugar production depends, however, essentially on the quantity of light the beet has received. When sunlight passes through white or yellow glass the leaf development is excessive, and the reverse is the case with blue or red glass. Experience shows that the so-called chemical sun-rays have the most important role to play. Observations show that to obtain the total organic substance of a beet, which in other words means to obtain beets with weight only, the rays with the average wave are the most favorable. It remains to be ascertained how one can throw upon a field of beets the waves of chemical rays that are the most suitable for its requirements, when the question of sugar elaboration is the issue under consideration. —*The Sugar Beet, Philadelphia.*

* * *

Farmers in the vicinity of Webster City who have raised sugar beets this season report a good yield and an excellent quality of the product, promising a handsome return from the experiments in that line. It is an established fact that the soil and climate of this section are well adapted to this new industry.

* * *

A special from Malvern, Mills county, to the Des Moines *News*, says that a mammoth sunflower measuring eight inches in diameter, came into full bloom in that town the last week in October. The fact is noted as resulting from the unusually warm weather prevalent during the month. The *News* also notes the fact that fresh, ripe strawberries were found the last of October on the farm of Samuel Jones, near the city limits of Des Moines. The month was phenomenally warm, and vegetation was remarkably green and luxuriant till its close.

* * *

The official announcement of the population of the United States is 76,295,220—a gain of 13,225,564 during the past ten years. This represents an increase of nearly 21 per cent. The population of Iowa is announced to be 2,251,829—a gain of 339,930 since 1890. The state census taken in 1895 showed a total of 2,058,069 inhabitants.

* * *

On October 31st, eight distinct shocks of earthquake were felt in Jacksonville, Florida. The vibrations apparently passed from south to north. The shocks were not strong enough to cause material damage. On the 29th the city of Caracas, Venezuela, suffered heavy damage and considerable loss of life by earthquake shocks.

* * *

Prof. L. G. Powers, statistician of the census bureau, says: "The present census when completed will unquestionably show that the visible material wealth in this country now has a value of $90,000,000,000. This is an addition since 1890 of $25,000,000,000. This sum added to our national wealth in the last decade, as you all know, is the savings of our people in that period. They were the savings of a people who were better fed, clothed and housed than any equal number of human beings in any other land or time, and yet it is a saving greater than all the people of the western continent had been able to make from the discovery of Columbus to the breaking out of the civil war. It is a saving which represents more houses and buildings, more furniture in the home, more implements and machinery to assist man in his work, more and better means of communication, more good clothes, good books and personal adornment than the entire race had saved during all the countless ages of struggles from Adam to the declaration of our American independence."

* * *

A month or so ago in this city, Tim Murphy, the famous comedian, ran across an old colored woman sitting under an awning and fanning herself.

'It's dreadfully hot, isn't it, mammy?" asked Mr. Murphy.
"Deed it is, chile," said the old woman, "'deed it is. 'Tain't
it for it to be so hot this-a-way. I tell you, forty years
, when the blessed Lawd made the weather we didn't have
se stewing days, honey, no, 'deed, we didn't; but now these
gety men up at this here weather office has the making of
weather, they does send us anything they please, and they
't skillful, chile, they ain't skillfu'."—*Washington Capital.*

* * *

According to the report of the statistician of the depart-
nt of agriculture the total increase in the value of farm
imals January 1, 1897, to January 1, 1900, amounted to
72,708,000. The increase in value of Iowa farm animals for
e same period was $47,759,000. Nebraska shows a gain of
er $54,000,000 and Kansas $40,000,000 in the three years.

* * *

England buys 60 per cent of all the products which the
merican farmer sends abroad. The United Kingdom is the
est market for American foodstuffs, and the British colonies
or our manufactured products.—*Crop Reporter.*

* * *

When corn is converted into beef, pork, mutton, poultry,
ggs or dairy products, it is given enhanced value in all the
vorld's markets, and there is no need of establishing "corn
itchens" to teach foreign people how to use it. The home
narket for raw material pays best prices.

SCIENTIFIC AGRICULTURE UP-TO-DATE.

Scientific agriculture, says the *Pittsburg Dispatch*, formerly meant the practical application of a few well-known principles. It has grown to have a wider meaning in these progressive days. Scientific agriculture now means chemical and microscopical research, engineering and physics generally. The scientific agriculturist of 1900 ranges over the field from hydro-statics to bacteria. It is not very many years, as time is calculated, since the discovery was made that clover and other leguminous plants stored nitrogen in the soil. Quickly thereafter it was determined the nitrogen was extracted from the air by multitudes of bacteria infesting the leguminous roots. Long before that, however, the practical farmer had learned that some soils would not grow clover, being "clover sick." But scientific agriculture has discovered a remedy for even this condition. The nitrogen-working bacteria have been cultivated and are supplied in proper medium for application to the land, just as phosphoric acid and potash are supplied by the aid of chemical process. Insects and parasites are cultivated and supplied to the farmer for the destruction of dangerous scales and other pests. Such is the scientific agriculture of to-day. It includes the ability to recognize causes by chemical reaction or microscopic investigation and the knowledge of what is needed to produce effects. Every year the requirements of successful agriculture are higher, and every year the attainments of the scientific agriculturist are increased.

WINTER AS A TONIC.

[St. Louis Globe-Democrat.]

Many persons regard the winter season as an unfortunate visitation. It is considered both uncomfortable to the body and harmful to health. This is an error. Cold is a most potent agent for the restoration and preservation of normal activity on the part of the organs of the human body. It is a wise plan of providence which gives us a change of seasons. The winter cold comes as a tonic to repair the injuries done by the enervating heat of summer. Summer, it is true, has many wise uses in the matter of health. It induces outdoor life, rids the system of poisons through copious perspiration and through the scorching rays of sun destroys germ life. Winter is the great bracer of the system. It stimulates activity in every organ. When cold attacks the surface of the body the blood is set into more free circulation as a means of bodily warmth. It is through the circulation of the blood that the human anatomy is kept in a state of repair. When the food has been digested and converted into liquid form, it is taken up by the blood and carried the rounds of the system for the purpose of repairing the waste places. When the cold causes increased circulation, it also brings about more perfect nutrition. Man's face and hands illustrate how weather-proof the body becomes when exposed to air. Continued activity in circulation on the surface, caused by the air coming in contact with the skin, tends to nourish and thicken the skin. Thus man's skin grows thicker in winter just as animals are supplied with a double coat of fur. The savages who dwell bareheaded in the open air, are seldom, if ever, known to be afflicted with bald heads, while, with the civilian who shields his scalp from air, baldness is prevalent. The Indians, who, if not now, in former days roamed our western borders, practically without clothing to shelter their bodies became, through long exposure, so inured to the cold that it gave them but little discomfort.

HURRICANES ON THE COAST OF TEXAS.

BY GEN. A. W. GREELY, U. S. ARMY.

The graphic and timely article of Prof. W. J. McGee on the terrible calamity that befell the city of Galveston, Texas, has been perused with great interest. Certainly every thoughtful reader must be impressed with his remarks on dangers incident to the building of cities on coastal formations, such as form the shore-lines of the great state of Texas.

It is not my desire nor intention to enlarge upon the geological formations of the coasts of the Gulf of Mexico, nor to discourage the afflicted citizens of Galveston from their energetic efforts to restore their heretofore prosperous city to its former position, as the greatest commercial entrepot of Texas. Indeed, it is my firm conviction that the ingenuity of man is such that he will be able to adopt such engineering devices as will protect Galveston from a repetition of the enormous loss of life and property which was caused by the advance of the last West Indian hurricane.

It is simply my wish to re-enforce Professor McGee's cautions by alluding to another chapter in the hurricane history of the Texas coast, concerning which his article is strangely silent, but with which I chance to be somewhat familiar. Reference is made to the hurricane of September 15-16, 1875 which caused a relatively greater loss of life and property to the town of Indianola, Texas, than was inflicted on Galveston by the recent hurricane. A quarter of a century has dimmed the recollection of the Indianola tragedy, and many of the few adult survivors of that ill-fated town have passed over to the silent majority.

Indianola, when I first knew it in 1873, was a town of about 1,500 inhabitants, but it was then waning in population, so that at the time of the storm it had a population variously estimated from 800 to 1,000. In the cyclone of September, 1875, at Indianola, the loss of life, as officially reported by the Signal Corps observer-sergeant, was 176—nearly one-fifth of the entire population—and the destruction of property as exceeding one million of dollars in value.

It should be remembered that Indianola is on the west shore of Matagorda Bay, fourteen miles from the Gulf of Mexico, a sheltered position as compared with that of Galveston. I visited Indianola about six months after the hurricane, when the town was partly restored; but at that time there remained evidences of one of the greatest storms of the century. The striking physical changes were the formation of a large lake in the rear of the town and the plowing of numerous bayous inland, five connecting across the solid land of an elevation ranging between ten and twenty feet above the level of Matagorda Bay, on which the town was built. One of these bayous was nearly twenty feet deep at the time of my visit.

As at Galveston, enormous quantities of sea water were driven inland and the greatest damage and loss of life occurred during the ebbing of the flood seaward. On the coast, at the entrance to Matagorda Bay, both the east and west shoal lights were carried away. The extent and violence of the storm inland may be judged by the fact that at this time the schooners *Agnes* and the *Phœnix* were wrecked two miles inland from Indianola, while the schooner *Comet* was carried five miles inland. So sudden and rapid were the flood waters inland that about 15,000 head of cattle and sheep were drowned.

The hurricane began by a northeasterly gale, which set in on the 15th. The wind increased steadily in force, with a falling barometer, until 5 P. M. of the 16th, when it stood 28.90. The northeast wind of eighty-two miles per hour rose to a velocity of eighty-eight miles at 5.15 P. M., but later, as it steadily increased, its velocity at midnight must have reached 100 miles.

But the loss of property least engrossed the attention of Indianola, when the lives of all were for hours in the balance. Realizing the situation, the strongest and best bent their energies to the task before them. During the forenoon of the 16th several hundred lives were preserved by the removal of the inmates of damaged and weak houses to the strongest and most protected buildings. Many people, women and children especially, were thus safely transferred by life-boats. Had it not been for these timely and well-directed efforts during the day it is believed that more than one-half of the population would have perished.

The following extracts from the official report of Sergt. C. A. Smith, Signal Corps, show the character of the storm later:

"The rain and wind both increased up to midnight, when the velocity must have been fully 100 miles per hour. This would have blown in the doors and windows, coming in gusts as it did, but for the precaution which had been taken of securely boarding them up. Soon after midnight a change in the tide was noticed; it rose several inches for a few minutes, and then began setting seaward rapidly. This evidence of abatement was hailed with shouts of joy, and was confirmed in a few minutes by the action of the wind, which gradually backed to the north and northwest.

"The tide now swept out toward the bay with terriffic force, the wind having but slightly abated, and it was at this time that the greatest destruction to life and property occurred. The buildings remaining had been so loosened and racked by northeast wind and tide that the moment the tremendous force was changed in a cross direction dozens of them toppled in ruins and were swept into the bay.

"It is a noteworthy fact that the immense volume of water, which for eighteen hours poured over the beach at Matagorda Bay until for twenty miles the back country of prairie was an open sea, occupied but the short space of six hours to completely recede on the wind changing to the northwest.

"The morning of the 17th opened cool and cloudy, with a gale still blowing from the northwest. We emerged from our retreat at an early hour, and it was not until then we could appreciate the full extent of the calamity which had befallen the town.

"Fully three-fourths of all the buildings had entirely disappeared from the scene, and of those remaining, a large part were in utter ruins. Many of those remaining had been swept from their original foundation—some but a few yards, others several blocks.

"Numerous bayous indented the shore, occupying the places where prominent buildings stood twenty-four hours previous. Five of these bayous extended clear across the town, and now join the lake in rear of the town. Seven others of considerable proportion had extended their encroachments but partially across."

Leaving Indianola much impressed by the immense damage wrought, and a few days later passing through Galveston, I broached to Mr. E. O. C. MacInerney, for years city clerk, the probability of Galveston suffering similarly in later years. Mr. MacInerney had served for years as an observer-sergeant of the Signal Corps at Galveston, and was alive to the observations I then made. He informed me that steps were being taken to strengthen the ocean beach so as to render it less liable to the action of the sea. Whether such corrective measures were continued or not I do not know, but it is evident both Galveston's late experience and the fate of Indianola, which was practically destroyed, emphasize the gravity of the situation. The best engineering talent of the country should apply itself to the prompt solution of the problem of protecting the tens of thousands of valuable lives and tens of millions of property from the assaults of the sea, whose wildest hurricanes threaten the stability of the western Gulf coast.—*Geographic Magazine.*

SCIENTIFIC VALUE OF PHILIPPINES.

Prof. John Trowbridge, director of the Jefferson physical laboratory of Harvard university, writes of the scientific value of the Philippines.

"The position of the islands is important from a scientific point of view. They lie almost directly under Porto Rico, over 12,000 miles away—one-half the circumference of the earth. The relative position is in itself an important acquisition, for, under an enlightened administration, simultaneous observations in meteorology could be taken by the United States which would be unique in the history of science and would prove of great value in the subject of storms and in questions relating to electricity and magnetism.

"In order, too, that we may understand the changes in the magnetism of the globe we need a belt of stations between the Philippines and Porto Rico. Our present knowledge of the force which directs our ships and feeds our dynamos is extremely meager. At present we assume a distribution of terrestrial magnetism, which is based on, I am tempted again to call parochial information.

"The meteorologist or the physicist who confines his observations to the atmospheric and electrical changes on the North American continent is like the physician who studies the nerves of one leg of a patient without regard to the nervous system of the entire body."

CLIMATOLOGY OF THE MONTH.

Barometer.—The mean pressure of the atmosphere for October was 30.01 inches. The highest observed was 30 51 inches at Clarinda on the 8th; lowest observed, 29 39 at Omaha, Neb., on the 21st. The range for the state was 1.12 inches.

Temperature.—The month was warmer than usual, the excess emperature ranging from 7° to 9°. The mean for the state, deduced from records of 101 stations, was 59.3°. The aver- of the northern section was 57.9°; central section, 59.4°; uthern section, 60.7°. The highest monthly mean was 62.4° Keokuk; lowest, 55.8° at West Bend. The highest tempera- e reported was 90° at Bedford on the 3rd and 4th and Toledo the 4th. The lowest temperature was 21° at Plover, on the th. The average monthly maximum, 85.7°; average monthly inimum, 30.7°. Greatest monthly range, 52° at Logan; aver- e of greatest daily ranges, 38.3°.

Precipitation.—The average rainfall for the state, as termined from records of 120 stations, was 3.91 inches, which mount is 1.63 inches above the normal for October. The verage by sections was as follows: Northern section, 3.29 ches; central section, 3.73 inches; southern section, 4.72. The rgest amount reported was 8.00 inches at College Springs; ast amount, 1.20 inches at Sibley. The greatest amount eported in any one day was 3.36 inches at College Springs on he 31st The average number of days on which .01 inch or nore fell was 7. There was an unusual amount of electrical disturbances during the month.

Wind and Weather.—The prevailing direction of the wind was south; highest velocity reported, 54 miles an hour at Sioux City, on the 6th, the direction being from the northwest. There were 16 clear days; 7 partly cloudy and 8 cloudy. The month as a whole was very favorable for farm operations, and unusually fair and pleasant for all classes.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES. Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.04	30.44	17	29.56	22
Des Moines	30.02	30.47	8	29.51	22
Clarinda	30.02	30.51	8	29.45	21,22
Cresco	.....	30.40	16	29.58	22
Dubuque	30 05	30.46	17	29.55	31
Omaha, Neb	29.95	30.42	8	29 39	21
Keokuk	30 04	30.43	17	29.55	22
Sioux City	29 98	30.46	16	29.47	21
Means	30.01	30.51	8	29.39	21

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	4,454	25	SE	31
Des Moines	5,655	32	SW	31
Dubuque	4,776	25	NW	7
Keokuk	4,404	28	S	31
La Crosse, Wis	5,157	28	NW	15
Omaha, Neb	5,836	32	N	31
Sioux City	9,603	54	NW	6

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* First killing frost was on morning of the 8th. During thunderstorm on the 3d a large barn six miles southwest was struck by lightning and burned with sixty tons of hay and eight horses.

AMANA—*Conrad Schadt.* October was dry during first and second decades, the last decade being rainy. Much plowing was done. No killing frosts during the month. Tomatoes were picked fresh from the vines the last of the month. There were many flowers in bloom. Pastures are green and wheat and rye fields look fine. Corn promises a big crop.

AMES (Near)—*Isaac Young.* The most rain I ever saw in October; Squaw creek and Skunk river are over their banks.

BEDFORD—*E. H. Griffin.* Frosts occurred between the 8th and 15th; also on the 17th and 18th, but not killing. Most of the garden flowers are in bloom, and especially petunias, morning glories and sweet peas.

BONAPARTE—*Hon. B. R. Vale.* A remarkably warm month; very favorable for fall grain and pasture till near the close of the month.

CARROLL—*Moses Simon.* A fine month, and no killing frost.

CHARITON—*Hon. S. H. Mallory.* Flowers and vegetables were not injured by frost; leaves began falling rapidly at close of month.

CLINTON—*Dr. Luke Roberts.* This has been the warmest October in the twenty-two years that I have kept the record; rainfall, 2.73 inches, .27-inch above normal. On the 17th the minimum temperature was 28°, but of such short duration that little damage was done to vegetation; grass is yet green. Light winds prevailed, mainly from the south.

CRESCO—*Gregory Marshall* A very mild October and no severe frosts. Sweet peas were in bloom on 31st; flies and insects were numerous.

ESTHERVILLE—*Leslie Littell.* During the latter part of October mosquitoes were more numerous than for years. On the 30th sweet peas, morning glories and golden rod were in bloom; leaves fell from trees without freezing.

FOREST CITY—*J. A. Peters.* A very wet month at the close. Many potatoes yet in the ground; some corn growing in shock.

GRAND MEADOW—*F. L. Williams.* The month averaged very warm. Pastures fine as in June; corn husking is well advanced and a large amount of plowing has been done; no hog cholera here.

GREENFIELD—*J. G. Culver.* Month unusually warm, with southerly winds twenty-five days. Sweet peas, nasturtiums, heliotrope, cannas and many other flowers were in bloom at close of the month; but little corn husked.

GRINNELL—*A. O. Price.* But one hard frost during month and but little vegetation killed; pastures abundant; streams and wells full.

GRUNDY CENTER—*E. S. King.* Very warm and damp; corn has grown badly in fields; husking retarded and lots of corn spoiled. Pumpkin vines were in bloom on the 27th; fall plowing well done.

HUMBOLDT—*H. S. Wells.* About half the month good for husking corn, which yields from fifty to sixty bushels per acre. Pastures still good.

KEOSAUQUA—*J. H. Landes.* A remarkable month; only one killing frost, and that didn't kill much. Flowers in bloom and some fruit trees had blossoms near the close of month. Fresh lettuce and radishes were grown in some gardens; pastures and wheat are fine.

LARRABEE—*H. B. Strever.* October has been very mild and moist; corn is drying out slowly; husking is in active operation; fresh vegetables and flowers have been seen in gardens up to the close of the month, something very rare in this latitude.

MT. VERNON—*J. W. Hubbard.* Remarkable month for high temperature and southerly winds; mean temperature, 9° above normal for eleven years; rainfall, 2 03 inches above normal for same period.

OSKALOOSA—*Joseph Boyd.* Month warm throughout; fall grain has made a good start, with plenty of moisture.

OVID—*H. C. Miller.* Only two frosts and no damage except on low ground; vines and flowers in bloom; grass green as in spring.

RIDGEWAY—*Arthur Betts.* A wonderful October. First frost to kill most tender vegetation was the 8th. This makes 156 days between frosts. On night of 5th and 6th a terrific

thunderstorm continued about all night. It was the longest in duration and most severe storm of the kind that ever visited this locality. Another severe storm, or a succession of showers with heavy thunder, came on 27th and 28th. Forests held their full verdure till after the 8th. Wild flowers and many cultivated flowers were in bloom. Pastures green as in June on November 1. Fall work advancing rapidly.

SIOUX CITY—*U. G. Purssell* The following paragraphs are copied from the Sioux City *Tribune* of November 3, 1900:

"At this time two years ago," said Weather Observer Purssell, "the Pacific Short Line road had already had one snow blockade which had tied it up four or five days; there had been snow on the ground for a good part of a month, and winter was well started. This year we didn't have frost—official frost—during the entire month of October. The present fall has thus far broken all records in this territory. There is every prospect, too, that the year will break the record for rainfall at this point."

It isn't easy, after contemplating the long succession of balmy days this fall, to realize such a change from two seasons ago. The average temperature for October here for twelve years is 51°; this year it was 59°. The lowest recorded was 46°, two years ago. On October 17, 18, 19, 20 and 21 two years ago it snowed and was very cold. The Short Line was blockaded several days, there being a foot of snow forty miles west of here; other roads were in bad shape.

The mean rainfall at this point for twelve years since observations have been taken is 24.35 inches. This year there has already been 32.51 inches. The greatest rainfall in any one year was 33.29 inches, in 1891, so that less than an inch is needed to break the record this year. The least rainfall in one year was 17.84 inches, in 1894. By years the observations show:

Years.	Inches.	Years.	Inches.
1890	22.25	1896	30.77
1891	33.29	1897	20.38
1892	26.38	1898	22.91
1893	23.05	1899	22.67
1894	17.84	1900 (to date)	32.51
1895	20.29		

In addition to being the warmest October, the past month was the only one recorded in which no frost was officially recorded. It must be understood that official frost means a registered temperature of 32° by the protected instruments on the federal building. Extremes are not so great, either of heat or cold, by the official as lay instruments.

"The best idea meteorologists can form from all testimony," said Mr. Purssell, "is that the climate is remarkably stationary. One twenty-year period compared with another will show the averages almost identical. No, I don't think the rainfall is increasing any in this territory as a result of cultivation and the growth of trees. There are people who believe those things have influence, but the figures don't bear them out. Cultivation enables the soil to take in and hold such moisture as falls, instead of letting it run off the surface That's why the streams dry up. The ground holds the water instead of shedding it, and thus there is constantly less danger of drouth as more and more of the land is cultivated. But man's influence on climate is about as great as the rainmakers' on precipitation. It takes great winds from the great waters, and certain conditions of temperature, to produce rains, whether the ground is fall plowed or seeded down cuts no figure with the winds and temperatures."

STORM LAKE—*Prof. M. L. Fuller.* The month's temperature was above the normal, and the rainfall almost double the average for the past sixteen years. Very severe thunderstorms on the nights of the 28th and 30th.

TOLEDO—*Lulu G. Bookwalter.* A very warm and pleasant month. Farmers are husking corn, which is thoroughly ripe and a large yield. Stock on full pastures; potatoes yielding a good crop, but not up to expectations.

WEST BEND—*Philip Dorweiler.* Month very warm and moist. Gardens are green and gooseberries and raspberries were putting forth new leaves.

ERROR IN AUGUST REVIEW.

Belle Plaine —Total precipitation recorded 6.96 inches on page 8, should have been 6.90 inches.

ERRATA IN SEPTEMBER REVIEW.

Forest City.—Minimum temperature of 34° on the 17th, recorded on page 10, should have been 33° on the 27th.

Monticello.—Total precipitation recorded 3.48 on pages 10 and 14, should have been 3.47 inches.

CLIMATOLOGICAL DATA FOR OCTOBER, 1900.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIP., IN INCHES.				Number rainy days	SKY.			Prevailing direction of wind.	Dates of thunderstorms.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.		
ona*	Kossuth	1,500	7	58.2	*10.1	82	4	36	17	....	4.15	*2.39	1.10	...	9	14	11	6	SE	21, 27, 30
	Buena Vista	1,519	8	57.7	*8.6	82	4, 5	31	8	35	2.61	*.30	.67	...	9	13	13	5	S	1, 3, 6, 27, 28, 30
	Buena Vista	....	....	.....	.....	...	...	...	.....	..	3.06	.....	1.13	....	7	...	...	...	.....	.....
t (near)	Kossuth	....	....	57.2	.....	85	4	31	17	34	3.50	.....	1 00	....	9	12	7	12	SE	2, 3, 5, 6, 27, 28, 31
croft	Hancock	1,230	....	57.4	.....	86	4	25	8	34	3.97	.....	2.00	..	9	11	19	1	S, SW	
t	Floyd	1,012	8	57.5	*8.4	84	3	29	8	35	2.97	*.93	1 17	....	5	9	15	7	SE	4
rles City	Cerro Gordo	984		58.6	....	85	4	35	17	32	3 50	.....	1.50	...	6	12	13	6	SW	
ar Lake	Howard	1,280	27	56 0	*9.7	84	3	27	8	30	4.83	*2.45	1.36	.	10	15	4	12	SE, SW	1, 3, 27, 28, 30
sco‡	Winneshiek	900	6	57.8	*9.3	84	3	29	17	34	5 34	*3.21	1 60	....	10	...	...	...	...	...
orah	Wright	....		58.6	...	87	4	25	8	41	4 05	.....	2 03	..	5	15	8	8	S	30
ws	Clayton	....	18	59 0	*10.8	89	3	28	17	45	4 08	*1.34	1.63	....	8	15	9	7	SE	4, 6, 28
ader	Emmet	....	....	56.0	....	85	2	29	8	40	3.00	.....	1.00	..	10	14	10	7	S	2, 3, 27, 28, 30
herville	Winnebago	1,220		58.8		86	4, 5	30	8	42	4 11	.....	1 67	....	6	14	5	12	S	
rest City	Clayton	....	8	58 0	*9.8	81	5	35	8		4.26	*1 72	1.20	..	9	12	5	14	SW	
and Meadow *	Butler	943		58 6	...	85	5	29	8	38	2 31	.....	1.20	..	9	13	10	8	SW	
eene	Franklin	1,240	9	60 2	*12 1	89	4	30	17	41	4.59	*1.92	1.85	....	10	16	5	10	SW	
mpton	Emmet	....	....	....	....	...	...	...	...	...	2.91	.....	1 05	....	6	20	6	5	SW	
prig	Humboldt	1,082	6	59.0	....	85	4	30	8	40	3.67	*2.00	1.60	....	9	16	8	7	SE	
mboldt	Allamakee	....	..	58.8	.....	88	3	32	17	40	4.62	.....	1.70	..	10	14	5	12	...	
nsing	Lyon	....	....	....	....	...	...	...	...	..	1.75	...	1 50	..	2	25	1	5	SE	
rchwood	Cherokee	....	8	57.2	*17.0	87	4	29	17	39	1.54	-.61	.79	....	5	17	9	5	SW	
rrabee ‡	Plymouth	1,221	...	57 3	.....	84	5	29	8	37	1 69	.....	.58	..	8	19	7	5	S	
Mars	Chickasaw	1,166	..	58 4	....	83	3	34	12	37	3 20	.....	1 55	..	8	...	...	...	S	
w Hampton (b)	Worth	1,210	....	56.6		81	3	30	17	33	4.37	.....	1.45	..	10	12	9	10	SW	
rthwood	Mitchell	1,178	8	56.1	*12.4	80	3	32	8, 17	29	3.20	*.63	1.19	..	9	9	6	16	SE	1, 3, 5, 6, 27, 28, 30
age	Humboldt	....	....	....	....	...	...	...	.....	....	2.60	.....	1.60	..	2	14	4	13	S	5, 30
oneer	Pocahontas		...	56 5	.....	86	4	21	14	49	3.68	.....	1.50		8	18	4	9	S	
over ‡	O'Brien	....	...	59.0	.....	80	2	35	7, 8	40	1.71	.....	.55	....	5	19	12	0	.....	.....
rimghar	Winneshiek	....	....	58.9	..	83	3	31	8	31	6.72	.....	1.88	..	16	16	9	6	S	1,2,3,4,5, 26, 27, 28
idgeway ‡	Palo Alto	....	...	58 2	....	86	5	31	7	41	3 45	.....	1 05	..	9	14	7	10	SW	
uthven	O'Brien	1,406		56.7	....	81	4	29	11	46	1 70	...	.60		6	13	7	11	S	
neldon	Osceola	1,506	6	58.0	*9.8	87	3	26	8	45	1.20	- 70	.46	T	5	17	10	4	SW	
bley	Sioux	....		57 4	...	86	3	31	7	36	2.26	...	1.05	...	5	15	7	9	S	27
oux Center	Dickinson	....	5	59.7	*12.2	88	4	...	...	...	1.51	-.67	.65	.	3	....	...	...	S	
pirit Lake‡ (d)	Buena Vista	....	10	58.1	...	82	5	36	8	32	3.32	*1 87	1 17	....	10	17	8	6	S	1, 3, 5, 6, 27, 30
torm Lake	Cherokee	....	..	....	....	...	...	...	...	..	3 42	.....	1 07	....	8	18	8	5	S	
Vashta	Bremer	942	....	59.4	....	85	2, 3	32	8	34	3 40	...	2.00	....	10	11	9	11	S	4, 27
Waverly	Palo Alto	....	6	55.8	*10.2	85	4	31	8	.....	4.35	*2.97	1.80	..	9	15	9	7	S	1, 2, 5, 6, 27, 28, 30
Vest Bend *	Fayette	1,105	....	.....	....	....	.....	.....	.....	.....	3.45	.....	1.28	....	6	...	...	...	.....	.....
Vest Union																				
Average				57.9	*10.2	84.4	....	30.7	.....		37 6	3.29	*1 55	...	...	8	15	8	8	S	

CENTRAL SECTION.

	Iowa	.....	23	59.0	*10.5	84	3, 4, 5	30	17	36	3.79	*1.12	1.25	..	8	18	6	7	S	2, 28, 30
Amana	Story	936	19	59.8	*9.9	87	2	31	17	42	3.73	*1.39	2.04	....	11	17	10	4	.....	
Ames	Audubon	....	6	57.5	*8 7	87	3	25	17	44	3.72	*1.76	1.80	..	5	14	8	9	S	
Audubon	Jasper	.....	....	59.6	.....	88	4	32	7	35	4 33	.....	1 50	....	9	11	17	3	SE	
Baxter	Carroll	....	9	59 3	*9.9	86	4	30	31	35	3 96	*1.31	1.60	..	7	19	2	10	.....	1, 2, 22, 28, 30
Carroll	Linn	744	17	60 6	*10.6	88	4	33	17	38	4.12	*1.46	1 45	...	7	18	3	10	SE	
Cedar Rapids	Clinton	609	8	59 2	*8 0	87	4	28	17	39	2.73	*1.15	1.55	...	7	16	5	10	S	
Clinton	Carroll	....	....	59 6		84	4, 5	33	17	30	3.48	...	1.70	....	6	15	9	7	S	31
Coon Rapids	Scott	615	27	61.8	*8.7	86	3	35	17	30	2.00	- 48	.86	...	8	19	3	9	SE	28
Davenport	Delaware	1,048	8	57.4	*10.9	85	3	28	17, 18	42	3 60	*1 32	1.31	....	8	13	8	10	S	
Delaware	Crawford	1,192	6	59.1	*10.7	85	4	28	17	38	6.39	*4.74	2 55	....	8	21	5	5	S	
Denison ‡	Polk	867	21	60.6	*7.0	87	4	33	8	37	3.08	*.23	1.56	....	7	10	12	9	SE	28, 30, 31
Des Moines	Dallas	866	...	59.6	.....	84	4	31	17	31	3.19	.....	1.30	....	6	18	7	6	SW	
De Soto	Dubuque	655	....	60 2	*9.6	86	3	35	17	32	2.38	-.26	.67	....	9	14	8	9	SE	2, 6, 28, 31
Dubuque	Webster	....	...	59 4	.....	87	4	29	8, 17	45	3.58	.....	1.32	....	6	13	12	6	SW	
Fort Dodge	Ida	....	6	57.8	*9.0	85	5	26	17	41	4.30	*3.16	1.68	....	7	17	2	12	S	
Galva (a)	Marshall	1,035	....	.....	.....	...	.....	.....	.....	....	4.67	...	2 25	...	8	13	6	12	S	
Gilman	Poweshiek	1,011	9	60.0	*12.8	83	4, 5	35	8	30	4.73	*2.36	2.22	..	6	15	7	9	S	
Grinnell	Poweshiek		...	60.6	...	85	4, 5	34	8, 17	33	4.76	...	2.00	...	9	19	5	7	SE	2,6,22,28,29,30,31
Grinnell (near)	Grundy	966	8	59 6	*9.8	86	3, 4, 5	31	8	36	4.89	*2.19	2.12	....	11	18	5	8	S	4
Grundy Center	Guthrie	1,269	....	60.5	... ..	89	3, 4, 5	28	17	42	3 76	.....	2.10	....	4	17	9	5	SW	31
Guthrie Center	Shelby	.....		58.2	....	85	3, 4, 5	27	17	39	4 32	.....	1.10	T	10	9	14	8	S	1,3,6,27,28,30,31
Harlan	Buchanan	921	37	58.3	*11.2	85	3	30	17	37	4.20	*1.83	1 00	..	7	16	6	9	S,SW	
Independence	Johnson	644	9	60.7	*10.1	88	3, 4	31	17	43	3.61	*1.62	1.25	..	9	17	6	8	S	
Iowa City	Hardin	.....	6	57.0	*9 0	86	4	27	8	41	3.77	*1 51	1.77	....	9	17	4	10	S	
Iowa Falls	Scott	.....	..	.....	...	....	.....	.....	.....	.....	1.60	....	.74	....	6	...	...	..	.....	
Le Claire	Harrison	928	34	58.3	*6.0	84	2, 4, 5	24	17	52	4.60	*2.23	.81	...	7	17	6	8	S	28
Logan	Jackson	.....	6	59.2	*6 0	84	3, 4, 5	27	17	42	4 64	*1.68	2.10	....	5	..	...	...	.....	
Maquoketa	Marshall	898	7	60.2	*9.5	88	3, 4	30	8	42	4.46	*1.90	2 40	..	9	17	8	6	S	
Marshalltown	Jones	800	45	57.7	*9.2	87	4	26	16	49	5.00	*2 25	1.98	....	6	15	5	11	SW	
Monticello	Linn	.....	...	60.0	.....	85	3, 4, 5	31	17	43	3.56	.....	.75	....	8	18	1	12	S	
Mt. Vernon (Hub.)	Jasper	958	12	59.4	*9.2	89	3	33	8, 17	35	4 23	*1.67	2 04	....	9	15	8	8	SE	
Newton	Sac	.....	....	59.8	.....	84	2, 4	28	7	36	6.23	.....	2.90	....	8	20	3	8	.....	27, 30
Odebolt	Boone	1,109	....	60.2	.....	87	4	29	8	40	3.17	... ...	1.72	..	8	22	4	5	SE	
Ogden	Monona	.....	....	60.2	.....	87	2, 5	28	7	40	4 11	.....	1 80	..	6	22	1	8	SE	27, 29
Onawa	Dallas	.....	....	60.2	.....	86	3, 4	31	8, 17	38	2.72	.....	1 66	....	5	19	8	4	SE	1, 30, 31
Perry	Calhoun	1,219	..	58.4	.....	84	4	32	8, 17	37	3.49	.....	1.34	..	6	16	4	11	.....	
Rockwell City	Sac	900	20	58.8	*7.6	85	4, 5	32	8, 17	36	4.52	*2.24	1.25	..	10	17	7	7	S	27
Sac City ‡	Greene	.....		59 2	.....	...	.....	35	8, 17	34	2.59	.....	1.28	....	5	20	6	5	S	
Scranton (c)	Woodbury	1,122	10	58.8	*8.0	86	5	33	8	39	2.21	* 55	.70	....	8	16	8	7	SE	
Sioux City	Tama	.....	5	60.8	*11.7	90	4	28	8	45	2.95	*.91	1.00	....	6	22	2	7	S	
Toledo	Benton	800	9	58.3	*9.1	86	3, 4, 5	32	8	.....	3.43	*.94	1.16	....	5	22	0	9	SW	
Vinton * (a)	BlackHawk	862	20	58.5	*6.5	87	3	30	8, 17	42	4.14	*1.86	2.35	..	6	17	4	10	SE	4, 28
Waterloo ‡	Muscatine	.....	....	59.7	.....	86	4	28	17	37	2 69	.....	.86	....	6	18	4	9	S	6
Wilton Junction	Hardin	.....	....	57.8	.....	84	4	29	8	33	4 24	.....	2.12	....	6	13	12	6	SW	30
Whitten																				
Average				59.4	*9.4	86.0	.....	30.2	.....		38.5	3.73	*1.41	.....	....	7	17	6	8	S	

*Is used to indicate the plus sign (+)

CLIMATOLOGICAL DATA FOR OCTOBER, 1900—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., IN INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.	Dates of thunderstorms.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days	Number partly cloudy days.	Number cloudy days.		
Afton	Union			59.9		85	3, 4	30	17	37	6.90	3	3.11	..	7	16	7	8	SW	
Albia(*d*)	Monroe	945		59.3		85	3, 4	31	14	47	3.55		1.50		5				S	
Atlantic	Cass		8	58.8	*8.6	87	3	24	17	46	5.15	*2.96	2.15		7	15	8	8	S	1, 21, 28, 30
Batavia	Jefferson	610									3.60		1.00		8					
Bedford	Taylor			59.6		90	3, 4	27	8	46	6.94		2.50		7	16	8	7	SW	
Belknap	Davis	857		61.1		87	3, 4	34	17	38	2.87		.90		7	23	6	2	S	
Bonaparte	Van Buren		8	61.8	*7.6	87	3, 4, 5	30	17	40	3.28	*1.72	1.35		4					
Buckingham	Tama	526									4.03		2.23		5	14	9	8		
Bussey	Marion										3.52		1.60		5					
Chariton	Lucas	1,030		60.4		85	2, 3, 4	34	17	35	4.72		1.97		10	16	8	7	SE	
Columbus Jct	Louisa			61.9		87	3, 4	33	17	35	2.83		.96		8	18	6	7		28
Clarinda	Page	1,069	9	60.3	*7.3	89	3, 4	29	17	44	7.85	*5.97	2.60		9	16	7	8	S	
College Spr'gs (*a*)	Page		8	59.3	*3.5	87	4	31	8	36	8.00	*5.38	3.36		9	19	3	9	SE	
Corning	Adams	1,127	7	59.2	*6.5	84	4	30	8	35	6.68	*4.95	2.42		7	16	6	9	SW	1, 28, 30
Council Bluffs	Pot'wat'mie	989		60.4		89	4	29	16	43	5.99		1.92		8	21	2	8	S	
Crawfordsville	Washington										3.66		1.23		9	21	1	9	SE	
Cumberland	Cass										4.40		1.83		6	16	3	12	S	
Danville	Des Moines	715									2.30		1.60		5					
Eldon	Wapello			61.6		88	3, 4	30	17	41	4.28		1.75		9	19	3	9	SE	28
Emerson	Mills										3.20		1.00		5					
Ft. Madison	Lee	516	51								4.19	*1.44	1.25		8	12	9	10	SW	1, 6
Glenwood ‡	Mills	979	29	61.5	*12.5	87	3, 4	29	17	40	5.85	*3.44	1.87		7	9	16	6	SW	
Greenfield	Adair		8	60.3	*8.5	86	4	33	8	31	5.86	*4.05	3.30		7	19	5	7	S	1, 30
Hedrick (*c*)	Keokuk			59.8							2.80									
Hopeville	Clarke			60.6		85	4	35	8, 17	39	5.78		1.80		7	10	14	7	S	1
Indianola	Warren			60.6		86	4	33	8	36	4.55		2.43		10	11	8	12	SW	1, 28, 31
Keokuk	Lee	618	28	62.4	*7.0	87	4	36	8	30	5.36	*2.71	1.26		10	18	6	7	SE	
Keosauqua ‡	Van Buren		7	63.0	*7.4	87	4	33	17	34	4.92	*3.45	2.73		9					
Lacona	Warren										5.45		1.80		7	14	10	7		
Lenox	Taylor			59.8		83	3, 4	33	8	29	7.27		4.20		6	20	4	7	S	30
Mooar	Lee			58.5		87	3, 4	29	23	47	5.26		1.40		8	18	7	6	SE	
Mt. Ayr	Ringgold	1,236	6	60.3	*7.3	87	4	34	8, 17	38	5.69	*3.78	1.53		8	13	11	7	SW	1, 28, 30
Mt. Pleasant	Henry	725		60.7		89	3	32	9	35	3.40		1.38		7	21	3	7	S	
Omaha (Neb.) ‡	Douglas	1,113	25	61.6	*8.0	89	4	37	17	32	5.43	*2.84	1.65		9	15	9	7	SE	
Osceola	Clarke	1,123		60.4		86	4	34	8	36	5.95		1.97		7	11	10	10	S	
Oskaloosa	Mahaska	850	16	59.8	*9.2	87	4	30	17	38	3.60	*1.32	1.25		9	20	3	8	SE	
Ottumwa	Wapello	630	5	61.3	*8.3	87	4	35	8	34	5.75	*3.22	2.00		5	17	7	7	SE	
Ovid	Wayne		6	60.2	*7.5	86	3, 4	31	8	39	4.41	*2.07	1.44		10	19	1	11	SE	1, 2, 27, 28, 29, 30
Pacific Junction	Mills	960		60.8		88	4	29	17	45	3.94		1.20		9	12	14	5	S	
Pella	Marion			60.6		88	4	33	7, 16	40	3.71				6	21	3	7	SE	
Red Oak	Montgomery	1,033		61.7		86	3, 4	32	8, 17	40	4.95		1.55		8	14	8	9	SE	
Sigourney	Keokuk			61.1		88	3, 4, 5	30	17	41	3.81		1.18		7	17	12	2	SE	1, 2
Stuart ‡	Guthrie			60.3		86	2	33	31	45	4.28		2.30		6	15	10	6	SW	
Thurman	Fremont			59.8		86	4	28	17	38	4.98		1.80		9	17	6	8	SE	28, 30
Villisca ‡	Montgomery	1,058	6	59.8	*9.1	89	3	28	16, 17	44	7.40	*5.49	1.54		9	20	5	6	SW	
Wapello(*b*)	Louisa	578		59.6		82	2, 3, 6	29	9	40	1.95		.74		6				S	
Washington	Washington		9	59.6	*7.3	87	4	30	8	41	4.12	*2.47	1.75		9				SW	
Winterset	Madison		8	60.5	*8.9	89	4	31	8	37	4.36	*2.42	2.07		6					
Woodburn	Clarke																			
Average				60.7	*7.5	86.7		31.2			38.7	4.72	*3.18		7	17	7	7	SE.S	
Av. for the state				59.3	*9.0	85.7		30.7			38.3	3.91	*2.05		7	16	7	8	S	

§ Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡ Received too late to be computed with means. *a* One day missing, *b* two days, etc.
*Is used to indicate the plus sign (+).

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR OCTOBER, 1900.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean.
n.....	Max.	64	84	85	85	83	75	59	61	68	65	67	69	72	75	78	73	63	74	75	72	65	60	69	76	78	74	79	77	60	64	64	71.4
	Min.	51	58	63	63	65	58	39	33	38	35	36	35	38	41	41	41	30	41	46	46	58	50	49	45	48	44	58	55	48	53	40	46.6
	Max.	68	84	85	85	83	84	67	60	66	..	..	..	..	78	71	73	63	74	73	72	70	61	65	74	75	71	78	73	63	70	64	71.5
a.....	Min.	48	52	56	58	64	64	38	32	35	..	..	68	73	76	74	76	54	65	76	38	44	51	50	48	51	53	50	54	58	51	52	44	47.1
	Max.	73	80	79	82	82	75	51	63	70	68	68	38	47	47	50	40	33	43	51	52	57	51	63	69	74	69	74	61	65	65	64	68.1
.....	Min.	54	60	65	66	63	48	38	31	39	43	38	66	68	72	76	65	59	72	43	70	68	64	53	72	52	47	55	72	56	55	44	47.3
	Max.	64	80	84	84	84	82	64	60	65	65	65	66	68	74	76	65	59	72	72	45	59	55	53	43	78	74	59	57	49	62	64	69 6
ana.....	Min.	51	59	67	66	66	61	46	32	34	37	36	35	36	39	44	45	30	45	51	72	67	61	70	74	78	74	73	66	62	64	47	48.3
	Max.	51	87	85	86	83	78	58	65	73	67	70	72	74	73	86	69	69	79	37	48	59	59	70	41	50	43	75	66	62	64	59	72.1
as	Min.	37	58	66	65	64	69	45	30	35	67	71	74	76	78	82	57	65	24	34	75	64	58	75	72	52	74	75	71	60	65	64	47.4
	Max	68	85	87	86	85	77	58	65	72	40	31	28	40	43	69	34	57	69	75	72	77	75	65	72	51	75	60	52	65	69	41	71.7
antic...	Min.	55	63	68	68	68	51	34	26	29	69	72	75	57	57	63	30	25	36	72	77	32	38	40	66	70	71	35	70	65	60	52	45 9
	Max.	70	86	87	86	85	76	40	26	32	38	36	34	28	39	68	39	69	25	64	55	74	76	58	67	70	71	39	65	50	43	41	72.4
lubon ..	Min.	45	61	62	67	66	45	40	26	32	67	68	67	68	68	74	45	55	64	31	47	50	54	41	40	51	41	77	78	61	64	56	42.6
	Max.	73	79	82	85	82	73	55	66	66	33	68	73	76	75	48	63	62	67	41	78	73	69	45	73	78	44	47	49	48	52	35	69.3
icroft ..	Min.	52	53	62	64	60	56	40	33	67	69	72	73	43	63	44	62	34	37	80	45	81	69	72	46	80	81	78	60	51	65	52	45.2
	Max.	87	84	87	88	86	78	57	74	39	39	40	42	43	48	82	44	64	71	35	81	45	68	76	48	44	42	38	60	56	65	40	72.4
ster.....	Min.	54	62	67	66	66	44	32	38	73	76	76	78	80	82	86	40	40	30	66	77	35	78	45	73	78	78	78	70	65	57	50	46.8
	Max.	83	89	90	90	85	78	63	73	30	34	32	32	35	36	35	40	60	66	77	73	42	69	60	75	78	78	50	78	58	58	55	49.6
lford....	Min.	43	54	60	60	60	43	37	27	38	69	69	72	75	77	80	47	45	34	64	39	48	54	52	47	73	51	78	68	58	68	71	65.6
	Max	67	85	87	87	83	83	60	62	35	39	41	40	73	45	77	82	69	64	30	77	37	72	53	73	78	64	52	78	58	58	57	50.1
lknap....	Min.	52	56	64	65	66	67	45	35	69	70	68	73	76	77	41	49	48	30	62	74	43	71	54	68	71	73	40	71	65	60	70	69.6
	Max.	75	85	87	87	87	84	67	61	32	36	38	39	41	72	72	80	48	62	28	44	50	49	65	52	72	51	56	76	71	42	42	45.3
naparte.	Min.	51	61	65	65	63	69	48	61	68	66	66	69	73	42	44	48	41	28	35	44	50	57	67	49	72	77	70	76	71	62	65	72.2
	Max.	72	81	83	86	83	78	52	37	25	32	39	35	71	73	76	81	68	64	77	75	71	70	67	65	44	56	49	54	61	53	55	49.0
itt.....	Min.	50	58	65	65	61	84	52	37	60	61	70	68	68	36	38	40	43	33	39	47	74	68	58	53	70	77	75	76	67	63	67	71.7
	Max.	66	83	87	88	86	84	59	45	34	35	38	38	69	70	72	76	80	63	75	75	50	57	51	58	73	54	75	62	57	67	54	49 1
dar Rap.	Min.	54	60	68	68	67	68	59	45	63	68	66	69	39	49	46	52	66	34	40	70	49	65	63	66	69	73	69	69	52	57	45	68.3
	Max.	65	85	85	85	84	50	59	44	37	37	40	41	67	67	71	72	68	62	68	72	49	59	52	48	66	39	82	52	65	68	65	46 6
nariton...	Min.	54	60	65	66	78	83	76	56	59	66	65	67	35	37	40	45	42	30	35	80	74	60	56	78	48	80	49	78	58	58	51	73.7
	Max.	63	72	67	64	61	55	44	29	70	34	36	73	72	79	80	83	62	69	80	74	78	51	66	78	49	70	42	75	76	60	60	46.8
narles Cy	Min.	52	56	67	89	89	85	72	62	70	75	70	73	33	38	39	46	39	29	36	71	47	64	66	49	70	72	57	77	51	76	64	69.5
	Max.	68	88	61	64	64	67	50	39	30	35	35	68	71	72	75	76	62	61	71	43	70	56	68	49	42	70	57	77	76	50	45	47.6
larinda...	Min.	55	62	84	85	82	77	52	42	38	42	44	42	70	39	43	46	42	35	44	70	43	68	54	64	70	77	51	73	49	58	64	71.2
	Max.	68	75	67	61	64	62	52	42	38	66	66	67	70	71	75	76	62	59	72	43	73	68	61	52	45	70	50	75	58	63	50	47 3
lear Lake	Min	50	57	67	64	87	86	83	54	58	66	35	35	40	41	40	41	39	28	33	73	37	69	61	50	76	50	78	53	64	56	50	71.4
	Max.	71	84	86	87	87	86	59	65	55	34	67	69	72	75	77	80	60	64	75	48	73	69	50	72	48	74	52	78	53	62	56	47.2
linton	Min.	45	57	61	60	87	84	77	56	55	70	67	69	72	42	45	49	41	35	75	48	76	70	65	63	74	78	52	78	57	68	60	73.6
	Max.	..	86	86	87	84	65	52	36	31	35	37	36	70	73	77	73	72	64	35	59	72	52	55	53	68	53	70	46	60	59	48	50.2
ollege Sps	Min.	..	61	60	65	87	85	83	66	69	69	69	70	40	42	42	52	40	33	73	42	71	67	60	68	73	70	40	70	55	53	60	69 5
	Max.	69	84	87	66	66	85	68	38	39	40	65	66	68	72	73	77	67	62	33	72	54	58	65	56	45	77	52	72	58	53	67	49.8
olumb Jc.	Min.	47	60	67	66	66	68	36	55	60	67	65	66	68	72	73	74	67	33	63	74	48	66	60	71	76	73	52	74	60	56	61	70 3
	Max.	72	81	83	84	84	84	76	55	40	43	45	42	66	68	72	74	67	43	74	72	53	58	52	49	71	48	76	52	66	52	50	48.1
oon Rap..	Min.	53	61	67	68	66	66	56	40	34	67	64	66	68	72	74	79	67	42	74	50	71	53	59	53	66	59	71	50	62	52	49	72.3
	Max.	65	83	83	84	82	75	54	39	30	38	39	38	33	76	44	79	59	84	79	49	75	62	53	66	55	62	52	77	59	53	68	48.6
orning....	Min.	50	61	66	66	66	67	54	57	70	74	70	72	76	78	73	77	62	29	43	73	43	68	56	74	75	56	74	75	61	61	68	71.4
	Max.	75	88	87	89	87	84	75	84	35	42	41	40	68	73	48	51	77	41	62	43	61	73	63	53	72	49	56	74	55	72	51	52 2
o. Bluffs.	Min.	62	68	70	68	68	70	40	34	57	59	67	67	68	70	77	48	52	78	38	70	28	61	35	62	53	70	40	67	53	74	56	68.3
	Max.	70	82	86	86	86	84	82	57	46	37	42	43	46	68	71	72	38	78	42	79	44	58	38	68	29	61	38	70	40	67	43	47 3
Davenp'rt.	Min.	55	61	69	69	67	66	57	46	53	58	67	66	68	68	73	38	38	42	79	44	81	50	59	40	61	35	70	28	64	35	74	68 9
	Max.	67	65	84	74	65	80	78	52	44	53	30	42	68	35	38	73	73	79	44	81	50	59	40	64	35	64	27	78	41	74	52	45.9
Decorah....	Min.	50	57	65	65	65	63	79	59	58	33	66	68	35	35	36	73	38	73	38	79	41	68	59	44	61	28	64	28	72	43	77	71 1
	Max.	62	77	85	83	80	80	57	43	31	33	38	35	70	73	73	73	44	50	81	50	74	73	53	74	49	73	48	72	47	72	50	49.8
Delaware..	Min.	48	51	65	65	65	65	57	56	65	70	66	68	70	42	73	44	77	50	44	61	35	61	31	65	50	41	72	41	78	37	72	69 1
	Max.	65	84	85	87	84	84	77	41	33	38	42	40	65	40	65	42	70	44	61	45	64	61	31	60	35	72	43	75	49	72	52	50.1
Des Moines	Min.	53	63	68	69	70	82	51	55	60	65	63	64	68	36	40	65	50	82	45	64	43	62	30	70	40	72	49	69	67	68	54	70.9
	Max.	76	80	82	84	82	71	53	46	63	38	32	67	69	33	70	74	42	72	40	72	49	67	66	56	42	68	49	71	67	59	45	69 5
De Soto....	Min.	56	64	69	70	71	85	53	63	63	70	68	69	70	74	46	72	74	43	60	72	42	78	56	63	39	76	54	76	60	67	54	51 0
	Max.	72	80	86	87	85	76	55	40	25	32	38	35	69	72	74	78	49	62	35	64	78	56	68	53	68	49	77	56	68	59	73	75.0
Dows.....	Min.	50	67	67	67	85	64	82	55	45	58	68	66	43	70	41	42	82	43	66	48	69	52	75	59	69	61	53	68	51	77	44	48.1
	Max.	66	72	86	82	72	55	45	68	37	63	71	38	36	73	76	35	80	46	62	79	45	67	53	68	51	67	52	74	40	72	44	72 3
Dubuque ..	Min.	53	61	67	69	86	86	64	85	68	71	33	71	36	36	75	78	39	78	45	83	46	62	36	65	28	68	33	77	33	75	40	45.6
	Max	84	86	88	88	66	66	64	67	47	51	33	35	71	74	78	33	66	44	68	38	83	62	36	55	28	68	30	65	33	75	40	69.6
Eldon	Min.	50	50	66	66	85	82	85	83	51	64	71	36	35	33	73	34	38	75	34	78	38	75	63	55	68	30	76	47	76	40	72	42 5
	Max.	65	73	89	67	62	81	53	42	38	30	32	43	69	41	70	37	68	39	75	40	71	50	68	54	76	47	77	44	73	50	70	70.9
Elkader ...	Min.	44	58	61	82	82	82	62	74	50	62	68	69	41	35	73	38	74	43	40	75	44	67	53	76	54	68	63	52	75	58	65	46.5
	Max.	82	85	82	60	53	42	38	29	62	29	32	43	68	37	74	76	73	37	76	47	76	68	63	53	76	42	75	43	71	37	70	72.1
Estherville	Min.	65	65	82	60	86	86	62	75	54	62	69	66	39	70	41	74	44	64	43	70	47	65	63	52	64	52	70	45	75	50	70	46.6
	Max.	70	77	82	60	64	62	51	41	30	30	34	39	70	72	74	75	44	64	43	70	44	68	60	65	29	62	34	79	65	47	77	70 5
Forest City	Min.	51	57	60	85	87	84	79	56	65	29	70	72	39	72	44	75	40	76	44	70	43	73	54	74	70	43	73	49	75	44	71	45.2
	Max.	74	85	85	63	66	66	65	55	43	29	..	68	69	74	76	76	44	77	40	82	44	81	52	76	39	73	37	75	47	76	50	70.6
Ft. Dodge..	Min.	54	60	65	63	83	85	85	75	52	65	71	38	41	43	76	45	75	40	82	44	68	72	47	72	52	76	30	78	53	78	53	46.6
	Max.	77	83	65	51	65	63	45	35	..	..	30	68	70	75	77	75	72	68	64	61	75	47	76	52	78	53	76	52	70	57	63	71 7
Galva.....	Min.	51	61	51	85	84	65	63	78	56	65	71	68	70	75	77	76	82	64	31	72	73	75	44	77	39	70	50	70	51	73	60	48.9
	Max.	66	75	85	66	66	66	64	56	44	29	63	66	68	76	76	48	81	44	73	40	75	45	66	57	67	58	68	59	68	57	63	69.9
Greene.....	Min	50	57	66	85	86	83	64	78	55	63	33	42	43	66	44	76	52	70	42	72	46	72	67	58	68	59	68	57	65	59	68	50 0
	Max.	68	84	85	86	86	83	67	47	38	59	65	64	65	44	68	71	74	45	59	72	46	72	58	61	52	68	52	72	53	62	52	71.6
Greenfield.	Min.	46	55	62	68	83	83	67	78	65	59	65	64	42	65	44	63	52	72	33	65	34	72	52	61	53	66	52	66	52	76	54	49.7
	Max.	67	80	82	67	67	83	66	60	44	63	41	69	42	70	72	74	80	52	74	45	75	49	72	59	68	52	67	48	72	46	72	71.0
Grinnell...	Min.	54	60	67	83	85	85	66	79	63	34	70	69	40	70	43	72	47	74	48	76	34	72	53	62	52	67	48	79	50	72	52	48.2
	Max.	70	81	83	68	67	66	63	73	45	63	40	70	70	72	74	74	74	76	33	76	40	75	45	75	52	76	45	75	50	70	55	73 4
Grin'l (nr.).	Min.	54	58	68	86	86	63	55	78	56	63	31	74	74	77	48	73	77	52	78	43	73	47	71	46	78	49	75	53	74	47	75	47.6
	Max	65	83	86	87	89	87	74	57	35	42	67	67	68	70	75	77	48	52	78	42	79	45	68	43	73	43	68	38	70	28	64	72.7
Grundy C'r	Min.	51	58	64	68	68	76	63	55	41	74	74	74	76	79	74	75	75	42	75	78	73	75	53	74	47	71	46	78	43	74	47	47.6
	Max.	71	84	89	89	86	86	63	79	30	30	36	41	70	75	77	78	42	75	45	75	47	72	56	74	53	74	47	71	46	78	43	70.4
Guthrie C'r	Min	52	61	68	78	89	69	86	77	49	66	75	70	73	75	42	74	38	42	75	45	75	80	51	72	48	71	43	74	35	74	44	45.9
	Max	69	81	88	89	86	86	66	50	38	32	42	40	66	75	40	74	74	75	42	75	45	80	63	40	74	74	48	72	52	74	48	70.2
Hampton..	Min.	50	58	67	68	66	66	63	54	37	63	66	68	71	73	74	40	72	73	46	78	50	80	45	78	50	80	50	82	46	72	45	50.9
	Max.	73	83	85	85	66	85	63	51	75	28	62	63	67	69	73	43	74	46	72	45	78	50	80	45	64	43	66	56	42	56	43	70.8
Harlan	Min.	53	61	66	66	66	85	84	56	75	52	65	70	40	42	73	44	77	50	44	61	35	61	31	65	41	72	41	74	45	72	43	47.3
	Max	62	84	84	66	66	85	66	52	77	43	43	43	74	74	43	72	74	72	45	77	37	72	47	72	50	64	32	64	35	77	47	69.4
Hopeville .	Min	54	60	66	66	66	84	66	83	56	43	56	67	68	72	74	72	43	72	74	42	72	45	68	42	62	32	60	36	73	44	74	47.2
	Max.	73	83	83	67	85	85	63	57	40	63	69	66	68	40	72	69	43	72	74	40	72	45	68	56	42	68	49	72	54	63	49	71.1
Humboldt.	Min.	51	57	67	65	84	82	80	53	60	69	66	68	36	69	35	72	40	45	43	70	60	44	74	44	59	70	51	77	48	74	62	50.1
	Max.	69	78	85	64	86	64	64	65	43	32	34	38	66	68	72	47	72	80	45	70	64	36	77	43	74	77	44	73	50	68	54	73.1
In'pend'ce.	Min.	48	57	66	65	86	82	76	63	63	63	63	66	66	41	71	44	77	53	80	45	63	36	77	41	77	44	74	73	50	79	52	48.4
	Max.	69	83	67	68	68	68	63	45	33	40	63	69	39	69	36	73	77	80	60	63	77	80	43	77	34	75	44	71	45	74	54	69 6
Indianola..	Min.	54	59	65	68	68	87	83	67	62	70	69	36	36	71	73	37	40	43	48	60	34	71	47	63	55	66	49	63	53	74	52	44.4
	Max.	69	84	88	88	64	63	65	47	33	34	34	65	66	68	71	72	37	72	80	56	35	62	29	61	75	34	72	41	75	44	74	71.5
Iowa City..	Min.	49	59	64	64	86	84	63	51	76	62	68	39	33	66	68	31	36	74	46	76	26	64	31	72	44	75	45	72	47	72	53	53.2
	Max.	75	80	85	86	87	66	84	50	34	27	58	67	37	66	68	74	75	78	48	80	40	72	51	78	46	80	44	77	51	76	64	71 6
Iowa Falls.	Min.	46	52	66	67	85	84	53	47	36	61	70	44	68	72	36	70	74	80	50	72	44	64	32	67	30	62	36	72	42	72	54	45 9
	Max.	75	84	86	87	87	68	68	47	36	61	70	68	38	36	72	74	76	80	40	77	41	72	55	41	68	43	72	46	72	45	72	69.1
Keokuk....	Min.	52	60	66	67	79	83	65	46	33	65	69	69	44	68	72	36	74	76	48	74	34	76	39	72	43	75	45	72	46	76	52	45.5
	Max.	66	66	88	79	83	65	81	86	61	33	65	69	38	70	36	72	40	77	41	72	30	67	37	75	39	72	43	75	45	72	50	69.7
Lansing ...	Min.	44	42	64	65	80	84	75	54	65	29	32	69	69	40	41	67	41	68	43	81	60	33	65	34	76	40	76	42	72	46	72	49 9
	Max	75	80	82	80	84	54	34	61	39	54	41	42	64	66	67	71	49	74	48	75	74	77	46	72	42	71	75	45	75	49	72	71 1
Le Mars....	Min.	57	62	56	61	54	47	76	61	33	55	26	61	70	68	71	45	73	75	45	78	49	80	50	76	24	61	27	66	33	76	38	45.5
	Max.	65	72	83	83	81	66	61	39	54	33	41	69	68	40	67	41	70	38	74	36	76	40	68	60	33	64	61	75	40	76	42	72 7
Lenox.....	Min.	55	60	66	66	66	84	61	78	55	61	26	31	69	39	38	74	76	36	76	40	76	42	78	36	76	40	71	54	62	52	68	45 6
	Max.	73	84	83	84	84	84	50	33	26	61	70	31	68	39	71	32	69	43	72	45	78	50	80	45	64	43	66	56	42	62	52	73.2
Logan.....	Min.	52	60	63	64	62	84	82	50	69	32	61	70	73	75	40	75	43	74	76	42	75	78	50	74	36	76	40	73	46	78	58	47.3
	Max.	67	80	84	84	84	63	60	38	32	69	32	31	32	74	36	73	74	35	73	74	36	76	36	83

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR OCTOBER, 1900—CONTINUED.

STATIONS.		DATE.																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Means.
Monticello.	Max.	75	78	86	87	84	80	81	60	68	68	69	78	80	79	82	68	74	72	71	68	66	74	75	77	72	74	76	75	74	65	62	72.1
	Min	44	43	50	55	65	60	37	29	28	33	33	33	34	37	33	26	34	33	38	42	42	48	50	42	43	45	42	42	41	48	50	41.2
Mooar	Max.	86	84	87	87	83	84	73	66	70	69	70	74	73	78	81	63	64	76	75	78	74	72	62	59	82	80	66	69	69	73	70	74.1
	Min .	53	50	40	63	62	60	35	30	32	32	33	35	33	32	40	48	45	50	40	40	43	43	29	45	48	48	45	46	48	45	38	43.9
Mt. Ayr. .	Max.	65	86	86	87	84	75	61	63	69	67	70	72	77	76	80	64	65	76	76	70	65	60	63	82	73	74	78	64	60	65	63	71.1
	Min	53	59	65	65	65	60	40	34	39	40	55	41	44	43	50	43	34	38	48	52	58	50	39	49	51	48	60	56	50	53	41	48.1
Mt.V.(Hub)	Max.	64	82	85	85	85	81	58	65	72	69	72	76	76	76	79	64	64	78	75	71	69	62	64	74	76	77	75	68	64	63	63	73.0
	Min .	51	56	64	62	64	58	44	32	40	39	39	39	43	43	46	44	31	35	43	46	56	54	49	43	52	49	54	57	52	54	53	48.1
NewH'pton	Max.	..	70	83	79	82	79	..	57	66	64	66	67	70	77	80	70	61	68	72	70	65	62	65	69	73	68	68	72	64	67	60	69.4
	Min .	..	55	63	65	63	55	42	37	35	37	37	34	50	40	45	47	42	37	44	46	55	51	48	47	52	45	51	56	46	50	46	47.4
Newton....	Max.	65	82	89	86	84	77	55	62	68	66	67	68	68	74	80	60	63	75	75	72	69	61	66	73	75	70	77	72	64	63	64	70.4
	Min	53	58	59	66	66	63	45	33	38	39	39	38	40	40	48	45	33	40	45	48	59	52	48	47	43	44	61	56	50	53	44	48.2
Northwood	Max.	65	73	81	71	80	73	47	60	67	65	66	69	70	72	77	55	62	68	72	70	65	65	67	69	71	63	69	65	61	65	51	66.9
	Min .	50	57	65	65	61	52	42	31	35	37	36	35	39	42	44	40	30	40	44	49	54	53	50	40	57	45	52	51	46	48	43	46.2
Odebolt	Max.	75	84	81	84	78	68	53	65	71	68	69	73	75	75	78	61	66	76	73	72	67	61	70	75	70	70	71	74	59	60	70	70.7
	Min	51	62	66	68	64	45	28	29	35	42	49	38	46	45	49	41	34	44	50	54	58	54	52	44	50	57	50	51	44	39	42	47.9
Ogden.....	Max.	71	86	86	87	85	76	58	66	72	67	70	70	75	73	84	64	65	80	77	77	65	62	71	76	76	70	74	69	64	63	61	72.1
	Min	55	61	69	66	65	57	42	29	38	42	40	40	41	44	49	45	34	40	47	48	58	50	49	46	50	37	60	50	49	47	42	48.1
Onawa.....	Max.	81	87	86	85	87	70	61	73	77	74	74	79	81	81	80	62	72	80	75	70	62	60	74	77	74	75	71	59	68	58	53	73.8
	Min .	51	53	58	59	57	46	28	33	39	44	40	41	41	51	50	42	32	42	53	56	58	54	52	47	54	41	59	51	44	44	43	47.2
Osage.....	Max.	63	69	80	76	79	74	55	57	65	64	65	67	68	70	76	61	60	65	70	68	65	63	65	67	71	63	68	63	58	62	59	66.2
	Min	50	56	63	61	61	53	38	32	35	40	38	38	43	43	47	40	32	36	42	49	55	51	47	43	48	45	50	50	47	51	43	46.0
Oskaloosa..	Max.	64	83	86	87	85	83	56	61	69	69	69	69	72	76	79	64	64	76	78	73	68	58	68	74	78	73	77	68	61	69	64	71.6
	Min .	53	60	65	67	66	55	44	32	34	35	36	35	35	38	49	42	30	39	44	49	58	52	52	45	53	53	61	59	51	54	45	48.1
Ottumwa...	Max	66	82	85	87	85	83	56	60	66	67	61	68	71	75	80	69	70	75	76	71	64	56	63	75	78	72	78	75	63	70	60	71.3
	Min .	55	64	67	67	65	68	47	35	37	38	41	40	41	45	53	48	46	41	48	51	48	52	55	48	56	51	61	62	51	58	55	51.4
Ovid	Max.	61	84	86	86	83	79	61	67	72	69	71	73	75	76	82	65	66	79	76	74	70	54	73	79	78	78	78	67	59	67	58	72.3
	Min	50	58	64	65	65	52	42	31	36	40	40	37	38	44	50	45	33	40	47	49	51	51	52	44	52	46	60	57	52	52	41	47.9
Pacific Jct.	Max	72	84	86	88	85	75	68	76	71	68	68	73	75	77	82	57	67	75	75	71	62	59	72	76	74	76	78	64	64	65	47	71.8
	Min .	60	66	67	69	68	68	39	31	39	41	38	36	43	47	49	43	29	38	50	57	59	54	53	49	50	40	63	58	49	48	44	48.6
Pella.....	Max.	74	85	86	88	86	80	75	67	72	69	70	72	73	76	86	61	66	79	79	77	76	59	70	75	76	74	76	70	60	69	60	73.7
	Min .	52	58	67	67	68	36	33	36	42	39	38	42	52	55	46	33	38	44	46	49	48	52	48	47	46	45	44	50	50	60	37	47.4
Perry.....	Max.	69	84	86	86	85	78	60	63	70	67	69	71	74	76	82	72	65	76	76	75	67	62	70	77	76	72	76	75	62	65	62	72.5
	Min .	52	60	67	66	65	58	44	31	37	41	41	35	42	42	47	46	31	38	47	50	59	52	52	47	51	40	60	50	48	47	42	48.0
Primghar ..	Max.	73	80	75	76	74	74	45	55	76	75	70	77	75	79	79	65	70	82	75	75	62	60	70	75	70	75	65	68	55	55	50	69.5
	Min	55	60	56	40	50	47	35	35	56	52	45	46	48	56	58	48	49	42	52	55	55	52	55	43	40	42	55	48	40	40	46	48.3
Red Oak...	Max	70	85	86	86	84	82	62	70	73	69	72	75	79	79	84	63	59	80	75	72	68	60	76	79	78	75	75	69	65	65	63	73.5
	Min .	58	63	67	70	68	51	40	32	39	42	38	37	45	48	52	40	32	40	53	55	57	54	53	50	55	42	62	57	50	54	42	49.9
Rockwell C	Max	71	82	81	84	83	78	61	63	66	65	61	70	74	72	80	56	63	76	73	69	64	66	68	74	72	69	70	67	59	67	60	69.8
	Min .	51	60	60	63	63	59	42	32	36	41	37	37	41	42	45	42	32	45	46	58	54	53	51	39	49	41	57	52	46	42	42	47.0
Ruthven ..	Max	71	78	79	84	86	82	64	71	71	64	69	73	75	76	79	72	74	77	74	75	62	58	62	71	70	66	62	58	56	58	55	70.1
	Min .	44	61	62	64	61	50	31	39	41	38	41	43	46	42	56	32	43	38	58	48	53	49	50	42	51	41	46	42	46	40	40	46.4
Scranton ..	Max.	70	82	..	.	..	81	57	62	70	66	68	70	74	73	80	70	69	75	74	71	67	60	68	74	72	68	70	70	60	62	64	68.6
	Min .	53	61	..	..	..	56	43	35	43	43	40	42	45	45	58	43	35	47	50	52	57	52	52	67	56	42	61	55	47	45	42	48.9
Sheldon....	Max	73	73	80	81	80	63	63	68	72	76	73	68	76	74	75	54	67	75	73	70	63	62	65	70	65	67	69	64	55	55	50	69.4
	Min .	55	61	62	63	60	40	31	30	30	30	29	32	45	48	49	40	32	42	50	55	57	55	51	42	51	39	54	47	38	38	41	45.1
Sibley.	Max.	77	80	87	85	84	74	56	66	74	73	73	78	81	80	77	58	73	82	76	72	63	65	66	73	69	70	70	64	64	55	51	71.5
	Min .	53	60	55	60	50	43	33	26	32	40	35	37	44	46	40	38	38	37	48	54	56	56	49	40	52	37	51	48	42	36	40	44.4
Sigourney..	Max.	68	85	88	88	88	85	70	62	72	70	72	73	75	79	81	68	63	77	78	74	69	63	67	75	78	75	78	70	65	72	66	74.0
	Min .	50	58	66	65	65	65	41	32	34	37	37	37	38	41	46	43	30	36	41	47	58	52	54	45	52	47	58	60	53	55	52	48.2
Sioux Cen.	Max	73	76	86	80	82	76	52	63	68	69	69	71	76	75	73	54	68	73	71	69	62	61	61	68	64	66	68	65	54	55	55	67.8
	Min	56	63	54	65	58	44	31	35	40	44	41	41	48	50	48	39	32	42	52	55	58	54	50	42	52	44	55	47	41	40	40	47.1
Sioux City..	Max.	74	82	83	83	86	76	55	67	72	70	71	75	78	78	78	56	71	78	72	68	61	63	67	76	68	72	69	58	58	55	46	69.9
	Min .	62	66	58	58	58	55	35	33	33	46	43	42	44	49	51	40	38	39	45	53	57	54	51	46	49	41	59	50	41	42	42	47.7
Storm L...	Max.	71	79	78	81	82	74	51	63	69	65	67	71	73	72	76	55	66	76	71	69	64	60	68	73	68	68	67	65	56	58	56	68.1
	Min .	53	60	63	67	65	42	38	36	42	45	42	41	47	50	48	40	38	46	51	51	56	53	51	43	53	42	57	49	42	39	41	48.1
Thurman..	Max.	69	84	84	86	83	77	58	64	67	65	67	70	73	75	78	67	65	73	73	68	65	58	71	70	72	75	74	68	63	65	63	70.6
	Min	59	65	69	71	70	55	39	30	36	45	34	33	38	42	47	42	28	35	51	57	58	53	51	48	58	42	61	57	50	49	42	48.9
Toledo.....	Max.	61	85	89	90	88	82	63	70	77	72	75	76	78	78	85	65	69	84	78	74	69	57	71	75	79	77	78	68	65	54	58	73.9
	Min .	53	59	67	67	66	67	45	28	32	35	37	34	34	38	50	46	32	41	40	48	59	54	50	42	54	43	57	59	50	51	37	47.6
Wapello ...	Max	62	82	82		..	82	70	51	69	64	64	66	66	71	74	66	57	67	71	69	79	66	61	69	73	70	73	68	68	70	66	66.8
	Min .	52	62	67	..	..	65	49	37	29	43	43	41	41	42	51	49	34	40	46	49	59	55	48	51	53	54	59	60	61	60	61	50.4
Washingt'n	Max.	69	83	86	87	84	83	52	62	68	68	69	72	73	76	80	60	63	76	76	72	69	59	63	74	78	76	77	72	68	69	64	71.9
	Min .	49	58	65	64	64	56	38	30	34	37	39	38	38	42	49	40	32	35	41	44	58	50	50	43	50	47	58	58	57	54	47	47.3
Waverly...	Max.	65	78	85	85	84	78	58	58	79	66	68	69	71	73	80	67	63	71	73	72	68	66	67	72	76	68	73	70	59	63	61	70.5
	Min	54	58	67	67	66	58	42	32	35	40	40	36	38	42	47	44	33	37	47	50	59	54	50	43	53	42	60	56	49	52	44	48.2
Whitten ...	Max.	68	80	83	84	82	78	56	60	67	64	65	67	68	70	78	67	62	74	73	69	67	68	66	70	73	64	73	68	65	66	64	69.3
	Min .	50	58	66	66	64	50	42	29	35	38	40	37	39	43	45	41	31	37	46	58	50	52	49	45	45	42	57	47	49	45	42	46.4
Wilton Jc..	Max.	73	83	85	86	84	83	71	57	65	65	66	68	71	73	75	65	58	72	72	69	71	65	66	70	74	71	75	73	70	73	67	71.5
	Min .	49	59	65	63	62	67	46	32	34	35	35	36	39	40	44	40	28	35	41	45	58	47	43	44	53	48	55	56	64	61	59	47.9
Winterset .	Max.	66	86	87	89	85	79	60	67	74	68	72	73	76	77	83	59	56	80	68	73	66	69	71	79	78	75	77	76	59	62	59	72.5
	Min .	54	49	66	67	67	68	43	31	38	49	35	36	41	42	51	43	33	43	48	50	41	54	51	46	53	41	62	56	49	52	43	48.5

DAILY AND MONTHLY PRECIPITATION FOR OCTOBER, 1900.

CATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
	.70	....	....	....	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.08	.11	....	....	....	....	....	1.71	1.10	.09	3.11	6.90
	.90	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.32	.23	....	....	....	....	....	.60	....	....	1.50	3.55
	.02	....	T	....	.50	.03	....	....	....	....	....	....	....	....	....	....	....	....	....	.01	.53	.23	....	....	....	....	.17	.67	....	.27	.43	2.61
	.12	....	.18	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.56	.14	....	....	....	....	1.13	....	....	.61	.16	3.06
	.19	....	.27	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.47	.44	.07	..	....	....	....	.34	.55	.02	1.25	3.79
(near)	....	.65	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.56	.12	....	....	....	....	.14	....	.09	.05	2.04	3.73
	.09	.28	....	.05	.21	.10	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.40	....	....	....	....	....	1.05	.17	....	2.65	4.75
	.15	.20	....	....	.05	.08	....	....	....	....	....	....	....	....	....	....	....	....	....	T	.89	.30	....	....	....	....	....	1.20	.21	.83	1.27	5.15
(near)	.45	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	T	1.08	T	....	....	....	T	.70	.08	.06	1.80	3.72
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.10	.20	....	....	....	....	.20	.80	....	....	1.00	3.50
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.60	.40	....	....	....	....	....	.40	.20	....	1.00	3.60
	....	.20	.60	....	.30	.10	..	....	....	....	....	....	....	....	....	....	....	....	....	....	.40	.15	T	....	....	....	....	.77	.08	1.50	.42	4.33
	....	1.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.26	.16	....	....	....	....	....	1.07	.67	.15	2 13	6.94
	....	....	....	....	.15	.03	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.90	.18	....	....	....	T	.10	.10	.35	.50	2.87
	.83	....	....	....	....	T	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.97	....	....	....	....	....	.40	....	T	1.35	3.28
	3.50	....	....	....	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.90	.01	....	....	....	.04	.89	....	....	2.10	3.97
	....	.74	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	.25	....	....	....	....	....	.50	.10	....	2.23	4.03
	....	.56	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.25	.33	..	..	....	....	....	.48	.50	....	1 50	3.52
	....	.04	.03	01	....	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.42	....	..	....	....	.05	....	1.10	....	....	1.60	3.96
	.05	.51	..	.06	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.76	..	..	....	....	.38	....	.50	.20	1 45	4.12
	.62	....	..	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1 32	.06	....	....	....	....	....	.69	.53	.10	1.97	4.72
	.35	....	.10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.06	.16	.03	.01	....	....	T	.44	....	..	1.17	2 97
	.21	..	....	..	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	.52	....	....	....	....	....	1.11	.26	..	3 50	7 85
	1.05	.12	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.33	.70	.15	....	....	....	....	.85	....	....	1.50	3.50
	T	.64	....	.20	T	T	T	....	....	....	....	....	....	....	....	....	....	....	....	....	.10	.75	..	....	....	....	.24	.20	..	.18	2.73
	1.80	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.55	....	....	.01	....	....	1.50	.15	.08	3.36	8 00
	..	....	....	.10	....	.20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.40	.80	....	....	....	....	....	.54	.06	T	.86	2.89
	..	....	....	....	....	1 55	....	....	....	....	....	....	....	....	....	....	.11	....	....	....	.10	.96	.05	....	....	....	....	.80	.03	....	1 70	3.48
	....	....	....	....	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.35	.25	T	....	....	....	T	1 17	.22	1 55	2 42	6.68
	1.51	....	.09	....	..	.09	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.20	.12	....	....	....	....	.02	.95	..	1.12	.70	5.99
	....	.23	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.15	1 92	.54	....	....	....	....	.50	.08	.30	1.28	3.66
	.35	....	..	....	....	....	....	....	....	....	....	....	....	....	T	....	....	....	....	....	.08	.90	.06	....	....	....	....	....	.33	....	1.83	4 40
	1.00	....	T	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.60	.10	T	....	....	....	1.13	....	.45	.10	.10	2.30
	.59	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	....	....	....	....	T	1.60	....	....	....	....	....	....	....	....	T	27	2 00
	T	.36	....	....	....	.10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	.52	.04	....	....	....	....	.81	.07	T	1 60	5.36
	.41	....	T	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.08	.54	.08	....	....	....	1.04	.36	.03	T	1 31	3.60
	T	..	....	....	..	....	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	.04	.50	12	....	....	....	....	.40	.70	.20	1 56	3.08
	....	.03	....	....	....	.07	.23	....	....	....	....	....	....	....	....	....	....	....	....	....	.03	19	T	....	....	....	....	.51	.10	T	1.30	3 19
	....	.81	....	.37	T	.45	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.24	.01	....	....	....	....	96	.10	....	2 03	4.05
	..	.33	....	....	....	....	T	..	....	....	....	....	....	....	....	....	....	....	....	T	....	1.07	....	....	....	....	.65	....	....	....	.57	2 38
	.65	.03	....	....	....	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	T	.37	.04	....	....	....	....	.30	.67	.02	1 75	4.28
	.58	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.82	.08	....	....	....	....	.06	.37	.06	1 63	4.08
	T	T	....	....	.25	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.51	.05	....	....	....	....	....	.30	.38	..	1.00	3.20
	....	24	....	....	T	.14	.03	....	....	....	....	....	....	....	....	....	....	....	....	....	.45	....	....	....	....	....	....	.45	....	....	.25	3.00
	.41	.22	..	....	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.50	....	....	....	....	....	....	.27	T	.01	1.00	4.11
	....	.22	..	.55	....	.50	....	....	....	....	....	....	....	....	....	....	....	....	....	T	.06	.57	.60	....	....	....	T	.08	.80	....	1.67	3.58
	1.00	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	1.27	.07	....	....	....	....	T	.94	.05	T	1.32	4.19
	T	.08	.08	....	T	.08	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	.45	T	....	....	....	....	....	.60	.50	.25	.30	4.30
	....	T	....	.22	T	T	..	....	....	....	....	....	....	....	....	....	....	....	....	....	1.25	.14	T	....	....	....	....	.32	1.68	..	.20	.37	4.69
	....	....	T	.42	.40	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.55	.93	....	....	....	....	....	....	.50	.15	.25	2.25	4 26
	.41	....	....	....	....	.74	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1 04	.04	....	....	....	....	.05	.38	.10	..	1 20	2.31
	....	....	.25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.20	.35	....	....	....	....	....	.11	.3	....	....	1.20	5.86
	.20	.24	....	....	T	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.08	.19	....	....	....	.04	....	....	1.24	.23	.12	3.30	5.86
	....	.61	....	1.14	....	.23	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.10	.20	....	....	....	....	....	....	.47	....	.17	2 22	4 73
	....	.24	....	.09	....	.05	..	....	....	....	....	....	....	....	....	....	....	....	....	....	1.00	.15	....	....	....	....	....	....	.50	.18	.14	2.00	4.76
	.67	..	T	..	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.12	83	.07	....	....	....	....	T	.75	.12	.05	2 12	4.89
	.72	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	.10	.88	.03	....	....	....	....	....	.73	.40	....	2.10	3.76
	.30	.62	..	..	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.47	....	....	....	2 25	4 59
(near)	.01	.77	....	.04	T	.02	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.30	.04	....	..	....	....	....	.21	.98	....	.02	1.10	4.32
	.53	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.01	1.06	.43	T	..	....	....	....	....	1.05	.90	.42	1 80	5.78
	.14	.04	.05	....	.20	.10	..	....	....	....	....	....	....	....	....	....	....	....	....	....	.20	T	....	....	....	....	....	.35	....	....	....	.76	2.91
	.40	....	.01	....	....	.10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.05	....	....	....	....	....	....	.01	1.00	....	....	1.60	3.67
	.38	....	....	....	....	.03	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.05	.68	.05	....	....	....	....	....	.50	.42	....	1.00	4.20
	....	....	.05	.25	.45	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.20	1.00	....	....	....	....	....	....	54	.56	.05	2.43	4.55
	....	....	.02	....	.22	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.06	.14	.01	T	....	....	....	....	.38	.15	.42	.98	3.61
	.04	..	....	....	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.25	.25	T	....	T	....	.05	.48	T	T	1.77	3.77
	....	.70	....	.38	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.43	.51	T	....	....	....	....	....	.39	.17	.04	.13	5.36
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	....	....	....	....	....	.74	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.18	.16	....	....	....	....	....	....	65	.88	....	.60	.60	4.60
	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.71	.81	....	....	....	....	....	.65	.71	....	....	79	4.64
	.09	....	.02	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.90	.40	..	....	....	....	....	.45	2.10	..	....	....	4.46
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	.52	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.50	.13	....	....	....	....	T	....	1.26	..	....	1.98	5.26
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	T	1.10	....	....	.03	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.25	.10	....	....	....	....	....	....	.36	.19	....	1.38	3 56
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	.41	.25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.60	.44	.04	....	....	....	.14	75	.05	T	.53	4.11
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	.44	.08	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.20	.10	.01	....	....	....	....	....	.44	.33	.02	2.60	3 71
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	.63	....	.03	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.08	.64	....	....	....	....	....	....	.66	....	1.28	....	1.70
	.40	....	.25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.15	.27	....	....	....	....	....	.16	.08	..	.04	32	1.20
	.06	....	.21	....	....	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.60	.50	....	....	....	....	....	.01	T	..	.08	.46	3 81
	.23	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	.36	.29	....	....	....	....	....	....	.50	.46	....	1.18	2.26
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	.23	.23	....	....	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.06	.38	.24	....	....	....	....	.21	1.17	....	.30	.42	4.98
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DAILY AND MONTHLY PRECIPITATION FOR OCTOBER, 1900—CONTINUED.

STATIONS.	DATE.																															Total.
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Washington	....	.08	....	....	....	.10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.72	.02	.10	....	....	....	....	.10	.15	1.10	1.75	4.12
Washta	.14		.10	..	....	T	....	....	....	....	....	....	....	....	....	....	....	..	....	....	1.07	25		....	....	....	.26	.60	..	.45	55	3.42
Waverly	....	.29	..	....	....	.10	....	..	....	....	....	....	....	....	....	....	....	....	....	....	.18	.29	.02	....	....	....	.02	.43	.04	.03	2.00	3.40
West Bend	.11	....	.31	....	T	22	....	..	....	....	....	....	....	....	....	....	....	....	....	T	.64	.12	.21	..	....	....	.18	.76		....	1.80	4.35
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Whitten	T	.50	..	..	.15	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.85	T	..	....	....	....	.60	.02	...	2 12	4 24
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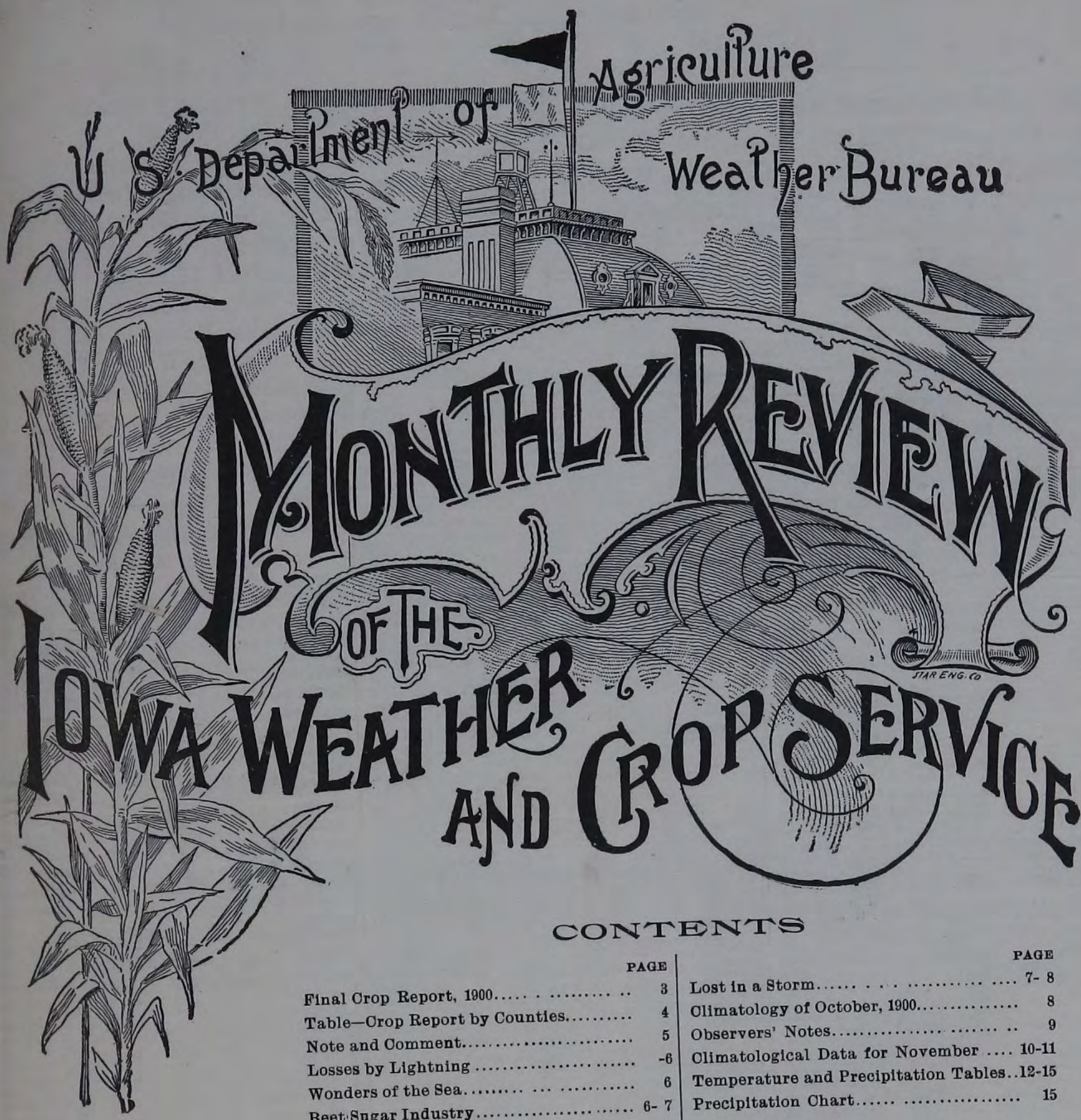
Precipitation Chart October 1900.



Vol. XI. NOVEMBER, 1900. No. 11.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

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Central Station, Des Moines, Iowa.

J. R. SAGE,
DIRECTOR

GEO. M. CHAPPEL, M. D.,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

ALLIED PRINTING TRADES UNION LABEL COUNCIL DES MOINES, IA.

DES MOINES:
F. R. CONAWAY, STATE PRINTER
1900.

THE IOWA WEATHER AND CROP SERVICE

Was established by act of the Twenty-third General Assembly, and placed under supervision of the Board of Directors of the State Agricultural Society, constituted as follows:

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Vice-President—J. C. FRAZIER, Bloomfield, Davis Co.
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From the following, weekly and monthly reports of Meteorological data are received by the Iowa Weather and Crop Service.

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Akron	H. B. Palm.
Albia	R. Moore.
Algona	C. D. Pettibone.
Alta	D. E. Hadden.
Alta (Near)	W. J. Minard.
Amana	Conrad Schadt.
Ames	Exp. Station.
Ames (6 miles s. e.)	Isaac Young.
Atlantic	J. W. Love
Audubon	Walter Haines.
Bancroft	E. G. Bailey.
Batavia	Agent C. B. & Q. Ry.
Baxter	Agent C. G. W. Ry.
Bedford	Prof. E. H. Griffin.
Belknap	A. W. Rankin.
Belle Plaine	S. P. Vandike.
Bonaparte	Hon. B. R. Vale.
Britt	G. P. Hardwick.
Buckingham (Traer P. O.)	Dr. W. A. Daniel.
Burlington	I. S Shontz
Bussey	Agent C., B. & Q Ry.
Carroll	Moses Simon
Carson	Agent C., B. & Q. Ry.
Cedar Rapids	Electric Light & Power Co.
Centerville (Walsh P. O.)	Geo. E Anderson.
Chariton	Hon. S. H. Mallory
Charles City	Chas. O. Schmidt.
Cherokee	Hon. L. W. Beal.
Chillicothe	Agent C. B. & Q. Ry.
Clarinda	A. S. Van Sandt
Clear Lake	John Cobb
Clinton	Luke Roberts
College Springs	A. M. Finley.
Columbus Junction	Prof. H. E. Simpson
Coon Rapids	Downs & Co
Corning	Jerome Smith.
Council Bluffs	J. B. Rishel.
Crawfordsville	C. D. Weldin & Co.
Cresco	Gregory Marshall.
Cumberland	Agent C., B. & Q. Ry.
Danville	Agent C. B. & Q. Ry.
Davenport	*J. M. Sherrier.
Delaware	Wm. Ball.
Decorah	F. H. Baker
Denison	Prof. W. O. Van Ness.
Des Moines	*Geo. M. Chappel
De Soto	R. D. Minard.
Dows	A. C. Fuller.
Dubuque	*E. H. Bowie.
Eagle Grove	Smallpage Bros
Eldon	T. Madden.
Elkader	Chas. Reinecke
Emerson	Agent C. B. & Q. Ry
Emmetsburg	A. Scott Ormsby
Estherville	Leslie Littell.
Fairfield	Charles J. Fulton.
Fayette	R. Z. Latimer.
Fort Dodge	C., R. I & P Agent.
Ft. Madison	Miss L. A. McCready
Fonda	H. P. Barron.
Forest City	J. A. Peters.
Galva	D. W. Farnsworth.
Gilman	Jas. L. Wylie.
Gladbrook	Agent C. G. W Ry.
Glenwood	J. P. Jackson.
Grand Meadow (Postville P. O.)	F. L. Williams.
Greene	J. L. Cole.
Greenfield	J. G. Culver.
Grinnell	Prof. S. J. Buck.
Grinnell (Near)	A. O. Price.
Grundy Center	Ed King
Guthrie Center	Clam Holden.
Hamburg	Agent C., B. & Q Ry.
Hampton	E. C. Grenelle.
Harlan	C. A. Reynolds.
Hawkeye	Miss Beatrice Kirkendall.
Hedrick	J. T. Brooks.
Hopeville	M. T. Ashley.
Hoprig	O. N. Young.
Humboldt	H. S. Wells.
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Iowa Falls	J. B. Parmelee.
Keokuk	*Fred. Z. Gosewisch.
Keosauqua	Prof. J. H. Landes
Knoxville	Casey & Belville
Lacona	Agent C., B. & Q Ry.
Lansing	G. H. Markley.
Larchwood	Prof. W. J Hunt.
Larrabee	H. B. Strever.
Lenox	J L. Hurley.
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Logan	Mrs. M. B. Stern.
Maquoketa	Dr. A. B. Bowen.
Marshalltown	Branch S. Jones.
Melrose	Agent C. B. & Q. Ry.
Monticello	C. E. Heisey.
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Mt. Ayr	A. F. Beard.
Mt. Pleasant	Dr. Frank T. Stevens.
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Northwood	Dr. J. H. Darey.
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Olin	Hon. Nathan Potter.
Omaha, Neb	*L. A. Welsh.
Onawa	C. G. Perkins.
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Ovid	H. C. Miller.
Osage	G. D. Pattingill.
Oskaloosa	Jos. Boyd.
Ottumwa	Dr. J. F. Herrick.
Pacific Junction	Agent C., B. & Q. Ry.
Pella	B. A. Viersen.
Perry	Dr. Theo. F. Johnson.
Plover	J. S. Smith.
Primghar	P. R. Bailey
Red Oak	William Boll.
Ridgeway	Arthur Betts.
Rockwell City	C. M. Randall.
Ruthven	C. E. McGlasson.
Sac City	J. A. Sodestrom
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Sigourney	Mrs. K. F. Ashbaugh.
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Storm Lake	Prof. M. L. Fuller.
Stuart	G. W. Boatright.
Thurman	C. R. Paul.
Toledo	Grace Bookwalter.
Vinton	T. F. McCune.
Villisca	C. E. Matteson.
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Washington	Wm. A. Cook.
Washta	H. L. Felter.
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U. S. DEPARTMENT OF AGRICULTURE---WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

Volume XI. NOVEMBER, 1900. No. 11.

FINAL CROP REPORT, 1900.

AVERAGE YIELD PER ACRE, TOTAL PRODUCTS AND AVERAGE PRICES DECEMBER 1, 1900.

Final reports for the season have been received from crop correspondents of the Iowa Weather and Crop Service, showing the average yield of staple farm products and the average prices obtainable therefor at the farms on or about December 1st. A preliminary estimate was compiled from reports received October 1st, and by comparison it will be noted that the figures relative to corn yield have been revised on conservative lines, making due allowance for losses resulting from unfavorable weather during the harvesting season. The reports have been tabulated by counties, and following is a general summary for the state:

WHEAT.—The yie'd of winter wheat on a reduced acreage as compared with former years, appears to be 1,018,070 bushels—an average of 13.3 bushels per acre. The total yield of spring wheat is 20,280,280 bushels—an average of 14.3 bushels per acre. The average home value of spring wheat is 60 cents, and winter wheat 62 cents per bushel, making the total of the wheat crop $12,799,371.

CORN.—The carefully revised figures made last June showed the area of corn planted this year to be 8,618,660 acres. The returns of the harvest show remarkable uniformity in the output of the crop in the different sections of the state, the average per acre for the several counties ranging from 35 to 43 bushels. There are 63 counties credited with an average yield of 40 to 43 bushels per acre. The total product of the state is 345,055,040 bushels. The average yield per acre is 40.3 bushels for the state. Average price 27 cents, and the value of the crop at that figure is $93,164,860. Fully three-fourths of the crop will be consumed within the state, and the amount realized therefor will be largely in excess of the current prices at the close of the harvest.

OATS.—Average yield per acre, 34.7 bushels; total product, 138,832,330 bushels. Value of the crop at average price of 20 cents per bushel, $27,766,466.

RYE.—Amount harvested, 1,621,630 bushels; average per acre, 15.6 bushels. Value, $697,300, at the average of 43 cents per bushel.

BARLEY.—Amount produced, 12,695,200 bushels—an average of 25.3 per acre Current farm price, 33 cents per bushel; value of crop, $4,189,416.

FLAXSEED.—Average yield per acre, 11.7 bushels. Amount harvested, 1,222,980 bushels. Average price about $1.50 per bushel, making total value of crop $1,834,470.

POTATOES.—Average yield, 72 bushels per acre; total product, 10,850,900 bushels. Total value at average price of 40 cents per bushel, $4,340,360.

SWEET POTATOES.—Estimated value, $275,000.

HAY (tame).—Total yield, 3,609,010 tons; average per acre, 1.4 tons. Value of crop at average of $6.50 per ton, $23,458,565.

HAY (wild).—Amount cut, 1,530,050 tons. Value about $5 per ton, making the total value $7,650,250. The average yield was about 1 ton per acre.

BUCKWHEAT.—The estimated amount of buckwheat harvested was about 180,000 bushels, valued at $144,000.

TIMOTHY SEED.—Yield about 3.8 bushels per acre. Value of product estimated at $825,000.

CLOVER SEED —Estimated value of crop, $350,000.

SORGHUM.—Estimated value, $275,000.

BROOM CORN.—Estimated value, $35,000.

CORN FODDER —In shock and fields, worth $9,500,000.

PASTURAGE.—Estimated value, $30,000,000.

STRAW and other forage, worth $4,000,000.

FRUITS AND VEGETABLES.—Estimated value, $8,500,000.

Average price of wool, 18 cents per pound.

The reports show that the average price of milch cows is $34, and horses $70 per head. The percentage of loss of hogs by cholera is materially less than in recent years, though in numerous localities the disease has raged with much virulence. It is impossible to make a reliable estimate of the losses by counties or for the state at large.

TABULATED CROP SUMMARY.

CROPS.	Yield per acre.	TOTAL PRODUCT.	Farm values December 1, 1900.
Winter wheat	13.3 bus.	1,018,070 bus.	$ 631.203
Spring wheat	14.3 bus.	20,280,280 bus.	12,168.168
Corn	40 3 bus.	345,055,040 bus	93,164,860
Oats	34 7 bus.	138.832,330 bus	27,766.466
Rye	15.6 bus	1,621,630 bus.	697,300
Barley	25 3 bus.	12,695,200 bus.	4,189,416
Flax.	11.7 bus.	1,222,980 bus.	1,834,470
Potatoes	72 bus.	10,850,900 bus.	4,340.360
Hay (tame)	1.4 tons	3,609 010 tons	23,458.565
Hay (wild)	1.1 tons	1,530.050 tons	7,650,250
Buckwheat	16 bus.	180,000 bus.	144,000
Timothy seed	3 8 bus.		825,000
Clover seed	1.5 bus.		350.000
Sorghum	85 gals.		275,000
Broom corn			35.000
Corn fodder			9,500.000
Pasturage			30,000 000
Straw and other forage			4,000,000
Fruits and vegetables			8,500,000
Sweet potatoes			275,000
Total			$229,805.058

The increment gained by converting soil products into beef, pork, mutton, dairy and poultry products, horses, etc., will add materially to the above showing of the value of the bountiful crops of 1900.

FINAL CROP REPORT, 1900—AVERAGE PER ACRE AND TOTAL YIELD BY COUNTIES.

COUNTIES.	WINTER WHEAT.		SPRING WHEAT.		CORN.		OATS.		RYE.		BARLEY.		FLAX.		POTATOES		CULTIVATED HAY.		WILD HAY.	
	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Tons per acre.	Total yield.	Tons per acre.	Total yield.
Adair	....	.....	13	145,340	37	3,719,610	25	1,048,500	18	7,380	25	8,750	..	.....	58	97,440	1.4	37,950	1.0	4,270
Adams	17	33,660	14	109,760	41	2,924,120	28	644,560	15	2,250	25	4,250	...	.....	43	37,840	1.5	34,450	1.0	2,160
Allamakee	18	32,400	14	68,180	43	2,208,480	35	1,469,300	18	8,100	30	173,100	12	4,200	90	144,900	1.2	41,850	1.0	1,520
Appanoose	18	14,940	...	....	36	1,616,040	33	349,470	15	4,800	.....		..	.....	75	38,250	1.0	40,730	1.0	980
Audubon	..	.....	15	282,800	37	3,316,680	25	906,000	...	...	28	90,440	....	.....	60	70,800	1.5	22,600	1.0	6,220
Benton	....	.....	15	42,150	42	5,121,480	35	2,477,650	15	10,800	32	429,120	...	.....	95	166,250	1.3	47,350	1.0	8,750
Black Hawk	...	.....	18	10,080	42	3,982,020	38	2,221,100	15	41,700	28	169,960	..	.....	90	143,100	1.3	39,830	1.0	11,680
Boone	....	.....	15	116,400	41	4,454,650	35	1,793,750	12	13,680	30	24,600	....	.....	52	69,680	1.5	24,780	1.0	18,260
Bremer	....	.....	15	12,450	42	2,627,100	28	1,444,520	14	11,620	24	56,400	...	.....	60	94,200	1.3	27,330	1.0	19,320
Buchanan	...	.....	15	9,150	42	3,625,440	33	1,556,610	16	16,960	25	75,250	10	1,450	72	105,560	1.3	44,650	1.2	15,420
Buena Vista	.	.....	14	243,600	41	4,598,560	43	2,490,980	15	7,800	25	187,000	10	11,400	90	184,500	1.5	23,760	1.0	26,140
Butler	....	.....	14	74,340	42	4,164,300	30	2,057,400	14	29,820	28	120,960	12	9,720	92	127,880	1.6	30,840	1.2	17,600
Calhoun	.	.....	15	229,800	43	4,498,230	40	2,028,400	13	15,990	25	99,000	10	10,800	80	104,800	1.3	14,090	1.2	27,960
Carroll	....	.....	18	459,360	40	4,832,800	40	2,168,230	18	14,040	30	105,900	...	.....	80	169,600	1.8	29,190	1.3	23,670
Cass	....	.....	16	426,240	41	4,459,980	24	936,240	18	4,140	25	10,250	..	.....	58	179,360	1.6	36,080	1.0	4,220
Cedar	12	13,680	11	9,350	41	4,167,650	33	1,397,550	14	14,840	25	130,750	.	.....	65	74,100	1.2	56,440	1.0	960
Cerro Gordo	..	.....	16	94,880	40	3,484,400	38	2,527,380	17	22,270	28	208,600	12	45,840	68	104,040	1.2	26,360	1.0	14,260
Cherokee	..	.....	18	692,480	41	4,398,480	40	1,998,400	20	4,200	25	218,750	12	4,680	76	113,960	1.5	25,260	1.0	15,620
Chickasaw	....	.....	16	38,720	38	2,172,840	37	2,249,970	15	6,900	30	126,900	12	74,160	70	109,900	1.2	35,38	1.0	12,370
Clarke	16	13,120	13	3,510	38	2,216,540	24	467,760	12	9,840	....	.....	....	.....	52	45,760	1.3	46,080	.5	730
Clay	....	.....	12	178,080	36	2,895,840	31	1,362,760	13	15,730	33	636,570	11	22,660	72	89,280	1.2	17,420	1.0	20,260
Clayton	17	24,480	16	84,480	43	3,270,580	40	2,407,200	15	41,250	33	134,640	..	.....	90	173,700	1.2	45,000	1.0	450
Clinton	..	.....	15	24,300	42	4,971,540	30	1,697,400	18	38,520	31	57,970	...	.....	80	126,400	1.5	72,840	1.0	3,520
Crawford	....	.....	14	702,520	39	4,847,310	33	1,404,150	16	7,360	25	103,500	....	.....	73	143,080	1.8	42,490	1.0	18,210
Dallas	14	4,480	13	82,680	41	3,736,330	35	1,129,100	16	9,120	30	23,400	..	.....	65	69,550	1.6	32,490	1.2	10,920
Davis	15	58,350	....	.....	38	2,313,440	30	531,900	12	9,000	..	.....	....	.....	80	39,200	1.2	52,940	....	.....
Decatur	16	44,160	20	4,400	40	2,626,000	32	562,520	15	7,350	.....		.....		63	49,770	1.5	61,330	1.0	1,000
Delaware	....	.....	15	14,250	41	3,728,130	32	1,517,760	12	10,080	30	144,600	..	.....	70	104,300	1.2	44,180	1.0	10,165
Des Moines	13	41,860	15	4,200	37	2,044,990	35	1,056,650	16	13,280	.....		.....		85	136,850	1.2	22,690	1.0	460
Dickinson	..	.....	15	316,350	36	1,090,080	33	788,370	16	19,360	23	359,030	11	73,810	70	47,500	1.3	7,740	1.0	21,260
Dubuque	....	.....	18	9,540	43	2,825,960	32	1,659,520	18	73,080	30	53,410	..	.....	95	223,250	1.2	44,290	1.0	2,410
Emmet	...	.....	13	296,140	38	1,508,980	35	787,150	17	8,160	28	283,080	11	58,410	85	40,800	1.6	11,020	1.2	23,180
Fayette	18	3,420	16	48,640	39	3,579,580	35	2,192,050	18	30,240	25	167,250	11	19,690	80	153,600	1.2	56,720	1.0	12,540
Floyd	....	.....	18	60,480	40	3,257,200	41	2,818,340	18	31,680	30	143,400	12	37,920	75	188,250	1.2	24,560	1.0	8,670
Franklin	..	.....	16	140,960	43	4,309,890	40	3,071,200	16	13,280	25	85,500	12	32,760	70	89,600	1.4	25,600	1.0	15,230
Fremont	20	33,600	15	144,300	35	3,826,550	30	351,300	18	3,780	.....		...	.....	90	61,200	1.8	10,950	1.5	6,840
Greene	...	.....	16	81,440	38	3,939,840	33	1,782,990	12	7,800	28	69,440	..	.....	85	101,550	1.5	23,280	1.0	22,320
Grundy	....	.....	14	94,640	39	3,766,230	30	1,813,400	15	11,400	27	330,720	12	2,880	95	192,850	1.8	39,660	1.2	14,870
Guthrie	18	9,720	13	54,580	37	3,604,910	31	1,401,510	14	7,980	30	44,100	...	.....	82	116,440	1.5	39,270	1.2	9,820
Hamilton	..	.....	18	164,700	43	4,521,020	40	2,240,800	15	3,450	25	42,250	.....		81	103,680	1.6	28,890	1.2	23,240
Hancock	..	.....	14	283,780	40	2,897,600	36	2,302,560	16	26,240	27	265,410	11	74,030	65	77,350	1.2	18,210	1.0	30,140
Hardin	....	.....	15	171,750	42	3,870,300	32	1,839,680	15	6,300	30	82,530	.	.....	76	95,760	1.4	29,380	1.0	16,720
Harrison	....	.....	12	491,040	38	3,978,980	30	455,400	15	13,800	26	20,120	....	.....	63	93,870	1.7	16,130	1.3	18,130
Henry	12	27,840	13	1,430	40	2,840,400	35	974,750	15	13,350	25	5,250	.	.....	88	83,600	1.6	45,290	....	.....
Howard	....	.....	15	49,800	38	1,956,620	35	1,848,700	17	3,910	28	206,640	11	69,740	82	91,840	1.2	40,920	1.0	12,740
Humboldt	....	.....	18	441,180	42	2,675,640	40	1,376,410	18	3,480	25	64,500	13	24,830	75	66,750	1.4	16,320	1.0	22,130
Ida	....	.....	13	280,150	40	4,116,400	31	1,113,210	16	3,040	22	92,840	..	.....	81	93,150	1.5	29,730	1.0	4,850
Iowa	....	.....	16	22,240	42	3,673,740	32	1,304,960	10	21,700	25	89,750	..	.....	75	82,250	1.8	67,950	1.0	3,270
Jackson	17	15,890	15	17,400	41	3,119,690	30	1,296,900	18	111,060	33	49,830	...	.....	82	134,480	1.6	64,330	1.0	1,820
Jasper	18	10,260	14	196,700	43	5,033,580	29	1,328,350	16	9,280	23	27,140	..	.....	74	449,920	1.6	55,720	1.2	3,140
Jefferson	13	18,460	12	3,120	38	2,190,320	32	744,760	14	18,340	28	5,440	..	.....	70	53,200	1.3	45,310	....	.....
Johnson	17	27,880	18	23,220	42	4,180,680	36	1,713,960	18	61,920	28	39,760	..	.....	77	119,350	1.7	73,230	1.2	2,790
Jones	..	.....	14	10,640	43	3,550,940	35	1,076,950	16	38,600	33	18,460	....	.....	76	81,320	1.6	67,240	1.2	2,380
Keokuk	14	29,820	14	15,810	42	4,085,340	33	1,374,560	15	24,150	25	21,750	....	.....	78	109,980	1.5	60,220	1.0	810
Kossuth	....	.....	15	685,950	41	4,711,310	40	3,073,600	15	7,940	30	421,800	12	94,920	65	193,700	1.0	14,960	1.0	63,280
Lee	13	80,340	...	.....	35	1,729,350	30	447,600	12	14,880	.....		....	.....	90	111,600	1.2	40,490	1.0	270
Linn	....	.....	16	18,720	42	4,420,920	35	1,765,050	15	37,950	22	41,580	...	.....	82	173,840	1.4	58,610	1.0	5,620
Louisa	18	32,580	15	6,750	37	2,114,180	35	854,700	14	20,300	.....		....	.....	80	47,200	1.3	24,380	1.2	1,230
Lucas	15	16,950	.....	.....	38	1,966,880	33	590,140	14	10,920	.....		.....	.....	61	34,770	1.4	57,120	1.0	370
Lyon	....	.....	13	1,104,880	35	2,078,300	36	1,282,680	15	9,410	25	112,900	10	8,100	70	106,400	1.3	7,320	1.0	15,670
Madison	16	26,560	14	99,680	40	3,385,280	30	777,900	18	22,140	25	22,250	...	.....	70	86,800	1.5	52,900	1.0	2,640
Mahaska	20	32,800	16	40,160	40	3,492,800	35	1,132,950	18	17,640	30	34,200	..	.....	56	93,520	1.5	46,350	1.0	1,180
Marion	14	33,740	13	83,460	42	3,897,920	33	993,630	15	18,150	25	20,250	...	.....	60	100,800	1.5	35,970	1.0	1,930
Marshall	....	.....	15	252,750	41	4,051,620	41	1,932,800	15	4,800	30	50,100	....	.....	80	140,800	1.5	46,190	1.0	2,980
Mills	20	16,800	12	196,440	36	3,570,480	28	406,280	18	3,420	25	6,500	.....		45	54,450	1.6	17,280	1.2	7,230
Mitchell	..	.....	14	82,040	40	2,217,600	38	1,891,260	15	13,650	30	427,500	10	96,200	80	158,400	1.0	33,620	1.0	3,860
Monona	....	.....	12	375,360	38	4,556,580	30	421,200	18	14,760	25	112,750	..	.....	75	84,750	1.5	11,560	1.0	28,260
Monroe	15	19,200	15	2,700	40	1,797,600	35	376,600	18	9,350	....	.....	....	.....	60	29,400	1.3	38,580	1.0	400
Montgomery	20	42,800	13	236,080	39	3,715,640	25	422,000	15	4,050	.....	.....	....	.....	45	45,450	1.4	22,620	1.0	2,370
Muscatine	14	22,120	15	24,300	40	2,532,800	33	842,160	18	30,780	26	98,280	.....		70	127,400	1.6	36,700	1.0	4,120
O'Brien	....	.....	15	538,650	38	3,530,960	33	1,496,220	.....	.....	30	1,071,300	11	11,550	80	108,000	1.2	14,810	1.0	13,840
Osceola	..	.....	12	399,480	35	1,529,850	25	667,750	15	5,250	22	92,040	11	25,520	66	58,740	1.0	7,930	1.2	12,270
Page	20	82,800	16	201,280	40	4,991,600	33	742,830	18	16,380	.....		...	.....	85	112,200	1.5	42,160	1.0	3,280
Palo Alto	...	.....	13	154,310	37	2,539,870	35	1,739,150	12	8,160	25	159,000	12	47,700	60	61,800	1.2	7,500	1.4	39,230
Plymouth	..	.....	14	1,430,940	40	4,088,400	35	1,524,250	15	8,100	30	276,300	8	2,960	70	154,700	1.6	16,240	1.2	37,680
Pocahontas	....	.....	18	261,540	42	3,976,140	40	2,109,600	20	16,400	28	198,240	10	49,500	70	146,300	1.6	15,150	1.3	51,240
Polk	17	3,380	15	224,100	42	4,320,120	30	967,200	18	9,180	30	6,300	....	.....	65	224,250	1.6	34,160	1.2	10,570
Pottawattamie	....	.....	13	819,650	39	8,479,770	25	975,500	16	5,580	30	28,800	..	.....	61	232,630	1.7	49,260	1.4	25,780
Poweshiek	18	4,320	17	57,630	42	4,506,180	40	1,956,800	17	10,370	30	100,500	...	.....	80	101,600	1.8	70,880	1.2	3,280
Ringgold	13	14,950	10	2,100	41	3,745,760	33	877,460	12	1,800	30	10,200	.....	.....	45	43,650	1.2	48,720	1.0	1,510
Sac	..	.....	20	350,600	43	5,191,820	40	1,805,600	20	13,200	33	224,730	12	6,840	80	103,400	1.5	30,150	1.2	20,810
Scott	15	15,600	14	103,460	42	3,010,980	30	717,900	15	28,500	28	671,440	....	.....	65	351,650	1.5	38,590	1.3	5,410
Shelby	..	.....	13	605,000	40	4,958,600	35	1,065,400	15	7,950	30	168,600	...	.....	70	131,600	1.5	35,450	1.0	8,960
Sioux	..	.....	14	1,534,540	38	4,190,640	30	1,752,600	15	6,900	23	632,960	10	4,900	70	87,500	1.6	9,790	1.2	26,900
Story	..	.....	13	74,570	43	4,547,680	40	1,930,400	15	12,900	30	25,200	....	.....	85	97,750	1.6	33,800	1.2	21,870
Tama	..	.....	14	165,620	41	4,730,580	35	1,836,800	18	12,780	25	687,000	..	.....	90	152,100	1.6	51,230	1.3	7,910
Taylor	15	33,450	12	5,040	38	3,342,480	30	694,200	16	9,120	22	12,320	...	.....	40	72,400	1.5	52,520	1.0	1,640
Union	15	3,300	14	7,980	42	2,575,020	30	749,700	17	8,840	25	7,000	....	.....	45	41,850	1.5	51,330	1.0	1,110
Van Buren	15	30,150	..	..	38	1,377,120	34	540,940	11	10,230	...	.....	...	.....	85	45,050	1.4	56,220	...	.....
Wapello	12	11,280	.....	.....	38	2,227,180	30	624,900	12	10,680	....	.....	....	.....	60	54,600	1.2	37,940	1.0	240
Warren	18	8,100	14	99,820	41	3,598,160	35	1,005,550	12	12,360	30	9,900	....	.....	62	109,120	1.8	61,930	1.2	2,650
Washington	15	14,700	12	4,320	39	3,510,780	31	1,267,590	13	21,840	20	9,200	....	.....	62	58,900	1.5	60,390	1.0	250
Wayne	13	8,580	11	20,350	38	1,661,740	35	510,300	12	4,080	.....		....	.....	65	60,450	1.4	70,570	1.0	300
Webster	....	.....	17	230,520	43	4,990,580	45	2,742,750	16	19,520	30	144,900	8	14,320	72	97,200	1.7	21,210	1.0	38,280
Winnebago	....	.....	15	399,750	40	1,762,400	33	1,202,520	20	3,600	25	84,000	11	37,070	85	79,900	1.2	11,820	1.0	23,460
Winneshiek	15	5,550	18	170,820	40	2,868,400	38	2,436,180	16	130,400	28	287,840	12	107,160	65	88,950	1.4	47,270	1.0	8,020
Woodbury	....	.....	14	1,150,660	40	5,898,000	34	1,060,120	15	10,800	30	147,300	11	3,850	66	127,040	1.6	14,170	1.3	26,290
Worth	....	.....	16	111,680	41	1,571,120	40	2,019,200	20	5,400	30	214,500	10	92,100	80	90,400	1.3	21,520	1.0	14,650
Wright	....	.....	18	288,900	43	3,729,820	41	2,381,280	17	6,970	34	166,260	11	41,250	85	100,300	1.7	23,370	1.0	27,620
Total for state	...	1,018,070	...	20,280,280		345,055,040	....	138,832,330	....	1,621,630		12,695,200		1,222,980	....	10,850,900		3,609,010		1,153,050
Av per acre	13.3	...	14.3	...	40.3	...	34.7	.....	15.6	...	25.3	.....	11.7	.....	73	...	1.4	....	1.1	.....

NOTE AND COMMENT.

Earthquakes appear to be indigenous in Japan, the number of shocks averaging about 500 per year.

* * *

The Paris exposition awarded six gold medals for butter, and the Iowa Agricultural College received one of them. That's rather more to be proud of than winning a foot ball game.

* * *

A single strand of fence wire is easily capable of transmitting such a voltage of electric current that contact with it when thus charged is fatal to man or beast. A teamster driving in an alley to empty a load of coal displaced a wire clothes-line so that touched a live arc light wire, the clothes-line flying back and touching his horses' heads. They both dropped dead in an instant. Thus cattle lying on the moist earth contiguous to a barbed wire fence are in as great danger from a bolt of electricity which falls half a mile away and charges the wire fence, as though they were in the immediate path of the current as it fell from the clouds. This fact is not generally known. A simple remedy is to ground the wires of the fence at intervals, by which the extremely high voltage of the distant lightning stroke may be safely conducted to the earth.—*J. S. Trigg, in Rockford Register.*

* * *

No killing frost visited the section of the country where the writer lives, in northern Iowa, until the 4th day of November, a most unusual event when the 20th of September nearly always sees tender vegetation destroyed by cold weather. On the 3d of November this year we gathered from the garden fresh radishes and self-sown lettuce, Soupert roses, English violets, pansies, geraniums and migonette.—*J. S. Trigg.*

* * *

Thousand of acres of cut-over lands in the lumber districts of northern Wisconsin and the Michigan peninsula, have been cleared and developed into valuable farming lands for the production of potatoes and beans. Good crops of wheat and rye have also been grown on these lands that were formerly regarded as well-nigh worthless. The larger part of that now desolate region will be converted into farms and homes some time in the coming century. Thus, the so-called waste places of old earth will be utilized and made to contribute to human weal.

LOSSES BY LIGHTNING.*

The season of 1900 brought forth bountiful crops, despite unusually heavy losses from effects of excessive rainfall, and many severe storms of wind, hail and lightning. The average rainfall for the state in the crop season (from April 1st to September 30th) was 25.74 inches. The total for the last three months of the season was 15.78 inches, or 6.75 inches above the normal for that period. In view of the great number of storms of unusual severity during the period when crops were most exposed to damage, it seems marvelous that the farmers have harvested such large amounts of grain and hay in fairly good condition.

The state weather records show that rain fell in measurable quantity at one or more stations in Iowa on 165 days during the six crop months; so there were only eighteen wholly rainless days over the entire state in that period. The larger amount of the season's rainfall came in showers of short duration; and the showers were generally thunderstorms, with frequent windsqualls of considerable severity. At the Des Moines station the records show that rain fell in measurable amount on sixty-one days, or an average of rain every third day during the season. And thunderstorms occurred on fifty-one days, or an average of two per week.

In this state about 70 per cent of the precipitation falls in the six crop months, and it generally comes in showers of short duration, with considerable display of electric force. From this statement it may appear that nature's sprinkling carts are run by electric motors, and that damage sometimes results from an excess of the motive power. In reality, however, electric energy is probably not the cause of storms, but an effect of the tremendous dynamic forces expended in the irrigation of this midland region. The sun is in the dynamo; heat, light and electricity are the life-giving forces emanating therefrom.

Having received more than the normal amount of heat and moisture the past season, there was a corresponding excess of electrical disturbance, with considerable loss of life and property from lightning strokes. Judging by the great number and wide extent of thunderstorms, and the numerous reports of casualties published in the newspapers, we conclude that the aggregate of loss by lightning greatly exceeds the total of recent years.

Only 162 reports have been received at the Weather Bureau office for the past season, as against 395 last year, and 204 in 1898. This does not indicate decrease in losses, but a decline of interest among the insurance officials, who seem to have come to the conclusion that there is nothing more to be learned in this line of inquiry. And it must be admitted that the reports are repeating about the same old story from year to year, with slight variations.

These reports probably do not include more than one-tenth of the actual casualties from lightning during the season, but they give some of the essential details and convey practical lessons of instruction as well as could be derived from a much larger number.

The total losses reported amount to $47,294. This includes losses on buildings, $38,040, and on live stock, $9,254.

The total number of buildings reported struck was thirty-five, including twenty-two barns, ten dwelling houses, two churches and one schoolhouse. Of the thirty-five buildings struck, nineteen were consumed, viz: sixteen barns, one house, one church and one schoolhouse.

As in former years, it will be seen that the heaviest loss has been suffered by the burning of barns. Of the twenty-two barns struck by lightning, nearly three-fourths were consumed, mostly with their contents, which in many cases greatly exceeded the value of the buildings. In the months of August and September nine of the ten barns struck were burned, as a result of the combustible nature of their contents at that season of the year. Only one of the ten residences struck was consumed, and the aggregate of damage to the other houses was small. The estimated loss of the sixteen barns consumed, with their contents, was $34,154, or an average of a little over $2,000 each.

The reports show that not one of the buildings struck was provided with a rod or other form of protection against lightning.

The reports give details of the loss of 253 head of farm animals killed in the fields or outside of the buildings that were struck. Of this number there were 194 cattle, ninety-five horses, nineteen sheep and five hogs. Of the number of cattle killed 125 were found in contact with wire fences. This indicates that over 64 per cent of the losses of cattle in the fields may be charged to the account of wire fences, rendered deadly by electric force. Of the thirty-five horses killed, thirteen were up against wire fences.

*Paper read by J. R. Sage before the state meeting of Farmers' Mutual Insurance Association, November 21, 1900.

Some of the details of these losses are worthy of note. On June 9, in Holland, Sioux county, five head of cattle and four horses were killed by a single stroke, all of the animals being in the same pasture and in contact with the wires; the loss amounting to $475. On June 22d, in Deep River township, Poweshiek county, fifteen cows, valued at $550, were killed by one stroke; they were all in a bunch against the wires. On August 14th, in Penn township, Madison county, seven cattle were killed, and found against the wires. In Liberty township, Jefferson county, on August 14th, eighteen cattle were killed, being found against the wires and huddled under a tree. The bunch were valued at $1,008. On June 27th, in Lee township, Franklin county, twenty cattle, valued at $600, were killed by a single stroke, and were found under a willow tree in pasture. In some cases lightning struck the wires some rods' distant from the place where the cattle were found. In Dubuque county a cow was killed by contact with a lightning rod on the side of a barn. The rod saved the building from damage, but the current was strong enough to burn the rod in two and kill the cow.

In Belmont, Warren county, on June 22d, a dwelling house was struck by lightning under unusual conditions. The bolt struck a cottonwood tree about four feet from the corner of the kitchen; passing downward a short distance, it left the tree and struck the corner of the house, causing some damage in its pathway to the earth. This is a peculiar case, seeming to disprove the general opinion that tall trees near a house serve to protect it from destructive strokes. Trees have been supposed to be better conductors than the dry timber of a building.

In one case reported, a steer received a fatal shock while passing under a wire used to stay a steel windmill. This instance serves as an additional illustration of the dangerous character of live wires in thunderstorms. Even an innocent-looking clothes-wire, stretching from the back kitchen to some convenient shade tree, may convey a deadly current to the house. Wires and metals generally become agents of destruction, or means of protection to life and property, according as they are used.

The investigations that have been made, by your generous assistance the past three seasons, lead to the conclusion that wire fences are exceedingly dangerous to live stock during thunderstorms. It appears that nearly two-thirds of the cattle killed in the fields have been found in close proximity to the fences, under conditions that leave no room to doubt that the wires were charged with the deadly currents. And it also appears to be well established that when the wires are properly grounded they are no longer dangerous, and may even afford a large measure of protection, by conveying the lightning directly to moist earth. This matter has passed beyond the realm of theory, and the conclusion may be considered fairly established. And it is time that action should be taken to enforce compliance with the simple requirements of safety. Those who fail to do their part to prevent losses should not be allowed compensation. It is not right to tax an association to pay for the results of the carelessness or indifference of some of its members. Whenever it is clearly established that certain losses are preventable, then they should be prevented. That which may be easily cured should not be endured.

Our investigations during the past three years afford a very strong evidence as to the utility of lightning rods on buildings. It appears to be strong presumptive proof that rods do protect buildings when so few of those that have been provided with even the poorest kind of rods have been damaged by lightning.

In fact, all my studies and observations for more than an average life-time lead to the conclusion that a very large measure of losses by lightning may be prevented by the use of the proper appliances. I fully believe that buildings in city or in the country may be rendered practically lightning-proof by metallic rods, scientifically constructed and attached.

It is well known that destructive strokes are exceedingly rare in densely populated cities, on account of the use of wires, pipes, metal roofs, etc. When these are used in the country, the same degree of immunity may be enjoyed on the farms.

WONDERS OF THE SEA.

[Electrical Review.]

The sea occupies three-fifths of the surface of the earth. At a depth of about 3,500 feet waves are not felt. The temperature is the same, varying only a trifle from the ice of the pole to the burning sun of the equator. A mile down, the water has a pressure of over a ton to the square inch. If a box six feet deep were filled with sea water and allowed to evaporate under the sun there would be two inches of salt left on the bottom Taking the average depth of the ocean to be three miles, there would be a layer of pure salt 230 feet thick on the bed of the Atlantic.

The water is colder at the bottom than at the surface. In the many bays on the coast of Norway the water often freezes at the bottoms before it does above.

Waves are very deceptive. To look at them in a storm one would think the water traveled. The water stays in the same place, but the motion goes on. Sometimes in storms these waves are forty feet high, and travel fifty miles an hour—more than twice as fast as the swiftest steamer. The distance from valley to valley is generally fifteen times the height; hence a wave of six feet high will extend over seventy-five feet of water.

The force of the sea dashing on Bell Rock, a reef of rocks in the German ocean, is said to be seventeen tons for each square yard.

Evaporation is a wonderful power in drawing the water from the sea. Every year a layer of the entire sea fourteen feet is taken up in the clouds. The winds bear their burden into the land, and the water comes down in rain upon the fields, to flow back at last through rivers.

The depth of the sea presents an interesting problem. If the Atlantic were lowered 6,564 feet, the distance from shore to shore would be half as great or 1,500 miles.

If lowered a little more than three miles, say 19,860 feet, there would be a road of dry land from Newfoundland to Ireland. This is the plan on which the great Atlantic cables are laid. The drying up of 660 feet would leave three different seas, and Africa would be joined with Italy. The British channel is more like a pond, which accounts for its choppy waves.

BEET SUGAR INDUSTRY.

(New York Evening Post.)

Beet sugar production in the United States last year was 79,000 tons. This was nearly one-half of the domestic production of cane sugar, but it is a very small proportion—about one-twenty-sixth—of the total consumption of sugar in this country. California was the pioneer state in the beet sugar industry, and has now eight factories, with a capacity of nearly 9,000 tons of beets daily. Nine factories are in Michigan, where a bounty of 1 cent a pound on refined sugar was offered by a law passed in 1897, and since declared unconstitutional. The total number of factories in operation last year was thirty, with a capacity of 19,100 tons of beets. Bounties are paid, on certain conditions, in New York, Minnesota, South Dakota and Wash-

ngton, and beginning has been made in each of the states in raising the beets and making and refining sugar. Iowa exempts beet sugar factories from taxation for ten years, and two companies have been organized to start the industry in that state. Besides the thirty factories now in operation in eleven states, six are under construction; one of the six in Utah, where two are already flourishing without bounty or exemption.

WEEDS GOOD TO EAT.

(Medical Times.)

The dandelion isn't the only weed eaten by people who know what's good to eat. Take wild chickory, the plague of the farmer. It makes one of the finest salads served, piquant, tender and wholesome. Charlock, or wild mustard, is another bane of the farmer. He doesn't know that as a potherb it can give a soup a delightful flavor. The dockweeds—how annoying the whole family are! Yet the broad leaf variety and the curly leaf are used all over Europe as table vegetables. There's pokeweed, commonest of them all. In France it is cultivated. It takes its place with sage, thyme, parsley and bay leaves as a flavoring for soup.

Everybody in America hates a nettle and can't see what use it is. In Scotland, Poland and Germany tender young nettle leaves are used as greens. The Germans boil it with other vegetables to give them a piquant flavor. Purslane is another weed that can be treated in the same way.

Most people think milkweed poisonous. It is a medicinal vegetable with a delightful flavor all its own. The young leaves, when they are in just the right condition, are a cross between spinach and asparagus, and in a salad are delicious.

Sorrel, fetticus and chevril are looked upon as field pests by ninety-nine out of every hundred farmers. The hundredth one picks the choicest leaves from these weeds and sends them to market, where they find a ready sale for salads to be eaten with game and for flavoring herbs—for herbs they are, and not weeds.

LOST IN A STORM.

THRILLING ADVENTURE IN AN OLD-TIME BLIZZARD.

[By Ex-Governor William Larrabee.]

The winter of 1856–7 was unusually severe in the northwest—in fact, none ever equaled it in the memory of the oldest settler. Snow fell to an enormous depth, and the mercury not infrequently ranged from 20° to 40° below zero for several days in succession. A series of great storms—now called "blizzards"—from the boreal regions—swept the prairies, whirling the dust of the powdery snow in a wild dance and piling up large banks wherever natural or artificial obstacles interrupted their turbulent course. During that long and severe winter nearly all the deer in northern Iowa were destroyed, some freezing, others starving to death, still others getting fast in the deep, crust-covered snow, and being killed by the merciless settlers while in this helpless condition. Few of the frontier people were prepared for such a winter, and certainly none had anticipated it. Thousands suffered for want of sufficient clothing and fuel, and many a man, overtaken by a blinding storm, or tired out wading through the deep snow, froze to death on the prairie, perhaps only a stone's throw from home.

Such winters are fortunately a rare occurrence, even in the northwest. Moreover, the people of this region have learned to provide for cold weather, and probably keep now as comfortable and get as much enjoyment out of the cold season as their countrymen east or south.

During the month of December, 1856, with my year's earnings in my pocket, I journeyed through the southeastern part of Minnesota with a view to select a good quarter section of government land. I finally made my choice, and then, to enter the land, set out for Winona, where the land office was located.

On the morning of the 23d of December, I left Mantorville and walked to Rochester, a distance of about seventeen miles, where I arrived about 4 o'clock in the afternoon. It had commenced snowing before I reached that town, but anxious to make a few more miles before dark, and hoping to find an inn on the road, I took lunch at Rochester and again pursued my journey.

As night approached a fierce wind arose and enwrapped me in blinding eddies of snow. The road followed a ridge between the Zumbro and Root rivers. There was no house, no fence or other landmark in sight. At first a well-beaten track served as my guide, but this was soon obliterated by the drifting snow. I found that I had lost the road and was forced entirely upon the wind to indicate my course. The snow was from one and a half to two feet deep and was covered with an icy crust. Having already walked more than twenty miles, I plodded wearily through the sea of snow.

The wind increased in severity as the night wore along, and every new gust seemed to be ushered in by a more furious howl. The high, treeless prairie presented no obstacle to the icy wave. As the blasts swept by me they seemed to penetrate every pore of my body. I was but thinly clad. Like other new comers, I had not yet learned to properly protect myself against the severity of the western winter. I wore neither overcoat nor overshoes, a pair of stockings and cowhide boots forming my sole foot-gear. For a few steps the snow would bear my weight and then give suddenly way below me; and as I fell headlong upon the snow or broke through its crust, the fine crystals worked into my boots, and gradually melting there, chilled my feet till their numbness reminded me that they were beginning to freeze. My body, however, was perspiring freely from the severe physical exercise, and perhaps also in consequence of the fear occasioned by the thought of freezing to death.

I had probably traveled eight or nine hours and was from ten to twelve miles out from Rochester before I fully realized the desperateness of my situation. I had no means of knowing how far I had strayed from the high road; I had walked mile after mile without discovering the least trace of a settlement, and the chances of finding a human habitation during the remainder of the night were small indeed. The whole landscape seemed to be wrapped in a cloud of white dust, and unless the glimmer of a light happened to penetrate the snow-filled air, I was almost as likely to step upon a mile stone below the snow as to find a human residence while groping my way through the blinding storm.

It could not be far from midnight, and as I was well aware that farmers are wont to retire early, the hope of being rescued by a guiding light appeared to be extremely slight.

Somewhat discouraged, I paused to consider the advisability of turning around to find my way back to Rochester, but a moment's reflection convinced me of the utter impracticability of such an undertaking. I had but little chance to successfully retrace my steps. Besides this, it would have been an all night's journey, and I was too much exhausted for such a task. The growing numbness of my feet and the drowsiness which was gradually stealing upon me, made me realize more and more the extreme danger into which I had placed myself. Feeling that possibly I had but a very few hours, at the farthest, dur-

ing which I could hope to use my lower extremities, I determined to make the best of my time and pushed on.

The rage of the storm seemed to increase from minute to minute. Toward midnight, with a temperature of from 20° to 40° below zero, the wind blew at a rate of from thirty to fifty miles an hour. Overpowered by the conviction that I could not hold out much longer, I occasionally halloed as loud as my strength would permit, in the hope of making myself heard by some one. But the maddened winds only seemed to mock my efforts.

With death staring me in the face, I could not help speculating upon the probable fate of my body It flashed through my mind that the wolves would be likely to pick my bones, and that when my skeleton would be found in the spring and my identity discovered or surmised, the newspapers would contain an item to the effect that I had been found dead on the prairie between Rochester and Winona, that presumably I had partaken too freely of strong liquor, and straying from the road, had frozen to death. As I had never even tasted of liquor, this thought worried me greatly and seemed to revive my flagging energies. From that day to this I have been careful not to ascribe any serious accident to intoxication, unless indications clearly justified such a charge.

While these and similar thoughts were still engaging my mind, I came to a partially constructed pioneer cabin. The structure consisted of only four walls of roughly joined logs. It had neither roof nor door, nor window, and the logs were not even chinked. Some one had probably commenced building this cabin on his claim late in the fall but had been compelled by the approach of winter to abandon it.

The discovery of this symbol of pioneer civilization in the snowy desert greatly encouraged me and I at once resolved to make it my headquarters for further explorations. A short survey of this airy resort fully convinced me that to rest here was to surrender to grim death without a struggle. Remembering that there is a well marked disposition among pioneers to settle in clusters, I determined to walk in a wide circle around this embryo cabin in the hope of finding some human habitation near it.

Taking a radius of about sixty or eighty rods, I proceeded to carry out my plan. I had passed not much more than half around the circle, when, after surmounting a long swell in the prairie, I discovered a small grove in the distance. I at once abandoned my former base and quickened my steps, fully assured that if there was a house anywhere upon that wide prairie, it would be found in the shelter of the grove before me. I had not advanced very far when I espied a faint glimmer of light proceeding, as it seemed to me, from a snow bank across a small ravine. Flying in the direction of this light as fast as my benumbed feet would carry me, I presently found myself before a small log cabin, which was half buried in a snow drift. It had but one little window, of which the lower portion was hidden by the snow, while its upper panes were so thickly covered with frost that they scarcely permitted the light to pass through them.

The joy which I experienced at the sight of this lowly cabin may be imagined, but cannot be described. I rapped loudly on the door, and when it was opened, did not even wait for an invitation to enter, but boldly stepped in. The house was occupied by a Mrs. Foot, with her three sons. After they had listened to the brief story of my cold adventure, the young men pulled off my boots and then brought in a pail of water to thaw out my frozen feet. They gave me a warm supper and a bed on the floor of the small attic. I slept close to the stove-pipe and had a good night's rest. Never shall I forget the hospitality which I received at the hands of these kind-hearted people. From them I learned that theirs was the only house within one mile from the main road for a distance of twenty miles, and that several persons had frozen to death on that road the previous winter.

The next morning, with the mercury hovering about the point of congelation, I walked fifteen miles to St. Charles, and on Christmas morning I proceeded from there to Winona. The wind had given way to a complete calm, and as I came in sight of that city a most beautiful spectacle, only to be seen in such a climate, presented itself to my eyes. The smoke from hundreds of chimneys rose in almost perpendicular columns until it seemed to vanish in the azure sky. Beyond the city lay the crystalized level of the majestic Mississippi, bordered by the snow-covered bluffs of the Wisconsin shore.

I went to the land office and, after paying a premium of 5 per cent for exchange of my wild-cat money for gold, entered my quarter section of land, and then turned my face toward my Iowa home, which I reached a day or two before the close of the old year, after having walked more than 600 miles in the midst of the severe weather of that extraordinary winter.—*Annals of Iowa.*

CLIMATOLOGY OF THE MONTH.

November was about normal as to temperature, with less than the usual amount of precipitation. The unusual amount of cloudiness, fog and misty weather retarded the corn harvest, and kept the fields and roads wet and heavy. But the pastures were fine, and there was abundant feed for stock throughout the month.

Barometer.—The mean pressure for the month was 30.15 inches; highest observed, 30.65 inches, at Cresco, on the 15th; lowest observed, 29.63, at Keokuk, on the 22d; range for the state, 1 01 inches.

Temperature —The monthly mean for the state, as deduced from records of 118 stations, was 33.5°. The highest monthly mean was 39 8°, at Burlington and Keokuk; lowest monthly mean, 26.8°, at Ruthven. The highest temperature reported was 79°, at Galva, on the 3d; lowest, 6° below zero, at Fonda, on the 15th. The average monthly maximum was 67.7°; average monthly minimum, 4 5°. The greatest daily range was 45°, at Mooar; average of greatest daily ranges, 32°. For the northern section the monthly mean, as shown by the records of thirty-one stations, was 30.3°. For the central section the records of forty-six stations show the monthly mean 33.8°. For the southern section the mean was 36 3°, as shown by reeords of forty-one stations.

Precipitation.—Average for the state, deduced from records of 134 stations, 1.06 inches, which is .36 of an inch below the November normal. The largest amount reported was 3.35 inches, at Danville; least amount reported, a "trace," at Glenwood and Primghar. The greatest daily rainfall reported was 2.60 inches, at Danville, on the 18th. Average number of days on which .01 inch or more was reported, 6. Average precipitation by sections as follows: Northern section, thirty-six stations, .95 of an inch; central section, forty-seven stations, 1.90 inches; southern section, fifty-one stations, 1.18 inches.

Wind and Weather.—Prevailing direction of the wind, northwest; highest velocity reported, 38 miles per hour, from the northwest, on the 10th, at Sioux City. Average number of clear days, 12; partly cloudy, 7; cloudy, 11.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.11	30.60	16	29.66	22
Des Moines	30.17	30.58	15	29.72	22
Clarinda	30.19	30.56	15	29.73	17
Cresco	.....	30.65	15	29 82	22
Dubuque	30.13	30.62	16	29.72	13
Omaha, Neb	30.14	30 51	15	29 72	22
Keokuk	30.13	30.57	15	29 64	22
Sioux City	30.18	30.55	15	29.75	22
Means	30.15	30.65	15	29 64	22

WIND VELOCITY.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,420	31	NW	21
Des Moines	5,144	27	SW	3
Dubuque	5,463	34	NW	13
Keokuk	5,680	36	NW	13
La Crosse, Wis	4,860	36	NW	8
Omaha, Neb	5,962	33	NW	13
Sioux City	7,676	38	NW	10

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* First snowstorm of the season November 10th, followed by colder weather.

AMANA—*Conrad Schadt.* First killing frost of the season November 8th, and first snow on the 10th. Weather favorable for farm work, and corn husking is practically completed.

ATLANTIC—*J. W Love.* November has been a pleasant month, with no rain and only 3 inches of snow.

BEDFORD—*E. H Griffin.* First killing frost November 5th, and ground unfrozen at close of month.

BONAPARTE—*Hon. B. R. Vale.* A month of mild temperature and much cloudy weather; considerable precipitation latter half; stock still in the pasture.

CARROLL—*Moses Simon.* First killing frost on 8th. Fair sleighing on 25th.

CLINTON—*Dr Luke Roberts.* The mean temperature was normal; rainfall was .65 of an inch below normal; no excessively warm or cold days, and no severe storms. Mississippi river rather low.

DENISON—*W. C. Van Ness.* Heavy fog from 16th to 20th; most of the time ground was covered with ice.

FOREST CITY—*J A. Peters.* Snow on 14th to 16th caught considerable corn afield, but it was about all picked at close of the month; ground froze solid on 15th.

FORT MADISON—*Miss L. A. McCready.* Farmers complain of damage by Hessian fly; they say wheat is looking yellow.

GRAND MEADOW—*F. L. Williams.* Month was cloudy and damp with many foggy days. Plowing continued till close of month, and stock was still on pasture.

GRINNELL—*A. O. Price.* A damp month for corn husking, and acres are yet ungathered.

HARLAN—*C. A. Reynolds.* Mean temperature of the month was almost 10° lower than November last year, with much more snow.

HUMBOLDT—*H. S. Wells.* Month was favorable for harvesting corn, but it was not all in on December 1st. But little disease among hogs.

MT. VERNON—*J. W. Hubbard.* Temperature, 1.09° above normal for period of eleven years. Precipitation, .73 of an inch below normal.

OLIN—*Hon. N. Potter.* There has been more than the usual amount of damp and cloudy weather the past month.

OVID—*H. C. Miller.* Month closed with no frost in the ground and no snow except a little in shaded places. Pastures and meadows green and cattle mostly at pasture; some corn ungathered.

PERRY—*Theo. F. Johnson, M. D* First killing freeze on the 15th.

RIDGEWAY—*Arthur Betts.* Month was much cooler than last November. It has been an agreeable month. First snow came on election day, and it was soft and mild. Thunderstorm on the 11th with vivid lightning. Wild flowers were in bloom till the 13th. Snow on seven dates and rain on four dates; considerable foggy weather.

STORM LAKE—*Prof. M. L. Fuller.* The lake was frozen over for first time on the 15th. Snow all melted at close.

BELATED REPORTS.

Fayette.—October—Mean temperature, 57.2°; highest, 85° on the 3rd; lowest, 26° on the 8th; greatest daily range, 41°; total precipitation, 3.68 inches; greatest in twenty-four hours, 1.43 inches on the 30th and 31st; prevailing direction, southeast; number of clear days, 16; partly cloudy, 3; cloudy, 12; rainy, 10.

Hawkeye.—October—Total precipitation, 5.22 inches; greatest in twenty-four hours, 1.08 inches on the 21st and 22d; number of rainy days, 6.

Knoxville.—October—Mean temperature, 58.9°; highest, 87° on the 5th; lowest, 32° on the 8th; greatest daily range, 41;° total precipitation, 4.86 inches; in twenty-four hours, 2.54 inches on the 31st; prevailing direction, southeast; number of clear days, 19; partly cloudy, 4; cloudy, 8; rainy, 7

Murray.—October—Total precipitation, 5.34 inches; greatest in twenty-four hours, 4.12 inches on the 31st; number of rainy days, 3.

West Branch.—October—Mean temperature, 56.8°;highest, 89° on the 4th; lowest, 29° on the 22d and 24th; greatest daily range, 51°; total precipitation, 4.10 inches; greatest in twenty-four hours, 1.16 inches on the 29th; number of clear days, 16; partly cloudy, 10; cloudy, 5; rainy, 8.

ERRATA IN OCTOBER REVIEW.

Afton.—Mean temperature recorded, 59.9° on page 10, should have been 59.0°.

Columbus Junction.—Total precipitation recorded, 2 83 inches on page 10, should have been 2.89 inches.

Grand Meadow.—Maximum temperature recorded, 81° on the 5th, on page 9, should have been 84° on the 3rd.

Iowa City.—Mean temperature recorded, 60.7° on page 9, should have been 60 8°.

Odebolt.—Mean temperature recorded, 59.8° on page 9, should have been 59.2°.

Ridgeway.—Mean temperature recorded, 58.9° on page 9, should have been 59°.

Sheldon.—Mean temperature recorded, 56.7° on page 9, should have been 56 8°.

Vinton.—Total precipitation recorded, 3.43 inches on pages 9 and 14, should have been 3.49 inches.

Waterloo.—Mean temperature recorded, 58.5° on page 9, should have been 58.6°.

CLIMATOLOGICAL DATA FOR NOVEMBER, 1900.

NORTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIP., IN INCHES.				Number rainy days	SKY.			Prevailing direction of wind.	Dates of thunder-storms.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours	Total snowfall (unmelted)		Number clear days.	Number partly cloudy days.	Number cloudy days.		
Algona*	Kossuth	1,50	7	30.9	*1.5	62	3	0	15	....	.95	-.09	.40	9.5	5	11	11	8	NW	
Alta	Buena Vista	1,519	8	30.1	*1.1	64	3	0	15	28	.68	-.32	.20	5.0	7	13	7	10	NW	
Alta (near)	Buena Vista	....	..	....	....	....	.....	...	.....	...	.79	....	.20	5 0	7	....	....	....	....	
Bancroft	Kossuth	....	..	29.4	.....	65	3, 4	-1	15	37	.60	.. ....	.20	5.0	....	10	9	11	NW	
Britt	Hancock	1,230	....	29 2	.....	61	2	-4	15	33	.45		.08	2 8	9	8	15	7	NW	
Charles City	Floyd	1,012	8	29.8	* 5	65	3	-6	15	32	1 85	*.51	.70	10 0	6	8	9	13	NW	
Clear Lake	Cerro Gordo	984		30.0	...	64	3	-4	15	34	.50	.....	.20	3 0	3	13	12	5	NW	
Cresco‡	Howard	1,280	27	27 6	-1.8	63	3	-9	15	27	1.22	-.23	.44	3 9	7	8	6	16	NW	
Decorah	Winneshiek	900	6	30 0	-0.3	66	3	-1	15	30	1 60	*.07	.40	5 5	8	..	..	..	..	
Dows	Wright	.....		30.5	.....	68	3	-3	15	32	1.06	....	.40	6 2	7	11	10	9	NW	
Elkader	Clayton	....	18	32.6	*1.3	74	4	-2	16	37	2 07	*.35	1.32	8.0	7	11	10	9	NW	18
Estherville	Emmet	....	....	27 8		68	3	-1	15	34	.60	.....	.30	6.0	8	12	6	12	NW	
Fayette	Fayette	1,000	9	29 7	-1.3	66	3	-4	15, 16	33	1 68	-.07	1.04	8 2	6	10	5	15	NW	18
Fonda	Pocahontas	1,237		29 3	.. .	66	1	-6	13	38	1.16	...	.40	5.8	9	16	8	6	NW	
Forest City	Winnebago	1,220		29 8	...	65	2	-1	15	34	38	..	.15	1.5	5	13	5	12	W	
Grand Meadow *	Clayton	.....	8	30.0	-0.5	58	3	1	14	..	1 67	*.05	.60	7.5	8	7	10	13	NW	
Greene	Butler	943		31.0		68	3	-6	15	34	1.46	.....	.57		9	12	4	14	N	
Hampton	Franklin	1,240	9	31.4	*1.7	69	3	2	15	34	.93	- 86	.33	5 2	6	10	13	7	NW	
Hawkeye	Fayette		6	....	...	....	.....	...	.....	...	1 70	*.04		7.0	6		...		.....	
Hoprig	Emmet			....	....	....	.....	....	... ...	.....	.15	....	.15	1 5	1	13	7	10	NW	
Humboldt	Humboldt	1,082	6	31.5	....	65	3	3	14	32	1.02	-.12	.40	7 1	9	11	11	8	NW	
Lansing	Allamakee	.....		32.6	....	71	3	2	15	36	1.92	.....	.86	5.3	7	5	17	8	.....	
Larrabee	Cherokee	....	8	31 2	*1.2	67	3	-4	15	32	.48	-.47	.22	5.3	5	13	7	10	NW	
Le Mars	Plymouth	.....	8	32 2	....	68	3	1	21	38	34	.....	.15	2 5	4	16	4	10	N	
New Hampton	Chickasaw	1,166		30.0		66	3	-5	15	29	1 50	.....	.50	7.5	7	10	12	8	NW	
Northwood	Worth	1,210	....	29 6		66	4	-2	15	22	1.14		.40	5 5	6	9	10	11	NW	
Osage	Mitchell	1,178	8	28.8	*2.4	62	3	-3	15	24	1.44	- 04	.30	7.7	10	3	8	19	NW	
Plover (a)	Pocahontas		...	30.2	...	55	1-3	0	15	28	.60	.....	.20	6.0	6	15	1	14	N	
Primghar	O'Brien	.....	...	32.7	....	72	3	0	21	38	T	.....	T	0	0	20	0	10	SW,W	
Ridgeway	Winneshiek		....	33 3	....	66	3, 4	0	15	30	1 88	.....	.75	5.4	16	8	13	9	NW	17
Ruthven	Palo Alto	.....		26.8		57	4	-2	15	24	.24	....	.10	2.4	4	18	2	10	NW	
Sheldon	O'Brien	1,406		29 7	....	65	3	2	15,21,23	33	.77	.....	.20	5 6	10	14	4	12	W	
Sibley	Osceola	1,506	6	29 6	*1.8	68	3	-2	5	32	.64	-.39	25	6 0	6	10	9	11	NW	
Sioux Center	Sioux	.		30 4		63	3	0	21	26	.55	.....	20	4.5	7	13	8	9	SE	
Spirit Lake (e)	Dickinson	.	5	29.1	*1.7	62	3	-3	15	30	.68	-.41	.40	6 8	4	15	2	10	NW	
Storm Lake	Buena Vista	.	10	31.3	.. .	64	3	-1	15	25	.46	-.33	.20	5 1	7	14	5	11	NW	
Washta	Cherokee	.		....	...	.....	...	.....	.....	...	.27	.....	.10	2.7	4	15	4	11	N	
Waverly	Bremer	942	....	31 8	....	67	3	1	15	29	1.11	....	.25	5.7	10	11	7	12	NW	
West Bend *	Palo Alto	....	6	28 8	*1.1	65	3	-1	15	...	.70	-.86	.20	7.0	5	9	9	12	NW	
West Union	Fayette	1 105	....	.....	....		...	....	... ...	.....	.05	.....	.05	0 5	1	14	0	16	NW	
Average				30.3	*0 7	62.1	.....	-1.4		31.4	0 95	- 18		5.4	7	11	8	11	NW	

CENTRAL SECTION.

Amana	Iowa	.....	23	35.0	*3.0	66	3	9	15	28	1.02	-.72	.55	1 7	8	10	13	7	NW	
Ames	Story	936	19	33.3	*1 5	72	3	5	15	31	.43	-.79	.35	4.0	7	13	3	14		
Audubon (a)	Audubon	.. .	6	33.1	*1 0	66	2	8	15, 21	34		.....	...	...		12	6	12	N	
Baxter	Jasper	.....	...	33.2	...	71	3	4	14	31	1.02	.....	20	5 5	9	4	16	10	NW	
Belle Plaine	Benton	810	9	32 5	*0 2	68	4	7	15	29	1.90	*.24	.80	6.0	6	4	20	6	SW	
Buckingham	Iowa	.	9				....	...	... ...	....	1.10	.. ....	.53	5.2	5	9	12	9	....	
Carroll	Carroll			33 7	*2.6	69	3	6	15	28	.60	- 48	60	6.0	2	18	3	9		
Cedar Rapids	Linn	744	17	34 9	*0 3	69	3	9	18	29	.15	-1.35	.15	1.5	1	6	13	11	NW	
Clinton	Clinton	609	8	35.6	*2.0	65	3, 4	13	14, 16	33	1.60	-.39	.67	1.9	8	10	7	13	SW	
Coon Rapids	Carroll	.....	....	33 6		67	4	8	15, 16	29	63	.....	.50	5 0	2	16	5	9	NW	
Davenport	Scott	615	27	37.6	*1 0	66	3	15	15	28	1.48	-.44	.89	1 5	11	9	8	13	W	
Delaware	Delaware	1,048	8	32.0	*2 5	65	3	2	15	28	1 77	*.03	.84	4 0	9	6	12	12	NW	
Denison	Crawford	1,192	6	33.0	*1.3	68	3	4	22	34	.10	-.90	08	1.2	2	16	6	8	N	
Des Moines	Polk	867	21	35.6	-1 0	71	3	11	15	30	96	-.63	.27	3.2	7	7	7	16	N	
De Soto	Dallas	866		35 0		66	3	10	15	24	1.41	... ..	.73	3.0	5	12	3	15	NW	
Dubuque	Dubuque	655	....	35.0	*1 0	67	3	10	15	26	1 64	-.29	.81	4.3	12	7	11	12	NW	
Fort Dodge	Webster		...	32.3	.....	68	3	0	15	35	1.08	.....	.48	4 0	6	10	11	9	NW	
Fruitland	Muscatine	.....	..	37.0	.....	68	3, 4	11	15	35		....	..	...	....	12	0	18	W	
Galva (a)	Ida	.....	6	31.0	*0.5	79	3	3	15	31	.70	-.47	.30	7.0	3	15	0	15	N	
Gilman	Marshall	1,053			....	....	.....	....	.....	...	1.11	... ..	.66	2.0	5	12	7	11	NW	
Grinnell	Poweshiek	1,011	9	34 0	-0.5	67	3, 4	6	15	26	1.02	-.51	.53	....	4	10	7	13	N	
Grinnell (near)	Poweshiek			33.8	....	68	3	6	15	30	1.85	....	70	7.0	9	10	5	15	SW	
Grundy Center	Grundy	966	8	32 0	*1.4	68	3	2	15	34	1.69	*.69	.66	3.0	11	11	8	11	NW	
Guthrie Center	Guthrie	1,269	....	34 8	.....	68	3	9	15	31	1.30	.....	.55	9.5	3	12	9	9	N	
Harlan	Shelby	.....		33 4		67	3	6	21	33	56	.....	.36	4 7	7	8	10	12	NW	
Independence	Buchanan	921	37	31.7	-0 3	67	3	1	15	30	1 26	-.15	68	3.7	7	12	9	9	NW	
Iowa City	Johnson	644	9	36.1	*0.3	69	3	12	15	33	1.43	-.29	1.02	1.0	4	7	14	9	NW	
Iowa Falls	Hardin	....	6	30.1	*0.4	67	3	0	15	28	1.31	-.04	.32	6.5	7	10	10	10	NW	
Le Claire	Scott	.....	...	...	.....	...	.....	....	.....	...	1.47	.....	.70	2.5	9		....	....	.. ....	
Logan	Harrison	928	34	32.4	-2 5	67	2	2	20	27	.41	-.65	.20	....	4	14	6	10	N	
Maquoketa	Jackson	.	6	36.6	*0.8	69	3	9	15	37	1.57	*.01	1.10	.5	3	....	....	....	.....	
Marshalltown	Marshall	898	7	34 2	*1.6	72	3	4	15	30	1.26	*.20	.35	4.0	9	12	7	11	NW	
Monticello	Jones	800	45	33.4	*0.2	66	3	5	15	36	1.30	-.95	.80	3 0	6	6	11	13	.....	
Mt. Vernon (Hub.)	Linn		...	35.4		69	3, 4	7	15	33	.93	.. ..	.40	2.2	7	12	3	15	N, NW	
Newton	Jasper	958	12	34 2	*1.5	68	3	5	15	31	1.60	-.27	.54	5.0	7	....	....	....	NW	
Odebolt	Sac	....		33 3	.....	65	3	5	15, 21	43	.64	.....	.30	4.5	5	18	4	8	.....	
Ogden	Boone	1,109	...	32.6	.....	69	3	2	15	34	.66	.....	20	6.0	5	17	0	13	NW	
Olin (b)	Jones	....	.	34 0	.....	65	4	8	15	31	1.13	.. ....	.73	1.5	5		...		NW	
Onawa	Monona	.. .	....	34 6	... ..	74	3	7	21	34	.29	.... ..	.13		5	18	3	9	NW	
Perry	Dallas	.....	....	34 6	....	69	2	7	15	34	.84	.....	.40	6 0	3	15	3	12	SE, NW	
Rockwell City	Calhoun	1,219		32 2	.....	62	2	2	15	27	.65	.....	.40	5 0	5	17	4	9	..	
Sac City	Sac	900	20	32 0	-1 1	37	3	2	15	31	.49	-.67	.25	4.9	5		....		NW	
Scranton	Greene	....		33.5	.....	67	3	8	15	29	.30	....	.30	3 0	1	23	2	5	NW	
Sioux City	Woodbury	1,122	10	33 6	0	71	3	4	21	36	.36	-.01	.07		8	13	8	9	NW	
Toledo	Tama	.	5	34.6	*1.6	73	2	5	15	40	1.51	*.21	78	6 0	4	11	7	12	NE	
Vinton*	Benton	800	9	33 0	*0.2	69	2	6	15		1.16	-.03	.77	2.2	4	19	1	10	NW	
Waterloo	Black Hawk	862	20	32.0	-4 6	69	3	1	15	34	.97	-.46	38	4.0	8	10	9	11	NW	
Wilton Junct'n (c)	Muscatine	...	...	37.6	.....	69	1	11	15	33	1.65	... ..	.78	...	8				NW	
Whitten	Hardin	.....	....	30.8	.....	66	4	0	15	32	68	-.67	.38	.5	4	11	9	10	NW	
Average				33 8	*0 5	68.2	... .	6 0	.....	31.6	1.04	- 67	....	3.9	6	12	7	11	NW	

*Is used to indicate the plus sign (+)

CLIMATOLOGICAL DATA FOR NOVEMBER, 1900—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., IN INCHES.				SKY.			Prevailing direction of wind.	Dates of thunderstorms.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted)	Number rainy days.	Number clear days	Number partly cloudy days.	Number cloudy days.	
Afton	Union			34.5	....	67	3	8	21	27	1.11	.....	.26	0.5	5	12	8	10	SW
Albia	Monroe	945	..	34 7	....	67	3	10	15, 16	42	1.85	.....	1.32	3.0	4	12	5	13	NW
Atlantic	Cass		8	34.4	-0.8	71	3	5	21	37	.30	-.44	.10	3.0	3	11	6	13	NW
Batavia	Jefferson	640	....		.....	.....	.....	.....	.....	35	1.55	.....	.50	T	6				
Bedford	Taylor		....	35.9	.....	72	3	3	21	35	.99	.....	.32	2 0	4	12	11	7	NW
Belknap	Davis	857		37 0	.....	71	2	14	15	40	2.78	.....	.97	4 0	10	16	5	9	NW
Bonaparte	Van Buren	.....	8	38.0	*1.8	69	3	15	15, 16	31	2 10	*.18	1.59	2.5	3	....	...	....	.....
Burlington	Des Moines	.....	....	39.8	.....	69	4	15	14	26	2 88	.....	1.54	3.0	9	8	11	11	..... 18, 19
Bussey	Marion	.....	....	.....	.....	.....	.....	.....	.....	.....	1.66	..	1.21	2.0	3	.....			.....
Chariton	Lucas	1,030	....	36.3	.....	70	3	10	15, 21	33	1.60	.....	.78	4.7	10	13	11	6	NW
Clarinda	Page	1,069	9	37.0	*1.2	74	3	6	21	37	.48	-.46	.21	1 3	6	12	9	9	NW
College Spr'gs	Page	.....	8	36 0	-1.1	60	4, 5	4	21	31	.47	-.31	.17	2.4	5	15	7	8	NW
Columbus Jct	Louisa	.....	....	37 4	.....	68	3	12	15	29	1.15	....	.84	0 5	6	13	11	6	 18
Corning	Adams	1,127	7	35 6	-0.2	67	3	6	21	32	.18	-.70	.10	1 5	2	16	4	10	W
Council Bluffs	Pot'wat'mie	989		36 0	.....	77	3	10	20, 21	35	.12	.....	.05	1.2	3	17	2	11	S
Crawfordsville	Washington	.....	..	... ..	....	..	.....	.....	.....	...	1.22	.....	.89	1 7	4	14	4	12	NW
Cumberland	Cass	.....	.	...	...	.....	.....	.....	.....	.....	.20	.....	.10	2 0	2	10	7	13	N,S,SW
Danville	Des Moines	715	...	.....	.....	... ..	.....	.....	.....	.....	3.35	.....	2.60		5	10	10	10	.....
Eldon	Wapello	...	...	37.2	...	72	3	13	15	37	2.09	.....	1.22	1 7	9	12	4	14	NW
Emerson	Mills	...	....	....	...	.....	.....	....	.....	..	.11	.....	.10		2		....	....	.....
Ft. Madison	Lee	516	51	.....		.....	.....	.....	... ...		3.08	* 89	1.80	2.0	6	8	7	15	SW
Glenwood	Mills	979	29	37.5	*3.6	75	3	7	21	36	T	-.91	T	T	0	8	9	13	NW
Greenfield (*a*)	Adair	.....	8	35 4	*1.6	68	3	8	15, 21	29	.80	-.20	.30	2.3	7	18	4	8	.....
Hedrick (*b*)	Keokuk	.....	..	34 4	..	67	5	10	15	35	1.66	.....	1.30	1 5	4			....	NW
Hopeville	Clarke	..	....	34 6	.....	68	3	10	21	27	.76	.....	.34		4	7	13	10	NW
Indianola	Warren	.....	....	35 6	.	71	3	9	9	26	.93	.....	.40	2.3	8	7	7	16	NW
Keokuk	Lee	618	28	39.8	*1 0	69	3	16	26	31	1.72	-.31	.64		8	10	9	11	NW
Keosauqua	Van Buren	.....	7	38.4	*1 3	67	3	17	14, 15	33	2 04	*.75	1.59	.5	3				.....
Knoxville	Marion	....	6	34.0	-2.2	70	3	6	15	33	.93	-.29	.36	1 5	6	12	4	14	NW
Lacona	Warren	.....	...	.....	.....	.....	.....	.....	.....	.....	1.15	.....	.55	3.5	5	7	14	9	.....
Lenox	Taylor	.....	...	35 7	....	67	3	8	21	30	.45	.....	.20	1.3	4	18	3	9	NW
Mooar	Lee	.....	...	36.8	.....	74	1, 2	13	14	45	1 22		.68	...	2	14	10	6	NE
Mt. Ayr	Ringgold	1,236	6	36 6	*1.2	69	3	6	21	32	1.38	*.12	.42		9	5	17	8	NW
Mt. Pleasant	Henry	725		37.4	.....	66	3	11	14	32	1.54	.....	1.30	1 5	4	12	8	10	NW
Murray	Clarke	1,183			.....	.....	.....	.....	.....	.....	.03	.....	.02	0 3	2	9	0	21	.....
Omaha (Neb.)	Douglas	1,113	25	36.9	.....	72	3	12	21	26	.15	.....	.07	1 3	4	11	7	13	N
Osceola	Clarke	1,123	...	35 5	..	70	3	10	15, 21	32	1 28	.....	.53	4.0	4	10	8	12	N
Oskaloosa	Mahaska	850	16	35.0	-0.7	71	3	10	15	31	2 54	*.88	.84	1 5	5	13	2	15	NW
Ottumwa	Wapello	630	5	38.1	*1 7	71	3	14	15	26	2.12	* 49	1.50	2	4	11	3	16	NE
Ovid	Wayne	.....	6	35 8	*3.1	71	3	10	15, 21	35	1 73	*.37	.80	3 3	7	14	3	13	NW
Pacific Junction	Mills	960	....	36.0	....	72	3	5	22	33	.11	.....	.06	.7	5	11	12	7	N
Pella	Marion	...	....	34.2	.....	72	4	8	15	37	.73	.....	.48	2 5	3	10	7	13	SW.NW
Red Oak	Montgomery	1,033		38.0	....	76	3	5	21	43	.16	.. ....	06	0.3	4	16	2	12	NW
Sigourney	Keokuk	.....	....	36.2	....	70	3	10	15	33	1.96	.....	1.26	1.2	5	17	9	4	NW
Stuart	Guthrie	.....	....	33.2	...	63	4	8	14.15.20	25	.35	.....	.25	2 5	2	17	3	10	SW,NW
Thurman	Fremont			36 0		70	3	4	21	32	10	... ...	.10	1 0	1	15	5	10	NW
Villisca	Montgomery	1.058	6	37 2	*3.0	72	3, 4	5	21	42	.74	- 38	32	2 0	3	12	11	7	NW 19
Wapello (*b*)	Louisa	578		38 6	..	72	4	15	13	30	1.42	....	1.00	2.0	4	....			.....
Washington	Washington		9	35.0	-0.6	69	3	8	15	32	1.12	-.34	.70	.7	6		....		NW
Winterset	Madison		8	34.4	*0.7	70	3	9	15	32	.92	-.26	.35	4.0	7	11	10	9	.....
Woodburn	Clarke			...	.....	...	....		....	.....	97	.....	35	4.2	6	15	4	11	.....
Average		.....	...	36 3	*0.8	69 9	....	9.0	.....		32.9	1.18	-.51		1.9	5	12	7	11	NW
Av. for the state		...		33 5	*0 7	66 7	...	4.5	....		32.0	1.06	-.45		3.7	6	12	7	11	NW

§Means determined from 7 A M 2 P M and 9 P M. observations. and maximum and minimum are taken from eye readings. †Means determined from 7 A M. and 7 P M observations ‡Received too late to be computed with means. *a* One day missing, *b* two days. etc

*Is used to indicate the plus sign (+).

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR NOVEMBER, 1900.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Afton	Max.	50	60	67	62	57	57	45	40	40	39	35	53	42	37	33	28	50	58	39	36	29	36	34	34	34	45	48	39	48	46	44.0
	Min	32	33	40	42	37	34	34	19	20	29	24	23	22	14	9	15	26	28	27	26	8	21	19	27	23	16	24	25	25	28	35.0
Albia	Max.	55	62	67	65	57	63	50	43	40	43	37	53	48	33	30	37	55	62	45	42	33	43	35	37	33	40	49	43	42	43	46.5
	Min	35	37	39	39	40	39	30	20	18	20	24	23	20	12	10	10	16	20	22	29	13	14	18	22	17	14	20	23	20	27	32.9
Alta	Max.	54	62	64	57	51	51	41	35	44	34	33	50	24	34	24	24	32	27	30	23	26	31	33	33	30	41	40	38	47	42	38.4
	Min	29	32	40	38	32	34	26	16	22	29	18	26	15	10	0	18	22	20	23	16	2	18	13	25	20	13	27	20	24	26	21.8
Amana	Max.	53	59	66	64	54	51	43	35	38	44	36	52	41	30	28	29	42	58	43	42	34	41	36	36	32	37	44	36	45	42	43.0
	Min	39	33	38	42	33	33	35	22	21	31	27	25	20	13	9	15	29	37	36	33	16	28	18	30	18	20	28	26	26	27	26.9
Ames	Max.	50	64	72	58	57	54	44	36	39	39	36	55	45	31	32	27	40	42	36	35	29	33	34	33	30	40	42	40	48	42	43.1
	Min	36	34	41	40	37	32	32	21	20	30	25	25	22	15	5	15	15	30	31	26	11	22	12	28	17	19	24	24	17	29	24.5
Atlantic	Max.	57	64	71	62	61	59	47	40	43	40	37	56	38	39	33	29	47	40	36	33	27	27	35	35	34	51	51	43	51	49	44.5
	Min	30	27	43	33	29	32	30	20	21	33	27	27	20	17	10	20	28	29	29	21	5	20	16	29	20	19	28	23	17	23	24.2
Baxter	Max.	58	67	71	64	58	59	46	39	36	38	36	56	31	31	33	32	53	35	39	33	32	39	36	34	32	41	45	31	50	46	43.5
	Min	35	41	40	34	34	30	19	19	29	23	22	27	11	4	13	21	29	31	29	10	15	18	21	12	18	18	23	19	26	29	23.0
Bedford	Max.	61	64	72	68	69	65	51	42	43	43	39	58	41	42	33	29	60	60	37	34	33	33	32	34	39	48	50	44	50	52	47.6
	Min	29	30	38	39	29	32	35	18	18	27	22	23	21	12	12	19	29	29	29	29	3	23	22	29	22	20	22	22	23	23	24.2
Belknap	Max.	70	71	70	65	59	64	48	38	43	44	36	55	32	30	26	26	60	41	46	39	34	46	36	37	38	44	49	57	52	54	46.3
	Min	50	36	36	42	35	37	31	22	20	32	29	23	29	15	14	19	20	32	35	36	16	28	23	26	20	16	30	25	20	30	27.6
Belle Pl'ne	Max.	53	59	46	68	57	54	45	35	40	44	37	52	32	31	23	27	55	37	40	35	30	40	34	35	33	38	43	30	45	43	41.4
	Min	37	32	33	40	32	37	31	22	20	25	24	24	22	12	7	15	26	31	32	33	12	11	17	20	12	18	20	19	18	22	23.6
Bonaparte	Max.	62	65	69	65	60	65	50	43	41	47	39	53	46	32	30	30	49	57	46	45	37	49	35	35	36	41	50	40	50	48	47.2
	Min	40	38	38	42	35	33	33	24	19	34	31	24	23	15	15	17	30	41	38	35	20	31	24	32	22	18	19	27	30	30	28.9
Britt	Max.	54	61	64	56	49	45	42	33	39	38	34	48	34	29	24	26	39	33	33	28	27	29	34	35	32	35	37	30	42	39	38.3
	Min	31	28	39	37	31	31	28	19	19	23	23	24	16	7	-4	10	24	25	23	20	6	12	7	21	18	10	20	20	12	18	20.0
Burlington	Max.	65	63	64	69	60	61	47	40	42	48	41	51	44	35	34	32	56	63	51	49	42	57	37	56	36	36	48	40	38	48	48.4
	Min	42	41	43	48	37	39	37	23	25	32	29	25	24	15	16	18	32	45	42	38	23	34	31	32	24	23	31	29	25	32	31.2
Carroll	Max.	62	66	69	59	60	57	46	41	40	42	56	32	42	34	30	32	33	32	30	27	32	35	32	40	38	42	45	40	50	46	43.0
	Min	42	44	41	40	32	38	32	18	20	31	23	26	26	12	6	22	25	20	22	7	20	19	24	15	22	15	26	20	22	23	24.4
Cedar Rap	Max.	56	64	69	64	54	46	43	35	37	42	35	52	40	43	55	47	29	29	42	29	33	41	35	35	33	35	43	33	44	44	42.2
	Min	40	36	40	42	35	35	32	23	22	32	27	27	31	34	33	27	14	9	19	15	16	26	19	28	19	19	28	26	24	29	26.9
Chariton	Max.	60	60	70	65	61	63	46	41	36	42	35	56	42	33	34	30	60	63	40	40	33	40	33	35	33	47	51	37	47	49	45.2
	Min	35	38	44	40	36	37	33	21	19	31	24	24	23	14	10	16	29	32	33	28	10	25	22	29	19	14	30	24	22	29	26.4
Charles Cy	Max.	60	59	65	55	48	42	40	34	34	41	36	45	40	25	26	24	35	33	32	33	25	32	30	33	29	31	33	30	40	38	37.6
	Min	37	32	37	40	32	31	29	21	21	27	24	28	23	10	-6	-2	16	31	28	25	12	17	10	16	10	19	19	21	20	25	21.9
Clarinda	Max.	63	69	74	67	69	61	47	41	46	43	39	59	42	41	37	29	61	61	37	33	28	32	36	36	37	51	52	44	52	52	48.0
	Min	30	32	40	41	33	33	34	20	23	32	25	25	22	17	13	20	29	29	31	20	6	24	23	30	24	25	29	25	20	28	26.1
Clear Lake	Max.	52	60	64	57	50	42	42	35	35	40	40	47	44	27	30	24	35	35	32	32	25	30	31	36	31	32	40	28	44	40	38.7
	Min	33	37	41	37	33	33	30	19	18	29	21	27	10	10	-4	4	21	21	23	20	9	16	11	23	17	19	21	20	14	24	21.4
Clinton	Max.	54	60	65	65	57	50	45	36	38	43	38	52	43	32	28	30	47	55	48	48	38	49	39	38	39	31	43	33	34	46	44.1
	Min	38	30	32	38	31	32	29	24	28	33	27	26	19	13	14	13	29	39	40	35	20	29	19	31	24	19	23	26	24	25	27.0
College Sps	Max.	58	63	69	65	65	60	47	38	44	43	38	55	44	42	35	24	60	60	36	33	28	36	31	35	37	49	50	42	50	49	46.3
	Min	30	35	39	41	34	37	35	17	18	28	24	22	23	15	13	19	27	29	28	25	4	24	22	29	27	24	29	23	21	26	25.6
Coon Rap	Max.	52	59	66	67	53	54	43	36	42	42	37	50	42	36	37	28	37	35	34	33	28	33	35	33	32	40	41	35	41	44	41.5
	Min	32	35	45	42	37	33	26	20	22	31	21	28	22	16	8	18	25	27	27	23	10	20	19	28	24	20	27	23	28	30	25.6
Corning	Max.	56	61	67	62	59	58	48	41	42	42	36	55	42	37	35	28	57	60	36	34	27	35	34	34	36	45	50	41	47	47	45.1
	Min	32	32	43	43	33	36	37	20	25	32	26	25	22	16	11	18	28	28	28	25	6	21	20	23	26	23	31	25	22	27	26.2
Co. Bluffs	Max.	62	67	77	61	62	57	49	39	49	42	44	61	33	45	34	31	48	31	34	33	30	37	39	37	42	52	49	45	55	48	46.4
	Min	32	35	42	35	35	40	22	22	29	27	27	29	18	13	13	25	29	28	27	10	10	22	27	25	24	27	23	25	24	26	25.7
Davenp'rt	Max.	55	62	66	66	57	52	45	35	37	44	38	51	43	30	30	31	59	59	50	47	37	48	35	39	39	35	47	32	41	46	45.2
	Min	43	42	45	43	40	39	31	23	22	35	28	28	20	16	15	18	31	42	42	36	20	29	22	30	24	19	32	23	26	32	30.0
Decorah	Max.	52	52	66	55	48	38	38	33	33	42	34	45	35	32	21	24	37	36	33	34	28	34	31	32	30	38	40	28	35	41	37.5
	Min	38	32	36	38	33	32	28	22	21	26	24	30	11	11	-1	1	25	31	29	24	15	21	10	23	15	20	18	23	20	23	22.6
Delaware	Max.	51	56	65	62	51	41	40	33	35	41	34	48	42	27	26	28	35	34	38	39	33	39	33	33	36	37	43	32	37	44	39.8
	Min	39	33	37	37	38	32	28	19	18	29	22	25	16	10	2	22	26	30	30	29	13	22	15	25	18	18	27	21	19	24	24.1
Denison	Max.	56	63	68	58	56	54	46	36	45	42	36	54	42	38	34	26	38	34	33	31	27	32	35	32	34	44	45	41	50	50	42.7
	Min	30	29	42	41	36	35	29	18	22	29	22	28	9	13	12	21	21	25	26	18	6	4	13	26	23	21	29	24	24	24	23.3
Des Moines	Max.	58	65	71	63	58	58	46	40	38	40	36	56	40	35	26	29	56	42	39	36	27	37	6	35	30	45	47	31	50	47	43.9
	Min	37	37	47	40	38	37	29	24	22	34	26	26	20	16	11	18	29	33	34	22	12	25	23	29	22	19	28	35	22	30	27.2
De Soto	Max.	53	57	66	59	54	56	45	36	38	41	36	52	40	36	32	30	45	45	39	37	31	35	35	35	36	42	45	32	47	44	42.6
	Min	37	34	46	42	38	35	32	23	21	35	28	30	23	18	10	8	30	32	33	28	13	25	19	28	24	21	22	24	23	32	27.5
Dows	Max.	65	63	68	57	51	45	42	35	37	38	39	52	45	22	29	25	34	34	32	32	24	30	32	33	32	33	38	29	47	41	39.5
	Min	33	32	30	38	32	32	32	19	18	27	21	23	18	8	-3	10	22	27	28	22	7	19	9	22	13	17	21	21	15	23	31.5
Dubuque	Max.	55	62	67	64	53	40	41	34	36	46	35	49	42	23	24	30	46	54	41	39	32	42	36	34	41	38	47	31	35	45	42.2
	Min	43	38	41	43	37	36	31	24	23	32	28	30	19	13	10	13	30	34	34	32	18	26	19	28	24	19	29	25	22	30	27.7
Eldon	Max.	58	66	72	67	61	67	48	43	40	48	38	51	43	31	33	32	50	65	44	44	36	47	35	35	37	45	51	40	53	47	47.5
	Min	38	33	39	41	31	30	30	22	19	32	27	21	22	15	13	16	30	36	35	33	18	30	23	29	21	17	28	26	19	29	26.8
Elkader	Max.	56	67	70	74	59	39	43	38	35	38	37	52	29	25	29	25	37	35	36	35	32	36	38	33	41	47	50	29	41	47	42.1
	Min	35	30	33	38	29	29	28	22	19	26	24	28	18	12	-1	-2	24	33	30	31	16	21	14	23	18	21	24	24	21	23	23.0
Estherville	Max.	56	60	68	56	50	50	40	37	43	34	34	50	35	30	21	23	33	31	29	25	24	29	31	34	30	34	35	32	42	38	37.9
	Min	29	30	34	31	30	30	30	15	17	28	22	22	15	5	-1	9	20	20	22	12	1	12	9	12	10	8	19	11	11	22	17.8
Forest City	Max.	55	65	64	56	49	44	49	35	37	38	35	47	39	24	27	22	34	31	33	30	23	27	32	35	29	33	35	25	44	33	37.8
	Min	32	45	30	39	31	35	29	19	22	26	22	25	16	9	-1	9	21	19	21	19	7	17	10	26	13	21	18	20	24	24	21.7
Ft. Dodge	Max.	57	65	68	63	63	52	44	38	42	40	35	52	48	31	30	28	35	35	33	33	28	32	34	36	37	41	40	34	48	42	42.1
	Min	32	30	39	30	33	36	34	19	18	31	24	28	19	10	0	11	23	26	27	23	7	22	10	19	21	16	24	22	15	25	22.5
Galva	Max.	57	62	79	57	53	52	41	35	46	41	36	52	41	38	34	25	34	34	30	30	29	20	33	21	34	42	42	40	49	34	40.7
	Min	27	29	50	35	30	30	30	15	20	32	20	26	14	13	3	19	24	24	25	16	4	6	9	11	22	15	24	20	22	25	21.3
Glenwood	Max.	62	67	75	63	62	59	52	45	47	44	39	59	50	43	39	27	52	48	35	52	28	37	35	35	46	53	51	45	52	51	48.4
	Min	30	31	46	44	33	38	39	20	24	32	25	29	25	17	12	20	27	27	27	22	7	21	20	30	24	22	30	24	21	26	26.6
Greene	Max.	54	63	68	59	52	42	41	38	36	43	37	49	44	26	28	25	35	33	34	30	27	34	34	35	32	34	40	33	45	43	39.8
	Min	35	34	40	40	31	34	28	21	18	27	23	25	19	10	-6	4	25	30	29	27	11	18	9	25	8	19	20	23	20	23	22.3
Greenfield	Max.	59	65	68	62	58	59	50	38	41	34	35	56	49	36	28	29	52	57	48	35	32	35	35	35	39	45	49	44	49	..	45.8
	Min	32	36	42	35	34	40	30	13	20	31	24	29	12	16	8	16	26	25	26	25	8	18	18	28	28	22	28	26	24	..	25.0
Grinnell	Max.	54	59	67	67	53	53	53	37	35	38	35	49	44	28	29	32	43	54	39	34	30	31	32	33	31	39	42	36	45	41	42.2
	Min	36	36	41	40	38	36	31	21	22	31	26	25	18	13	6	14	26	33	34	29	13	24	18	28	16	19	30	24	22	28	28.9
Grin'l (nr.)	Max.	53	60	68	62	62	54	48	38	36	38	38	51	40	30	24	28	40	50	39	33	32	36	32	32	30	37	43	35	45	41	42.1
	Min	35	35	38	37	33	38	32	20	19	30	25	24	21	11	6	14	26	33	33	29	12	25	20	28	16	20	27	27	20	27	25.4
Grundy C'r	Max.	56	64	68	61	55	43	44	37	34	39	36	55	42	26	28	26	35	45	35	35	29	34	33	31	32	35	42	33	46	43	40.9
	Min	35	34	34	38	32	34	30	20	18	27	23	23	13	10	2	11	25	32	31	23	11	21	14	27	12	17	23	23	16	23	23.1
Guthrie C'r	Max.	54	62	68	60	57	57	52	44	42	40	37	55	50	48	36	32	35	48	37	35	30	35	25	35	..	43	43	42	49	48	44.8
	Min	32	31	43	35	33	31	32	20	19	33	25	25	25	14	9	14	24	29	29	27	9	21	11	29	21	20	31	23	23	28	24.9
Hampton	Max.	54	66	69	58	51	44	43	36	37	40	36	51	32	29	24	27	39	33	33	30	30	32	35	36	33	36	40	29	49	42	39.8
	Min	34	35	41	40	34	33	27	20	22	27	23	25	15	10	2	10	24	28	28	23	9	17	13	23	18	18	25	22	15	25	22.9
Harlan	Max.	57	61	67	59	55	54	45	34	43	40	35	53	40	38	35	27	43	37	36	32	28	33	36	37	37	46	48	39	47	45	42.8
	Min	29	28	37	39	31	34	34	18	23	31	23	23	21	12	8	20	23	26	26	19	6	21	16	28	24	21	26	23	20	28	24.0
Hedrick	Max.	55	62	..	..	67	62	47	40	43	44	37	52	42	34	30	31	52	60	44	42	33	43	35	35	34	41	47	36	47	47	44.4
	Min	36	32	..	..	32	31	32	20	18	30	22	20	19	12	10	15	30	35	35	30	15	21	20	28	20	19	27	25	19	28	24.3
Hopeville	Max.	55	61	68	63	58	59	46	37	39	40	35	53	43	35	33	29	59	59	38	36	28	37	33	34	33	44	50	39	48	47	41.3
	Min		38	41	44	37	38	35	21	23	31	25	25	21	16	11	17	29	30	31	27	10	24	23	29	23	20	32	27	25	29	27.0
Humboldt	Max.	50	62	65	57	52	59	44	36	41	38	36	50	40	29	26	34	34	32	32	28	31	34	33	29	32	28	37	32	47	41	39.6
	Min	32	30	41	37	32	37	30	19	23	30	26	25	20	3	12	24	26	28	26	8	21	10	27	13	18	18	25	22	16	25	23.4
In'pend'ce	Max.	52	62	67	61	51	44	41	35	34	42	40	49	35	26	26	26	34	34	38	33	27	36	36	32	31	33	42	30	40	42	39.3
	Min	38	32	37	37	33	35	30	20	19	28	24	25	26	11	1	7	24	33	30	30	14	21	15	26	14	18	23	24	21	27	24.1
Indianola	Max.	56	64	71	64	57	59	45	42	37	39	35	54	47	33	32	28	45	60	38	37	30	35	33	35	32	42	47	38	49	44	44.3
	Min	35	39	46	45	38	37	33	21	21	32	25	25	24	16	9	16	27	32	32	28	11	24	20	28	20	17	31	25	23	29	27.0
Iowa City	Max.	55	52	69	66	53	54	46	37	36	44	38	53	47	31	38	39	43	55	45	41	35	45	37	42	36	37	47	35	37	45	44.7
	Min	41	32	36	39	33	32	34	23	21	32	27	25	31	13	12	14	28	37	37	35	18	28	17	28	22	22	29	26	27	26	27.5
Iowa Falls	Max.	54	59	67	57	51	46	43	35	36	39	34	51	38	27	28	26	35	35	33	33	25	31	31	32	32	33	38	29	43	41	38.7
	Min	34	31	39	35	31	27	26	20	19	29	22	24	15	10	0	10	25	30	29	23	9	18	10	21	13	15	19	21	15	23	21.5
Keokuk	Max.	58	63	69	56	60	64	51	33	41	47	38	52	38	33	28	32	50	55	64	45	39	57	35	37	37	47	48	30	49	48	48.0
	Min	42	42	45	49	39	41	35	25	32	33	30	27	24	18	20	20	32	45	41	36	23	37	27	32	24	16	35	27	25	32	31.7
Keosauqua	Max.	56	62	67	65	59	64	50	31	38	45	37	52	43	30	31	31	57	58	45	45	37	49	33	35	36	45	50	35	55	51	46.4
	Min	41	37	43	45	37	37	35	25	23	35	28	36	22	17	17	18	31	40	39	35	26	30	25	32	25	20	31	28	22	32	30.4
Knoxville	Max.	64	65	70	64	57	60	46	36	38	42	36	55	28	34	27	30	48	61	42	33	32	39	36	35	32	43	42	31	54	44	44.2
	Min	32	32	40	39	34	33	29	19	18	29	24	22	20	12	6	13	25	30	31	27	9	22	18	25	16	14	27	22	19	27	23.8
Lansing	Max.	56	64	71	64	63	45	43	35	34	51	42	51	44	26	20	24	36	36	34	36	32	28	38	34	37	30	46	40	37	44	41.4
	Min	44	32	35	38	31	31	27	25	20	25	28	29	22	12	2	6	23	22	28	32	16	18	12	26	17	22	20	24	23	22	23.7

DAILY MAXIMUM AND MINIMUM TEMPERATURE FOR NOVEMBER, 1900—CONTINUED.

STATIONS		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Mean.
...e Mars....	Max.	56	60	68	58	52	58	45	35	51	45	38	50	30	38	35	28	34	34	30	27	29	33	35	37	32	42	42	40	50	43	41 8
	Min	28	29	30	35	31	33	30	16	25	31	22	26	21	22	3	20	24	21	22	16	1	20	10	20	19	21	27	21	27	25	22.5
...enox.. ...	Max	53	60	67	62	58	58	49	42	42	41	34	53	43	38	34	28	56	59	36	35	29	33	33	33	35	45	49	38	47	47	44.6
	Min	32	37	42	43	36	39	37	20	24	30	25	25	23	16	11	17	27	29	28	27	8	23	22	28	25	23	31	26	24	26	26 8
...ogan.....	Max	54	67	66	59	54	50	42	46	48	44	36	50	44	34	28	30	37	35	26	29	32	34	35	37	36	42	41	43	40	38	42.9
	Min	27	42	36	36	30	32	16	22	22	28	21	26	20	14	7	17	23	24	15	2	12	14	18	23	20	19	23	26	20	21	21 9
Maquoketa	Max	67	65	69	67	57	44	45	40	39	43	45	51	51	33	34	34	41	55	46	51	43	50	41	41	46	42	50	39	40	58	47 6
	Min	42	29	35	36	30	31	29	20	19	30	27	25	27	12	9	12	26	35	35	32	17	25	27	30	23	17	24	24	21	21	25 7
Marsh'l't'n	Max	57	65	72	65	57	55	47	38	36	40	37	54	45	28	28	27	38	53	37	37	31	37	37	34	33	37	44	35	48	45	43 2
	Min	36	36	42	38	35	35	29	21	20	32	25	26	19	13	4	14	26	32	32	28	11	23	16	28	15	18	30	24	18	27	25.1
Monticello.	Max	64	63	66	58	50	45	43	45	43	42	42	45	43	28	27	22	43	52	38	43	45	52	33	42	35	46	39	43	44	45	44.2
	Min	40	31	30	29	28	28	27	22	18	19	21	22	20	11	5	8	22	23	24	31	35	28	17	15	11	25	28	22	24	22	22 7
Mooar.....	Max	74	74	71	72	64	66	59	33	40	46	58	41	37	24	33	56	49	52	47	53	55	38	31	42	51	48	31	53	59	30	49.3
	Min	29	32	39	24	29	34	25	20	19	28	22	29	28	13	14	19	16	18	37	38	24	35	21	24	19	15	24	16	26	22	24.3
Mt. Ayr	Max	59	64	69	65	60	59	65	38	40	41	35	55	45	36	35	29	60	60	41	33	29	37	32	33	38	47	52	43	50	48	46.7
	Min	33	38	43	40	36	37	32	20	23	30	23	23	25	14	11	17	28	30	30	28	6	25	24	29	25	20	21	28	21	27	26.5
Mt. Pl's'nt	Max	63	61	66	65	58	63	58	45	42	48	40	52	42	32	32	31	52	60	50	50	39	50	36	35	37	37	49	42	45	47	47.6
	Min	39	35	38	41	32	31	33	22	19	33	26	21	22	11	12	13	28	50	37	36	18	29	20	30	21	18	26	26	18	26	27.1
Mt.V.(Hub)	Max	58	66	69	69	58	51	44	38	38	30	25	24	20	10	7	11	36	34	35	32	14	27	26	27	16	19	25	24	22	27	44.8
	Min	40	35	36	40	33	36	32	20	20	35	42	35	45	44	22	23	22	35	34	34	41	35	32	33	27	30	37	36	36	38	38.5
NewH'pton	Max	52	59	66	64	49	44	39	33	33	42	35	45	44	22	23	22	35	34	34	41	35	32	32	33	27	30	37	36	36	38	21 5
	Min	37	32	37	40	31	32	28	26	20	23	21	25	18	8	-5	2	15	20	27	26	12	31	35	34	35	38	43	36	47	42	42 6
Newton ...	Max	52	65	68	66	55	51	45	30	37	42	35	51	42	30	29	27	40	53	39	39	31	35	32	37	29	33	37	37	29	28	25.8
	Min	36	34	40	40	35	35	30	20	20	30	25	23	21	12	5	14	26	32	33	34	26	31	23	19	29	39	34	37	43	40	37 9
Northwood	Max	54	60	65	66	48	45	40	34	38	41	34	44	34	27	20	23	35	31	34	27	26	30	31	34	27	21	18	20	18	16	21.4
	Min	34	34	36	37	32	32	28	20	22	27	20	26	17	9	-2	8	23	23	23	21	9	28	30	54	55	33	41	42	45	46	42 7
Odebolt	Max	55	62	65	57	50	54	45	35	36	44	41	35	51	43	36	32	34	35	33	30	5	20	11	27	27	33	19	22	25	25	23.9
	Min	33	30	42	40	31	32	30	18	20	31	20	29	21	14	5	24	35	38	35	35	28	32	34	36	36	42	43	34	48	44	42.4
Ogden.....	Max	58	65	69	37	34	35	28	20	17	19	22	23	14	8	2	16	23	24	15	2	12	14	18	23	20	19	23	26	20	21	22.7
	Min	31	31	41	65	53	46	45	39	37	49	37	51	48	30	27	31	40	52	45	51	43	50	41	41	46	42	50	39	40	58	42.1
Olin.....	Max	..	..	61	57	26	31	35	22	19	32	28	26	22	13	8	12	28	44	34	23	17	25	27	30	23	17	25	25	25	25	25.8
	Min	..	..	30	37	26	31	35	22	19	32	28	26	22	13	8	12	28	44	34	33	31	28	35	35	34	37	50	50	45	52	45 0
Om'ha,Neb	Max	60	65	72	60	58	57	48	37	47	45	39	58	50	43	27	34	43	50	43	44	27	39	28	30	27	31	45	48	30	51	28.9
	Min	36	39	48	44	41	43	34	22	30	34	27	82	24	21	13	22	29	38	28	34	26	33	23	35	28	36	48	47	54	49	43.9
Onawa.....	Max	61	67	74	62	59	57	48	43	45	36	43	52	29	43	32	29	43	52	38	43	45	52	33	42	35	46	39	43	44	45	44.2
	Min	29	33	42	42	33	35	36	19	27	32	23	26	23	15	10	21	22	35	34	33	24	28	17	15	11	25	28	22	24	22	22 7
Osage.....	Max	50	57	62	53	47	40	38	32	35	40	34	42	37	25	8	-3	25	31	23	24	31	35	28	17	15	11	25	28	30	30	49.3
	Min	35	33	39	38	32	32	27	20	22	27	21	27	16	8	34	25	33	31	37	37	31	38	31	42	51	48	31	53	59	30	49.3
Osceola....	Max	58	65	70	63	60	60	55	38	39	38	33	25	26	26	15	10	29	31	31	38	32	42	49	49	19	15	24	16	26	22	24.3
	Min	35	38	45	54	40	35	35	20	21	33	25	36	33	30	30	30	30	30	47	43	24	35	21	24	19	15	24	16	26	22	24.3
Oskaloosa..	Max	59	64	71	65	58	60	46	37	39	40	36	55	40	19	17	10	17	29	34	33	14	26	35	38	29	25	20	18	28	29	46.7
	Min	37	31	41	41	33	29	29	21	19	30	23	23	54	48	33	27	31	48	45	44	33	45	34	34	38	37	49	42	45	47	26.5
Ottumwa...	Max	56	62	71	68	69	62	48	38	40	40	38	54	48	28	33	14	21	34	34	37	19	32	32	34	31	26	37	37	49	42	47.6
	Min	40	37	45	43	46	40	32	24	22	36	27	33	28	13	33	35	31	61	37	41	32	35	21	24	19	15	24	16	26	18	27.1
Ovid	Max	62	68	71	70	65	64	48	43	38	42	37	58	34	18	13	10	15	29	32	31	10	26	20	28	21	24	49	29	50	51	44.8
	Min	33	38	42	40	35	36	32	18	18	30	22	23	18	32	45	31	31	52	32	32	30	37	32	32	30	24	39	29	29	27	26.1
Pacific Jct.	Max	58	64	72	62	60	59	60	46	53	42	30	42	57	32	15	14	20	29	29	29	30	37	29	38	34	29	38	32	48	36	38.5
	Min	29	32	42	40	32	35	35	20	35	43	23	26	24	32	30	22	28	43	60	43	40	22	34	20	29	29	32	18	21	19	21.4
Pella.....	Max	59	60	62	72	58	54	50	40	43	43	42	56	32	13	10	8	11	26	35	30	12	12	30	34	35	34	32	19	10	18	34.2
	Min	36	41	37	35	36	32	22	20	21	23	23	46	31	30	20	22	28	..	31	33	28	30	20	35	10	29	34	20	32	36	38 7
Plover.....	Max	55	54	55	54	50	49	41	35	45	41	40	23	60	19	10	0	15	..	27	25	25	5	10	20	29	30	32	20	25	20	21.6
	Min	32	28	28	31	35	30	28	18	25	28	25	40	40	20	20	23	30	26	30	25	35	25	35	25	40	40	20	20	19	23	42.4
Primghar ..	Max	50	60	72	62	58	52	49	50	50	30	40	15	22	18	15	18	10	20	20	20	25	0	20	25	39	39	42	42	50	25	23.0
	Min	28	32	40	35	38	30	27	15	25	20	15	36	53	40	36	37	23	38	37	39	38	41	38	22	29	29	28	22	10	26	43.6
Perry.....	Max	55	60	59	69	54	58	46	37	40	40	32	43	25	26	14	7	18	28	31	31	25	8	18	37	38	35	52	52	45	52	25 5
	Min	42	31	39	42	34	34	31	20	20	32	43	42	60	35	39	37	30	56	59	36	65	29	20	19	28	24	22	28	20	19	53 0
Red Oak...	Max	64	72	76	73	65	69	51	48	50	43	32	28	35	22	9	10	17	25	27	28	22	5	30	34	36	35	40	44	34	47	25.9
	Min	33	33	44	43	35	39	40	20	27	34	45	40	50	39	27	30	24	36	37	35	35	14	22	11	24	17	20	22	25	21	41 0
Ridgeway	Max	53	62	66	66	58	32	33	28	22	21	27	23	28	16	9	0	5	29	37	36	35	28	32	35	35	38	40	40	47	25	23.6
	Min	40	32	39	41	58	52	53	45	31	41	38	37	53	47	36	23	29	37	36	35	28	32	22	15	18	21	18	20	23	28	23.2
Rockwell C	Max	55	62	61	39	33	35	31	20	24	30	42	25	25	20	14	2	17	23	24	22	17	24	22	29	25	23	33	22	30	20	34 4
	Min	31	35	41	57	54	51	42	41	42	42	34	43	28	23	22	23	15	21	21	21	12	4	13	14	13	15	14	17	17	20	19.3
Ruthven ..	Max	53	55	52	35	27	32	28	22	17	20	22	20	16	10	-2	32	32	27	31	32	32	27	31	32	32	32	41	41	37	48	41 0
	Min	29	33	31	35	27	32	28	22	17	20	22	20	16	10	-2	32	32	27	31	32	32	5	20	14	16	21	15	26	21	25	23.0
Sac City...	Max	57	63	67	58	53	52	43	37	42	40	35	52	42	35	33	18	18	25	34	34	25	20	5	20	32	32	40	41	37	46	41.5
	Min	30	33	43	39	34	34	29	18	22	30	22	26	20	12	2	35	27	35	38	33	28	32	34	34	27	24	15	28	38	39	25.5
Scranton ..	Max	52	60	67	63	52	53	48	40	40	40	30	34	52	42	35	8	18	25	28	25	25	10	21	18	38	28	19	25	38	39	38.6
	Min	33	35	43	43	37	36	32	20	23	30	25	23	47	42	30	29	25	33	32	27	25	2	24	2	16	18	19	38	37	38	20.8
Sheldon....	Max	43	58	65	55	49	50	41	34	43	42	34	47	26	17	10	2	15	15	20	22	15	2	24	2	34	31	38	38	39	46	39.6
	Min	28	29	41	35	29	32	26	15	25	30	19	26	17	44	30	30	23	32	31	25	24	21	28	27	16	18	14	18	22	24	19.7
Sibley	Max	55	63	68	58	52	51	40	40	42	48	34	52	44	30	10	-2	11	22	19	20	16	0	22	7	26	15	36	43	50	40	46 0
	Min	26	28	37	33	26	31	28	16	19	28	25	26	16	48	33	30	29	45	61	43	42	33	41	37	35	36	20	20	30	26	26.5
Sigourney..	Max	55	65	70	65	58	60	49	41	41	42	38	53	38	23	11	10	14	27	36	35	32	15	28	19	30	35	38	40	38	40	39 3
	Min	38	32	42	42	34	31	33	20	19	32	27	22	44	42	34	28	26	35	34	29	29	26	29	34	23	18	18	26	20	24	21 5
Sioux Cen.	Max	50	55	65	56	47	50	43	33	33	48	44	35	44	27	18	12	4	18	23	17	13	0	13	14	34	33	47	43	43	54	41 6
	Min	30	32	40	36	29	33	25	15	26	28	18	28	53	26	41	26	27	33	25	31	22	30	31	36	22	17	25	33	24	30	25.6
Sioux City..	Max	57	64	71	58	54	53	44	36	53	36	36	40	15	26	22	16	9	24	28	21	28	4	26	11	22	16	30	26	39	46	39.9
	Min	34	33	35	42	37	37	34	18	32	32	31	52	43	33	30	29	32	32	29	32	27	35	29	20	13	26	16	35	39	26	22 7
Storm L...	Max	56	61	64	57	57	53	42	35	44	40	31	19	29	19	12	-1	16	21	23	24	16	3	28	35	35	34	35	44	45	47	42.4
	Min	31	36	43	37	34	37	25	16	25	30	37	54	53	27	32	25	30	41	36	32	35	28	19	25	23	20	24	26	25	30	24.0
Stuart	Max	45	61	62	63	56	56	45	36	53	36	53	37	25	24	14	8	8	22	29	32	20	8	10	37	35	35	34	50	48	43	46.0
	Min	32	36	39	38	36	33	19	19	27	43	45	38	56	49	44	39	29	56	48	33	33	28	4	22	20	24	24	31	21	18	26.2
Thurman..	Max	57	62	70	63	58	58	48	40	44	22	22	33	27	29	24	18	14	21	29	25	28	22	4	30	39	35	29	50	43	35	45.4
	Min	29	31	46	42	32	34	40	22	22	41	41	40	60	30	29	31	31	54	38	40	33	31	11	23	15	18	29	27	25	20	23.7
Toledo.....	Max	70	73	72	70	60	59	47	40	21	18	30	25	23	29	9	5	13	10	33	32	45	34	38	36	38	34	42	54	49	53	55.7
	Min	32	34	32	38	34	32	31	65	40	45	60	48	63	55	48	49	46	43	40	48	20	5	18	20	24	26	22	25	22	20	23.6
Villisca....	Max	58	60	72	72	63	67	65	30	18	18	30	31	26	23	22	12	18	25	24	22	47	39	56	34	36	40	32	44	38	40	47.4
	Min	30	30	35	30	32	32	56	43	43	44	40	56	39	35	32	..	46	56	44	41	37	23	32	24	32	25	23	30	29	24	29.9
Wapello ...	Max	63	67	67	72	68	..	35	25	22	33	28	22	15	16	17	..	29	44	45	44	37	33	47	35	38	38	39	51	30	50	44.6
	Min	41	37	42	42	35	60	58	47	38	38	38	38	54	34	34	28	31	53	36	35	30	16	25	18	30	20	17	28	24	18	25 4
Washingt'n	Max	57	65	69	65	60	32	32	32	20	17	29	38	22	22	12	10	8	13	29	36	40	36	34	28	33	33	33	27	35	22	40.3
	Min	37	34	39	39	39	56	47	44	34	36	45	38	54	34	27	22	27	35	40	35	34	24	13	22	15	23	15	17	22	25	23.8
Waterloo ..	Max	58	63	69	62	56	47	33	31	20	20	30	24	27	18	11	1	11	24	32	32	34	30	27	13	21	13	27	14	20	24	23	22	25	40	39.4
	Min	38	32	37	38	32	33	31	20	20	30	24	27	18	11	1	11	24	32	32	34	34	30	27	13	21	13	27	14	20	24	23	22	25	40	24 2
Waverly...	Max	54	62	67	59	51	32	34	31	22	..	28	24	28	19	12	1	6	25	32	30	27	34	28	34	32	32	32	34	39	29	38	40	40.4
	Min	37	33	40	38	32	51	50	44	35	36	38	40	51	42	27	28	37	41	42	44	31	28	34	32	24	14	18	20	16	20	21	21	21.2
Whitten ...	Max	51	58	60	66	32	32	32	26	19	19	20	21	22	13	9	0	11	25	30	43	55	48	46	35	47	36	38	39	34	45	..	..	..	..	46.0
	Min	34	32	34	32	32	60	54	36	40	43	39	51	42	33	28	30	43	55	48	46	35	47	36	38	30	23	19	26	..	..	..	..	..	..	29.1
Wilton Jc..	Max	69	63	65	65	58	60	54	36	40	43	39	51	42	33	28	30	43	30	38	40	34	19	30	18	30	23	19	26	..	..	..	..	..	..	42.4
	Min	44	37	32	40	48	44	47	22	34	32	27	25	22	12	11	13	30	28	33	38	31	33	36	33	35	38	44	49	33	49	36	42	26.3
Winterset .	Max	59	66	70	64	60	60	46	39	38	39	37	55	28	34	28	15	9	17	24	31	30	30	10	13	20	30	22	18	31	27	23	29	..	..	....
	Min	33	34	43	42	37	36	33	19	20	32	24	25	27	15	9	17	24	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
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DAILY AND MONTHLY PRECIPITATION FOR NOVEMBER, 1900.

STATIONS.	DATE.																													Total.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Afton	.24									T	T						T	.33	T	.26	.05		T	.23							1.11
Albia									T					T			T	1.32	03	.20	T			.30							1.85
Algona										.10				.15		.20			T	.10				.40							.95
Alta										.10			T	.10			.08	07	.03	.10				.20							.68
Alta (near)										.10				.10			.10	.15	.04	.10				.20							.79
Amana	.09									.02			T	.03				.55	.05	.14	04			.10							1.02
Ames										.01				.05			.03	04	02	.01			.35								.51
Ames (near)										T			T	.05		.10	T	T	T	10				.52							.77
Atlantic										T										.10			10	10							.30
Batavia										.30			T	T				.50	.35	.20			.10	.10							1.55
Baxter										07				.05		05	.10	.18	.05	02	20		.30								1.02
Bedford	09									T	T					T		.28		T	.32		.30								.99
Belknap	97										.05			T	T	.10	.06	.82	.06	.33	.05			.30	.04						2.78
Belle Plaine						T								.08				.80	.20	.30	02			.50							1.90
Bonaparte																		1.57		.28				.25							2.10
Britt						T				.06			T	07	.02	.08	.03	.05	03	T	.03	T		.08	T						.45
Buckingham										T			T	.02				53	.05	10				.40				T			1.10
Burlington										.09				.08		.16	.08	1.54	.10	.42			.11		.30						2.88
Bussey																		1.21		.25			.20								1.66
Carroll					T				T									T						.60							.60
Cedar Rapids										T						T	T							.15							.15
Chariton	.10									.05	.05					.01	.02	.78	.04	.13	.15			.27							1.60
Charles City	.50					T	T				T	T	T	.10	.03	.20	T	.70	T	T	T			.30	T			T			1.85
Clarinda										T				T		T		21	.11	.11			T	.05							.48
Clear Lake	.20									T				T	.20	10		T			T			T							.50
Clinton	.02									.10				.02		.06		67	.12	.40				21							1.60
College Springs																	.03	.10		.10	.17			.07							.47
Columbus Junct	.01					T				T	T		T	.02		.01	.02	.84	T	20				.05				T			1.15
Coon Rapids	.13									T				T			T		T	T	T			.50							.63
Corning										T			T			T				T	.10			.08							.18
Council Bluffs																				.05			.05	.02							.12
Crawfordsville														.05				.89		.16				.12							1.22
Cumberland										T			T					T		T	.10			.10							.20
Danville										T				.10		.05	T	2 60	T	.30				.30							3.35
Davenport	.01					T		T		.03	.01		T	.02		T	.01	.89	.09	.24	.02			.11	.05						1.48
Decorah	.28					.22	.05							.20		.26	.40	.15			.10				T						1.60
Delaware	.35									.02				.10	10			.84	.04	.12	.10			.10							1.77
Denison										.02			T	T		T	T	T	T	T			.08								.10
Des Moines	.27									08	T		T	.03		T	T	.24	T	.12	.05			.17							.96
De Soto	.73									.05			T	T			T			.33	.10		.20								1.41
Dows	.40					.04				T				.05		.20		.02			.05			.30							1.06
Dubuque	.04					03	T	T		T	.04	T	T	.01	.07	.11	.10	.81	.09	.13	.07	T		.14							1.64
Eldon	.28									.03	T			.01			.07	1 22	.05	.22	.03		T	.18							2.09
Elkader						.04				.18				.20		.25		1.32			.08			T							2.07
Emerson																					.10		.01								.11
Estherville					T		T				T		T	.03	.01	.15	.01	T	T	.01	.06	T		.30			T	T			.60
Fayette	.11					T	T			T	T		T	21		.16		1 01			.09			.07							1.68
Fonda										.08			T	06	T	.16	12	06	.15	08	T	.05	.40								1.16
Forest City	.08					T				T				.05		.05	T	.15	T	T	.05										.38
Ft. Dodge	.20									.05			T	.10		T	T	.48	T		.05		.20		T						1.08
Ft. Madison										T				.10		.20		1.80	.41	.10				.47							3.08
Galva																				10				.30	.30						.70
Gilman	.18					T				T				T	T		T	.66	.02	.05	T		.20								1.11
Glenwood		T								T			T				T	T													T
Grand Meadow						.20			.10			T	.35		.20		T	60		.07	.10			.05							1.67
Greene	.57					.05				.01			.02	.08		.12		.35			.14			.12							1.46
Gr enfield	.30									01							T	.01	.02	T	.15	.11		T	.20						.80
Grinnell										.17									.53		.19			.13							1 02
Grinnell (near)	.25									.15	.02		.01	.10				70		.12	.20			.30							1.85
Grundy Center	.66					.03				.04				.03		.08	03	.28	.05	.04	.12			.30							1.69
Guthrie Center	.35									T				T						T	T			.30							1.30
Hampton						.03								.07		.33	.26			.07			.40	.55							.93
Harlan				T						.06	T		T	T			.02	.04	02	.01	.05	T	.17								.56
Hawkeye						T				T					.40	.20			1.00			.10		.36	T						1.70
Hedrick	.07									T				T		T		1.30	T	.14	T			.15		T					1.66
Hopeville										T			T					.34		.22	.10		.10								.76
Hoprig									T		T						T	T	T	T				.15							.15
Humboldt	.21					.02				.06					.08	.08	11	.03		.03			.40								1.02
Independence	.20													.10		.07		.68		.01	.10			.10							1 26
Indianola	17									.08	T		T	T		T	.01	.40	.01	.14	.12		T	.03	T	T					.96
Iowa City										T				T				1 07		.28				.08							1.43
Iowa Falls	.32					.02	T			T			T	.10		.15	T	.32		T	.10	T		.30				T			1.31
Keokuk										.03	T			T		.05	.17	.43	.12	.34				.20	.08						1.72
Keosauqua										T			T	T		T		1 59	T	.25				.20							2.04
Knoxville	.12									.08			T			T		.36	T	.09	.10			.18							93
Lacona										.10	T	T	T			T	T	.55	T	.15	.10			.25							1.15
Lansing	.18					.35	T	T	T	T			T	.04	.28	.11	T	.86	T	T	.10			T				T			1 92
Le Claire	.19						T	T		T	.03				.05		.05	.21	.70	.02	.02					.20					1.47
Le Mars										.06				.10		03			T	.15											.31
Lenox	.20									T							T	.12		T	10			.03							.45
Logan										T					T		.10		.10		.01			.20							.41
Maquoketa														.05				1.10				.42									1.57
Marshalltown	.13									.02				.04			.04	.56	.05	.02	.05			.35							1.26
Monticello	.10						T			T		T	T	T		T		.02	.80	T	.08	.10		.20							1.30
Mooar																T		.68	T				.54							1.22
Mt. Ayr	.14									.05						.01	.02	42	.02	.20	.22			30							1 38
Mt. Pleasant	.03									.06			T					1.30		T					.15						1 54
Mt. Vernon(Hub)										T			T	.04		02	T	.40	.13		.15			.17		.02					.93
Murray					T	T	T	T				T			T	T	T	T	T	.01	T	.02									.03
New Hampton	.25						T							.20	.10	.30		.50			.05			.10							1 50
Newton	.23									.15				.05		T	.08	.54		T	.15			.40							1.60
Northwood	.22					.04	T			T		T	T	.40		.10	T	T	.33		.05	T		T	T						1.14
Odebolt										.11				.05			10			.08				.30							.64
Ogden	.30									T				T				.16	T	T	.15	.01		.04							.66
Olin						T	T			T			T	.05		T	T	.73		.20	.05			.10							1.13
Omaha										T	T		T			T	T	.01	T	.02	.05			.07							.15
Onawa										.03				.05				.01			.07			.13							.29
Osage	.30					.03	T			T		T	T	.26	.14	.20	.01	29	.04		.12			.05				T			1 44
Osceola										T						T		.53	T		.35	.15		.25							1 28
Oskaloosa	.15									T				.50				.84		.05			1.00								2.54
Ottumwa																		1 50	.10	.50			02								2.12
Ovid										.11						.02		.80	.05	.21			.41	.13							1 73
Pacific Junction										T							.01	.01	T	.02	.06			.01							.11
Pella										T		T								.48	.05			.20							.73
Perry	.24									T			T		T	T	T	T	T	T	.20		.40								.84
Plover										.05	.05			.05	.10	.15							.20								.60
Primghar										T																					T
Red Oak										.06						.01		T	.06		.03			T							.16

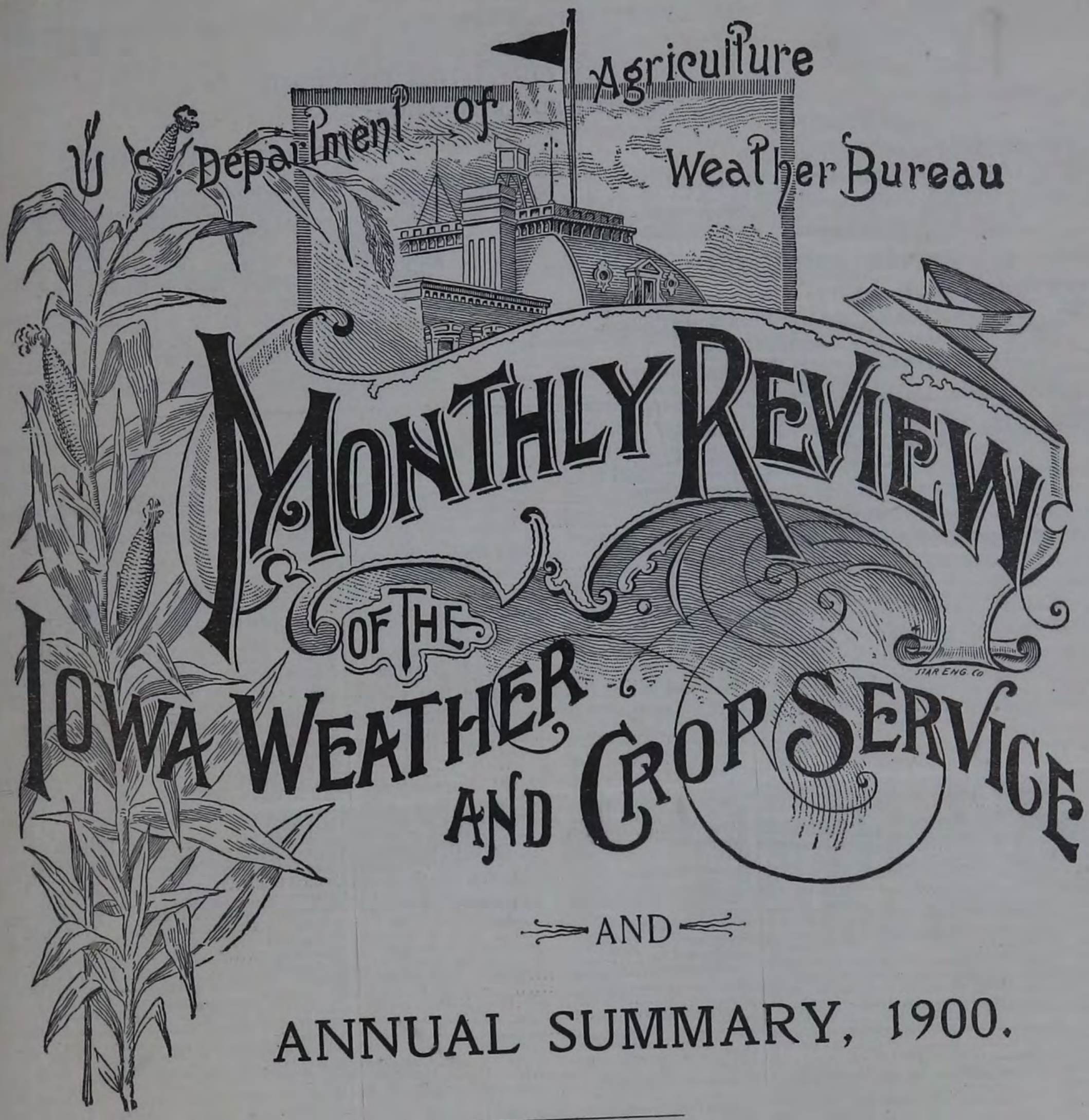
DAILY AND MONTHLY PRECIPITATION FOR NOVEMBER, 1900—CONTINUED.

STATIONS.	DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total.
Ridgeway	....	....	..	....	...	.18	.02	...	....	.02	..	.01	03	.40	..	.17	.75	.04	.05	.03	.08	....	....	03	.03	.03	...	...	.01	..	1.88
Rockwell City	.10	....	....	....	....	....	....	....	....	....	.10	T	T	.05	T	....	....	.05	.05	..	....	..	..	.40	....	..	T	..	....	....	.65
Ruthven	....	....	....	....	....	....	....	....	....	.06	....	T	.07	....	....	T	T	T	.03	....	.08	T	.25	....	..	....	....	....	....	....	.30
Sac City	....	....	....	....	....	....	....	....	....	....	....	....	T	....	....	....	....	....	....	....	T	....	.30	....	....	....	....	....	....	....	.77
Scranton	....	....	....	....	....	....	....	....	....	.20	....	....	T	.01	.05	.05	10	.10	.01	.05	.10	....	....	.10	....	....	....	....	....	....	.64
Sheldon	....	....	....	....	....	....	....	....	....	.10	....	....	....	T	.05	15	.04	T	T	T	.05	T	T	.25	....	....	....	....	....	....	1.96
Sibley	....	....	....	....	....	....	....	....	....	.03	....	....	T	T	....	....	T	1.26	....	.17	T	....	.14	....	....	....	....	....	....	....	.55
Sigourney	.36	....	....	....	....	....	....	....	....	.20	....	....	T	.05	.02	T	.11	....	T	05	.05	....	....	.07	....	....	....	....	....	....	.36
Sioux Center	....	....	....	....	....	....	....	....	....	.04	T	..	T	.06	....	T	.07	.01	.03	.07	05	....	....	.03	....	....	....	....	....	....	.46
Sioux City	....	....	....	....	....	....	....	....	....	08	....	....	....	.05	....	T	.02	.03	.02	....	.06	..	....	.20	T	....	..	....	....	....	.35
Storm Lake	....	....	..	....	...	....	....	....	....	T	....	....	....	....	....	....	....	....	....	.10	....	....	.25	T	....	....	....	....	....	....	.10
Stuart	....	....	..	....	..	....	....	....	....	T	T	....	T	....	..	T	T	T	T	T	.10	..	T	T	T	..	....	....	....	....	1.51
Thurman	....	....	....	....	..	....	....	....	....	T	....	....	....	....	..	....	....	.78	....	.13	.40	....	....	....	....	....	....	....	....	....	.74
Toledo	....	....	....	....	..	....	....	....	20	..	....	....	....	T	....	....	....	....	.30	.12	.32	T	....	T	....	....	....	....	....	....	1.16
Villisca	....	....	....	....	..	....	....	....	....	T	..	....	T	T	....	T	T	....	.77	.16	.03	..	....	.20	....	....	....	....	....	....	1 42
Vinton	....	....	....	....	..	....	..	....	....	..	....	....	.01	....	....	....	..	1 00	T	.36	..	....	....	T	.05	..	....	....	....	....	1.12
Wapello	....	....	....	....	....	....	....	....	....	....	....	....	.02	.02	..	....	....	.70	....	.32	.03	....	....	.03	....	....	....	....	....	....	.27
Washington	....	....	....	....	....	....	....	..	...	T	....	....	....	.02	....	....	T	T	....	....	.10	T	....	.10	..	....	....	....	....	....	.97
Washta	....	....	....	....	....	....	....	....	...	.05	....	....	T	T	.04	14	.03	38	T	.06	09	....	....	.12	....	....	....	....	....	....	1 11
Waterloo	.11	....	..	....	....	T	T	...	....	....	....	T	.01	.05	.05	.17	....	.25	.04	....	.08	....	....	.13	..	....	....	....	....	....	.70
Waverly	.25	....	....	....	....	.08	....	..	..	....	....	....	....	.20	....	....	....	....	.10	..	.15	....	....	.15	..	....	....	....	....	....	.05
West Bend	....	....	....	....	....	....	....	..	...	.10	....	....	.05	....	..	T	T	..	....	T	....	..	....	T	....	..	....	....	....	....	.68
West Union	....	....	....	....	....	T	....	..	....	....	....	....	T	T	....	T	T	....	.25	T	.01	..	..	.04	..	..	..	....	....	....	1.65
Whitten	.38	..	....	..	....	....	....	..	..	T	....	....	....	.04	....	T	....	.78	.10	.15	....	....	..	.10	.15	....	..	....	....	....	.92
Wilton Junction	.22	....	....	..	....	....	..	....	....	.11	....	....	....	T	....	..	01	14	.04	.22	.05	..	....	.35	....	..	..	....	....	....	.97
Winterset	....	....	....	....	....	....	..	...	..	T	.11	..	..	....	...	T	....	.35	T	.10	.15	...	.05	.22	....	....	....	....	....	....	
Woodburn	.01	....	....	....	....	....	....	....	....	.08	.01	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	

Precipitation Chart November 1900.



Vol. XI. DECEMBER, 1900. No. 12.



AND

ANNUAL SUMMARY, 1900.

CENTRAL STATION, DES MOINES, IOWA.

J. R. SAGE,
DIRECTOR.

GEO. M. CHAPPEL,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

DES MOINES:
BERNARD MURPHY, STATE PRINTER.
1901.

THE IOWA WEATHER AND CROP SERVICE

WAS ESTABLISHED BY ACT OF THE TWENTY-THIRD GENERAL ASSEMBLY, AND IS UNDER SUPERVISION OF THE

STATE BOARD OF AGRICULTURE,

CONSTITUTED AS FOLLOWS:

OFFICERS.

R. J. JOHNSTON, PRESIDENT, Humboldt.
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U. S. DEPARTMENT AGRICULTURE --- WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XI. DECEMBER, 1900. No. 12.

NOTES ON CLIMATOLOGY OF IOWA.

PAPER READ BEFORE STATE HORTICULTURAL SOCIETY, DECEMBER 13, 1900, BY J. R. SAGE.

Climate is a product of certain elements and properties of the atmosphere, and physicial features of the earths surface. And as these elements and conditions are substantially permanent, we have ample assurance of the stability of climate. The sun's energy is a physicial constant, producing in earth and air the threefold forms of force termed heat, light and electricity, and causing the varied phenomena of evaporation and precipitation, wind movements, storms, etc. So we have nature's warranty that the climate of this section will be practically unchanged so long as the continents and seas abide in their present forms and bounds, and the everlasting mountains remain in place.

All climatic records attest this fact of permanence. And the student of climatology may find in the constituents of the soil ample proofs as to the weather conditions existing many thousands of years prior to the historic age, in like manner as the skilled geologist reads in the rocks the graphic story of nature's processes in world-building in the more distant epochs of the past.

One of the most obvious facts as to the climate of this midland region is the wide range of extremes, and the marked variableness of the seasons as compared with the normals. This does not in the least contravene the theory of the permanence of climate; but it simply implies that one of the permanent features of daily and seasonal weather is this tendency toward variation. Every season illustrates the fact that the law of variety halds sway in relation to the weather as in all of nature's operations. The past season was notable as a record breaker in respect to sustained high temperature for many days during the summer; and 1899 broke all records of long continued low temperature in the winter. So with substantial unity and stability, we note perpetual variety and changefulness, in respect to the weather, irregularity is the regular thing to be expected. And if a year should be strictly normal from first to last, it would take rank as a phenomenal exception among all the years of record. Thus we reach the apparently paradoxical conclusion that in weather the exceptional condition is the rule, and some measure of departure from the normal is the normal state of things.

In weather records the average are carefully noted, but the extremes most vitally affect human interests. And the tendency toward extremes is the most striking feature of the climate of this midcontinent region. Being remote from the equalizing effects of the oceans, it has winters of considerable severity and summers of unusual warmth. In Iowa the records of temperature for the past decade show an average range of 136 degrees per year. The highest temperature recorded for the ten year period was 110 degrees in July 1890, and the lowest was 40 degrees below zero in February, 1899, making a range of 150 degrees for the decade. These figures may be regarded as about the maximum and minimum of temperature for this state. And now as illustrating the difference between an insular and a continental climate, it may be stated that in the Bermudas the annual range is only 36 degrees, the maximum being 85 and the minimum 49 degrees.

Variableness in the annual and seasonal precipitation is also a notable feature of our climate; and for that matter there is no part of this continent wholly exempt from severe drouths or damaging excess of moisture. Since 1890 we have had about the full extent of variation that may be expected in this section. The average precipitation for the state is a little over 30 inches per year; and in the last decade the lowest amount was 21.95 inches in 1894, and the highest 37.45 inches in 1896. The normal for the three summer months is 11 inches. In 1894 the total for the summer months was only 4.88 inches; and in 1900 the amount was 14.78, or 10 inches above the low water mark. That difference of about 10 inches in the critical months of the crop season accounts for the fact that the output of cereals in 1900 was more than twice the total produced in 1894.

Thare is marked inequality in the distribution of rainfall in a single season within the limits of this state, and sometimes within the narrower bounds of a few counties. A considerable portion of the summer rainfall comes in form of purely local showers that irrigate narrow belts and short distances. So it happens at times that a portion of a single county may suffer from drouth while the adjoining parts are well watered. Our precipitation maps, issued monthly, graphically illustrate this feature of the climate.

Fully 70 per cent on the average, of our annual precipitation falls in the six crop months, and over 37 per cent of the yearly total comes in the three summer months. So there is in Iowa a wet and dry season about as well defined as in some of the tropical countries. This must be taken into account as an important factor in fruit growing and farming. During the past eleven years the average from April 1 to October 1 has been 21.67 inches, with some noteworthy departures above and below. In 1892 the state average for the crop season was 27.77 inches; in 1896 it was 29.33 inches, and in 1900, 25.74 inches. But in 1894, the memorable year of the great drouth, the amount was only 13 39 inches, and about half of that total fell in April and September, leaving the four months in which the bulk of crop growth was made, with very scant moisture. It seems almost miraculous that the cereal products of that extremely dry season amounted to over 256,000,000 bushels, and fruit was far above a total failure. That drouthy period, which began in 1893 and did not wholly terminate until the summer of 1895, gave us a crucial test of the hardiness of trees, shrubs and plants, and attested the drouth resisting qualities of Iowa soil. Whatever survived was certainly well fitted for the survival.

The records show that quite severe drouthy periods have occurred at irregular intervals averaging about one to two in

each decade, since the early settlement of this region. But the drouths of former days were not so destructive to crops because there was not so much to suffer injury, and the stores of ground water were not so heavily drawn upon to sustain plant growth.

Probably the best all round crop year of the decade was 1895; that is, it was best both for the production and harvesting ing of crops. And yet the soil was extremely dry at seed time. and there was less than the usual amount of rainfall throughout the season. Th soil and sub-soil in March and April contained less moisture than had ever been known at that period since the early settlement of the country. The great drouth of 1894 had given the soil a period of rest and recuperation; the surface ponds and miasmatic sloughs had been thoroughly drained and dried out, and thousands of acres of the richest lands in the state were made arable and bore great crops. The moderate rains of that season were fairly well distributed and came often enough to maintain crop growth. No water was wasted by being held in ponds and sloughs to be evaporated by sun and winds; but it was mostly utilized by evoporation through plants, which is the scientific way of using up rainfall. And this leads to the statement that in this climate, and with our receptive and retentive soil, the best results are brought forth in seasons when there is a tendency toward shortage rather than excess of rainfall. It is better not to have the basins, pools, sloughs and streams continually full of water; better in fact, to have the moisture all absorbed and held below the surface. In all the years of crop production in Iowa it is probable that more actual loss resulted from excess than deficiency of rainfall in the growing season.

The farmers and fruit growers of this region are most seriously affected by wind storms, in the form of hot winds of droughty periods, and the squalls and more swiftly destructive storms of the summer. But these are necessary ills; for it should be noted that this great valley, being so remote from the gulf and oceans, must needs be watered by the expenditure of stupendous force. Every drop of water that comes into this inland region is imported, and brought hither at heavy cost of transportation. Those who receive the benefits must pay the freight in one form or another. The Sun, Wind & Co. have formed a gigantic combination and hold a monopoly of the irrigation business. The gulf is in the pool, and the combination is strictly unlimited. Cyclones are the vehicles of transportation, and when they are sweeping across the continent they hold the right of way. There seems to be no other way to get our fields watered, so we must pay the cost in form of damage, though we are assured that the benefits vastly exceed the incidental injuries. But whether we like the system or not we must submit to nature's methods, or the ways of Providence. Most likely we should make a botch of the business if we should try to amend the constitution of the nniverse!

Now there are regions where the climate is more agreeable to invalids and indolent people, and where delicate fruits and nuts may be produced at small cost of care and labor; but no portion of the earth's surface is better adapted to the development of hardy, stalwart and brainy people than this fertile valley, where the rigors and extremes of climate incite men to a strenuous life. Some of the adverse conditions seem to be necessary to develop hardiness and vigor in plants, animals and mankind.

There is no perfect climate on earth. The climate of Iowa, despite the ills I have enumerated, seems to be most admirably adapted to produce great field crops and fairly good fruits of the temperate zone. There must needs be some very benign elements, else such vast quantities could not be produced with the slack and unscientific methods so largely prevalent here. We may go abroad and find some favored localities where the climate is more equable, and where hot winds, squalls, blizzards and tornadoes are unknown; but when we remove to such a paradise, we had better provide sufficient cash to send back to Iowa for the substantial necessities of life. Man cannot live on climate alone, however dry, delightful and salubrious.

But the most of us must stay here where the great staples of food are produced. We must accept the situation and make the most of it, knowing full well that we cannot change the general features of climate. The records of the past, showing great variability and wide range of extremes, give us prophetic warnings as to future conditions. The first half of the twentieth century will bring extremes of temperature, severe wind storms, and alternations of wet and dry seasons, in about the same measure as the last half of the nineteenth century. There will be about the same old wild symphony of nature and the elements—with the variations.

This is the condition as well as theory confronting us; and what shall we do about it? Just this—study the art of adaptation to existing conditions. Take the weather as it comes, without croaking against Providence (or the weather service) and use all the resources of human ingenuity and art to improve the environments. That is what we are here for, and that is why men are endowed with brains as well as hands.

We construct houses for the comfort and safety of our families, and the thrifty farmer provides ample shelter for his domestic herds. Some measure of this thoughtful care and shelter should be given to fruits and vegetables, and even some of the field crops. I cannot go extensively into details, for it would require a volume to set forth all that may be said hereon. In all our year books of horticulture there are many helpful hints and suggestions to this end, but there is need of line upon line to enforce the precepts and incite men to the practice of affording protection to orchards, small fruits, and vegetables against the extremes of heat and cold, wet and dry weather incident to this region.

It appears to me that there is a lack of sense and science in planting a farm orchard, with the usual varieties of tender and hardy fruits, on an elevated site, exposed to all the winds that blow. That certainly is not nature's method in planting and caring for even the most wild and hardy of the native varieties. In their native state apple trees were found in the friendly environment of groves, or huddling together on the leeward side of slopes to escape the severity of damaging winds. The apple is easily at the head of the list of fruits of the temperate zone, and the apple orchard should be given the best location the farm affords, and the best care that may be afforded.

The way to protect a tree is to plant a great many other trees. Only an extremely hardy tree of any species can withstand the full force of our prairie winds. The most favorable location for an apple orchard is a well drained and fertile field sloping to the northeast, and it would be well to give additional protection by shelter belts at the south and west. If such slope can not be had, then the need is more imperative to provide ample shelter belts at the south and west. The heaviest loss suffered in apple orchards in Iowa is from the effects of hot southwest winds, and the severe wind squalls that sweep down from the west and northwest. A very large percentage of apples grown this year were blown from the trees before maturity.

The problem to be solved is how to secure air drainage and sufficient sunshine and at the same time protect the orchards from destructive hot wlnds and severe squalls. By deep planting, proper drainage and nature's system of mulching, there need be but little loss from root killing during our severest winters. The value of tile drainage to warm the soil early in the spring, to keep it in good tilth and make it retentive of moisture in drouthy seasons, has never been duly appreciated. I believe that by thorough drainage and proper culture of orchards and fields it is possible to grow excellent crops in the most drouthy season ever known in this section. And certainly no one will question the value of tiling in extremely wet seasons.

One of the most difficult problems is how to protect fruits and field crops in seasons when hot winds prevail for many days, and possibly weeks. But by study of the situation you will observe that the extent of damage depends upon the location and exposure to the full effects of the scorching blasts from the southwest. A stubble field, or a closely cropped and dried up pasture, situated at the windward side of a cornfield or orchard, will add very greatly to the deadly effects af winds that blow thirty miles an hour when the temperature is among the upper nineties and the relative humidity of the air is very low. The fact should be noted that hot winds are local productions; that is to say, the scorching and deadly effects are due mainly to the number and extent of radiators that maintain the high temperatures. Stubble fields, bare pastures, stretches of bare or sandy lands, etc., are the radiators that do the damage. We are not afflicted by hot winds of the deadly type when the meadows, pastures and grainfields are covered by green and luxuriant crops of grass and grain.

We are as yet in the experimental stages of our horticulture and agriculture in this section In due time we will have produced varieties of fruits, grains and vegetables that are thoroughly acclimated and hardy enough to withstand all the extremes of climate. We can not change the climate or increase or decrease the rainfall, but we may hedge against adverse conditians and achieve fair success in even the worst seasons ever known.

I am satisfied that in the line of judicious and scientific forestry the best work of the future is to be done. The treeless farm will be a rare thing in Iowa before the middle of the coming century. With fully one-fourth or one third of our entire area in timber belts, groves and orchards, the balance of the land will produce larger crops in all seasons and the conditions will be more comfortable for the happy and prosperous people who abide in this most productive state.

NOTE AND COMMENT.

Mr. Le Grand Powers, chief statistician for agriculture in he census bureau, has prepared a bulletin showing the number of domestic animals not on farms or ranges, presenting results of special inquiries relating to live stock, authorized by congress in an act amendatory of the law relating to the twelfth census. It is a surprising showing as to the number of all classes of domestic animals not found on farms; that is, mostly kept in towns, villages and cities. The totals for the United States are as follows: Horses of all ages, 2,833,877; neat cattle, 1,466,970; mules, 162,115; sheep, 156,470; swine, 1,592,861; goats, 47,652. For Iowa the following aggregates are given: Horses, 153,304; mules, 5,203; cattle, 76 327,(including 57,642 cows); sheep, 2,291; swine, 15,280; goats, 276. These numbers will make a considerable addition to the grand totals of domestic animals on farms.

* * *

The possibilities of crop production so far exceeds the average yield of crops produced that an illimitable field is ever open for the enterprising farmer to work. We have before us seven ears of corn grown in one hill of three stalks, which weigh seven and one-quarter pounds Assuming that each hill on one acre of corn could be made to do as well (which of course could not be done), the yield would be 298 bushels per acre. If we recollect aright a yield of 262 bushels has been obtained from one measured acre. J. S. TRIGG.

* * *

A grain moth known as the "Saratoga Cereallella," has become a destructive pest in New Jersey and other portions of the east. It is likely to be somewhat better known in the near future.

The Chief of the United States Weather Bureau announces the establishment of a Opecial Meteorological station of the Weather Bureau at Hamilton, Bermuda. This is an important step in the direction of giving forecasts and warnings to vessels that traverse the Atlantic.

* * *

According to the United States Census Bureau Iowa has 681 incorporated towns and cities Of these, 49 have less than 1,000 population; 593 have less than 2,000; 64 have more than 2,000 and less than 5,000; 10 have more than 5,000 and less than 10,000; 8 have more than 10,000 and less than 25,000; and 6 which have more than 25,000 inhabitants, namely: Des Moines, 62,139; Dubuque, 36,297; Davenport, 35,254; Sioux City, 33,111; Council Bluffs, 25,802, and Cedar Rapids, 25,656. The most notable rate of increase is that of Cedar Rapids, which shows a gain in population of 42.4 per cent. Davenport is next in order with a gain of 31.2 per cent. The population of the state in 1900 is 2,231,853, as against 1,911,896 in 1890, representing an increase since 1890 of 319,957, or 16.7 per cent. The total land surface of Iowa is, approximately, 55,475 square miles,t he average number of persons to the square mile at the censuses of 1890 and 1900 being as follows: 1890, 34 5; 1900, 40.2.

* * *

It is estimated that the cost of maintaining the United States Weather Bureau is about $1,000,000 per year. Of this amount $180,000 is expended in telegraphy, though the utmost economy is effected by the employment of a cipher code. As the value of weather forecasts lies in the immediate distribution of the knowledge obtained within two hours after the instruments are read in the morning, the information is sent to abont oue thousand centers of distribution, thence by telephone, mail, and railway service to more than 73,000 addresses, the greater number being delivered early in the day and none later than 6 p. m. Observations are received in Washington within an hour of the time when taken, as arrangements are made with the telegraph officials whereby certain wires are held exclusively for weather reports during certain hours of the day. Besides the 1,000 telegraph distributing centers, the forecasts are telegraphed at Government expense to about 1,800 additoinal places, where they are communicated to the public by means of signals, both of sound and sight, the latter consisting of flags and the former of steam whistles. In addition, about 8,000 emergency stations are supplied with news concerning prospective hurricanes, cold waves, frosts, and local storms of local severity. It is reported that Germany proposes to copy the system prevailing in the United States.—*Monthly Bulletin of American Republics*.

ERRATA IN NOVEMBER REVIEW

AMES.—Total precipitation recorded .43 inch, on page 10, should have been .51 inch.

AUDUBON —Maximum temperature recorded 66° on the 2nd, on page 10, should have been 71° on the 3rd.

BRITT —Maximum temperature recorded 61° on the 2nd, on page 10, should have been 64° on the 3rd.

COLLEGE SPRINGS.—Maximum temperature recorded 60° on the 4th and 5th, on page 11, should have been 69° on the 3rd.

MOOAR.—Mean temperature recorded 36.8°, on page 11, should have been 36 6°.

NEWTON —Total snowfall recorded 5.0 inches, on page 10, should have been 6.0 inches.

STUART.—Total snowfall recorded 2.5 inches on page 11, should have been 3.5 inches.

THURMAN.—Mean temperature recorded 36° on page 11 should have been 36.1°.

CLIMATOLOGY OF THE MONTH.

BAROMETER.—The mean pressure for December was 30.12 inches; highest observed, 30.71 inches at Clarinda and Sioux City on the 9th; lowest observed, 29.21 at Dubuque on the 23rd; range for the state, 1.50 inches.

TEMPERATURE.—The mean temperature of the month shown by records of 118 stations, was 26.9°, which is 3.3° above normal. The mean of the sections was as follows: Northern section (33 stations) 24.1°; central section, (44 stations) 27.2°; southern section, (41 stations) 29.4°. The highest monthly mean was 32.1° at Omaha, Neb.; lowest monthly mean, 20.1° at Spirit Lake. The highest temperature reported was 63° at Omaha on the 17th; lowest 10° below zero at Primghar, Sibley, Sioux Center and Spirit Lake on the 31st. The average monthly maximum was 52. and 6°; average monthly minimum, 3.7° below zero. The greatest daily range was 44° at College Springs; average of greatest daily ranges, 32°.

PRECIPITATION.—The average precipitation for the state as shown by records of 133 stations, was 0.45 of an inch. Averages by sections were as follows: Northern section, (38 stations) 0.42 of an inch; central section, (45 stations) 0 51 of an inch; southern section, (50 stations) 0.41 of an inch. The largest amount reported at any station was 2.70 inches at Vinton; least amount, a trace at Bonaparte, Clear Lake and Mooar. The greatest daily precipitation reported was 2.50 inches at Vinton, on the 6th; average number of days on which .01 or more precipitated was reported, 4.

WIND AND WEATHER.—Prevailing direction of wind, north west; highest velocity reported, 48 miles per hour, at Keokuk on the 23d. Average number of clear days, 13; partly cloudy, 6; cloudy, 12.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.10	30.51	9	29.29	22
Des Moines.	30.14	30 60	9	29.29	22
Clarinda	30.16	30.71	9	29.29	22
Cresco	.....	30.64	9	29.34	22
Dubuque	30 10	30.53	9	29 21	23
Omaha, Neb	30.10	30 61	9	29 25	22
Keokuk	30.12	30.54	9	29 28	22
Sioux City	30.11	30.71	9	29.30	22
....	.	.	..	.	..
....	30.12	30.71	9	29.21	23

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	6,288	29	S W	23
Des Moines	5,884	28	S W	29
Dubuque	6,047	38	N W	9
Keokuk	5,756	48	W	23
La Crosse, Wis	5,755	36	N W	8
Omaha, Neb	6,557	36	N	9
Sioux City	9,342	43	N W	23
...	....	..	....	..

OBSERVER'S NOTES.

ALTA—*David E. Hadden.* A remarkably warm December; no snow on ground till 22d, when 4 inches fell; month closed with coldest weather of the season thus far, being 7° below zero.

AMANA—*Conrad Schadt.* December was mild and plowing could be done during large part of the month; last day of the month and of the 19th century brought first real winter weather of the season. A parhelia was observed on the 31st.

BONAPARTE—*Hon. B. R. Vale.* A moderate month with no precipitation and good roads. Stock on pasture up to New Years.

CLEAR LAKE—*John Cobb.* Traces of snow on four days and trace of rain one day; not enough to measure at any time.

CLINTON—*Dr. Luke Roberts.* Lightest rainfall on record for December at this station; only 0.26 of an inch. The normal is 1.90 inches.. Cloudiness, normal; mean temperature, 2.5° above normal.

ELKADER—*Chas. Reinecke.* Total precipitation for the year 1900, 37.10 inches; snowfall, 37.5 inches; highest temperature, 98° on June 25th and August 18th and 20th Lowest temperature, 17° below zero, Feb. 6th.

GREENFIELD—*J. G. Culver.* A complete, brilliant rainbow was seen a little after sunset on 22nd, have never before seen one so far north.

GRINNELL—*Aaron O. Price.* No bad storms and weather fine for finishing corn picking.

LARRABEE—*H. B. Strever.* The closing month of the year and century was as mild as the autumn preceeding it; very little frost in the ground before Christmas.

OLIN—*Nathan Potter.* Little precipitation, with much cloudiness; a remarkably favorable month for feeding stock and doing outdoor work.

RIDGEWAY—*Arthur Betts.* Extremely mild; rain on seven dates, amounting to 1.02 inches. Dug parsnips on the 4th to save them from pocket gophers that were making havoc; up to 9th the grass was green as in June. At time of shortest day we had 48 consecutive hours without freezing—the 21st to 23d; 46 per cent. of sunshine, or 129 hours.

LOSSES BY HAILSTORMS, 1900.

The crop season of 1900 was characterized by an unusual number of hailstorms of great severity and wide distribution, which were especially frequent and destructive in July and August. The area visited by this class of storms was considerably greater than in any previous year of the past decade, though we are unable to secure complete data as to the number of farms that suffered loss thereby and the extent of damage to crops. The table published herewith, prepared by the officials of the Farmers Mutual Hail Insurance Association of Iowa, will give some idea of the extent and distribution of these most destructive storms. The figures in the table show the number of farms on which losses occurred, in the several counties, and the dates of the storms. It will be understood, of course, that this table covers only a fraction of the actual area on which losses occurred, as this is only one of several companies writing hailstorm policies. The books of the Mutual Hailstorm Insurance Association of Iowa, the Farmers State Mutual Insurance Association. the Des Moines Mutual Hail Insurance Co., and possibly some other companies, would show a much wider range and greater amount of losses. And probably two-thirds of the farms of the state are not included in any hailstorm insurance association. The table is published as an exhibit of one of the striking characteristics of the climate of this section. It shows an aggregate of 2,202 farms in sixty four counties that suffered damage to the amount of over $140,000.

LOSSES BY HAILSTORMS—DATES AND NUMBER OF CLAIMS ADJUSTED.

COUNTIES	APRIL DATES			MAY DATES					JUNE DATES													JULY DATES																	AUGUST DATES														SEPT. Dates		No. Claims of Loss
	24	26	27	13	14	29	30	31	6	9	10	12	16	18	19	20	21	27	28	29	1	2	3	4	5	6	7	9	10	11	12	13	14	15	16	17	18	19	23	9	10	11	12	13	14	15	16	17	18	21	22	23	24	31	14	16	
Audubon										2															1	6									3								1		2	1			1				2			19
Adair																										13																			1											24
Appanoose						2							4																																		1									1
Buena Vista																		4									12	3										3	1																		32
Benton																		1																																						4
Black Hawk																										3		2																			5									13
Boone																										1																														1
Buchanan					2																				1	5		1																											14
Calhoun								1	22				2			1			1						1	5	1	1	1																												29
Cherokee																																																					12
Crawford																									1	17																															23
Carroll																										1																															2
Clay																										1																															14
Cass																			2																			4																		4
Cedar																																																					2
Chickasaw										17								11	5	1		2				3		3																												51
Dickinson																										1		1																												5
Dallas										14			1						1	1						1																														17
Emmet																										3																														2
Franklin																																																					3
Fayette	3							1					70					7								89	2	3	8	1	3																								82
Fremont													3													5			2																											246
Greene																										2			1																											7
Grundy																									1				1																											13
Guthrie										12																22	1	14	29																											14
Hancock										9		2						8								2																													123
Harrison																										6	1																													10
Hardin																										1																													8
Humboldt																										1																													2
Hamilton										3								3		1	1																																	35
Ida																																3		3	1	19																	1
Iowa																		1	1	1												1	1																					4
Jasper										10																																													10
Kossuth						3				1	7							2				5	17	1		1	13																												40
Lyon				1	1																													4		1																	33
Monona										3	1																							7	9	15																	38
Montgomery																		6								1										1																			1
Marion																			4																																				121
Madison																										5		1	2							1																		15
Marshall																										3																													6
Muscatine																																																				171
O'Brien	1	1				2		2		11				1	1			1		1	1	44	83			3																												40
Osceola										20			1										3		1																														13
Page					1		1										6	1	1	4	8	1	22	19		2	2		14	2					2	1	1	11	15		1		5		14	1	1	4	4	2					6		151
Plymouth						2				15	1								2									2																											29
Palo Alto																										2																													2
Polk																										2																													3
Pocahontas																										1																													4
Pottawattamie																										1		1																													4
Poweshiek																																																					1
Ringgold																																3																								62
Sioux	1									14												8	25			1												5	3			1			2	2								86
Shelby			1																						1	60		4	19																	2							56
Sac																									1	2	18	13																	5		1	5	7						1
Story																		4																													1						27
Scott																												2																							6		1	17	1			5
Tama																		1											1	3																									2
Union				1														63		24						1	7												1													1	363
Woodbury										6												4				1		1	3																									7
Winnebago																			1							5			1																									15
Wright																										1		1																									7
W nneshiek																										1																									4
Webster																										1		1																									67
Warren																																																			Total - 2202

CLIMATOLOGICAL DATA FOR DECEMBER, 1900.

NORTHERN SECTION.

STATIONS	COUNTIES	Elevation, feet	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., IN INCHES				Number rainy days	SKY			Prevailing direction of wind	OBSERVERS
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall (unmelted)		Number clear days	Number partly cloudy days	Number cloudy days		
Algona*	Kossuth	1,100	7	24 1	*3 7	47	20,21	-9	31	....	.35	-.94	.25	3.5	2	12	5	14	NW	
Alta	Buena Vista	1,519	8	24.4	*2.8	52	20	-7	31	30	.55	-.43	.45	4 2	7	13	8	10	NW	
Alta (near)	Buena Vista		..	..	..	..	.....	.....	....	....	.34	....	25	..	3	..			.....	
Bancroft	Kossuth		..	24.2	..	51	20	-8	31	32	.40	.	.30	3 0	2	13	3	15	NW	
Britt	Hancock	1,236	..	23 2		49	20	-7	31	32	.18	...	08	1 0	4	11	10	10	NW	
Charles City	Floyd	1,012	8	24 0	*3 4	45	22	-4	26-31	29	.49	-.93	.42	1 5	3	10	8	13	NW	
Clear Lake	Cerro Gordo	984	..	23.4		46	20,21	-7	31	34	T		T	T	0	10	10	11	NW	
Cresco	Howard	1,288	27	21.6	*3 4	46	22	-4	31	27	80	- 50	70	1 0	4	10	5	16	NW	
Decorah	Winnesheik	900	6	23 0	*2 0	47	22	-4	31	30	.72	-.54	.48	2 0	4	...				
Dows	Wright	....		24 0		49	20 21,22	-6	31	35	15		.05	.8	4	14	3	14	NW	
Elkader	Clayton		18	26.0	*4 5	54	22	-2	26	32	.74	-1.49	.32	5 0	5	11	8	12	NW	
Estherville	Emmett		..	22.6	....	52	20	-6	25	35	.15		12	1 4	3	15	4	12	NW	
Fonda	Pocahontas	1,237	..								.59		.22	4.5	4	19	3	9	SW	
Forest City	Winnebago	1,220	..	23 0		47	21	-8	31	34	.14	...	14	T	1	12	3	16	W, SW	
Grand Meadow*	Clayton	...	8	23.3	*0 8	45	22	-4	31	..	.81	- 78	32	6.5	7	8	7	16	NW	
Greene	Butler	943		24.8	....	47	22	-3	31	29	.34		28		4	12	7	12	NW	
Hampton	Franklin	1,240	9	24.4	*3 4	50	21	-5	31	30	.38	-.97	.20	1.2	3	10	11	10	NW	
Hawkeye	Fayette		..					....	.....	....	.80		.50	3.0	2					
Hoprig	Emmett		..			..	.....	....	....	....	.05		.05	0.5	1	12	7	12	NW	
Humboldt (a)	Humboldt	1,082	6	24.8		52	21	-5	31	34	.10	- 50	.05	1 0	5	14	6	11	NW	
Lansing	Allamakee	...		26 8		52	22	0	31	32	.37		.21	2 6	3	6	9	16	.....	
Larrabee	Cherokee		8	25 4	*2 8	53	20 21	-7	31	35	.33	- 81	.27	3 4	5	15	6	10	NW	
Le Mars	Plymouth			26 0	....	52	20	-5	31	34	.20		.15	2.0	2	13	8	10	S	
New Hampton (a)	Chickasaw	1,166	..	22 8		49	22	-5	31	26	72		.70	0.1	3		..	....	NW	
Northwood	Worth	1,210	..	22.6		45	20,21	-6	31	28	.10	..	.10	1.0	1	11	6	14	NW	
Osage	Mitchell	1,178	8	22 8	*3.7	43	21	-6	31	30	.26	-1.05	.17	1.3	4	5	8	18	NW	
Plover	Pocahontas		..	26 6		53	20	-6	31	33	.25	..	.20	2.5	2	15	1	15	S	
Pringhar	O'Brien		..	24 8		60	20	-10	31	27	.20	...	.20	2 0	1	17	0	14	SW, NW	
Ridgeway	Winneshiek		..	26 3	....	52	22	-6	31	29	1.25		.88	1.3	11	9	9	13	NW	
Ruthven	Palo Alto		..	21 8		44	21	-9	24	34	.21	....	.10	1 5	3	20	1	10	NW	
Sheldon	O'Brien	1,406	..	25.2		48	20	-9	31	28	.50	..	30	5.0	4	17	3	11	S	
Sibley	Osceola	1,506	6	24 6	*5 2	50	20	-10	31	35	57	-.13	.30	3.2	4	10	13	8	N	
Sioux Center (a)	Sioux		..	25.4		47	20,21	-10	31	31	.60		50	1.0	2	13	4	14	NW	
Spirit Lake (f)	Dickinson		5	20.1	-1.0	50	20	-10	31	30					....	....			NW	
Storm Lake (a)	Buena Vista		10	25 0		50	20	-7	31	27	.34	-.58	.25	2.5	4	15	4	12	NW	
Washta	Cherokee	...	..			..			...	. .	.40		.20	4 0	3	15	5	11	NW	
Waverly	Bremer	942	..	25 2		52	22	-3	31	29	67		45	2.9	6	16	1	14	NW	
West Bend*	Palo Alta	...	6	23.0	*5.1	50	20	-6	31	....	.48	-.40	.40	4.0	2	12	6	13	NW	
West Union	Fayette	1 105	..	....	.	..	.....	...	....		.35	...	.20	3.5	3	....	....		NW	
Average	.....	.....		24 1	*3 1	49.4		6.2	.....	31.0	.42	-.65		2.3	3	13	5	13	NW	

CENTRAL SECTION

Amana	Iowa		23	27 8	*6.0	53	22	-2	31	28	.44	-1.00	.14	0.5	7	12	9	10	NW	
Ames	Story	938	19	27.2	*5.4	60	22	-3	31	33	.19	-.80	.09	...	3	16	5	10	.....	
Baxter	Jasper		..	26.6		55	22	-8	31	36	.97	....	.36	2.9	6	6	12	13	NW	
Belle Plaine	Benton	840	9	25 4	*1 5	56	21	-2	31	36	.55	-.78	.20	4.5	4	9	15	7	W	
Buckingham	Iowa	...	..	....	...	..	.....	...	.. ...	...	27	....	.16	2 7	4	12	10	9	.....	
Carroll	Carroll		9	27.4	*4.1	56	20	-4	31	34	.30	-.67	.30	3.0	2	20	4	7	.....	
Cedar Rapids	Linn	944	17	27.6	*2.9	54	22	-4	31	27	.92	-.72	.40	2 4	3	11	8	12	NW	
Clinton	Clinton	609	8	28 5	*2 2	52	21	-3	31	30	.26	-.88	.15	.8	4	9	7	15	W	
Coon Rapids	Carroll	..	..	27.5		52	22	-4	31	30	.38		.20	.3	3	16	7	8	NW	
Davenport	Scott	615	27	29 4	*1 8	53	22	0	31	27	.21	-1 42	.11	0.5	4	13	6	12	W	
Delaware	Delaware	1,018	8	24 8	*3 4	50	22	-9	31	30	.58	-.94	.24	5.0	5	9	8	14	NW	
Denison	Crawford	1,182	6	27.4	*5.1	55	21	-4	31	32	.20	-.21	.20	2.0	2	15	7	9	N	
Des Moines	Polk	867	21	28 7	*3.0	54	21	-2	31	30	.35	-1.03	.13	3 0	7	7	9	15	NW	
De Soto	Dallas	866	..	29 0		53	21	-3	31	27	.39	....	.11	2 6	4	16	3	12	NW	
Dubuque	Dubuque	655	..	27 4	*0 9	51	22	-3	31	27	.42	-1 25	.13	2 4	8	9	8	14	W	
Fort Dodge	Webster		..	25.4	....	52	20	-5	31	37	.10		10	1.0	1	15	1	15	NW	
Fruitland	Muscatine		..	28.8		55	22	-1	31	35	.34	.....	.20	1.4	3	18	3	10	W	
Galva	Ida		6	26.6	*4 2	56	1	-5	31	37	.30	- 42	.30	3.0	1	..	..	..	N	
Gilman	Marshall	1,053	..	...	...	..	....	..	... ...	.	.44	.	.27	1.0	4	15	3	13	N	
Grinnell	Poweshiek	1 011	9	27.6	*2 8	52	21	-2	31	28	.70	-.50	.43		5	8	12	11	W	
Grinnell (near)	Poweshiek		..	26 4	....	52	22	-3	31	27	.90	...	.55	5.0	4	11	5	15	NW	
Grundy Center	Grundy	966	8	26.0	*3.0	49	22	-3	31	28	.65	-.63	.30	4 5	6	15	3	13	NW	
Guthrie Center (h)	Guthrie	1,269	..	29.3		51	20	-5	31	38	.84	.....	.30	4 4	5	17	3	11	N	
Harlan	Shelby		..	27 2	...	52	21	-4	31	37	67	...	.15	3.9	8	10	8	13	NW	
Independence	Buchanan	921	37	24 3	*3.2	50	22	-2	31	30	.62	-.76	.23	4 4	5	13	7	11	NW	
Iowa City	Johnson	644	9	27 6	*0 6	54	22	1	31	31	.75	-.89	.32	2.0	4	9	11	11	NW	
Iowa Falls	Hardin	...	6	24.2	*3.2	48	22	-5	31	30	.55	-.55	.25	5.5	3	15	0	16	NW	
Le Claire	Scott		.		...				...		.20		.09	0.4	6	..	.	..	.....	
Logan	Harrison	928	34	26 4	-0 4	54	20	-6	31	32	1.08	-.22	40	10.0	5	17	6	8	S	
Marshalltown	Marshall	858	7	27.1	*3.5	53	21 22	-4	31	32	.87	-.77	45	3 7	10	15	3	13	NW	
Monticello	Jones	800	45	25 0	*2 9	50	21	0	26,30	35	.30	-1 92	.20	3.0	2	13	5	13	NW	
Mt. Vernon	Linn		..	26.2		53	22	-6	31	33	.56	.....	.20	3 2	5	13	4	14	SW	
Newton	Jasper	958	12	27.0	*5 1	54	21	-5	31	39	.97	- 30	.52	4.0	3	12	5	14	NW	
Odebolt	Sac		..	26.8	---	52	21	-4	31	34	50	...	.50	3.0	1	15	3	13	.....	
Ogden	Boone	1,109	.	24 5		51	21	-6	31	33	.16	....	.09	.5	4	10	2	19	NW	
Olin	Jones		..	28 0		52	22	1	31	32	.20	.....	.10	2.0	2	13	5	13	N	
Onawa	Monona	..	..	28 8	..	57	17,21	-2	31	34	.41	.....	.14	...	7	18	1	12	NW	
Perry	Dallas		.	28.2	....	55	21	-7	31	32	.20	...	.20	2 0	1	13	3	15	NW	
Rockwell City		1,219	..	26.3		53	21	-5	31	29	.63	...	.50	5 2	3	15	4	12	.....	
Sac City	Sac	900	20	27 0	*3.6	52	20,21	-4	31	31	.34	-.90	.27	3.4	2	17	2	12	NW	
Scranton	Greene		...	28 2	....	51	21	-3	31	34	.25		.25	3.0	1	21	2	8	NW	
Sioux City	Woodbury	1,112	10	28.2	*2.0	56	20	-5	31	33	.35	- 51	.14		5	11	8	12	NW	
Toledo	Tama		5	28.0	*4.7	57	22	-2	31	38	.65	-.53	.30	6 5	4	*13	6	12	SW	
Vinton*	Benton	800	9	26.1	*1.5	53	22	-5	31		2 70	*1.47	2.50		3	..	..	..	NW	
Waterloo	Black Hawk	862	20	26 3	*3.0	51	22	-7	31	30	.98	-.25	.60	2 7	5	12	5	14	SE	
Wilton Junction	Muscatine		..	28.5	..	54	22	0	31	28	.35	.....	22	2.0	3	14	6	11	NW	
West Branch	Cedar		..	28.4	....	48	18	2	31	30	.10	.....	.10	.1	1	14	6	11	NW	
Whitten (g)	Hardin		..	27 0	....	49	21	-5	31	36		...	..	.	.	..	..	.	NW	
Average	.....	.....		27 2	*3 1	52.7	..	-3.5	.....	32.0	0 51	-.69		3 0	4	13	6	12	NW	

*Used to indicate the plus sign.

CLIMATOLOGICAL DATA FOR DECEMBER, 1900—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PREC. IN INCHES				Number rainy days.	SKY.			Prevailing direction of wind.	OBSERVERS.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted.)		Number clear days.	Number partly cloudy days.	Number cloudy days.		
Afton	Union	....	....	28.6	.....	51	21	-5	31	32	.25	.....	.10	2.0	3	12	6	13	NW	
Albia	Monroe	945	....	29.8	....	62	23	-3	31	40	.60	.....	.50	1.0	2	12	3	16	NW	
Atlantic	Cass	....	8	27.8	*2.9	55	21	-1	31	38	1.24	- .06	.45	9.5	6	11	7	13	NW	
Batavia	Jefferson	640	....	.....	.....	...	...	...	....	.....	.10	.....	.10	T	1	....	....	....	....	
Belknap	Davis	857	....	29.6	....	55	21	-1	31	32	1.06	.....	.84	1.0	4	15	9	7	NW	
Bonaparte	Van Buren	....	8	30.4	*1.6	56	22	3	31	33	T	-1.72	T	T	0	....	....	....	....	
Burlington	Des Moines	....	....	31.2	....	57	22	5	31	31	.54	....	.26	2.0	3	14	4	13	....	
Bussey	Marion	....	....	....	.....	....	....	....	....	.....	1.01	.....	.90	1.1	3	....	....	....	.....	
Centerville (*a*)	Appanoose	1,013	6	31.2	*0.9	56	22	-2	31	28	.50	-2.62	.50	T	1	16	9	6	SE	
Chariton	Lucas	1,030	....	29.2	....	55	22	-2	31	30	.48	.....	.26	1.4	7	12	12	7	NW	
Clarinda	Page	1,069	9	29.7	*2.5	54	20	-3	31	35	.50	- .67	.22	4.5	6	17	4	10	NW	
College Springs (*b*)	Page	....	8	30.0	*2.0	56	18	-2	31	44	.42	-1.08	.17	3.1	5	17	4	10	NW	
Columbus Junct	Louisa	....	....	29.4	....	56	22	1	31	31	.12	...	.11	.5	2	14	7	10	S	
Corning	Adams	1,127	7	29.0	*2.4	52	21	-2	31	31	.12	- .87	.05	1.2	3	15	2	14	NW	
Council Bluffs	Pot'wat'mie	989	....	31.4	....	60	17	0	31	37	.56	.....	.30	3.5	4	16	1	14	S	
Crawfordsville	Washington	....	....	....	....	....	....	....	....	.....	.23	.....	.09	.5	3	19	3	9	NW	
Cumberland	Cass	....	....	....	....	....	....	....	....	.....	.30	.....	.20	3.0	2	15	3	13	S	
Danville	Des Moines	715	....	.....	....	....	....	....	....	.....	.11	.....	.10	0.1	2	14	3	14		
Eldon	Wapello	....	....	29.4	....	56	21	-1	31	36	.46	.....	.21	1.3	3	14	3	14	NW	
Emerson	Mills	....	....	....	....	....	....	....	....	.....	.57	.....	.35		4	....	....	....	....	
Fort Madison	Lee	516	51	.....	.....	.....	.....	.....	....	.....	.35	-1.68	.19	1.1	3	10	6	15	SW	
Glenwood	Mills	979	29	31.4	*6.5	59	17	-2	31	39	.23	- .58	.08	2.2	4	14	7	10	NW	
Greenfield	Adair	....	8	28.0	*5.4	56	21	-5	31	31	.13	-1.33	.05	1.2	5	15	7	9		
Hedrick	Keokuk	....	....	27.4	....	54	21, 22	-4	31	30	.40	....	.26	1.4	4	14	3	14	NW	
Hopeville	Clarke	....	....	28.8	.....	53	22	-3	31	25	.26	.....	.10	....	6	10	11	10	NW	
Indianola (*b*)	Warren	....	....	25.8	....	53	21	-3	31	28	.28	....	.10	2.0	4	10	4	17	NW	
Keokuk	Lee	618	28	31.4	*1.0	57	21	7	31	31	.25	-1.61	.09		4	16	2	13	NW	
Keosauqua	Van Buren	....	7	30.8	*3.6	57	22	3	31	31	.58	- .90	.37	1.0	3	....	....	....	....	
Knoxville	Marion	....	6	27.2	*1.7	55	21, 22	-6	31	37	.20	-1.03	.10	2.0	3	13	4	14	NW	
Lacona	Warren	....	....	....	....	....	....	....	....	.....	.38	.....	.20	2.3	5	7	14	10	....	
Lenox (*a*)	Taylor	....	....	27.4	....	51	21	-5	31	31	.24	.....	.08	1.1	5	....	....	....	NW	
Mooar	Lee	....	....	29.5	.....	55	17, 22	10	26, 30, 31	35	T	....	T	....	0	14	11	6	NW	
Mt Ayr	Ringgold	1,236	6	29.1	*3.6	53	21, 22	-3	31	30	.38	- .91	10	2.0	7	8	11	12	W	
Mt. Pleasant	Henry	725	....	30.6	....	57	22	2	30	31	.17	.....	.09	....	2	15	9	7	NW	
Omaha	Douglass	1,113	25	32.1	*5.0	63	17	-2	31	32	46	- .48	.17	3.4	6	13	6	12	NW	
Osceola	Clarke	1,123	....	28.7	....	54	20, 21	-4	31	30	.26	....	.10	2.0	3	....	....	....	NW	
Oskaloosa	Mahaska	850	16	28.1	*1.9	55	21, 22	-3	31	33	1.10	- .05	.47	2.3	5	14	2	15	NW	
Ottumwa	Wapello	630	5	30.4	*2.7	58	22	0	31	25	.47	-1.32	.45	0.2	3	16	2	13	SE	
Ovid	Wayne	....	6	29.4	*2.9	56	22	-4	31	33	.64	- .94	.24	1.2	6	16	0	15	NW	
Pacific Junction	Mills	960	....	31.0	.....	57	21	-1	31	33	.39	.....	.20	1.9	6	11	8	12	W	
Pella (*a*)	Marion	....	....	27.4	.....	54	21	-6	31	37	.13	....	.07	1.2	3	10	11	10	NW	
Red Oak	Montgom'ry	1,033	....	29.4	.....	56	20	-4	31	33	.43	..	15	2.3	5	15	1	15	N	
Sigourney	Keokuk	....	....	28.8	....	57	22	-1	31	31	.56	..	.21	T	4	14	8	9	W	
Stuart	Guthrie	....	....	26.7	.....	58	20	-6	30	35	.10	..	.05	1.0	2	20	0	11	NW	
Thurman	Freemont	....	....	30.4	....	54	17	-2	31	34	.22	..	.18	....	3	15	1	15	SWNW	
Villisca	Montgom'ry	1,058	6	31.6	*7.6	55	2	-4	31	42	1.33	* 33	.50	7.0	6	16	4	11	SWNW	
Wapello (*b*)	Louisa	578	....	31.4	....	54	19, 22	6	31	33	.35	.....	.13	0.8	4	....	....	....	NW	
Washington	Washington	....	9	27.2	*0.9	56	22	-4	31	34	.30	- .92	.18	0.5	3	....	....	....	NW	
Winterset	Madison	....	8	28.4	*2.8	54	21	-3	31	29	.23	-1.12	.08	1.0	4	....	....	....	....	
Woodburn	Clarke	....	....	.....	.....	....	.....	....	....	....	.35	.....	.15	2.0	5	13	5	13	.....	
Average		....	....	29.4	*3.1	55.7	.....	-1.5	....	33.0	0.41	- .97	....	1.8	4	14	5	12	NW	
Av. for the state		....	....	26.9	*3.1	52.6	.....	-3.7	....	32.0	0.45	- .77	....	2.4	4	13	6	12	NW	

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P. M. observations. ‡Received too late to be computed with means. *a*, One day missing; *b*, two days, etc.

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR DECEMBER, 1900.

STATIONS.		DATE.																														Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton.....	Max...	48	40	41	40	42	38	36	46	40	31	27	44	37	32	30	39	47	49	46	50	51	48	36	34	30	35	33	22	35	25	12	37.5
	Min..	22	31	28	26	24	25	26	19	8	13	16	17	15	19	20	26	21	30	25	20	30	34	18	18	18	21	25	7	11	9	—5	19.7
Albia.....	Max. .	47	46	40	44	45	53	35	46	55	29	35	45	41	37	35	36	47	54	47	50	47	59	62	35	28	35	40	34	34	33	25	41.9
	Min...	22	24	27	30	24	25	25	18	10	10	12	15	14	16	12	16	18	23	23	37	23	30	22	11	9	8	12	8	11	13	—3	17.6
Alta	Max..	44	32	32	41	41	30	32	44	15	30	28	39	26	26	28	36	48	44	46	52	51	36	20	13	25	34	20	20	34	12	6	32.0
	Min	24	30	28	26	20	27	20	24	2	9	10	20	10	12	22	26	26	24	22	22	32	23	15	7	0	14	17	3	10	—2	—7	16.7
Amana ...	Max...	35	40	38	39	41	31	34	42	38	26	22	42	35	27	32	36	38	46	45	43	49	53	46	23	19	28	33	27	35	32	16	35.3
	Min...	26	32	34	32	26	23	26	19	11	11	12	14	14	19	22	29	36	29	22	18	32	41	22	14	5	3	21	8	11	16	—2	20.3
Ames	Max .	38	40	36	41	47	35	35	46	36	28	26	43	28	28	47	35	37	46	47	51	49	60	39	23	23	30	32	22	37	31	17	30.5
	Min..	2	20	32	28	26	23	26	21	6	6	11	16	13	18	15	27	31	30	23	18	25	35	20	12	8	4	18	7	11	9	—3	17.8
Atlantic ...	Max..	50	41	35	44	45	37	36	49	33	34	33	46	40	31	31	42	52	47	50	52	55	43	31	19	27	36	37	21	35	29	8	37.7
	Min...	19	28	31	29	19	25	21	21	10	11	15	21	16	25	26	25	19	23	18	14	34	30	18	12	1	12	16	6	5	5	—1	17.8
Bancroft..	Max...	38	38	43	38	48	35	35	45	22	28	26	38	23	27	32	35	43	42	40	51	48	44	31	21	20	33	25	29	23	18	10	33.2
	Min...	18	20	28	26	18	25	21	20	—1	8	6	14	11	17	22	30	31	2	20	19	29	31	13	7	0	4	15	—2	4	2	—8	15.3
Baxter.. ..	Max ..	46	42	35	39	47	35	36	47	22	33	29	44	31	23	31	47	36	49	47	50	54	55	23	21	31	30	33	26	37	32	9	36.2
	Min ..	24	32	28	23	26	25	19	7	11	10	13	12	16	13	21	29	27	23	19	21	33	19	11	11	19	14	7	9	18	—4	—8	17.0
Belknap...	Max..	46	47	39	40	48	39	35	48	23	32	44	47	42	33	38	41	42	48	48	50	55	54	25	26	27	34	35	25	39	35	16	38.7
	Min...	25	30	32	31	26	28	30	20	12	12	15	15	17	11	19	23	31	28	20	25	32	33	22	15	12	9	20	11	15	16	—1	20.5
Bonaparte.	Max...	37	50	43	39	47	38	36	48	35	31	26	48	38	28	38	39	44	48	46	48	54	56	49	27	28	29	35	33	36	40	20	39.2
	Min...	24	30	32	33	27	24	32	20	15	12	14	15	16	22	18	30	34	27	23	18	31	41	24	15	14	6	23	13	11	20	3	21.5
Britt.....	Max ..	37	35	35	39	39	39	33	43	31	26	22	38	23	26	29	34	41	43	39	49	48	44	32	16	15	31	30	20	31	21	4	32.0
	Min...	18	26	30	23	21	21	21	18	0	6	3	15	7	17	17	26	29	26	17	16	29	31	15	8	—2	—1	15	—3	6	3	—7	14.5
Burlington.	Max...	37	52	39	41	45	39	36	43	38	28	46	36	33	27	34	41	41	47	46	44	52	57	49	27	25	29	39	33	35	42	25	38.9
	Min. .	30	31	35	35	27	28	30	22	16	16	18	17	18	25	23	30	34	30	26	22	33	33	25	17	15	10	25	14	15	24	5	23.5
Carroll.	Max..	46	34	48	34	47	40	46	47	22	34	31	44	30	28	35	38	33	48	54	56	55	38	26	22	21	34	24	22	35	28	18	36.1
	Min...	29	27	22	26	34	30	32	20	5	6	12	16	12	14	20	23	22	24	20	18	44	36	18	9	0	15	18	4	17	9	—4	18.6
Centerville	Max...	48	47	46	41	48	38	39	47	40	33	27	46	39	31	32	40	47	49	50	49	54	56	36	..	32	33	35	29	33	35	14	39.8
	Min...	24	31	31	31	26	30	28	20	12	12	15	17	17	23	19	28	28	30	31	22	34	38	22	11	11	12	23	11	21	12	—2	21.5
Cedar Rap	Max..	33	41	40	40	40	36	35	43	36	26	24	43	27	25	31	35	38	48	46	45	50	54	48	22	16	27	33	23	35	30	14	35.0
	Min...	26	31	34	32	26	21	22	20	11	12	13	16	14	19	23	27	34	30	21	20	32	41	21	13	5	6	22	8	13	13	—4	20.2
Chariton...	Max..	47	46	36	43	48	36	35	48	39	34	28	45	37	32	30	38	43	53	50	50	54	55	41	22	25	32	33	25	35	31	12	38.2
	Min .	23	30	32	31	24	28	25	20	11	11	15	18	16	22	17	27	27	28	25	20	33	37	21	13	9	12	24	9	11	11	—2	20.3
Charles Cy.	Max .	32	37	34	35	35	34	34	42	32	24	21	37	26	20	28	32	34	42	38	40	43	45	38	32	28	25	22	19	32	27	17	31.8
	Min...	15	30	32	29	23	21	21	20	4	7	6	13	9	15	20	26	30	28	21	15	29	35	16	9	1	—4	12	4	7	11	—4	16.2
Clarinda...	Max..	52	44	36	45	44	40	38	51	35	35	34	48	44	34	31	43	53	49	47	54	52	46	30	26	29	37	35	26	38	27	10	39.1
	Min...	23	29	31	27	24	30	23	21	12	12	16	19	18	28	24	30	24	26	23	19	33	28	22	13	8	20	19	11	12	8	—3	20.3
Clear Lake	Max...	32	35	32	38	37	35	32	44	34	23	24	35	24	22	28	33	35	42	37	46	46	42	42	20	18	28	30	22	35	30	12	32.0
	Min...	17	25	30	24	21	21	20	18	0	5	3	14	6	13	18	26	30	8	19	16	30	32	14	6	—1	0	15	1	11	4	—7	14.8
Clinton .	Max.	38	45	38	41	37	39	35	41	36	23	25	42	33	25	29	37	45	47	46	42	50	52	49	25	20	27	40	33	34	38	25	36.7
	Min ..	29	31	34	34	26	20	22	17	13	10	10	12	15	20	23	27	32	30	20	17	29	38	23	15	10	7	21	12	10	24	—3	20.3
College Sp.	Max .	51	..	37	45	43	39	38	50	55	34	31	46	44	35	32	44	54	56	..	52	52	45	32	28	32	37	35	26	36	29	11	39.6
	Min..	26	.	28	25	22	34	30	21	11	13	15	17	20	28	23	30	25	26	22	21	31	32	22	12	8	14	24	11	12	11	—2	20.4
Columbus J	Max .	42	46	39	42	45	36	40	46	39	29	24	45	33	28	33	39	39	47	47	48	53	56	50	25	20	26	40	34	35	37	18	38.1
	Min..	32	32	33	29	25	24	30	20	13	12	15	16	1	17	23	29	32	29	27	21	31	40	22	13	7	8	9	10	12	17	1	20.8
Coon Rap..	Max...	46	41	34	42	42	37	34	45	36	29	25	42	32	29	30	39	42	45	4	49	52	45	35	22	23	34	35	22	32	31	12	35.8
	Min...	23	32	30	25	28	25	22	22	6	11	15	22	14	18	22	28	22	30	24	22	3	30	19	10	5	18	18	7	11	5	—4	19.2
Corning ...	Max...	50	40	35	42	42	38	36	48	40	30	30	45	40	31	31	40	50	51	46	50	52	45	36	25	28	35	35	24	35	30	10	37.7
	Min...	22	32	31	29	22	25	25	21	9	12	15	20	18	23	25	23	25	26	23	19	35	34	20	11	8	18	21	10	20	10	—2	20.3
Co. Bluffs..	Max .	54	40	37	51	44	42	42	54	29	34	34	50	50	35	39	50	60	49	51	58	58	42	33	22	30	41	30	28	45	30	17	41.3
	Min ..	28	28	20	26	25	35	24	23	12	10	18	21	21	25	37	30	26	26	22	21	32	26	22	14	9	26	20	16	16	5	0	21.4
Cresco	Max...	31	36	34	34	31	34	30	38	11	21	15	35	16	18	26	30	34	40	36	38	41	46	37	12	15	24	26	17	30	17	6	28.0
	Min...	19	30	31	26	21	18	17	16	3	5	2	12	7	13	19	21	29	29	23	17	28	36	14	7	3	—3	12	1	8	6	—4	15.1
Davenport.	Max..	34	48	38	39	41	35	36	44	32	26	25	44	31	24	30	38	41	45	47	44	49	53	46	24	18	26	42	28	34	38	19	36.2
	Min.	29	32	34	34	28	26	26	22	13	13	18	17	16	20	21	27	31	32	29	23	35	41	23	14	10	10	25	12	15	19	0	22.6
Decorah....	Max...	33	37	34	35	32	37	31	40	15	21	20	38	21	20	28	33	35	42	38	39	44	47	27	17	12	27	32	19	32	22	12	29.7
	Min. .	22	32	32	29	24	19	25	15	5	4	5	9	9	14	19	19	30	31	15	13	25	33	26	12	5	—3	14	3	7	12	—4	16.2
Deleware..	Max..	34	34	35	35	31	34	32	40	35	24	20	41	28	21	28	32	37	44	42	42	45	50	45	20	15	28	31	25	35	30	17	33.3
	Min	23	23	30	30	23	19	19	12	7	7	8	10	10	14	20	22	30	30	22	16	30	37	17	10	2	3	17	3	8	10	—9	16.2
Denison...	Max..	48	40	33	46	44	35	37	47	33	32	32	44	34	29	29	41	52	47	48	54	55	44	34	14	24	34	35	21	36	30	7	36.8
	Min .	23	32	30	29	23	23	25	25	6	11	13	22	13	13	25	28	22	27	19	25	34	28	15	9	2	2	18	7	11	5	—4	18.1
Des Moi'es	Max .	47	43	37	41	47	38	37	49	28	31	27	47	31	30	31	39	45	52	49	51	54	52	30	17	23	33	34	25	37	29	10	36.9
	Min .	24	31	34	31	27	28	25	24	10	13	15	20	17	20	18	28	30	30	26	21	35	30	17	14	10	10	18	10	13	4	—2	23.4
DeSoto	Max...	47	40	36	41	43	39	35	46	26	27	25	45	33	32	32	40	45	49	45	48	53	50	33	22	24	36	31	35	29	7	36.2
	Min.	23	34	34	33	27	25	24	23	9	13	15	21	18	21	25	31	30	31	29	21	37	33	22	14	10	26	20	10	11	7	—3	21.7
Dows	Max .	34	36	34	39	41	36	35	45	38	27	23	41	24	24	27	33	37	46	42	49	49	49	38	19	17	23	30	19	35	31	9	33.2
	Min ..	20	26	30	24	21	21	21	18	3	7	5	15	8	16	15	25	30	26	18	15	30	33	15	8	—2	—4	4	—1	7	7	—6	14.7
Dubuque...	Max. .	34	36	36	38	37	35	34	40	27	22	22	41	26	24	27	34	40	48	46	43	47	51	47	20	16	26	34	25	36	33	18	33.6
	Min ..	30	32	34	33	29	25	23	20	11	10	14	15	15	17	22	26	32	34	26	23	33	43	20	12	9	9	23	9	13	18	—3	21.2
Eldon	Max ..	41	48	41	41	46	36	37	49	38	31	26	47	38	30	32	38	47	52	48	51	56	52	49	28	27	31	36	32	37	37	18	39.4
	Min. .	21	29	32	29	26	21	28	18	12	10	11	13	16	20	16	27	31	28	21	15	29	41	21	14	12	5	21	9	9	16	—1	19.4
Elkader....	Max..	35	37	35	36	39	36	38	45	22	32	25	42	28	21	30	32	38	51	49	45	47	54	31	16	18	26	32	24	41	29	11	33.7
	Min ..	21	33	33	30	22	18	27	17	9	14	9	10	11	16	21	25	30	27	25	15	31	39	18	10	6	—2	18	3	18	12	0	18.3
Estherville	Max..	40	40	32	39	41	35	33	40	17	28	27	35	22	28	24	35	35	45	40	52	50	50	25	17	22	30	26	21	26	27	26	32.5
	Min ..	5	29	26	26	20	18	19	15	—3	10	3	12	7	7	13	25	27	23	20	19	25	25	11	7	—6	—3	3	1	5	3	2	12.7
Forest City	Max...	33	38	32	35	32	35	28	42	33	25	22	37	23	21	21	33	34	43	38	42	47	42	34	15	20	28	21	30	30	28	8	30.7
	Min...	19	28	20	31	28	26	20	18	—1	5	2	15	6	14	17	24	28	27	20	18	29	32	14	7	6	7	5	6	8	5	—8	15.4
Ft. Dodge	Max...	42	41	38	43	44	36	35	46	39	40	29	42	38	28	28	35	43	44	46	52	51	47	32	15	16	32	32	22	33	30	7	35.7
	Min..	19	28	29	23	22	19	23	15	3	10	8	18	10	14	18	25	28	25	16	15	31	30	14	9	0	—4	17	2	10	0	—5	15.2
Fruitland..	Max...	44	50	42	40	45	40	40	45	35	29	26	35	32	28	40	42	40	47	42	51	50	55	28	27	21	27	41	30	36	39	20	37.6
	Min .	32	35	34	33	35	32	19	15	14	9	10	11	14	18	24	22	26	28	28	16	28	35	24	12	9	3	20	11	6	18	—1	20.0
Galva.....	Max ..	56	40	33	44	44	39	36	43	30	37	31	32	29	30	30	30	49	49	45	52	54	44	31	19	25	38	30	24	35	31	15	36.0
	Min .	21	30	30	33	19	19	22	21	5	11	20	26	11	15	26	29	24	22	16	25	30	20	15	9	0	15	17	4	—2	1	—5	17.2
Glenwood..	Max .	45	40	45	44	42	41	54	40	38	36	35	49	47	39	34	51	59	53	50	56	58	49	33	31	29	39	40	26	40	35	16	41.7
	Min...	36	35	31	22	32	29	23	11	14	13	17	24	18	25	26	30	23	27	19	20	36	30	22	13	10	13	20	16	16	9	—2	21.2
Greene. .	Max.	35	37	35	37	40	38	35	44	22	27	25	40	30	22	30	32	35	44	40	45	46	47	40	19	18	27	32	22	35	30	10	32.9
	Min...	17	19	32	28	24	21	23	19	5	7	8	14	10	16	18	26	31	27	18	16	27	34	19	11	2	0	21	4	9	20	—3	16.8
Greenfield.	Max..	51	43	37	40	46	39	35	47	34	32	31	45	35	33	31	39	49	48	50	51	56	49	35	19	30	38	34	25	26	24	8	37.4
	Min ..	23	32	32	23	21	26	23	22	7	8	14	19	14	18	22	22	24	27	23	20	32	31	19	11	5	20	19	5	7	8	—5	18.5
Grinnell....	Max. .	34	41	35	37	42	32	33	42	37	28	22	42	34	27	29	35	37	45	40	45	52	52	44	25	31	28	32	23	34	31	12	35.1
	Min.	25	30	32	30	21	28	26	21	8	12	11	16	12	16	16	26	32	28	24	22	32	39	20	13	8	6	20	6	13	11	—2	20.1
Grin'l (nr.)	Max. .	38	41	37	36	43	36	33	43	31	26	25	42	32	27	29	34	34	40	46	45	51	52	40	22	22	29	32	22	33	29	10	34.2
	Min . .	25	29	32	30	23	26	25	19	9	12	12	15	12	17	15	25	32	27	23	18	30	38	20	12	8	3	21	5	10	10	—3	18.7
Grundy C'r	Max...	34	40	34	36	41	41	34	43	36	20	24	43	35	24	29	32	35	47	45	46	48	49	45	21	18	26	32	26	34	30	12	34.4
	Min . .	20	29	32	28	21	21	26	19	6	8	8	15	11	14	16	28	32	26	21	18	32	37	19	11	1	2	19	5	7	11	—3	17.0
Guthrie C'r	Max...		45	..	.	..	..		..	..	44	44	45	49	42	37	47	50	48	47	51	50	50	41	22	25	34	34	33	34	32	19	40.1
	Min...	..	30	32	30	22	..	26	20	6	10	16	21	14	17	22	28	23	29	22	18	12	33	20	11	7	21	22	8	11	10	—5	18.5
Hampton..	Max	33	36	34	38	42	36	34	41	17	30	23	40	30	23	30	39	36	45	42	49	50	48	25	13	20	28	31	20	37	17	6	32.0
	Min...	19	28	31	26	22	24	21	19	3	8	7	14	10	17	16	26	30	30	24	19	31	35	14	8	0	3	15	6	11	6	—5	16.7
Harlan.....	Max ..	49	37	33	44	42	36	35	48	35	31	30	46	36	33	30	43	51	45	45	42	52	41	30	18	26	36	34	20	35	23	7	36.2
	Min..	23	32	30	28	21	24	24	21	7	11	15	19	15	19	25	25	20	23	22	15	29	29	18	10	5	20	16	7	6	6	—4	18.1
Hedrick ...	Max ..	37	46	47	38	45	35	34	45	37	27	23	44	34	31	32	37	43	48	47	46	54	54	46	26	27	32	36	32	36	14	24	37.4
	Min .	22	28	31	30	25	24	24	18	12	10	14	14	9	19	14	29	33	27	24	16	30	38	20	10	8	2	20	8	10	—4	—4	17.5
Hopeville..	Max ..	47	42	36	42	43	38	34	45	35	30	27	43	37	32	29	38	46	50	47	49	51	53	34	21	26	33	33	21	35	29	10	36.6
	Min...	25	32	32	30	25	30	25	22	10	13	10	19	17	23	20	28	26	28	25	25	33	33	21	12	9	20	19	10	13	9	—3	20.9
Humboldt..	Max..	40	30	33	42	40	36	36	44	37	27	25	40	33	28	28	36	39	46	..	50	52	44	33	20	18	28	21	22	32	30	8	33.5
	Min.	19	30	31	26	22	22	20	18	3	13	7	16	11	16	18	26	29	26	..	18	20	30	17	10	2	0	14	2	10	8	—5	10.0
In'pend'ce.	Max.	38	38	37	36	35	35	33	43	17	27	22	41	26	21	29	32	36	45	42	42	44	50	25	14	15	23	32	18	34	25	4	31.0
	Min..	22	29	32	30	24	21	27	17	7	8	8	11	10	15	20	25	30	28	24	17	28	35	21	11	2	—1	19	4	6	18	—2	17.6
Indianola	Max. .	47	42	36	40	45	39	35	.	36	29	26	44	40	30	30	..	42	48	47	50	53	45	22	14	20	33	33	19	32	22	12	32.0
	Min.	24	33	32	30	25	29	27	22	9	11	14	19	14	21	16	..	27	29	23	21	35	43	21	12	8	31	..	8	11	12	—3	19.5
Iowa City..	Max...	35	37	37	39	44	35	34	35	28	27	24	44	35	27	33	34	38	48	47	46	51	54	38	24	18	26	36	30	36	34	17	35.2
	Min .	24	32	33	33	26	22	26	18	12	9	12	13	14	18	22	28	34	30	23	18	28	38	17	16	6

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR DECEMBER, 1900—CONTINUED.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Keosauqua	Max	34	51	41	39	48	38	36	35	35	33	35	45	36	30	31	38	44	49	44	50	55	57	45	28	26	30	35	29	38	40	22	38.6
	Min	23	32	34	33	28	24	28	22	17	13	14	17	22	22	17	31	35	30	26	19	32	43	25	19	15	11	25	14	14	21	3	22 9
Knoxville	Max	41	42	37	36	46	37	35	43	35	31	26	48	33	32	33	42	42	48	48	52	55	55	40	20	23	35	35	26	38	30	16	37.4
	Min	19	28	29	26	27	25	23	18	6	19	10	11	12	19	12	22	27	22	22	17	31	40	18	10	9	6	18	7	16	16	−6	17 0
Lansing	Max	36	36	38	36	36	37	38	44	40	27	24	40	36	20	28	32	38	48	46	42	44	52	46	22	20	24	32	29	37	33	20	34 8
	Min	30	30	34	32	28	21	26	18	8	7	10	10	12	14	18	24	28	34	20	16	30	38	20	12	8	2	22	5	5	20	0	18 8
Larrabee	Max	47	48	34	42	43	37	34	43	27	31	26	39	25	28	29	38	47	40	44	53	53	43	27	16	20	35	28	21	37	28	8	34 5
	Min	24	30	28	27	20	24	22	23	1	8	9	20	30	29	32	43	46	42	44	52	50	38	30	28	24	36	24	22	36	30	10	16.2
LeMars	Max	40	33	37	43	41	37	36	35	25	28	29	40	12	14	15	29	22	25	19	18	27	22	12	12	1	20	18	4	13	4	−5	34 5
	Min	31	29	28	25	20	28	27	25	4	12	10	22	38	33	..	31	49	49	46	49	51	45	37	26	28	34	34	22	34	30	13	17 0
Lenox	Max	48	41	35	40	42	38	37	45	40	31	30	43	19	23	39	24	26	26	25	23	31	36	20	11	8	19	21	9	13	11	5	20 7
	Min	26	31	30	29	24	30	27	22	9	12	14	19	17	23	..	24	26	26	25	23	31	36	20	11	8	19	21	9	13	11	5	20 7
Logan	Max	50	40	35	38	40	42	48	52	37	34	31	45	42	38	39	45	52	46	45	54	43	50	29	22	28	34	22	24	28	31	9	37 7
	Min	20	28	27	22	18	24	26	20	6	9	14	20	18	16	2.	24	20	18	17	15	30	18	17	2	22	2	4	5	7	5	−6	15 0
Marsh'l't'n	Max	36	44	38	38	43	35	35	44	39	27	24	40	36	20	28	32	38	48	46	42	44	52	46	22	20	24	32	29	37	37	20	34 8
	Min	21	30	32	28	24	23	26	21	7	11	10	16	12	24	15	30	38	20	12	8	22	22	12	8	5	0	18	6	28	32	0	16 2
Monticello	Max	35	38	42	37	32	25	19	11	9	10	8	9	15	17	20	33	55	52	50	49	54	55	51	44	39	29	43	28	37	32	30	41 4
	Min	29	28	29	26	25	27	39	37	40	31	33	36	37	40	32	19	20	21	24	15	25	20	19	19	16	10	21	12	13	10	10	17 6
Mooar	Max	48	50	43	45	46	44	20	19	17	13	12	14	18	19	19	19	20	21	47	47	51	53	53	33	26	28	35	18	33	25	10	37.8
	Min	20	22	26	22	20	38	37	47	40	33	30	45	40	32	30	39	50	47	27	21	32	33	20	12	9	18	21	1	9	10	2	2 4
Mt. Ayr	Max	50	43	36	44	45	38	27	19	10	11	13	17	24	24	22	27	42	52	46	45	53	57	39	23	13	13	7	22	38	33	28	40.9
	Min	24	31	31	27	25	30	45	46	40	38	25	48	39	31	34	41	30	27	23	17	30	50	23	13	17	22	2	22	32	20	2	20.3
Mt. Plea'nt	Max	43	48	41	41	32	25	22	30	16	13	10	16	14	18	16	29	30	27	23	17	29	30	26	17	14	4	2	23	31	20	9	34.0
	Min	23	30	32	32	38	43	35	37	43	22	30	30	44	33	23	35	36	51	49	46	53	53	26	19	14	12	4	23	21	5	−6	18.5
Mt.V.(Hub)	Max	32	35	36	38	43	25	22	27	..	9	9	11	11	11	21	25	32	43	43	40	53	49	36	16	12	0	1	30	20	8	−5	3 6
	Min	24	28	32	31	25	22	27	..	41	13	23	18	38	26	19	28	20	26	30	22	30	15	43	15	6	23	21	30	32	21	11	15 1
NewH'pton	Max	38	40	43	34	33	21	21	21	18	0	5	12	9	15	28	30	36	38	45	45	48	54	43	23	11	3	12	32	20	5	−5	36 3
	Min	20	29	30	28	21	21	40	45	43	27	23	44	41	28	30	10	14	33	35	44	37	45	32	19	12	20	29	16	35	18	−4	17 7
Newton	Max	39	42	37	37	43	40	40	24	19	7	11	19	5	14	23	27	23	26	18	18	29	27	14	8	2	8	18	1	10	1	−7	29.6
	Min	21	28	32	29	23	24	24	23	1	8	26	36	23	30	32	43	46	42	44	52	50	38	30	28	24	36	24	22	36	30	10	15 7
Northwood	Max	32	36	35	38	38	37	34	43	27	31	26	39	25	28	29	38	47	40	44	53	53	43	27	16	20	35	28	18	37	28	8	35 4
	Min	17	26	30	27	22	22	19	20	27	30	29	41	35	12	23	38	27	27	26	18	29	27	14	8	2	8	18	1	10	1	−7	16.2
Odebolt	Max	41	41	34	43	44	36	34	22	23	5	10	22	12	21	26	38	27	26	18	18	29	27	14	8	24	36	24	22	36	30	10	34 5
	Min	24	35	30	28	21	23	38	35	25	10	19	21	35	30	7	14	25	17	22	17	50	38	30	28	24	36	24	22	36	30	10	34 5
Ogden	Max	43	38	35	43	48	38	24	23	20	5	9	14	18	36	25	30	40	36	32	30	46	52	38	32	23	30	37	19	25	14	4	17.6
	Min	21	32	31	22	20	37	36	34	41	34	23	40	12	13.	17	22	26	33	31	52	26	56	28	21	30	18	11	24	19	12	−5	17.6
Olin	Max	39	37	37	40	37	28	20	16	12	28	34	33	48	46	24	26	29	33	47	31	57	47	21	30	18	11	15	4	13	4	−5	34 0
	Min	25	31	33	33	28	20	41	41	54	28	34	33	20	25	38	46	31	51	47	21	45	42	34	24	15	28	34	34	22	34	30	13	34 0
Om'ha Neb	Max	54	44	34	50	42	41	41	54	27	10	17	34	25	14	15	29	22	25	19	18	27	22	12	12	1	20	18	8	22	13	4	17.6
	Min	31	33	31	31	28	36	30	43	50	22	34	35	47	16	19	29	33	29	46	49	51	45	37	26	28	34	34	22	34	30	13	34 0
Onawa	Max	48	37	35	51	44	38	26	27	24	8	12	15	23	20	29	29	31	32	34	23	43	29	34	24	14	25	9	32	34	22	14	20 7
	Min	24	33	30	29	2	26	32	32	42	32	23	21	36	8	13	20	29	29	19	38	19	54	28	14	7	25	9	19	23	34	11	37 7
Osage	Max	31	35	33	35	36	23	19	18	22	2	7	4	46	42	31	38	29	30	26	22	28	50	26	48	22	25	2	19	25	34	9	33 9
	Min	17	30	30	28	21	23	34	48	22	9	15	19	24	45	16	21	17	31	29	30	15	34	55	39	20	25	11	25	34	1	31	16.2
Osceola	Max	42	36	42	48	37	47	48	22	9	33	29	45	16	21	17	29	39	43	45	55	58	43	25	22	28	34	22	24	28	31	9	37 7
	Min	32	32	32	25	27	26	22	9	46	10	13	24	45	34	20	34	20	15	28	32	34	20	29	22	18	16	25	12	24	28	13	37 2
Oskaloosa	Max	36	46	37	38	46	35	55	46	33	22	23	25	40	15	34	31	39	42	50	49	54	34	43	25	19	16	25	12	31	24	0	23 6
	Min	20	29	32	30	24	21	23	16	10	10	23	25	40	34	34	22	30	23	32	31	35	32	25	20	11	25	16	32	35	20	14	39.0
Ottumwa	Max	34	47	39	41	46	37	36	30	23	14	15	32	48	40	32	38	29	45	51	54	52	54	40	18	11	9	12	20	8	12	29	19 8
	Min	17	30	34	32	29	32	30	38	50	28	36	32	17	15	45	25	27	21	48	49	20	32	43	27	24	33	5	12	31	25	40	40 5
Ovid	Max	49	49	37	43	51	48	27	21	19	10	10	13	17	50	45	17	31	35	48	21	55	32	32	23	15	24	33	12	43	25	15	21 5
	Min	23	30	29	30	23	27	21	27	53	25	31	40	15	45	17	25	31	28	24	23	14	47	32	27	23	15	5	31	34	19	36	36.8
Pacific Jct	Max	53	42	37	48	45	45	40	34	22	13	12	15	19	17	25	40	25	30	38	23	47	54	47	26	12	35	36	26	6	35	7	34	18	28	−3	18.1
	Min	24	32	33	30	20	30	34	45	26	26	28	25	44	14	15	26	30	38	21	30	15	51	32	20	13	30	12	10	20	22	2	35	15	33	18	25	24	8	12	−6	10	31 3
Pella	Max	37	26	44	42	46	36	36	36	18	9	12	19	14	14	36	8	38	30	20	23	53	53	33	20	15	8	3	28	32	5	23	38	12	30	10	25	10	3	-10	11	40.2
	Min	26	28	27	25	25	25	25	18	9	37	30	25	44	36	30	20	23	20	10	12	45	50	30	15	8	28	32	11	20	21	6	25	4	34	17	33	20	2	23	31	37	18 7
Perry	Max	46	30	36	41	43	41	27	35	46	6	12	15	28	8	20	45	50	49	42	42	44	42	20	11	6	19	3	12	31	23	3	19	3	23	3	23	7	34 5
	Min	23	20	33	23	23	23	23	27	21	22	28	27	39	38	26	27	37	28	21	25	42	52	29	15	7	17	0	28	30	4	32	25	10	30	10	25	8	12	30	10	32	16 5
Plover	Max	45	40	35	43	42	36	40	24	28	0	15	6	22	30	20	30	40	21	25	42	50	51	47	29	15	8	3	32	15	8	28	11	34	17	33	20	12	0	25	19	39	11	35	40.2
	Min	20	32	29	28	22	32	24	25	45	12	23	8	20	23	20	10	12	34	20	35	50	49	56	33	20	12	5	37	38	7	22	13	4	23	25	4	34	17	33	20	32	18 7
Primghar	Max	43	40	35	37	30	45	25	45	35	0	10	20	10	45	20	33	45	20	35	50	49	56	33	15	45	20	11	28	32	5	23	25	42	33	25	3	23	3	19	25	35	10	35	34.5
	Min	35	35	28	27	20	25	22	45	45	38	37	25	45	15	34	26	22	36	49	25	19	45	42	18	11	20	21	6	25	4	34	19	32	20	23	3	19	−4	21	10	32	18.1
Red Oak	Max	52	42	36	46	46	43	29	20	20	9	9	12	20	15	25	30	31	36	33	45	42	50	37	30	18	19	25	3	34	13	21	31	20	34	8	35	6	26	5	31	34	18 1
	Min	20	29	29	20	20	36	38	40	43	33	32	26	39	31	24	30	25	31	45	26	20	53	46	30	18	9	3	28	32	3	19	−4	21	31	10	34	10	7	36	10	34	18 6
Ridgeway	Max	35	38	37	38	30	25	22	24	20	4	5	6	15	35	14	19	36	32	45	44	50	53	30	18	9	25	3	13	21	8	34	16	32	10	33	19	3	−4	21	10	32	19 8
	Min	21	33	34	30	25	25	37	35	44	22	28	33	40	35	33	32	36	41	24	21	22	28	32	16	25	28	21	8	34	18	33	18	4	20	5	19	2	18	34	10	32	36 6
Rockwell C	Max	40	39	43	42	43	37	28	23	22	4	12	15	11	15	11	25	38	27	35	40	41	44	25	18	10	21	8	34	18	33	20	5	19	2	18	34	22	35	10	33	28	19 8
	Min	24	31	31	31	21	21	34	34	26	30	28	24	21	20	20	15	27	27	21	35	20	22	25	30	18	−9	20	24	1	22	35	25	16	27	7	20	4	21	19	2	18	32.6
Ruthven	Max	32	30	30	39	26	20	27	17	12	46	12	5	42	12	5	34	27	27	21	28	52	52	29	33	17	9	20	1	24	10	4	21	10	34	15	7	30	16	34	10	34	16.2
	Min	20	22	23	26	20	27	41	34	17	34	30	27	42	34	27	21	27	22	17	22	21	34	29	17	9	20	10	4	21	2	25	19	2	18	30	3	34	10	38	17	1	34.1
Sac City	Max	45	40	34	42	44	41	25	22	22	4	11	20	12	37	14	23	38	27	25	45	50	51	32	20	10	16	7	−2	22	15	7	24	11	19	7	2	28	34	10	38	31	15.1
	Min	24	30	30	28	22	22	39	35	45	40	30	26	42	37	31	38	25	30	24	25	23	34	32	15	4	21	19	−6	23	11	33	22	13	33	11	34	17	31	9	38	24	38 2
Scranton	Max	45	42	34	31	30	42	43	39	26	23	45	23	38	20	31	30	40	28	44	42	48	46	26	26	39	30	15	7	15	22	10	34	10	38	9	22	8	19	2	27	32	19.3
	Min	25	34	31	30	34	34	34	42	42	28	27	22	38	21	9	25	30	28	44	44	44	19	42	20	50	48	26	39	25	14	7	24	11	22	29	13	36	30	10	34	10	35.4
Sheldon	Max	43	36	34	36	34	34	22	18	25	42	25	0	34	8	21	28	30	28	44	44	50	48	26	39	25	14	7	−6	23	13	30	7	−1	33	8	22	11	34	10	38	11	19.3
	Min	25	30	28	26	24	41	41	42	43	42	29	11	28	34	21	23	13	31	32	23	18	26	25	57	47	22	11	13	2	20	31	8	22	34	9	−10	31	17	1	33 9
Sibley	Max	43	35	34	41	41	42	23	22	21	47	36	30	46	39	31	32	36	41	48	49	17	31	40	42	29	10	6	2	....	22	2	38	24	6	25	−3	26	10	11	12	31	16.8
	Min	24	30	27	29	18	23	39	36	47	36	30	25	46	39	31	32	36	29	33	27	42	22	11	19	22	2	35	19	8	22	9	16	32	8	16	32	25	10	12	34	9	35.4
Sigourney	Max	40	39	40	41	45	39	24	29	18	11	9	12	15	14	18	13	29	33	42	42	40	47	42	29	19	22	2	22	38	9	0	−10	16	34	18	28	32	14	40	24	6	21 1
	Min	22	30	32	24	25	24	36	35	40	32	26	28	38	32	28	32	41	29	26	26	21	22	10	6	2	....	15	23	2	38	24	6	25	4	28	8	19	2	22	8	16	32	8	28.8
Sioux Cen	Max	43	38	33	41	37	28	28	25	24	1	10	20	10	13	28	33	21	29	46	50	47	45	39	25	19	10	8	22	8	16	32	8	−3	26	10	11	4	19	2	18	25	11 4
	Min	27	28	27	28	20	28	37	38	49	16	28	31	42	33	15	19	29	35	28	30	26	23	50	42	34	16	6	15	24	11	25	19	11	6	5	13	27	25	15	−2	19	32.9
Sioux City	Max	48	35	33	45	42	24	32	29	27	6	15	14	27	15	19	29	35	42	50	46	16	49	40	12	11	6	15	20	32	15	32	16	4	20	33	8	−2	19	32	15	34	17.2
	Min	28	29	30	28	24	36	..	40	10	28	25	26	18	24	17	26	37	26	46	46	31	45	29	15	7	17	0	28	30	8	15	34	30	9	40	20	4	22	11	24	17	36.9
Spirit Lake	Max	..					31	.	10	−3	10	3	10	12	17	26	27	37	26	46	46	46	20	23	50	49	15	7	20	4	32	15	34	30	9	40	20	4	22	11	24	17	32	16 5
	Min																																									
Storm L	Max	42	38	32	42	43	35	33	44	31	2	11	10	20	10	32	30	33	40	47	49	52	58	55	28	29	4	33	23	52	46	24	57	50	16	37	33	32	7	36	14	38	18 3
	Min	25	26	28	26	20	26	21	23	2	25	29	40	45	32	30	20	23	22	27	23	53	23	14	46	23	14	4	22	30	20	32	39	26	13	17	7	25	9	32	20	6	20 6
Stuart	Max	47	45	35	46	42	38	33	45	25	7	16	15	14	14	36	33	20	20	23	54	48	46	23	52	35	24	57	39	56	18	52	49	37	30	18	9	25	28	12	24	1	20 7
	Min	22	32	30	23	22	26	42	39	53	43	33	33	47	44	17	30	31	28	28	32	20	37	27	51	52	27	20	16	52	49	41	21	51	33	17	9	20	10	4	21	9	17 6
Thurman	Max	52	45	36	48	42	42	42	39	22	20	50	34	22	16	23	30	47	30	31	16	12	52	30	18	9	25	28	12	24	1	20	10	4	22	8	26	14	−4	8	13	9	29 8
	Min	21	30	32	30	21	32	22	20	50	34	32	30	47	30	31	16	12	52	30	18	9	25	28	30	18	9	25	28	12	8	34	16	33	18	33	25	16	−4	21	4	20	13 9
Toledo	Max	32	44	36	38	49	34	22	27	18	15	12	9	15	35	53	48	13	38	25	35	48	32	52	52	48	33	17	9	20	6	34	18	33	10	28	3	34	18	33	20	25	36 0
	Min	21	29	32	30	22	22	40	27	18	15	12	9	35	53	48	13	25	35	27	48	32	52	34	18	9	25	28	12	24	1	18	34	18	33	20	12	34	10	32	16	24	18 1
Villisca	Max	52	55	45	49	43	48	44	53	40	10	10	33	34	44	13	25	27	38	27	48	32	54	41	25	17	20	10	6	3	27	2	18	33	20	5	19	2	18	34	10	32	36 6
	Min	25	28	35	29	21	23	30	20	10	33	34	44	11	46	31	17	23	38	24	21	17	32	46	29	15	32	20	5	19	2	18	34	18	33	20	25	19	−1	33	8	22	19 8
Wapello	Max	39	54	39	43	49	35	28	28	30	22	12	16	17	11	18	28	38	27	34	39	48	50	32	20	10	32	19	3	27	2	18	32	20	4	40	22	8	25	5	20	4	32 7
	Min	28	32	35	32	28	28	30	22	12	23	29	26	46	31	28	32	19	28	38	30	25	23	46	32	15	44	32	10	27	9	34	12	36	30	13	−4	20	−7	17	9	34	17 9
Washi'gt'n	Max	34	45	38	40	46	35	24	20	17	10	10	11	12	24	23	38	21	28	30	36	49	46	26	17	44	29	46	38	52	43	18	10	2	16	3	27	0	20	4	40	24	32 7
	Min	22	29	31	30	24	24	35	35	45	32	29	24	44	14	16	23	31	21	32	36	29	32	46	29	34	24	14	44	20	12	25	19	11	15	13	2	27	2	18	32	20	17 8
Waterloo	Max	33	40	37	37	38	22	21	21	21	45	32	6

DAILY AND MONTHLY PRECIPITATION FOR DECEMBER, 1900.

STATIONS.	DAY OF MONTH																													TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	...	....	....	..	..	.05		....	....	..	..	....	....	..	T.		...	....	....	....	..	.	10	...	T.	....	....	....	...	T.	.10	.25
Albia	..	....	..	..	..	T.	...	....	....	..	..	....	..	....	...	T.	..	....	....	..	..	.50	T.	.10	....	....	....	..	..	..	T.	.60
Algona	....	T.	..	....	....	.10	...	....	..	T.	..	....	....	...	..	T.		...	..	..	..	....	.25	....	..	....	....	....	....	..	..	.35
Alta	...	.02	..	.01	...	.03	..	....	..	T.	....	..	..	..	....	.02	..		....	....	..	..	.45	.02	....	....	T.	..	....	T.	....	.55
Alta (near)	.	....	....	T.	....	.07	....	....	....	....	....	..	...	..	....	.02			..	....	....	.25	..	....	..	....	....	....	..	....	....	.34
Ames	....	..	...		..	.09	..	....		....	.	..	..	....	.02	....	...	..	...	....	....	...	....	.08	..	....	....	.	....	..	....	.19
Ames (near)	..	....			..	.20	....	..	....	....	....	....	....		..	...	..		..	....	....	..	..	.18	.08	.	....	....	.	....	..	....	.58
Atlantic	...	..	..	....	....	T.	...	.10	....	..		....	..	....	.	T		.05			....	..	...	34		.30	..	..	..	.12	.	1.24
Bancroft	....	....	..	....	....		....		..	..	....	....		....	..		....	..	....	..	....	.10	.30		....	....		..	..	..	.45	.40
Batavia	....		...	...	..	...		...	....		..	..		....		..	...	..	..	..	....	...	.10				T.	T.	T.		..	.10
Baxter	..	T	T.	...		.35	.02	...	..	....	....	....	....	....	...	.02	T	....		....	..	....	3	10	..	..	.	....	....	....	..	.97
Belknap	..	...	..	....	..	T.	.12	..	....	....	....	....	..	....		....	T.	....	..	....	....	T.	.84	.05	..	..	....	....	....	.12	....	1.06
Bonaparte	...			...	..	....	..		..	....	....	..				....		....			..	T.	T.							.05	T.
Britt	T.	T.	T.	...	....	.03	. .	....		....	....	....	..	...		T.	....	..	....	..	..	T.	.08	.04	03	..	....	....	..	..	T.	.18
Buckingham	..		..	..	..	16		..		..	..	..	....	..	....	05	....	....	..	....	....	....	....	.01	..	..	....	....	..	..	.05	....	.27
Burlington	..	....	..	..	..	T.	.18		..	....	....	....	....	..	....	..	..	..	..	....	....	....	....	.26						T.	.10	.54
Bussey	..	..	....	..	..	.1		....	....		..	..	..	....	....	....	....	..	..	....	....	....	.9	.01	..	..	....	....	....	....	..	1.01
Carroll	....	....	..	..	....	..	..	....	....	....	....	....	..			....	..	..	..	..	..	....	3	....	....	....	....	....	....	....	..	.30
Cedar Rapids	..	T.	T	.	..	T.	....	..	..	....	....	..			..	T.	..	..	....	....	..	.32	T	.40	..	..	..	..	..	20	.92
Centerville	..	..	....	....	..	T		..	....	....	..	.	....		..	T.	T.	....	..	..	....	T	.50	T	....	....	..	..	..	T	.50
Chariton	....	..	..	..	....	.07	.02	..	....	....	....	....	....	....	....	.03	.01	..	....	....	..	.05	26	01	....	....	..	..	....	T.	T.	.48
Charles City	..	T.		T.		T.	....	..	....	....	T.	....			T.	.05	....	..	..		..	T.	.42	T.	.02	....	....	..	....	T.	.49
Clarinda	....	....	..	....	....	.10	....	..	....	..	..	....	....		..	.04			....	..		.22	T.	02	.07	....	....	....	....	.05	..	.50
Clear Lake	..	....		....	....	T.		....	..	....	....	....		..	..	T.	....	....	....	....	..	T.	T.	T.	....	....	....	....	....	....	....	T.
Clinton	..		...	....	....	.15	....	..	....	..	....	....		....	....	.02	....	....	..	....	..	.05		T	....	....	..	....	....	....	..	.04	.26
College Springs	..	....	..	..	....	.11		....	..	..	....	..	..	.	....	....	....	....	..	....	....	....	.17	08	.05	....	....	....	....	T	.01	.42
Columbus Junction	..	....	T	....	....	.11	T.	....	....	....	....	....	..	..	....	T.	.01	....		....	....	T.	T.	T.	....	....	....	....	..	....	T.	.12
Coon Rapids	....	....	..	....	..	.08	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	.10	20	T	....	....	....	....	....	..	T.	.38
Corning	....	....	T.	....	..	....	..	..	....	....	....	....	....	..	....	T.	....	..	....	....	....	....	.05	T	03	....	T.	....	....	T.	.04	.12
Council Bluffs	....	..	....	....	..	.01	....	....	T.	....	.	.	..	....	T.	....	....	....	..	..	....	.3	05	T	..	....	....	....	....	.2	..	.56
Crawfordsville	....			..	..	.09	T.	....	....		....	....	....	....	....	T.	..	..	....	..	..	.09	T.	.05	.	T.	....	T.	....	....	....	..	.23
Cresco	....	...	T.	....	T.	T	....	....	. .	.01		....		T.	T	.03	..	..	....	..	..	.70	.06		T.	T.	....	....	..	T.	..	.80
Cumberland	....	..	..	..	..	T.	....	....	..	....	....	....	....		....	T.	..	....	....	....	....	T.	T.	.20	T.	....	..	..	..	.10	..	.30
Danville	....	....	....			.10	..	....	....		..	....	....	..	..		..	..	....		T.										
Davenport	..		T	T.	..	.09	.02	..		T	....	..	....	....	....	T.	T.	....	..	.	....	T	.08	T.	T.	....	..	T.	....	....	....	.01	.02
Decorah	....	T.	T.	.02	..	T.	....	....	T		....	..	....	....	....	T.	.10	..	....	....	....	.48	.12	....	....	....	....	....	....	....	....	.72
Delaware	..	..	..	..	....	.15	....	..		T.	....	....	..		....	..	.07	....	.	....	....	....	.24	.02	....	....	....	....	....	....	.10	.58
Denison	..	..	..	....	....	T.	..	..	....		....	....	..		....	....	....	....	....	....	..	....	.20	..	....	....	....	....	....	....	....	.20
Des Moines	....	T.	T	..	....	03	.01	....	..		....	....		....	....	.03	T.	....	....	....	..	T.	.13	04	T.	....	..	....	....	.04	.07	.35
De Soto	....	....	T.	..	....	.10	....	....	..		....	....	....	....	....	....	....	....	....	....	....	....	.08	.10	....	....	....	....	....	.11	....	.39
Dows	....		T.	..	....	.04	....	....	....	....	....	....	....	....		.03	..	....	....	....	....	.03	.05	T.	....	....	....	....	....	....	....	.15
Dubuque	..	T.	.02	.04	....	.09	.02		....	.01	....	....		T.	T.	T.	.02	....	....	....	....	T	.09	T.	T.	T.	T.	....	..	T.	.13	.42
Eldon	....	..	..	..	..	.05	T.	....		....	....	....	..	....	....	....	....	....	....	....	....	.20	.21	T.	T.	..	....	....	..	..	T.	.46
Elkader	....	T.	.02	..	....	.07	....		..	T.	....	....	..	....	..	.08	..	..	....	.	....	32	..	..	....	.	....	....	....	.25	....	.74
Emerson	...		..	..	....	.10		....	....		....	....	..	....	..		....	....	....	....	....	T	.35	.10	..	....	....	.02	....	....	..	.57
Estherville	..	T	T.	..	....	.01	T.	....	..	T.	.02	....	..	....	T.	T	....	....	....	....	....	T.	.12	T.	..	....	T.	....	....	....	....	.15
Fonda	..	T.		T.	..	12		....		....	....	....	....	....	....	....	....	....	....	....	....	.22	.20	.05	....		T	....	....	T.	....	.59
Forest City	....	T.	T.	..	....		T.		....	....	....	....	....	....	....	T.	T.	....			..	T.	14	T	..	....	....	....	....	T.	..	.14
Fort Dodge	....	.	T.	T.	....	T.		....	..		....	....	....	....	....	T.	..	..	..	....	....	T	T.	.10	....	....	....	....	....	....	..	.10
Fort Madison	..	..				.15	T.	....	....	....		....		....	..		....	....	....	....	....	T.	.19		....	....	....	....	....	....	.01	.35
Fruitland	...		..	..	..	.20	....		..	..	..	....	....	....	....	T.	....	..	..	..	....	....	T.	.09	..	....	....	....	....	....	....	.05	.24
Galva	...	T.	..	..	....		..		..	....	....	....	.	..	....		....	..	....	..	....	.3			....	..	....	....	....	....	....	.20
Gilman	...	T.	T.	..	....		.07	..	....	....	....	....	.	..	....	T.	....	....	....	..	..	....	.27	.05	....	....	....	....	....	.05	....	.44
Glenwood	..	....		....	T.	....	....	..	....	....	....	....	..	....	..	....	....	....	....	..	..	T.	.02	.05	.08	....	T.	....	....	.08	....	.23
Grand Meadow	....	..	.02	....	....	.05	....	....	....	.05	....	....	....	T	....	....	..	.15	....	..	..	....	32	.02	....	....	....	....	....	....	.20	.81
Greene	..	....				.02	....	....	..	....		....	....	....	....	.03	..	..	....	....	....	T.	.28	.01	....	..	..	....	..	....	....	.34
Greenfield	....		T.	....	....	.04	....	..	....	....	....	....	....	....	T.	T.	....	....	....	....	....	T.	.05	.01	.02	....	..	....	.01	T.	....	.13
Grinnell	...	..		....	....	.16	....	..		....	....	..	..	....	..	.04	....	....	....	....	....	.43	.03	....	....	..	..	....	....	.04	..	.70
Grinnell (near)	...	..	..	....	....	.20	....	....	....	..		....	..	..	..	T.	....	....	....	....	....	....	45	10	..	....	....	....	....	T.	.15	.90
Grundy Center	..		.03	....	....	.10	.02	....	....	..	....	..	..	..	..	.10	T.	....	....	....	....	....	30	T.	....	....	....	....	....	T.	.10	.65
Guthrie Center	..	..	..	..	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.20	.20	.3	....	....	....	....	.05	..	.09	.84
Hampton						.12	....	..	....	....	....	....	....	....	.	.06	.	..	..	..	....	T.	.20	T.	....							.38
Harlan		T.	T.	....	T.	.12	....	..	....		....	..	....	..	....	.02			....	..	....	.14	.10	.05	.04	T.	T	T.	..	.05	.15	.57
Hawkeye	...		..	T.	....	....	....		..	....	....	T.	....	....	....	....	..	..	.50	.30	....		....	....	....	....	....	....	....	....	....	.80
Hedrick	....	....	....	....	.	.05		..	....	....	....	....	....	....	....	....	....	....				.26	.04	05	....	..	....	....	....	....	..	.40
Hopeville	....	..	....	..	....	.10	....	....	....	....	....	....	..	..		.	..	....	....	....		.02	.07	.04	.01	....	....	....	....	.02	.	.26
Hoprig		..	..	....	..	..		....	....	....	....	....	....	....		..	..	....	....	....		T.	.05			....	....	....	....	....	....	.05
Humboldt	..	..	..	..	.	.01		....	....	....	....	....	....	....	....		.01	....	....	.	.	.05	.02	.01	....	....	....	....	....	....	....	.10
Independence	....	T.	T.	....	....	.10		...	....	....	....	....	....	....	....	.06	....	....			...	.18	.05	T		....	....	....	....	.23	...	.62
Indianola	....	....	....	....		.08	T.	....	....	....	....	....	....	....	T.	T.		....	.			....	.10	.05	....	....	....	....	....	.05		.28
Iowa City	....	T.	T.	T.	....	.23	....		....	....	....	....	....	....	.10	....	..	..	..	..	..	.32	T.	T	....	..	....	....	....	....	.10	.75
Iowa Falls	....	....	..	..	..	.25		....	.	....	....	....	....	.05		....	....	..	....	....	....	T.	.25	T	....	..	....	....	....	....	....	.55
Keokuk	..	....	..	....	....	05	.09	..	....	....	....	....	....	....	....		T.	....	....	..	....	02	.09	T	T.	..	....	....	....	....	T.	.25
Keosauqua	.	..		....	....	T.	..	....	....	....	....	....	....	....	..	T.	....	....	....	....	..	.37	.18	T.	.	....	....	....	..	....	.03	.58
Knoxville	..	..	....	....	.	.10	..	..	....	....	....	....	....	..	..	T.	....	....	....	....	....	....	.05	.05	....	....				T.	..	.20
Lacona	....	....	....	..	....	.11	.	....	....	....	....	....	....	....	T.	.05	T.	..	..	....	T.	.02	.10	....	....		....	....	..	....	10	.38
Lansing	....	T.	....	T.	....	.02	....	....	....	....	....	....	....	T.	T.	T.	.10	..	....	..	....	T.	.21	T.	T.	T.	.	..	....	....	.06	.37
Larrabee	....	..	....	....	..	....	.09	....	....	....	....	....	....	....	....	....	....	....	....	..	....	..	.27	.02	....	....	....	..	..	.02	....	.33
Le Claire	T.	..	..	....	....	T	..	.	..	....	....	....	..	....	..	....	.02	....	....		....	..	.03	.03	.01	....	....	....	....	....	.02	.20
Le Mars	..	..	....	....	..	.08	....	....	..	....	....	....	....	....	....	....	....	....	....	.	..	.15	..	....	.05	....	....	....	....	....	....	.20
Lenox	....	....	T.	....	....	.08	....	....	....	....	....	....	....	....	.05	....	....	....	....	....	....	....	.04	.05	.02	..	....	....	T.	..	....	.24
Logan	....	..	.03	....	....	.09	..	....	....	....	....	....	....	....	.20	....	....	....	....	....	....	.20	....	....	.40	....	....	.20	T.	....	....	1.08
Marshalltown	T.	..	T.	..	T.	T	10		..	....	....	....	....	T.	....	.03	.03	.01	....	....	....	.01	.45	.05	.	....	....	....	....	06	.11	.87
Monticello	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	T.	T.	T.	....	....	....	....	T.	....	20	.30
Mooar		..	....	....	.	.07	....	....	..	..	....	....	....	..	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	....	T.
Mount Ayr		..	..	....	..	.08	....	....	....	....	....	....	....	..	....	.07	.02	..	.	....	....	T.	.10	.05	T	.02	....	....	....	T.	05	.38
Mount Pleasant		T.	T.		....	.18	.	....	....	....	....	....	....	T.		....	..	....	....	....	....	T.	.09	..	....	....	....	....	....	....	..	.17
Mt. Vernon (Hub.)		....	....	....	....	....	....	....	....	....	....	....	....	....	T.	.05	....	....	....	....	....	.20	.05	....	....	....	....	....	....	.c8	....	.56
New Hampton		..	....	....	..	T	.20	..		T	T.	....	....	T.		T	T.	....	..	..	....	....	.01	.70	.01	....	....	....	....	....	.25	.97
Newton	....	T.	T.	T	....	T.	....	..	..	....	....	....	T.		T	....	..	..	....	....	T.	.10	T	....	....	....	....	....	T	....	.10
Northwood	....	....	....	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.50	T.	T.	....	....	....	....	....	....	....	.50
Odebolt	...	..	....		....	T.	....	....	..	..	....	..	....	..	....	.02	T.	....	..	..	..	.09	03	.02	T.	..	....	..	..	T.	.	.16
Ogden	....	T.	T.	T.	..	.10	....	....	....	....	....	....	T.	T	T.	....	....	..	....	....	T.	T.	T.	T.	....	....	....	....	....	....	.10	.20
Olin		....	T.	....	.	T.	T.	...	..		....	....	....	T.	....	T.	....	..	....	..	....	.15	.17	.01	.03	T.	T.	T.	....	.04	.06	.46
Omaha	.	....	T.	....	.	T.	T.	...	..		..	..	....	..	T.	T	....	..	..	..	..	.05	.14	04	.04	....	....	..	....	.02	.	.41
Onawa	....	..	..	..	....	.08	.04		..	..	....	....	....	T	....	....	..	....	..	..	..	.01	.17	T.	T.	T.	....	....	....	.03	..	.26
Osage	...	T	T.	....	....	T.	...	....	....	....	T.	....	..	T	....	.05	..	..	....	..	T.	.10		T.	T.	....	....	....	....	....	T.	.26
Osceola	...	T.	....	....	.06	....	....	....	....	....	....	....	....	T.	....	T.	....	....	....	.	....	.47	.25	.05	....	....	....	....	....	.08		1.10
Oskaloosa	....	....	....	....	....	.25	....	....	..	....	....	....	....	....	T.	..	..	....	..	....	....	.45	....	.01	....	....	....	....	....	....	....	.47
Ottumwa	....	....	..				....	.01	....	....	....	....	....	....	....	.04	....	....	....	....	....	.20	.24	.02	T	....	....	....	....	....	.05	.64
Ovid	..	....	..	....	....	.09	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.06	.20	.04	.05	..	T.	....	..	.02	.02	.39
Pacific Junction	....	....	..	....	....	T	....	....	....	....	....	....	....	T.	T.	....	....	....	....	....	....	T.	.03	T.	....	....	....	....	....	.07	....	.13
Pella	....		..	....	....	.03	....	....	....	....	....	....	....			....	....	....	....	....	....	T.	T	T.	....	....	....	....	....		.20	.20
Perry	....	....	....		....	T	....	....	....	....	....	....	..			....	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	....	.25
Plover	..	....	..	.	....	....	.05	....	....	....	....		....	....	....	....	....	....	....	....	....	....	.20	....	....	....	....	....	....	....	....	....	.20
Primghar		....		....	....	....		....	....	....	....	.	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....
Red Oak	....	....	T.	....	....	.15	....	....	....	....	....	....	....	....	T.	.05	....	....	....	....	....	T.	.15	.05	.03	....	T.	....	....	T.	....	.43

DAILY AND MONTHLY PRECIPITATION FOR DECEMBER, 1900—CONTINUED.

STATIONS	DAY OF MONTH. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL.
Ridgeway	...	.01	.03	T	....	.03	..		....	.03	....	..	....	.01	....	.05	.02	...	....	....	....	.17	.88	.01	.01	....	....	....	....	T.	..	1.25
Rockwell City	...	..	...	..	...	.03	....	....	..	..	..	....	....	....	....	....	....	....	....	....	.10	.50	....	....	..	....	....	....	..	....	....	.63
Ruthven	...	...	...	..	...	.06	T.	..	...	..	....	....	....	...	....	.	..	....	....	....	....	.05	.10	...	..	..	....	....	..	....	....	.21
Sac City	....	T.	T.	.	....	T.	....	....	...		....	....	...	....	...	....	....	....	....	....	....	.07	.27	T.	...	....	....	....	..	....	....	.34
Scranton	...	T	..	.	...		...		...		....	..		....	....	....	....	....	...	....	....	....	.30	25	...	....	....	....	..	....	....	.25
Sheldon	...	T	....	T.	...	.10	..		....	....	..	...		...	....	....	....	....	....	....	....	....	.30	.05		..	T.	....	....	.05	....	.50
Sibley	T.	T.	..	..	....	.30					....	....		...	....	....	....	....	....	....	....	....	.15	.10	...	....	T.	....	....	.02		.57
Sigourney	...	...	...		..	.16	.02	....	...		....	....	...	..	...	T.	....	..	....	....	....	.17	.21	T.	T.	..	T.	....	....	....	T.	.56
Sioux Center	....	T	.	T.	...	.50	...	....	..		....	....	...	..	...	T.	...	..	....	....	....	.10	T	T.	T	..	T.	T.	....	.01		.60
Sioux City	....	T.	..	T.	....	.14		....			T.	....	...	..	...	....	....	....	....	....	....	.05	.11	T.	.0	...			....	T	.	.35
Storm Lake	...	T.	T.	T.	...	.04			...	...	T.			...	T.	.02	...	....	....	....	....	.03	.25			....	..		....	.05	.	.34
Stuart	..	T	T.	...	....	T.							..	T.	T.	T.				...	...	.05	T.	T.	T.	T.		T.	..	T.	.02	.10
Thurman	..	..	T.	....	....	T.			...				..			.20	..	.	....	....	....	.18	..	T.	.02		T	T.	..	.30		.22
Toledo	..	....	....		..	.05				...			..			.33		..	....		....		.50		.10	.05	T.		.20	....	.65
Villisca	...	..	T.	...	....	.15	...		..	....	...	.	..	...		T.		..			....	T.	.10	....	....	..	....	....	..	.1	....	1.33
Vinton	..	..	....			2.50	.	...		...			....	....	..	....	.05	..	...	...	..	....	.13	...	....	..	....	....		T.	..	2.70
Wapello	....	....				.05	.12	.	....	..	....	....	...	....		....		..	....		..	.1				..	..	T.	...		..	.35
Washington	....	T	T.		....	.10	...	..				..	....	....		.02					....	....	.10	.20	T.	T.	..	..	....	....	.15		.30
Washta	....	T	T.	T.	...	.10	..	..	.			..	....	....	..	.03	....	....	....	....	....	....	.60	.12	T.	..	..	..	....	T.	.07		.30
Waterloo	...	T	T.	T.	...	.08	...	...	...	....	....	..		T.	....	.02	T.	..	....	....	..	T.	.45	.08	..	..	..	....	....	....	....		.98
Waverly	..	T	T.	.01	..	.04		....	...		....				....	.02	T.	..	....	....	..	..	.40	T.	..	..	....	T.	....	....			.67
West Bend	....	T	..	..	..	.08	...	.	..	....		..	....	....	..	T.	T.	..	....	....	..	T.	.10	...	..	..	..	..	....	....	.10	.35	.48
West Branch	..		T.	T.	.	T.		..	..	....	..	..	..	....	..	T.	.05	....	....	....	..	T.	.10	...	..	..	..	..	....	....	....	.35	.10
West Union	....					..		..		T.	T.		.		....	.05	....	....	....	....	..	T.	.20	....	....	....	....	....	....	T	.03	.35	.10
Wilton Junction	....	..		....	....	.22	..	...			T.	....	....	....	....	T.	.05		....	....	....	T.	..	.20	...	....	....	....	....	....	....	....	.35
Winterset	..	..	T	..		T.	.08	..	..	..	..	....	....	....		T.	.05				....	T.	..	.05	....	....	....	....	....	T.	....	.23
Woodburn	....			..		.13	.01		....	....	....			....		.01						T.	.15	T.	..	T.			....	T.	.05	.35

Precipitation Chart December 1900.



APPENDIX.

SUMMARY FOR THE YEAR 1900.

BAROMETER.—The mean atmosheric pressure for the year was 30.04 inches. The highest observed was 30.71 inches on December 9th, a Sioux City and Clarinda; lowest, 29.21 inches at Dubuque on December 23rd; range for the state, 1.50 inches.

TEMPERATURE.—The mean temperature as deduced from the complete records for the year of 95 stations, was 49.5°, which is 2.3° above the normal. The highest temperature reported was 103° on August 3rd, at Wapello; lowest reported, 27° below zero at Denison, on February 15th. The range for the year 130°.

PRECIPITATION.—The average amount of rainfall and melted snow for the year was 35.60 inches, as shown by the complete records of 111 stations. This is 5.30 inches above the normal. The greatest amount of precipitation reported for the year was 47.33 inches, at Ames(near) Story county; least amount reported, 25.05 inches, at Batavia, Jefferson county. The greatest monthly rainfall was 18.45 inches at Primghar, in July. The least monthly precipitation was a Trace at Galva, Guthrie Center, Odebolt and Scranton in January, Bonaparte, Clear Lake and Mooar in December, and Glenwood and Primghar in November. The greatest amount in 24 consecutive hours was 13.00 inches at Primghar on July 14th and 15th. The average number of days on which .01 of an inch or more fell was 84.

WIND AND WEATHER.—The prevailing direction of the wind was Northwest. The highest velocity reported was 70 miles per hour, at Sioux City, on the 14th of September; average daily wind movement, 210 miles. There were 172 clear days during the year; 101 partly cloudy, and 92 cloudy days.

MONTHLY SUMMARIES.

JANUARY.—Mean temperature for state 25.6°, which is about 8.5° above normal. Highest temperature 66°, at Ottumwa on the 4th; lowest, 20° below zero, at Ruthven on the 29th. Average precipitation for state, 0.53 of an inch, which is 0.69 of an inch below normal. Wind velocity, maximum, 60 miles per hour, at Sioux City on the 24th.

FEBRUARY.—Mean temperature 14.8°, which is 6.9° below normal. Highest temperature 60° at Keokuk on the 7th; lowest, 27° below zero, at Denison on the 15th. Average precipitation 1.30 inches. Maximum wind velocity 50 miles per hour, at Sioux City on the 8th.

MARCH.—Mean temperature 30.7°, about 2.5° below normnl. Highest temperature 81° at Wapello on the 22nd; lowest, 13° below zero, at Osage on the 16th. Average precipitation 2.06 inches. Maximum wind velocity 50 miles per hour, at Sioux on the 19th.

APRIL.—Mean temperature 52.2°. Highest temperature 89°, at Hampton and Red Oak on the 27th and 28th; lowest, 19°, at Mt. Pleasant on the 1st. Average precipitation, 2.67 inches. Highest velocity of wind 45 miles per hour, at Sioux City on the 24th.

MAY.—Mean temperature 63.2°. Highest temperature 98°, on the 23rd, at Toledo; lowest, 22°, at Sibley on the 3rd. Average precipitation, 3.31 inches. Maximum velocity of wind 53 miles per hour, at Sioux City on the 31st.

JUNE.—Mean temperature 69.7°. Highest temperature 102°, at Odebolt on 26th; lowest, 38°, at Larrabee on the 22nd. Precipitation, 3.98 inches. Maximum wind velocity 50 miles per hour, at Sioux City on the 16th.

JULY.—Mean temperature 73.4°. Highest temperature 102°. at Logan on the 6th; lowest, 37°. at Larchwood on the 22nd. Precipitation, 6 15 inches. Maximum wind velocity 54 miles per hour, at Sioux City on the 5th.

AUGUST.—Mean temperature 77.4°. Highest temperature 103°, at Wapello on the 3rd and 5th; lowest, 44°, at Sheldon on the 28th. Precipitation, 4.65 inches. Highest wind velocity 47 miles per hour, at Sioux City on the 15th.

SEPTEMBER.—Mean temperature 64.4°. Highest temperature 99°, at Wapello on the 5th; lowest, 26°, at Sioux Center on the 29th. Average precipitation, 4.98 inches. Highest velocity of of wind 70 miles per hour at Sioux City on the 14th.

OCTOBER.—Mean temperature 59.3°. Highest temperature 90°, at Bedford on the 3rd and 4th. Precipitation 3.91 inches. Highest wind velocity 54 miles per hour, at Sioux City on the 6th.

NOVEMBER.—Mean temperature 33.5°- Highest temperature 79°, at Galva on the 3rd; lowest, 6° below zero, at Fonda on the 15th. Precipitation, 1.06 inches. Highest velocity of wind 38 miles per hour, at Sioux City on the 10th.

DECEMBER.—Mean temperature 26 9°. Highest temperature 63°, at Omaha, Nebraska, on the 17th; lowest, 10° below zero, at Primghar, Sibley, Sioux Center and Spirit Lake, on the 31st. Average precipitation, 0.45 of an inch. Highest velocity of wind 48 miles per hour, at Keokuk on the 23rd.

CLIMATOLOGICAL DATA FOR THE YEAR 1900.

STATIONS.	COUNTIES.	Elevation, feet.	Length of Record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.						PRECIP., IN INCHES.				Month.	SKY.					Prevailing direction of wind.
				Annual Mean.	Highest.	Date.	Lowest.	Date.	Length of record, years.	Total for the year	Greatest monthly.	Month.	Least monthly.		Total snowfall.	Number rainy days.	Number clear days.	Number partly cloudy days.	Number cloudy days.	
Afton	Union			50.8	98	July 3	-11	Jan. 28	...	38.57	6.90	Oct.	.23	Jan.	....	72	139	131	95	SW
Albia	Monroe	945	...	50.4	95	Aug. *5	-10	Jan. *28; Feb. 15	....	32.79	5.12	July	.34	Jan.	22.1	...		...	...	SE
Algona	Kossuth	1,500	9	47.8	94	June 26	-20	Feb. 9	9	33.43	5.84	July	.35	Dec	34.4	74	135	156	74	SE
Alta	Buena Vista	1,519	10	47.0	94	June 26	-16	Feb. *15	10	39.14	11.11	July	.45	Jan	34 9	100	171	123	71	S
Alta (near)	Buena Vista									36.57	10'95	July	.34	Dec	32.0	...		....	.....	.....
Amana	Iowa		25	49.8	93	July *3	-10	Jan 31	26	37.27	5.49	July ..	.44	Dec	14.7	100	169	120	76	NW
Ames	Story	936	21	....	96	June 26	-12	Feb. 15	26	43.24	9.14	July	.19	Dec	. .	....	...	...	.....	.....
Ames (near)	Story	.....	10	49.8	99	June 26	-21	Feb. 15	10	47.33	8.15	June. ..	.38	Jan ...	22.8	..	....	..	....	SE
Atlantic	Cass	.....	..	....	....	....	-22	Feb. 9	...	33.89	8.20	July ...	.30	Nov .. .	26.8	78	117	139	109	NW
Bancroft	Kossuth	.....	..	.....	.....	....	....	.....	...	.....	.....	.....	.....	.....	39.0	....	....	....	....	.....
Batavia	Jefferson	.....	....	49.4	95	Aug. 20	-14	Feb. 14	....	25.05	4.10	Sept	.06	Jan	23.0	....	....	....	....	.....
Baxter	Jasper	.....			99	June 26; Aug. 20	-12	Feb. 15	.....	38.78	5.39	July	.26	Jan	....	97	104	188	73	SE
Bedford	Taylor	....	..							.....	.....	.....	.....	.....	....	....	....	....	....	.....
Belknap	Davis	857	..	51.2	95	Aug. *3	- 8	Jan. *28	.....	35.11	5.94	May	.80	Jan	30.0	88	230	85	50	S
Bonaparte	Van Buren			52.0	100	Aug. 5	- 8	Feb. 15	10	32.41	5.87	Sept	T	Dec	19.0	....	....	....	....	.....
Britt	Hancock	1,230	..	46.6	95	July 4	-24	Feb. 9	....	33 75	6.76	Sept	.18	Dec	21.0	104	108	182	75	NW
Buckingham	Tama	..			.....	... ...	.....	.. .		35 65	6.63	July	.27	Dec	....	77	155	135	75	.....
Burlington	Des Moines	526			.....	....	.. .	.....		.....	.....	... .	....	....	....	....	....	....	....	.... ..
Bussey	Marion	.....	..	...	...	.....	....	.....	...	36.46	....	.....	.....	.....	18.1	....	....	....	....	.....
Carroll	Carroll	1,240	11	48.8	96	June 26; July 3	-18	Feb. 15	11	40.18	9.01	Aug	.18	Jan	25.0	73	237	38	90	.....
Cedar Rapids	Linn	744	19	50.7	97	Aug *5	-10	Jan. 31; Feb. 16	19	31 20	4.46	Aug	.15	Nov	....	79	179	83	103	NW
Chariton	Lucas	1,030	.	50.9	94	July 3; Aug. 20	-10	Jan. 28	.....	36 37	6.29	July	.15	Jan	21.6	109	147	150	68	NW
Charles City	Floyd	1,012	10	46.8	96	Aug. 4	-22	Feb. 9	10	33.80	6.75	Sept...	.49	Dec	3.95	74	129	153	83	NW
Clarinda	Page	1,069	11	51.9	98	June 6; July 6; Aug. 20	-10	Feb. 15	11	34 48	7.83	Oct.....	.48	Nov	16.4	83	200	74	91	S
Clear Lake	Cerro Gordo	984	...	47.2	97	June 25	-24	Feb. 9	....	32.20	6.60	June....	T.	Dec	36.0	59	183	110	72	SW
Clinton	Clinton	609	10	49.7	98	July 4	-10	Feb. *16	10	36 88	6.32	July	.26	Dec	35.9	90	152	102	111	W
College Springs	Page	..	10	51.8	97	June 7; July 6	-13	Feb. 15	10	367.6	8.07	Aug ...	.22	Jan	....	79	223	68	74	.....
Coon Rapids	Carroll			49.6	95	June 26	-15	Jan. 28; Feb. 9		39 25	6.83	Aug	.26	Jan ..	16.0	78	193	101	71	NW
Council Bluffs	Pot'wat'mie	989	..	51.9	101	July 6	-11	Feb. 8	....	31.87	6.47	July ...	.12	Nov ...		69	242	31	92	.....
Cresco	Howard	1,312	29	45.2	96	Aug. 18	-23	Feb. 9	30	32.24	6.29	Sept	.80	Jan. Dec	39.1	93	168	78	119	NW
Cumberland	Cass					....	....	....	.....	26.98	4.63	Sept	.10	Jan	12 2	64	188	67	110	S
Davenport	Scott	615	29	51.2	97	Aug. 5	- 8	Jan. 31	29	32.06	4.90	Aug	.21	Dec ...		114	152	88	125	SW NW
Danville	Des Moines	... ..				...	.....	....	.....	32.42	4.69	Sept	.11	Dec	22 7	64	....	....	.	.....
Delaware	Delaware	1,084	10	47.2	93	June 26; Aug. *5	-15	Feb. 6	10	35.25	8.06	July .. .	.58	Dec .. .	28.9	92	132	141	92	S
Decorah	Winneshiek	900	8	46.5	99	Aug. 9	-17	Jan. 31	8	31.29	5.36	Oct	72	Dec	38.9	..	....	. ..	....	....
Denison	Crawford	1,192	8	49.3	97	July *3	-27	Feb 15	8	33.90	7.32	Aug ..	.15	Nov	8 2	74	239	62	64	S
Des Moines	Polk	861	23	50.7	95	July 3	-10	Jan. 28	22	38 46	8.02	Aug ..	.20	Jan	....	107	109	149	107	SW
De Soto	Dallas	886	...	50.7	96	June 26	-10	Feb. 15	...	39.52	9.30	Aug	.20	Jan	....	90	186	87	92	SW
Dows	Wright		.. .	47.1	93	June 26; Sept. 5	-21	Feb. 9	....	34.82	6.72	July	.15	Dec	21.5	76	158	114	93	S
Dubuque	Dubuque	665	28	49.4	95	Aug. 5	-13	Jan. 31	28	33.43	8.00	July	.42	Dec	....	118	145	123	97	NW
Eldon	Wapello	...	.	52.2	99	Aug. 5	-11	Feb. 15		37.48	5.98	June ...	.46	Dec	24.7	91	215	46	104	S
Elkader	Clayton	....	20	48.7	98	June 25; Aug *18	-17	Feb. 6	22	37.44	8.60	July	.73	Jan	37.5	81	173	119	73	NW
Fort Madison	Lee				...	....		....	53	35.72	4.50	Feb	.35	Dec	27.6	76	108	114	143	SW
Fayette	Fayette	1,000	11	46.7	95	June 25	-18	Feb 6	11	32.62	7.73	July	.50	Dec		89	173	78	114	NW
Fort Dodge	Webster	....	..		.....	.....	-22	Feb. 9	.....	44.03	7.55	July .	.10	Jan. Dec		66				SW
Forest City	Winnebago	1,220		46.5	94	June 26	-24	Feb. 9	... ..	33.28	6.79	Sept	.14	Dec	25.0	85	192	59	114	NW
Galva	Ida	....	8	.....	97	June 26	-17	Feb. 15	.....	36.47	7.42	July ...	T	Jan		68	....	....	....	SW
Gilman	Marshall	.....	....	.....		... ..	... ..	.....	.....	34.93	7 35	June ..	.14	Jan ...	....	70	195	86	84	S
Glenwood	Mills	979	31	52.2	96	Sept. 5	-12	Feb. *9	17	27.57	5.85	Oct	T	Nov ...	..	53	92	203	70	NW
Greene	Butler	943		48.2	99	June 25	-19	Feb. 9	.....	28.67	5.49	June ...	.34	Dec	..	94	169	87	109	W
Greenfield	Adair	.....	10	50.5	97	June 26	-12	Jan. 28; Feb. 15	10	32.37	5.86	Oct	.13	Dec	12.6	....	. .	....	....	.....
Guthrie Center	Guthrie	1,269	....	50.4	100	July 21; Aug. 18; Sept. 8	-18	Feb. 15	... ..	33.03	6.52	Aug	T	Jan	23.9	60	188	101	76	N
Hampton	Franklin	1,240	11	48.2	96	June 26	-17	Feb. 9	11	37 49	7.26	July	.38	Dec	39.4	81	135	157	73	NW
Harlan	Shelby			49.2	98	July 6	-23	Feb. 15	... ..	39 26	8.33	July	.35	Jan ...	24.1	97	109	151	105	NW
Hawkeye	Fayette	.....	.	.....	...	.....	... ..	.....	8	37.94	6.59	July	.80	Dec	60.5	....	....		. ..	.....
Hedrick	Keokuk		...	50.4	97	Aug. 8	-10	Feb. 15	..	36 82	6.21	June....	27	Jan		77	....	....	....	..... .
Humboldt	Humboldt	1,082		48.5	95	June 26	-20	Feb *9	8	32.57	6.52	July	.10	Dec ..		92	218	75	72	NW
Independence	Buchanan	1,111	39	47.2	92	Aug. *5; Sept. 5	-13	Feb. 6	34	37.37	11.02	July	.34	Jan	22 7	64	....	....	....	S
Indianola	Warren		9	50.8	94	July *3	-12	Feb. 15	9	36.35	7.92	Aug	.28	Dec	31.6	81	201	86	78	NW
Iowa City	Johnson	674	11	50.5	99	Aug. 5	-12	Feb. 16	11	37.71	6.27	Aug	.73	Jan	11.6	96	....	....	...	NW
Iowa Falls	Hardin	...	.	47.2	95	July 3	-15	Feb. 15	8	34 45	5.92	June...	.46	Jan	18.0	84	154	122	89	NW
Keosauqua	Van Buren		9	52.8	97	Aug. *5	- 6	Jan. 31	9	34.82	4.92	Oct ..	.58	Dec	....	88	178	78	109	.....
Keokuk	Lee	618	30	53.5	98	Aug. 18	- 4	Jan. 31	29	33 61	5.36	Oct	25	Dec .	25.5	...	...	....	.	NW
Knoxville	Marion		8	50.9	96	July 6	- 9	Feb. 15	8	40.20	9.78	Aug	15	Jan	13 7	77	185	71	109	NW
Lacona	Warren	...	....		...		... ..	.....	.....	37 10	5.80	Sept	.25	Jan	20.3	81	121	149	95	.....
Lansing	Allamakee	....		48.9	97	May 27; June 25	-13	Jan. 31; Feb. 1		31.86	5.28	July	.37	Dec	40.2	74	104	159	102	.....
Larrabee	Cherokee	..	10	47.2	98	June 26	-21	Feb. 15	11	43.95	14.08	July	.33	Dec ...	26 6	81	147	163	55	SW
Lenox	Taylor			50.4	94	July *3	-12	Feb. 15	.....	34.93	7.27	Oct	.24	Dec	7.9	77	...	....	.	S
Le Mars	Plymouth	1,221		48.4	96	June 26; July 3	-16	Feb. 9	. ..	35.32	12.00	July ...	.20	Dec	21.5	78	196	99	70	S
Logan	Harrison	928	36	49.3	102	July 6	-24	Feb. 14	35	31 39	7.39	July ...	.08	Dec	....	78	193	79	93	S
Marshalltown	Marshall	898	9	50.0	95	July 6; Aug.* 4	-14	Feb. 15	9	46.32	7.79	June...	.87	Dec . ..	....	107	196	72	97	S
Monticello	Jones.	800	47	48.2	96	Aug. 5	-13	Feb. 16	46	31 75	6.49	July ...	.30	Dec	31.5	71	165	86	114	SW
Mooar	Lee	.....	....	.....	99	Aug. 7	- 4	Jan. *28; Feb. 9	...	33.12	6.50	May ...	T	Dec	....	....	....	....	....	....
Mt. Vernon H	Linn	900	....	49.6	96	Aug. 5	-12	Jan. 31; Feb. 16	...	34 21	6.05	July ...	.32	Dec	32.2	111	186	59	120	S
Mt. Ayr	Ringgold	1,236	8	51.3	97	July *3	-10	Jan. 28; Feb. 15	8	30.54	5.69	Oct	.24	Jan	....	95	113	168	84	S
Mt. Pleasant	Henry	725	....	50.5	97	Aug 11	-12	Jan. 31	.....	29.24	4.80	May ..	.17	Dec	....	73	176	131	58	NW

* and other dates.

CLIMATOLOGICAL DATA FOR THE YEAR 1900.—CONTINUED.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE IN DEGREES FAHRENHEIT.						PRECIPITATION, IN INCHES.						Number of rainy days.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.	Prevailing direction of wind.
				Annual mean.	Highest.	Date.	Lowest.	Date.	Length of record, years.	Total for the year.	Greatest monthly.	Month.	Least monthly.	Month.	Total snowfall.					
New Hampton	Chickasaw	1,166	....	46 6	93	Aug. *2	-18	Feb. 9	.....	28.10	4.47	June	.60	Feb	37.1	78	....	....	....	NW
Newton	Jasper	958	14	.....	93	July 6 Aug. *4	-13	Jan 31 Feb. 15	14	40.07	6.11	August	.37	Jan	29 5	89	158	132	75	SE
Northwood	Worth	1,210	....	46 4	91	June 26 Aug. *2 Sept. 5	-23	Feb. 9	.....	35.49	7.02	July	10	Dec	....	86	196	74	95	NW
Odebolt	Sac	.....	....	49 9	102	June 26	-19	Feb 15	.....	34 43	6.67	July	T	Jan	21.7	73	230	56	79	
Ogden	Boone	1.109	....	49.1	95	June 26	-22	Feb. 15	.....	45 32	8.34	August	.16	Dec	21.2	86	....	....	....	SE
Omaha, Neb	Douglas	.....	30	52 6	97	July 6	- 9	Feb 15	29	31.20	6.86	July	.15	Jan Nov	....	87	148	137	80	SE
Onawa	Monona	.....	....	50 8	97	July 3	-14	Feb 16	18	42.20	10.34	July	.26	an	....	89	252	47	66	SE
Osceola	Clarke	1 123	....	50 8	95	July * 3	-10	Jan. 28 Feb 15	.....	40.48	6.78	Sept	.19	Jan	....	72	....	....	....	S
Ovid	Wayne	.....	....	50 8	96	Aug. 21	-10	Feb. 15	8	37.17	5.75	May	.25	Jan.	19.1	106	184	44	137	SE
Osage	M tchell	1,178	10	45 6	94	July 4	-23	Feb 9	10	31.38	5.53	Sept	.26	Dec	48 5	104	93	116	156	NW
Oskaloosa	Mahaska	850	18	50 8	96	Aug. *5	-12	Feb 15	24	35.43	5.55	August	34	Jan	15.0	90	189	59	117	NW
Ottumwa	Wapello	630	7	53 1	97	Aug. 20	- 6	Jan *28	7	38.63	6.15	Sept	47	Dec.	12 5	60	170	83	112	SE
Pacific Junction	Mills	961	....	51 0	95	July 6 Sept. 5	-17	Feb. 15	.....	28.35	4.95	June	11	Nov	11 7	80	141	166	58	S
Plover	Pocahontas	.....	....	48 2	96	June 26	-18	Feb. 15	.....	31.68	8.58	July	25	Dec.	26.4	79	213	49	103	S
Primghar	O'Brien	.....	....	48 6	98	June 25	-20	Feb, 15	.....	40.09	8 45	July	T	Nov.	....	43	226	21	115	SW
Red Oak	Montgom'y	1,033	....	53 1	98	July 10	- 9	Feb. 9	.....	29.02	4.95	Oct	.16	Nov	....	75	185	58	122	S
Ridgeway	Winneshelk	.....	....	48 5	98	Aug. 2	-20	Feb. 9	.....	42.35	6 88	Sept	1 25	Dec	51 3	155	157	132	76	S
Rockwell City	Calhoun	1,219	....	48 6	95	July 4	-14	Feb. 16	.....	37.20	8 36	June	55	Jan	26.2	70	228	43	94	
Ruthven	Palo Alto	.....	....	.....	95	June 26	.....	.....	.....	37.12	8.82	July	.21	Dec	34 9	70	173	64	123	SW
Sac City	Sac	900	22	48 5	94	June 26 July 3	-17	Feb 15	26	34 21	6 49	June	.34	Dec	....	85	....	....	....	NW
Scranton	Greene	.....	....	49 7	98	June 26	-14	Feb 16	.....	44 37	10 43	August	T	Jan	17.5	54	220	80	65	S
Sheldon	O'Brien	1,406	....	46 8	94	June 26 July 13	-21	Feb. 9	.....	37 30	16 50	July	.27	Jan	29 3	90	182	62	121	S
Sibley	Osceola	1,509	8	46.9	98	Aug. 2	-20	Feb 9	8	31 57	8 41	July	.22	Jan	26 1	89	150	154	61	NW
Sioux City	Woodbury	1,122	12	49 5	97	July 31 Aug. 2	-12	Jan. 28 Feb 9	12	33 22	8 72	July	.24	Jan	....	92	169	110	86	NW
Sigourney	Keokuk	.....	....	51 7	99	Aug. 3	-10	Jan 31 Feb. 15	.....	38 90	6.71	Sept	32	Jan	15 1	81	181	145	39	NW
Sioux Center	Sioux	.....	....	48.1	100	June 26	-15	Jan 28 Feb. 15	.....	38 98	7 22	Sept	15	Jan	24 0	80	186	77	102	SE
Storm Lake	Buena Vista	.....	....	47.4	92	June 26	-15	Feb 16	12	36 94	9 16	July	.34	Dec	29.4	101	191	97	77	NW
Thurman	Fremont	.....	....	51.6	96	June 6	-14	Feb. 15	.....	44 67	10.55	June	.10	Nov.	....	83	174	73	118	SW
Toledo	Tama	.....	....	49 7	98	May* 2	-13	Feb. 16	7	37 14	6 74	June	.33	Jan	....	70	192	56	117	SW
Vinton	Benton	800	11	48 8	93	Aug. *9 Sept. 5	-11	Jan. 31	11	.....	.....	.....	.....	.....	....	60	.....	.....	.....	NW
Villisca	Montgom'ry	1 058	8	52 4	101	July 14	-12	Feb. 15	8	38 12	7.40	Oct	.32	Jan	....	83	201	87	77	SW
Wapello	Louisa	578	....	52 3	103	Aug. *3	- 6	Jan. 31 Feb 26		30 98	5 69	August	.35	Dec	....	82	....	....	....	NW
Washington	Washington	738	10	49 6	98	Aug. 5	-11	Jan *28 Feb. 15	11	33 24	7 22	August	.30	Dec.	....	....	....	....	....	SW
Washta	Cherokee	.....	....	.....	.....	.....	.....	.....	.....	35 61	8 21	July	.27	Nov	23 2	80	192	103	70	S
Waterloo	Blackhawk	862	22	48 4	95	Aug. *18	-12	Jan. 31	22	37 35	7 92	July	.70	Jan	29 2	95	178	95	92	NW
Waverly	Bremer	942	....	48 4	94	Sept. 5	-15	Feb. 6	.....	31 38	5 61	July	.64	Jan	....	107	....	....	....	S, NW
West Bend	Palo Alto	.....	....	46 5	96	June 26	-21	Feb. 15	8	29 38	5 62	July	.48	Dec	40 5	87	137	122	106	NW
Whitten	Hardin	.....	....	47 4	96	Aug. 5	-16	Feb. 15	.....	.....	.....	.....	.....	.....	....	....	....	....	....	
Wilton Junction	Mu-catine	672	....	50 3	98	Aug*. 5	- 9	Feb. 25	.....	37 39	7 40	August	35	Dec	....	79	....	....	....	NW
Winterset	Madison		10	50 6	96	July 6	-11	Jan. 28	10	40 20	7 24	July	23	Jan Dec.	24 5	....	....	....	....	
Averages	.....	.....	....	49 5	.....	.....	.....	.....	.....	35 60	.....	.....	.....	.....	26 3	84	172	101	92	NW

MONTHLY MAXIMUM AND MINIMUM TEMPERATURES FOR 1900, WITH DATES.

STATIONS.		Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.	
		Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date
Alton	Max	51	*22	44	11	67	11	83	27	90	*13	98	26	98	3	96	14	92	* 5	85	* 3	67	3	51	21
	Min	-11	28	- 9	15	- 5	16	23	12	33	3	47	2	50	8	56	26	35	17	30	17	8	21	- 5	31
Albia	Max	54	*22	47	7	65	*11	82	29	89	27	93	26	93	* 4	95	* 5	92	* 5	85	3	67	3	62	23
	Min	-10	*28	-10	15	- 3	15	21	5	34	3	47	2	51	23	58	* 26	33	17	31	14	10	*15	- 3	31
Algona	Max	51	22	38	11	58	12	78	*26	92	27	94	26	92	3	91	* 4	89	5	82	4	62	3	47	*20
	Min	-18	31	-20	9	-10	16	28	11	36	3	49	2	58	*17	59	28	35	27	36	17	0	15	- 9	31
Alta	Max	56	22	38	6	68	12	82	28	91	11	94	26	92	13	92	2	89	* 5	82	* 4	64	3	52	20
	Min	-15	28	-16	*15	-10	16	23	12	27	3	41	2	50	8	56	25	33	17	31	8	0	15	- 7	31
Amana	Max	49	24	45	7	63	22	80	29	90	27	92	26	93	* 3	93	* 4	91	5	84	* 3	66	3	53	22
	Min	-10	31	- 9	16	- 3	16	27	4	34	* 3	48	* 3	51	12	60	27	37	17	30	17	9	15	- 2	31
Ames	Max	54	22	..	..	..	..	82	30	90	*12	96	26	95	3	94	9	93	5	87	2	72	3	60	22
	Min	-11	*28	-12	15	- 4	16	27	12	33	3	47	11	51	* 8	58	26	36	17	31	17	5	15	- 3	31
Atlantic	Max	53	22	44	11	69	*11	82	27	88	11	99	26	97	6	94	12	93	* 5	87	3	71	3	55	21
	Min	-10	28	-21	15	- 4	16	24	*11	25	3	40	11	50	* 9	54	26	29	17	24	17	5	21	- 1	31
Audubon	Max	52	22	45	3	69	12	80	27	87	29	97	26	..	..	98	6	..	..	87	3	66	2	55	*19
	Min	-12	28	-15	9	- 6	16	23	12	29	3	41	14	..	..	49	* 1	..	..	25	17	8	*15	3	29
Bancroft	Max	53	22	39	11	60	12	80	27	91	27	94	26	..	..	93	* 2	90	5	85	4	65	* 3	51	20
	Min	-16	31	-22	9	- 9	16	24	12	25	3	44	4	..	..	47	30	32	27	31	17	- 1	15	- 8	31
Baxter	Max	53	22	45	22	67	27	82	29	91	28	94	* 7	94	31	95	20	93	5	88	4	71	3	55	22
	Min	-12	30	-14	14	- 5	15	26	11	29	2	47	1	54	*17	59	25	33	16	32	7	4	14	- 8	31
Bedford	Max	55	23	49	11	72	*11	84	27	94	30	99	26	98	* 3	99	20	96	* 5	90	* 3	72	3	.	.
	Min	-10	28	-12	15	- 2	16	25	*12	28	3	..	..	51	18	53	26	30	17	27	8	3	21	..	..
Belknap	Max	57	22	51	7	67	22	82	29	87	*13	89	* 6	93	3	95	* 3	94	5	87	* 3	71	2	55	21
	Min	- 8	*28	- 7	1	- 1	16	27	*11	35	3	50	2	55	* 9	61	26	36	17	34	17	14	15	- 1	31
Belle Plaine	Max	..	..	40	11	63	21	84	30	90	*28	92	26	93	* 3	95	5	91	5	..	..	68	4	56	21
	Min	..	..	-13	16	- 4	16	26	4	33	3	48	3	50	11	62	*27	34	17	.	..	7	15	- 2	31
Bonaparte	Max	55	22	55	7	66	22	84	29	87	*13	91	* 3	96	31	100	5	95	5	87	* 3	69	3	56	22
	Min	- 6	31	- 8	15	1	16	27	12	35	3	51	* 3	53	9	62	27	36	17	30	17	15	*15	3	31
Britt	Max	45	6	39	11	60	12	84	27	93	27	94	* 26	95	4	92	* 8	91	5	86	4	64	3	49	20
	Min	-15	31	-24	9	- 9	16	25	* 4	25	3	44	* 8	45	12	50	3	30	17	25	8	- 4	15	- 7	31
Carroll	Max	59	13	44	6	72	12	82	*27	90	*13	96	26	96	3	93	20	93	8	86	4	69	3	56	20
	Min	-14	28	-18	15	-10	17	20	5	26	3	45	*11	51	8	58	*15	32	17	30	31	6	15	- 4	31
Cedar Rapids	Max	53	22	45	* 7	64	22	84	*27	93	27	94	* 6	96	* 3	97	* 5	95	5	88	4	69	3	54	22
	Min	-10	31	-10	16	- 3	16	28	*11	35	3	51	* 4	53	12	62	30	38	17	33	17	9	18	- 4	31
Chariton	Max	55	22	52	7	68	22	79	29	86	28	92	26	94	* 3	94	20	93	* 5	85	* 2	70	3	55	22
	Min	-10	28	- 9	15	- 3	16	24	12	32	3	46	*11	52	9	58	26	34	17	34	17	10	*15	- 2	31
Charles City	Max	43	*22	37	11	55	22	83	29	90	27	94	26	92	4	96	4	92	5	84	3	65	3	45	22
	Min	-14	31	-22	9	-10	16	25	10	29	3	40	19	50	9	54	29	35	17	29	8	- 6	15	- 4	*26
Clarinda	Max	57	23	49	11	77	11	84	27	92	11	98	6	98	6	98	20	96	* 5	89	* 3	74	3	54	20
	Min	- 8	28	-10	15	- 3	16	26	12	32	3	46	11	51	9	56	26	33	17	29	17	6	21	- 3	31
Clear Lake	Max	45	22	38	11	57	22	80	*26	93	27	97	25	95	31	95	*18	92	5	85	4	64	3	46	*20
	Min	-17	31	-24	9	-10	16	25	* 4	28	3	45	11	45	12	52	26	38	28	35	17	- 4	15	- 7	31
Clinton	Max	51	24	49	7	60	22	86	29	90	*13	94	26	98	4	97	5	93	2	87	4	65	* 3	52	22
	Min	- 8	31	-10	*16	0	17	24	5	31	5	45	19	48	21	58	30	36	18	28	17	13	*14	- 3	31
College Springs	Max	53	23	46	11	69	*11	82	27	95	30	97	7	97	6	96	5	95	9	88	4	65	* 4	56	18
	Min	- 8	*28	-13	15	- 4	16	24	*12	30	3	48	2	53	30	56	26	34	17	31	8	4	21	- 2	31
Coon Rapids	Max	51	22	42	12	68	12	77	27	89	13	95	26	94	3	92	* 1	91	* 5	84	* 4	67	4	52	21
	Min	-15	28	-15	9	- 7	16	23	12	32	3	48	* 2	53	8	60	*25	36	17	33	17	8	*15	- 4	31
Corning	Max	50	*23	45	11	67	*11	81	27	88	13	95	26	96	* 3	93	*12	..	..	84	4	67	3	52	21
	Min	-10	28	-11	15	- 4	16	22	10	30	3	43	11	50	9	55	26	..	..	30	8	6	21	- 2	31
Council Bluffs	Max	63	22	47	11	77	12	81	*26	91	*11	98	* 6	101	6	96	*17	96	5	89	4	77	3	60	17
	Min	- 8	25	-11	8	- 4	16	26	10	32	2	50	* 1	55	16	60	25	38	16	29	16	10	*20	0	31
Cresco	Max	40	24	37	* 7	46	*22	80	27	88	27	93	26	92	* 3	96	*18	91	5	84	3	63	3	46	22
	Min	-18	31	-23	9	-11	16	25	11	26	3	47	8	44	12	53	29	32	17	27	8	- 9	15	- 4	31
Davenport	Max	52	24	53	7	60	22	81	29	89	27	90	7	95	4	97	5	91	5	86	3	66	3	53	22
	Min	- 8	31	- 7	15	0	16	28	12	37	3	53	4	57	21	63	17	38	17	30	17	15	15	0	31
Delaware	Max	46	22	40	*11	58	22	80	29	89	27	93	26	90	31	93	* 5	90	5	85	3	65	3	50	22
	Min	-13	31	-15	6	- 5	16	24	4	31	* 4	42	2	51	*12	58	*26	34	17	28	*17	2	15	- 9	31
Decorah	Max	43	*22	38	* 7	50	21	82	*27	89	13	94	*25	94	4	99	9	95	5	84	3	66	3	47	22
	Min	-17	31	-16	9	- 9	16	23	12	27	5	40	18	46	12	49	29	34	18	29	17	- 1	15	- 4	31
Denison	Max	54	22	43	22	80	11	79	26	89	11	95	21	97	* 3	93	20	91	* 5	85	4	68	3	55	21
	Min	-14	28	-27	15	- 9	16	23	11	29	3	46	11	51	9	57	*25	30	17	28	17	4	22	- 4	31
Des Moines	Max	54	22	45	11	68	22	80	27	89	11	95	26	95	3	92	5	92	5	87	4	71	3	54	21
	Min	-10	28	-10	15	- 4	16	28	12	35	3	50	11	54	9	61	26	40	17	33	8	11	15	- 2	31
De Soto	Max	53	22	46	11	66	22	84	27	91	14	96	26	95	6	95	9	90	5	84	4	66	3	53	21
	Min	- 9	*28	-10	15	- 3	16	25	5	35	3	49	11	54	9	59	1	38	17	31	17	10	15	- 3	31
Dows	Max	51	22	38	*11	63	12	82	27	90	27	93	26	92	3	92	2	93	5	87	4	68	3	49	*20
	Min	-15	31	-21	9	- 8	16	25	12	25	3	44	11	47	12	54	26	30	17	25	8	- 3	15	- 6	31
Dubuque	Max	49	22	45	11	59	22	80	29	89	27	92	25	92	4	95	5	92	5	86	3	67	3	51	22
	Min	-13	31	-10	16	- 4	16	27	12	33	4	51	11	53	21	59	29	38	18	35	17	10	15	- 3	31
Eldon	Max	58	22	55	7	68	22	86	29	91	27	93	6	96	* 3	99	5	96	9	88	* 3	72	3	56	21
	Min	- 8	*28	-11	15	- 1	16	25	5	35	5	48	*11	51	21	60	1	38	17	30	17	13	15	- 1	31
Elkader	Max	54	22	42	11	60	22	83	28	94	27	98	25	95	4	98	*18	95	5	89	3	74	4	54	22
	Min	-12	31	-17	6	- 5	16	23	4	29	5	45	* 9	48	12	54	29	33	18	28	17	- 2	16	- 2	26
Estherville	Max	..	..	40	11	63	22	80	26	92	27	94	26	91	* 4	92	*10	89	5	85	2	68	3	52	20
	Min	..	..	-25	9	-10	16	24	4	28	3	41	11	45	12	51	28	30	27	29	8	- 1	15	- 6	25
Fairfield	Max	53	24	46	11	67	22	82	29	88	*27	90	*25	94	* 4	99	10	94	10	..	..	..	..	..	..
	Min	- 7	31	- 8	15	0	16	27	12	35	3	49	* 3	51	21	60	* 3	33	17	..	..	..	..	..	..
Fayette	Max	44	*22	39	11	54	22	79	*27	90	27	95	25	93	4	93	* 5	93	7	85	3	66	3	49	22
	Min	-14	31	-18	6	- 8	16	22	4	26	5	41	2	48	26	56	27	31	17	26	8	- 4	*15	-12	31
Ft. Dodge	Max	58	22	45	11	70	12	81	27	92	27	92	25	94	3	93	18	92	* 5	87	4	68	3	52	20
	Min	-14	28	-22	9	- 6	16	22	5	28	3	44	11	49	21	55	26	30	17	29	* 8	0	15	- 5	31
Fonda	Max	56	22	41	5	71	12	81	27	93	27	94	26	95	3	93	*14	98	1	..	..	66	1	..	.
	Min	-14	30	-21	8	- 8	15	24	10	26	2	43	10	48	8	66	*15	25	16	..	..	- 6	13	..	.
Forest City	Max	50	22	36	*11	58	22	82	27	89	27	94	26	91	* 3	92	2	91	5	86	* 4	65	2	47	21
	Min	17	31	-24	9	-10	16	26	* 4	26	3	47	* 2	49	12	54	*25	33	27	30	8	- 1	15	- 8	31
Galva	Max	57	22	40	* 6	70	*12	83	27	96	27	97	26	93	* 1	92	* 2	92	..	85	5	79	3	56	1
	Min	-13	28	-17	15	- 8	16	23	11	29	3	43	2	51	8	57	24	..	..	26	17	3	15	- 5	31
Glenwood	Max	56	22	49	*11	73	22	80	27	89	13	94	6	95	6	95	20	96	5	87	* 3	75	3	59	17
	Min	- 8	28	-12	* 9	- 4	16	25	11	31	3	46	14	52	9	63	*12	35	17	29	17	7	21	- 2	31
Grand Meadow	Max	40	*22	38	11	48	22	80	29	86	13	..	..	88	* 3	90	*18	90	* 5	84	3	58	3	45	22
	Min	-14	31	-10	* 9	- 6	16	26	*10	32	3	..	..	54	*17	60	29	38	17	35	* 3	18	14	- 4	31
Greene	Max	47	22	38	11	60	22	85	*27	93	27	99	25	95	* 3	95	* 6	93	5	85	* 3	68	3	47	22
	Min	-13	31	-19	9	- 8	16	25	* 4	28	3	46	11	47	12	55	29	33	17	29	8	8	15	- 3	31
Greenfield	Max	52	22	47	11	66	*11	87	27	92	30	97	26	96	13	94	* 6	91	7	86	4	68	*15	- 5	31
	Min	-12	28	-12	15	- 6	16	23	12	28	3	47	1	52	8	56	31	33	17	33	* 4	8	* 3	52	21
Grinnell	Max	48	23	48	5	61	22	77	*27	..	..	88	* 7	..	..	..	..	91	1	83	8	67	6	52	21
	Min	-10	31	-10	15	- 4	16	28	12	..	..	49	2	..	..	..	..	32	17	35	* 4	6	15	- 2	31
Grinnell (near)	Max	48	*22	43	7	64	22	80	*27	89	13	..	..	93	6	95	5	94	17	85	* 8	68	3	52	22
	Min	-11	31	-12	*15	- 5	16	27	* 4	31	3	..	..	55	*12	62	*26	38	* 5	34	* 3	6	15	- 3	31
Grundy Center	Max	50	21	40	11	63	22	82	26	..	..	90	26	91	* 3	92	* 5	91	5	86	3	68	3	49	22
	Min	-15	31	-13	15	- 8	13	25	* 5	..	..	47	2	51	12	58	*25	33	17	31	8	2	15	- 3	31

MONTHLY MAXIMUM AND MINIMUM TEMPERATURES FOR 1900, WITH DATES.

STATIONS.		Jan.		Feb		March		April		May		June		July		Aug.		Sept.		Oct.		Nov		Dec.	
		Deg.	Date	Deg.	Date	Deg.	Date	Deg	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date
Guthrie Center	Max	52	22	43	11	67	23	79	*28	88	*14	95	26	100	21	100	18	100	8	89	* 3	68	3	51	29
	Min	-11	30	-18	15	- 3	16	21	* 5	30	3	41	11	..	..	53	1	36	29	28	17	9	*15	- 5	31
Hampton	Max	53	22	40	22	63	22	84	27	95	22	96	26	94	3	95	* 2	95	5	89	4	69	3	- 50	21
	Min	-14	31	-17	9	- 8	16	26	4	29	3	49	* 2	50	12	58	*28	35	17	30	17	2	15	- 5	31
Harlan	Max	52	22	43	* 5	72	12	81	27	89	26	95	*21	98	6	94	14	92	* 5	85	* 3	67	3	- 52	21
	Min	-12	28	-23	15	- 7	16	23	11	27	3	44	14	50	21	56	26	30	17	27	17	6	21	- 4	31
Hedrick	Max	53	22	55	7	66	22	85	29	90	27	92	* 7	94	14	97	8	93	5	..	..	67	5	54	*21
	Min	- 9	31	-10	15	- 2	16	26	4	32	3	48	* 3	51	21	58	*26	34	17	..	..	10	15	- 4	31
Hopeville	Max	51	*22	47	7	67	11	80	27	88	13	..	..	95	3	93	14	92	* 5	85	4	68	3	53	22
	Min	-10	28	-10	15	- 4	16	23	12	32	3	..	..	56	9	60	26	36	17	35	* 8	10	21	- 3	31
Humboldt	Max	52	22	38	*11	66	12	81	27	91	13	95	26	94	3	94	2	93	5	85	4	65	3	52	21
	Min	-13	31	-20	* 9	- 8	16	25	12	28	3	45	2	51	* 9	57	28	33	17	30	8	3	14	- 5	31
Independence	Max	46	22	38	11	60	22	78	*27	89	27	91	25	91	4	92	* 5	92	5	85	3	67	3	50	22
	Min	-13	31	-13	6	- 7	16	24	*10	30	3	46	3	50	12	58	*30	34	17	30	17	1	15	- 2	31
Indianola	Max	52	22	45	11	70	22	81	27	88	*13	93	26	94	* 3	93	* 5	92	5	86	4	71	3	53	21
	Min	-10	28	-12	15	- 4	16	27	4	31	3	46	5	54	9	59	26	36	17	33	8	9	9	- 3	31
Iowa City	Max	54	23	48	11	63	22	83	29	90	27	95	25	96	14	99	5	93	5	88	* 3	69	3	54	22
	Min	-10	31	-12	16	- 3	16	27	5	35	* 3	47	11	51	12	62	3	37	17	31	17	12	15	1	31
Iowa Falls	Max	48	22	39	11	62	22	83	27	92	27	94	*25	95	3	91	* 2	92	5	86	4	67	3	48	22
	Min	-13	31	-15	15	- 7	16	26	4	27	3	45	* 8	48	12	57	26	32	17	27	8	0	15	- 5	31
Keokuk	Max	57	22	60	7	64	11	82	29	87	13	90	28	94	3	98	18	92	* 2	87	4	69	3	57	21
	Min	- 4	31	- 2	*17	3	16	28	12	38	3	53	3	57	21	66	26	42	17	36	8	16	23	7	31
Keosauqua	Max	56	22	55	7	67	22	84	29	90	27	92	* 7	94	3	97	* 5	95	5	87	4	67	3	57	22
	Min	- 6	31	- 5	15	2	16	26	* 5	36	3	52	* 4	54	21	64	30	39	17	33	17	17	*14	3	31
Knoxville	Max	55	22	48	7	69	22	83	27	91	*27	95	* 6	96	6	95	* 1	93	5	87	5	70	3	55	*21
	Min	- 8	31	- 9	15	- 3	16	27	12	40	4	49	11	53	9	59	*26	35	17	32	8	6	15	- 6	31
Lansing	Max	51	22	41	7	56	24	83	28	97	27	97	25	94	4	96	*18	95	4	88	3	71	3	52	22
	Min	-13	31	-13	1	- 5	16	25	* 4	29	* 4	42	*23	49	12	54	29	34	*17	32	17	2	15	0	31
Larrabee	Max	57	22	43	11	67	*10	83	27	92	13	98	26	93	* 3	92	* 2	91	8	87	4	67	3	53	*20
	Min	-16	31	-21	15	-11	16	21	1	28	3	38	2	48	17	55	*25	29	*17	29	17	- 4	15	- 7	31
Lenox	Max	51	23	45	11	68	11	80	27	86	13	90	25	94	* 3	91	20	90	9	83	* 3	67	3	51	21
	Min	-11	28	-12	15	- 6	16	24	12	29	3	48	2	54	9	58	26	37	17	33	8	8	21	- 5	31
Le Mars	Max	58	13	42	6	70	12	76	*25	89	*11	90	26	96	3	95	2	90	8	84	5	68	3	52	20
	Min	-13	28	-16	9	- 8	16	23	11	28	3	43	* 2	52	* 8	55	13	31	17	29	8	1	21	- 5	31
Logan	Max	53	24	47	6	70	*10	78	27	90	28	100	26	102	6	97	7	93	* 5	84	* 2	67	2	54	20
	Min	-10	31	-24	14	- 6	16	23	11	27	3	43	8	51	*17	58	*13	31	17	24	17	2	20	- 6	31
Maquoketa	Max	54	23	49	11	63	23	80	*28	87	13	89	25	93	4	95	5	91	5	84	* 3	69	3	..	..
	Min	-11	31	-12	16	- 2	16	20	1	30	5	46	* 3	40	21	57	30	34	18	27	17	9	15	..	..
Marshalltown	Max	51	22	42	*11	65	22	82	*27	92	27	93	* 6	95	6	95	* 4	93	9	88	* 3	72	3	53	*21
	Min	-12	31	-14	15	- 5	16	27	* 4	31	3	47	11	52	12	60	*26	34	17	30	8	4	15	- 4	31
Monticello	Max	48	24	44	11	..	..	82	30	90	27	94	27	95	4	96	5	94	5	87	4	66	3	50	21
	Min	-12	*28	-13	16	- 2	16	19	2	30	6	39	4	48	24	52	1	32	18	26	16	5	15	0	*26
Mooar	Max	58	24	59	7	65	22	82	7	87	12	90	7	96	14	99	7	93	10	87	* 3	74	* 1	55	*17
	Min	- 4	*28	- 4	9	2	* 3	23	5	35	9	48	21	49	23	50	26	36	* 22	29	* 23	13	* 14	10	*26
Mt. Vernon (Hubbard)	Max	51	*22	45	11	64	22	85	28	92	30	95	25	93	31	96	5	92	* 5	85	* 3	69	* 3	53	22
	Min	-12	31	-12	16	- 5	16	24	10	32	3	43	16	50	12	60	29	33	17	31	17	7	15	- 6	31
Mt. Ayr	Max	52	*13	48	7	67	*11	82	*26	89	28	94	26	97	* 3	96	12	96	9	87	4	69	3	53	*21
	Min	-10	28	-10	15	- 5	16	24	12	30	3	49	2	55	18	57	26	36	17	34	* 8	6	21	- 3	31
Mt. Pleasant	Max	54	24	54	7	70	22	85	29	92	28	92	*25	95	* 3	97	11	94	* 5	89	3	66	3	57	22
	Min	-12	31	-11	* 1	0	3	19	1	34	3	45	* 4	51	18	57	29	37	17	32	9	11	14	2	30
New Hampton	Max	42	22	37	* 7	53	22	79	*27	88	27	91	26	91	4	93	* 2	92	5	83	3	66	3	49	22
	Min	-15	31	-18	9	- 9	16	24	10	27	3	47	11	51	21	56	30	36	29	34	12	- 5	15	- 5	31
Newton	Max	..	..	43	11	65	22	81	27	89	28	92	7	93	6	93	* 4	92	5	89	3	68	3	54	21
	Min	-13	31	-13	15	- 6	16	23	8	32	3	49	2	54	*12	60	26	34	17	33	* 8	5	15	- 5	31
Northwood	Max	49	22	34	* 7	62	22	85	19	88	27	91	26	90	4	91	* 2	91	5	81	3	66	4	45	*20
	Min	-16	31	-23	9	-10	16	25	10	29	3	47	* 2	48	12	56	25	34	27	30	17	- 2	15	- 6	31
Odebolt	Max	57	22	42	6	71	12	82	27	94	27	102	26	98	3	95	* 1	95	8	84	* 2	65	3	52	21
	Min	-12	28	-19	15	- 7	16	24	11	26	3	43	8	51	* 8	56	25	30	17	28	7	5	*15	- 4	31
Ogden	Max	54	22	41	11	68	22	80	27	89	*27	95	26	94	* 3	92	2	92	5	87	4	69	3	51	21
	Min	-12	*28	-22	15	- 6	16	26	13	27	3	44	11	51	8	57	26	34	17	29	8	2	15	- 6	31
Omaha	Max	57	22	45	11	77	12	79	27	89	12	94	26	97	6	94	20	94	5	89	4	72	3	63	17
	Min	- 8	28	- 9	15	- 6	16	27	12	40	3	52	2	56	*17	62	24	42	17	37	17	12	21	- 2	31
Onawa	Max	63	22	44	1	76	12	84	27	92	13	95	26	97	3	94	2	93	* 5	87	* 5	74	3	57	*17
	Min	-10	28	-14	16	- 6	16	20	11	30	3	46	2	54	17	59	25	36	17	28	7	7	21	- 2	31
Osceola	Max	54	22	48	7	69	22	80	*26	92	12	92	27	95	* 3	94	* 7	93	9	86	4	70	3	54	*20
	Min	-10	28	-10	15	- 4	16	23	12	32	3	48	2	54	18	60	26	36	17	34	8	10	*15	- 4	31
Ovid	Max	57	22	52	7	70	11	81	27	86	*13	90	*26	92	* 6	96	21	95	9	86	* 3	71	3	56	22
	Min	- 9	*28	-10	15	- 3	16	22	12	30	3	47	2	52	9	58	26	33	17	31	8	10	*15	- 4	31
Osage	Max	43	22	38	11	52	22	80	27	88	13	92	26	94	4	90	* 2	90	5	80	3	62	3	43	21
	Min	-17	31	-23	9	-13	16	23	10	28	3	42	11	44	12	54	*28	34	17	32	* 8	- 3	15	- 6	31
Oskaloosa	Max	55	22	40	7	68	22	81	29	88	13	91	26	93	14	96	* 5	94	5	87	4	71	3	55	*21
	Min	-10	*28	-12	15	- 2	16	26	4	32	3	44	11	50	9	60	*26	34	17	30	17	10	15	- 3	31
Ottumwa	Max	66	4	53	7	65	*11	83	29	89	27	90	6	93	* 2	97	20	94	5	87	4	71	3	58	22
	Min	- 6	*28	- 2	24	1	16	29	12	38	3	56	2	58	*11	61	24	37	17	35	8	14	15	0	31
Pacific Junction	Max	54	22	49	11	73	12	81	27	90	13	93	* 6	95	6	92	20	95	5	88	4	72	3	57	21
	Min	- 8	28	-17	15	- 4	16	25	11	28	3	46	14	51	9	56	26	35	17	29	17	5	22	- 1	31
Pella	Max	47	22	38	* 4	58	12	..	..	92	28	96	26	95	3	96	8	93	9	88	4	72	4	54	21
	Min	-10	*28	-12	15	- 2	16	..	..	34	3	54	2	64	*21	57	15	35	16	33	* 7	8	15	- 6	31
Plover	Max	55	22	40	* 6	67	12	85	27	95	27	96	26	95	3	95	20	94	* 5	86	4	55	* 1	53	20
	Min	-14	31	-18	15	- 8	16	20	11	24	3	42	2	49	* 9	54	*26	31	17	21	14	0	15	- 6	31
Pr nghar	Max	60	20	36	5	76	12	84	26	92	*11	98	25	93	* 1	94	2	91	* 5	80	2	72	3	60	20
	Min	-16	31	-20	15	-10	16	20	*10	35	2	42	2	49	8	60	24	32	*17	35	* 7	0	21	-10	31
Red Oak	Max	58	* 7	50	* 3	78	10	89	28	89	13	97	26	98	10	95	20	94	* 5	86	* 3	76	3	56	20
	Min	- 8	28	- 9	15	- 2	16	28	12	33	3	48	*11	52	18	58	26	35	17	32	* 8	5	21	- 4	31
Ridgeway	Max	45	20	40	7	52	*10	81	*27	93	27	92	26	94	* 3	98	2	92	5	83	3	66	* 3	52	22
	Min	-16	*31	-20	9	-11	16	25	*10	29	3	40	9	53	*17	62	*25	36	17	31	8	0	15	- 6	31
Rockwell City	Max	53	22	48	22	68	12	80	27	93	27	94	26	95	4	93	2	92	5	84	4	62	2	53	21
	Min	-13	31	-14	16	- 7	16	25	11	26	3	44	2	52	8	58	*25	34	17	32	* 8	2	15	- 5	31
Ruthven	Max	45	22	47	7	63	12	78	27	90	27	95	26	93	4	94	* 2	90	5	86	5	57	4	44	21
	Min	-20	29	-22	15	-12	16	24	12	26	3	45	2	50	8	48	13	32	27	31	7	- 2	15	- 9	24
Sac City	Max	56	22	42	6	70	12	80	27	90	11	94	26	94	3	93	20	91	* 5	85	* 4	67	3	52	*20
	Min	-13	28	-17	15	- 8	16	24	11	28	3	44	2	52	8	57	25	32	17	32	* 8	2	15	- 4	31
Scranton	Max	52	22	40	11	67	12	78	27	90	13	98	26	96	3	93	6	91	5	..	..	67	3	51	21
	Min	-11	28	-14	16	- 5	16	26	11	32	2	47	2	54	* 8	59	26	35	17	35	* 8	8	15	- 3	31
Sheldon	Max	55	13	37	11	66	*10	76	28	89	11	94	26	94	13	93	2	89	* 5	81	4	65	3	48	20
	Min	-15	*28	-21	9	-10	16	24	11	27	3	41	2	50	8	44	28	31	17	29	11	2	*15	- 9	31
Sibley	Max	55	13	38	22	69	12	80	28	94	11	96	26	96	13	98	2	91	9	87	3	68	3	50	20
	Min	-17	31	-20	9	-12	16	23	12	22	3	40	2	47	8	51	24	29	27	26	8	- 2	5	-10	31
Sigourney	Max	55	22	52	7	68	22	88	29	92	*27	98	25	97	3	99	5	97	9	88	* 3	70	3	57	22
	Min	-10	31	-10	15	- 3	16	25	4	33	3	47	* 3	51	21	59	20	35	17	30	17	10	15	- 1	31
Sioux Center	Max	54	13	39	22	66	12	75	19	93	11	100	20	96	31	98	2	89	9	86	3	63	3	47	*20
	Min	-15	28	-15	15	-10	16	25	11	30	3	44	2	51	17	56	25	26	29	31	7	0	21	-10	31

MONTHLY MAXIMUM AND MINIMUM TEMPERATURES FOR 1900, WITH DATES.

STATIONS.		Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.	
		Deg.	Date	Deg	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date	Deg.	Date
Sioux City.	Max	60	13	47	6	71	12	78	27	91	13	96	26	97	31	97	2	92	8	86	5	71	3	56	20
	Min	-12	28	-12	9	- 8	16	26	11	29	3	48	2	55	17	58	13	35	17	33	8	4	21	- 5	31
Spirit Lake	Max	51	22	40	27	62	22	84	*26	..	..	..	..	..	..	97	20	91	5	88	4	62	3	50	20
	Min	-16	31	-19	9	-11	16	23	11	..	..	..	..	..	..	55	28	35	17	..	..	- 3	15	-10	31
Storm Lake	Max	54	22	37	* 6	69	12	78	27	87	27	92	*26	90	3	91	20	88	* 5	82	5	64	3	50	20
	Min	-14	*28	-15	16	-10	16	24	*11	29	3	44	* 2	52	8	58	13	32	*17	36	8	- 1	15	- 7	31
Stuart	Max	48	23	42	6	63	11	84	27	89	28	96	26	98	31	98	2	..	..	86	2	63	4	58	20
	Min	-12	*28	-12	8	- 7	16	25	*12	31	2	48	2	52	8	55	15	.	..	33	31	8	*14	- 6	30
Thurman	Max	57	13	49	11	70	*11	79	27	89	13	96	6	95	* 3	94	20	93	5	86	4	70	3	54	17
	Min	- 5	28	-14	15	- 2	16	26	*11	31	3	45	11	52	9	58	* 1	37	17	28	17	4	21	- 2	31
Toledo	Max	54	22	43	27	68	22	83	29	98	23	96	7	97	31	96	9	94	5	90	4	73	22	57	22
	Min	-12	31	-13	16	- 5	16	26	* 1	32	* 3	40	18	40	30	50	3	34	17	28	8	5	15	- 2	31
Vinton	Max	50	22	41	11	61	22	78	*27	90	27	92	7	91	3	93	* 9	93	5	86	* 3	69	2	53	22
	Min	-11	31	-10	15	- 5	16	29	11	39	3	57	* 4	56	17	62	29	38	17	32	8	6	15	- 5	31
Villisca	Max	50	* 7	48	6	78	11	87	27	92	31	98	27	101	14	97	5	98	9	89	3	72	* 3	55	2
	Min	- 9	28	-12	15	- 4	16	24	12	28	3	45	* 2	52	*21	55	*18	30	17	28	*16	5	21	- 4	31
Wapello	Max	58	24	47	11	81	22	84	29	92	27	97	28	99	6	103	* 3	99	5	82	* 2	72	4	54	*19
	Min	- 6	31	- 6	26	1	17	29	12	32	3	51	3	54	* 9	65	27	38	17	29	9	15	13	6	31
Washington	Max	54	24	52	7	66	22	86	29	88	*13	92	25	93	* 3	98	5	93	5	87	4	69	3	56	22
	Min	-11	*28	-11	15	- 5	*16	24	4	32	3	48	* 2	50	21	60	27	34	17	30	8	8	15	- 4	31
Waterloo	Max	49	22	40	11	62	22	80	*28	93	27	92	7	93	4	95	*18	94	5	87	3	69	3	51	22
	Min	-12	31	-11	6	- 6	16	25	10	31	3	47	3	50	12	57	29	35	17	30	* 8	1	15	- 7	31
Waverly	Max	46	22	41	7	59	22	81	27	91	27	91	* 6	92	4	93	* 7	94	5	85	* 2	67	3	52	22
	Min	-12	31	-15	6	- 7	16	27	5	31	3	50	* 3	52	12	59	28	36	17	32	8	1	15	- 3	31
West Bend	Max	53	22	38	11	59	22	81	28	93	27	96	26	94	13	94	* 2	92	9	85	4	65	3	50	20
	Min	-15	31	-21	15	- 8	16	27	12	33	3	52	2	57	*16	59	28	34	27	31	8	- 1	15	- 6	31
West Branch	Max	..	..	45	11	60	23	84	29	93	27	94	* 6	..	..	100	5	95	5	89	4	..	.	48	18
	Min	..	..	-12	17	0	16	22	4	30	5	44	21	..	..	56	* 3	33	17	29	*22	..	..	2	31
Whitten	Max	48	22	40	11	62	22	78	27	90	27	93	26	93	* 3	96	5	93	5	84	4	66	4	49	21
	Min	-15	31	-16	15	- 8	16	25	12	27	3	46	2	51	30	60	*24	33	17	29	* 8	0	15	- 5	31
Wilton Junction	Max	48	22	47	* 7	61	22	83	29	89	27	92	*25	96	14	98	* 5	92	5	86	4	69	1	54	22
	Min	- 8	*28	- 9	25	1	*16	26	5	34	* 3	45	18	47	12	60	29	35	17	28	17	11	15	0	31
Winterset	Max	52	22	45	11	64	*10	83	27	90	13	93	26	96	6	94	* 4	94	* 5	89	4	70	3	54	21
	Min	-11	28	-10	15	- 3	16	24	12	32	3	47	11	52	* 9	58	26	33	17	31	8	9	15	- 3	31

*And other dates.

MONTHLY AND ANNUAL MEAN TEMPERATURES FOR 1900 WITH DEPARTURES.

STATIONS.	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Annual	
	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept	Tem.	Dept.	Tem.	Dept	Tem	Dept.	Tem.	Dept	Tem.	Dept	Tem.	Dept	Tem.	Dept	Tem.	Dept	Tem.	Dept.
Afton	27 4	.....	19.4	.	33 6	.....	54 2	. . .	64 4	....	70 9	.....	75.0	.....	77.1	.....	65 0	.....	59.0	. ...	34.5	. .	28 6	. . .	50 8	.....
Albia	28 8	....	18 2	.....	33 6	...	52 8		63.2		69 5	.	72 8	.	77 8	.	64.1	.....	59.3	....	34 7	.....	29.8	.	50 4	.....
Algona	22.7	* 8 5	11 c	-8.1	27 9	-2 8	51.8	* 3 8	64 1	* 5 7	70 2	* 0 2	73 2	-0.4	76 9	* 7.6	62 7	-0.9	58 2	*10 1	30.9	* 1.5	24 1	* 3 7	47 8	* 2.4
Alta	23.3	* 8 3	10 8	-7 4	28 4	-1.2	51 4	* 4.0	62 8	* 5 2	68.0	-1 1	70 8	-1.9	74 9	* 4 9	62.0	-2.6	57.7	* 8 6	30.1	* 1 1	24 4	* 2.8	47.0	* 1 7
Amana	26.9	*12 5	16 8	-4 0	30 8	-0 3	52 2	* 3 8	63 8	* 4 2	69.5	-0 4	73.6	-0 1	77.5	* 7 2	65 1	* 3.2	59 0	*10 5	35 0	* 3.0	27 8	* 6 0	49 8	* 3.7
Ames	26 4	*10.6	....		....	....	....	....	64.4	* 5 4	69 4	-0 6	73 0	-2 0	76.8	* 4 8	66 0	* 2.4	59 8	* 9 9	33 3	* 1 5	27 2	* 5.4	....	....
Atlantic	27 2	* 8 8	15 5	-7.4	32 6	-0 8	52 6	* 3 6	63.2	* 4 8	69 1	* 0 7	74 8	* 2.0	77 0	* 6 4	64.4	-1 3	58 8	* 8 6	34.4	-0 8	27 8	* 2.9	49 8	* 2 4
Audubon	26 0	* 7 8	15 3	-4 7	32 6	-1.4	52.2	* 2.4	62.4	* 2 9	68 2	-1.3	.	.	76 2	* 4.5	....	....	57.5	* 8 7	33 1	* 1.0	31 2	....	....	....
Bancroft	23 1	....	11.1	.	28.2		50 5	.	61.3	....	67.1	....		.	75.4	....	61 6	.....	57.2	....	29 4	.....	24 2	....		....
Baxter	24 2	.	15 2	.....	31 2	...	53 2	.	64.4	....	69 4	.	73 2	.	77 9	. ..	64.8	.....	59 6	. ...	33 2	.....	26 6	.	49.4	....
Bedford	28.6	. ...	18 6	. ..	35 2	....	53.6	.	64 8	.	72 8	. ...	76 5	.	78 5	.....	67 0	.....	59 6	. ..	35.9	.....		....		....
Belknap	28.1	. ...	18.1	.	32.8	.	54 2	.	63 8	.	69 4	.	74 5	.	79.1	. .	66 4	.....	61 1	....	37 0	.	29.6	...	51 2	....
Belle Plaine		.	15 6	-6 9	30.0	-2 4	52 0	* 2 4	63 1	* 4 9	70 0	* 0.7	74 1	* 1.3	77 0	* 7 1	64 0	-0.1		....	32 5	* 0 2	25 4	* 1 5		
Bonaparte	29 8	* 8 2	19.5	-5.9	33 3	-5 1	53 7	* 1.7	64.1	* 1 8	70 0	-3 1	75 0	-0 9	80.8	* 6.7	68 2	-0.0	61.8	* 7.6	38 0	* 1.8	30 4	* 1.6	52 0	* 1.1
Britt	22 1	.	11 4	. ...	27 2		50 6	....	61 3	....	67 6	. .	71 0	.....	75 2	.	61.6	....	57 4		29 2	....	23.2	. . .	46 6	.....
Burlington	33 2	.	23 2	....	34.8	. . .	55 4	....	65.5	.	71 3	. .	75.7	. .	.	. .	.	.....	.	.	39 8	.	31 2	....	.	.
Carroll	24.0	* 5.5	13 0	-7 7	30.2	-1.0	52 5	* 3 7	64 3	* 5 8	68 6	-1.4	73 0	-0 1	76 7	* 6 5	63.2	-0 7	59 3	* 9 9	33 7	* 2 6	27 4	* 4 1	48 8	* 2 2
Cedar Rapids	28 4	*11.7	16.4	-5.3	30 3	-2 5	54.2	*10.4	65.7	* 6 7	71 0	* 0.4	74.2	-0 4	79 4	* 7.9	66 0	* 2 6	60 6	*10 6	34 9	* 0.3	27.6	* 2 9	50 7	* 3.7
Centerville	29.5	* 8 0	18.6	-4 1	33.4	-7.3	54 3	* 0 9	64 6	* 2 6	70.8	-1.2	....	....	.	. .	.	.....	.	.	.	.	31 2	* 0.9		
Chariton	28 4	.	18 1	. . .	33 5	.	53 7	.	63 3	.	69 2	....	74 6	....	78 1	.	65 5	.....	60 4	.	36 3	....	29.2	. .	50.9	.....
Charles City	22 4	* 1.2	11.1	-6 5	26 0	-4 5	50 2	* 3.3	62 4	* 5.1	67 8	-0 8	71 6	-1 8	76 8	* 6 6	62 4	-1.2	57 4	* 8 4	29.8	* 0 5	24 0	* 3 4	46 8	* 1.7
Clarinda	28.4	* 7 2	18 7	-6 2	35 6	* 0 7	55 2	* 3 2	65 0	* 4 2	71 8	-0.1	76 4	* 0.6	78.2	* 4 4	66 8	-0 8	60 2	* 7.3	37 0	* 1 2	29 7	* 2 5	51 9	* 2.0
Clear Lake	21 8	.	10 6	.....	26 6	.....	50.6	....	62.8	.	68 8	.	72 8	.	77 3	.	63 7	.....	58.6	.	30 0		23 4	.	47 2	....
Clinton	27 0	* 8 3	17 1	-5 6	29 2	-7 5	50.8	-0 1	63 0	* 2 1	70 0	-1 5	73 3	-0 8	77 6	* 5 5	65 5	* 0.1	59 2	* 8 0	35 6	* 2 0	28 5	* 2 2	49 7	* 1.0
College Springs	29 0	* 6.5	18 3	-8.1	34 8	-2 5	54 4	* 3 7	65 1	* 4 5	71 9	* 1 1	76 4	* 2.0	77 7	* 4.2	68 1	-0.7	59.3	* 3 5	36 0	-1 1	30.0	* 2.0	51 8	* 1.3
Coon Rapids	26 5	.	15 2	.	32 6	.	52 0	.....	64 0	....	69 2	.	73 4	.	78.2	. . .	63.8	....	59 6	.	33 6	....	27 5	.	49.6	.....
Corning	28.0	* 7.4	17 0	-8 2	34 0	-2 7	53.1	* 2 0	62 8	* 2.5	70 0	-0 4	75.8	* 2.3	77 6	* 5 6	....	.....	59.2	* 6 5	35 6	-0 2	29.0	* 2.4	....	. ..
Council Bluffs	28 8	.	17 0	.....	35 0	.....	54 5	. . .	65 4	.	73 1	....	76 3	.	79 1	. . .	66 0	. ...	60.4	. . .	36 0	. . .	31 4	.	51 9	.
Cresco	19 0	* 8 7	8 2	-7 7	23.5	-2 3	47 9	* 5 3	60.6	* 4 1	67 0	* 0 7	71 1	* 0 2	77 1	* 8 5	61 0	* 1 2	56 0	* 9 7	27.6	-1 8	21 6	* 3 4	45 2	* 2 5
Davenport	28.2	* 7 0	18 0	-7 0	30 8	-4 0	52 6	* 3 0	64 0	* 3 0	70 4	-1 0	74 8	‡0	79 9	* 7.0	66 9	* 2.0	61 8	* 8 7	37.6	* 1 0	29.4	* 1 8	51 2	* 2 0
Decorah	20 2	* 7 7	11 0	-6 5	24.9	-7.1	50 2	* 1 0	61.5	* 1 7	68 0	-0 4	71 8	* 1 5	77 5	* 8 0	62 3	-0.9	57 8	* 9.3	30 0	-0 3	23 0	* 2 0	46 5	* 1.3
Delaware	24 1	*10 8	13 4	-4 7	27 1	-3 8	49 9	* 3 2	61 8	* 3 9	67.4	-1 4	70.4	‡0	75 8	* 7 0	62 9	* 1 1	57.4	*10.9	32.0	* 2 5	24 8	* 3.4	47.2	* 2 6
Denison	26 1	* 6 1	13 4	-9 1	32 7	* 0.6	54 0	* 4.7	63 7	* 3 7	69 1	* 0 4	73 0	* 0 2	76 4	* 5 7	63 7	-1 6	59 1	*10 7	33 0	* 1 3	27 2	* 5 1	49 3	* 2 3
Des Moines	27.5	* 9.0	17 0	-6.0	33 1	-1.0	54 4	* 3.0	64 1	* 3 0	70.1	-1.0	74 2	-0 1	77 7	* 5 0	65 4	‡0	60 6	* 7.0	35 6	-1 0	28.7	* 3 0	50 7	* 2.0
DeSoto	26 9	. .	16 8	.	33 2	.....	54 0	. . .	65 9	. .	70 4	.....	75 0	....	78 0	. .	64 8	. ...	59 6	....	35.0	.....	29 0	....	50 7	....
Dows	22 8	.....	11.1	... .	28.5		51 4	.	62 2	.	66 8	.	71 2	.	75 7	. .	62 9	....	58 6	.	30 5	.	24.0	. .	47 1	.....
Dubuque	25 6	* 8 0	15 4	-8.0	28.4	-5 0	51 6	* 3.0	63.2	* 3.2	69 7	* 1.0	72 8	-1.5	78 0	* 6.3	65 4	* 2.3	60 2	* 9 6	35.0	* 1 0	27.4	* 0.9	49 4	* 2.0
Eldon	30 0	. . .	19 0	.	33.8	.	54 8	.	65 2	.	71 6	.....	75 7	.	80 0	. .	68 0	. . .	61 6	.	37 2	.	29.4	.	52 2	
Elkader	24 5	11 5	14 7	-4.4	28 4	-2.5	50 8	* 2 8	63 4	* 2.8	69 6	* 0 1	73 0	-0.7	78 6	* 8.4	64 2	-2 0	59 0	*10 8	32 6	* 1 3	26 0	* 4.5	48 7	* 3.0
Estherville	....	.	10 8	.....	26 4	....	50.2	.....	59 8	.....	66 6	.....	69 9	....	75 4	.	61 4	.	56.0	. .	27 8	.	22 6	....	....	....
Fairfield	29 0	*13 6	19.2	-3 5	32 7	-0 9	54 0	* 4 9	64 0	* 4 9	69 9	-0 2	74 2	0.6	78 7	* 8 3	66 4	* 2.3		....		.		.		.
Fayette	22 2	* 7.5	12 8	-7 3	26 1	-4 8	49 6	* 2 4	61.3	* 4.5	67 6	-0.8	70 9	-0.8	75 7	* 7.0	63 8	* 0 2	57 2	* 8 9	29 7	-1 3	23.3	. . .	46 7	* 1.3
Fonda	22 4	.	9 6	.....	29 8	.	52 0	.....	64.0	. .	68.3	....	71 6	.	79 4	. . .	63 0	....		....	29 3	.		.		.
Forest City	21.4	.	10 8	.....	26.8	.	50 8	.....	62 0	. .	67 3	.	70 6	.	75 3	....	61 6	.....	58 7	....	29 8	. . .	23 0	....	46 5	.....
Ft Dodge	...	....	12 2	.....	30 6	.	51 8	.....	62 9	. .	68 3	....	71.7	.	76 5	. . .	63 3	.....	59 4	....	32 3	....	25.4	.	....	.....
Galva	24.5	* 9.1	14 6	-5 4	30 3	-3 5	52 7	* 3.4	63 8	* 3 6	68.2	-1 0	72 6	-0 9	76 6	* 6 6	.	. . .	57 8	* 9.0	31.0	* 0 5	26.6	* 4.2	....	.....
Glenwood	30 0	*12 3	18 3	-5 4	36 7	* 3 4	54 8	* 6 0	64 7	* 4 8	70 6	* 0 1	75 1	* 1 0	79 6	* 7 5	66 0	* 3.8	61.5	*12 5	37.5	* 3 6	31 4	* 6 5	52 2	* 4.7
Grand Meadow	21.8	* 6 9	13 0	-6 7	26.2	-4.9	49 9	* 2.7	60.8	* 3.3	....	.....	68 9	-1 2	74 7	* 6 8	61 5	-1.5	58 0	* 9 8	30.0	-0.5	23 3	* 0 8	....	.....
Greene	23 6	.....	13 2	.	28.4	.	52 0	.....	63 4	.....	69.5	.....	72 6	.	77 6	. .	63 3	.....	58 6	.	31 0	.	24.8		48 2	.....
Greenfield	26.8	* 6 2	16 4	-6 6	33 0	-1 0	54 1	* 3.3	64 4	* 4 8	72 2	* 1.4	75 0	* 1 0	76 7	* 4.5	64 0	-2 1	60 3	* 8 5	35 4	* 1 6	28 0	* 5 4	50 5	* 2 3
Grinnell	25 8	* 7.5	16 2	-7.0	30 7	-2.4	52 8	* 2 1	....	....	69 2	-1.0	....	....	....	....	64 4	* 1.0	60.0	*12 8	34 0	-0.5	27 6	* 2 8	....	.
Grinnell (near)	26 2	.	15 2	.	30.4	....	52 6	.	63.0	. ...	....	....	72 9	.	77 0	. .	65 2	....	60 6	.	33 8	.	26 4	....	....	.....
Grundy Center	22.4	* 7.5	12 2	-7.8	28 5	-3.6	51 1	* 2.3		. . .	67.9	-1 9	71.4	-0.3	77.2	* 7.4	63 8	‡0	59 6	* 9.8	32 0	* 1 4	26 0	* 3.0	....	....
Guthrie Center	28 5	.	16 0	.	33 0	....	52 6	....	63 3	.....	68.5	. . .	73 7	.	78 2	. . .	65.4	....	60 5		34.8	. ..	29 3	. .	50.4	....
Hampton	23 3	* 9.4	12 2	-5 8	28 0	-1.0	52 3	* 5.5	63 2	* 6 2	69 3	* 1.4	73.0	* 1.3	78 0	* 9.3	63.5	* 1.1	60 2	*12.1	31 4	* 1.7	24.4	* 3 4	48.2	* 3.7
Harlan	26.0	. .	14 8	.	32 5	.	52 4	.	63 6	.	69 6	.....	73 2	. .	75 6	.	63 6	.....	58 2	.....	33 4	....	27 2	....	49 2	.....
Hedrick	28 2	.	17 4	. .	32 4	.	54 2	. . .	63 2	. ...	70.5	. .	73.9	.	77 4	. .	65.6	....	59 8		34 4	. . .	27 4	.	50 4	.
Hopeville	27 8	* 7.4	16 8	-7.0	33 2	-1 9	54 0	* 2.4	63 0	* 3.0		....	74 5	* 1 0	77 1	* 5.0	66.1	-1.0	60 6	* 7.5	34 6	.....	28.8	....		.....
Humboldt	24 5	.	13 0	.	30 2	. . .	52 6	.	63 4	.	68 8	. . .	72 8	.	77 8	.	63 7	....	59 0		31 5	....	24.8	.	48.5	.
Independence	23.2	* 8 4	12 4	-7 9	27 0	-3 4	50 1	* 2 8	61 6	* 2.2	68.0	* 1 0	71.1	-0.1	75 6	* 7 5	63 1	* 3.1	58 3	*11 2	31 7	-0.3	24.3	* 3 2	47 2	* 2.3
Indianola	27 7	* 8 4	17 8	-7 2	34.3	-2.3	55 0	* 2 9	64 6	* 4 2	70 4	-0 4	74 8	* 0 6	77 4	* 4 6	66 0	-1.0	60 6	* 6 0	35 6	-0 4	27.4	* 1 7	50 8	* 1.3
Iowa City	27 1	* 6.1	17 0	-7 9	30.5	-4 7	53.2	* 2.4	64 1	* 4 5	70.4	-0 8	74 2	* 0 3	78 6	* 7 9	66 2	* 1.0	60 8	*10 1	36.1	* 0 3	27 6	* 0 6	50 5	* 1.7
Iowa Falls	22 2	*10 0	12 2	-5 0	27.7	-4 0	51 2	* 4 2	63 2	* 4 2	68 9	* 0 2	72 0	-0 3	75 6	* 6 6	62 0	-0 5	57 0	* 9 0	30 1	* 0 4	24.2	* 3 2	47 2	* 2 3
Keokuk	32 c	* 8 0	22 7	-5 0	34 1	-4 0	54 6	* 3 0	65 5	* 3 0	71 9	-0 5	76 4	-1 0	82 2	* 7 0	68 6	* 2 0	62 4	* 7 0	39 8	* 1 0	31 4	* 1 0	53 5	* 2 0
Keosauqua	30 0	* 7 6	20 8	-5 8	33 8	-5 2	54 0	* 1 0	65 7	* 3 6	72 1	-1 2	76.0	-0 4	81 4	* 7 3	68 2	* 0 2	62 c	* 7 4	38 4	* 1 3	30 8	* 3 6	52 8	* 1.6
Knoxville	29 0	* 5.6	18 2	-6 0	33 4	*3 6	55 0	* 2.2	65 8	* 3 0	71 0	-1 0	75.0	-0 5	78 2	* 5.2	65 3	-1 9	58 9	* 7.1	34 0	-2 2	27 2	* 1 7	50 9	....
Lansing	24 7	.	14 9	....	29.6	.	51 8	....	63 4	.	69 2	. . .	72 3	. .	77 6	....	65 0	....	58 8	.	32.6	....	26 8	.....	48 9	
Larchwood	22 6	.	13 9	....			51 6	....		....	69.4	.	71.6	.	75 9	.	62 1	.....		....						
Larrabee	23 2	* 6 7	11 4	-9.1	29.6	-1 0	49 6	* 1.1	63.4	* 5 8	68.0	-1.6	70 4	-1 8	76.0	* 4.8	61 6	* 2.9	57 2	*17 0	31 2	-1.2	25 4	* 2 8	47 2	* 1.2
Lenox	27 8	.....	16 8	....	33 4	. ...	53 8	.....	63 0	. ...	69.9	.....	75 0	....	76 5	....	66 3	. ...	59 8	.	35 7	. ..	27 4	....	50 4	....
LeMars	25 4	....	13 1	.....	32 0	.....	51.3	.	63.2	.	69.4	. . .	72 1	.	76 0	. .	63 1	....	57 3		32 2	....	26 0	.....	48.4	.....
Logan	27 1	* 6 8	13 6	-10 5	33 0	-1.0	51.2	-0 7	63.0	* 2 2	70 6	-0 5	75 8	* 1.0	77 5	* 5.4	63 0	-3 3	58 3	* 6 0	32 4	-2 5	26.4	-0.4	49.3	* 0.1
Maquoketa	25 7	* 7 9	17.4	-7.9	30 1	-5 6	51 4	* 3 1	61 2	* 0 5	67 6	-3 5	71 2	-4 5	76 3	* 4.7	64 6	-0 1	59.2	* 6 0	36 6	* 0 8		....		.
Marshalltown	26.4	* 8 4	16.0	-5 7	31.3	* 0 6	53 6	* 4 5	64 4	* 6 1	69 8	* 0 7	73 8	*1.4	78 3	* 7 7	65.1	* 0 2	60.2	* 9 5	34 2	* 1 6	27.1	* 3 5	50 0	* 3 1
Monticello	25 9	*10.5	13 4	-8.0	29 0	-2.9	53.c	* 4.7	61.4	* 2.3	67 0	-1 8	72 1	-0.8	76 3	* 6 3	64 2	* 2.5	57 7	* 9 2	33 4	* 0 2	25.c	* 2 9	48 2	* 2 1
Mooar	30 6	.	19 8	. ....	33 2	....	50 3	.....	62.3	. ..	71 6	....	72 2	....	74 4	.....	63 5	.	58.5	....	36 8	. ..	29 5	.	.	.
Mt. Vernon (Hubbard)	26 2	.	15 2	...	29 4	....	52 9	. .	64 0	.	69 7	. ...	72.5	.....	78 1	....	65 0	.	60 0	. . .	35 4	.	26 2	..	49 6	.....
Mt Ayr	27 8	* 5 6	17 5	-9.0	33 8	-2 6	54 2	* 2.0	64 0	* 1.8	71 1	* 0.1	75 9	* 0 7	78 1	* 5 1	67 6	-0.6	60 3	* 7.3	36 6	* 1.2	29.1	* 3.6	51 3	* 1.2
Mt. Pleasant	26 0	.	16 4	. ..	29 9	....	51 8		63 6	. ...	68 6	.....	75 4	.....	78.7	.	67.2		60 7	. ...	37 4	.....	30 6	.	50 5	.....
New Hampton	21 4	.....	11 5	.	26 5	.	50 7	....	61 2		65 4	....	72.4	...	76 7		62 4	.	58 4		30 0	....	22 8	....	46 6	.....
Newton	....	....	15.0	-6 7	31 3	-3.1	52 8	* 4.2	64 0	* 3 5	69.4	-1.2	73.4	-1.4	76 9	* 5.1	64.8	* 1.9	59.4	* 9 2	34.2	* 1.5	27 0	* 5.1		.....
Northwood	21 2	.	10 4	.	27 2	.	52 9	. .	62 2	. .	68.2	.....	70 3	.....	75.3	.	60 6	. .	56 6	. .	29.6	.....	22 6	.....	46.4	.....
Odebolt	26 0	. . .	14.8	.	31 8	. . .	53.4	....	65 2	.....	71 6	....	74 6	....	77 4	.	64 8	.	59 2	.....	33 3	....	26 8	.	49.9	.....
Ogden	26.2	....	13 9	.....	31.7	. ..	53.4	.	63 8	.....	68 9	.	73 3	.	76 4	. . .	64 6	.....	60 2	. ..	32.6	. . .	24 5	....	49 1	.....
Olin	29 7	....	16 0	.	30 4	....	50 6	. . .	61 8	....	....	....	....	....	....	....	....	....	....	....	34 0	....	28 0	.	....	....
Omaha	29 6	*10 4	18.0	-7.2	36 0	* 1 0	56 0	* 4 6	66 3	* 4 6	72 8	* 1.2	75 4	-0 5	79 0	* 5 3	66 9	* 2 0	61 6	* 8 0	36.9	‡0	32 1	* 5 0	52 6	* 3.0
Onawa	27 9	.	16 1	. . .	34 3	. .	54 0	. .	65 8	.....	71.0	.....	74 5	.....	77 3	. . .	65 6	....	60 2	....	34 6	.	28 8	...	50.8	.....
Osceola	27 9	....	16 6	.	33 0	.....	53 8	. .	64 0	.	69.6	. .	75.4	.	78 0	.....	66 4	. . .	60 4	. . .	35.5	....	28 7	....	50 8	.
Ovid	28 0	*5 4	18 0	-6 8	33 4	-4 0	54 4	* 1 8	63 1	* 1 8	69 6	-1 7	73 8	-1 5	78 1	* 4 4	66 2	-1 6	60 2	* 7 5	35 8	* 3 1	29 4	* 2 9	50 8	* 0 7
Osage	20 4	*8 0	10 1	-5 9	25 8	-2 7	49 5	* 4 7	60 8	* 4 7	66 2	-0 3	70 6	* 0 7	74 2	* 8 1	60 6	* 1 3	56.1	*12 4	28 8	* 2 4	22 8	* 3 7	45 6	* 3 2
Oskaloosa	24 5	*6 9	16 4	-6 0	32 0	-2 3	53 4	* 3 2	63 6	* 3 7	67 2	-0 5	73 4	-1 3	78 3	* 7 2	65 7	* 1 2	59 8	*9 2	35 0	-0 7	28 1	* 1 9	50 0	* 1.9
Ottumwa	29 8	*7.2	21 4	-3.8	34 4	-4 5	55 4	* 1 9	66 6	* 3.6	73.4	* 0.5	76 7	* 1.1	82 0	* 8 0	67 5	-0.4	61 3	*8.3	38 1	* 1 7	30 4	* 2.7	53 1	* 2.2
Pacific Junction	27 9	...	17 0		34 6	...	53 7	....	64 0	.	70 1	....	74 2	...	76 7		65 7	....	60 8	....	36 0	.....	31 0	.....	51.0	.....
Pella	23 8	.	16 2	.....	30 2	. ...		....	65 2	.....	74 5	.	79 0	....	77 4	.	64 8	.....	60.6	.	34.2	.....	27 4	.	....	....
Plover	25 1	. . .	13 0	.	29 6	. . .	51 8	....	64.0	...	69 4	....	73 2	.....	75 8	.....	63 3	....	56 5	.....	30 2	. ...	26 6	. ...	48 2	....
Primghar	27 0	...	8 8	. ...	....	. ..	53 3	....	65 8	.....	69 5	....	73 8	.....	77 4	.....	60 4	.....	59 0	.....	32 7	. ...	24 8	.....	48 6	.....
Red Oak	31 6	....	21 6		37 8	.	56 6	. ..	65 4		72 9	.....	75 6	.....	78 4	.	67 8	.....	61 7	...	38 0	....	29.4	.	53.1	.....
Ridgeway	24 4	.....	13 8		27 3	. ...	51 2	...	62 7	.	70 0		72 6	.	78 5	. . .	63 4	.....	59 0	. ..	32 3	.	26 3	.....	48 5	.....
Rockwell City	23 8	....	13 3		32 6	.	52 2	. ..	63 2	.	68 6	.	72.6	..	76 6	. ....	62 8	.....	58 4	.....	32 2	.....	26 3	....	48.6	.....
Ruthven	18 3	.	9 0	. ..	25 8	....	49 2		62 6	....	67 8	....	72 0	.	76 0	. ..	62 8	.	58 2	..	26 8	....	21 8	....	....	
Sac City	25 8	*11 9	13 2	-6 5	30 0	-1.2	52 4	* 2 7	63 0	* 4 0	68 2	-3.5	72 3	-3 8	76 4	* 3 9	63 2	-5 7	58 8	*7.6	32.0	-1.1	27 0	* 3.6	48 5	* 1 3
Scranton	26 7	.....	15 2	. .	32 5	.....	52 5	.....	64 2	.....	70 0	. .	73 8	.....	76 3	....	63.8	.....	59 2	. .	33.5	. . .	28.2	.	49 7	. .
Sheldon	25.0	.....	10 3	. ..	28 8	. ...	50 4	.	61.4	. ...	67.7	.....	71.0	.....	74 4	. ..	61 8	.....	56 8	.....	29.7	.....	24 4	.....	46.8	.....

*Indicates, plus (†)

MONTHLY AND ANNUAL MEAN TEMPERATURES FOR 1900 WITH DEPARTURES.

STATIONS.	Jan.		Fed.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Annual	
	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.
Sibley	22 6	* 9 8	10 5	-7 2	29 0	-1 4	50 6	* 2 4	62 2	* 5 4	69 8	* 0 5	71 0	* 0 7	75 0	* 7 4	61 7	- 0.5	58 0	* 9 8	29 6	* 1 8	24 6	* 5 2	46 0	* 2 7
Sigourney	25 8	.....	18 0	.....	32 2	.....	54 4	.....	65 5	.....	71 6	.....	76 0	.....	79 8	.....	69 0	.....	57 4	.....	30 4	.....	25 4	.....	48 1	.....
Sioux Center	23 4	.....	12 5	.....	30 2	.....	51 0	.....	64 3	.....	70 8	.....	73 8	.....	75 8	.....	63 0	.....	53 6	.....	25 6	.....	18 2	.....	45 7	.....
Sioux City	26 6	* 8 0	13 8	-5 0	32 9	* 3 0	52 9	* 2 0	64 0	* 4 0	69 8	‡0	73 6	‡0	77 0	* 5 0	62 8	-2 0	58 8	* 8 0	33 6	* 2 0	28 2	* 2 0	49 5	* 2 0
Spirit Lake	22 3	* 8 0	10 0	-8.7	26 0	-5 7	51 8	* 2 5	62 7	.....	69 1	.....	71 1	.....	75 4	.....	62 8	.....	58 1	.....	31 5	.....	20 1	-1 0	.....	.....
Storm Lake	24 2	.....	11 1	.....	29 2	.....	51 5	.....	64 0	.....	69 8	.....	73 8	.....	77 6	.....	.....	.....	60 2	.....	33 2	.....	25 0	.....	47 4	.....
Stuart	24 8	.....	15 3	.....	28 8	.....	50 4	.....	64 0	.....	72 2	.....	75 7	.....	77 2	.....	66 2	.....	59 8	.....	30 1	.....	25 0	.....	51 6	.....
Tabor	25 6	.....	18 3	.....	35 2	.....	53 6	.....	66 0	.....	72 2	.....	75 7	.....	77 2	.....	66 2	.....	60 8	*11 7	34 6	* 1 6	28 0	* 4 7	49 7	* 1 9
Thurman	24 0	* 6 2	15 4	-6.6	29 2	-5 8	52 7	* 1 8	65 2	* 3 6	69 2	-1 3	72 9	-0 9	77 5	* 6 1	65 8	* 1 2	60 8	* 9 1	33 0	* 0 2	26 1	* 1 5	48 8	* 2 0
Toledo	25 4	* 8 2	16 0	-5 9	28 0	-3 8	51 8	* 2 9	63 2	* 4 4	70 0	* 0 1	72 4	-0 8	77 0	* 7 4	63 8	* 0 6	59 8	* 9 1	32 2	* 3 0	31 6	* 7 6	52 4	* 3 6
Vinton	26 8	* 6 0	20 1	-4 4	35 0	-1 2	54 9	* 2 9	66 8	* 5 4	72 4	* 1 4	75 6	* 1 6	77 7	* 6 7	67 1	* 2 3	59 8	* 7 3	35 6	-0 6	27 2	* 0 9	49 6	* 0 3
Villisca	26 4	* 4 9	16 3	-9 1	30 1	-5 1	52 4	* 0 1	65 1	.....	71 9	.....	77 8	.....	82 1	.....	68 2	.....	59 6	* 6 5	38 6	.....	31 4	.....	52 3	.....
Washington	29 4	.....	18 0	.....	31 5	.....	53 6	.....	66 8	* 0 1	69 0	-1 8	72 2	-5 6	77 5	* 3 1	64 0	* 2 0	58 6	.....	32 0	-4 6	26 3	* 3 0	48 4	-0 6
Waterloo	24 1	* 7 4	13 2	-8.7	28 8	-4 1	51 6	.....	63 4	.....	69 4	.....	72 2	.....	77 4	.....	63 8	.....	55 6	*10 2	28 8	* 1 1	21 0	* 5.1	46.5	-2.7
Waverly	23 3	.....	14 1	.....	28 8	.....	51 6	.....	63 4	.....	69 4	.....	72 2	.....	77 4	.....	63 8	.....	55 6	.....	28 8	.....	23 0	.....	48 4	.....
Webster City	21 9	* 6 3	11 0	-8.7	27 6	-2 3	50 2	* 4 0	62 9	* 4 5	69 0	* 0 8	71 6	-0 6	75 4	* 6 2	64 7	.....	57 8	.....	30 8	.....	27 0	.....	47.4	.....
West Bend	.....	.....	16 0	.....	29 6	.....	52 4	.....	63 6	.....	70 4	.....	73 4	.....	78 0	.....	66 4	.....	59 7	.....	32 6	.....	28 1	.....	50 3	.....
West Branch	23 4	.....	12 2	.....	28 6	.....	50 6	.....	62 4	.....	67 8	.....	71 4	.....	76 1	.....	63 4	.....	57 8	.....	30 8	.....	27 6	.....	48 1	.....
Whiten	27 9	.....	17 8	.....	30 2	.....	51 8	.....	63 3	.....	69 0	.....	73 0	.....	79 3	.....	65 0	.....	59 7	.....	32 6	.....	28 1	.....	50 3	.....
Wilton Junction	27 0	* 7 2	17 2	-6 4	33 2	-2 0	54 4	* 3 0	64 5	* 4 1	70 0	-0 4	74 8	* 1 4	78 1	* 6 7	66 2	* 0 3	60 5	* 8 9	34 4	* 0.7	28 4	* 2 8	50 0	* 3 2
Winterset	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Indicates, plus (†)

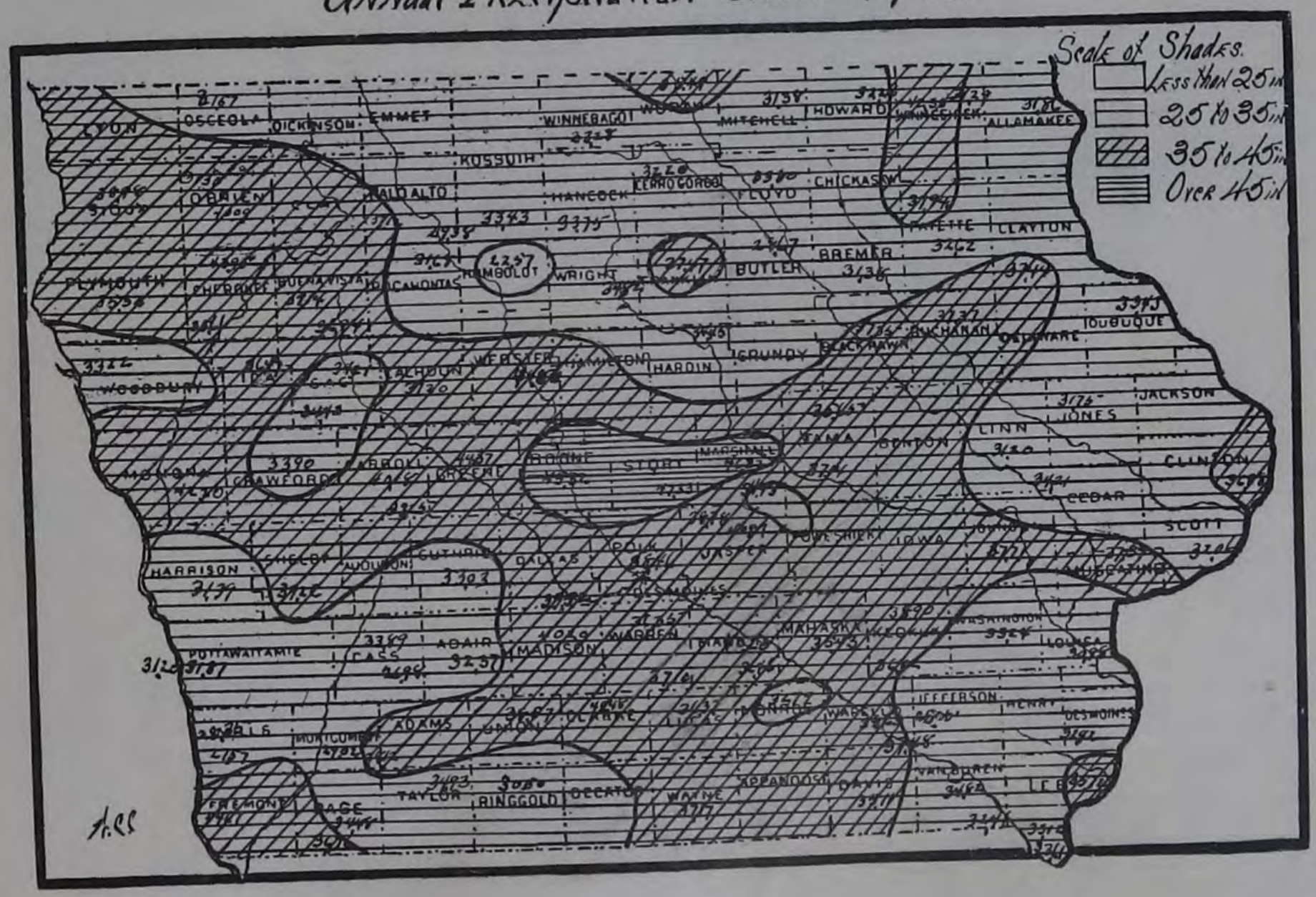
MONTHLY AND ANNUAL PRECIPITATION FOR 1900, WITH DEPARTURES FROM NORMAL.

STATIONS	Jan.		Feb.		March		April		May		June		July		Aug		Sept.		Oct.		Nov.		Dec.		Annual	
	Prec	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.
Afton	.23	.. ..	1.51	.. ..	2.52	.. ..	3.39	.. ..	4.42	.. ..	2.02	.. ..	5.67	.. ..	4.59	.. ..	5.96	.. ..	6.90	.. ..	1.11	.. ..	.25	.. ..	38.57	
Albia	.34	.. ..	2.10	.. ..	1.13	.. ..	3.04	.. ..	4.38	.. ..	2.52	.. ..	5.12	.. ..	4.24	.. ..	3.92	.. ..	3.55	.. ..	1.85	.. ..	.60	.. ..	32.79	
Algona	.63	* .02	1.15	* .28	2.50	* .87	2.12	-1.82	1.04	-2.56	4.87	*1.29	5.84	*3.61	4.41	*1.57	5.42	*3.60	4.15	*2.39	.95	- .09	.35	- .94	33.43	* 8.22
Alta	.45	- .32	1.38	* .62	1.96	* .07	2.19	-1.85	3.00	-1.22	6.23	* .87	11.11	*7.51	3.64	- .12	5.34	*3.33	2.61	* .30	.68	- .32	.55	- .43	39.14	* 8 48
Alta (near)	.38	.. ..	1.25	.. ..	1.24	.. ..	1.80	.. ..	2.50	.. ..	5.20	.....	10.95	.. ..	3.94	.. ..	5.12	.. ..	3.06	.. ..	.79	.. ..	.34	.. ..	36.57	
Amana	.72	- .82	1.61	* .34	2.96	* .98	3.57	* .63	4.18	- .02	3.75	- .72	5.49	*1.38	5.35	*1.95	4.39	*1.02	3.79	*1.12	1.02	- .72	.. ..	.. ..	.....	.....
Ames	.38	- .66	.45	- .47	2.81	*1.42	2.61	- .24	4.36	* .52	6.48	*2.04	9.14	*4.60	5.46	*2.06	7.12	*2.61	3.73	*1.39	.51	- .79	.19	- .80	43.24	*12.85
Ames (near)	.28	.. ..	1.06	.. ..	3.66	.. ..	3.28	.. ..	3.65	.. ..	8.15	.. ..	7.77	.. ..	6.80	.. ..	6.48	.. ..	4.75	.. ..	.77	.. ..	.58	.. ..	47 33	
Atlantic	.40	- .37	1.30	* .39	2.04	* .19	2.33	-1.20	2.35	-1.97	2.09	-3.76	8.20	*4.63	4.81	*2.15	3.68	* .88	5.15	*2.96	.30	- .44	1.24	- .06	33 89	* 3.40
Audubon	.37	- .35	1.25	* .36	2.05	* .19	2.95	- .95	3.48	- .18	2.24	-1.02	.. ..	.. ..	6.51	*3.30	.. ..	.. ..	3.72	*1.76	.. ..	.. ..	.20	- .92	.. ..	.. ..
Bancroft	.50	.. ..	.90	.. ..	2.40	.. ..	1.50	.. ..	1.15	.. ..	5.28	.. ..	..	.. ..	3.78	.. ..	6.82	.. ..	3.50	.. ..	.60	.. ..	.40	.. ..	.....	.....
Batavia	.06	.. ..	1.60	.. ..	.71	.. ..	.43	.. ..	3.41	.. ..	3.40	.. ..	3.69	.. ..	2.40	.. ..	4.10	.. ..	3.60	.. ..	1.55	.. ..	.10	.. ..	25.05	.....
Baxter	.26	.. ..	1.15	.. ..	3.44	.. ..	1.06	.. ..	5.29	.. ..	4.13	.. ..	5.39	.. ..	5.06	.. ..	3.68	.. ..	4.33	.. ..	1.02	.. ..	.97	.. ..	38.78	.....
Bedford	.32	.. ..	1.21	.. ..	1.49	.. ..	2.68	.. ..	5.40	.. ..	2 10	.. ..	3 93	.. ..	3 78	.. ..	3 04	.. ..	6 94	.. ..	.99	.. ..	....	.. ..	.....	.....
Belknap	.80	.. ..	3.09	.. ..	1.54	.. ..	2.65	.. ..	5.94	.. ..	3.15	.. ..	2.84	.. ..	4.54	.. ..	3.85	.. ..	2.87	.. ..	2.78	.. ..	1.06	.. ..	35.11	.....
Belle Plaine	....	.. ..	2.17	*1.05	4.64	*2.57	4.10	*1.56	1.67	-2.37	7.30	*3.74	6.65	*3.36	6.90	*3.84	5.12	*2.35	....	.. ..	1.90	* .24	.55	- .78	.....	.....
Bonaparte	1.54	- .47	3.65	*2.03	1.86	-1.02	2.16	-1.64	3.66	- .39	2.73	-1.55	1.95	-1.79	3.61	- .28	5.87	*1.47	3.28	*1.72	2.10	* .18	T	-1.72	32.41	- 2.86
Britt	63	.. ..	.50	.. ..	1.69	.. ..	1.56	.. ..	2.99	.. ..	5.25	.. ..	5.44	.. ..	4.33	.. ..	6.76	.. ..	3.97	.. ..	.45	.. ..	.18	.. ..	33.75	.....
Buckingham	.42	.. ..	1.37	.. ..	3.20	.. ..	3.32	.. ..	2.09	.. ..	6.04	.. ..	6.63	.. ..	3.39	.. ..	3.79	.. ..	4.03	.. ..	1 10	.. ..	.27	.. ..	35.65	.....
Burlington	1.68	.. ..	4.27	.. ..	2.23	.. ..	3.78	.. ..	3.80	.. ..	....	.. ..	2.87	.. ..	....	.. ..	....	.. ..	....	.. ..	2.88	.. ..	.54	.. ..	.....	.....
Bussey	.38	.. ..	2.02	.. ..	1 95	.. ..	2.79	.. ..	2.88	.. ..	3.79	.. ..	4.30	.. ..	7.92	.. ..	4.24	.. ..	3.52	.. ..	1.66	.. ..	1.01	.. ..	36.46	.....
Carroll	.18	-1.05	1.28	* .25	2.97	* .49	4.50	* .63	1.90	-2.43	3.88	- .30	6.95	*3.73	9.01	*6.20	4.65	*2.46	3.96	*1.31	.60	- .48	.30	- .67	40.18	*10.14
Carson	.79	.. ..	.66	.. ..	1.19	.....	....	.. ..	2.01	.. ..	1.57	.. ..	6.07	.. ..	4.28	.....	....	.. ..	....	.. ..	....	.. ..	....	.. ..	.....	.....
Cedar Rapids	.61	- .99	1.03	- .64	2.37	* .11	3.62	-1.69	3.13	-1.35	4.22	* .40	3.74	- .01	4.46	*1.48	2.83	- .12	4.12	*1.46	.15	-1.35	.92	- .72	31.20	- 1.27
Centerville	.30	-1.12	2.00	* .82	1.30	- .65	1.39	-3.18	4.83	*1.40	3.43	- .41	1.97	-3.54	....	.. ..	....	.. ..	....	.. ..	....	.. ..	.50	-2.62	.....	.....
Chariton	.15	.. ..	1.85	.. ..	2.23	.. ..	2.95	.. ..	3.47	.. ..	2.63	.....	6.29	.. ..	4.85	.. ..	5.15	.....	4.72	.. ..	1.60	.. ..	.48	.. ..	36.37	.....
Charles City	.58	- .71	1.16	- .18	1.94	* .36	2.78	- .60	2.87	- .90	5.53	* .64	4.23	*1.47	2.65	* .40	6.75	*4.47	2.97	* .93	1.85	* .51	.49	- .93	33.80	*5.46
Clarinda	.49	- .52	1.25	* .19	1.07	- .64	2.48	- .76	4.46	- .13	3.15	-1.90	3.46	- .87	5.67	*2.32	3.64	*1.51	7.85	*5.97	.48	- .46	.50	- .67	34.48	*3.92
Clear Lake	.55	.. ..	1.10	.. ..	1.65	.. ..	2.25	.. ..	3.30	.. ..	6.60	.. ..	4.20	.. ..	3.75	.. ..	4.80	.. ..	3.50	.. ..	.50	.. ..	T	.. ..	32.20	.....
Clinton	1.31	- .87	2.78	*1.08	3.24	* .69	2.24	- .95	4.77	* .63	1.70	-3.11	6.32	*2.98	5.32	*2.54	4.61	*1.62	2.73	*1.15	1.60	- .39	.26	- .88	36.88	* 4.52
College Springs	.22	- .36	1.10	* .18	.94	- .86	3.75	- .31	3.85	- .70	2.34	-2.04	4.62	- .72	8.07	*5.38	2.98	* .61	8.00	*5.38	.47	- .31	.42	-1.08	36.76	- 5.17
Coon Rapids	.26	.. ..	.75	.. ..	3.53	.. ..	3.43	.. ..	2.99	.. ..	4.58	.. ..	5.61	..	6.83	.. ..	6.78	.. ..	3.48	.. ..	.63	.. ..	.38	..	39.25	.....
Corning	.25	- .57	1.23	* .40	1.55	- .17	1.79	-1.77	3.97	- .68	1.23	-3.13	5.85	*1.82	3.14	* .01	....	.. ..	6.68	*4.95	.18	- .70	.12	- .87	.....	.....
Council Bluffs	.19	.. ..	.25	..	1.12	.. ..	3.03	.. ..	2.93	.. ..	2.32	.. ..	6.47	.. ..	5.32	.. ..	3.57	.. ..	5.99	.. ..	.12	.. ..	.56	.. ..	31.87	.....
Cresco	.80	- .43	1.15	* .22	1.38	* .05	2.14	- .45	4.72	*1.15	3.84	-1.29	3.36	- .54	1.71	-1.18	6.29	*2.65	4.83	*2.45	1.22	- .23	.80	- .50	32.24	* .90
Cumberland	.10	.. ..	.73	.. ..	2.12	.. ..	1.91	.. ..	2.78	..	1.89	.. ..	4.33	.. ..	3.59	.. ..	4.63	.. ..	4.40	.. ..	.20	..	.30	.. ..	26.98	.....
Danville	1.20	.. ..	4.57	..	1.94	.. ..	3.01	.. ..	4.22	.. ..	1.78	.. ..	1.85	.. ..	3.45	.. ..	4.69	.. ..	2.30	.. ..	3.30	..	.11	..	32.42	.....
Davenport	1.27	- .45	2.45	* .84	2.92	* .67	2.10	- .72	4.68	* .25	1.01	-3.05	3.49	- .13	4.90	*1.31	3.66	* .58	2.00	- .48	1.48	- .44	.21	-1.42	30.17	-3.04
Delaware	.74	- .48	1.42	* .64	2.36	* .55	4.42	*1.04	2.25	-1.57	2.70	-1.58	8.06	*4.76	3.72	* .84	3.63	* .2	3.60	*1.32	1.77	* .03	.58	- .94	35.25	* 4.86
Decorah	1.07	- .19	1.16	* .39	2.20	* .72	2.32	-1.00	3.34	* .14	2.76	-1.59	4.48	*2.09	2.28	* .90	4.00	*1.09	5.36	*3.21	1.60	* .07	.72	- .54	31.29	*5.29
Denison	.20	-1.26	.45	- .41	1.80	* .06	2.83	-2.34	2.37	-1.87	2.45	- .50	6.10	*2.36	7.32	*4.32	3.64	*1.35	6.39	*4.74	.15	- .90	.20	- .21	33.90	* 6.23
Des Moines	.20	-1.05	.50	- .64	3.07	*1.56	3.82	* .78	4.76	* .02	4.89	- .21	5.15	*1.68	8.02	*4.61	3.66	* .65	3.08	* .23	.96	- .63	.35	-1.03	38.46	* 5.51
De Soto	.20	.. ..	1.17	.. ..	2.64	.. ..	2.88	.. ..	4.14	.. ..	4.79	.. ..	5.84	.. ..	9.30	.. ..	3.57	.. ..	3.19	.. ..	1.41	.. ..	.39	.. ..	39.52	.....
Dows	.35	.. ..	.50	.. ..	3.13	.. ..	1.56	.. ..	4.75	.. ..	4.57	.. ..	6.72	.. ..	2.70	.. ..	5.28	.. ..	4.05	.. ..	1.06	.. ..	.15	.. ..	34.82	.....
Dubuque	1.15	- .47	2.13	* .66	1.84	- .37	2.39	- .69	4.75	* .55	2.04	-2.78	8.00	*3.60	3.35	* .29	3.34	- .60	2.38	- .26	1.64	- .29	.42	-1.25	33.43	- 1.61
Eldon	.57	.. ..	2.73	.. ..	1.58	.. ..	2.61	.. ..	5.74	..	5.98	.. ..	2.17	.. ..	5.46	.. ..	3.81	.. ..	4.28	.. ..	2.09	.. ..	.46	.. ..	37.48	.....
Elkader	.73	- .77	1.45	* .35	1.96	* .18	3.28	* .32	4.13	* .42	2.53	-1.36	8.60	*4.49	3.88	*1.03	3.99	* .08	4.08	*1.34	2.07	*. 35	.74	-1.49	37.44	*4.94
Emerson	.29	.. ..	.56	.. ..	....	.. ..	2.23	.. ..	2.18	.. ..	3.70	.. ..	3.99	.. ..	3.11	.. ..	3.06	.. ..	3.20	.. ..	.11	.. ..	.57	.. ..	.....	.....
Emmetsburg	36	.. ..	.62	.. ..	1 25	.. ..	1 53	.. ..	2 52	.. ..	6 73	.. ..	7.15	.. ..	....	.. ..	6 08	.. ..	....	.. ..	....	.. ..	....	.. ..	.....	.....
Estherville	....	.. ..	49	.. ..	1 43	.. ..	2 06	.. ..	2.06	.. ..	3 96	.. ..	6 71	.. ..	3 34	.. ..	7 25	.. ..	3 00	.. ..	.60	.. ..	15	.. ..	.....	.....
Fairfield	83	- 93	3 28	*1 92	1 81	- 31	3 79	* .74	5 31	- 71	3 03	-1 36	4 35	*1 07	3 64	- 07	4 54	*1 76	....	.. ..	....	.. ..	....	.. ..	.....	.....
Fayette	.88	- .56	1 21	* 10	2 74	* 64	2 63	- 99	1 95	-2 03	3.14	-2 96	7.73	*4 58	2 76	* 01	3.72	* .89	3 68	* 93	1.68	- .07	.50	- .96	32.62	- .41
Ft Dodge	10	.. ..	60	.. ..	4 20	.. ..	4 04	.. ..	4 57	.. ..	5 34	.. ..	7 55	.. ..	6.87	.. ..	6 00	.. ..	3 58	.. ..	1.08	.. ..	.10	.. ..	44.03	.....
Ft. Madison	2 00	* .00	4 50	*2.56	1 72	-1 02	2 13	-1 09	3 93	- 46	2 88	-1 40	3 15	- .75	3 82	* 17	3 97	* .12	4 19	*1 44	3.08	* .89	.35	-1.68	35.72	- 1.25
Fonda	.85	.. ..	2 31	.. ..	5 15	.. ..	4 73	.. ..	4 73	.. ..	11 90	.. ..	8 57	.. ..	....	.. ..	5 51	.. ..	....	.. ..	1.16	.. ..	.59	.. ..	.....	.....
Forest City	65	.. ..	65	.. ..	1 43	.. ..	1 55	.. ..	2 47	.. ..	4 39	.. ..	6 26	.. ..	4.46	.. ..	6 79	.. ..	4 11	.. ..	.38	.. ..	.14	.. ..	33.28	.....
Galva	T	- .44	.80	* 47	1 13	- 14	2 20	-1 40	3 54	- 01	2.88	- 80	7 42	*4 00	6 16	*3 26	7 04	*5.08	4 30	*3 16	.70	- .47	.30	- .42	36.47	*12.29
Gilman	14	.. ..	.61	.. ..	2 22	.. ..	1 84	.. ..	2 50	.. ..	7 35	.. ..	5 46	.. ..	4 85	.. ..	3 74	.. ..	4 67	.. ..	1.11	.. ..	.44	.. ..	34.93	.....
Glenwood	.27	- 61	.50	- .30	90	- 47	2.87	* 34	2 40	-2 70	4.48	* .01	3 79	* 05	3 95	* .58	2 33	* 10	5 85	*3 44	T	- .91	.23	- .58	27.57	- 1 14
Grand Meadow	.64	- 79	1 35	* .30	1.79	- 26	2 74	- 84	2 53	-1 68	.. ..	.. ..	8.24	*4 60	2.23	- 13	3 19	* .30	4 26	*1.72	1.67	* .05	.81	- .78	.....	.....
Greene	.55	.. ..	91	.. ..	1.57	.. ..	2 19	.. ..	1 26	.. ..	5 49	.. ..	5 06	.. ..	2 37	.. ..	5 16	.. ..	2 31	.. ..	1.46	.. ..	.34	.. ..	28.67	.....
Greenfield	.33	- .76	.88	- 29	2 19	- 21	2 26	-1 34	2 99	-1 44	3 56	-1 65	5 33	* .89	3 37	* .78	4 67	*1 64	5 86	*4 05	.80	- .20	.13	-1.33	32.37	- .14
Grinnell	54	- 87	1 23	* .46	3 38	*1 80	2 88	- 85	....	..	7 80	*2 82	.. ..	.. ..	.. ..	.. ..	4 39	*2.35	4 73	*2 36	1.02	- .51	.70	- .50	.....	.....
Grinnell	70	.. ..	1.47	.. ..	3 00	.. ..	2 53	.. ..	4 94	.. ..	.. ..	.. ..	5 74	.. ..	7 55	.. ..	4 99	.. ..	4 76	.. ..	1.85	.. ..	.90	.. ..	.....	.....
Grundy Center	42	- 33	.75	* 05	2 34	*1 01	3 63	- .37	....	.. ..	11 44	*7 42	7 69	*3 96	3 85	* 86	8.54	*5 68	4 89	*2 19	1.69	* .69	.65	- .63	.....	.....
Guthrie Center	T	.. ..	1 05	.. ..	1 78	.. ..	1 92	.. ..	3 34	.. ..	4 26	.. ..	3 16	.. ..	6 52	.. ..	5 10	.. ..	3 76	.. ..	1.30	.. ..	.84	.. ..	33.03	.....
Hamburg	T	.. ..	.95	.. ..	....	.. ..	4 58	.. ..	3 09	.. ..	3 81	.. ..	3 09	.. ..	6 19	.. ..	....	.. ..	....	.. ..	....	.. ..	....	.. ..	.....	.....
Hampton	47	- 76	93	- 24	2 97	* 96	2 21	-1.92	2 47	*1 29	5 72	* 75	7 26	*3 93	2 68	- 35	6 86	*3 99	4 59	*1.92	.93	- .86	.38	- .97	37.47	*5.16
Harlan	35	.. ..	1 49	.. ..	1 99	.. ..	4 67	.. ..	3 09	.. ..	1 89	.. ..	8 33	.. ..	7 99	.. ..	3 91	.. ..	4 32	.. ..	.56	.. ..	.67	.. ..	39.26	.....
Hawkeye	96	- 78	1 15	- .18	2 80	* 70	4 11	*1 14	3 71	- 09	3 81	- 65	6 59	*3 89	2 92	* .36	4 17	*1 51	5 22	*3 20	1.70	* .04	.80	- .60	37.94	* 8.46
Hedrick	27	.. ..	1 66	.. ..	1 83	.. ..	3 20	.. ..	4 53	.. ..	6 21	.. ..	4 29	.. ..	5 48	.. ..	4 49	.. ..	2 80	.. ..	1.66	.. ..	.40	.. ..	36.82	.....
Hopeville	17	- 99	1 20	* 32	1 33	- 39	2 50	-1 37	4 64	- 20	.. ..	.. ..	7 29	*3 03	2 83	- 21	5 26	*2 10	5 78	*3 92	.76	- .18	.26	- .81	.....	.....
Hoprig	25	.. ..	....	.. ..	....	.. ..	1 24	.. ..	1 05	.. ..	6.40	.. ..	4 04	.. ..	.. ..	.. ..	3 28	.. ..	2 91	.. ..	.15	.. ..	.05	.. ..	.....	.....
Humboldt	27	- 22	55	- 09	2 23	* .71	2 75	-1 28	2 38	-1 30	4 71	*1 10	6 52	*3 38	3 32	* 49	5 05	*2 05	3 67	*2 00	1.02	- .12	.10	- .50	32.57	* 7.27
Independence	.34	- .96	.70	* .34	1 02	- 72	3 37	* 93	1 74	-2 27	3 83	- 97	11 02	*6 73	3 12	- 02	6 15	*1 68	4 20	*1 83	1.26	- .15	.62	- .76	37.37	* 5.16
Indianola	.39	-1 10	.79	* 09	2 90	*1 97	1.98	-1 83	4 17	- .57	3 93	- 35	4 45	*1.26	7 92	*4.62	4 03	*1 19	4 55	*2.93	.96	- .34	.28	-1.25	36.35	* 6.62
Iowa City	73	-1 30	2 20	* .95	3 32	* 93	3 31	* .13	4 31	* 16	2 18	-1 50	5 25	*1 12	6 27	*3.92	4.35	*1 65	3 61	*1.62	1.43	- .29	.75	- .89	37.71	* 6.50
Iowa Falls	.46	- .45	1.35	* .52	2.80	*1.54	1.61	-2.61	1.79	-1.89	5.92	*2.30	5.30	* 2.48	4.42	*1.50	5.17	*2.18	3.77	*1.51	1.31	- .04	.55	- .55	34.45	* 6.49
Keokuk	2.46	* .62	3.24	*1.60	1.43	- .93	2.10	-1.15	4.56	-1.20	1.06	-3.01	2.20	- 2.20	4.21	*1.27	5.02	*1.52	5.36	*2.71	1.72	- .31	.25	-1.61	33.61	- 1.65
Keosauqua	.75	-1.08	3.74	*2.52	1.71	- .78	2.74	-1.78	3.61	-1.12	3.30	- .64	3.19	- .63	3.34	* .01	4.90	- .23	4.92	*3.45	2.04	* .75	.58	- .90	34.82	- .45
Knoxville	.15	-1.24	1.51	* .12	1.44	* .17	1.43	-2.67	3.55	- .28	6.24	*2.79	4.75	* .90	9.78	*5.88	5.36	*2.01	4 86	*2 44	.93	- .29	.20	-1.03	40.20	* 9.80
Lacona	25	.. ..	2 25	.. ..	1 97	.. ..	2 28	.. ..	3 38	..	4 55	.. ..	4 39	....	5 25	.. ..	5 80	..	5 45	.. ..	1.15	.. ..	.38	.. ..	37.10	.
Lansing	1 05	.. ..	1 14	..	1 69	.. ..	2 84	.. ..	4 35	.. ..	2 03	.. ..	5 28	....	3 02	.. ..	3 55	.. ..	4 62	.. ..	1.92	..	37	..	31.86	
Larchwood	05	.. ..	.22	..	1 07	.. ..	2 80	.. ..	.. ..	.. ..	2 83	.. ..	11 63	....	2 91	..	3 80	.. ..	1 75	.. ..	....	.. ..	....	.. ..	.....	.....
Larrabee	.35	- .29	1 25	* 65	1.55	- .33	2.67	-1 16	6.30	*2 43	6.93	* .77	14 08	*11.94	2 23	- 96	6 24	*4 27	1 54	- 61	.48	- .47	.33	- .81	43.95	*13.63
Le Mars	24	.. ..	1 10	.. ..	1 35	.. ..	4 16	.. ..	96	.. ..	3 42	.. ..	12 00	....	2 85	.. ..	7 01	.. ..	1 69	.. ..	.34	.. ..	.20	..	35.32	...
Lenox	39	.. ..	.56	.. ..	1 49	.. ..	2 14	.. ..	5 71	.. ..	2 42	.. ..	6 34	....	3 78	.. ..	4 14	.. ..	7 27	.. ..	.45	.. ..	.24	.. ..	34.93	... ..
Logan	20	- 99	1 30	* .12	1 95	* .08	3 50	* 52	1 97	-2 42	1 27	-4 24	7 39	* 2 53	4 63	* .75	4 09	*1 03	4 60	*2.23	.41	- .65	.08	-1.22	31.39	- 2.28
Maquoketa	83	- .88	1 10	- .68	2 34	- 10	1 90	-1 32	7 06	*2 97	2 20	-4 14	8 04	* 4 85	4 43	*1 65	4 62	*1 84	4 64	*1 68	1.57	* .01	.. ..	.. ..	....	....
Marshalltown	1 08	* 24	1 37	* .65	3 78	*2 24	2 83	- .85	3 08	-1 37	7 79	*3 88	7 14	* 2 80	7 31	*4 69	5 35	*3 22	4 46	*1 90	1.26	* .20	.87	- .77	46.32	*16.88
Monticello	73	- 88	1 76	* .05	2 49	* 10	3 23	* 55	2 75	-1 12	1 26	-2 20	6 49	* 2 35	2 97	- 69	3 47	- 30	5 00	*2 25	1.30	- .95	.30	-1.92	31.75	- 3.77
Mooar	2 47	.. ..	2 80	.. ..	1 64	.. ..	1 72	.. ..	6 50	.. ..	1 21	.. ..	1 80	.. ..	4 49	.. ..	4 01	.. ..	5 26	.. ..	1.22	.. ..	T	.. ..	33.12	... ..
Mt. Ayr	24	-1 08	1 70	* .56	1 75	- 38	1 92	-1 84	4 11	-1 66	1 85	-2 75	4 79	- 04	3 12	* .11	3 61	* 84	5 69	*3 78	1.38	* .12	.38	- 91	30.54	* 3.25
Mt. Pleasant	1 23	.. ..	2 64	.. ..	1 30	.. ..	1 20	.. ..	4 80	.. ..	3 19	.. ..	1 94	.. ..	3 25	.. ..	4 58	.. ..	3 40	.. ..	1.54	.. ..	.17	.. ..	29.24	.....
Mt. Vernon	.91	.. ..	1 90	.. ..	2 90	.. ..	2 90	.. ..	4 22	.. ..	3.09	* ..	6 05	.. ..	4 06	.. ..	3 37	.. ..	3 56	.. ..	.93	..	.56	.. ..	34.21	..
Murray	....	.. ..	1 00	.. ..	1 37	.. ..	1 82	.. ..	5 67	.. ..	2 65	.. ..	6 77	.. ..	3 20	.. ..	5 07	.. ..	5 34	.. ..	.03	.. ..	..	.. ..	.....	...
New Hampton	1 22	.. ..	60	.. ..	1 45	.. ..	2 35	.. ..	2 29	.. ..	4 47	.. ..	3 77	.. ..	2.37	.. ..	4 16	.. ..	3 20	.. ..	1.50	.. ..	.72	.. ..	28.10	
Newton	.37	- 55	1 36	- 87	3 55	*1 20	2 79	- 71	4 03	- 47	6 35	*2 29	4 98	* 1 79	6 11	*2 56	3 73	* .43	4 23	*1 67	1.60	- .27	.97	- .30	40 07	* 9.03
Northwood	65	.. ..	1 50	.. ..	1.43	.. ..	2 15	.. ..	2 31	.. ..	4 88	.. ..	7.02	....	3 34	.. ..	5.60	.. ..	4 37	.. ..	1.14	.. ..	.10	.. ..	35.49	
Odeboldt	T	.. ..	1 19	.. ..	1 50	.. ..	2 35	.. ..	1 57	.. ..	3.20	.. ..	6 67	....	6.37	.. ..	4 21	.. ..	6 23	.. ..	.64	.. ..	.50	.. ..	34.43	
Odgen	.31	.. ..	1.09	.. ..	2.09	.. ..	3 49	.. ..	4 82	.. ..	6 30	.. ..	8 03	.. ..	8.34	.. ..	6.86	.. ..	3 17	.. ..	.66	.. ..	.16	.. ..	45.32	

MONTHLY AND ANNUAL PRECIPITATION FOR 1900, WITH DEPARTURES FROM NORMAL.

STATIONS.	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Annual	
	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.
Olin	.81	.. ..	1.56	.. ..	3.14	.. ..	3.27	.. ..	3 08	.. ..	.. ..	.. ..	.. ..	.....	.. ..	.. ..	....	.. ..	.. ..	.. ..	1.13	.. ..	.20	..	....	.....
Omaha, Neb.	.15	- 54	81	* .02	1.48	- .02	3 43	* 30	2 24	-2.13	3.07	-2.60	6.86	* 2.11	3.52	* .18	3.60	* 76	5.43	*2.84	.15	- .87	.46	- .48	31.20	- 1.35
Onawa	.26	-2 06	1 09	- .03	1 40	- .11	3 22	* .43	3 66	- 95	2.97	-2 14	10 34	* 6 11	7.49	*3.45	6.96	-1 37	4 11	*2 00	.29	- 76	.41	- .65	42 20	* 9 92
Osage	.93	* 01	1 33	* .16	2.00	* .55	1 71	-1.19	2 98	-1 11	4 13	- .09	4 64	* 1 24	3.23	* .49	5.53	*2.15	3 20	* .63	1.44	- .04	.26	-1.05	31 38	* 1.75
Osceola	.19	.. ..	1 67	.. ..	1.80	..	2 64	.. ..	3 96	.. ..	4 62	.. ..	6 04	.....	5 29	.. ..	6 78	.. ..	5 95	.. ..	1.28	.. ..	.26	.. ..	40 48	.. ..
Oskaloosa	.34	- .62	1 71	* 64	2.32	* .34	2.79	* .05	3 07	- .64	3 63	- .37	4.41	* .69	5 55	*2 82	4 37	*1 46	3 60	*1.32	2 54	* .88	1.10	- .05	35 43	* 6.52
Ottumwa	.50	-2 00	76	- .37	1 30	- .80	2.38	-1 50	6.20	*1 33	3 60	* .20	3 35	- .80	6.05	*2 70	6.15	*2.79	5 75	*3.22	2 12	* .49	.47	-1.32	38 63	* 3 84
Ovid	.25	-1 76	2 56	*1 21	1 78	- .41	3.15	- .49	5.75	*2 32	4 64	* .81	3 47	- 06	3.39	- 47	5 40	*1.66	4 41	*2.07	1 73	* .37	.64	- .94	37.17	* 4.32
Pacific Junction	.27	..	.88	.. ..	.96	.. ..	3.44	.. ..	2 07	.. ..	4.95	.. ..	3 81	.....	3.81	..	3 72	.. ..	3 94	.. ..	.11	.. ..	.39	.. ..	28 35	.....
Pella	.10	.. ..	48	.. ..	....	.. ..	2.55	.. ..	2 29	..	3 83	.. ..	4.37	....	5.74	.. ..	5.57	.. ..	3 71	.. ..	.73	.. ..	.13	.. ..	.....	.....
Plover	.35	.. .	1.10	.. ..	1 30	..	1 60	..	2 69	.. .	4.67	..	8 58	.	2.40	.. ..	4 46	.. ..	3 68	.. ..	.60	.. ..	.25	.. ..	31.68	.....
Primghar	.10	.. ..	60	.. ..	4.13	.. ..	2.35	.. ..	2 75	.. .	2.40	.. ..	18 45	.	1 85	.. ..	5 55	.. ..	1 71	.. ..	T	.. ..	.20	.. ..	40 09	.....
Red Oak	.34	..	84	.. ..	1.31	. ..	2 46	.	2 56	.. ..	3 82	.. ..	4 57	.....	3.39	.. ..	4 19	.. ..	4.95	.. ..	.16	.. ..	.43	.. ..	29.02	....
Ridgeway	1.65	.. ..	1.52	.. ..	3 20	.. ..	2 74	.. ..	6.55	. ..	4.14	.. ..	3 71	....	2.11	. .	6 88	.. ..	6.72	.. ..	1.88	.. ..	1.25	.. ..	42 35	.....
Rockwell City	55	.. .	1.05	.. ..	1 81	. ..	2.15	.. ..	1 78	.. ..	8 36	.. ..	5.66	...	6.53	.. ..	4 54	.. ..	3.49	..	.65	.. ..	.63	.. ..	37 20	....
Ruthven	.47	. ..	1 00	.. ..	1 74	.. ..	1.41	.. ..	1 78	.. ..	6 67	.. ..	8 82	....	4 51	.. ..	6 82	.. ..	3.45	.. ..	.24	.. ..	.21	.. ..	37.12	....
Sac City	.38	- 73	1 08	* .02	1 61	* .00	1.85	-1.52	1 52	-2.66	6.49	*1 40	5 63	* 1.90	6.46	*3 14	3 84	* .75	4 52	*2.24	.49	- .67	.34	- .90	34 21	* 2.97
Scranton	T	.. .	.72	.. ..	2 82	. ..	4 58	. ..	2 83	. ..	4 59	.. .	8 68	.....	10 43	.. .	6 58	.. ..	2 59	.. .	.30	.. ..	.25	.. ..	44 37	.....
Sioux City	.24	- 35	.62	* .06	1 53	* .34	3 80	* 69	1 87	-1.84	4 32	* .43	8 72	* 5.28	3 56	* 51	5 64	*3.91	2 21	* .55	.36	- .01	.35	- 51	33 23	* 9 05
Sheldon	.27	.. ..	.75	.. ..	1 24	.. ..	2 05	.. ..	1.09	.. ..	3 63	.. ..	16.50	.....	1.85	.. .	6 95	.. ..	1 70	..	.77	.. ..	.50	.. .	37.30	.....
Sibley	.22	- .58	45	* .07	1 41	* .24	2.19	-1.29	1.29	-2.07	2.99	- 96	8.41	* 4 41	6 29	*4 26	5 91	*3 52	1 20	- .70	.64	- .39	.57	- 13	31.57	* 7 37
Sigourney	32	.. ..	1.98	.. ..	3 40	.. ..	3 83	. ..	4 62	.. ..	2.68	.. ..	5.01	....	4 02	.. ..	6 71	..	3 81	.. ..	1.96	.. ..	.56	.. ..	38 90	.....
Sioux Center	.15	. ..	.95	.. ..	1 17	.. ..	3 95	. ..	2 20	.. ..	4 42	.. ..	12 31	.....	3.20	.. ..	7 22	.. ..	2 26	.. ..	55	.. ..	.60	.. ..	38.98	.....
Spirit Lake	.32	- .25	.65	* .37	1.10	* .27	2 79	- .50	....	.. ..	.. ..	.. ..	.. ..	.. ..	4.31	*1.66	8 82	*6.68	1 51	- .67	.68	- .41	....	.. ..	.....	.....
Storm Lake	.35	- .46	85	* .17	1.96	* .59	2 33	- .16	1 47	-2.00	6 79	*2.27	9.16	* 5 37	4 58	*1.92	5.33	*2.67	3 32	*1.87	46	- .33	.34	- .58	36.94	*11.33
Stuart	....	.. ..	60	. ..	2.12	.. .	2 73	.. ..	3.84	.. ..	3 60	. ..	3 15	....	6 55	. .	....	.. ..	4 28	. ..	35	.. ..	.10	.. ..	.....	.....
Thurman	.80	.. ..	2 53	.. .	84	.. ..	6 62	. ..	2.81	. ..	10 55	.. ..	4 96		7 32	.. ..	2 91	.. ..	4 98	.. ..	.10	.. ..	.22	.. ..	44 67	.....
Toledo	33	- .67	.98	* .36	1.72	* .39	2.96	- 46	2.57	- 57	6 74	*4 28	5.47	* 2 39	6 89	*4 33	4 37	*1 26	2.95	* .91	1 51	* .21	65	- .53	37 14	*11 88
Villisca	.32	- 40	2.43	*1.58	1 71	- .43	2 72	-1 02	4 22	* 34	3 32	-1 57	5.45	* 90	4.45	* 03	4 03	*1.64	7.40	*5.49	74	- .38	1 33	* 33	38.12	* 6 31
Vinton	.20	-1.17	85	- 11	1 57	- .12	....	.. ..	1 68	-2.04	3 87	* .33	6.10	* 3 51	2 74	* 50	2 77	* .05	3 49	* .94	1 16	- .03	2.70	*1.47	.....	....
Wapello	1.40	.. ..	2 79	.. ..	3.13	.. ..	2.20	.. ..	3 89	.. ..	.84	.. ..	2 81	.....	5 69	.. ..	4.51	.. ..	1.95	.. ..	1 42	.. ..	.35	.. ..	30 98	
Washington	74	-1 08	2 03	*1.03	3 48	*1 23	2 50	- 21	2 80	- .73	1 52	-1.60	2 65	- 1 29	7 22	*4 66	4.76	*2 14	4.12	*2.47	1.12	- .34	.30	- .92	33 24	* 5.46
Washta	.34	.. ..	1 30	.. ..	1 36	.. ..	2 52	.. ..	2.81	.. ..	3 20	.. ..	8.21	.....	4.31	.. ..	7 47	.. ..	3.42	.. ..	.27	.. ..	40	.. ..	35.61	.....
Waterloo	70	- .50	1.19	* .08	2 86	*1 48	2.79	* 31	1 37	-2.23	5.47	*1 87	7 9	* 3.94	3.48	- .11	5 48	*1 24	4.14	*1.86	97	- .46	98	- 25	37.35	* 7.23
Waverly	.64	.. ..	1 24	..	2 97	.. ..	2.40	.. ..	1 35	.. ..	5.48	.. ..	5.61	.....	2.33	.. ..	4 18	.. ..	3.40	.. ..	1.11	.. ..	.67	.. ..	31 38	.....
West Bend	.70	- .06	1 10	* .18	1 94	* .24	1 67	-1.75	2 34	- .47	2.59	-1.27	5.62	* 2 66	3 34	* .75	4 55	*2 39	4 35	*2.97	.70	- .86	48	- .40	29.38	* 4.38
West Branch	..	.. ..	1 06	.. ..	1.74	.. ..	3.59	.. ..	3 91	.. ..	2.97	.. ..	.. ..	..	7 49	.. ..	4 31	.. ..	4 10	.. ..	....	.. ..	.10	.. ..		....
West Union	.45	.. ..	20	..	....	.. ..	..	.. ..	3 91	.. ..	3.51	.. ..	5.90		1 26	.. ..	2 87	.. ..	3 45	.. ..	.05	.. ..	.35	.. ..	...	.....
Whitten	10	.. ..	60	.. ..	.45	.. ..	3 85	.. ..	1 48	.. ..	.. ..	.. .	7.30	...	4.74	.. ..	8 61	. ..	4.24	.. ..	68	. ..	...	.. ..	...	.....
Wilton Junction	1.65	.. ..	2 89	..	4 17	.. ..	2 23	. ..	4.59	.. .	1 68	.. ..	3.97	.	7.40	..	4 12	.. ..	2 69	.. ..	1.65	.. ..	.35	.. ..	37 39	.....
Winterset	.23	- .88	1 30	* .41	2 81	* .98	2 32	-2 11	4 34	- 22	5.33	- .84	7 24	* 1.93	5.53	*1 46	5 65	*2.55	4.30	*2.42	.92	- 26	.23	-1.12	40 20	* 5.26
Woodburn	27	.. ..	2.33	.. ..	1.74	.. ..	2.39	.. ..	.	.	3.13	. ..	. ..	.....	5.91	.. ..	4 86	.. ..	..	.. ..	.97	.. ..	.35	.. ..		....

Annual Precipitation Chart 1900.



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1901

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U. S. DEPARTMENT AGRICULTURE --- WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XII. JANUARY, 1901. No. 1.

NOTE AND COMMENT.

Iowa will be in the heart of the banana and orange belt within the present century if the climate has been modified during the last thirty or forty years to the marvelous extent that some good people talk about. But it is more probable that there has been a lapse in their memories than that the universe has slipped a cog and is shoving the parallels of 40 to 43 N. Lat. down towards the tropics. Our northern Iowa farmers had better not trade their fur caps and overcoats for linen dusters and straw hats until they are certain the tropical conditions have come to stay. "Lest we forget," it is well to refer to the fact that in February, 1899, the temperature fell to 40° below zero in Iowa, and the average temperature for the state in that month was 12° above zero. The frost line went down six feet into the soil in many places during that extremely cold snap.

* * *

The German government has placed an order with a Philadelphia firm for 2,400 tons of sauerkraut for the use of the German troops in China. That is something like carrying coal to Newcastle.

* * *

During the last year 157,000 tons of unwrought steel were shipped from this country to the United Kingdom.

* * *

French and Italian scientists, in convention at Padua, Italy, united in a report favoring bombardment of storm clouds to avert hail. The experiments in that line will be watched with interest, though we think American scientists are generally skeptical as to the extravagant statement that by the firing of cannon in previous years hurricanes have been stopped and the force of thunderstorms broken and dissipated.

* * *

Gustav Holm, of Marengo, reported a large, brilliant meteor passing over that place from southeast to northwest, at 9:30 P. M., January 11th, 1901. An explosion was observed.

* * *

The Philippine Bureau of Forestry, in its first report on the forest wealth of the islands, states that from one-fourth to one-half of the Philippines are public forest lands. In the islands of Mindoro and Paragua at least 5,000,000 acres of the virgin forests are owned by the state. The island of Mindanao, with an area of 20,000,000 acres, is almost entirely covered with timber. In some of the southern islands magnificent tracts are standing, with from 10,000 to 20,000 cubic feet an acre. The trees tower to a height of 150 feet without a branch, and four feet in diameter. It is a gratifying to learn that measures are being taken to regulate the cutting and prevent spoliation of these magnificent forests.

NEWSPAPERS AND THE WEATHER.

(*Des Moines Leader.*)

A Philadelphia newspaper man, in an article explanatory and instructive in the *Popular Science Monthly*, makes a strong indictment of the American newspapers in the matter of their treatment of the weather. He confesses that it is "as amazing as it is deplorable that such an indictment of the newspaper treatment of the weather can be made," but he makes the indictment almost without qualification. "Instead of informing," he says, "most newspapers merely confirm popular error. Although for a generation the main facts of weather drift have been settled beyond dispute, they know nothing of it; they are still in the swaddling clothes of belief, and still accept the concepts of their grandfathers who swore by the 'Shepherd of Banbury's Rules,' and knew a wet moon when they saw it. As under normal circumstances this profound ignorance would give way slowly to the new science, it is regrettable that on the part of journalism there should be so gross a dereliction, and that at this late day, instead of being the harbinger of the new fact, it should still be the handmaiden of the old obscurantism." This writer particularizes as follows the ways in which the average newspaper fails in its duty to the public so far as the weather is concerned:

First—By reason of a misapprehension and misrepresentation of the simplest fundamental facts of atmospheric circulation and weather movement, effects being treated as causes, etc.

Second—By reason of a constant confusion of terminology and a generally slipshod use of weather terms and facts.

Third—By reason of a persistent refusal to recognize much, if any, difference between the scientist and the charlatan, between the expert and the quack; and, in fact, by a disposition—marked in some quarters—to give undue prominence to bogus weather prophets and wondermongers, at the expense of the equipped and reputable students of the subject.

Fourth—By reason of a hypercritical but uninformed attitude toward the daily forecasts of the United States weather bureau, by which the work of the bureau is hampered and its value to the public materially reduced.

This particular statement of the ways in which newspapers fail of their duty to the public in regard to weather news is worthy of the consideration, not alone of newspaper men but of the newspaper readers. It is only partly justified, for the writer evidently has in mind the few newspapers and not the many; but in so far as it is a true indictment the readers of newspapers must share with the makers of newspapers in the responsibility. There is no one thing better established in newspaper circles than that newspapers are pretty much what the newspaper readers want them to be. It is true that newspaper writers do not always discriminate between the quack and the expert, but the experts have not been doing business as many decades as the quacks have centuries, and it is not to be expected that newspapers will ignore weather quackery more than other forms of dangerous but interesting charlatanism.

But as a matter of fact appreciation of the splendid work being done by the students of meteorology in the weather bureau and the consequent advancement in that science, is becoming commoner and bids fair to be well nigh universal in

a few years, and this sense of the value of the science is due as much to newspapers as to those engaged directly in the study. But it must not be forgotten that old superstitions about the weather are hard to uproot. Neither the newspapers nor the scientists nor both can do this quickly. The progress is gratifying to all but those in unseemly haste to undo the work of centuries of misinstruction.

ELECTRICITY AND THE FARMER.

Hon. James Wilson, secretary of agriculture, in *Success:* The prediction of Mr. Edison that electricity will come to the rescue of the farmer during the next fifty years is likely to prove true—but not in the way of heavy machinery. It will come about, in my opinion, through the use of electricity in transportation, mining, and manufacturing. It is just a trifle improbable that anything will ever be invented to take the place, for instance, of a team of horses for farm work. Automobiles run smoothly on a level road, but not in mud.

But electric railways are going out into the country, radiating from every town and city in America. Every one of these benefits the farmer. City people move out, build houses, beautify grounds, and come into healthful contact with Mother Nature. The farmer, not to be behind, brightens up his own place a bit, uses the trolley himself, enlarges his horizon—and his market.

So, too, works every other invention of the electrician of Edison's class. Every electrical ore crusher put in operation means more work, more villages, more men to feed. Every improvement in electrical power means more factories.

The farmer is not slow to see these advantages. The American farmer is a business man, keen and alert to grasp situations. Go where you will, you find him better informed than his city neighbor on prices current, trade developments, and supply and demand. He may not know the details of the coming out party of Miss Sugarloaf, or the latest bit of club scandal; but he subscribes for papers and magazines that help him to get solid and timely information, and he generally profits by what he reads. Unlike the poor creature whom the great French painter and our own distinguished poet depicted, on canvas and in verse, the American farmer is a gentleman quite capable of taking care of himself and of showing to the world that he is not in the Millet, but in the Edisonian class.

HURRICANES OF THE TROPICS.

(*New York Tribune.*)

The most terrible tempests known to man are those which develop in greater or less abundance near the equator immediately after the hottest season of the year. Those with which Americans are most familiar generally occur in August, Septemper or October, and make their first appearance in or near the West Indies. At this period the trade winds have caused an accumulation of hot surface water at the western limit of the ocean in low latitudes, and out of this steaming caldron, whose temperature ranges from 90 to 95 degrees, are generated storms like that which has just almost annihilated Galveston.

The hurricanes show a disposition to follow a certain track. At first their movement is nearly westward, under the influence of the trade winds, but they seek to push northward, and having done so, thay are caught by the great eastward upper current of atmosphere and turned in almost the opposite direction. The curve described is a gentle one, and is sharpest in about latitude 25 or 30 degrees. Sometimes the storm continues on its westward way until it reaches the Gulf of Mexico, but more often it "recurves" so as to follow the Atlantic coast from Florida to Hatteras. Thence, as a rule, it swings away toward northern Europe, following the gulf stream very closely.

In exceptional cases these tropical hurricanes are diverted to the left hand sufficiently to be felt seriously on the New Jersey and Long Island coasts. Sometimes the center keeps just inside the coast line. Again the recurvature may occur so far to the eastward that the Bermudas suffer and the United States is entirely exempt. What was known as the "Nova Scotia cyclone," and what Greely described as the most destructive storm of this type known to America, occurred in 1875, and did practically no damage on land, but it destroyed no less than 1,223 vessels of different kinds and caused the deaths of 600 people.

The chief characteristic of tropical hurricanes is their wind velocity. No storm of temperate latitudes ever develops such appalling fury. There are few places in the interior of the United States where the wiud ever blows more than forty miles an hour; but in a West Indian cyclone velocities of eighty, ninety, and one hundred miles are not uncommon, and in 1897 at Cape Lookout, N. C., the anemometer registered 138. At sea this means the destruction of small vessels, and often proves fatal to large ones; on land, it means the demolition of weak edifices and damage to crops; and where the contour of the shore favors such an operation, continued gales of exceptional force bank up the sea five, ten and even fifteen feet higher than usual.

This last phenomenon should be distinguished from the mysterious tidal wave, that sometimes accompanies a hurricane, but which is a momentary affair. A surge rising from ten to twenty feet will sometimes rush in toward land when a tropical storm is prevailing, working inconceivable disaster within a few minutes. Ships are torn from their anchorage and hurled ashore, to remain high, if not dry, hundreds of yards from the water. Small vessels have thus been landed in tree tops in the Bahamas. A storm wave that swept the Ganges delta in 1864 drowned 45,000 persons, and another in 1876 no less than 100,000

During the early stages of their history tropical cyclones rarely advance more than eight or ten miles an hour. At that time their diameter is small, generally between one hundred and two hundred miles. After reaching higher latitudes and recurving, they expand somewhat, and their progress is more rapid. Eight full days elapsed after the recent hurricane was detected to the south of Porto Rico, before Galveston felt it. Another peculiarity of this class of disturbances is the remarkable fall in the barometer that accompanies them. From the outside to the center, or calm "eye of the storm", the distance may not be more than fity miles, and yet the barometer may fall during the passage of the hurricane over a given spot from the vicinity of 30 inches to 27.5. Green mentions a case in which the barometer at Guadaloupe fell from 29.6 to 27.9 in seventy minutes. Much lower readings than this have been observed however. Few storms of temperate latitudes ever affect the barometer to a greater extent than half an inch, and even this change is far more gradual than with a hurricane, owing to the much greater breadth of northern depressions. Torrents of rain, often amounting to three or four inches a day, and sometimes even more, usually fall while a tropical storm is prevailing.

A West Indian hurricane is circular in form. Hence Piddington applied to them the name "cyclone," derived from the same root as that found in "bicycle." Some fierce discussions have been conducted over the direction of the wind with reference to the center. Piddington and Redfield thought that the wind blew in circles around the latter. Espy held that it aimed straight for the centre. The truth lies between the two suppositions. The air moves in an inward spiral, and its course forms a considerable angle, with a tangent to the circle. Eliot, who has carefully studied the storms of the Indian ocean, and Toynbee, of the British naval service, have made very careful computations of this angle.

The question is one of immense practical importance to the

mariner who finds himself entangled in the outer edges of such a whirl. With the proper knowledge of the anatomy of a hurricane he can determine the position of its center from the direction of the wind. From the latitude he can conjecture the course which the storm is following. He can then so navigate his ship as to get out of the destroyer's path as soon as possible.

The typhoon of the Orient is an own sister of the West Indian cyclone. It is generated in low latitudes, late in the summer or early in the autumn, at the western edge of the Pacific, not far from the Philippines. It begins its career by moving Westward, but in time returns to the coast of China and Japan. Storms of precisely the same character develop in the North Indian ocean and assail the eastern coast of Hindostan, often advancing up the Bay of Bengal to Calcutta The southern hemisphere also has such disturbances. They are rare or unknown in the South Atlantic but are common in the South Indian ocean and South Pacific. Their course is at first westward, but in recurving to higher latitudes they swing around to the southeast, not the northeast. Again, in that part of the world it is summer when this country is having winter. Hence, tropical hurricanes there are most numerous in February and March.

It was in the latter month of 1889 that a memorable typhoon swept over the Samoan Islands, moving so slowly that its influence was felt for portions of three days. Six ships of the American and foreign navies, and ten merchant vessels, dragged their anchors in the harbor of Apia, and were either wrecked on the coral reefs of the bay or purposely beached by their commanders. In spite of a gallant fight with the storm one hundred and fifty men were drowned, and property to the value of $3,000,000 was lost.

THE RINGS OF SATURN.

The November number of the *Popular Science Monthly* contains a memorial article by Professor W. W. Campbell, acting director of the Lick observatory, upon the late Professor James Edward Keeler, director and demonstrator of the motion of Saturn's rings.

Professor Keeler, who went to the Lick as director from Allegheny City observatory, in 1898, died last July of heart disease, probably aggravated by residence in the rare atmosphere of the mountain observatory. His great work at the Lick was the final demonstration by means of the spectroscope of the motion of the planet Saturn on its axis and the motion of the rings about the planet.

Philosophers and mathematicians had shown that the rings or the bodies composing them must have motion, but it remained for this astronomer to observe that motion and announce the law governing it. Professor Campbell says of this discovery: "His beautiful observations of Saturn's rings, proving that they are a cluster of meteorites—myriads of little moons—have never been surpassed in interest in the entire astronomical field. He proved spectrographically that every point in the ring system is moving with the velocity which a moon would have if situated at that distance from the planet."

Next to the discovery of the rings by Huygens, in 1656, is the work of Professor Keeler in definitely determining their character. Galileo saw the rings in his imperfect little telescope, but they were not so defined as to enable him to determine their form or character. He saw them in such a way as to lead him to infer that Saturn was triple. When they turned on edge and disappeared altogether he was mystified to a still greater degree. He died before the mystery was solved. Huygens wrote in cipher, in 1656, the planet is "girdled with a thin, flat ring, nowhere touching Saturn, and inclined to the ecliptic." This brief description has never been improved, but Keeler has enlarged it, adding new laurels to those already gained by American astronomers.—*Rochester Democrat and Chronicle*.

LONG RANGE WEATHER FORECASTS.

J. S. TRIGG, IN ROCKFORD GAZETTE.

The ability to forecast weather conditions a year, six months, three months, or even thirty days ahead correctly would be worth millions to the country at large, could it be done. But it can't. Some secrets Omniscience guards from man, and this is one of them. The latent and inborn superstition of man tempts him to accept the dictum of some old fakir, who, after consulting a deck of cards and the stars, boldly prophesies thunder storms and cyclones in June and blizzards in January a year ahead, gravely interpreting stellar conjunctions and lunar changes as promoters of siesmic disturbances, floods and droughts. And the suckers pay their money and believe in his prophetic rot. What man shall come to know about climatic changes he will find out by the aid of science and not superstition. The weather forecasts made by the government under the care of skilled scientists, limited though these forecasts be in their range, are the only reliable weather forecasts to be had.

NATIONAL BULLETIN FOR JANUARY, 1901.

Extracts from the Climate and Crop Summary of the U. S. Weather Bureau.

With the exception of small areas along the immediate North Pacific coast and in North-Central California, and portions of the Carolinas and Eastern Florida, the temperature during January, 1901, was above the normal, the average daily excess ranging from 3° to 10° from the Mississippi valley westward, being greatest in the upper Missouri valley, where the temperature excess ranged from 8° to 13° per day. Elsewhere, outside of a limited portion of the Lake region, the average temperature was but little above the normal for the month. No unusually high temperatures for the season were reported, and while the southern limit of freezing temperature reached the Gulf coast, in Western Florida, the minimum temperatures for the month were not below the average.

Over much the greater portion of the country the precipitation during January was below the average, although the Central Pacific Slope and limited areas in New Mexico, Missouri, the Northern Peninsula of Michigan, New York, Maine, and the Central and East Gulf States received more than the usual amount. With the exception of the sections above specified, the month was marked by exceptionally light precipitation. Excessive rains, however, were reported from San Luis Obispo, California, Jupiter, Florida, and limited sections of Alabama, Louisiana, and Mississippi, ranging from 6 to nearly 12 inches. At the close of the month the ground was covered by snow to depths ranging from 1 to 20 inches over the greater portion of the winter wheat belt.

GENERAL REMARKS.

The weather conditions during January were generally favorable for winter wheat, although adverse reports were received from Kansas, Missouri, and Texas, of lack of moistnre, and from Kentucky, West Virginia, Pennsylvania, and Maryland, of injury by alternate freezing and thawing and lack of snow protection. At the close of the month the condition of wheat was about the average in most sections, excepting Michigan, Kentucky, and Tennessee, notwithstanding continued reports of damage to the early sown by Hessian fly in some portions of Kansas, Missouri, Arkansas, Illinois, Indiana, Ohio, and Virginia. The crop is suffering from drought in Texas and West-

ern Kansas and needs rain in some districts of Missouri. On the Pacific coast very favorable weather for this cereal prevailed and the condition of the crop continues excellent; the grain having germinated nicely, being well rooted and making healthy growth.

LOSS BY LIGHTNING.

Henry I. Wooden, of Pittsburg, reports the loss of three horses by lightning in Jackson township, Van Buren county, on the premises of J V. Scholl, during prevalence of a thunder-storm on the 22d of January, about 9:00 P. M. Several observers at distant stations note the fact that lightning was observed on that evening. The horses were on dry upland prairie. Loss, $250.

JANUARY WEATHER AT SIOUX CITY.

(*Sioux City Times.*)

The records of the local weather office show that the January just concluded was not a record breaker. Two others within the past twelve years, or since the establishment of the office here, have passed without registering zero, and three have equaled or surpassed it in the height of its mean temperature.

January, 1898, brought a minimum of 1°, the same as last month, while January, 1891, beat either of them with a record of 3° above zero; but in 1891 the mean temperature was considerably higher than in 1901, while both mean temperature and minimum of January, 1898, exactly tied those of this year. The figures for the past twelve years, showing the maximum, minimum and mean temperatures, and the inches of precipitation for January, are as follows:

	Max.	Min.	Mean.	Prec.
1890	52	–20	14	1.14
1891	58	3	28	1.66
1892	48	–28	15	.41
1893	46	–11	13	.34
1894	52	–16	15	.60
1895	52	–15	14	.16
1896	63	–10	23	.21
1897	45	–18	14	1.41
1898	40	1	24	.27
1899	57	–19	21	.08
1900	60	–12	27	.24
1901	54	1	24	.22

The highest temperature last month was 54°, on the 14th, and the lowest was 1° above, on New Year's day.

CLIMATOLOGY OF THE MONTH.

BAROMETER.—Mean pressure for January, 30.11 inches; highest observed, 30.71 inches, at Dubuque, on the 2d; lowest, 29.42 inches, at Dubuque, on the 15th; range for the state, 1.29 inches.

TEMPERATURE.—The month was unusually mild aud pleasant. The mean temperature for the state was 23.7°, which is 6.5° above the normal for January. The mean of the corresponding month in 1900 was 1.6° warmer. The mean temperatures by sections were as follows: Northern section, 20.1°; central section, 23.8°; southern section, 27 0°. The highest monthly mean for the state was 30.6°, at Keokuk; lowest mean, 15.3°. Highest temperature reported, 60°, at Keokuk, on the 15th; lowest temperature, 21° below zero, at Elkader, on the 1st. The average monthly maximum was 50.5°; average monthly minimum, 7° below zero. The greatest daily range was 49° at Olin; average of greatest daily ranges, 34 1°.

PRECIPITATION.—The average precipitation, as shown by records of 134 stations, was .74 of an inch. By sections, the averages were as follows: Northern section, .64 of an inch; central section, .83 of an inch; southern section, .76 of an inch. The largest amount reported was 2.34 inches, at Olin; least amount, .04 of an inch, at Murray. The greatest daily rainfall was 1.34 inches, at Ridgeway, on the 9th. Average number of days on which .01 inch or more precipitation was reported, 4.

WIND AND WEATHER.—Prevailing direction of wind, northwest; highest velocity reported, 54 miles an hour, from northwest, at Sioux City, on the 8th. Average number of clear days, 14; partly cloudy, 9; cloudy, 8.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduce barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.08	30.67	2	29.51	15
Des Moines	30 13	30 69	2	29 52	15
Dubuque	30.09	30 71	2	29.42	15
Omaha, Neb	30.11	30.60	2	29.54	15
Keokuk	30 11	30 68	2	29 49	15
Sioux City	30 14	30 62	2	29 47	15
	30.11	30 71	2	29 42	15

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	6,624	34	W	16
Des Moines	6,324	26	S W	20
Dubuque	6,674	38	N W	16
Keokuk	6,472	34	N W	16
La Crosse, Wis	5,983	30	W	15
Omaha, Neb	6,683	38	N W	15
Sioux City	9,966	54	N W	8

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* January was mild and pleasant, and ground was bare during larger part of month. Mean temperature was 4.3° warmer than the eleven-year normal, but was 3° colder than in January, 1900.

BANCROFT—*E. G. Bailey.* The month was marked by sudden changes in temperature. But little hay had been fed at the close of the month.

BONAPARTE—*Hon. B. R. Vale.* A remarkable month; even temperature and good roads.

BRITT—*G. P. Hardwick.* A mild month, free from blizzards.

CLINTON—*Dr. Luke Roberts.* January, 1901, was remarkably mild and agreeable for a month that usually furnishes the most rigorous weather of the year. The mean temperature was 24.1°, which is 4.1° above the January normal. The maximum was 53°, on the 20th, and the minimum was 7° below zero, on the 1st. Precipitation, 1.35 inches, mostly in form of snow There were only five storm days, or three less than the January average.

COLUMBUS JUNCTION—*H. E. Simpson.* On the 22d, between 8:00 and 9:00 P. M , many flashes of lightning were observed, followed by storm of ice and snow.

CRESCO—*Gregory Marshall.* A milder month than usual for January, but 3° colder than the same month in 1900. There has been much sickness, mostly grippe.

DENISON—*W. C. Van Ness.* On January 21, at 10:00 P. M., lightning was observed in the southeast; sky, clear.

ESTHERVILLE—*Leslie Littell.* The most delightful winter ever known in this part of the state; warm weather and clear skies.

GRAND MEADOW—*F. L. Williams.* On 11th, at 9:00 P. M., an extremely brilliant meteor in the southwest lighted up the sky. Month was dry and pleasant.

GREENFIELD—*J. G. Culver.* Faint lightning was observed at 8:30 P.M., on the 22d. Larks have been with us all winter thus far, gathering in coveys like quail.

GRINNELL—*A. O. Price.* Zero weather, but four days, and about that number of days sleighing. Fine month for stock.

HARLAN—*C. A. Reynolds.* An unusually fine winter month. Roads good; no hard storms; much sunshine; moderate temperature.

LOGAN—*Mrs. M. B. Stern.* Weather very fine; no storms or high winds.

MT. PLEASANT—*F. T. Stevens, M. D.* Thunder and lightning on the 23d.

MT. VERNON—*Jos. W. Hubbard.* Temperature, 2.19° above normal. Precipitation, .24 of an inch below normal; observation, twelve years.

ONAWA—*C. G. Perkins.* The Missouri river closed January 1.

OSKALOOSA—*Jos. Boyd.* Month mild, and stock is doing remarkably well. Fall wheat and rye not looking very well.

OVID—*H. C. Miller.* First sleighing of the winter on the 9th; but little frost in the ground, and no ice put up. Thunder-storm on night of 22d.

RIDGEWAY—*Arthur Betts.* Month 2° colder than January, 1900, and nearly twice as much snow. There have been 196 hours of sunshine, or 6.7 per cent. The year 1900 had 3,065 hours of sunshine, or 41 days were sunless, and 148 perfect sunshine.

STORM LAKE—*M. L. Fuller.* On evening of 22d lightning was observed in the southeast.

WEST BEND—*Ph. Dorweiler.* An ideal winter month.

BELATED REPORTS.

FAYETTE.—December: Mean temperature, 23.3°; highest, 49°, on the 22d; lowest, -12°, on the 31st; greatest daily range, 32°. Total preciptitation, 0.50 inch; greatest in 24 hours, .33 inch, on the 22d and 23d. Prevailing wind-direction, northwest. Number of clear days, 12; partly cloudy, 3; cloudy, 16; rainy, 4.

AUDUBON.—December: Mean temperature, 31.2°; highest, 55°, on the 19th and 20th; lowest, 3°, on the 29th; greatest daily range, 30°. Total precipitation, 0 20 inch; greatest in 24 hours, 2 20 inches on the 24th. total snowfall, 2.0 inches. Prevailing wind-direction, north. Number of clear days, 14; partly cloudy, 7; cloudy, 10; rainy, 1.

ERRATA IN DECEMBER REVIEW.

CENTERVILLE.—Mean temperature recorded 31.2°, on pages 9 and 20, should have been 30.6°.

HOPRIG.—Total precipitation recorded .05 inch, on pages 8, 12 and 22, should have been .15 inch. Total snowfall recorded 0.5 inch, on page 8, should have been 1.5 inches.

INDIANOLA.—Mean temperature recorded 25.8°, on pages 9 and 20, should have been 27.5°. Mean maximum temperature recorded 32 0°, on page 10, should have been 34.2°. Mean minimum temperature recorded 19.5°, on page 10, should have been 20.8°.

CLIMATOLOGICAL DATA FOR JANUARY, 1901.

NORTHERN SECTION.

STATIONS	COUNTIES	Elevation, feet	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., IN INCHES				Number rainy days	SKY			Prevailing direction of wind	OBSERVERS
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall (unmelted)		Number clear days	Number partly cloudy days	Number cloudy days		
Algona	Kossuth	1,500	8	20.3	*6.1	46	15	-10	2	32	.55	-.06	.30	5.5	3	8	15	8	NW	
Alta	Buena Vista	1,519	9	21.1	*6.1	46	14, 15, 20	-7	2	36	.42	-.31	.34	3.8	4	12	15	4	NW	
Alta (near)	Buena Vista	....	..	....	....	.	.....	....	.....	....	.25	.....	.20	2.0	2			..	.....	
Bancroft	Kossuth	...	..	21.0	...	48	14	-11	2	31	.50	.....	.20	5.0	4	8	13	10	NW	
Britt	Hancock	1,230	..	19.2	....	46	15	-10	2	40	.44		.15	4.3	7	9	19	3	NW	
Charles City (b)	Floyd	1,012	9	19.4	*5.5	43	20	-9	30	28	1.10	-.19	.41	8.0	5	8	13	10	.....	
Clear Lake	Cerro Gordo	984	..	19.6	....	45	15, 16	-9	2	31	.50	..	.20	5.0	4	19	12	0	NW	
Cresco (d)	Howard	1,280	28	16.4	*6.1	40	15	-12	30	34	.48	-.75	.30	4.7	5	11	10	10	NW	
Decorah	Winnesheik	900	7	19.4	*6.9	45	15	-10	30	33	.90	-.36	.50	9.0	3	...	...	...	.....	
Dows	Wright	....	..	20.6		49	20	-8	2	33	.89	..	.40	8.5	5	15	9	7	NW	
Elkader	Clayton	....	19	20.2	*7.2	51	20	-21	1	51	.91	-.59	.50	9.0	4	17	6	8	NW	
Estherville (a)	Emmett	.....	..	17.8	..	46	19	-17	2	37	.29	....	.15	2.9	4	16	8	7	NW	
Fayette	Fayette	1,000	10	20.5	*4.8	46	20	-17	1	36	1.10	-.34	.61	10.1	9	12	10	9	NW	
Fonda	Pocahontas	1,237	..		....	..	.....	.	.. ....	.	.60	.....	.30	6.0	2	16	12	3	.....	
Forest City	Winnebago	1,220	..	19.4	...	45	20	-8	2	31	.90	.....	.40	9.0	4	12	8	11	W	
Grand Meadow	Clayton	...	9		....	..	....	..	.... ..	...	.94	-.49	.50	9.5	4	10	10	11	NW	
Greene	Butler	943	..	20.9	....	46	20	-8	30	26	.96	..	.31	12.5	6	9	10	12	W	
Hampton	Franklin	1,240	10	....	....	..	.....	-6	30	....	1.01	-.22	.60	10.3	3	10	16	5	NW	
Hawkeye	Fayette	...	7	...	....	..	.....	...	... .		1.20	-.54	..	12.0	4	....		..	.....	
Hoprig	Emmett		..	....	...	..	.....	....	.....		.15	....	.15	1.5	1				NW	
Humboldt	Humboldt	1,082	7	22.3	....	48	15	-9	2	38	.09	-.40	.05	.9	4	19	6	6	NW	
Lansing	Allamakee	...	..	22.6	..	49	20	-10	1	32	.66	.....	.43	6.6	3	8	16	7	.....	
Larchwood (a)	Lyon	.....	..	21.8	....	50	23	-9	2	33	.20	.....	.20	2.0	1	21	6	4	NW	
Le Mars (a)	Plymouth	.....	..	22.8	. .	48	14	-2	2	34	.08	.....	.08	0.8	1	13	14	4	S	
New Hampton (a)	Chickasaw	1,166	..	20.0	...	42	20, 23	-10	30	29	1.05	.....	.40	10.5	5	14	4	13	NW	
Northwood	Worth	1,210	..	17.5	...	47	20	-7	2	29	.75	.....	.30	7.5	4	12	7	12	NW	
Osage	Mitchell	1,178	9	18.6	*6.2	42	15	-8	2	28	1.22	*.30	.40	11.8	9	4	11	16	NW	
Plover	Pocahontas	....	..	21.2	....	47	15, 20	-10	2	36	.50	.....	.30	5.0	3	13	6	12	W	
Primghar (c)	O'Brien	....	..	20.4	....	48	14	-5	8-9	35		.....	...			14	0	17	NW	
Ridgeway	Winneshiek	....	..	22.1	...	49	20	-11	30	35	1.97	.....	1.34	11.0	10	9	17	5	NW	
Ruthven	Palo Alto	.....	..	15.3	....	44	15	-8	1	35	.35	.....	.20	3.5	2	13	13	5	NW	
Sheldon	O'Brien	1,406	..	20.0	....	45	14, 20	-9	2	33	.20	... ..	.06	1.9	5	20	5	6	S	
Sibley (b)	Osceola	1,506	7	19.6	*6.9	47	20	-11	2	39	.15	-.65	.08	1.5	3	....		....	S, NW	
Sioux Center	Sioux	....	..	21.2	....	46	23	-6	2	30	.27	.....	.20	2.8	3	15	9	7	S	
Storm Lake	Buena Vista	.....	11	21.8	....	46	20	-7	2	36	.39	-.42	.30	3.6	4	15	12	4	SW, NW	
Washta	Cherokee	...	..		....	..	.....	.. .	....	.. .	.45	..	.30	4.0	4	17	12	2	S	
Waverly	Bremer	942	..	21.8		48	15	-7	30	28	.84	....	.28	8.5	7	10	13	8	NW	
West Bend*	Palo Alta	.....	7	19.8	*4.2	43	20	-10	2	...	.50	-.26	.30	5.0	3	12	7	12	NW	
Average	.....	.....	...	20.1	*6.0	46.2	....	-9.8	... .		33.6	0.64	-.35	.....	6.2	4	13	10	8	NW

CENTRAL SECTION

Amana	Iowa	.....	24	24.3	*9.9	51	20	-9	1	30	1.50	-.04	.62	12.9	6	13	8	10	NW	
Ames	Story	936	20	23.6	*7.8	51	15	-8	1	36	.57	-.47	.40	5.7	3	17	5	9	NW	
Baxter (a)	Jasper	.....	..	23.3	...	52	20, 23	-5	1	40	.82	..	.35	8.2	5	6	17	8	NW	
Belle Plaine (d)	Benton	840	10	23.8	*5.3	48	15, 20	-9	1	33	.66	-1.07	.40	6.6	5	12	13	6	SE	
Buckingham	Iowa	...	..		..	..	.....	....	.....	...	1.25	.	.73	10.8	4	12	15	4	.....	
Carroll	Carroll	...	10	24.0	*5.5	50	20	-5	2	33	.50	-.73	.45	5.0	3	22	0	9	..	
Cedar Rapids	Linn	744	18	25.8	*9.1	52	20	-10	1	31	1.05	-.55	.50	10.8	3	17	3	11	NW	
Clinton	Clinton	609	9	24.4	*5.7	53	20	-7	1	27	1.35	-.83	.58	12.2	5	11	8	12	W	
Coon Rapids	Carroll	....	..	24.4		48	15, 23	-8	2	34	.20	.. ..	.15	2.0	2	18	10	3	NW	
Davenport	Scott	615	28	26.6	*5.6	54	20	-3	30	27	1.10	-.60	.54	7.5	8	15	6	10	W	
Delaware	Delaware	1,048	9	20.5	*7.2	47	20	-16	1	35	.74	-.48	.23	4.6	9	11	11	9	NW	
Denison	Crawford	1,192	7	22.8	*2.8	51	20	-6	2	37	.35	-.27	.20	3.5	4	22	3	6	N	
Des Moines	Polk	867	22	26.3	*7.0	57	23	-3	1	34	1.01	-.23	.59	10.3	5	10	11	10	NW	
De Soto	Dallas	866	..	26.2		54	15	-4	2	38	.60	.....	.30	6.0	4	18	7	6	NW	
Dubuque	Dubuque	655	..	23.7	*6.0	52	20	-11	1	30	1.07	-.53	.41	9.0	8	13	8	10	NW	
Fort Dodge (a)	Webster		..	22.0	.	48	21	-8	12	48	.85	.....	.50	8.5	3	...	...	.	NW	
Fruitland	Muscatine	....	.	25.7		55	15	-8	1	33	.50	.....	.30	5.0	2	20	5	6	W	
Galva (*)	Ida	....	7	23.4	*7.4	49	14, 20	-4	1, 2	33	.22	-.22	.22	2.2	1	19	7	5	S	
Gilman	Marshall	1,053	..	....	....	.	.....	....	.....		.82	..	.50	8.2	3	16	6	9	N	
Grinnell	Poweshiek	1,011	10	24.3	*6.0	49	20	-3	1	31	.75	-.66	.40	...	3	11	7	13	NW	
Grinnell (near)	Poweshiek		..	23.4		48	20	-7	1	30	1.01	....	.45	10.5	6	11	5	15	NW	
Grundy Center (a)	Grundy	966	9	22.1	*7.2	47	20	-9	1	29	.75	‡.00	.45	7.5	2	12	9	10	NW	
Guthrie Center	Guthrie	1,269	..	29.6	....	49	22	-6	12	35	1.10	.....	.70	11.0	3	11	15	5	N	
Harlan	Shelby	..	..	23.5	....	50	20	-9	1	31	.38	.....	.17	3.1	6	7	14	10	NW	
Independence	Buchanan	921	38	..	.	.	.....	-14	1	....	.93	-.37	.40	8.8	4	17	7	7	W	
Iowa City	Johnson	644	10	24.7	*3.7	55	19	-10	1	30	1.07	-.96	.54	9.0	3	15	7	9	NW	
Iowa Falls	Hardin	....	7	20.8	*8.6	46	15	-7	2, 30	37	.82	-.09	.40	8.2	5	16	5	10	NW	
Le Claire	Scott	.....	..		....	.	.....	....	... ...	....	.98	.....	.41	...	6	..			... .	
Logan	Harrison	928	35	23.1	*2.8	56	20	-11	3	34	.70	-.49	.30	7.0	4	20	4	7	N	
Maquoketa (d)	Jackson	.	7	25.6	*7.8	52	20	-8	31	31	1.15	-.56	.70	.	6	12	4	15	W	
Marshalltown	Marshall	898	8	24.4	*6.4	52	20	-11	1	35	1.05	-.21	.39	9.6	7	11	13	7	NW	
Monticello	Jones	800	46	22.7	*7.3	52	21	-11	2	40	1.36	-.25	.48	10.5	4	12	7	12	NW	
Mt. Vernon	Linn	...	..	21.8		52	20	-10	1	35	1.08	.	.43	10.5	11	12	6	13	W	
Newton	Jasper	958	13	24.8	*8.5	51	20	-8	1	30	1.00	*.08	.50	10.5	4	12	14	5	SE, W, NW	
Odebolt	Sac	...	..	23.4	.. .	49	20	-4	1, 2	33	.18	.....	.13	2.0	2	21	6	4	.....	
Ogden	Boone	1,109	..	22.5	...	48	15	-8	1	37	.55	.....	.15	5.5	5	13	6	12	NW	
Olin	Jones	.	..	20.4	....	50	21	-18	3	49	2.34	..	.70	10.0	7	16	7	8	NW	
Onawa	Monona	.....	..	25.3	....	51	14	-3	1, 2	32	.29	.....	.20	2.8	5	25	2	4	NW	
Perry	Dallas	....	..	26.9	...	52	15	0	13, 30	42	.	.....	...	...	.	20	4	7	NW	
Rockwell City (e)		1,219	.	24.0	....	47	20	-5	2	36	.80	...	.50	8.0	2	20	2	9	.. ....	
Sac City	Sac	900	21	23.0	*9.1	51	20	-6	2	37	.10	-1.01	.10	1.0	1	18	8	5	NW	
Scranton	Greene		..	24.1		48	20	-3	1	35	.38	.	.30	3.8	2	22	3	6	NW	
Sioux City	Woodbury	1,122	11	24.2	*5.0	54	14	1	1	28	.22	-.34	.16	....	4	12	14	5	NW	
Toledo	Tama	....	6	21.2	*2.8	54	20	-10	2	47	1.00	‡.00	.50	10.0	3	15	6	10	SW	
Vinton*	Benton	800	10	24.4	*7.2	49	20	-6	2, 30	..	.95	-.42	.50	9.5	3	22	2	7	NW	
Waterloo	Black Hawk	862	21	22.0	*5.3	49	20	-10	1	34	1.07	-.13	.34	10.0	5	15	7	9	NW	
Wilton Junction	Muscatine	...	..	25.1	...	54	20	-6	1	27	.78	.....	.70	6.0	2	17	4	10	NW	
Whitten (c)	Hardin	.. .	..	22.0	..	48	15	-10	1	28	1.00	.....	.60	10.0	2	..	.	.	.. ..	
Average	....	....	...	23.8	*6.4	50.8	.....	-7.5	... .		34.2	0.83	-.42	...	7.5	4	15	7	9	NW

*Used to indicate the plus sign.

CLIMATOLOGICAL DATA FOR JANUARY, 1901—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PREC. IN INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.	Dates of thunder-storms.	OBSERVERS.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted.)		Number clear days.	Number partly cloudy days.	Number cloudy days.			
Afton	Union		..	26.0	..	51	20, 23	-5	1	32	.76	.....	.36	4.0	3	9	18	4	SW	....	
Albia	Monroe	945	..	26.0	...	53	15, 20	-4	1	36	.60	.....	.30	6.0	3	15	7	9	..		
Atlantic	Cass		9	24.3	*5.9	53	23	-13	1	42	.78	*.01	.50	6.0	4	11	11	9	NW		
Batavia	Jefferson	640	..		...	..	.....	....	... ..	..	.60	.....	.30	6.0	4		..		.....	....	
Bedford (*i*)	Taylor	..	..	28.1	..	55	20	.. .	.....	46	.62	.....	.42	7.0	...	...			....	..	
Belknap	Davis	857	..	28.6	....	55	15, 20	-3	1	36	1.23	.....	.46	7.0	7	18	12	1	NW	..	
Bonaparte	Van Buren	.....	9	28.8	*7.2	56	20	-3	1	29	1.05	-.96	.90	1.5	2	..		..	....	..	
Burlington	Des Moines	....	..	29.6		56	20	0	1	24	1.84	....	.88	2.7	4	15	6	10	.....	..	
Bussey	Marion	.....	..	....	...	..	....	...	.....	...	.75	... .	.60	..	3	...		..	.....	..	
Centerville	Appanoose	1,013	7	28.6	*7.1	54	20	-3	2	32	.40	-1.02	.20	4.0	2	16	11	4	NW	..	
Chariton	Lucas	1,030	..	27.0		57	23	-4	1	44	.95	.....	.60	9.0	5	11	16	4	NW	..	
Clarinda	Page	1,069	10	27.0	*5.8	56	20	-7	1	39	.82	-.29	.54	7.3	4	15	10	6	NW		
College Springs	Page	...	9	27.1	*4.6	54	20	-6	1	31	.69	*.11	.44	5.4	6	23	5	3	NW	...	
Columbus Junct	Louisa	. ..	..	27.6	...	56	15, 19	-2	1, 30	25	.92	....	.37	3.7	5	14	6	11	NW	22	
Corning	Adams	1 127	8	26.4	*5.8	52	23	-4	12	36	.50	-.32	.40	4.0	2	15	8	8	NW		
Council Bluffs	Pot'wat'mie	989	..	27.6	....	56	19	-2	1, 2	31	.27	....	.20	..	3	20	2	9	S		
Crawfordsville	Washington	....	..	..	....	..	.....	....	. . ....	...	.09	.....	.09		1	19	0	12	NW	..	
Cumberland	Cass	.....	..		....	..	.....	....	.... ..	...	.40	.....	.30	4.0	2	19	6	6	S	....	
Danville	Des Moines	715	..	.	....	..	.....	...	.....		.90	.....	.60		2	..	...		.....		
Eldon	Wapello	..	..	27.6	...	58	15	-6	1	33	.98	.....	.63	2.7	6	17	3	11	NW	23	
Emerson	Mills	....	..		....	..	.....	....	.....	. .	.33		.30	...	1	..		..	.....	...	
Fort Madison	Lee	516	52	...	..	..	.....	...	....	....	1.30	-.70	.85	1.0	3	11	9	11	NW	...	
Glenwood (*b*)	Mills	979	30	28.8	*11.1	55	20	-5	1, 2	30	.32	-.56	.30	3.2	2	5	21	5	NW	. ..	
Greenfield (*a*)	Adair	.....	9	25.8	*5.6	53	23	-3	1, 2	32	.41	-.68	.32	3.8	4	19	7	5	NW		
Griswold	Cass	....	..		....	..	. ... ..	....	....	....	.30		.30	3.0	1	17	6	8	NW	..	
Hedrick (*h*)	Keokuk	....	..	26.6	....	52	20	....	.....	...	1.05	....	.50	5.5	4				.....	....	
Hopeville	Clarke	....	..	26.2	....	53	23	-2	1	28	.60	.....	.39		3	10	15	6	NW		
Indianola	Warren	...	..	...	....	..	.....		. .....	....	.89	...	.40	6.4	5	7	8	16	NW	..	
Keokuk	Lee	618	29	30.6	*7.0	60	15	3	1	30	1.41	-.45	.96	...	6	14	9	8	NW	..	
Lacona	Warren	.....	..	.	....	..	.....	....	.....	...	1.15	.....	.70	11.5	4	11	15	5	....		
Lenox	Taylor	....	..	25.8	....	51	20	-6	1	43	.23	...	.18	2.3	2	14	12	5	NW	..	
Mooar	Lee	....	..	....	...	..	... ...	3	3	....	1.32	.....	.88		3	20	6	5	.....	..	
Mt Ayr	Ringgold	1,236	7	26.7	*4.5	54	20	-8	1	30	.76	-.56	.46	7.5	4	11	13	7	W	.	
Mt. Pleasant	Henry	725	..	28.0	.. .	55	19, 20	0	2	29	.80	.....	.52	...	5	22	6	3	NW	. ..	
Murray	Clarke	1,183	..		...	..	.....	....	.....	...	.04	.....	.03	.4	2	10	20	1	.....	....	
Omaha	Douglass	1,113	26	27.8	*7.0	54	19	0	1	27	.31	-.32	.21	3.1	5	16	7	8	NW	..	
Oskaloosa (*a*)	Mahaska	850	17	25.8	*8.2	54	20	-7	12	31	.83	-.13	.38	5.0	7	12	5	14	.....	..	
Ottumwa (*f*)	Wapello	630	6	29.4	*6.8	57	20	2	1	26	.40	-2.10	.30	3.0	2	18	6	7	SE	....	
Ovid (*e*)	Wayne	.....	7	26.4	*3.7	56	23	-4	1	35	1.86	-.15	.75	7.0	5	16	1	14	NW	..	
Pacific Junction	Mills	960	..	26.6	....	54	15, 20	-6	1	33	.33	.....	.22	3.1	5	10	12	9	S	..	
Pella	Marion	.....	..	25.0	...	55	20	-3	1	37	.75	... ..	.50	7.5	3	12	9	10	NW	..	
Red Oak	Montgom'ry	1,033	..	25.8	....	53	15	-5	1, 2, 12	42	.40	.....	.30	4.0	2	19	6	6	S	....	
Sigourney	Keokuk	.....	..	26.8	....	57	20	-6	1	33	1.32	. ..	.61	7.5	5	17	11	3	NW	...	
Stuart	Guthrie	.....	..	23.6	...	53	22	0	29	43	.30	.....	.30	3.0	1	20	2	9	NW	...	
Thurman	Fremont		..	28.0	...	54	15	-8	1	36	.54		.42	5.5	3	17	5	9	NW	....	
Villisca	Montgom'ry	1,058	7	25.7	*4.9	54	23	-7	1	43	.82	*.10	.50	7.0	4	22	6	3	NW	...	
Wapello (*c*)	Louisa	578	..	28.5		54	20	-2	1	40	1.11	.....	.59	.	4	...		....	NW	....	
Washington (*g*)	Washington	. ..	10	24.4	*2.9	56	20	-6	1	43	1.04	-.78	.52		4	...	.	....	NW	..	
Winterset (*b*)	Madison	....	9	26.2	*6.4	54	23	-1	1, 2	33	.80	-.31	.30	8.0	3		....	....	.....	....	
Woodburn	Clarke	.....	..		....	..	.....	...	....	...	.65	.....	.35	6.5	5	18	8	5	.....	....	
Average		.....	....	27.0	*6.2	54.6	.....	-3.8	....	34.6	0.76	-.51	.....	5.0	4	15	9	7	NW	..	
Av. for the state		.....	...	23.6	*6.2	50.5	... .	-7.0	.....	34.1	.74	-.43	.....	6.2	4	14	9	8	NW	..	

§Means determined from 7 A. M., 2 P M, and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P M observations ‡Received too late to be computed with means. *a*, One day missing; *b*, two days, etc.
*Is used to indicate the plus sign (+).

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR JANUARY, 1901.

STATIONS.		DATE.																														Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton.....	Max...	19	24	36	35	37	35	30	39	19	24	28	30	40	48	50	39	33	32	46	51	42	44	51	40	35	39	39	37	31	23	35	35.8
	Min...	-5	0	7	18	16	23	12	16	11	15	19	12	8	32	33	25	10	13	16	34	27	17	29	11	7	27	19	19	19	1	11	16.2
Albia	Max...	20	28	35	40	42	43	34	46	24	34	33	34	40	42	53	47	35	34	41	53	50	42	52	47	34	40	42	36	47	23	31	38.8
	Min...	-4	2	4	9	9	18	20	20	13	18	20	7	7	13	20	20	10	14	11	17	21	18	23	11	8	14	20	21	18	2	8	13.3
Algona	Max...	20	19	32	16	31	30	28	19	15	20	27	22	34	42	46	39	22	32	33	44	38	37	32	32	30	31	39	34	25	20	20	28.7
	Min...	-2	-10	13	8	19	16	8	6	6	13	17	3	2	30	33	16	2	13	4	28	22	16	28	8	5	23	16	8	8	-2	12	11.9
Alta . ..	Max...	21	22	32	..	28	..	28	33	15	22	25	22	36	46	46	32	..	25	40	46	..	41	44	24	36	38	40	..	..	21	22	31.9
	Min...	-4	-7	11	6	11	12	8	8	6	11	7	1	10	28	30	18	2	10	4	29	19	18	23	8	6	10	15	9	3	-1	8	10.3
Amana ...	Max...	21	21	33	34	32	37	31	40	25	28	30	28	33	41	47	41	25	28	32	51	41	37	46	37	28	37	33	32	23	18	20	32.6
	Min..	-9	-4	7	18	25	29	22	17	14	24	19	5	23	31	31	23	8	7	10	31	27	15	31	11	13	25	20	11	10	-5	6	16.0
Ames.....	Max..	21	20	36	26	32	34	29	37	20	23	26	26	36	45	51	41	29	31	38	50	42	41	49	..	32	36	39	35	26	20	24	33.2
	Min...	-8	-4	6	16	19	20	12	13	10	13	13	-5	0	33	30	23	8	15	12	33	25	16	28	12	7	27	25	9	15	0	14	14.1
Atlantic ...	Max...	20	24	35	30	32	33	33	26	19	28	28	32	39	47	50	38	32	36	47	51	41	52	53	33	37	43	43	35	34	25	28	35.9
	Min...	-13	-11	12	12	14	19	11	15	13	14	-5	-8	-3	26	32	26	10	9	22	36	22	17	29	14	9	29	20	22	15	3	8	12.7
Bancroft ..	Max..	22	20	32	32	31	33	32	32	19	20	32	23	33	48	47	40	22	33	34	45	39	38	43	33	32	33	46	38	27	24	20	32.4
	Min ..	4	-11	10	6	15	10	7	6	6	10	15	0	-2	25	30	9	-1	8	3	23	17	13	25	6	4	16	14	13	12	-4	10	9.6
Baxter.. ..	Max..	25	22	36	33	35	37	37	36	23	28	32	26	42	47	49	33	20	32	43	52	..	41	52	27	37	42	40	32	26	27	24	34.5
	Min..	3	1	14	18	24	13	17	11	14	19	-5	2	12	22	22	8	10	8	12	20	17	22	12	7	16	18	16	15	-1	5	7	12.1
Bedford ...	Max...	..	..	..	..	..	..	..	..	22	29	30	34	45	47	51	..	37	39	47	55	45	45	53	36	36	45	41	46	31	27	27	39.5
	Min...	..	..	..	..	..	..	..	..	12	12	19	-8	-1	27	27	9	15	23	29	37	25	17	28	15	9	27	16	23	18	3	5	16.7
Belknap...	Max ..	23	38	38	40	43	43	43	45	..	30	28	32	40	50	55	45	37	33	46	55	37	42	53	..	34	38	39	36	32	..	27	39.4
	Min...	-3	2	12	16	20	25	23	24	15	19	20	11	13	18	35	27	20	13	15	22	23	20	28	14	10	28	24	22	23	3	14	17.9
Belle Pl'ne	Max...	20	21	33	39	33	36	30	38	22	26	33	34	44	45	48	..	..	32	36	48	32	38	40	22	24	43	..	25	24	20	23	32.5
	Min. ..	-9	-5	0	9	19	30	18	30	17	14	20	2	25	30	32	22	6	12	9	28	24	15	18	7	10	34	19	14	13	-5	12	15.2
Bonaparte.	Max..	24	27	37	43	38	46	33	44	32	..	27	32	36	49	55	41	30	33	40	56	45	39	54	39	31	37	37	34	40	22	30	37.7
	Min..	-3	3	8	22	27	31	26	21	17	25	19	10	23	33	33	29	13	13	14	36	27	18	30	18	12	27	25	19	21	4	15	19.9
Britt.....	Max...	21	17	34	23	28	31	31	33	17	22	27	26	34	39	46	36	18	31	35	39	34	38	44	31	32	32	36	30	21	20	19	29.8
	Min...	-8	-10	10	10	17	13	6	6	3	10	13	1	-6	24	29	14	0	10	2	22	18	11	23	5	0	20	10	8	7	-5	7	8.7
Burlington.	Max...	22	26	36	44	38	46	38	46	33	33	29	35	35	49	56	42	30	31	40	56	45	40	51	41	30	37	37	37	40	22	29	37.9
	Min...	0	7	12	25	27	32	27	23	18	27	25	14	27	32	34	29	13	14	16	36	29	20	32	18	13	26	25	18	20	3	17	21.3
Carrol'.....	Max..	21	23	36	31	30	31	30	35	18	25	24	24	38	49	48	40	29	35	46	50	40	42	48	32	38	44	42	38	28	24	28	34.4
	Min .	-2	-5	11	13	15	20	9	13	10	12	14	-4	5	28	35	23	6	13	12	35	26	18	28	5	7	25	18	14	10	-2	10	13.6
Cedar Rap.	Max .	21	20	34	33	32	36	33	42	26	28	29	29	35	41	48	44	21	32	33	52	41	37	48	38	29	37	33	28	21	16	19	36.1
	Min...	-10	-6	9	17	25	29	20	15	13	24	18	6	19	33	31	20	7	9	10	32	24	15	32	9	14	24	22	12	14	-5	-1	15.5
Centerville	Max..	22	28	38	43	37	41	33	48	25	30	28	32	45	49	52	44	34	33	44	54	48	43	50	46	32	38	39	35	30	26	23	37.7
	Min...	-2	-3	10	25	24	31	21	22	15	19	21	20	18	30	35	28	15	15	14	39	33	21	28	14	11	29	28	16	14	4	14	19.6
Chariton...	Max...	21	28	36	38	35	39	32	45	23	25	29	27	38	48	54	42	32	35	45	55	45	43	57	38	34	39	41	36	34	23	26	36.9
	Min...	-4	1	11	20	20	26	17	17	14	18	16	3	9	33	35	26	12	14	12	38	26	18	29	17	9	18	21	21	19	3	14	17.2
Charles Cy.	Max. .	20	15	30	26	26	32	..	34	..	25	26	26	25	37	40	37	18	25	28	43	35	34	41	33	25	32	32	27	19	15	16	28.3
	Min ..	-4	-7	7	11	20	25	10	10	5	16	20	10	8	25	25	15	2	2	0	15	20	9	25	5	5	22	13	10	9	-9	4	10.5
Clarinda...	Max .	23	26	38	37	38	34	32	34	19	25	28	36	42	47	52	40	33	38	52	56	40	46	54	35	36	44	43	40	34	26	30	37.4
	Min...	-7	-4	10	16	17	20	13	16	15	16	8	-3	8	32	32	27	10	15	24	36	24	20	31	14	13	28	21	25	18	6	13	16.6
Clear Lake	Max .	22	17	30	30	25	30	31	32	15	25	29	20	30	39	45	45	24	27	30	44	40	35	40	34	28	35	35	32	24	19	20	30.1
	Min...	-3	-9	5	13	15	18	6	7	3	13	11	3	0	22	28	14	0	8	1	24	18	11	25	4	1	23	9	8	5	-8	6	9.1
Clinton ...	Max...	20	19	31	37	33	43	35	44	31	32	32	31	35	40	48	38	20	28	29	53	42	37	45	34	29	34	30	26	24	17	20	32.8
	Min. .	-7	-1	4	19	25	28	28	22	17	27	21	15	25	30	24	20	9	7	8	26	30	19	28	13	11	25	18	7	10	-4	-4	16.1
College Sp.	Max...	21	24	35	36	37	33	32	29	19	27	30	34	43	46	51	40	33	39	50	54	40	50	51	40	38	40	43	40	33	27	30	36.9
	Min...	-6	-1	9	18	16	23	12	15	15	12	15	8	12	29	32	26	10	15	25	34	29	21	30	15	12	28	22	23	22	4	10	17.3
Columbus J	Max..	23	27	25	40	33	42	34	44	30	32	29	34	36	45	56	41	..	29	56	52	45	40	52	37	32	37	32	32	32	...	23	36.9
	Min ..	-2	3	9	19	24	28	25	20	15	24	21	7	24	32	35	24	9	10	28	29	26	18	27	12	12	25	22	14	14	-2	12	18.2
Coon Rap..	Max...	18	21	34	32	31	33	30	38	19	24	24	26	38	42	48	42	31	33	44	47	42	43	48	37	37	40	39	38	34	23	25	34.2
	Min...	-1	-8	11	13	16	20	11	13	9	15	9	0	9	28	37	24	9	12	10	36	25	19	30	11	9	27	20	16	12	2	11	14.7
Corning ...	Max...	19	23	36	34	36	33	30	37	19	24	2	30	39	42	50	41	35	34	46	51	..	42	52	38	34	41	40	40	33	23	28	36.8
	Min..	-3	-3	11	15	17	24	17	15	13	15	5	-4	3	20	35	25	9	12	22	36	29	19	30	13	9	27	20	21	20	3	10	16.0
Co Bluffs..	Max...	23	22	40	26	28	29	34	34	21	25	28	33	42	52	52	43	34	48	56	54	40	48	52	32	36	43	45	40	35	28	31	37.2
	Min...	-2	-2	14	15	16	16	14	14	14	14	5	4	13	32	34	28	10	22	25	33	24	23	27	16	14	26	20	25	12	7	12	16.9
Cresco .. .	Max..	18	12	28	25	24	32	27	33	18	26	28	20	30	36	40	..	..	25	28	39	..	32	30	..	25	34	27	15	18	14	13	26.1
	Min. .	-8	-7	8	17	18	20	13	7	5	18	12	0	0	9	24	10	-1	-2	0	5	14	9	12	4	3	6	13	7	0	-12	1	6.6
Davenport.	Max...	21	22	34	40	32	40	35	46	34	33	29	33	36	42	52	39	21	29	36	54	44	37	50	33	29	34	31	27	24	15	21	34.0
	Min...	0	7	9	25	25	31	28	19	18	27	22	15	26	35	35	21	10	12	10	36	28	22	31	12	13	24	24	12	14	-3	10	19.3
Decorah....	Max..	18	12	31	29	29	35	27	33	21	33	33	27	30	40	45	22	14	25	26	44	36	38	42	14	22	40	29	24	22	12	17	28.1
	Min ..	-8	-8	2	15	25	29	16	10	8	21	21	2	15	22	19	14	0	-2	-1	19	22	5	25	6	5	21	15	10	10	-10	5	10.7
Delaware..	Max...	19	14	29	31	27	34	34	36	21	29	30	26	28	39	44	37	20	25	26	47	40	36	43	35	28	35	29	24	20	18	15	29.6
	Min..	-16	-9	-1	14	20	24	17	10	9	19	19	6	17	24	27	17	2	4	5	24	24	14	29	6	10	20	17	4	7	-11	2	11.4
Denison...	Max ..	20	21	31	31	28	30	31	34	17	24	25	26	37	50	49	41	31	39	45	51	40	44	47	35	38	39	43	31	31	24	26	33.2
	Min ..	-4	-6	9	11	15	15	10	9	10	14	6	6	0	30	36	23	-1	12	12	34	25	19	26	15	7	24	18	15	1	2	6	12.5
Des Moi'es	Max...	22	25	37	33	34	36	35	40	26	28	28	27	39	50	54	37	25	33	45	53	41	43	57	34	33	39	41	36	30	24	27	35.9
	Min...	-3	-1	13	22	20	21	15	15	13	20	8	0	5	35	35	25	12	16	12	40	24	20	30	14	10	29	21	20	10	3	15	16.7
DeSoto	Max. .	20	22	35	30	35	35	33	39	21	25	29	31	42	47	54	41	30	32	43	51	51	44	53	32	36	40	41	37	31	23	25	35.7
	Min. .	0	-4	8	20	19	20	16	16	14	19	7	-3	4	34	34	28	12	16	19	40	24	19	31	15	10	29	23	19	13	3	15	16.8
Dows	Max...	22	17	34	28	28	33	21	35	19	24	25	21	30	42	47	44	24	28	33	49	39	38	46	36	29	34	36	32	21	19	19	30.7
	Min ..	-6	-8	9	14	20	18	7	8	7	11	18	-2	-3	25	29	17	2	10	4	29	19	12	24	8	3	24	10	8	11	-7	8	10.6
Dubuque ..	Max...	19	14	30	33	28	35	32	39	26	29	29	26	32	41	48	39	18	26	34	52	43	35	45	36	29	34	30	27	21	14	17	31.0
	Min ..	-11	0	4	22	22	28	21	15	11	26	25	11	20	32	29	18	7	7	8	34	25	19	30	10	14	26	24	12	13	-2	8	16.4
Eldon	Max...	24	28	38	41	37	43	34	43	31	31	28	31	38	50	58	44	33	33	43	57	48	40	55	43	32	36	38	34	36	23	28	38.0
	Min..	-6	-2	7	17	25	30	23	19	14	22	18	5	13	32	31	26	10	15	10	35	28	16	26	11	9	26	21	19	20	2	13	17.3
Elkader....	Max...	26	25	36	35	26	36	..	37	..	31	32	32	31	49	45	..	21	26	30	51	..	40	50	..	32	40	32	25	24	17	20	32.7
	Min..	-21	-20	-15	-9	21	22	19	12	10	11	22	11	11	14	23	15	3	1	1	24	29	10	10	9	9	12	21	9	6	-7	-6	7.7
Estherville	Max...	22	..	31	22	31	28	30	32	14	23	29	24	33	45	40	28	20	31	46	38	40	40	20	30	30	32	40	35	22	22	20	30.0
	Min ..	-5	-17	-6	4	11	12	10	6	5	2	3	-8	-3	25	28	12	-1	4	10	12	10	10	5	0	1	20	13	7	3	-5	8	6.1
Fayette ...	Max...	19	14	29	30	28	35	30	35	23	28	28	25	33	39	45	33	..	25	33	46	38	35	39	32	28	35	29	..	20	14	14	29.7
	Min. .	-17	-13	4	16	20	22	22	14	9	21	12	4	16	27	28	15	1	-1	1	31	16	8	30	5	8	22	15	10	8	-10	5	11.3
Forest City	Max..	22	17	34	29	25	30	31	33	15	20	23	19	29	40	42	36	17	29	30	45	40	43	32	31	30	37	41	31	19	20	17	29.3
	Min...	6	-8	7	11	15	18	6	7	3	12	15	3	-2	16	30	13	-1	7	2	26	17	25	6	1	22	11	13	7	9	-6	5	9.5
Ft. Dodge	Max..	25	26	34	40	42	44	41	..	36	35	25	24	38	45	46	42	30	28	38	45	48	40	47	37	34	36	40	38	28	23	25	36.0
	Min ..	-3	-4	0	-1	0	-4	6	..	5	6	0	-8	-7	12	31	20	5	13	2	27	21	11	24	10	5	23	15	11	11	-2	12	8.0
Fruitland..	Max...	22	25	35	41	35	43	35	45	32	35	30	33	35	44	55	40	29	30	35	46	41	40	47	40	32	40	33	32	30	17	24	35.5
	Min ..	-8	-2	2	15	25	29	25	20	11	25	20	10	27	32	29	27	10	7	11	26	25	14	28	14	7	25	22	9	8	-2	2	15.9
Galva.....	Max ..	21	23	24	..	25	..	..	34	15	20	25	28	40	49	45	40	..	37	42	49	37	44	45	35	39	39	44	..	38	24	..	34.5
	Min ..	-4	-4	12	9	12	8	..	8	9	10	11	12	10	27	31	19	4	14	9	28	24	16	25	9	6	22	15	11	15	0	3	12.4
Glenwood..	Max ..	25	25	40	37	..	27	30	32	..	25	28	36	42	53	53	45	37	44	54	55	47	46	53	44	35	42	47	45	36	28	30	39.3
	Min ..	-5	-5	10	17	16	22	13	15	12	12	17	18	17	32	37	27	8	17	24	32	29	22	27	16	12	28	19	25	23	5	15	18.3
Greene.....	Max...	21	18	32	28	27	33	25	34	20	25	28	24	30	41	44	38	19	25	28	46	39	35	44	33	28	34	34	29	20	18	17	29.6
	Min...	-3	-5	6	16	21	25	11	11	8	18	20	8	6	25	28	16	3	6	2	25	22	13	26	7	6	23	11	12	14	-8	4	12.2
Greenfield.	Max..	21	26	37	34	33	31	30	37	21	34	29	31	42	46	52	40	..	33	47	52	42	45	53	40	34	43	44	37	35	23	27	36.6
	Min...	-3	-3	11	12	16	16	10	14	12	14	12	5	10	29	34	24	9	11	17	35	19	17	28	11	5	28	28	19	14	0	10	15.0
Grinnell....	Max...	19	21	33	30	31	35	29	33	22	26	27	25	34	42	46	41	29	29	36	49	45	38	48	36	38	37	36	34	23	19	21	32.6
	Min ..	-3	-1	9	21	19	26	19	14	11	20	17	1	11	32	33	23	8	13	10	33	27	20	30	12	7	24	19	17	16	-2	11	16.0
Grin'l (nr.)	Max..	19	22	33	30	30	36	29	38	21	26	25	27	34	40	45	39	26	28	36	48	36	39	43	37	30	37	35	31	23	19	20	31.7
	Min...	-7	-2	6	17	19	26	19	15	11	20	14	-3	17	30	31	23	9	13	8	33	27	17	29	11	6	25	17	16	15	-3	8	15.0
Grundy C'r	Max .	20	18	33	30	29	34	29	34	20	26	27	21	30	40	44	38	..	25	32	47	43	35	46	37	29	36	36	31	20	17	20	30.9
	Min...	-9	-4	5	14	21	26	11	15	9	17	18	-1	13	28	29	22	5	10	5	30	24	16	28	9	6	24	13	13	15	-6	6	13.3
Guthrie C'r	Max. .	20	23	36	36	34	33	31	35	19	24	27	22	39	44	49	43	31	32	45	50	45	44	51	35	36	39	42	33	30	23	20	34.5
	Min ..	-5	7	9	19	17	21	11	15	11	11	9	-6	7	32	35	8	10	11	11	36	29	19	30	12	8	28	19	20	8	1	11	14.6
Hampton..	Max...	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
	Min...	-3	-4	6	17	20	18	10	8	8	17	18	3	2	27	32	18	3	11	3	26	20	16	27	5	5	23	15	10	8	-6	6	11.9
Harlan.....	Max.	18	20	34	25	30	31	31	32	17	25	25	30	39	46	48	40	32	37	44	50	38	42	48	34	37	40	42	35	31	23	26	33.9
	Min...	-9	-7	4	11	15	19	11	13	11	14	9	-1	2	32	30	24	6	12	20	28	24	16	22	11	7	24	17	17	16	2	7	13.1
Hedrick ...	Max ..	..	..	..	..	..	..	..	..	40	29	29	23	36	45	52	38	30	29	38	52	43	42	47	..	30	40	37	33	33	21	25	36.0
	Min. .	..	..	..	..	..	..	..	..	14	20	14	5	6	32	32	24	10	10	11	34	26	17	29	10	9	26	22	17	15	0	13	17.2
Hopeville..	Max..	19	24	33	36	36	36	32	40	20	24	25	29	39	46	49	40	31	32	46	52	44	42	53	33	32	40	38	37	32	23	25	35.1
	Min..	-2	2	9	21	20	21	15	14	13	17	15	4	11	33	36	27	13	15	17	38	25	19	30	13	9	29	21	21	17	3	13	17.4
Humboldt.	Max...	30	21	34	..	28	32	28

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR JANUARY, 1901—CONTINUED.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Indianola	Max.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
	Min.	-3	-2	12	22	17	27	14	17	13	18	19	2	9	32	35	26	11	11	11	39	29	19	31	13	8	29	20	20	20	2	15	17.3
Iowa City	Max.	26	25	34	36	33	38	34	41	24	29	29	30	33	42	52	41	25	28	35	55	43	39	47	37	31	37	32	31	33	21	21	34.1
	Min.	-10	-5	5	18	24	28	23	18	14	24	20	5	24	30	28	15	8	6	10	29	27	14	30	13	13	25	22	9	10	-5	2	15.3
Iowa Falls	Max.	20	17	32	27	28	34	30	34	20	30	25	21	34	40	46	37	14	30	33	45	37	37	45	31	29	35	34	30	22	19	18	30.1
	Min.	-6	-7	8	14	20	18	9	8	8	17	16	1	-3	30	31	12	3	12	5	32	19	13	25	7	4	24	15	10	5	-7	11	11.4
Keokuk	Max.	25	28	40	46	38	46	35	51	33	29	27	33	41	50	60	37	26	32	43	57	40	39	54	28	32	37	38	32	41	32	30	37.7
	Min.	3	11	10	26	29	32	28	25	19	27	24	17	29	35	39	31	18	17	20	38	31	23	34	24	13	26	27	24	23	6	18	23.4
Lansing	Max.	22	22	33	32	28	33	34	37	23	30	30	30	28	47	46	42	20	27	24	49	..	34	48	..	30	40	35	..	26	21	18	31.8
	Min.	-10	-6	1	18	20	23	18	21	9	20	24	8	18	23	20	16	0	-1	2	22	22	20	28	8	8	22	21	20	14	-5	8	13.3
Larch w o'd	Max.	18	19	32	29	22	28	28	..	17	20	25	28	35	49	48	40	27	40	40	48	38	42	50	34	36	36	40	37	32	25	24	32.9
	Min.	-4	9	12	1	1	11	10	-5	5	6	10	4	20	28	32	16	-1	15	7	24	16	21	26	7	9	21	12	9	10	4	10	10.7
LeMars	Max.	23	22	33	29	29	26	30	..	17	24	23	27	36	48	47	40	30	41	42	46	39	42	43	35	37	39	42	38	26	28	25	33.6
	Min.	-1	-2	14	6	9	19	9	6	9	7	9	2	3	30	32	20	0	7	10	24	23	20	20	9	7	23	16	16	14	2	10	12.0
Lenox	Max.	20	23	35	33	36	34	30	37	19	23	26	30	39	43	48	39	34	33	46	51	43	42	50	41	33	40	39	39	32	23	26	35.1
	Min.	-6	-1	7	18	18	24	12	12	12	14	15	14	11	26	35	26	8	11	22	37	21	20	30	13	8	28	19	21	20	2	10	16.4
Logan	Max.	20	20	23	30	28	30	31	..	9	12	7	-6	1	20	24	30	24	3	21	30	52	43	35	46	42	30	32	33	28	21	20	20	33.6
	Min.	-7	-9	-11	9	10	15	18	9	9	26	30	30	29	30	44	45	43	25	26	30	52	43	35	46	42	30	32	21	11	6	-4	-8	17.5
Maquoketa	Max.	..	..	..	..	36	35	36	41	26	30	30	29	30	44	45	43	25	26	18	24	28	15	27	11	11	22	21	11	6	-4	-8	17.5
	Min.	..	..	..	..	32	32	22	21	14	24	23	12	21	26	24	21	13	5	18	24	28	15	27	11	11	22	21	11	6	-4	-8	17.5
Marsh'l't'n	Max.	24	19	35	31	31	35	29	37	22	27	39	24	34	44	49	41	27	29	37	52	44	40	50	38	31	39	38	35	22	21	23	33.8
	Min.	11	-7	9	18	20	25	14	13	11	19	18	-1	12	32	32	22	7	13	8	33	26	18	30	11	8	26	19	15	17	-2	13	15.1
Monticello	Max.	21	20	32	32	35	33	26	39	23	30	34	25	35	38	45	25	28	23	35	50	52	35	48	30	30	35	32	30	28	25	28	32.5
	Min.	-19	-11	-2	12	12	15	19	16	12	21	24	6	32	30	32	22	5	5	10	20	25	27	28	6	5	20	9	8	6	-7	7	12.7
Mooar	Max.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25	24	21	12	12	12	15	18	22	20	14	11	24	14	17	14	5	11	16.2
	Min.	7	7	3	20	25	21	26	18	19	21	20	12	11	42	47	51	40	34	35	50	54	39	45	53	37	33	40	39	39	34	24	26	36.3
Mt. Ayr	Max.	20	27	36	38	38	35	30	40	20	24	26	30	42	47	51	40	34	35	50	54	39	45	53	37	33	8	28	19	21	18	3	9	17.1
	Min.	-8	2	10	18	20	25	13	17	13	16	16	10	14	31	33	26	11	15	20	34	27	17	29	14	8	29	37	36	33	37	22	28	36.9
Mt. Plea'nt	Max.	22	26	35	41	38	47	38	45	35	..	29	33	36	..	..	33	32	31	55	55	49	39	..	43	29	37	36	33	37	22	28	36.9
	Min.	..	0	6	19	23	29	25	22	15	22	23	7	23	31	30	29	17	10	29	32	27	15	29	21	31	35	35	28	23	14	21	32.7
Mt. Vernon	Max.	19	24	33	36	30	34	32	37	..	30	30	18	4	8	22	28	15	5	7	7	10	28	38	33	42	33	25	32	29	15	19	13	14	27.0
	Min.	-10	-8	-2	6	19	..	19	18	12	16	18	4	8	22	28	15	5	7	7	10	28	38	33	42	33	25	32	29	15	19	13	14	27.0
NewH'pton	Max.	20	16	29	27	24	33	26	33	19	26	30	6	16	23	35	20	16	0	-1	2	22	22	20	28	8	8	22	21	20	14	-5	8	13.3
	Min.	-9	-6	5	15	7	22	12	7	8	14	25	28	25	35	43	48	42	32	28	38	51	44	40	50	41	30	38	37	35	26	20	23	33.6
Newton	Max.	21	21	34	32	32	35	29	37	21	25	28	25	35	49	48	42	32	28	38	8	33	27	17	37	12	27	33	34	21	20	20	17	28.1
	Min.	-8	-3	6	18	18	17	17	15	11	19	20	15	15	31	31	23	8	14	30	26	47	..	37	43	..	27	5	15	10	6	-7	-6	6.9
Northwood	Max.	23	15	35	25	25	32	30	15	17	25	29	23	25	41	43	..	..	..	0	1	2	19	12	15	5	4	5	15	10	6	-7	-6	6.9
	Min.	-4	-7	6	14	15	19	7	7	5	9	17	5	-1	1	29	13	-1	0	35	43	49	42	42	46	35	37	39	41	40	27	23	24	33.1
Odebolt	Max.	20	22	34	30	27	30	29	34	17	24	25	26	37	42	47	40	30	5	13	9	33	24	16	25	11	7	25	15	13	17	0	8	13.6
	Min.	-4	-4	12	11	15	19	9	11	10	15	15	1	4	30	35	21	5	13	9	33	24	16	25	11	7	25	32	38	35	26	21	23	32.8
Ogden	Max.	20	21	34	31	32	33	26	35	21	6	11	12	14	27	30	21	6	13	4	27	37	50	34	36	45	20	28	36	29	19	25	14	31.0
	Min.	-8	-4	7	14	16	19	9	11	33	33	32	31	27	35	39	45	27	6	17	6	7	12	20	14	16	12	10	12	22	10	5	-5	-5	9.9
Olin	Max.	17	18	31	35	32	35	25	40	22	15	23	22	5	3	22	25	22	6	17	6	7	54	54	41	45	51	31	34	42	46	38	30	36.4
	Min.	-17	-15	-18	3	15	28	28	34	22	18	24	25	30	41	50	52	42	32	44	25	27	46	51	28	16	18	30	23	23	37	27	30	19.3
Om'ha Neb	Max.	21	25	40	31	30	27	24	32	28	21	25	30	30	39	51	49	40	34	47	46	49	43	45	48	35	38	44	45	40	52	30	28	35.9
	Min.	0	5	16	14	16	18	16	13	13	21	25	30	30	17	29	33	24	7	17	22	27	25	19	24	12	10	24	15	20	18	4	10	14.7
Onawa	Max.	23	25	37	30	27	24	32	28	12	11	7	14	4	7	29	37	33	42	36	26	40	35	35	41	32	24	32	30	26	18	17	17	27.3
	Min.	-3	-3	13	12	13	18	12	12	12	17	24	26	22	6	25	37	24	16	28	26	40	24	12	25	4	3	21	13	9	7	-9	6	9.8
Osage	Max.	20	12	30	25	24	31	25	32	7	4	15	19	6	3	40	46	24	0	3	40	54	39	40	51	32	30	38	38	35	31	23	26	35.3
	Min.	-5	-8	4	13	18	21	7	7	4	24	28	29	29	40	53	33	26	10	16	9	36	25	15	28	14	9	27	21	19	14	1	14	16.2
Oskaloosa	Max.	23	26	37	37	36	40	34	40	16	13	21	10	29	40	48	31	33	54	31	39	57	..	40	32	21	14	30	38	37	22	22	19	5	19	20.9
	Min.	-5	-3	9	21	22	24	20	16	41	30	30	..	19	11	14	36	50	39	28	13	19	15	37	29	43	56	..	33	41	41	36	37	..	29	39.2
Ottumwa	Max.	23	25	35	40	36	40	35	41	29	18	25	27	28	41	50	39	55	39	28	13	19	35	46	11	15	2	7	10	19	22	37	2	5	13.5
	Min.	2	5	12	26	27	30	25	46	16	12	15	28	28	5	33	55	33	25	39	11	11	11	15	37	12	7	37	42	48	37	31	31	31	36.6
Ovid	Max.	24	31	38	43	35	41	27	14	23	20	27	30	35	40	50	54	40	37	41	51	54	37	45	52	34	10	28	17	27	21	5	19	16.6
	Min.	-4	-2	3	11	21	27	29	32	16	20	27	30	10	40	50	28	34	34	37	41	32	30	20	30	15	31	42	42	32	28	25	26	35.6
Pacific Jct.	Max.	24	25	40	29	28	29	32	15	15	14	10	10	2	7	28	34	37	25	34	41	55	38	41	50	31	12	20	20	20	0	3	5	14.3
	Min.	-6	-4	9	15	17	21	13	..	24	30	31	31	45	50	51	37	25	15	9	33	18	18	21	14	8	42	36	18	18	39	..	24	..	31.3
Pella	Max.	20	22	35	37	35	39	41	11	..	18	21	0	3	26	33	26	11	35	15	33	42	50	44	18	28	4	40	40	18	16	18	0	12	16.5
	Min.	-3	0	10	20	25	35	19	24	29	..	28	30	29	42	45	52	35	30	10	12	8	37	27	18	40	43	28	4	..	10	38	32	24	20	21	31.2
Perry	Max.	37	22	..	..	18	5	27	30	29	15	12	18	20	15	24	35	32	26	36	37	1	47	16	35	14	24	10	38	32	8	34	14	4	15	11	11.1
	Min.	15	5	15	27	29	30	29	7	34	15	24	23	24	-5	35	41	30	18	14	35	35	22	14	35	30	10	32	40	40	20	35	20	15	10	20	28.8
Plover	Max.	22	23	22	10	15	23	7	25	15	7	12	9	26	35	30	48	32	48	35	5	25	..	35	30	38	25	8	40	40	20	35	20	10	10	7	12.0
	Min.	-5	-10	8	30	22	15	8	5	30	-5	15	20	12	15	8	25	35	0	33	38	5	53	20	50	51	28	14	30	34	12	31	24	32	24	20	30.4
Primghar	Max.	10	18	30	30	3	10	8	5	-5	-5	10	25	29	37	41	2	53	30	25	8	20	0	26	39	47	32	6	5	33	18	4	10	15.2
	Min.	5	10	10	3	10	36	32	33	34	20	25	29	15	33	2	30	37	5	41	2	33	14	40	44	32	31	18	28	18	8	-11	6	12.4
Red Oak	Max.	23	26	38	31	13	10	22	10	12	13	13	15	33	2	38	25	50	32	51	33	46	21	38	28	14	6	5	22	17	39	37	28	23	22	34.3
	Min.	-5	-5	11	13	27	34	30	10	35	20	33	17	3	30	42	28	14	32	28	38	51	44	40	50	41	30	38	37	35	26	20	23	33.6
Ridgeway	Max.	25	17	32	31	27	34	30	35	12	8	17	20	3	14	30	44	38	21	32	28	38	21	32	39	30	33	7	35	37	12	8	26	19	17	17	16.0
	Min.	-6	-4	5	18	20	27	16	30	12	..	..	..	..	40	44	46	38	14	8	33	27	17	37	43	..	27	33	34	21	20	20	17	28.1
Rockwell C	Max.	22	20	35	31	30	16	30	9	12	..	8	12	16	15	29	46	39	21	32	3	16	13	18	42	35	10	35	40	41	41	12	19	19	9	8.6
	Min.	-2	-5	9	16	16	25	15	24	12	15	14	24	10	32	46	24	44	19	14	32	18	39	16	25	11	7	25	21	19	17	31	22	-5	9	23	33.3
Ruthven	Max.	10	18	16	12	25	10	5	5	6	5	0	5	4	18	24	45	46	40	30	6	32	48	51	39	47	28	6	40	41	17	37	28	21	23	9	12.8
	Min.	8	6	-2	-5	10	29	30	28	34	15	24	25	23	35	45	36	21	6	12	30	32	24	12	28	10	6	22	17	12	37	28	21	23	12	33.0
Sac City	Max.	20	22	34	8	29	10	15	9	12	8	14	12	-1	37	31	45	31	41	42	30	48	35	45	34	39	9	34	37	40	27	19	1	24	22	15.2
	Min.	-2	-6	8	10	31	31	32	28	35	18	23	23	25	8	37	42	35	23	9	32	42	25	19	42	30	12	39	27	35	21	24	2	8	10	30.0
Scranton	Max.	18	20	34	31	14	17	21	..	10	20	10	10	4	24	32	45	34	16	38	12	39	23	47	..	39	7	37	35	38	12	36	25	23	21	8	31.1
	Min.	-3	2	10	14	17	25	..	12	7	6	10	23	25	24	5	35	44	34	16	42	27	0	40	25	32	39	33	7	5	18	38	7	9	0	22	8.2
Sheldon	Max.	19	20	30	23	25	7	12	27	28	5	12	23	25	24	35	46	44	42	27	35	39	18	..	40	19	22	49	44	30	31	36	37	35	30	31	36.8
	Min.	-6	-9	3	5	7	12	7	28	..	12	5	10	3	0	24	31	56	45	30	10	31	40	9	34	30	13	38	37	22	16	15	30	23	23	13	16.8
Sibley	Max.	19	21	31	8	26	22	27	28	5	41	24	30	30	32	39	47	32	45	30	10	31	40	9	34	47	30	15	42	49	30	37	8	31	2	8	31.6
	Min.	-9	-11	8	2	9	14	5	35	41	19	14	22	21	-1	20	32	43	36	29	1	38	8	38	43	40	15	30	34	7	27	13	31	37	8	30	10.7
Sigourney	Max.	24	29	37	38	36	41	29	22	19	14	22	21	23	25	32	44	32	43	36	29	38	8	24	47	34	7	9	35	40	27	21	2	25	26	11	32.4
	Min.	-6	-2	8	21	29	25	26	28	32	16	24	23	25	6	10	32	17	37	24	1	20	2	25	47	27	10	33	38	21	7	24	4	21	22	4	16.1
Sioux Cen.	Max.	18	21	32	29	3	8	13	8	4	8	6	13	6	29	42	54	53	37	24	2	25	46	34	53	28	18	47	40	46	44	26	33	38	12	31.8
	Min.	-4	-6	12	3	8	24	13	30	16	16	22	22	29	8	14	38	40	24	38	44	24	35	24	40	39	40	45	33	8	40	12	42	42	16	40	11.9
Sioux City	Max.	23	23	35	8	15	18	29	28	9	11	15	20	22	21	35	44	45	38	19	4	12	4	30	53	18	28	8	18	39	17	33	42	19	40	19	33.7
	Min.	1	1	17	8	15	18	9	11	34	6	12	9	0	9	30	35	44	30	35	12	32	4	43	10	25	45	19	41	30	21	1	43	28	16	14	13.5
Storm L.	Max.	20	20	32	29	27	29	12	6	8	6	12	25	23	27	42	30	47	30	9	32	42	43	15	18	25	53	39	43	10	8	18	39	17	27	21	34	27	4	30	39.6
	Min.	-1	-7	11	7	12	12	32	35	16	35	15	10	8	12	22	37	25	54	41	20	9	18	39	17	33	42	28	34	21	28	22	22	-4	6	-9	16.5
Stuart	Max.	22	27	38	33	33	18	18	17	30	35	18	23	25	32	40	48	30	32	28	10	29	8	8	37	13	30	37	34	21	14	23	2	14	26	0	12.4
	Min.	1	2	2	22	18	28	28	30	15	14	13	7	-6	4	30	32	49	32	28	8	37	56	22	27	30	13	52	31	17	33	22	4	20	29	4	37.1
Thurman	Max.	21	23	39	35	15	15	22	36	38	25	28	31	25	26	36	48	48	49	32	21	48	7	7	53	47	43	20	14	52	30	10	28	38	45	26	14.3
	Min.	-8	-6	3	15	15	22	36	38	25	22	9	20	26	0	0	5	25	32	52	22	27	54	44	20	37	14	52	31	18	..	34	12	35	34	26	36.9
Toledo	Max.	25	27	36	35	34	25	22	25	17	22	9	20	26	0	38	43	2	38	27	9	30	37	13	34	12	31	56	54	44	29	21	39	52	34	18	23	39	36	20	35	22	27	10	8	28	20.1
	Min.	-9	-10	3	12	22	32	34	32	22	23	33	34	17	32	38	28	32	12	33	48	30	27	37	14	30	13	14	30	38	9	13	8	24	5	27	39	20	40	27	19	28	18	23	2	14	26	36.5
Villisca	Max.	26	28	33	37	35	32	15	15	17	15	14	31	36	32	12	38	28	25	50	32	46	21	33	42	28	5	30	39	23	36	20	38	27	13	29	22	8	-8	17	-7	6	12.4
	Min.	-7	-5	5	12	47	33	40	34	43	32	36	32	32	12	28	38	32	49	32	50	32	46	28	41	26	41	28	30	28	23	27	33	29	14	21	14	21	19	-7	..	17	30.3
Wapello	Max.	30	31	..	7	40	33	41	28	23	19	27	26	12	33	38	46	21	33	23	8	38	56	13	20	9	42	16	14	46	34	7	27	32	17	38	13	..	36	9	41	10	20	19	20	4	18	18	31.8
	Min.	2	5	36	8	21	28	21	15	35	13	35	12	4	22	8	27	42	25	41	26	30	10	28	6	30	10	28	8	31	45	13	7	29	4	28	37	23	16	12	32	30	20	12	6	-4	19	22	31.6
Washi'gt'n	Max.	25	28	3	32	31	29	35	27	13	35	22	18	27	4	22	42	25	41	26	30	48	28	49	32	27	6	28	6	30	10	28	7	27	7	39	24	33	27	13	29	14	21	17	-7	-6	12.3
	Min.	-6	-1	3	8	21	29	22	27	13	13	10	22	8	8	15	27	46	32	5	28	6	30	10	28	8	4	32	7	29	4	28	37	23	39	17	37	33	22	16	37	15	28	8	21	17	30.3
Waterloo	Max.	22	24	32	31	29	22	27	35	29	13	35	18	28	8	23	28	41	25	42	28	48	28	46	37	14	4	18	5	27	7	7	29	30	24	39	17	33	14	33	14	21	14	-7	6	13.2
	Min.	-10	-6	4	14	29	22	35	28	35	35	21	28	30	23	11	15	26	41	28	48	28	41	18	38	18	4	46	34	7	32	17	7	4	32	15	37	18	37	11	7	26	19	-6	..	31.5
Waverly	Max.	22	17	31	17

DAILY AND MONTHLY PRECIPITATION FOR JANUARY, 1901.

STATIONS.	DAY OF MONTH.																													TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	...	....	....	....	..	....		....	.20	.20	T.	....	....	....	....	..	..	T.	....	....	..	....	...	....	...	.36	....	...	....	....	....	.76
Albia	..	....	....	...	..	....	...	....	.30	...	T.	...	....	....	....	..	....	.15	..	..	...	....	...	....	...	.15	....	....	....	....	....	.00
Algona	....	....	...	....	....	....	....	....	.30	..	.	T.	T.	..	....	....	.10	...	..	..	..	....	T.	..	.15	....	T.	....	T.	T.	....	.55
Alta	....	...	..		...	....	..	...	.34	...	.01	....	.05	...	....	....	.02	...	..	..	..	....	....	. ..	T.	..	....	...	...	....	....	.42
Alta (near)	. .	....	....	..	....	....	...	....	.20		T.	....	.05	..	...	T.	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.25
Amana	....	....	....	....	..	T.	..	....	.62	.18	.01	....	..	T.	.	....		.03	....	....	....	....	.09	T.	..	.57	....	...	T.	....	T.	1.50
Ames	..	....		....	..	....	....	..	.40	..	T.	..	..	....	..	....	....	.10	..	....	..	....	....	..	..	.07	..	....	....	....	....	.57
Ames (near)	....	...	....	....	....	....	...	..	.40	...	.10	....	.	....	..	..	.05	....	..	..	....	...	....	...	.10	...	....	....	T.	....	....	.65
Atlantic	....	....	..	....	....	....	....	....	.50		.05	...	..		...	.05		..	....	..	....	...	....	..	.18	....	..	...	....	....	....	.78
Bancroft	....	....	....	....	..	....	.	....	.10	.20	T.	....	....		..	.	....	.10	..	..	....	....	..	T.		.10	....	...	T.	....	....	.50
Batavia	..	....	....	....		....	..	..	.10	.30	.10	..	....		..	....	..	....	....	..	....	..	....	....	..	....	....	....	....	....	....	.60
Baxter	..	....	..	..	..	....	.. .		.35	.05	.02	....	..	...	..	....	.10	....	..	....	..	....	..	.10		..	....	....	...	...	..	.82
Bedford	....	...	....	..	..	....		..	.42	...		..	...	.	....	T.	....	..	..	....	....	....	...	...	.30	...	..	....	...	...	....	.62
Belknap	..	....	....	..	..	....		...	....	.46	.10	.05	...	.	....	....	..	.20	.	..	....	...	.17	....	....	.25		....	..	....	....	1.23
Belle Plaine	..	...	....	..	..	....	..	T.	.40	.08	.05	.	....	..	...	....	....	.08	..		....	....	....	..	....	.05	....	..	....	....	....	.66
Bonaparte	..	....	....	..	...	....	....	..	.90	..		....	....	..	....	....	..	T	..	..	....	....	..	..	....	.15	..	...		...	..	1.05
Britt	...	....	....	. .	..	....	..	.01	.15	.05	.02	...	..		...	....	..	.05	..	..	....	....	..	..	....	.15	..	...	.01	..	..	.44
Buckingham	....	....	....	...	....	....	....		.73		T.	....	...	.17	..	....	..	.05	..	....	....	....	..	T.	..	.30	..	..	T.	....	T.	1.25
Burlington	..		..	....	..	....	....	T.	.88	.08	.05	....	..	..	....	....	..	.12	....	....	..	..	.27	T.	....	.34	.10	....	....	....	....	1.84
Bussey	...	...	..	...	..	....	....	....	....	.60	..	....		..	....	....	.15	.	..	..	....	..	..	..	T.	....	....	....	....	....	....	.75
Carroll	....	....	....	....	....	....	....	..	....	.45		..	..		....		.05	....	....	..	....	....		..		....	....	....	..	..	..	.50
Cedar Rapids	...	...	....	...	.	T.	T.	....	.40	..	T	....	..	...	....	.	T.	T.	..	....	..	....	T.	..	T.	....	....	....	..	....	....	1.05
Centerville	....	....	..	..	...	....	...		.20		..	....	..	..	....	....	..	.20	...	..	..	.		....	..	.50	..	.15	....	..	...	.40
Chariton	...	..	....	....	....	....	....	T	.60	.03	.06	....	....		....	....	....	.06	....	....	.	..	....	....	....		....	....	....	....	....	.95
Charles City	..	..	....	....	....	....	..	T.	.20	.40	.04	.	.	..	..	..	..	.05	..	....	..	..	....	....	....	.20	...	....	...	....	...	1.10
Clarinda	....	...	..	..	...	....	...	....	.54		.02	...	..	...	....	..	.06	..	..	..	..	...	..	....	....	.41	...	....	...	....	...	.82
Clear Lake	..	...	..	..	....	T.	T.	T.	.15	.10	T.	T.	T.	T.	....	..	..	.05		...	....		...	....	.20	...	.	....	..	....	.50
Clinton	....	....	....	..	..	....	T.	T.	.58	...	.02	....		....	....	...			..	....	..	.14		....	....	.20	....	T.	T.	....	....	1.35
College Springs	..	..	..	....	..	....	...	....	.44	.02	.04	....	....	..	..	...	.03	T.	....	....	....		..		.01	.15	...	..	.09	..	...	.69
Columbus Junction	..	....	...	....	..	....	....	....	.23	.22	.01	..	...		...	....	....	T.	..	....	....	....	.09	T.	....	.37	..	....	T.	....	T.	.92
Coon Rapids	....	....	....	....	..	....	....	...	.15			..	..	....	...	....	..	.05	..	....	..		..	..	....	T.	..	....	..	....	....	.20
Corning	....	....	....	....	..	....	....	..	.40		T.	..	...	....		....	....	.	....	....		....	..	....	.10	....	T.	..	...	....	....	.50
Council Bluffs	....	..	....	....		....	....	....	.20	..	.03	...	....	....	....	T.	T.	....	..	...		...	....	..	.04	..		....	....	....	..	.27
Crawfordsville	....	....	....	..		....	....	....	....	.09		..	..	....	....		..	....	..	....	.	...	..	.		..	..		....	....	....	.09
Cresco	..	..	....	..	T.	....	....	.01	.30	.	T.	....	...	....	.	....	....	.01	..	.	...	....	..		....	.10	T.	T.	.05	T.	.01	.48
Danville	...	..	....	..	....	....	....	...	.30		.10	....	....	....		...	T.	..	..	..	....	....	....	T.	...	....	....	....	....	....	..	.40
Davenport	...	....	....	..	....	.01	....	T.	.60	T.	T.	T.	....	..	..	....	....	....		....	....	..	.30		....	..	....	..	....	..	..	.90
Decorah	....	....	..	..	....	....	....	....	.35	.19	.01	....		....	..	..	....	..	....	..	..	....	.15	T.	....	.34	..	...	.04	.01	T.	1.10
Delaware	....	....	....	....	....	.05	...	.01	.50	..	...	..	..		..	....	....	..	.	..	....	....	.	....		.20	..	...	.20	....	T.	.90
Denison	....	....	....	....	....	....	....		.13	...	.04	..	.08	..		....		T.	....	....	..	....	.16	..		.23	..	.02	.02	....	..	.74
Des Moines	....	..	....	....	....	....	T.	T.	.20	..	.05	....	..		....	.05	.05	T.	..	..	....	....	....	....	T.		....	....	....	....	....	.35
De Soto	....	....	....	....	..	....	....		.52	.07	T.	...	....	T.	..		...	.08	....	....	..	..	....	.01	...	.33	....	..	T.	....	T.	1.01
Dows	....	....	....	....	....	....	T.	....	.10	.30	T.	....		..	...			.10	....	....	..	....	....	..	....	.10	..	...		....	....	.60
Dubuque	....	..	....	....	....	12	..	....	.40		.05		.04		....			.10	....		....	....	....	T.	....	.30	..	....	T.			.89
Eldon	....	....		....	....	..	....	....	.08	.22	.01	T.	...	.12	..	..	..	T.	T		....	....	.04	T.	....	.41	....	..	.07	....	T.	1.07
Elkader	....	.	.	....	..	.01	....		.63	.03	.02	....	.	..	..		....	.07	..	..	....	...	.02	T.	...	.21	....	...	....	..	...	.98
Emerson	....	...	....	...	...	....		....	.50	..	.	....	..	....		....	....	T.	..	..	...	..		T.		.30	...	....	.10	....	..	.91
Estherville	....	....	....	T.	T.	T.	T.	T.	.30	....	..	....	....	....	....	T.	...		..	..	....		..	..	.03	T.	....	..	...	....	....	.33
Fayette	..	..	....	....	....	.02	..	.01	.07	.15	..	....	..	....	....	....	..		.06	...		....	T.			..	....	..	.01	...	....	.29
Fonda	....	. ..	T.	...	..		....	T.	.61	....	.03	..	....	..	....	....	..	T.	....	..	...		....	.04	....	.33	....		.06	....		1.10
Forest City	....	...	....	....	....	T.	....	T.	.35	T.	....	..	..	..	..	.25	T.	....	..	..	T	...	T.	..	T.	....	T.	T.	T.	T.	.60
Fort Dodge	....	....	....	....	....		....		.20	.20	T.	T.	T.	..	..	..	.10	....	..	..	....	....	..	.40		....	T.	T.	T.	....	.90
Fort Madison	....	....	....	....	....	T.	...	T.	.30	.50		..	..	....	..	..	.05	..		..	....	..	T.	T.	....	..	....	....	....	...	..	.85
Fruitland	....	....	....	....	....	....	..	..	.85	....	T.	....	..	....	.	..	..	....	..	....	....	.25	....	..	..	.20	....	....	....	....	....	1.30
Galva	....	..	....	....	....	....	....	....	.20	....	....	....	..	....	....	....	..	....	..	....	....	....	..	....	..	.30		..	....	....	....	.50
Gilman	....	....	....	....	....	....	....	....	.22	....	T.	...	T.	..	..	T.	T.	..	....		....	....	....	..	T.		....	....	....	....	....	.22
Glenwood	....	....	....	....	....	....	....	....	....	.02	..	...	....	.50	....	....	....	..	..	..	....	....	....	....	....	....	.30	..	....	....	....	.82
Grand Meadow	....	..	....	....	....	T.	....	....	.30	....	.02	....	....	....	..	..	..	..	..	..	....	....	....	..	T.	....	..	....	....	....	....	.32
Greene	.. .	...	...	....	....	....	....	. ..	....	.50	.02	....	....	..	....	..	T.	..	..	....	....	....	....			.35	...	..	.07	..	..	.94
Greenfield	....	....	..	...	....	...	....	..	.14	.23	.01	....	....	....	....	..	.08	..	....	....	.	..	..	...	....	.31	...	T	.19	..	..	.96
Grinnell	...	..	...	...	....	...	..	...	.32	....	.02	....	....	..	....	..	T.	....	....	...	....	..	..	....	.02	.05	T	..	T.	T.	....	.41
Grinnell (near)	..	..	...	....	....	T.	...	...	.24	....	..	....	..	...	....	..	.11	....	..	..	....	....	....	..	.40	..	....	....	..	T.	....	.75
Grundy Center	....	...	...	....	..	..	....	....	.25	.20	.05	..	...	.03	....	..	....	.03	....	..	....	....	....	..	.05	.45		...	T.	....	T.	1.01
Guthrie Center	....	....	...	....	....	....	....	....	.45	...	T.	....	....	....	....		...	T.	..	..	....	..	....	..		.30		. .	T.	....	T.	.75
Hamburg	....	....		....	....	....	..	...	.30	....	..	.30	...	....	..	.	....	T.	....	....	..	...	....	....	..	.10	..	....	....	....	..	1.10
Hampton	..	....	..	....	..	....	....	....	.60	....	...	....	...	..	....	....	..	..	....	..	....	....	....	....	....	....	..	..	....	....	....	.30
Harlan	.	....	....	....	....	....	...	...	.17	.03	.06	....	..	..	..	....	.10	..	....	....	....	....	....	....	.33	..	..	....	....	....	..	1.01
Hawkeye	..	....	....	..	..	....	.	..	....	.50	.30	..	....	....	....	....	.05	....	....	.	....	....	....	..	.06	..	.01	....	....	....	....	.38
Hedrick	....	..	....	....		....	..	..	.40	.10	....	...	..	..	....	....	..	.05	....	..	..	....	....	.40	....	..	T.	....	.	....	..	1.20
Hopeville	....	....	..	.	....	....	....	....	.39	...	.01	....	....	....		....	..	T.		..	...	T.	....	....	.20	....	..	....	..	T.	..	1.05
Hoprig	....	..	..	...	...	....	...	...	.15	...	..		....	....	..	....	T.	..	...	..	.	....	..	T.	..	..	...	....	..	....	....	.60
Humboldt	....	....	...	....	....	....	T.	.01	....	.02	..	..	....	....	..	....	.01	..	..	..	....	..	....	....	....	.05	....	..	..	..	..	.15
Independence	....	....	....	....	..	T.	..	..	.38	...	.10	....	.	..	..	....	.05	..	....	....	....	....	....	....	.40	....	..	....	..	..	....	.09
Indianola	....	..	..	....	....	....	T.	..	.40	.03	.05	T.	.	..	.	..	.15	....	....	.	..	..	....	..	.26	....	..	T.	T.	....	..	.93
Iowa City	....	....	....	....		T.	...	..	.54	..	T.	...	....	....	..	..	T.	....		...	T.	..	..	....	.53	....	..	T.	....		..	.89
Iowa Falls	....	....	....	....	....	T.	T.	T.	.40		.05	...	T.		....	..	.05	....	..	....	....	....	....	....	.30	....	T.	.02	....	T	..	1.07
Keokuk	..	....	....	....	....	..	..	....	.96	.04	.01	..	...	..	....	..	.01	....	..	....	...	.23	T.	....	.16	..	..	T.	...	....	....	.82
Lacona	...	....	....	....		....	..	..	.70	...	.10	..	..	....	....	..	.10	....	..	..	..	....	....	..	.25	....	..	T.	....			1.41
Lansing	....	....	....	. ..	..	T	.. .	T.	T.	.43	T.	T.	....	....	..	....	....	..	..	..	..	....	....	..	.14	..	....	..	.09	....	T.	1.15
Larchwood	....	....	....	...	..	....	...	....	.20	..	...	..	..	....	....	..	....	..	....	....	....	....	....	....	....	..	....	..	....	....	....	.66
Le Claire	T.	....	....	....	....	....	T.	....	T.	.41	....	.03	....	T.	....	....	....	....	..	....	..	..	.09	T.	T.	.31	.04	...	.10	T.	..	.20
Le Mars	..	....	....	....	....	....	..		.08	....	....	....	..	....	....	....	....	....	..	..	..	..	.09	T.	T.	.31	.04	...	.10	T.	..	.98
Lenox	....	....	..	..	..	....	...	...	.18	..	....	....	..	....	....	....	....	..	..	...	....	...	..	...	....	..	...	..	....	....	.	.08
Logan		....	..	....	.10	....	....	.20	.30	.10	T.	....	....	....	....	....	....	....		....	....	....	....	T.	.05	....	....	..	..	..	..	.23
Maquoketa	..	....	....	....	....	25	....	T.	....	.12	T.	....	..	.05	....	....	....	..	..	....	....	....	.14	T.	....	....	....	T.	....	....	....	.70
Marshalltown	..	....	...		....	...	..	T.	.37	.20	.06	..	...	.03	..		..	.04	..	....	....	....		....	....	.70	..	....	.09	....	..	1.15
Monticello	....	....	....	..	...	T	....	..	T.	.48	T.	..	...	T.	..	T.		....	....	....		....	.23	T.	..	.34	....	...	.01	....	....	1 05
Mooar	...	....	...	....	...	....	....	...	.88	..	..	..	..	..	....	....	....		..	..	..	...	.25	...	....	.19	..	.20	....	..	....	1.36
Mount Ayr	..	....		....	....	....	....	.03	.46	....	.05	..	..	..	....	....	T.	T.	..	..	..	..		....	....	.22	....	....	....	T.	..	....	1.32
Mount Pleasant	....	....	....	....	....	..	....	T	.52	.	.05		..	..	..	..	....	.05	..	....			.05	...	..	.13	....	T.	T.	....	....	.70
Mt. Vernon	.	....	....	....	....	.01	....	.01	.25	.	.10	...	....	.02	..	..	.03	..	T.	..	..	.07		.02	..	.43	..	..	.13	....	.01	.80
Murray	T.	....	...	....	....		...	..	.03	..	T.	..	...	...	...	...	..	..	..	..	T.	...		..	..	.01	....	....	....	..	....	1.08
New Hampton		....	....	....	..	T.	....	..	.20	.40	.05	..	....	...	....	....		..	....	..	....	..	....	....	..	30	..	...	.10	....	....	.04
Newton	..	....	....	....	....	..	....	....	.50	...	.04	..	...	.	....	..	....	.04	.	..	...	....	....	....	....	.42	..		....	....	....	1.05
Northwood	..	....	....	..	T.	..	....	....	.10	.30	T.	.	....	T.	...	...		.05	..	..	...	....	..	....	....	.30	....	T.	T.	..	....	1.00
Odebolt	..	....	....	....	..	....	..		.13		.05	....	...	T.		....	T.		..	....	....	..	..	....	T.		....	..	..	....	....	.75
Ogden	....	....	....	....	....	....		T.	.10	.15	.12				....	..	..	.10	..	.	..	....		....	....	.08	...		T.	....	.	.18
Olin		....	....	....	....	.01	..	....	....	.30	.10	..	..	.58	..	...	....	....	....	..	....	....	.50	....	..	.70	..	....	.15	..	....	.55
Omaha	....	....	....	.	..	....	..	..	.20	.01	.07	..	...	.	..	...	.01	...	..	....	....			..	.02	..	....	...	T.	T.	....	2.34
Onawa	..	....	....	.	...	....	.		.20	.02	.04	..	...	..	...	....	.02	..	....	....	..	....	..	...	.01	..	....		.	....		.31
Osage	....	....	....	....	....	....	....	.04	.20	.4	.05		T.	..	....		....	.04			..			.01		.34	...	.04	.10	..	T.	29
Oskaloosa	...	....		....	....	....	....	....	.38	...	.03	....	..	....	....	....	....	.07	...	..	..	.10	..	..	..	.25	..	..	..	...	..	1.22
Ottumwa	....	....	....	..	....	....	....	...	.30	...		...	..	....	....	..			...	....	....	.10	....	....	..	...	....	..	..	....	....	83
Ovid	....	....	....	. ..	..	....	....	....	.75	.	.05	.	..	...	....	..	.25	...	..	....	....	.06	....	..		.75	....	..	..	..	....	.40
Pacific Junction	....	....	....	....	..	....	....	..	.22	.02	.05	..	....	....	....	....	.01	...	..	....	....	....	....	..	.03	....	....	....	....	....	....	1.86
Pella	....	....	....	....	....	....	....	....	.50	....	....	....	....	....	....	....	.10	....	..	....	....	....	....	....	.15	..	....	....	....	....	....	.33

DAILY AND MONTHLY PRECIPITATION FOR JANUARY, 1901—CONTINUED.

STATIONS.	DAY OF MONTH.																															TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Plover	....	....	....	....	....	....	..	..	.30	....	..	.	..	....	....	....	..	.10	....	..	..	....	....	....	..	.10	....	....	T.	T.	....	.50
Primghar	...	...	...	..	....	..	....	..	..	..	..	....	....	....	..	..	....	..	..	.	....	....	..	....	..	..	....	....	..	T.	..	.00
Red Oak	...	..	....	...	....	..	....	...	.30	..	T.	....	..	....	..	..	....	....	....	....	....	....	....	....	.10	....	.	....	..	T.	..	.40
Ridgeway	...	..	....	...	....	.05	...	.05	1.34		.02	.04	....	....	..	....	.01	....	....	....	....	..	..	....	.37	...	...	....	.05	.03	.01	1.97
Rockwell City	....	....	....	..	..	..	..	...	.50	...	....	....	..	...	....	....	..	.30	....	..	....	...	..	....	..	.	...	....	....	....	....	.80
Ruthven	....	..	....	....	..	..	..	.20		..	....	....	..	..	....	....	..	.15	..	....	..	....	....	....	..	..	....	....	....	..	....	.35
Sac City	....	....	....	....	..	....	.	....	.50	...	. ..	....	..	...	....	....	..	.15	..	....	..	....	....	....	..	..	....	....	....	..	....	.10
Scranton	....	....	....	.	..	T.	...	....	.10	....	T.	....	..	..	....	....	....	....	....	....	....	....	....	....	..	..	....	....	....	....	....	.38
Sheldon	..	....	....	..	..	....	..	....	.08	.	....	....	....	....	....	....	....	.30	..	....	....	..	..	....	..	..	..	....	....	....	....	.20
Sibley	..	....	....	..	..	....	..	....	.04	.06	.04	....	....	.01	..	..	.05	....	....	....	..	....	....	.	..	..	..	....	T.	....	T.	.15
Sigourney	....	....	....	..	..	....	..	....	.02	.05	....	..	....	....	....	..	T.	.08	....	..	..	..	..	T.	....	....	....	....	T	....	T	1.32
Sioux Center	....	....	....	T.	T.	..	.	..	.02	.05	...	.	..	....	....	..	....	.05	....		....	.19	....	T.	..	.42	T.	....	T.	T.	T.	.27
Storm Lake	...	....	....	....	..	T.	..	...	.61	.05	T.	T.	...	..	T.	..	....	.02	..	..	.	....	..	....	..	....	....	...	T.	T.	T.	.22
Stuart	....	....	...	....	T.	T.	..	..	.20	....	.05	....	..	.03	....	.	T.	....	....	....	....	....	..	....	T.	T.	..	..	....	T.	T.	....	.39
Thurman	...	....	...	...	T.	..	....	....	.16	.01	.02	..	..	.03	.	.	....	.05	....	..	....	....	..	T.	....	..	..	....	T.	T.	....	.30
Toledo	....	..	..	....	..	....	....	..	.30	.01	T.	T.	..	....	..	..	T.	....	....	....	....	..	..	T.	.01	....	...	..	T.	T.	T.	.54
Villisca	....	..	..	....	..	....	....	..	.30	....	T.	..	....	....	..	..	T.	....	..	..	..	...	..	..	....	.40	T.	.	..	.. .	....	1.00
Vinton		....	..	..	..	....	....	..	.50	.	T.	....	....	..	T.	....	....	.10	..	....	....	....	..	....	.12	.10	T.	....	..	....	..	.82
Wapello	....	..	....	....	....	....	...	....	.50	..	....	....	.	....	.	..	.10	....	..	....	....	....	....	..	....	.40	....	T.	....	....	....	.95
Washington	....	....	..	....	..	....	....	..	.50	.	T.	....	....	..	....	....	....	.05	..	....	....	..	.14	..	....	.34	...	....	..	....	....	1.11
Washta	....	....	..	....	..	....	....	..	.59	....	.04	.	....	....	T.	....	....	.02	....	..	..	T.	..	...	T.	.52	T.	.	T.	T.	T.	1.04
Waterloo	....	..	..	....	..	..	..	..	.	.48	.02	..	....	....	..	..	.05	T.	..	..	....	..	..	....	T.	T	.05	..	..	....	....	.45
Waverly	....	....	..	....	..	T	....	..	.30	....	.05	..	.05	....	..	T.	..	T.	....	....	..	....	....	..	.01	.28	.	T.	.02	....	T.	1.07
West Bend	....	..	..	....	..	T.	....	T.	.25	.31	T.	..	..	.12	....	T.	....	.06	....	..	..	....	..	....	....	.10	....	....	T.	..	T.	.84
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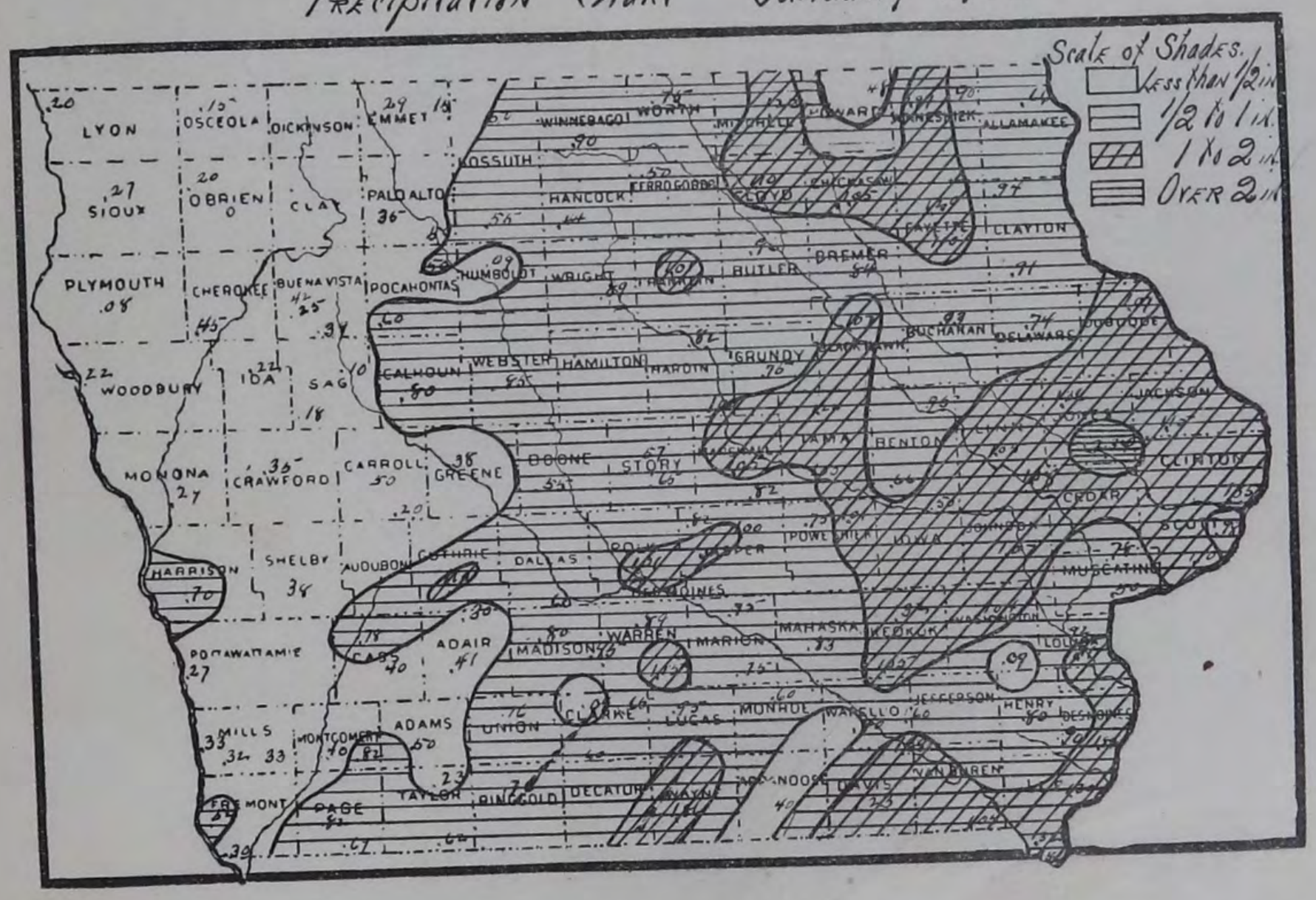
Woodburn	....	..	....	..	..	....	..	....	....	.30	....	..	....	....	..	....	....	.30	....	..	....	..	....	....	T.	.10	.	...	....	..	....	.80
	....		.	..		...	...		.35	.05	.05			...			...	.10	...	..		...	...	....								.65

Precipitation Chart January 1901.



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DES MOINES:
BERNARD MURPHY, STATE PRINTER.
1901.

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U. S. DEPARTMENT AGRICULTURE --- WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XII. FEBRUARY, 1901. No. 2.

NOTE AND COMMENT.

The first number of the weekly CLIMATE AND CROP BULLETIN of the Iowa Section for the season of 1901, will be issued April 9. Blanks for weekly reports will be sent to the reporters for that branch of the service in due time. The weekly Bulletin constitutes one of the most important and popular features of Weather Bureau work. To maintain it at its high standard of value the section director solicits the faithful co-operation of all who have served in former years, and others whose names may be added to the list of reporters.

* * *

Congressman Hepburn in a recent speech made reference to the limited area within which a large surplus of corn is produced. He said: "The region of country that produces corn in its best condition is limited to six degrees of latitude and extends from Ohio only a couple of hundred miles west of the Missouri river. That is substantially all the corn land—I mean where corn is produced in greatest quantities and cheapest—that there is in the world. People will be surprised to know that the world's corn producing region is so limited. It is a well known fact that the use of corn as an article of diet in the old countries is constantly increasing and that in consequence the foreign demand is greater than ever. We may reasonably infer that the time is not far distant when land in the corn belt will be the most valuable of all country property. Business prudence protests against our farmers parting with their lands in order to obtain cheaper farms in the semi arid countries of the south and west."

* * *

The standing committee on crop reports of the National Board of Trade, in a report adopted January 23, paid a high compliment to the Division of Statistics of the Department of Agriculture. The committee said: "The official service of this branch of the governmental work is of far more importance than is generally accorded to it. Its influence is widespread and far reaching, not alone among trading men and mere speculative interests, but including the producer, the manufacturer and the transporter. The effect of crop reporting work upon market values has been very pronounced within the past year. The need of official work of the highest obtainable degree of reliability has been very forcibly demonstrated. The importance of impartial, honest, intelligent and fearless presentation of statements of crop conditions has rarely, if ever, been more positively illustrated."

* * *

The next total eclipse of the sun will occur about mid-day, May 18, 1901. The totality will last 6 minutes and 20 seconds, and will cross the interior of the island of Dutch Sumatra, at which point scientists of various nations will erect stations of observation.

Great care is needed at this season of the year against taking "cold." Pneumonia, rheumatism, bronchitis, catarrhal affections, neuralgia, and tuberculosis are all caused or aggravated by the atmospheric conditions existing in the latter part of February, and in March and April, and unless the clothing, diet and methods of exposure are intelligently considered unnecessary sickness and death are sure to result. In all these affections as well as others, prevention is infinitely better than cure. If a "cure" were always possible it would not be so bad. Prevention is not nearly so difficult.—*Iowa Health Bulletin.*

* * *

During the third week in February Europe experienced the most severe winter weather of the season. The temperature ranged below zero as far south as Madrid, and snow fell in Africa in places where it was unknown before.

* * *

"Many remarkable meteorite falls occurred during the 19th century. Beginning with the stone shower of L'Aigle in 1803, when 2,000 to 3,000 stones fell, no less than eleven such showers have been recorded. In the shower of Poltusk, Poland, which occurred in 1868, 100,000 stones are estimated to have fallen, their total weight reaching over 400 pounds. In the shower at Moos, Germany, in 1882, more than 3,000 stones fell. In our own country about 750 pounds of meteoric matter fell at Estherville, Iowa, in 1879, and several thousand stones fell over an area nine miles in length and one mile wide near Forest City, Iowa, in 1890. Many of these falls have been marked by extraordinary phenomena of light and sonnd, making them events never to be forgotten by those who witnessed them, and worthy to be reckoned among the most remarkable natural occurrences of the century. About 285 actually observed meteoric falls is the total recorded during the century. It is a remarkable fact regarding the nature of the material fallen that only five of these have becn of meteoric irons. One of these irons fell at Mazapil, Mexico, during the star shower of November, 1885, at the time when the return of Biela's comet was looked for, and was thus considered an occurrence corroborative of the already suspected relationship among comets, shooting stars and meteorites."—*Popular Science Monthly.*

* * *

On February 24th the steamship Teutonic, sailing westward in mid-ocean, was struck by a huge wave, causing great commotion among the passengers, and damaging the vessel to some extent. The weather was fine, there was no storm raging within hundreds of miles, and the wave came without the slightest warning. The phenomenon is attributed to submarine volcanic action.

* * *

A bulletin issued by the Department of Agriculture on "Our Foreign Trade in Agricultural Products, 1891–1900," informs us that products of United States agriculture were marketed abroad in the fiscal year 1900 to the value of $844,616,530, form-

ing about 62 per cent of the total domestic exports. With the single exception of 1898, the past year witnessed the largest annual export trade in farm products on record. The value attained came within $15,000,000 of the phenomenal figures of 1898, and surpassed those for 1899 by more than 50,000,000. A considerable portion of the increase over 1899 was accounted for by the higher price of cotton. The exports of this great staple, although actually smaller than during the preceding year, exhibited an advance of nearly $33,000,000 in value. Aside from cotton, the largest gains in value were those afforded by the exports of meat products and live stock. Tobacco, fruits and nuts, vegetable oils, oil cake and oil cake meal, dairy products and seeds also furnished examples of increase.

* * *

The value of clover as a fertilizer is not generally fully appreciated. Besides its great value in producing nitrogen from the air, it can, by means of its long roots, penetrate deeply into the earth, bring up potash and phosphoric acid and other elements lying out of the reach of the roots of our cereals. These elements, after a time, become available by the decomposition of the clover roots. It has been estimated that the weight of the roots of clover exceed the weight of that part of the plant which grows above the surface.

Their decomposition consequently adds a large amount of humus, decaying vegetable matter, which is especially valuable in lightening and loosening heavy soils and also enables heat, light and air to penetrate the earth and affords a means of drainage for surplus surface water. It must be borne in mind that heat, light and air are essential for the germination and growth of all seeds, and that no seed can germinate and grow in absolute darkness. This explains why seeds will germinate at a greater depth in loose than in heavy and compact soils.—*Orange Judd Farmer.*

* * *

According to tests which have been made, the comparative heating power of coal and wood has been found to be as follows: One pound of charcoal heats 73 pounds of water from 32 degrees, which is the freezing point, to 212, which is the boiling point of water. One pound of anthracite coal heats 70 pounds of water in the same way, and a pound of dry wood heats 35 pounds of water the same, so that coal has just twice the heating power that dry wood has, and a little less than charcoal has. Of course wood that is not dry loses a proportionate heating value corresponding to the quantity of water remaining in it, and air dry wood has on an average 12 per cent of water in it. So that we reasonably estimate the value of one ton of coal to be equal to two cords of wood, and this, of course, is to be based on the fact that the coal is nearly a solid mass, while a cord of wood is very nearly, if not quite, one-half empty spaces, and some of it is bark, which has much less heating value than wood. It might be interesting to note that the loss of heat of fuel burned in open fireplace is three-fourths of it, and only one-fourth radiating in the room, while burned in a stove provided with proper dampers to control the current of air through the fire, the loss is not quite one-fourth.—*Black Diamond.*

* * *

There are quite a number of diseases that seem to originate from the miasm or malaria developed by low grounds—Neuralgia, Rheumatism, Intermittent, Remittent and Typho-Malarial Fever, as well as Pneumonia are common in such districts, and when Consumption once gets a foothold in a house so situated it is almost impossible to get rid of it. There are many districts in Iowa that would not only be greatly benefitted hygienically, but would be greatly increased in value commercially by generous and judicious drainage. The paltry expense should not stand in the way. Every house designed for a residence, office, schoolhouse or workshop should be built on, and surrounded by, not only a dry surface but a dry or well drained subsoil, so that all the house, including the cellar, may be free from dampness. This point is so well established as to be really uncontroverted. If this proposition is true no argument is needed to prove that people owning swamp lands, who deliberately resist their drainage, are ignorant of, or reckless as to, their best interests.—Dr. J. F. Kennedy in *Iowa Health Bulletin.*

* * *

"Undoubtedly one of the most wonderful discoveries of modern chemistry has to do with the soil," says the *Saturday Evening Post.* "It has been ascertained that the most barren land can be made rich simply by adding to it certain mineral elements which cost but little. On this basis it is estimated that the United States will be able eventually to maintain 500,000,000 people—more than one-third of the present population of the world. It is merely a question of supplying the requisite quantities of nitrogen, phosphoric acid and potash. The last two are readily obtainable at small expense, whereas the first may be supplied either by furnishing to the soil condensed nitrogen in the shape of slaughter waste or nitrate of soda or by planting clover, beans or peas, which have an affinity for nitrogen and absorb it from the atmosphere. It is now known that nitrogen is the most important plant food, and inasmuch as this element composes four fifths of the atmosphere, the question is merely to absorb it into the soil. It has also come to be understood that only 2 per cent. of the material of plants is derived from the soil, the remaining 98 per cent. being drawn from the air and from water."

PROFITS IN FEEDING CORN.

(Cincinnati Price Current.)

How many pounds of pork, as represented in a live hog, does a bushel of corn represent, is a question which has frequently arisen. It has been the custom in past years to count a bushel of corn as equivalent to ten pounds weight to the animal. Doubtless this may be a fair approximation, under careless feeding, such as turning the animals into the field to help themselves to corn, or other wasteful methods. But careful feeding may bring far more important results Mr. C. G. Neff, president of the Bradford Belting Co., Cincinnati, is interested with his brother in farming operations near Yellow Springs, Greene county, Ohio. On December 13 they weighed a bunch of fifty hogs, and again weighed them on December 20 and 28. The gain for the corn fed during the first period was an average of 14 8 pounds in weight per bushel of corn, and for the second period a gain of 15¾ pounds per bushel. In the first instance, calculating hogs at $4.60, the feeding value of the corn was 68½ cents per bushel, and in the second instance—at $4.65 for hogs—the result represented 70¾ cents for corn. The market value of corn at the same time was 32 cents per bushel. This is an interesting illustration of what profits can be realized in converting grain into fat animals

---

NITROGEN AS PLANT FOOD.

(J. S. Trigg in Rockford Register.)

The most valuable and important of all plant foods is nitrogen. It costs from 15 to 20 cents a pound as used in the commercial fertilizers. The air we breathe is four-fifths nitrogen, and so it is one of the most widely diffused and common, yet expensive of necessities. How can the plant secure the needed nitrogen from the superabundant stock in the atmosphere? That's the question. Certain plants—the legumes—have the power to work out this problem in nature's chemical laboratory,

absorbing the nitrogen from the air and depositing it in the form of plant food in the soil. Clover, alfalfa, beans, peas, peanuts all do this work, hence the necessity of growing as much as possible of such crops in order to maintain the farm's fertility. A clover crop which is cut for hay and later for seed, will take from the air and place in the soil for the benefit of succeeding crops from 250 to 300 pounds of nitrogen per acre, equivalent in value to over $40 per acre at the current price of commercial nitrogenous fertilizers. Here is where it pays to grow clover. One ton of well cured clover hay is worth as a milk-producing food almost as much as two tons of equally well cured timothy hay, and one pound of clover hay fed a work horse is worth almost as much as one pound of oats.

THE U. S. WEATHER BUREAU.

ITS RAPID DEVELOPMENT AND FUTURE PROSPECTS.

(From the Philadelphia Press.)

Prof Willis L. Moore, chief of the United States weather bureau, speaking of the development and future prospects of the bureau, said to a *Press* reporter recently:

"When Gen. Albert J. Myer received his first appropriation of $20,000 to inaugurate a tentative weather service in 1870 he doubtless had no conception of the wonderful extension of the system which he was then authorized by congress to begin. It is comparatively easy, with the system now at our command and with scientists who have had twenty years' experience in watching the development and progress of storms, to herald to the shipping and other industries of the United States fore-warnings of atmospheric changes which may be destructive to either life or property.

"Thanks to the policy of expansion of Secretary Wilson the weather service has had a phenomenal growth during the past four years. It is a wonderful picture of atmospheric conditions that is now presented twice daily to the experienced eye of the forecaster. It embraces an area extending from the Atlantic to the Pacific, from the north coast of South America over Mexico, the islands of the West Indies and the Bahamas and northward to the uttermost confines of Canadian habitation. It is a panoramic picture of the exact air conditions over this broad area that is twice daily presented for the study of our experts. Hurricanes, cold waves, hot waves or rainstorms are shown wherever present in this broad area; their development since the last report is noted and from the knowledge thus gained their future course and intensity are quite successfully forecast.

"Most people measure the value of the weather service by the daily predictions of rain or snow that they see at the head of their newspaper column. This is one of the most imperfect parts of the work of the weather service, as it is more difficult to determine accurately the coming of a moderate rain or snow storm, which has little effect upon the life or property of our people, than it is to give accurate warning of the coming of destructive marine storms, or the sweep of great icy blasts in the form of cold waves.

"The utilities of the meteorological service for which the government expends over $1,000,000 annually, are well illustrated by the benefits that the fruit interests of California derive from the rain warnings that, on account of the peculiar topography of that region, are made with a high degree of accuracy but four, six or eight hours before the coming of the rain; yet far enough in advance to enable the owners of vineyards, all of which are connected by telephones, to gather and stack their trays and thus save the drying raisins from destruction. Since the organization of the rain warning service in California those deeply interested in raisin culture tell us that little or no loss has occurred to the crop, which is worth over $6,000,000 annually. Along the Rocky mountain plateau and the eastern slope our stations are now so numerous and our system of distributing warnings so perfect that the sweep of every cold wave is heralded to every ranch that has telegraphic communication.

"In the cranberry marshes of Wisconsin the flood gates are regulated by the frost warnings of the bureau, and where formerly a profitable crop was made only once in seven years, on account of injury by frost, it is now a rare exception that any damage occurs.

"As we go further south and east into the gulf and South Atlantic states our frost warnings are made with a far greater degree of accuracy than in any other part of the country. We find the growers of sugar cane in Louisiana, the truck growers from Norfolk southward to Jacksonville and the orange growers of Florida timing their operations by the forecasts and warnings of the bureau. From the estimates of these people it is indicated that the amount annually saved to the interests of the South Atlantic and gulf states by the frost warnings of the weather bureau is far greater than that expended for the support of the entire department of agriculture.

"Our experts have become so proficient in detecting severe storms and in marking out their course and intensity that it is a fact that no port of the United States, either lake or ocean, has been visited by a storm destructive to commerce in over six years without the danger warnings being given in advance of the storm, and as a result it is safe to say, from the estimates made by maritime insurance people, that the annual return from this part of the meteorological service of the department of agriculture exceeds $5,000,000.

"Under the direction of Secretary Wilson we are now arranging with Europe and with the Azores islands for the receipt of meteorological reports that, in connection with our present expansive system, will enable us to forecast wind force and wind direction for transatlantic steamers for periods of three days outward from each continent. Some of these European reports are now being received and the remainder will come within the next thirty days. This is an extension of the meteorological service that has long been sought by mariners. The new German cable from Lisbon to New York enables us to get direct communication with several islands, reports from which are necessary in the making of these ocean forecasts, as many suppose would be the case."

PERMANENCE OF AVERAGE PRECIPITATION.

(From the Boston Transcript.)

The opinion of the "oldest inhabitant" to the contrary notwithstanding, the officials of the weather and hydrographic departments of the government assert that the seasons are no better or worse than they were a century ago. Stated as a general proposition, the rainfall is no greater or less, and the streams of the country, except in rare instances, carry as much water as they did when white men first settled along their banks.

Seventy-five years includes the greater part of the history of the United States, and yet the government water experts say this is all too short a time in which to establish accurate rules in regard to the supply of moisture. The statement that the rainfall has not decreased or the streams are not smaller does not mean that this is so of each succeeding year, but that through all the variations of the seasons there runs a general average which is assumed to be normal and which does not change.

Many interesting and complicated theories have been evolved as to the regularity of the periods of drought and wet. Some

of these assume that seven years is the limit of any particular dry spell, and that it will always be followed by seven years of plentiful water supply. Others take eleven years, and others seventeen years as the basis of their calculations, and the figures are always produced which apparently prove the truth of each and every one of the theories.

During the past year the streams of New England, the Middle states, the Northwestern states and the Pacific coast have been at the lowest ebb in a century of observation. On the other hand, the streams of Arizona and Texas, which five years ago were apparently about to disappear entirely, have taken on new life and more water is flowing therefrom at the present time than for many years past. If the amount of rain which has fallen in the Western states during the past twelve months were to be taken as a criterion, it would appear that it would not be long before that section of the country was deprived of any rainfall whatever. But the rain experts of the government philosophically declare that this is probably the crisis in a cycle of drought, and that from this time on until another depression is due the rainfall will increase to a marked degree.

In the early part of this century, from 1830 to 1850, New England suffered from such an abnormal lack of moisture as is not recorded of any other section of the United States. From 1850 to 1865 the precipitation was normal, and up to the present time it has been far above what is called the average so much so that in the years 1888, 1889 and 1890 the rainfall was so heavy as to seriously change the character of the climate. The Ohio and Mississippi valleys have had their years of dryness and their years of superabundant rain, but there is a remarkable uniformity in the annual precipitation of moisture along the valleys of both these great rivers.

The flow of streams is not entirely dependent upon the rainfall, for the temperature, velocity of the wind and dryness of the atmosphere are all factors in aiding or preventing the increase in the volume of water in flowing streams. When the thermometer is high, the air dry and moving with considerable speed, the evaporation is so great that an unusual fall of rain would be absorbed before the water could reach its natural drainage, and it is not an uncommon occurrence for the streams to be low when the rainfall is above normal.

This theory of an unchangeable average advanced by the water experts is sustained by the records of every part of the world, no matter how far back they may go. In every section where man has been afforded an opportunity of observation it is found that there is a normal average of rainfall, which however exceeded in one period of years, will be maintained in a following period by an equal decrease. European observations extend back several centuries. long enough to cause the weather experts to admit the possibility of drawing accurate deductions, and in even the comparatively brief time covered by observations in the United States the European experience has been repeated in succeeding periods of drought and moisture.

New England and eastern New York during the past season have suffered great loss through the diminution of flow in all water courses. Fish preserves have been ruined, navigation hindered and water powers decreased. This condition cannot be entirely accounted for, as the rainfall has not been much below the normal. The hydrographic experts of the government say that while there is temporary inconvenience in this condition no alarm need be felt, as within a short time all of these streams will again contain their full quota of water. The case of Texas is most remarkable, for in the southern part of that state the streams have remained dry for so long that it was accepted as their natural condition, and all hope was abandoned of a resumption of their flow. Rain or no rain, these streams, such as remained in existence at all, were mere brooks compared to what they had been in the earlier histroy of the state. Two years ago, without any marked increase in the rainfall, the Texas streams began to rise, and continued to do so until they assumed an appearance familiar only to those who had seen them twenty or twenty-five years before. It was thought at first that this was due merely to some temporary cause. such as an increased amount of water from the mountain shed to the west; but to the surprise and gratification of everybody, there are still no signs of any loss in volume.

In a few instances the flow of streams is permanently decreased by the stripping of timber from adjacent hills, and the diverting of water near the source, though as a rule a large percentage of water taken from a stream for industrial, farming or other purposes returns to it in one form or another later on. It may be some consolation to those who are suffering at any time from the effects of drought to know that it will not last forever, but that the time is sure to come when they will have more water than ever, and it may temper the joy of those to whom plenty of water is given to know that their time of drought is only just ahead of them.

NATIONAL CLIMATE AND CROP BULLETIN.

(Extracts from the Weather Bureau Summary for February.)

February, 1901, was milder than usual in the Pacific coast and Plateau regions and in the upper Missouri and red river of the North valleys, the average daily temperature excess amounting to more than 3° along the California coast, over the eastern portion of Oregon and Washington, northern Utah, southern Idaho, and over the eastern portion of the Dakotas and western Minnesota. The month averaged colder than usual in the lower Missouri Valley, middle Rocky Mountain slope, west Gulf States, and in all districts to the east of the Mississippi. The deficiency in temperature for the most part exceeded 3° per day, and ranged from 6° to 11° over nearly the whole of the area east of the Mississippi, the departures from normal being most marked over the northern portions of Illinois, Indiana, and Ohio, southern Michigan, and on the coast of North Carolina and Virginia.

Eastward of the Rocky Mountains the precipitation during February was decidedly deficient in nearly all districts, only portions of the central and east Gulf States and limited areas elsewhere receiving more than the February average. The deficiency amounted to more than an inch in southern Texas and over much the greater part of the country east of the Mississippi, including southern Missouri, Arkansas, and northern Louisiana. From western Arkansas eastward over the central Mississippi and Ohio valleys, Tennessee, North Carolina, the Middle Atlantic States, and southern New England, the deficiency amounted to more than 2 inches and ranged from 3 to 4 inches in Tennessee, Kentucky, and northern Arkansas. There was also a decided deficiency in southern Florida, but over the northern portion of that state and the southern portion of the South Atlantic States and central Gulf States the excess ranged from 1 to 3 inches. A marked feature of the month's precipitation is the excessive amounts reported from the greater portion of the Pacific coast districts, more particularly California, where from 1 to nearly 3 inches more than the usual amount fell.

At the close of the month the northern portions of the country from the upper Mississippi Valley eastward to the southern New England coast were covered with snow, the southern portions of this region having from 3 to 8 inches, while the more northerly districts were covered to much greater depths, 2 to 4 feet being reported from the upper Michigan Peninsula and the northern portions of New York and New England.

While the month has been cold in the principal agricultual districts the precipitation was light, and such farm work as is

usually performed in winter has been conducted very satisfactorily. In the southern states extensive preparations for spring planting have been made. In southern Texas and in Florida some corn has been planted and oat seeding has begun in the portions of the central Gulf states.

Over the southern portion of the winter wheat region, owing to general lack of snow protection and alternate freezing and thawing, the reports respecting winter wheat are for the most part unfavorable, but over the northern portion there has generally been ample snow covering, and the reports indicate that the crop is in very promising condition. Reports of injury by fly continue, but they are less numerous than in the preceding month. On the Pacific coast the wheat outlook is reported as excellent, although growth has been retarded by low temperatures of the first and last decades, some damage having resulted from heavy rains in central and northern California.

The southern states experienced very trying temperature conditions from the 20th to the 25th, when freezing temperature occurred as far south as central Florida.

CLIMATOLOGY OF THE MONTH.

BAROMETER.—The mean pressure for February was 30.17 inches; highest observed 30.73 inches at Des Moines on the 12th; lowest 29 55 inches at Des Moines on the 17th; range for the state, 1.18 inches.

TEMPERATURE.—The monthly mean temperature for the state, as deduced from records of 120 stations, was 17.5°, which is about 4° below normal. By sections the means were as follows: Northern section, 15.5°; central section, 17,0°; southern section, 19.9°. The highest mean for the month was 22.9°, at Omaha; lowest mean, 11.2°, at Cresco. The highest temperature reported was 49° at Bedford, on the 17th; lowest temperature reported, 21° below zero at Iowa City, on the 10th. The average monthly maximum was 42.1°; average monthly minimum, 9.9° below zero. The greatest daily range was 53° at Audubon; average of greatest daily ranges, 36.2°.

PRECIPITATION.—The average precipitation for the state, as shown by records of 137 stations, was 1.01 inches, which is about normal. By sections the averages were as follows: Northern section, 0.76 of an inch; central section, 1.09 inches; southern section, 1.18 inches The largest amount reported was 3.00 inches at Ruthven; least amount reported for the month, 0.12 of an inch at Murray. The greatest daily amount reported was 2.00 inches at Ruthven, on the 8th; average number of days on which .01 inch of precipitation was reported was 4.

WIND AND WEATHER.—Prevailing direction of the wind, north-west; highest velocity reported, 45 miles per hour at Sioux City, on the 17th. The average number of clear days was 15; partly cloudy, 7; cloudy, 6.

The month, though somewhat colder than usual, was generally an ideal winter month, with no severe storms or sudden changes or extremes of temperature. The weather was generally favorable for feeding stock and for such farming operations as may be carried on in mid-winter. The north-eastern counties were colder than the other portions of the state, and the ground was well covered with snow a considerable portion of the month.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES. Highest reduced barometer.	Date.	Lowest reduced barometer.	Date.
Davenport	30.14	30 65	5	29.59	17
Des Moines.	30 20	30 73	12	29 55	17
Dubuque	30 15	30 66	12	29.61	17
Omaha, Neb	30.18	30.69	5	29.63	17
Keokuk	30 15	30 67	12	29 58	17
Sioux City	30 22	30 71	5	29 62	17
....	.....	.....	.....	.....	....
	30 17	30 73	12	29 55	17

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,611	30	N	3
Des Moines	5,352	28	NE	3
Dubuque	5,074	32	NW	19
Keokuk	5,588	30	NW	19
La Crosse, Wis	4,558	24	W	26
Omaha, Neb	6,389	36	N	3
Sioux City	8 491	45	NW	17
...	..	..	....	....

OBSERVERS' NOTES.

BANCROFT—*E. G. Bailey.* An ideal winter month. Stock has needed but little shelter, and rough feed has been consumed.

BONAPARTE—*B. R. Vale.* No severe storms; stock in fields; good month for feeding; roads good.

CLEAR LAKE—*John Cobb.* Very mild month; very little snow in spots.

CLINTON—*Dr. Luke Roberts.* The highest temperature during the month was 39 degrees, occurring on the 17th. This is 12.9 degrees below a February normal. The minimum temperature was 12 degrees below zero, and occurred on the 6th. This is 2 8 degrees above a February normal. The mean temperature of the month was 14 5 degrees, or 7 degrees below normal. The mean temperature of the warmest day, the 17th, was 3.5 degrees, or 9.1 degrees below normal. The mean of the coldest day, the 5th, was 1.5 degrees below zero, or 3 degrees above normal.

There were five storm days, in which was precipitated 14 inches of snow or 1.40 inches of water. The prevailing direction of the wind was from the west. The maximum velocity was 23 miles an hour, occurring on the 3d. Total movement for the month, 3,830 miles, or 857 miles below normal. The number of clear days was 14; cloudy and part cloudy, 7 each. The clear days were five in excess of normal.

The minimum temperature for February, 1885, was 33 degrees below zero, and the mean for the month was 8.3 degrees. February, 1895, gave a minimum of 21 degrees below zero, and a mean of 14.2 degrees. These were the only Februaries during

the last 23 years furnishing a record of a mean temperature colder than that of 1901.

Notwithstanding the February just closed was one of the coldest, it was a good month for business, the roads were good, sleighing was good the entire month, and dating back into January five days, gave 33 days of continuous sleighing. It is a rarity in this locality to have such a fine run of sleighing, and not only has everybody ut lized it, but it brought much healthy and invigorating enjoyment. It was not really a severe month for man or beast. Stock passed through all right and thrived every day. The ice crop was large.

CRESCO—*Gregory Marshall.* Steady cold weather and fair sleighing; numerous "sun dogs," halos, parhelia during the cold spell; maximum barometer, 30.74 inches on 12th; minimum barometer, 29 67 on 17th

ESTHERVILLE—*Leslie Littell.* This has been the warmest winter ever known in the history of this county, and the snow has been unusually light.

FONDA—*N. P. Barron.* A fine month for stock, as there was snow on ground only a few days. Wild ducks were seen going north on the 23th.

GRAND MEADOW—*F. L. Williams.* Narrow range of temperature; weather very dry and favorable for farm stock.

GREENFIELD—*J. G. Culver.* Larks have spent the entire winter in this vicinity.

GRINNELL—*A. O. Price.* Two weeks of fine sleighing, and an entire month of delightful weather.

HARLAN—*C. A. Reynolds.* The finest February ever known in this section.

HUMBOLDT—*H. S. Wells.* Storms have been of short duration. Sickness abating; stock generally in good condition.

MT. VERNON—*J. W. Hubbard.* Mean temperature 6.23° below normal; precipitation, .01 of an inch above normal, 12 years' records.

OLIN—*Hon. Nathan Potter.* An ideal winter month, with good sleighing, no drifts and no severe storms; 10 inches snow at close of month.

RIDGEWAY—*Arthur Betts.* This month has been 1.8° colder than the average of the three preceding Februaries. A good winter month; 226 hours of sunshine, 294 hours being the greatest possible for this latitude, which is 43° 20′. No extreme cold, and but little thaw.

ERRATA IN DECEMBER REVIEW.

BUSSEY.—Total precipitation recorded, 1.01 inches on pages 9 and 12, should have been 1.10 inches. Total snowfall recorded, 1.1 inches on page 9, should have been 2.0 inches. Amount of precipitation on 24th, on page 12, should read .10 inch instead of .01 inch.

KNOXVILLE.—Total precipitation recorded, .20 inch on pages 9 and 12, should have been .50 inch.

CLIMATOLOGICAL DATA FOR FEBRUARY, 1901.

NORTHERN SECTION.

STATIONS	COUNTIES	Elevation, feet	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., IN INCHES				Number rainy days	SKY			Prevailing direction of wind	OBSERVERS
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall (unmelted)		Number clear days	Number partly cloudy days	Number cloudy days		
Algona	Kossuth	1,500	8	16.7	-2.4	40	13	- 5	5, 10	29	.80	-.07	.35	6.5	4	10	15	3	NW	
Alta	Buena Vista	1,519	9	17.4	-0.8	42	15, 28	- 8	9	31	.49	-.27	.35	4.0	4	14	9	5	NW	
Bancroft	Kossuth	...	..	17.2	..	42	16	- 7	10	38	.80	....	.30	6.0	5	13	9	6	NW	
Britt	Hancock	1,230	..	15.4		40	28	- 7	10	37	.51	.....	.23	3.1	5	16	9	3	NW	
Charles City	Floyd	1,012	9	13.2	-4.4	37	13	-14	7	39	.79	-.55	.45	4.0	4	13	11	4	NW	
Clear Lake	Cerro Gordo	984	..	14.6	....	39	17	- 8	10	34	.70		.30	7.0	4	19	7	2	NW	
Cresco	Howard	1,280	28	11.2	-4.7	36	17	-11	10	36	.77	-.16	.40	7.7	4	15	8	5	NW	
Decorah	Winnesheik	900	7	11.8	-5.7	39	17, 28	-16	10	47	.83	†.06	.43	9.0	2				.....	
Dows	Wright	..	..	15.2	....	40	13	-11	10	36	1.00		.60	7.5	3	20	3	5	NW	
Elkader (*a*)	Clayton	.	19	13.8	-5.3	41	13, 28	-18	10	47	.85	-.25	.57	8.0	2	15	9	4	NW	
Estherville	Emmett	....	..	15.6		48	13	-15	10	38	1.00	....	.70	10.0	4	17	7	4	NW	
Fayette	Fayette	1,000	10	12.3	-7.8	37	28	-17	10	38	.66	-.45	.40	6.5	4	17	5	6	NW	
Fonda	Pocahontas	1,237	..		...	..	.....	....	.....		.49	.....	.31	1.5	2	17	8	3	NW	
Forest City	Winnebago	1,220	..	14.4	....	40	13	- 8	10	36	.70	.....	.50	6.0	3	18	1	9	W	
Grand Meadow	Clayton	...	9	12.4	-7.3	30	17	- 5	22	25	.35	-.70	.30	3.5	2	14	10	4	NW	
Greene	Butler	943	..	15.6		41	13	- 9	10	40	.51	.. .	.25	3.2	4	16	5	7	W	
Hampton	Franklin	1,240	10	17.0	-1.0	42	13	- 8	10	32	.98	-.19	.50	9.1	3	11	14	3	NW	
Hawkeye	Fayette	...	7		....	..	.....		... .	....	.90	-.43	.70	9.0	2		...	..	.....	
Hoprig	Emmett		..		...	..	.....		...		.20	.....	.15	1.5	2	17	6	5	NW	
Humboldt	Humboldt	1,082	7	17.8	..	40	17	- 8	10	35	.50	-.44	.40	4.1	4	17	3	8	NW	
Lansing	Allamakee		..	15.8	....	40	13, 15	-11	10	44	1.08	.....	.53	10.8	4	9	14	5		
Larchwood	Lyon	.....	..	17.9		48	13	- 9	9	40	.40	.....	.25	1.5	3	23	1	4	NW	
Larrabee	Cherokee	.....	9	17.4	-3.1	45	28	-10	9	38	.46	-.14	.38	4.3	3	13	12	3	NW	
Le Mars	Plymouth	.....	..	18.2	....	48	28	- 7	9	30	.63	....	.60	6.0	2	18	5	5	N, S	
New Hampton	Chickasaw	1,166	..	12 6	.	35	17	-10	10	33	.80	.....	.30	8.0	4	16	8	4	NW	
Northwood	Worth	1,210	..	15 4	...	41	13	-10	10	39	.70	.....	.30	7.0	3	15	6	7	NW	
Osage	Mitchell	1,178	9	12.6	-3.4	36	17	- 9	10	34	.95	-.22	.47	8.3	4	9	12	7	NW	
Plover	Pocahontas	....	..	17.6	..	40	13, 28	-10	10	37	.37	.....	.20	3.0	3	15	5	8	NW	
Ridgeway	Winneshiek	....	..	15.8	...	39	15	- 6	22	33	1.69	.....	1.00	9.9	5	14	11	3	NW	
Ruthven	Palo Alto	.....	..	15.1	...	43	14	- 8	11	29	3.00	.....	2.00	30.0	2	24	2	2	NW	
Sheldon	O'Brien	1,406	..	15 3	....	44	28	-10	9, 21	41	.63	.....	.30	3.3	3	16	4	8	S	
Sibley	Osceola	1,506	7	16.8	-1.2	46	13	- 7	9, 10	41	.64	†.26	.43	2.1	3	11	14	3	NW	
Sioux Center	Sioux	..	..	18.3	....	45	28	-10	9	30	.70	.....	.60	6.5	3	16	6	6	S	
Spirit Lake (*e*)	Dickinson	.....	6	17.2	-2.1	48	13	- 5	4, 11	*37	.25	-.03	.20	2.5	2	....		...	.....	
Storm Lake	Buena Vista	....	11	17.4	....	42	28	- 9	10	33	.53	-.15	.40	4.2	4	13	6	9	NW	
Washta	Cherokee	..	..		....	..	.....	.. .	.... ..	....	.90		.70	7.0	2	19	7	2	NW	
Waverly	Bremer	942	..	15.1	...	37	13	-15	10	37	.97	.....	.40	7.0	4	12	6	10	NW	
West Bend*	Palo Alto	....	7	16.2	-3.5	40	13	- 8	10	.. .	.43	-.49	.20	3.3	4	12	9	7	NW	
West Union	Fayette	1,105	..	....	...	.	.....	...	.....	...	.80	....	.80		1		..	....	.....	
Average				15.5	-3.8	40.9		-9.7	...	36.2	0.76	-.02	....	6.4	3	15	8	5	NW	

CENTRAL SECTION

Amana	Iowa	..	24	15.1	-5.7	39	17	-18	10	38	1.69	†.42	.71	15.0	4	15	8	5	NW	
Ames	Story	936	20	18.0	-4.4	40	13	-14	10	37	.29	-.63	.20	7.0	2	14	6	8	NW	
Audubon	Audubon	..	7	18.3	-2.7	48	14	-10	9	53	.23	-.66	.18	2.2	2	20	4	4	N	
Baxter	Jasper	....	..	15.2		44	13	-10	23	49	1.18		.52	.	4	5	20	3	NW	
Belle Plaine	Benton	840	10	16.0	-6.5	40	17	-13	10	33	1.90	†.78	.60	14.0	7	8	17	3	NW	
Buckingham	Iowa		..		....	..	.....	...	... .	..	1.20	.....	.75	10.5	4	14	11	3	... .	
Carroll	Carroll		10	20.0	-0.7	44	15	- 6	9	35	.75	-.28	.65	6.5	2	18	2	8		
Cedar Rapids	Linn	744	18	15.2	-6.5	39	17	-18	10	41	1.84	†.17	.90	16.1	5	17	3	8	NW	
Clinton	Clinton	609	9	14.8	-7.9	39	17	-12	6	35	1.40	-.30	.75	14.0	5	14	7	7	W	
Coon Rapids	Carroll	...	..	20.0		44	17	- 5	9	27	.83		.70	8.0	3	19	7	2	NW	
Davenport	Scott	615	30	15.7	-8.9	39	17	- 7	6	35	1.59	-.02	.96	17.7	7	17	6	5	W	
Delaware	Delaware	1,048	9	11.8	-6.3	37	17	-13	10	37	.55	-.23	.36	5.5	4	14	10	4	NW	
Denison	Crawford	1,192	7	18.0	-4.5	43	15, 17	- 9	12	41	.72	-.14	.40	4.8	5	19	2	7	N	
Des Moines	Polk	867	23	20.0	-3.0	44	17	- 8	10	31	1.11	-.04	.79	13.5	6	11	9	8	NW	
De Soto	Dallas	866	..	20.6		42	17	- 6	10	32	1.45		1.00	14.5	4	18	2	8	NW	
Dubuque	Dubuque	655	28	14.5	-8.1	38	17	-10	6	36	1.07	-.39	.48	11.3	6	18	4	6	NW	
Fort Dodge	Webster		..	18.0	....	41	17	- 8	12	35	.40	.....	.40	4.0	1	13	6	9	NW	
Fruitland	Muscatine	.	.	15.8	....	40	17	-19	10	49	1.50		.70	11.5	4	21	2	5	W	
Galva	Ida		7	18.6	-1.4	45	27	- 6	9, 10	45	.90	†.57	.50	9.0	2	..			NW	
Gilman	Marshall	1,053	..	....		..	.....	...	.....		1.64	.. ..	1.00	14.0	3	15	7	6	N	
Grinnell	Poweshiek	1,011	10	17.4	-5.8	35	13	- 3	10	21	.68	-.09	.33	4.1	5	11	8	9	NW	
Grinnell (near)	Poweshiek		..	16.7	....	38	17	-11	10	33	1.24	.....	.55	16.8	5	12	6	10	W	
Grundy Center	Grundy	966	9	15.6	-4.4	40	17	-10	10	36	1.10	†.40	.50	9.0	5	19	5	4	NW	
Harlan	Shelby	...	..	19.2		44	17	-10	10	39	1.05		.65	10.3	6	10	10	8	NW	
Independence	Buchanan	921	38	12.8	-7.5	37	17	-13	10	32	.90	-.14	.65	9.0	4	20	4	4	NW	
Iowa City	Johnson	644	10	14.6	-10.3	41	17	-21	10	44	1.97	†.72	.83	17.0	3	20	3	5	W, NW	
Iowa Falls	Hardin	..	7	14.5	-2.7	37	17	-17	10	34	1.30	†.47	.90	11.5	3	16	5	7	NW	
Le Claire	Scott	.....	..	.		.	.....	....	.. ...	....	1.52	....	.70	....	4	...			.....	
Logan	Harrison	928	35	20.6	-3.5	46	26	- 9	10, 12	44	.90	-.28	.65	9.0	6	12	9	7	N	
Maquoketa	Jackson		7	14.2	-11.1	39	17	-18	6	45	1.25	-.53	.60	11.0	3	22	3	3	W	
Marshalltown	Marshall	898	8	18.2	-3.5	42	17	-12	10	28	1.17	†.45	.48	11.9	5	14	5	9	W	
Monticello	Jones	800	46	15.2	-6.2	40	28	-14	10	44	.63	-1.08	.28	11.5	3	16	4	8	NW	
Mt. Vernon	Linn	....	..	16.0	.. .	40	17	-10	6, 10	32	1.23	....	.60	13.9	5	19	3	6	W	
Newton	Jasper	958	13	17.6	-4.1	41	17	-15	10	33	1.80	†.83	.93	19.0	4	14	10	4	NW	
Odebolt	Sac	....	..	19.4	...	43	17	- 7	9	40	.53	.....	.50	6.2	2	17	7	4	.....	
Ogden	Boone	1,109	..	17.0	....	42	17	-15	10	36	.60		.27	4.6	4	9	6	13	NW	
Olin	Jones		..	13.2		40	17	-18	6	40	1.34	.	.60	14.0	5	20	4	4	NW	
Onawa	Monona	....	..	21.9	....	47	14	- 5	9	40	.87	.....	.65	10.2	4	19	4	5	NW	
Perry	Dallas		..	19.5	....	42	17	- 8	10, 12	38	1.20	. ...	1.00	12.0	2	20	5	3	NW	
Rockwell City	Calhoun	1,219	.	18.8		42	17	-10	10	30	.70		.60	6.0	2	21	0	7	..	
Sac City	Sac	900	21	18.8	-0.9	40	17, 28	- 8	12	34	.51	-.55	.48	4.8	2	14	9	5	NW	
Scranton	Greene		..	19.4	...	40	17	- 4	9, 10	35	.30	.....	.30	4.0	1	22	2	4	NW	
Sioux City	Woodbury	1,122	12	20.0	†1.0	44	28	- 8	9	38	54	-.02	.45	...	5	16	4	8	NW	
Toledo	Tama	...	6	17.0	-5.0	42	13, 17	-15	10	44	1.30	†.68	.80	13.0	3	11	7	10	NW	
Vinton*	Benton	800	10	15.8	-6.1	39	13, 17	- 5	5	...	1.50	†.54	1.00	15.0	3	22	0	6	NW	
Waterloo	Black Hawk	862	21	15.9	-6.0	40	17	-13	10	36	1.06	-.05	.45	11.0	3	16	8	4	NW	
Wilton Junction	Muscatine		..	15.4	....	41	17	-15	10	40	2.06	.....	1.30	16.0	3	22	1	5	NW	
Whitten (*e*)	Hardin	...	..	16.7	...	40	17	-12	10	29	.90	.....	.80	9.0	.	...	.		.....	
Average				17.0	-5.1	41.1		-11.1	...	37.1	1.09	†.02	...	10.6	4	16	6	6	NW	

CLIMATOLOGICAL DATA FOR FEBRUARY, 1901—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PREC. IN INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.	OBSERVERS.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted.)		Number clear days.	Number partly cloudy days.	Number cloudy days.		
Afton	Union		..	19.7	..	43	17	-9	10	33	1.10	.....	.60	11.0	2	9	9	10	NW	
Albia	Monroe	945	..	20.9	...	43	17,18,25	-7	10	32	2.35	.....	1.40	23.5	4	12	6	10	NW	
Atlantic	Cass		9	19.4	-3.5	46	17	-13	10	38	1.70	†.79	.80	16.0	4	11	8	9	NW	
Batavia	Jefferson	640	..	..	...	..	.....	..	...	..	1.00	.....	1.00	10.0	1				....	
Bedford	Taylor	....	..	20.4		49	17	-17	10	46	.84	.....	.46	10.2	3	10	14	4	NW	
Belknap (g)	Davis	857	..	19.0	....	39	14	-8	10	33	2.00	.....	.60	20.0	5	18	4	6	NW	
Bonaparte	Van Buren	.....	9	19.2	-6.2	42	17	-12	10	37	1.17	†.15	.80	11.5	3	...			... ..	
Burlington	Des Moines	....	..	21.0		47	7	-5	5	27	1.66	....	.70	15.5	7	17	3	8	...	
Bussey	Marion	....	..	....	...	..	....	...	....	..	1.25	.. .	.85	12.5	2	..			...	
Centerville	Appanoose	1,013	7	20.9	-1.8	44	17	-7	10	33	1.50	†.32	1.20	15.0	3	14	6	8	NW	
Chariton	Lucas	1,030	..	19.8	...	44	17	-8	10	30	1.13	....	.66	11.2	5	12	7	9	NW	
Clarinda	Page	1,069	10	22.0	-2.9	48	17	-10	10	37	1.42	†.36	.86	16.0	3	13	8	7	NW	
College Springs	Page	..	9	21.3	-5.1	47	27	-6	10	33	.98	†.06	.50	9.8	5	18	4	6	NW	
Columbus Junct	Louisa	. ..	..	17.4	....	40	17	-6	5,6,10	38	1.23	...	.69	15.0	4	14	8	6	NW	
Corning	Adams	1,127	8	19.7	-5.5	42	17	-11	10	34	1.35	†.52	.95	14 5	3	13	9	6	NW	
Council Bluffs	Pot'wat'mie	989	..	22.8	...	47	13,17	-2	9,10,12	37	1.06	....	.69	10.2	4	18	3	7	N	
Cumberland	Cass	.....	..		....	..	.....	....	..	...	1.50	.....	.80	15.0	3	15	6	7	N,S	
Danville	Des Moines	715	..	.		..	.....	...	..		1.00	.....	.60	10.0	2	..	..		.....	
Eldon	Wapello		..	18.2	..	43	17	-20	10	43	.68	....	.45	13.4	5	17	3	8	NW	
Emerson	Mills	....	..		....	..	.....	....	.....	. . .	2.00		1.00		2			..	.. ..	
Fort Madison	Lee	516	52	..	..	..	.		....	....	1.04	-.90	.65	12.0	3	12	7	9	W	
Glenwood	Mills	979	30	22.2	-1.5	46	27,28	-7	10	36	.70	-.10	.40	7.0	3	5	15	8	NW	
Greenfield	Adair	...	9	20.8	-2.2	44	17	-6	5	36	1.05	-.12	.55	10.9	7	16	4	8	NW	
Hamburg	Fremont	912	..	.	..	..	.....	....	. . .	....	.40	...	.35	4.0	2	12	10	6	NW	
Hedrick	Keokuk	....	.	17.8	....	41	17	-11	10	40	.74	..	.40	7.4	4	21	2	5	NW	
Hopeville	Clarke	....	..	20.0	....	42	17	-7	10	30	.84	....	.48		2	10	9	9	NW	
Indianola	Warren	.	..	19.5	...	41	17	-6	10	30	1.57	...	.80	14.7	6	7	6	15	NW	
Keokuk	Lee	618	29	19.8	-8.0	45	17	-3	5	29	.75	-.95	.27	...	5	20	2	6	NW	
Keosauqua	Van Buren	.....	8	21.8	-4.8	46	17	-7	6	38	1.21	-.01	.70	12.5	5				....	
Knoxville	Marion	....	7	18.2	-6.0	44	17	-10	10	33	.90	-.09	.45	10.0	2	13	8	7	.....	
Lacona	Warren	....	..	....	....	..	... ...	...	.....	....	1.60	.....	.80	15.0	4	6	17	5	.....	
Lenox(‡)	Taylor	.....	..	19.7	....	42	17	-8	10	31	.47		.30	4.7	4	17	3	8	NW	
Mooar	Lee	...	..	20.2	.	44	11	-12	6	31	1.02	.....	.58		3	18	3	7	NW	
Mt Ayr	Ringgold	1,236	7	20.2	-6.3	43	17	-7	10	31	1.52	†.38	.77	14.5	5	10	8	10	NW	
Mt. Pleasant	Henry	725	..	19.0	....	42	17	-12	10	38	.48	.....	.16	4.8	2	18	5	5	NW	
Murray	Clarke	1,183	..	....	....	..	..	.	.... ..	...	.12	....	.08	1.2	2	1	23	4	.. .	
Omaha	Douglass	1,113	31	22.9	-2.0	46	17	0	9	27	.66	-.08	.36	7.0	2	11	10	7	NW	
Oskaloosa	Mahaska	850	17	18.0	-4.4	42	17	-17	10	40	1.38	†.31	.50	12.2	5	16	3	9	... ...	
Ottumwa	Wapello	630	6	21.0	-4.2	46	17	-10	10	33	1 69	†.56	.80	16.9	4	16	3	9	NE	
Ovid	Wayne	.....	7	19.4	-5.4	45	17	-11	10	36	1.58	†.23	.96	15.2	6	12	3	13	NW	
Pacific Junction	Mills	960	..	22.6	...	48	17,27,28	-8	10	36	.44	.....	.24	4.4	4	12	11	5	N	
Pella	Marion	.....	..	16.6	....	46	17	-12	9	35	1.40	... ..	.80	14.0	2	15	1	12	NW	
Red Oak	Montgom'ry	1,033	..	19.9	....	45	17	-9	10, 12	41	.80	.....	.40	8.0	2	18	2	8	S	
Sigourney	Keokuk	....	..	19.0	...	42	13	-12	10	37	1.91	. ..	.80	21.0	5	15	10	3	NW	
Stuart	Guthrie	..	..	18.6	...	..	..	-5	9	37	.80	.....	.50	8.0	2	18	0	10	NW	
Thurman	Fremont		..	22.0		47	17,28	-13	10	39	1.35		.60	14.0	4	15	4	9	NW	
Villisca	Montgom'ry	1,058	7	20.6	-3.9	46	17	-10	9,11	39	1.15	†.30	.60	11.0	4	11	9	8	NW	
Wapello	Louisa	578	..	19.1	....	45	16	-7	6	30	.83	.....	.59	14.5	3	21	3	4	NW	
Washington	Washington	.	10	17.5	-8.1	41	17	-10	6	42	1.80	†.80	1.20	12.0	3	....	..	....	NW	
Winterset	Madison	.	9	19.3	-4.3	43	17	-7	22	34	1.20	†.31	.60	12.0	2			....	.....	
Woodburn	Clarke	.....	..	...	..	...	.....	.....	....	...	1.03	.....	.70	10.0	3	14	6	8	....	
Average	....	.....	....	19.9	-4.5	44.2	.....	-9.0	.... ..	35.2	1.18	†.14	.....	12.0	4	14	7	7	NW	
Av. for the state.	.....			17.5	-4.5	42.1	.. ..	-9.9	..	36.2	1.01	†.05	.....	9.7	4	15	7	6	NW	

§Means determined from 7 A. M., 2 P M, and 9 P. M observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A. M. and 7 P M. observations. ‡Received too late to be computed with means *a*, One day missing; *b*, two days, etc.

*Is used to indicate plus sign (†).

†Is used to indicate plus sign.

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR FEBRUARY, 1901.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Mean.
Afton	Max.	28	30	21	18	15	28	33	28	21	22	25	32	34	39	37	37	43	39	..	22	25	18	24	37	34	32	40	37	29.6
	Min.	7	14	15	-4	-3	0	16	18	-2	-9	10	-1	7	10	15	20	29	29	11	5	15	2	8	9	17	9	10	27	9.8
Albia	Max.	33	30	37	32	15	26	35	32	25	21	30	28	37	41	39	37	43	43	42	38	33	32	27	38	43	30	41	36	33.7
	Min	8	14	8	0	-1	-2	3	10	4	-7	8	-1	8	11	17	20	22	22	9	7	8	4	7	10	14	7	7	9	8.1
Algona	Max	23	33	23	15	17	28	28	..	..	18	18	26	40	33	25	32	38	31	20	18	18	17	22	26	..	26	33	35	25.7
	Min	5	10	12	-4	-5	4	18	17	-4	-5	3	4	11	14	12	21	27	17	1	0	7	-4	7	6	8	5	7	21	7.7
Alta	Max	28	37	18	13	21	32	28	19	13	20	22	32	37	38	42	32	40	32	17	22	16	19	22	34	26	30	40	42	27.5
	Min	4	12	4	-4	-2	4	18	10	-8	-6	1	1	12	16	16	18	30	17	2	0	9	-4	8	6	8	3	7	25	7.4
Amana	Max	22	27	25	20	5	-16	13	21	3	-18	8	-1	-3	4	2	20	26	23	6	7	2	1	7	4	4	1	-1	9	5.3
	Min.	5	0	20	5	-4	-16	13	21	3	-18	8	-1	-3	4	2	20	26	23	6	7	2	1	7	4	4	1	-1	9	5.3
Ames	Max	28	30	22	..	20	26	23	26	20	19	20	22	40	35	26	32	31	32	25	23	21	19	24	34	34	31	32	32	26.9
	Min	8	11	15	2	1	6	19	21	0	-14	10	-5	3	6	7	23	23	24	7	4	10	2	8	10	14	8	10	22	9.1
Atlantic	Max	31	33	27	17	17	26	28	26	15	23	23	27	37	39	44	35	46	40	20	25	25	20	25	39	34	35	42	44	30.1
	Min	10	12	13	-1	-6	-4	18	15	-5	-13	2	-10	3	4	9	23	32	29	10	6	16	4	13	11	14	6	4	28	8.7
Audubon	Max	32	29	32	30	29	38	35	28	15	33	30	35	40	48	42	41	42	42	28	25	32	30	22	36	31	35	45	38	33.7
	Min	1	-2	4	-5	-2	-1	3	-5	-10	-5	-7	-8	-3	-5	-1	22	24	14	10	8	12	4	1	9	6	10	2	5	2.9
Bancroft	Max	28	35	29	15	23	30	34	20	20	23	18	24	42	35	31	35	41	31	18	17	18	17	25	41	31	30	35	38	28.0
	Min	3	8	9	-4	-4	5	18	14	-3	-7	3	-3	8	15	13	18	26	18	-4	0	6	-4	6	3	7	6	5	20	6.5
Baxter	Max	30	28	22	18	20	26	30	25	12	25	22	28	44	29	34	37	42	35	18	22	23	22	26	38	33	33	33	33	28.1
	Min	12	13	1	-3	1	7	18	2	-9	2	-2	-4	-5	-8	-8	22	25	-7	-4	-7	-1	-7	-10	15	-5	-9	17	21	2.4
Bedford	Max	27	32	..	20	21	23	33	30	19	27	33	36	39	46	44	43	49	44	33	27	33	23	28	39	37	36	45	40	33.6
	Min	7	16	15	-5	-11	-7	15	15	-3	-17	2	-10	-5	3	11	23	31	29	13	5	13	3	12	7	17	10	7	7	7.2
Belknap	Max	31	33	..	..	-14	29	34	..	..	25	23	27	36	39	33	34	..	..	..	11	14	7	13	12	22	8	11	24	28.8
	Min.	11	11	22	2	-5	-4	5	22	7	-8	4	0	3	12	15	..	..	..	..	20	26	17	23	34	26	25	27	33	9.1
Belle Pl'ne	Max	24	32	..	..	13	28	29	24	..	18	20	19	33	29	28	36	40	34	..	5	5	5	0	1	4	7	2	3	26.6
	Min	4	5	8	3	-4	-5	2	19	5	-13	8	-1	1	6	7	12	24	23	5	5	5	0	1	4	7	2	3	12	5.3
Bonaparte	Max	31	30	30	21	10	23	30	27	23	23	27	24	37	37	35	31	42	36	29	20	23	17	22	36	32	28	32	31	28.1
	Min	12	17	21	1	-8	-9	8	21	5	-12	10	-3	0	8	19	21	28	29	13	9	7	7	9	12	21	9	11	21	10.2
Britt	Max	23	34	21	12	15	28	37	23	19	19	20	23	39	32	25	34	39	30	16	17	17	16	22	32	22	29	32	40	25.6
	Min	0	1	10	-3	-6	0	16	17	-3	-7	3	-3	2	13	12	20	26	15	-1	-1	6	-4	5	0	2	7	1	17	5.2
Burlington	Max	30	30	30	23	13	21	30	27	24	23	32	24	37	36	43	30	47	37	30	22	24	20	21	38	38	28	32	34	29.4
	Min	14	20	22	7	-5	-4	13	22	10	-4	14	4	7	14	21	20	26	29	12	8	7	8	10	12	20	14	14	19	12.6
Carroll	Max	30	32	28	17	28	30	28	25	..	23	21	30	40	42	44	35	43	36	30	24	21	21	25	35	31	33	42	42	31.0
	Min	15	4	15	0	0	6	18	15	-6	-5	5	-5	10	20	15	18	21	27	6	2	12	-1	9	8	12	5	3	25	9.1
Cedar Rap	Max	20	27	25	20	19	20	38	26	20	-2	-18	8	-1	-5	3	6	20	25	5	7	3	1	7	7	5	2	3	10	25.5
	Min	0	-6	19	1	-6	-15	14	28	23	26	22	29	39	42	34	32	44	39	32	22	22	22	24	35	34	31	35	31	4.8
Centerville	Max	31	28	27	20	14	23	31	21	4	-7	-1	5	12	14	21	23	30	30	14	9	10	9	11	12	20	9	13	26	29.3
	Min	11	18	19	-6	-3	8	17	21	4	-7	-1	5	12	14	21	23	30	30	14	9	10	9	11	12	20	9	13	26	12.5
Chariton	Max	31	29	27	20	16	20	31	28	23	19	25	28	35	38	34	34	44	37	33	22	24	19	24	35	33	32	36	33	28.9
	Min	9	15	18	1	-5	-2	18	20	4	-8	11	-2	7	11	17	23	30	29	12	8	13	6	10	10	18	7	10	9	10.7
Charles Cy	Max	20	28	22	18	9	21	27	29	20	15	18	18	37	32	31	30	38	29	-1	-1	3	-4	4	3	0	1	-1	7	23.4
	Min	0	-3	12	5	-6	-7	12	14	2	-14	-4	-7	-2	7	7	20	23	15	-1	-1	3	-4	4	3	0	1	-1	7	3.0
Clarinda	Max	32	36	27	15	21	26	32	29	16	28	25	32	39	44	44	39	48	43	33	26	27	24	28	42	37	39	47	43	32.7
	Min	10	20	12	-2	-3	3	17	14	-3	-10	7	-6	2	7	19	22	34	32	15	7	12	5	13	12	20	14	12	29	11.2
Clear Lake	Max	23	30	29	12	12	25	34	24	20	18	20	21	38	32	30	32	39	32	20	18	15	15	20	32	..	27	32	35	25.0
	Min.	0	3	10	-1	-7	-1	11	13	-1	-8	3	-5	7	8	13	20	24	12	-3	-2	4	-5	4	2	3	0	-2	13	4.1
Clinton	Max.	17	28	29	25	11	20	30	30	29	20	29	21	30	32	34	31	39	34	18	17	18	12	20	28	26	24	35	35	25.5
	Min.	3	-1	23	5	10	-12	8	12	5	-9	2	-5	3	-5	8	9	17	24	4	2	-5	-3	2	5	7	0	1	4	4.2
College Sp	Max	31	30	28	17	18	25	32	27	18	27	21	26	32	38	42	42	46	41	32	23	32	22	26	41	36	37	47	43	31.4
	Min	8	12	17	-5	-3	4	16	18	-2	-6	10	-5	4	10	15	19	35	32	14	6	16	5	11	10	17	12	15	28	11.2
Columbus J	Max	25	26	25	21	16	-6	-6	13	18	4	-6	10	2	1	13	18	25	21	8	6	3	4	6	16	10	4	8	16	26.0
	Min.	13	16	20	4	20	20	25	27	29	22	20	24	22	35	38	39	34	44	35	34	22	24	22	25	35	36	31	36	8.5
Coon Rap	Max	28	31	32	-1	0	8	18	16	-5	-4	7	-4	15	15	38	36	36	42	37	35	24	24	19	24	35	34	37	39	29.5
	Min.	9	13	13	18	16	23	29	28	19	20	24	24	32	38	12	27	21	31	31	12	5	15	3	10	10	17	10	9	10.4
Corning	Max	29	29	27	18	16	-5	2	16	17	-3	-11	6	-10	6	47	44	45	41	47	39	32	24	24	25	28	38	37	40	45	45	29.1
	Min.	8	11	16	-4	-5	2	16	17	-3	-11	6	-10	6	47	44	45	41	47	39	32	24	24	25	28	38	37	40	45	10.3
Co. Bluffs	Max	35	33	24	15	24	27	29	27	15	25	28	30	47	44	45	41	47	39	32	24	24	25	28	38	37	40	45	45	32.6
	Min.	10	18	10	0	5	13	20	11	-2	-2	5	17	35	25	29	27	36	..	..	11	13	8	19	22	18	12	17	21	13.0
Cresco	Max	15	29	21	..	..	21	28	22	..	14	15	17	35	25	29	27	36	..	..	11	13	8	14	26	18	12	17	21	21.7
	Min	-2	0	9	-1	-8	-6	9	14	-5	-11	0	-6	0	2	8	12	17	5	-5	-3	0	-4	2	-5	-4	-8	-10	2	0.7
Davenport	Max	19	27	30	22	8	19	29	25	25	3	-5	9	4	1	5	8	15	27	16	5	5	3	1	22	20	21	18	21	24.4
	Min	7	8	22	4	-5	-7	10	16	26	21	18	29	22	33	33	32	31	39	28	18	15	17	-6	3	-6	-12	-5	-12	7.0
Decorah	Max	16	30	23	20	9	22	32	26	20	6	-16	7	-8	-4	9	6	21	20	10	-2	2	-11	3	17	27	20	20	27	23.4
	Min.	0	-6	5	5	-9	-8	6	20	29	25	24	16	20	21	33	29	31	30	37	30	17	12	15	11	17	27	20	20	23.1
Delaware	Max	17	27	23	20	17	-10	-10	6	19	1	-13	1	-5	-4	2	31	30	37	30	17	12	15	11	17	27	20	20	27	0.2
	Min	-2	-5	13	2	-10	-10	6	19	1	-13	1	-5	-4	2	31	30	37	30	17	12	15	11	17	27	20	20	27	32	0.6
Denison	Max	32	34	29	14	-2	-2	2	13	-5	-5	0	6	-9	0	9	15	21	29	26	37	24	24	23	21	26	35	31	33	34	32	28.6
	Min	6	9	-5	-2	19	22	29	26	20	21	24	25	39	37	34	33	44	31	24	10	6	14	5	10	12	19	12	11	23	11.4
Des Moi'es	Max	32	32	25	18	19	22	29	26	20	1	-8	10	-2	8	9	37	29	42	37	28	22	28	20	26	39	30	33	38	35	29.5
	Min.	11	16	13	3	1	4	19	20	27	18	21	23	29	37	8	10	25	33	28	11	7	16	5	11	11	17	9	8	27	11.6
DeSoto	Max	32	34	26	15	17	32	34	27	18	21	23	29	37	8	10	10	25	33	28	11	7	16	5	11	11	17	9	8	27	11.6
	Min	11	14	15	1	-1	4	21	15	-1	-6	18	-3	8	40	31	25	32	39	32	20	18	17	12	22	31	23	28	29	35	24.9
Dows	Max	25	30	22	17	14	27	28	25	22	16	19	19	40	8	7	9	20	25	18	0	0	7	-3	5	4	6	22	21	24	33	23.5
	Min	-2	1	15	-1	-1	-2	17	19	-3	-11	2	-5	4	29	34	30	38	30	14	2	7	1	-2	6	26	5	2	4	1	0	5.5
Dubuque	Max	15	27	26	22	12	20	28	25	26	4	-3	7	4	-3	11	8	17	24	14	2	7	1	-2	6	26	36	34	30	34	32	29.2
	Min.	3	-1	20	5	-6	-10	11	22	28	25	23	24	24	38	40	33	32	43	37	30	21	29	20	26	7	10	17	6	4	20	7.2
Eldon	Max	31	30	29	21	12	12	23	33	20	2	-20	10	-9	-7	3	6	18	29	27	9	6	5	15	24	33	25	26	32	41	28.3
	Min.	10	12	19	1	-2	-15	11	26	27	27	25	28	30	41	34	40	33	39	37	15	22	19	-3	2	4	-10	0	-10	-6	-0.8
Elkader	Max	22	34	24	..	0	-10	-11	-11	12	7	-18	9	-6	-7	0	0	19	21	14	0	4	19	17	22	34	..	28	36	43	27.0
	Min	2	-9	-9	0	11	20	30	28	18	17	20	21	34	48	36	27	34	38	25	20	-1	-1	4	-6	5	5	6	2	-2	23	4.3
Estherville	Max	24	34	30	5	-5	-7	-2	13	10	-4	-15	1	-6	10	10	9	19	28	36	27	14	-2	1	-5	-5	4	2	19	27	19	-3	-2	-8	2	37	22.4
	Min.	5	3	22	16	9	20	27	24	20	14	19	23	35	31	3	5	21	22	14	-2	1	-5	-5	4	2	-3	-2	2	26	30	34	24.6
Fayette	Max	15	30	14	6	-7	-10	14	22	-3	-17	8	-5	-3	3	34	24	30	36	29	19	17	14	13	20	31	1	3	1	2	14	4.1
	Min.	-2	-5	14	6	-7	-10	14	22	-3	-17	8	-5	-3	3	34	24	30	36	29	19	17	14	13	20	31	1	3	1	2	14	4.1
Forest City	Max	23	35	22	15	14	26	28	27	19	18	18	23	40	34	11	8	20	22	15	-5	-2	4	-5	-5	1	3	35	32	31	34	28.6
	Min	1	4	12	-3	-7	3	11	14	-2	-8	2	-1	4	27	36	31	31	41	36	26	23	21	20	24	34	35	32	31	34	22	7.3
Ft. Dodge	Max	29	35	30	20	20	30	28	26	20	25	27	38	36	8	6	9	20	23	4	2	8	0	8	7	9	4	1	22	7.3
	Min	5	4	18	0	-2	9	15	18	-5	7	6	-8	7	8	6	9	20	23	4	2	8	0	8	7	9	4	1	22	27.5
Fruitland	Max	23	43	30	24	10	24	32	24	25	22	24	23	38	34	35	35	35	40	35	24	18	23	14	21	34	28	24	45	42	29.7
	Min	3	1	22	5	-10	-17	10	16	3	-19	7	-4	-11	0	0	20	20	24	7	6	0	0	0	5	10	8	0	1	4	4.0
Galva	Max	19	37	33	15	24	22	..	19	11	-6	-6	2	-6	13	9	11	27	28	20	25	23	25	22	26	40	38	37	46	46	32.3
	Min	6	9	-2	-2	-2	4	19	11	-6	-6	2	-6	13	9	11	27	28	20	25	23	25	22	26	40	38	37	46	46	32.3
Glenwood	Max	30	31	30	20	20	22	35	..	28	18	25	26	30	43	45	..	..	45	8	32	11	5	18	6	14	14	19	13	33	28	11.6
	Min.	10	15	20	0	-3	7	18	17	-3	-7	11	-6	11	10	12	24	8	37	30	18	18	16	15	26	32	5	28	27	29	35	25.8
Greene	Max	23	31	22	18	13	27	30	25	22	20	19	23	41	34	32	31	21	24	18	0	1	5	-2	6	5	28	6	3	1	11	5.5
	Min.	-1	0	13	5	-6	-2	15	19	1	-9	7	-4	1	8	9	42	40	44	40	31	25	27	19	26	38	35	34	43	38	31.4
Greenfield	Max	32	34	27	16	19	32	30	27	16	23	22	36	38	40	13	12	20	30	28	13	4	14	1	9	23	32	30	26	26	32	10.1
	Min	7	15	15	-5	-6	3	13	15	-3	-4	7	7	10	35	34	27	31	38	31	26	19	21	18	23	8	14	7	8	15	9	25.7
Grinnell	Max	25	27	25	14	12	21	28	27	23	17	19	20	35	8	6	7	22	26	25	8	5	7	1	16	22	32	27	27	29	32	9.2
	Min	7	14	17	2	-2	2	15	19	4	-3	22	19	23	35	30	27	32	38	33	26	20	19	2	0	5	5	10	3	3	15	26.0
Grin'l (nr.)	Max	25	27	24	20	12	28	34	27	20	2	-11	10	-1	3	4	8	20	26	25	7	5	2	20	24	31	26	27	29	32	25.8
	Min	5	10	20	1	-4	-2	15	20	25	23	18	18	23	39	31	29	30	40	32	24	20	3	20	16	24	26	6	-2	0	12	7.4
Grundy C'r	Max	24	29	23	21	14	24	29	16	21	-1	-10	6	-5	3	5	5	20	23	18	3	20	17	17	22	32	..	28	32	34	25.8
	Min	1	9	18	2	-0	-1	28	30	..	..	21	19	25	42	..	31	31	40	..	..	1	7	-2	6	7	9	5	5	15	5.4
Hampton	Max	26	33	..	..	1	-5	1	18	19	-1	-8	5	-2	10	7	12	23	25	15	1	12	24	19	24	37	30	33	43	43	29.4
	Min.	1	9	12	1	-5	1	18	19	-1	-8	5	-2	10	7	12	23	25	18	0	0	3	-1	9	8	12	5	3	25	7.0
Harlan	Max	29	32	27	14	18	26	28	25	16	22	21	27	37	38	42	37	44	37	29	22	24	14	1	10	7	14	7	4	26	8.9
	Min.	5	12	13	-2	-3	3	18	15	-3	-10	6	-7	3	9	14	23	30	28	8	3	14	1	17	23	36	32	26	30	37	28.0
Hedrick	Max	27	31	26	..	12	23	36	..	..	19	22	22	37	34	28	35	41	35	27	9	6	5	3	7	24	36	33	32	39	34	28.5
	Min	9	12	16	0	-5	-4	-4	19	21	-11	5	-3	4	9	10	17	33	28	37	30	22	22	17	24	10	12	19	9	13	28	11.6
Hopeville	Max	29	29	25	16	14	23	31	28	18	0	-7	7	-2	10	13	16	23	30	30	13	7	18	20	23	33	32	30	34	35	27.7
	Min	9	15	15	-1	-3	3	18	26	20	20	20	27	39	32	26	34	40	33	25	22	8	-2	8	6	28	23	23	21	31	7.8
Humboldt	Max	27	33	32	18	18	30	29	19	20	-4	-8	6	-4	4	10	6	22	38	23	5	2	13	11	19	28	23	23	21	31	22.4
	Min	5	7	18	0	-2	2	19	25	25	24	15	19	17	30	28	29	29	37	30	19	14	13	11	19	28	23	23	21	31	22.4

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR FEBRUARY, 1901—CONTINUED.

STATIONS		DATE																											Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Indianola..	Max	25	25	..	..	13	21	27	..	..	19	25	23	38	36	30	31	41	35	31	21	21	19	24	35	34	30	33	31	27.8
	Min	10	15	18	3	-3	2	18	21	0	-6	12	0	8	12	11	23	29	28	10	6	13	4	10	11	17	8	11	24	11.2
Iowa City.	Max.	23	31	27	22	9	23	31	25	24	21	20	23	36	34	32	29	41	33	22	18	18	14	20	31	26	24	28	35	25.7
	Min	5	-2	15	3	-7	-19	10	19	3	-21	6	4	-8	1	7	16	21	18	2	6	0	1	5	4	2	0	0	10	3.6
Iowa Falls.	Max.	23	30	22	12	12	25	30	24	20	17	19	20	36	29	28	30	37	30	15	19	16	17	21	30	26	26	28	34	24.1
	Min	0	0	10	0	-5	0	17	18	-3	-17	5	-7	6	5	5	20	26	13	2	1	6	-2	5	6	6	3	1	16	4.9
Keokuk ...	Max	29	30	31	17	13	24	30	27	21	21	31	23	32	40	40	32	45	38	19	22	21	17	22	37	35	28	33	32	25.7
	Min	15	26	23	9	-3	0	14	24	14	-1	16	6	9	19	26	23	30	31	15	10	10	11	10	15	28	13	16	23	13.9
Keosauqua	Max.	30	30	30	23	15	24	33	27	24	23	26	26	39	38	38	32	46	38	32	28	24	25	25	37	37	32	37	32	30.4
	Min	14	19	21	6	-3	-7	12	22	12	-6	16	2	1	11	23	23	30	30	15	10	11	9	11	14	24	12	13	23	13.1
Knoxville..	Max.	30	31	26	15	14	31	36	23	18	23	21	28	40	40	30	35	44	36	26	23	23	19	26	36	31	30	37	35	28.8
	Min.	7	11	15	-2	4	-2	9	17	0	-10	8	5	4	8	10	19	24	24	8	2	7	0	5	7	14	5	5	19	7.7
Lansing ...	Max.	24	31	..	22	..	24	26	27	28	..	28	28	40	30	40	34	32	38	25	22	20	14	25	28	27	24	28	38	28.1
	Min	4	-5	6	12	-6	-6	12	21	16	-11	8	-2	-3	12	4	24	28	12	1	4	-8	-4	-3	2	-3	0	-6	-6	3.6
Larch w o'd	Max.	27	35	..	11	22	34	31	22	23	22	22	38	48	44	42	35	36	33	18	20	17	18	25	34	30	31	44	44	29.9
	Min.	4	10	9	-5	0	4	15	9	-9	-4	-3	-2	15	15	15	15	17	13	0	-2	7	-4	5	2	5	0	4	28	5.9
Larrabee ..	Max	28	35	23	13	25	35	28	18	15	24	22	36	38	40	43	34	39	33	23	23	19	20	24	36	27	31	41	45	29.2
	Min	4	-1	5	-5	-3	2	18	10	-10	-8	-1	-2	12	10	9	17	29	23	1	-1	7	-4	6	5	6	0	4	26	5.7
LeMars....	Max	29	37	29	12	23	32	28	22	15	22	22	32	37	40	43	35	39	34	22	22	20	20	24	35	27	26	42	48	29.2
	Min	6	7	10	-3	0	0	10	12	-7	-5	0	-4	7	10	14	14	31	21	3	1	0	-1	4	10	8	4	23	30	7.3
Lenox..	Max.	28	28	28	..	16	23	29	28	20	20	23	27	33	36	38	36	42	37	34	23	25	19	23	36	34	33	39	37	29.4
	Min.	7	14	16	-4	-4	1	15	18	-5	-8	9	-9	4	10	11	22	31	32	12	5	15	2	11	9	17	8	12	28	10.0
Logan.....	Max	31	23	26	15	21	28	33	..	14	29	25	35	39	43	44	40	43	38	..	25	22	26	28	36	32	46	40	45	31.8
	Min.	4	10	11	-4	-5	0	13	7	0	-9	5	-9	5	10	13	20	29	26	7	0	1	12	16	17	15	22	22	27	9.5
Maquoketa	Max.	19	25	26	24	15	19	31	26	26	19	28	26	35	32	36	30	39	39	25	19	25	19	23	31	30	31	29	38	27.3
	Min	1	-11	19	-10	-14	-18	5	19	11	-11	-2	1	-10	1	2	19	22	19	2	5	-6	-4	4	5	-3	-2	-2	-6	1.2
Marsh'l't'n	Max.	27	30	27	20	16	24	31	28	24	20	21	24	38	33	31	32	42	34	28	23	22	19	25	35	30	29	30	34	27.8
	Min	6	8	18	3	-3	0	17	21	1	-12	10	-4	8	6	4	23	26	25	6	6	7	0	7	10	11	6	7	16	8.7
Monticello.	Max	28	28	..	28	30	26	32	27	25	24	26	25	35	34	30	30	34	39	28	..	18	14	27	33	32	34	38	40	29.4
	Min.	3	7	5	8	-8	-13	13	7	8	-14	10	-4	-9	10	5	14	10	5	2	-2	-5	-6	-2	-1	-2	-3	-6	0	1.1
Mooar	Max.	32	32	32	23	10	18	33	32	37	42	44	41	35	40	41	39	42	37	37	21	20	17	18	20	37	28	22	35	30.9
	Min.	8	9	12	2	-6	-12	13	12	16	15	22	20	16	11	10	13	19	21	20	3	2	-7	2	5	15	6	3	16	9.6
Mt. Ayr ...	Max.	30	29	27	16	14	25	31	27	20	23	24	27	29	40	37	35	43	40	33	22	24	18	24	37	32	33	41	37	29.2
	Min.	8	15	16	-3	-2	1	15	17	-1	-7	10	-3	3	9	15	28	30	30	13	6	16	4	12	8	20	11	15	28	11.2
Mt. Plea'nt	Max	29	31	32	24	11	20	35	26	24	20	26	20	36	34	34	33	42	37	30	19	24	20	22	35	33	25	27	35	28.0
	Min.	11	14	20	4	-5	-9	10	20	8	-12	7	2	-2	5	15	20	27	27	12	17	6	9	11	9	19	8	9	16	9.9
Mt.Vernon	Max.	22	23	24	..	..	22	28	25	..	..	22	27	38	34	36	31	40	32	..	..	19	16	21	31	26	25	30	32	27.5
	Min.	2	5	14	4	-7	-10	8	15	6	-10	7	-2	-2	7	5	16	21	19	4	4	0	-2	4	4	9	1	1	7	4.6
NewH'pton	Max.	15	28	23	17	8	20	26	24	22	13	18	19	33	28	30	26	35	28	15	12	11	10	17	26	24	20	32	33	21.9
	Min	-1	1	13	5	-8	-8	9	19	1	-10	7	-4	0	8	9	20	22	14	-3	-2	-2	-6	3	1	3	-2	-2	6	3.3
Newton....	Max.	27	29	27	20	15	24	28	27	24	18	20	20	37	34	28	32	41	34	28	21	22	18	25	34	32	31	28	32	27.0
	Min.	7	10	18	1	-4	-2	16	16	-1	-15	11	-2	4	3	8	22	22	25	7	4	7	0	6	8	14	16	7	29	8.2
Northwood	Max.	22	33	22	12	12	26	32	26	24	22	20	23	41	35	31	34	40	31	19	17	15	15	21	31	30	28	31	36	26.0
	Min.	1	4	11	-1	-7	4	15	15	0	-10	4	-2	2	13	14	20	24	14	-3	-2	4	6	5	3	5	0	1	10	4.9
Odebolt....	Max.	29	35	29	15	23	31	30	25	16	24	22	34	38	42	42	38	41	35	30	22	20	20	24	34	28	32	42	43	30.1
	Min.	6	10	13	-1	-1	8	18	15	-7	6	2	-1	13	15	15	20	22	28	6	3	12	-1	9	2	8	5	2	26	8.6
Ogden.	Max.	27	32	29	24	20	28	30	26	23	21	21	25	36	32	28	34	42	34	9	22	21	20	26	35	29	29	34	33	28.3
	Min.	1	8	16	-1	-3	1	11	17	-7	-15	4	-8	3	5	9	20	26	24	5	2	6	-1	6	4	7	0	1	21	5.8
Olin..	Max.	20	25	25	22	11	19	29	29	25	15	22	18	31	28	30	31	40	..	24	16	19	12	20	28	22	20	21	34	23.6
	Min.	0	-11	18	8	-12	-18	7	19	9	-17	9	-1	-9	-3	7	16	24	18	4	5	4	5	5	4	-3	-3	-5	0	2.9
Om'ha Neb	Max.	33	32	24	13	19	26	28	27	14	25	25	32	42	43	44	40	46	39	26	22	22	25	25	39	34	38	44	44	31.0
	Min.	11	21	10	0	7	14	20	11	0	2	10	7	17	22	27	27	36	26	10	5	14	6	13	13	19	15	17	32	14.7
Onawa....	Max.	37	34	32	19	28	33	32	29	19	24	22	37	45	47	44	38	44	37	27	24	22	24	25	43	36	39	43	46	33.2
	Min	7	12	16	-1	4	9	20	15	5	-4	4	-3	9	9	18	24	32	27	7	3	14	4	11	9	13	7	9	28	10.6
Osage.....	Max	17	28	22	15	8	21	26	23	21	15	19	19	35	28	30	29	36	29	12	12	12	12	19	25	19	22	22	32	21.7
	Min.	0	1	10	2	-8	-1	12	14	1	-9	5	-4	1	10	7	20	21	12	-4	-2	3	-6	4	1	3	-1	-1	6	3.5
Oskaloosa .	Max.	30	30	28	18	13	28	34	34	24	22	22	28	39	37	28	34	42	35	25	20	25	18	20	36	31	28	31	34	28.4
	Min	9	11	18	0	-5	-8	17	20	-4	-17	7	-5	-1	5	4	22	28	24	10	7	7	2	7	9	14	6	5	19	7.5
Ottumwa ..	Max	28	31	..	..	12	21	31	..	..	22	21	23	38	..	31	33	46	37	..	22	25	20	24	36	33	28	31	35	28.5
	Min.	13	19	20	4	-1	4	17	21	11	-10	10	4	5	14	14	27	31	29	16	11	13	9	12	13	22	11	12	25	13.4
Ovid..	Max.	33	30	25	17	18	22	31	23	15	25	27	31	39	40	37	35	45	42	20	25	25	19	26	39	34	33	39	33	20.6
	Min.	8	16	15	-3	-8	-4	16	18	-4	-11	6	-4	4	10	15	22	29	26	13	7	13	3	9	9	15	5	9	25	9.2
Pacific Jct.	Max.	33	33	32	..	25	30	31	29	18	28	23	31	41	40	45	43	48	43	..	26	31	24	27	42	35	40	48	48	34.3
	Min.	10	11	20	-5	-6	4	19	17	-5	-8	5	-5	5	12	20	23	32	33	15	6	18	6	14	9	15	9	10	25	11.0
Pella. ..	Max.	30	27	22	21	19	28	25	22	19	18	26	18	40	43	26	40	46	38	22	25	20	23	26	36	36	33	30	32	28.3
	Min.	10	5	1	-3	-3	0	-10	-10	-12	0	-4	4	9	12	10	20	23	25	12	5	8	3	5	5	5	6	6	4	4.9
Perry	Max.	29	33	29	19	20	26	30	27	20	22	23	30	39	35	32	37	42	36	30	30	25	20	23	40	32	30	37	35	29.7
	Min.	6	13	18	0	0	4	20	19	-2	-8	10	8	7	5	8	23	29	29	8	5	15	2	5	9	9	5	5	24	9.3
Plover.....	Max.	29	28	20	10	24	32	30	20	15	20	22	33	40	35	29	36	40	32	23	24	21	22	24	33	28	29	34	40	27.7
	Min.	5	19	17	-2	-4	1	15	15	-5	-10	-1	-4	13	11	12	25	30	22	2	0	7	-5	7	3	1	4	2	23	7.6
Primghar..	Max.	18	27	..	..	17	25	..	23	..	17	17	27	30	40	43	38	32	30	..	17	..	17	..	17	..	..	18	20	24.9
	Min.	4	10	8	-5	-4	6	16	10	-12	-6	3	3	10	15	4	18	20	15	0	0	8	-5	6	3	5	10	15	10	6.0
Red Oak...	Max	31	30	28	17	21	28	29	28	19	26	23	31	37	39	42	36	45	25	28	23	25	21	23	40	34	37	45	48	30.6
	Min.	8	10	18	-4	-3	4	17	18	-3	-9	8	-9	7	5	10	21	33	12	10	5	12	4	12	11	16	9	10	26	9.2
Ridgeway .	Max ..	18	33	27	23	20	28	30	26	26	26	28	28	38	31	39	32	37	30	16	22	20	13	24	26	26	22	31	35	27.0
	Min	0	5	10	3	-5	-3	11	20	5	-4	10	-1	5	11	7	22	20	11	-2	0	0	-6	5	2	4	-3	0	5	4.7
Rockwell C	Max	28	34	30	14	22	30	30	..	..	20	23	29	37	34	33	35	42	34	..	24	21	20	24	36	28	30	37	37	29.3
	Min.	5	12	10	-1	0	8	19	16	-6	-10	4	0	11	8	9	18	29	25	5	2	10	-2	8	8	10	4	7	25	8.4
Ruthven..	Max.	24	28	..	10	18	29	..	..	..	16	18	30	37	43	..	30	31	..	..	20	..	15	20	25	25	..	32	34	25.3
	Min.	3	10	10	-5	-5	3	10	4	-5	-4	-8	1	12	23	11	18	22	12	0	0	0	-5	-5	5	5	0	3	23	4.9
Sac City,...	Max ..	28	34	29	15	22	32	28	27	17	20	22	30	38	36	39	32	40	39	29	23	21	20	25	34	30	31	38	40	29.2
	Min	5	10	12	-1	-1	..	19	15	-6	-8	3	-4	10	13	10	18	30	26	5	3	10	-2	8	8	10	4	5	25	8.4
Scranton ..	Max ..	27	31	30	17	20	27	27	27	20	20	21	26	36	35	35	34	40	35	31	22	23	19	25	34	32	30	35	34	28.3
	Min	7	14	17	1	1	8	19	18	-4	-4	2	2	13	15	11	19	30	27	8	4	13	1	9	10	13	7	10	25	10.6
Sheldon ...	Max.	27	32	..	9	20	31	..	25	17	20	20	30	39	41	40	32	37	33	18	20	17	19	24	34	25	30	37	44	25.8
	Min	5	9	8	-5	-3	4	8	12	-10	-7	0	0	0	0	15	18	29	18	0	0	-10	-5	7	5	5	1	2	27	4.8
Sibley	Max.	27	34	26	12	20	31	28	18	16	23	24	37	46	45	40	33	36	31	18	22	17	17	23	33	29	30	40	44	28.6
	Min.	3	5	7	-5	-6	-2	17	9	-7	-7	-1	0	11	12	14	15	28	17	-1	-1	5	-5	5	3	5	1	-1	20	5.0
Sigourney .	Max.	28	34	27	21	13	27	36	27	24	24	22	30	42	37	31	33	41	36	31	20	24	18	23	36	31	27	32	38	29.0
	Min.	8	11	19	2	-5	-6	15	20	6	-12	12	-2	5	6	9	19	27	27	10	6	4	3	8	8	15	15	6	15	9.0
Sioux Cen.	Max	28	34	28	12	22	33	28	23	16	20	21	32	37	39	40	35	37	35	25	22	22	20	25	34	30	32	40	45	29.1
	Min	5	13	7	-6	1	5	20	10	-10	-5	-3	1	9	13	19	20	28	20	0	-2	10	-3	6	6	5	2	8	30	7.5
Sioux City.	Max.	30	36	22	14	24	32	30	17	12	22	18	35	41	41	42	33	42	34	16	20	18	19	25	35	29	34	41	44	28.8
	Min.	9	13	15	-2	4	17	22	14	-8	-4	1	-3	13	15	26	24	35	23	5	1	13	2	10	10	10	8	7	31	11.1
Spirit Lake	Max	22	33	18	10	..	..	..	14	20	..	23	37	48	39	26	37	35	..	16	12	16	22	23	34	24	29	35	42	26.7
	Min	2	9	9	-5	..	..	..	9	13	..	-5	0	12	16	13	24	23	16	-4	0	5	4	5	3	5	4	8	16	7.6
Storm L...	Max	28	35	26	13	21	32	27	23	14	18	20	30	35	35	40	30	39	33	23	22	18	19	23	32	26	30	38	42	27.6
	Min	5	13	9	-4	-3	6	18	13	-7	-9	1	-3	12	14	11	18	28	21	3	0	8	-4	6	6	8	3	4	25	7.2
Stuart	Max	32	34	..	17	19	24	30	25	14	22	22	30	40	43	45	39	45	..	32	25	18	15	17	35	30	..	30	35	28.7
	Min.	12	13	-3	-3	-2	14	20	-2	-5	0	0	2	8	7	12	15	30	28	8	11	7	0	8	10	15	7	10	20	8.5
Thurman..	Max	31	29	29	28	17	25	30	..	17	26	25	26	39	39	43	39	47	42	36	22	25	26	25	40	37	37	44	47	32.3
	Min.	9	17	18	2	10	-1	10	17	-2	-13	10	-8	10	18	17	23	34	34	12	6	18	6	14	11	29	10	12	27	11.6
Toledo.....	Max	30	..	..	21	20	..	30	30	..	23	20	20	42	32	30	35	42	35	32	30	28	26	25	30	..	30	32	34	29.4
	Min.	5	3	4	3	-4	-5	2	18	3	-15	3	-3	-2	-5	3	4	15	20	12	15	4	0	6	6	23	3	3	10	4.7
Villisca ..	Max.	30	33	26	13	20	30	32	31	25	28	23	31	36	39	42	39	46	32	30	28	32	36	38	42	40	37	37	43	32.8
	Min.	6	12	18	-5	-4	0	15	-5	-10	10	-10	-8	0	8	10	19	30	20	4	5	16	14	12	12	14	14	8	27	8.3
Wapello ...	Max	28	29	30	28	14	19	28	25	25	19	26	23	32	32	35	45	37	35	30	22	23	18	20	31	33	30	27	32	27.7
	Min.	11	11	22	9	-6	-7	13	20	8	-5	12	4	2	10	14	20	27	28	11	8	5	6	9	11	21	8	8	13	10.5
Washi'gt'n	Max	27	30	28	18	12	25	29	24	18	23	23	23	40	34	32	30	41	35	..	20	22	..	22	34	30	26	27	34	27.1
	Min.	6	10	16	-2	-8	-10	-5	16	-2	-13	-9	-2	-2	1	9	13	25	24	6	4	0	2	5	5	14	3	4	11	7.9
Waterloo..	Max	23	28	23	17	16	22	24	26	24	23	21	21	38	31	31	31	40	36	21	23	19	18	24	31	25	26	24	32	25.6
	Min	2	0	8	5	-3	6	12	17	7	-13	6	8	10	13	14	13	17	11	0	4	6	0	8	5	5	1	3	8	6.2
Waverly ...	Max	21	31	23	18	11	26	30	25	22	19	19	21	37	31	30	32	39	29	16	17	17	16	23	31	23	23	25	35	24.6
	Min	1	0	17	6	-4	-4	16	22	2	-15	9	-3	0	7	8	21	24	16	1	2	5	-2	7	5	2	4	1	10	5.6
Whitten...	Max	26	32	20	19	12	22	32	27	22	12	18	22	35	32	30	33	40	32	27	19	20	..	..	32	27	..	..	..	26.3
	Min	24	19	1	1	-5	-2	6	20	-2	-12	8	-5	2	5	5	21	25	13	3	3	4	..	..	5	7	..	..	..	7.1
Wilton Jc .	Max	20	29	28	23	10	22	32	25	25	18	23	20	34	33	31	32	41	37	15	23	14	20	31	26	22	24	34	26.0
	Min	3	0	23	7	-8	-14	8	19	11	-15	8	0	-6	3	6	15	25	23	6	5	-3	0	6	5	4	0	1	5	4.9
Winterset	Max	30	31	21	15	16	25	29	25	24	22	22	32	38	42	35	35	43	36	30	22	24	19	24	36	31	31	36	34	29.6

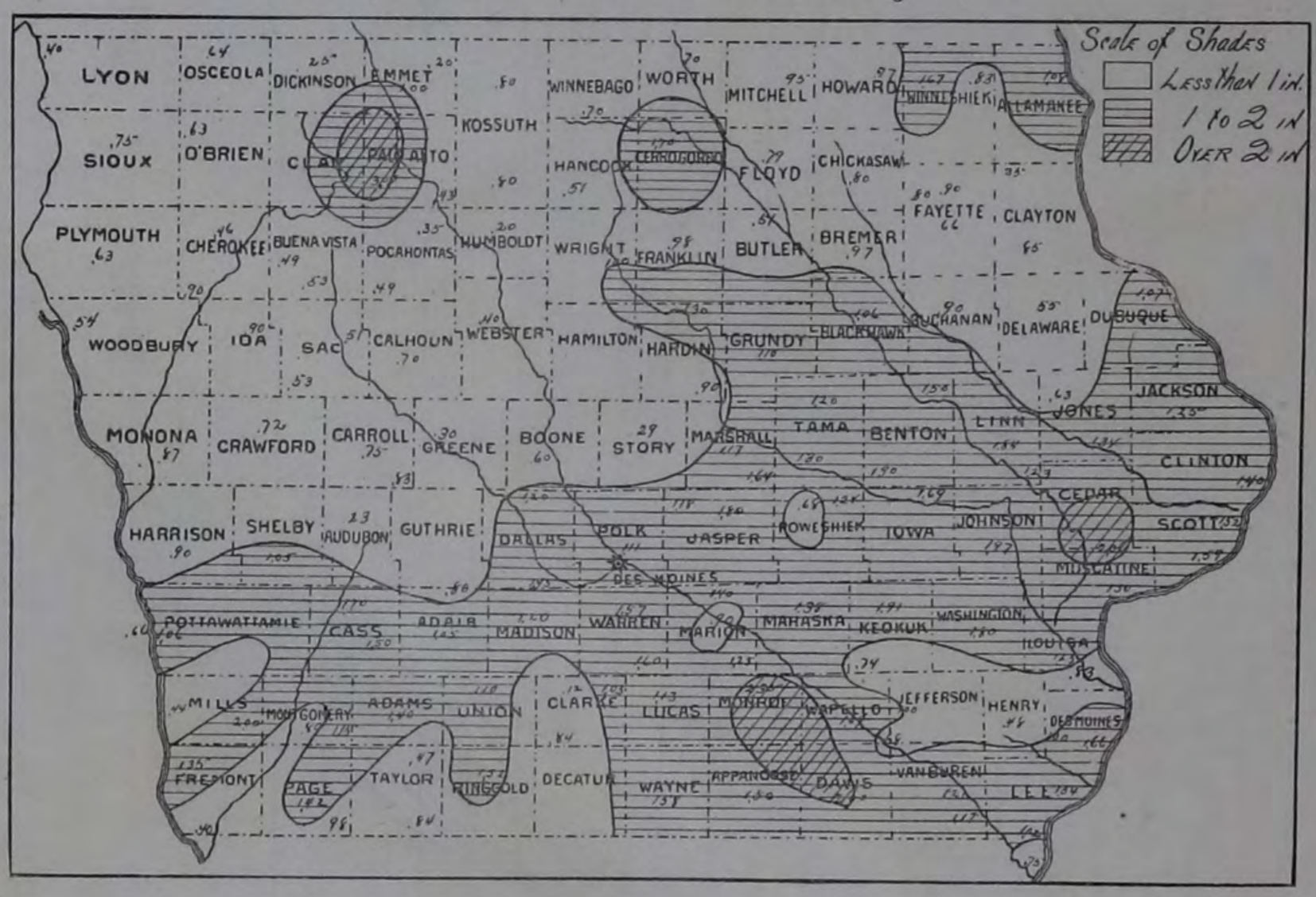
DAILY AND MONTHLY PRECIPITATION FOR FEBRUARY, 1901.

STATIONS.	DAY OF MONTH																											TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Afton		T	.60					.50													T.	T.					.20	T	1.10
Albia		T.	1.40				.05	.70									T.			T.	T.	T.					.05		2.35
Algona						.15		.35									.25	T.			.02		T.					.05	.80
Alta							.02	.35								.10													.49
Alta (near)																					T	T.	T.						1.69
Amana			.69			T.	T.	.71	.09								.20											.20	.29
Ames			T.				T.	.09									T.						T				T.	T.	1.70
Atlantic			.60					.80								.10					.20								.23
Audubon		.05					T.	.18										T.	T.				T.					.10	.80
Bancroft							.10	.30	.10								.20				T.					T.			1.00
Batavia					1.00			T																				.01	1.18
Baxter			.30			.05		.52								.30					.02		T.						.84
Bedford		T	.46				T.	.36													T.							.20	2.00
Belknap			.60	.40				.40	.40												T.								1 90
Belle Plaine			.60			.10	.05	.50	.10								.55					T.			T.			.05	1 17
Bonaparte		.80						.32																				T.	.51
Britt							.10	.15	.03								.23												1.20
Buckingham			.28				.02	.75									.15		T.		T.								1.66
Burlington		.12	.70	.08			T.	.50	.10								.11				T.	T.	T.	.05					1.25
Bussey	T	T.	.40			T		.85																		T.	T.		.75
Carroll			T					.65									.10												
Carson																													
Cedar Falls																													1.84
Cedar Rapids			.90				.25	.60								.08					T.						T.		1.50
Centerville							T	.20													T.							.04	1.13
Chariton		.10	1 20			T.	.02	.39									T.		T.	T.	T.	T.	T.						.79
Charles City		.02	.66				.05	.25	.04								.45				T		T						1.42
Clarinda								.50													.06								.70
Clear Lake			.86			T.											.10					T.	T.						1 40
Clinton							.20	.30	10								.13												.98
College Springs		.01	.75					.50			.01										.07								1.23
Columbus Junction		.09	.50				.02	.30											T.		T.		T.	T.					.83
Coon Rapids		T.	.69	.02			T.	.45	T.								.07												1.40
Corning			.10				T.	.70	T.								03											T.	1.06
Council Bluffs			.95					.40									T.	T.			05								.77
Cresco		.02	.32			T.	.03	.69															T.		T.				1.50
Cumberland							.05	.25	.07								.40				.10					T.			1 00
Danville			.60			T.		.80																					1.59
Davenport			.60					.40									.06				T.		T.	T.			T.		.83
Decorah		.02	.93	.03			T.	.50	.04		.01						40												.55
Delaware								43																					72
Denison			.05				04	.36									.10				.05							.01	1.11
Des Moines				.02				40									.02	.25		T	T.	T.	T.					.10	1.45
De Soto			.26			T.	.03	.77	.02								T											T.	1.00
Dows							.05	1.00																					1.07
Dubuque	T.		30				.10	.60									30			T.	T.	T	T.	T.				.05	.68
Eldon			32	.02		T.	.01	.23	.25							T.	.24												.85
Elkader		.03	.45					.14	T.								.01												2.00
Emerson			T.				T.	.57									.28												1.00
Estherville			1.00					1.00																					
Fairfield						T.	.10	.15	.70								.05	T.					T.	T.					.66
Fayette																					T.								.49
Fonda			T.			T.	T.	.18									.14				T.							T.	.70
Forest City								.10	.40								.31						T.						.40
Fort Dodge								T.	.40							T.		.20	T.									T.	1.04
Fort Madison									.40												T.		T.						1.50
Fruitland			.65						.39									.30					T.						90
Galva		.10	.70					T.	.40												T.								1 64
Gilman								T.	.50							.40		.24					T.						.70
Glenwood				.40					1.00												.05								.35
Grand Meadow			.40					.05	.25									.30											.57
Greene								.06	T.									.25											1.05
Greenfield		T.	.44					.02	.13	.07								.27	T.		.01	.01	.01					.01	.68
Grinnell			.08						.55									.27											1.24
Grinnell (near)			.40				.04	.55	.15									.10		T.									1.10
Grundy Center		T.	.10				.10	.50	.20									.20											
Guthrie Center																													.40
Hamburg																													98
Hampton			.05	.35				.18	.50									.30					T.					T.	1 05
Harlan								.02	.65	T.								.02	.01	T.		.20	T.	T.					.90
Hawkeye			.05							.70								.20											.74
Hedrick								T.	.40	.20																		T.	.84
Hopeville		.04		.10			T.	.01	.35															T.				T.	.20
Hoprig			.48					T.	.05	.15								T.										03	.50
Humboldt									.40									.06											.90
Independence								.01	.40									.05					T.					.02	1.57
Indianola			.20						.65									.10			T.	T		T.					
Iowa City		T.	.50			T.	.05	.80	.10									.33						T.					1 97
Iowa Falls			.83					T.	.81			T						.25		T.	T.	T.	T.	T.				T.	1.30
Keokuk								.15	.90									T.				.01	T.	T.				.10	0.75
Keosauqua		.12	.27					T.	.25	T.		T						T.		T.	T.		T.	T.		T		.11	1.21
Knoxville		.10	.70					T.	.28	.02								T.				T.							.90
Lacona		T.	.45					T.	.45												T.		T.					T.	1.60
Lansing			.80					.10	.60									.10		T.				T.					1.08
Larchwood								.12	.25	.18								.53											.40
Larrabee								.05	.10								.05	.25	T			T.	T.						.46
Le Claire			.01	.70				.03	.38									.12				T.	T.	T.					1.52
Le Mars									T.	.69		T.					.03		T.										.63
Lenox		.03	.10						.60									T.											.47
Logan			.20						.60													T.							.90
Maquoketa			.60						.50			T						.15	.10										1.25
Marshalltown			.23					.05	.48	.17								.24											1.17
Melrose																													.63
Monticello			.28			T.		.28										.07				T.						.24	1.02
Mooar		.58	.20																									.05	1.52
Mount Ayr		.05	.77					.60														.05							.48
Mount Pleasant			.32					.16	T.									.19		T.		T.		T.					1.23
Mt. Vernon			.60				.01	.42	.01		T.												T.						.12
Murray			.04			T.			.08									.20						T.					.80
New Hampton							.10	.20	.30								.37											.05	1.80
Newton			.45					.93										.30								T.		T.	.70
Northwood						T.	.10	.30														.03							.53
Odebolt							T.	.50										.18				T.	T.	T.				T.	.60
Ogden			T.			T.	08	.27	.07								T.	.12						.01					1.34
Olin			.60	T.			.01	.60	T.										T.	T.			T.		T.				.66
Omaha		T.	.36				T.	.30	T.																				

DAILY AND MONTHLY PRECIPITATION FOR FEBRUARY, 1901—CONTINUED.

STATIONS	DAY OF MONTH. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	TOTAL.
Onawa	...		.02		T		T.	.65	..		....			...	...	....	T.	.15	....	....	.05	....	T					T.	.87
Osage	....			.10		.30	.15	.27	.06		..	...	T.	...	..		.47	T.	....	...	T.	T.	T.	....	...	T.		....	.95
Osceola	..		.40	..	...	..	....	.50		..		..		...	..	..	....	...	..		....			....	....		....	....	1.30
Oskaloosa	....	.11	.80		....	....	.04	.57	....			..	....	..	..	..	.27			....	....	T.	....		....	....	T.	...	1.38
Ottumwa		.03	.96		.		.70	...		....											..	..	...			.	...	.08	1 69
Ovid		T.	.03	..		....	.02	.24		..	..		...				..	...	..	..	.02	..	....	.01		..		.08	1.58
Pacific Junction	...		.60	....	..	..		.80	....	..				....			....	....		....	.15	..	..		....	....	T.	....	.44
Pella			.20				T.	1.00	..			.		..			....		....	..	....		T.	T.		T.	T.	1.40
Perry			..	....		T.	.10	.20				...	.	..	..		05		..	..	.	.	....	....			T.	....	1.20
Primghar		T.	.40		...	..	T.	.40	.	..		..	....	....		..	T.	..	...		T.			....	....	..	....	....	.35
Red Oak	...	....	.	..	..	..	.12	1.00	..	....	..	....	....	....		..	.55	....	....	....	T.	....	..	..	....		....	....	.80
Rockwell City			..		....	....	..	..	.60	..		....	....		....	..	.10		..		..		..	..	..	..	....	..	1.67
Ruthven	..	..		..	....	T.	1.00	2.00	..	....		.	..	....	....	..	T.	....		.	T.	....	T.	T	..	..		....	.70
Sac City	....	..		....	....		T.	.48	..		.	....	..		..	..	.03	T.		....	T.	....	....	....	....	....	....	T.	3.00
Scranton			T.		...		T.	..	.30			.		....	....	....		....		..	..	....	....	....	....	....	T.	.51
Sheldon	.				..	T.	.03	.30					..			....	.30	T.	..	..	T	T.	T.	....	....	....	T	....	.30
Sibley	....					T.	.05	.16	T.		....	..					.43	T.	....	..	T.	T.	T.	....	....	....	....	....	.63
Sigourney	....	T.	.70	..		T.	.05	.80	.10	..				....	....	....	.26	....	T.	....	T.	....	T.	....	....	....	....	....	.64
Sioux Center	....			..	T.	T	.05	.60		....		..		..			.10	T.	..		T.	T	T.	....	....	....	....	T	1.91
Sioux City	...		.		..	T.	T.	.45	T			..					.04	.01	..	T.	.02	T.	.01	....	....	....	T.	....	.54
Spirit Lake		..	..	....	..	....		..	.20			..				.05				..	T.	T.	T.	....	....	....	....	....	.25
Storm Lake	..	....				T.	.01	.40	....					....			.11	T.			.01	....	T.	....	....	....	....	T.	.53
Stuart		.30						.50		....		..		..	..	....		T		T.	T.	....		....	....	....	....	T.	.80
Thurman		T	.60	..	..		T	.40	.05			..	....		..		...	T	T.	..	.30	T.	T.	....	....	....	T.	T.	1.35
Toledo	....		.80	..	....	.	.10	.40		.	..		..	.	....														1.30
Villisca		T.	.60	..	..			.48				..			..			T.	T	T.	.10	T.	T.	....	....	....	....	....	1.15
Vinton	...		.40				.10	1.00	....			..	..	..		....	..	..			..	....	....	....	....	....	....	....	1.50
Wapello	.02	.22		....				.59		...	..	.		....	..	....		...	..			....	....	....	....	....	....	....	.83
Washington	....		1.10		..			.50								....	.10			..		....	....	....	....	....	....	....	1.80
Washta	..			..		..	T.	.70	.			..		....	.	.20		T.			T	....	....	....	....	....	T.	....	.90
Waterloo			T.	..			.45	43				..	..	..		.	.18					....	....	....	....	....	....	....	1.06
Waverly	..		T.		..		.10	.40	.20			..	....		....	..	.27					....	....	....	....	....	....	....	.97
West Bend	....					T.	.10	.20				....	....	..	..		.10	..			T.	T.	T.	....	....	....	....	....	.43
West Union	..	....	..		..		80			.	..	....	.	..	..		....	....	....	..	....	....	....	....	....	....	....	03	.80
Whitten		....	T.	..	....	..	T	80	.10						..	.	T				....	....	....	....	....	....	....	....	.90
Wilton Junction	....	T.	1.30	...	....		..	.56					....			..	.20		..	..	....	T.	....	....	....	....	....	....	2 06
Winterset	..		.60	..	.		T.		.60	....	....					..	...		..		....	....	....	....	....	....	....	T	1.20
Woodburn	...	T.	.70		...			.30	T.				..				..	...	..	T	T.	....	....	....	....	....	....	.03	1.03

Precipitation Chart February 1901.



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U. S. WEATHER BUREAU, ASS'T DIRECTOR.

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DES MOINES:
BERNARD MURPHY, STATE PRINTER
1901.

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MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XII. MARCH, 1901. No. 3.

SPECIAL HAILSTORM REPORTS.

It is well known that hailstorms cause very heavy damage to crops, the aggregate probably exceeding the loss suffered annually from effects of all other storms. It is desired to make a special investigation as to the frequency, severity, and extent of these destructive visitations, and to the end that the requisite information may be obtained we solicit the co-operation of voluntary observers, crop reporters, officers and adjusting agents of insurance companies that issue policies covering this class of hazard, and all others who are interested in the subject of inquiry. By this method we aim to collect and tabulate a large amount of data which will be valuable from a practical as well as scientific standpoint. Reports of hailstorms should, if possible, include notes of the date, hour of the day, breadth and length of the hail belt, the sections, township and county traversed by the storm, the general direction of movement, size of hailstones, character of the storm, whether moderate or very destructive, and all other phenomena of general interest. Newspaper clippings relating to such storms will be valuable and helpful. Observers and crop reporters are requested to make use of the stationery, envelopes and weather blanks in their hands in mailing special hailstorm reports on the date of occurrence, or as soon thereafter as may be practicable. All classes of citizens are invited to contribute reports.

FIRST CROP BULLETIN, 1901.

Following is the summary of the first weekly Climate and Crop Bulletin of the season of 1891, issued April 9.

The crop season is ten days to two weeks later than usual on account of excessive moisture, and several days of drying weather will be necessary to put the soil in condition for seeding and plowing. Frequent storms of snow, sleet and rain in March, with continued wet and cloudy weather the first week in April, rendered field work practically impossible in all portions of the state, except very limited areas in the southwest district, where a beginning has been made in sowing wheat, oats and clover seed. In some other sections a start has been made during the past week in plowing sod ground. The plowed fields are generally saturated, and the highways are well nigh impassable. Grass wintered in excellent condition, and the season is thus far very favorable for pastures and meadows. Winter rye looks well, and the small acreage of winter wheat appears to be unusually promising.

All reports indicate that farm animals are in good health. The cold and wet weather has been somewhat unfavorable for the early pig crop.

Fruit buds appear to be uninjured in all sections of the state.

CONCERNING LATE AND EARLY SEASONS.

In respect to seeding and general farm operations the season of 1901 is ten days to two weeks later than the average. The temperature has been seasonable, but excessive cloudiness and frequent storms of snow, sleet and rain rendered field work well nigh impossible throughout March and the first ten days of April. The question is raised, what will be the effect of this belated spring upon the output of the season? Possessing no gift of prophecy, or ability to forecast weather conditions months in advance by star reading or other occult system, we can only judge of the future by the past. The records of this office covering a little more than a decade show that these adverse conditions at the outset of the season are not unprecedented. Some of our most productive seasons have been exceedingly unpropitious at the start, as the following notes will show.

The spring of 1891 was exceedingly late and altogether unpromising The average temperature of March was about 6° below normal, and excessive precipitation retarded field work. The first half of April was cold, wet and cloudy, causing still further delay in farm operations. The season was reported two weeks late by crop correspondents. But the final report issued Dec. 1, showed that it was one of the most prosperous crop seasons ever enjoyed by the farmers of Iowa.

In 1892 conditions were favorable at the outset, but the reports showed heavy storms of snow, with a blizzard about the 10th and 11th of April. In the northern districts the railways were blockaded by drifts, and all farm operations were delayed. A second severe snow storm occurred on the 20th of April. The output of that year was below the average, caused by adverse weather later in the season.

The first bulletin issued in 1893, dated April 11, gave a very flattering outlook, the season being a week earlier than usual, with excellent progress in seeding and plowing in the last week in March and first decade of April. But the last half of April and first half of May brought somewhat adverse conditions which served to offset the exceptionally favorable opening of the season. The crops of that year were only medium

The crop season of 1894, the year of the great drouth, was notable for its very early opening and extraordinary prospects prior to the middle of July. The first bulletin dated April 10, said: "Farming operations were begun three weeks earlier than the average, and in the central and southern districts more than half the usual amount of small grain was sown before the 20th of March." The very low yield of that season was the result of

the unprecedented midsummer drouth and scorching hot winds. The drouth might not have been so disastrous if the spring had been cold, wet and backward.

The early spring of 1895 was fine, warm and favorable for seeding and plowing. The entire season was in keeping with the conditions at the outset, though the precipttation was somewhat below normal. It was a year of great productiveness.

In 1896 the month of March was cool and dry, with high winds and severe dust storms. April and May were excessively warm and wet. The season was relatively late and weather conditions caused much delay in field work throughout the spring months. The output of the year was fairly good but the quality of the corn crop was lowered by wet, cool weather in the fall.

The spring of 1897 was about two weeks late. April was excessively wet and cloudy, and conditions were very unfavorable for seeding small grain and plowing for corn. May was cold and dry, causing the formation of clods in the fields that had been worked during the wet period in April The stand of corn was very poor as a result of these unfavorable conditions. But June, July and August were fairly good months and the season's output was much better than was anticipated at close of the spring.

March 1898 was warmer than usual, and favorable for early farm operations, except in the southeastern counties where excessive rainfall saturated the soil. The bulk of small grain was sown before the middle of April, except in the extreme southeast. There were but few drawbacks during the growing months, and the year's output was fairly good.

The first Bulletin issued in 1899, dated April 10, said the season for beginning seeding and other farm operations was about three weeks late. Winter temperature prevailed through March and until the close of the first week in April. Very little seeding and plowing were done prior to the 15th of April; but after that date the season was generally favorable and the harvests were excellent notwithstanding the late start.

In 1900 March was colder than usual, and conditions were generally unfavorable for work in the fields and the month closed with a general storm of sieet and rain. The season was later than usual at the outset, but conditions changed rapidly for the better in April and May, and it proved to be a season of great productiveness.

From this brief review it will be seen that a late beginning does not augur a poor output of the crop season. The critical crop months are June, July and August.

NOTE AND COMMENT.

The grasses are the greatest crops of the farms of this country. A conservative estimate places the total annual value of grass and forage crops at more than one billion dollars. Compared with the cereals the cost of production is very small. And best of all, the grasses do not exhaust the fertility of the soil like the cereal crops; in fact, with a proper admixture of clover, and by pasturing, the fertility of depleted soils may be restored.

* * *

"Sugar is one of the few great commodities in the production of which the United States is weak and dependent," says the *Review of Reviews*. "In almost all of the great necessaries of life—food, clothing, fuel and shelter—the country is more than self-supporting, but in the matter of sugar we are largely dependent on foreign countries. And our sugar bill is the largest by far of any of our foreign accounts—twice that of coffee, which stands next in prominence, and much greater than that of India rubber, tea, silk or hemp. Every year we pay about $100,000,000, or $1.35 for every man, woman and child in the country, to foreign countries for sugar. Indeed, out of more than 2,000,000 tons of sugar which the United States consumes annually, we produce a paltry 270,000 tons, mostly from the cane fields of Louisiana. This does not include the production of the new island possessions, Porto Rico, Hawaii and the Philippines, but this would add only 400,000 tons to our production, still leaving us to obtain much more than half our sugar from the foreigner. And all this in the face of the fact that so good an authority as Secretary Wilson of the Department of Agriculture says: "We have no more need to import sugar than to import wheat."

* * *

Mr. J. A. Sodestrom, voluntary observer in Sac City, writes that he is about to take a trip to Europe, and will leave the meteorological station in charge of Mr. A. F. Brownell.

* * *

According to Dr. G. L. Spencer, an expert special agent of the United States Department of Agriculture, there were in operation at the close of the census year thirty-seven beet sugar factories in the United States, capable of manufacturing 240,000 tons of sugar annually. Dr. Spencer in his review of the industry says: "Experience has demonstrated that the greatest problems in the American beet sugar industry are to be found in the field rather than in the factory. It should not be assumed from this statement that suitable beets are difficult to grow in satisfactory quantities; the problem is to convince the farmer that with persistent effort and experience he will find sugar beets a surer and more profitable crop than many others."

* * *

Prof. Newcomb, an eminent astronomer says: "The records of 200 or 300 years do not indicate that the heat of the sun or the temperature of the earth are materally changing. Nor is there any reason to believe that any important changes are developiug upon the planet on which we live. What changes may come to the solar system or the universe can only be matters of uncertain speculation."

* * *

We have boiled the hydrant water,
We have sterilized the milk,
We have strained the prowling microbe
Through the finest kind of silk.
We have bought and we have borrowed
Every patent health device,
And at last the doctor tells us
That we've got to boil the ice.

—*What To Eat.*

* * *

A Berlin press dispatch, dated March 12, says, "The red-rain phenomenon is reported from many places in Germany, from the south to the Baltic. It was very noticeable at Hamburg, where heavy rain and snow were mixed with a brownish sand, giving a curious tint to the roofs and shipping." A dispatch from Vienna, same date, says, "There have been falls of tinted snow in southern Austria and the Alpine provinces, which are variously described as red, brown and yellow. The colored deposits are being analytically examined at various places. Professor Salohor is of the opinion that it is sirocco-borne sand from the desert of Sahara. He suspects some volcanic disturbance."

* * *

Exports of corn from the United States during the calendar year 1900, amounted to 190,386,489 bushels, valued at $84,284,733; as against 206,135,233 bushels in 1899, valued at $82,728,589.—*Crop Reporter*.

The Year book of the United States Department of Agriculture for 1900 will be available for distribution the latter part of May.

* * *

J. S. Trigg in the Rockford (Ia.) Register, says:

"The man with the rolling farm has always one enemy to watch which the man on the flat lands never need worry about, and this is the erosion of his hill fields by the floods and rains and the consequent and certain loss of their fertility. No land having a slope in excess of twenty degrees should ever be kept in cultivated crops if the soil be of a loose and friable texture. Where the inclination exceeds this, such lands should be used for grasses, pasture, orchards and forests. The pitch might be increased if the soil is a stiff clay, but not otherwise. In all hilly countries erosion has done more to deplete the fertility of the soils than all the crops which were ever raised on the land. The elements of soil fertility which the Mississippi river dumps into the Gulf of Mexico every year far exceed in value all the soil products which are transported upon its surface."

* * *

The advocates of good roads have been utterly unable to do justice to the subject this spring. Human language is found to be wholly inadequate under existing conditions.

THE CHILD OF THE WOODS.

He knew the first sweet note of the thrush,
The first pale wall flower hidden in the grass;
The little shrines where fireflies say mass
Swing low their censers through the marshland's bush;
The quickening sound before the poignant hush
Which preludes charges at old earth's cuirass—
That magic moment when the season's pass
And all live things to newer promise rush.
He loved the bob-o'-link's familiar call,
The friendly clover nodding to the bees;
The tiger lilies flaunting gay and tall,
Their motley coats of spotted harmonies;
And when the night lay on the forest grim
He heard the tree tops croon a song for him.

—Charlotte Becker in Outing.

ADVENT OF SPRING.

[Sioux City Journal, March 22.]

At 1 o'clock yesterday morning the sun stood directly over the equator, and the spring equinox had come, making the day and night of equal length.

In this vicinity the inauguration of a new spring brought very acceptable weather conditions, and it may generally be depended upon that the disturbances and sudden fluctuations which have characterized the past few weeks will settle into something more reliable. So far as this region is concerned, both history and philosophy promise rising temperatures and generally the beauties for which the springtime is noted in poetry and otherwise. There will be bad days, of course, but not in such marked proportion as during the past fortnight or more, and the northwest will be bragging on its weather.

The recent powerful disturbances that have been suffered east and south of this locality, which in some sections have been declared to be unprecedented, have doubtless already been noted in the minds of the adherents of the "equinoctial storm" idea as proof positive that March 21, when the sun crosses the equator, is especially liable to tremendous turmoil among the elements. While in a general way it is true that this season is subject to great meteorological variations, the arrival of the sun over the equator has nothing directly to do with it. This merely marks the period of a couple or three weeks during which winter and spring struggle for the mastery.

The most generally accepted scientific view of the phenomena of the equinoctial season has been expressed in a pamphlet issued by the weather bureau, written by Frank H. Bigelow, professor of meteorology, and entitled "Storms, Storm Tracks and Weather Forecasting." It contains special comments upon the characteristic phenomena of each month of the year, and the causes operating to produce them. From the section devoted to March the following is extracted:

"March impresses itself upon the dweller in the northern half of the United States as a particularly windy and disagreeable month, with strong alternations of wintry and mild weather. This is due to the breaking up of the conditions that have prevailed since December, and the processes of return to spring and summer. There is in the arctic zone an enormous amount of cold material to be disposed of, covering the northern regions in the form of ice and snow; at the same time the southern zone is becoming decidedly warmer in consequence of the advance of the sun to the north side of the equator.

"The United States is peculiarly the theater of this contest between the giants of cold and heat, and they stagger back and forth over this territory as the one or the other is for the time being in the strongest form. The cold waves launch themselves from the north and carry their icy chill to the warm southern states; or, on the other hand, the warm currents of air from the south advance far into the north, and this alternation causes a rapid variation in the temperature and the other weather conditions at stations of the middle latitude.

"The unsettled weather of the month of March, especially in the northeastern portions of the United States, with its rapid alternations of warm and cold winds, often reaching considerable violence, is therefore the parting salute of the cold winter that has prevailed for five months throughout the northern cap. A most impressive feature of this change, as deduced from a close study of the barometers and temperature readings of the weather bureau, is the suddenness with which the struggle is concluded in the northwest, for March often comes in with very violent action, and this is almost certain to end about the 20th of the month with moderate movements of the air. The struggle is prolonged in the east, but is usually over by the 10th of April."

INTERESTING CLIMATIC NOTES.

The San Francisco *Daily Chronicle*, in its issue of March 17 contained some interesting notes contributed by Alexander McAdie, local forecast official U. S Weather Bureau. Though referring to local climatology, the article is sufficiently interesting to all students of meteorology to justify its reproduction in these columns:

Few of us have ever been to Athens. But many of us have been upon the Sausalito hills and either upon the summit of Mount Tamalpais or along the ridges which stretch toward Bolinas. On a memorable day twenty-four centuries ago, a Persian monarch sitting on Mount Aegalus, looked down upon the fleets off Salamis. That day the East and West met. Professor D. Eginitis, director of the royal observatory at Athens, a skillful meteorologist, has studied the instrumental records of the past forty years and the references in classic literature to the climatic conditions prevailing in Greece 2,000 years ago. He finds that there has been no material change in the climate of Greece since the days when Salamis was fought. Sitting on Mount Tamalpais and looking down upon the Golden Gate, through which now and then a transport bearing armed men hurries seaward, one realizes that history is repeating itself, and that the West and the East have again joined issue, and that the fight is on for supremacy between the old and the new civilizations. We have no classical literature to appeal to in order to determine whether or not our climate has changed since Salamis was fought. There are, perhaps, redwood trees

within view from Mount Tamalpais that were vigorous standards when the great sea fight occurred. Some sylviculturist may yet decipher in the growth of these redwood trees, the summed up history of the sunshine and rainfall of the seasons that seem so far away in the past. And in all probability we shall learn that our climate has not materially changed, and that the race of men inhabiting these shores seventy generations ago doubtless experienced the same climatic conditions which we live under to-day. The fogs, the summer afternoon winds, the winter rains and the long dry summers are not then in any sense new conditions. Our written records, thanks to Thomas Tennent, date back to October 1, 1849. There are not many places in the United States where a continuous record of rainfall for fifty-two years can be referred to.

As there is no royal road to wisdom, so there is no short cut in forecasting. An inspection of the table for the last fifty years will show that there is no regular periodicity in the distribution of rainfall of such a character that it can be used to advantage in forecasting wet and dry seasons. Two extremely wet seasons have been followed by dry seasons, but there are also wet seasons followed by wet seasons. It is apparent that in fifty years' record wet and dry season come and go, and that as a rule a dry period seldom exceeds three years. Many of us will not forget in a hurry the dry period from 1897 to 1900. To anyone who visited the southern portion of the state in the month of October, 1900, the intense interest exhibited by all classes in the question whether the season was to resemble the three preceeding seasons or not, was calculated to make a deep impression. It happened that the forecast official visited the southern section of the state in October, and at nearly every point he was asked to express an opinion in this matter. Notwithstanding his earnest protestations that no seasonal forecast can in the present state of our knowledge be made with any certainty, he was reported in prominent headlines in many of the leading journals to have prophesied a wet winter. What he really did say (and this was nearly always correctly reported in the body of the interview) was that a longer continuance of the dry spell was unlikely, and that from the mean path of the storms thus far observed, and the absence of the pronounced features of the continental high area, conditions were more favorable for a return to normal conditions.

And this brings us to the four chief factors controlling our climatic conditions These are: First, the great general pressure area movements; second, the prevailing westerly drift of the atmosphere in temperate latitudes; third. our proximity to the large mass of water, the Pacific ocean; fourth, the topography of the coast. Under the first heading we include the general question of storm movement. There is one pleasing tradition concerning our climate which should have received a decent burial with the end of the century, though it is hard to keep such myths under ground. The Kuro Siwo or Japan current, can from the very nature of things play but a small part in influencing the climate of the Pacific coast. We were all of us in our youth brought up to believe that the mild climate of the British islands was due to the Gulf stream It is not, but rather to the general eastward drift of the air. Modern science has succeeded at last in making plain the mistakes of the work of fifty years ago And as for the Japan current, it may be frankly said that the data concerning this stream are so meager that as yet no thoroughly scientific statement concerning its dimensions, extent and probable functions has appeared.

We will at once be asked to explain why the Atlantic coast states and the Asiatic provinces have climates so much colder than similar latitudes in Europe and along the Pacific coast. As Harvey M. Watts succintly puts it, "Reverse the aerial current around the world and Japan by the mitigating influences of the Pacific ocean would have an eternal spring for its climate, while the Atlantic Coast states from North Carolina to Newfoundland would have the mildness of Bermuda, not, however, on account of any one ocean current that laved their shores, but because the conserved warmth of the ocean as a whole was theirs."

Passing from this very general review of the controlling factors of rainfall at San Francisco, we are interested perhaps more in the remarkable exhibition of fog phenomena in the vicinity of San Francisco than in any other climatic feature. There are those who consider fog an unmitigated nuisance, and there are others who are so enthusiastic as to maintain that San Francisco possesses untold blessings in her wondrous fog blankets. No single article can begin to do justice to the fogs of the bay district. It may be of some interest to compute roughly the weight of water vapor in an average summer afternoon fog lying without the Heads. With a dew point temperature of 10 6 degrees centigrade (51 degrees Fahrenheit) over an area of 100 square miles we would have a gross weight of something like a million tons of water, or the equivalent of a rainfall of .14 of an inch. In some recent scientific papers which have been published in the Monthly Weather Review there is given in detail a discussion of the various conditions controlling fog formation.

The temperatures of San Francisco are remarkably even, the range being very small. Ask a native of San Francisco what is the coldest month of the year and he can hardly tell you Likewise he is at a loss to name the warmest month The highest temperature ever recorded at San Francisco was 100 degrees and the lowest 29 degrees, Snow is rare in San Francisco, and since March 1, 1871, there have been but ten days on which snow fell Thunder-storms are by no means unknown; but the damage done by all the storms of the past thirty years probably does not exceed the damage done by earthquakes during the same period. In both cases the loss has been exceedingly small considering the nature of the phenomena.

NATIONAL CLIMATE AND CROP BULLETIN.

EXTRACTS FROM WEATHER BUREAU SUMMARY FOR MARCH

The mean temperature of the month averaged nearly normal from the lower Missouri Valley southward to the central and west Gulf coast and over the middle Rocky Mountain slope portions of the Carolinas, Georgia, and eastern Tennessee and northern New England. It was slightly colder than usual in the east Gulf States and Florida and over the central and southern Plateau districts, where the average daily deficiency generally ranged from 1° to 3°. On the Pacific coast the monthly mean temperature averaged above the normal, but the excess was slight, except on the southern coast, where it amounted to more than 3°. From Idaho eastward to the Red River of the North Valley the month was milder than usual, the average daily temperature excess ranging from 3° to 8°. From the upper Mississippi Valley eastward to the middle Atlantic and New England coasts the month, for the most part, was slightly milder than usual, the average daily temperature excess being less than 3°, except over portions of the Middle Atlantic States, where it ranged from 3° to 5°.

The monthly precipitation exceeded the average in the lower Missouri and upper Mississippi valleys, upper Lake region, New England, and over portions of the middle and south Atlantic and east Gulf States. There was also more than the average amount over portions of the middle and southern Rocky Mountain regions. Except near the mouth of the Columbia River the precipitation on the Pacific coast was below the average, and also over the western portions of the Plateau region, in the west Gulf States, upper Missouri Valley, portions of the Ohio Valley, lower Lake region, and Middle Atlantic States A marked deficiency exists over the greater part of Kentucky and Tennessee, in the lower Mississippi Valley, and generally throughout California. The greatest excess is shown on the New England coast in northern Florida

At the close of the month snow covered the northern portions of Wisconsin, Michigan, New York, and New England to depths ranging from 1 inch to more than 2 feet. Traces of snow are also reported over portions of the upper Mississippi and Missouri valleys, and portions of western Nebraska and southeastern Wyoming are covered to depths ranging from 2 to 4 inches.

From the central Mississippi Valley eastward to the middle Atlantic coast the weather conditions of March were generally favorable for farm work, but in the States of the Missouri Valley and upper Lake region, they were not so favorable. Complaints of drouth are received from central and western Texas, while heavy rains in the South Atlantic and east Gulf States during the latter part of the month interfered with farm work and caused injury by washing prepared land. On the Pacific coast the month was unusually favorable in California, but in Oregon

cold rains and frequent frosts delayed work and retarded growth.

Preparations for planting corn are in progress as far north as Kansas, Missouri, Kentucky, and Virginia, some having been planted in the southern portions of the two first named states. Farther south a large part of the crop has been planted.

Oat seeding is well advanced in Missouri, Kansas, Oklahoma, and Arkansas, and is nearly finished in Kentucky. The general condition of winter wheat is better than at the close of February, but unfavorable reports continue from portions of the Ohio Valley. In the states of the Missouri Valley it has wintered well and the outlook is very promising. On the Pacific coast the prospects for wheat are excellent. In portions of Texas wheat is suffering from drouth, and in the northern counties has been seriously damaged by insects. The general outlook for fruit is very good.

A PHENOMENAL HAILSTORM.

The Sac City *Sun*, dated March 28, 1901, contained the following account of a strange, and altogether unprecedented hailstorm, or precipitation of carbonate or alkaline substance, in Sac county on the 24th of March. The *Sun* says:

"About four o'clock last Sunday afternoon a peculiar hailstorm occurred in the northwestern part of Sac county, many of the hailstones containing a large per cent of mineral. Many persons in Sac City noted the peculiar softness of the large stones as they fell and some who attempted to taste them found them alkaline and quickly dropped them. It was noted also that the hail melted very slowly, some of it remaining on the ground even till the next morning. Not much was thought of the matter, however, until Philip H. Lewis who resides near the C., M. & St. P. railway, about four miles northwest of Sac City, appeared in town with a hailstone weighing nearly four pounds, a specimen he said, of tons of mineral hail that fell in his neighborhood. He stated that he could have gathered 500 pounds of it in his orchard after the storm and that he saw traces of it along the railway until within a mile of town. His specimen was taken to Dr. Mansfield, who brought it to the *Sun* office. It was inspected by scores of people and the local chemists made tests, showing that it was readily soluble in water, and contained carbon, sodium, boron, and a little calcuim. It was strongly alkaline and resmbled somewhat sal soda.

Representatives of the college and public school and others who visited the neighborhood of the Lewis farm in the afternoon found only small, soft particles of the hail remaining, the continuous fall of moisture having dissolved it.

The *Sun* has no doubt of the genuineness of the mineral hail. Mr. Lewis witnessed the fall of the large hailstones, and there are the best of reasons for believing that they did not differ in composition from the smaller ones that fell over a larger territory. Portions of the mineral brought to the *Sun* office will be analyzed at college laboratories.

Numerous theories are advanced to account for the strange phenomenon. Some hold that particles of dust carried in the air from some alkaline plain may have caused it and others think that it was caused by a meteor."

Mr. A. L. Brownell, voluntary observer at Sac City writes as follows concerning the phenomenal deposit, inclosing a sample about the size of a chestnut: "The hail was soft like snow, composed of pellets about the size of peas pressed together without breaking their shape. About two miles north and extending three miles, the hail was like the sample; one chunk picked up was claimed to weigh eleven pounds. One that I saw weighed fifty-seven ounces. The area in which the storm occurred was crescent shaped, the heaviest deposit about the center, where the track of the storm was about eighty rods wide."

CLIMATOLOGY OF THE MONTH.

BAROMETER.—The mean pressure for the month was 29.88 inches; highest observed, 30.54 inches at Sioux City, on the 5th; lowest observed, 29.20 inches at Omaha, Neb., on the 12th; range for the state, 1.34 inches.

TEMPERATURE.—The monthly mean temperature for March, as shown by records of 117 stations, was 34.2,—a daily excess of about 1°. The highest monthly mean was 39° at Burlington, and the lowest monthly mean was 29° at Cresco. By sections the means were as follows: Northern section, 31.8°; central section, 34.3°; southern section, 36.4°. The highest temperature reported in the state was 76° at Atlantic, on the 17th; lowest, 8° below zero at Denison on the 4th. The average monthly maximum was 65.4°; average monthly minimum, 2°. The greatest daily range was 52°, at Larchwood; averag eof greatest daily ranges, 36.7.°

PRECIPITATION.—The average precipitation for the state, as shown by records of 128 stations, was 2.64 inches, which is .89 of an inch above normal. The averages of the sections were as follows: Northern section, 2.30 inches; central section, 2.70 inches; southern section, 2.91 inches. The largest amount reported was 5.25 inches, at Red Oak; least amount, .70 of an inch, at Whitten. The greatest daily precipitation reported was 2.20 inches, at Winterset on the 11th. Average number of days on which .01 or more precipitation was reported, 7.

WIND AND WEATHER.—Prevailing direction of wind, N.W.; highest velocity reported, 58 miles per hour, from the N. W., at Sioux City, on the 3rd. The average number of clear days was 9; partly cloudy 8, and cloudy 14.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date
Davenport	29.84	30.36	5	29.29	13
Des Moines	29 90	30 47	5	29.31	12
Dubuque	29.86	30 32	5	29.33	13
Omaha, Neb	29.88	30.51	5	29.20	12
Keokuk	29 85	30 44	5	29 21	10
Sioux City	29-93	30 54	5	29 43	8
.....	.....	.....	.....	.....	....
Mean	29.88	30.54	5	29.20	12

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	7,653	35	NE	10
Des Moines	7,561	29	NW	5
Dubuque	7,176	36	NW	5
Keokuk	8,324	38	SW	13
La Crosse, Wis	6,493	44	W	3
Omaha, Neb	9,271	40	N	19
Sioux City	11,219	58	NW	3
...	.....	..	....	....

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* First thunder storm of season on 24th, light. March was a very changeable month, with frequent heavy snow storms, and excess of cloudiness; roads very muddy latter part of month.

AMANA—*Conrad Schadt.* On morning of 10th, trees were covered with ice. Icicles hung from every branch. No farm work in fields during the month.

BONAPARTE—*B. R. Vale.* A variable month; no farm work done; plenty of moisture, but not excessive.

CLARINDA—*A. S. Van Sandt.* Many roads impassable for days, on account of drifted snow and mud.

CLINTON—*Luke Roberts.* During the month there were seven clear, five partly cloudy, and nineteen cloudy days, the cloudiness exceeding the normal eight days. Rainfall, 3.86 inches—1.30 inches above normal. Mean temperature 34.70; highest temperature, 68° on the 18th; lowest, 5° above zero on the 5th. The wind movement for month was 6,340 miles, or about 300 miles in excess of normal.

COLUMBUS JUNCTION—*H. E. Simpson.* The heavy rains of 19th and 25th, raised waters of Iowa and Cedar rivers so that approach to the Junction bridge was impossible; water was four feet over the wagon road for nearly a week.

CRESCO—*Gregory Marshall.* Sleet storm of 19th did much damage to trees and shrubbery. The excess of precipitation mostly ran off the surface and will do but little good. Roads almost impassable.

ELKADER—*Chas. Reinecke.* Ice went out of the Turkey river March 3d.

FAYETTE—*R. Z. Latimer.* Ice went out of the Volga on 17th; many migratory birds were seen on the 17th.

FRUITLAND—*R. T. Hummel.* First southern red bird made its appearance March 1st; blackbirds, larks, and robins on the 18th; on the 27th, sowing oats and wheat on sandy lands.

GRINNELL—*A. O. Price.* March leaves the farmers with very bad roads and miry feed yards; farm operations yet in the distance.

HAMPTON—*E. C. Grenelle.* On the 8th, robins first observed; blue birds on 18th.

HARLAN—*C. A. Reynolds.* Three severe snow storms during month; roads very bad; very much cloudy weather.

INDIANOLA—*J. L. Tilton.* On night of 21st after snow had ceased there came a shower of dust, covering snow with yellow dirt and soiling eastern window panes; the hour not known.

IOWA FALLS—*J. B. Parmelee.* Month brought three quite severe storms; also the worst roads for many years.

OLIN—*N. Potter.* Thunder very heavy at 1 o'clock, A. M., the 19th. March has verified its reputation as the most disagreeable month in the year.

RIDGEWAY—*Arthur Betts.* Following figures have been compiled from the records for the first three months of the current year: Mean temperature of the quarter 23.5°. Mean temperature, same period 1900, 22.1°. Mean temperature, same period 1899, 17.0°. Mean temperature, same period, 1898, 30.6°. For 7 days the frost point was not reached; against 5 in 1900, 3 in 1899 and 10 in 1898. This quarter in 1901 gave 11 dates below zero, against 21 in 1900, 26 in 1899 and 3 in 1898. During the last quarter there were 25 spring days, against 24 in 1900, 13 in 1899 and 40 in 1898. Spring days must average not lower than 32°. Snowfall for the quarter, 38.8 inches. Range of thermometer 56° down to 11° below zero. It has been a good winter for man and beast. On the 29th of March, 1901, in the middle of the day the sun was enclosed in a beautiful circle with a radius of 22½ degrees, while another circle of pure white intersected the sun and passed entirely around the mid heavens, cutting the small circle at two points. The large circle was twice as large as the small one. It was a very pretty sight.

STORM LAKE—*M. L. Fuller.* Lake gradually cleared of ice from 10th to 25th.

ERROR IN JANUARY REVIEW.

GUTHRIE CENTER.—Maximum temperature recorded 49° on the 22nd, on page 8, should have been 51° on the 23rd.

ERRATA IN FEBRUARY REVIEW.

AMES.—Total precipitation record .29 inch on pages 9 and 13, should have been .90 inch.

CORNING.—Total precipitation recorded 1.35 inches on page 10, should have been 1.40 inches.

SIOUX CENTER.—Total precipitation recorded .70 inch on page 9, should have been .75 inch.

PLOVER.—Total precipitation recorded .37 inch on page 9, should have been .35 inch.

PLOVER.—Mean temperature recorded 17.6° on page 9, should have been 17.4°.

SIGOURNEY.—Total snowfall recorded 21.0 inches on page 10, should have been 16.5 inches.

GRINNELL.—Maximum temperature recorded 35° on the 13th, on page 9, should have been 38° on the 17th.

WASHINGTON.—Minimum temperature recorded –10° on the 6th, on page 10, should have been –13° on the 10th.

WAVERLY—Maximum temperature recorded 37° on the 13th, on page 9, should have been 39° on the 17th.

IOWA WEATHER AND CROP SERVICE.

CLIMATOLOGICAL DATA FOR MARCH, 1901.

NORTHERN SECTION.

STATIONS	COUNTIES	Elevation, feet	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., IN INCHES				Number rainy days	SKY			Prevailing direction of wind	DATES OF THUNDER-STORMS.
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall (unmelted)		Number clear days	Number partly cloudy days	Number cloudy days		
Algona	Kossuth	1,500	8	32.0	*1.3	57	23	- 3	5	30	2.21	†.58	.90	18.0	6	8	12	11	NW	
Alta	Buena Vista	1,519	9	31.8	*2.2	63	1	- 2	5	36	2.34	†.45	.63	17.5	10	10	8	13	NW	24
Alta (near)	Buena Vista	....	..	...	....	..	.....	...	....	....	1.42	.....	.40		7		..	...	.....	
Bancroft	Kossuth	.....	..	31.8	....	63	17	- 5	5	37	2.60	.....	.60	15.0	10	11	4	16	NW	12
Britt	Hancock	1,230	..	31.0	...	61	23	- 4	5	40	1.35	.....	.33	8.2	7	9	11	11	NW	24
Charles City	Floyd	1,012	9	31.4	*0.9	58	18	- 3	5	28	2.65	†1.07	.70	8.5	7	11	7	13	NW	
Clear Lake	Cerro Gordo	984	..	30.6	....	59	23	- 5	5	34	2.10		.50	16.0	8	14	8	9	NW	
Cresco	Howard	1,280	28	29 0	*3.2	51	23	- 6	5	26	2.78	†1.45	1.15	11.2	7	8	7	16	NW	24
Decorah	Winneshiek	900	7	30.6	*1.4	57	18	- 4	5	33	2.82	†1.34	.90	18.0	7				.....	
Dows	Wright	....	..	32.5	....	63	18	- 4	5	33	3.31		.80	15.0	7	18	0	13	NW	12, 24
Elkader	Clayton	....	19	33.4	*2.5	65	18	0	5	37	2.62	†.84	.75	16.0	8	11	5	15	NW	
Estherville	Emmet	.....	..	30 3		60	1	- 6	5	38	1.15	....	.40	9.1	8	12	6	13	NW	12
Fayette (*a*)	Fayette	1,000	10	31.3	*0.4	61	18	- 4	5	30	3.25	†1.15	.97	14.5	7	10	5	16	NW	19, 23
Fonda	Pocahontas	1,237	..	...	...	..	.....	....	.....	..	3.56	.....	1.15	30.6	8	12	10	9	NW	23
Forest City	Winnebago	1,220	..	30.4	....	67	23	- 6	5	37	1.95	.....	.65	14.0	6	13	5	13	N	
Grand Meadow	Clayton	....	9	31.8	*0.7	56	17	- 3	5	30	2.55	†.50	.80	12.5	7	9	6	16	NW	
Greene	Butler	943	..	32.2		62	18	- 2	5	33	2.24	... ..	.68	6.0	8	10	6	15	W	
Hampton	Franklin	1,240	10	33.4	*4.4	66	18	- 3	5	33	3.38	†1.37	.82	20.8	10	8	9	14	NW	
Hawkeye	Fayette	....	7		....	..	.....	....	... .	....	2.10	‡.00	.90	19.0	5	..	...	..	.....	
Hoprig	Emmet	.....	..		....	..	.....	....	.....		1.02	....	.30	7.8	5	13	11	7	NW	
Humboldt	Humboldt	1,082	7	33.8	....	60	1, 25	- 2	5	38	1.80	†.28	.70	15.3	5	15	5	11	NW	
Lansing	Allamakee	...	..	33.0	....	58	18	- 2	5	34	3.73	.....	.86	20.6	9	7	11	13	.....	
Larchwood	Lyon	.....	..	32.6	....	67	17	- 7	5	52	...	.....	...	....	..	17	4	10	NW	
Larrabee	Cherokee	.....	9	32.4	*1.8	65	1	- 2	5	40	1.98	†.10	.56	12.1	10	...			NW	
Le Mars	Plymouth	.....	..	34.4	....	68	1, 17	1	5	41	1.06	.....	.25	6.5	5	11	9	11	N	24
New Hampton (*a*)	Chickasaw	1,166	..	30 2	...	58	18	- 4	5	30	1.65	.....	.60	14.0	7	11	5	15	NW	
Northwood	Worth	1,210	..	32.5	....	60	17	- 5	5	43	2.25	.....	.50	19.0	7	9	9	13	NW	
Osage	Mitchell	1,178	9	29.1	*0.6	51	23	- 5	5	25	2.50	†1.05	.69	15.2	8	6	8	17	NW	
Plover	Pocahontas	....	..	31.3	....	60	1, 23	0	5	33	2.75	.....	1.30	24.0	7	12	2	17	N	
Primghar (*h*)	O'Brien	.....	..	32.8	...	60	1	9	11	45	.	.....		..	...	7	0	24	NE	
Ridgeway	Winneshiek	.....	..	32.1	...	56	17, 18, 23	- 2	5	29	4.28	.....	1.36	17.7	13	10	7	14	NW	24
Ruthven	Palo Alto	.....	..	29 6	....	57	1	- 5	5	....	1.70	...	.60	17.0	6	13	8	10	NW	
Sheldon	O'Brien	1,406	..	31.8	....	65	1	- 4	5	40	1.39	.....	.60	5.6	7	16	2	13	S	
Sibley (*c*)	Osceola	1,506	7	32.8	*2.4	65	1	- 4	5	48	1.35	†.18	.62	4.0	8	....		..	NW	24
Sioux Center (*e*)	Sioux	.....	..	34 4	....	65	1	- 3	5	34	1.41	.....	.48	8.5	5	12	5	14	NW	24
Storm Lake	Buena Vista	.....	11	32.2	....	62	1	- 2	5	34	1.82	†.45	.42	13.3	12	11	7	13	NW	24
Washta	Cherokee	.....	..		....	..	.....	.. .	.....	....	2.18	.....	.60	14.0	6	11	10	10	S	
Waverly	Bremer	942	..	32 8	....	63	18	- 1	5	32	3.51	.....	1.25	9.4	10	10	7	14	NW	19, 25
West Bend*	Palo Alto	....	7	30.4	*0.5	57	23	3	5	.. .	2.49	†.79	.80	21.0	8	8	8	15	NW	
West Union	Fayette	1,105	..	....	...	.	.....	...	.....	....		...	..	..	....		..	....	.....	
Average	.....	....	...	31.8	*1.5	60.7	.....	-2.8	... .	35.4	2.30	†.72	.....	14.3	5	11	7	13	NW	

CENTRAL SECTION

Amana	Iowa	.....	24	36.4	*5.3	65	18	4	5	28	3.48	†1.50	1.29	9.4	11	11	9	11	NW	18
Ames	Story	936	20	34.3	*1.9	67	18	1	5, 6	41	1.64	†.25	.50	8.5	7	15	4	12	NW	
Audubon	Audubon	.....	7	...	....	..	.....	....	.....	...	....	.....	..	....	....	...	...	..	.....	
Baxter	Jasper	.....	..	36.8		72	18	5	5	43	4.11	.....	1.50	6.0	8	7	11	13	NW	12
Belle Plaine (*a*)	Benton	840	10	34.1	*1.7	65	18	3	5	33	5.02	†2.95	2.00	10.5	11	8	17	6	NW	
Buckingham	Iowa	.....	..		....	..	... .	....	.....	....	2.59	.....	.80	10.0	8	6	19	6	.....	
Carroll	Carroll	.....	10	35.0	*3.8	67	1	1	5	43	2.78	†.30	1.00	25.5	9	13	4	14	.....	
Cedar Rapids	Linn	744	18	34.6	*1.8	67	18	1	5	31	2.74	†.48	.60	12.8	11	9	4	18	NW	
Clinton	Clinton	609	9	34.7	-2.0	68	18	5	5	32	3.86	†1.31	.95	4.5	9	7	5	19	W	25
Davenport	Scott	615	30	35.8	*1.2	67	18	4	5	27	2.57	† 31	.92	3.4	11	7	8	16	W	
Delaware	Delaware	1,048	9	30.3	-0.6	64	18	- 1	5	34	2.16	†.35	.60	8.0	7	9	8	14	NW	
Denison	Crawford	1,192	7	33.1	*1.0	69	1	- 8	4	45	1.69	-.05	.60	15.7	8	17	5	9	N	
Des Moines	Polk	867	23	35.8	*1.0	66	18	4	5	36	3.02	†1.43	1.47	16.6	11	7	12	12	NW	12, 13, 19, 24
De Soto	Dallas	866	..	36.4		66	18	7	5	38	1.82	..	.60	17.0	8	12	8	11	NW	
Dubuque	Dubuque	655	28	32.8	‡0.c	65	18	- 2	5	30	2.88	†.35	.94	12.0	12	8	8	15	NW	
Fort Dodge	Webster	....	..	32.4	....	62	1, 17, 18	0	5	41	1.50	.....	.50	15.0	5	12	2	17	NW	
Fruitland	Muscatine	.....	.	36.2	....	70	18	5	5	34	2.15		.90	3.0	4	11	10	10	W	12, 18, 19
Galva (*a*)	Ida	....	7	32.5	-1.3	65	1	- 2	5, 10	46	3.40	†2.13	.70	8.0	7	..	.	.....		
Gilman	Marshall	1,053	..	....		..	.....	...	.....		2.17	.. ..	.77	....	8	11	8	12	S	
Grinnell	Poweshiek	1,011	10	34.3	*1.2	64	18	4	5	32	2.98	†1.40	1.28		8	11	7	13	N	
Grinnell (near)	Poweshiek	..	..	34.0	....	65	18	2	5	37	3.20	.....	1.28	8.0	9	6	7	18	SE	24
Grundy Center	Grundy	966	9	32.7	*0.6	65	18	0	5	34	3.17	†1.84	1.18	5.0	10	14	5	12	NW	12, 14
Guthrie Center	Guthrie	1,269	..	35.4	...	66	23	6	5	43	1.55	.....	.80	15.5	3	9	13	9	N	
Harlan	Shelby	...	..	34.8	....	68	17	4	5	43	3.26	.....	1.20	29.3	10	4	13	14	NW	
Independence	Buchanan	921	38	32.0	*1.6	64	18	- 2	5	31	1.62	-.12	.50	11.0	8	9	11	11	NW	
Iowa City (*a*)	Johnson	644	10	35.3	*0.1	68	18	8	5, 6	40	3.62	†1.23	1.20	7.5	12	7	8	16	W	
Iowa Falls	Hardin	....	7	31.2	-0.5	63	18	- 2	5	33	2.13	†.87	.45	15.5	9	13	6	12	NW	12, 24
Le Claire	Scott	.....	..	....		..	.....	....	... .	....	2.53	....	.46	....	13	...	.	.	.....	
Logan	Harrison	928	35	37.4	*3.4	70	1, 17	8	5	38	3.00	†1.13	1.00	28.0	8	11	7	13	S	
Maquoketa	Jackson	...	7	35.4	-0.3	66	18	1	5	35	3.03	†.59	1.15	6.0	9	12	6	13	W	18
Marshalltown	Marshall	898	8	35.0	*3.1	67	18	2	5	36	3.71	†2.17	1.05	5.0	11	13	3	15	NW	12, 24
Monticello	Jones	800	46	32.6	*0.7	65	18	- 2	6	38	3.38	†.99	1.75	13.5	6	8	9	14	NW	
Mt. Vernon	Linn	....	..	33.5	.. .	66	18	0	5	34	3.32	.....	1.30	13.5	10	10	4	17	NE	13, 19
Newton	Jasper	958	13	34.2	-0.2	66	18	3	5	38	3.47	†2.12	1.08	16.0	9	11	9	11	NW	
Odebolt	Sac	....	..	34.7	....	69	23	3	5	40	2 29	.....	.90	23.5	7	17	1	13	.....	24
Ogden	Boone	1,109	..	33.6	....	64	18	0	5	41	1.61	.....	.68	11.3	9	4	8	19	NW	
Olin	Jones	....	..	32.7	....	64	17	2	5	31	3.41	..	1.16	8.5	7	8	11	13	E, NW	12, 19
Onawa	Monona	.....	..	36.2	....	73	1	5	5	44	2.86	.....	.80		10	14	6	11	NW	24
Perry (*c*)	Dallas	....	..	35.4	....	66	18	4	5	40	1.60	.....	.80	16.0	6	13	0	18	NW	
Rockwell City (*a*)	Calhoun	1,219	..	34.6	.	66	23	1	5	37	2.85	.....	1.00	28.0	6		...	..	.....	
Sac City	Sac	900	21	33.4	*2.2	63	1	1	5	37	2.31	†.70	.64	17.2	6	15	3	13	NW	24
Scranton	Greene	...	..	34.3	....	62	1, 18	3	5	37	1.17	.....	.50	15.0	3	16	5	10	NW	
Sioux City	Woodbury	1,122	12	35.0	*4.0	70	1	4	5	37	1.58	†.36	.45	...	12	7	11	13	NW	
Toledo	Tama	....	6	35.9	*0.9	70	18	2	6	43	3.97	†2.64	2.00		5	12	9	10	NW	
Vinton*	Benton	800	10	33.4	*1.0	66	23	6	5	....	2.65	†.96	1.40	10.0	6	15	2	14	NW	12
Waterloo	Black Hawk	862	21	33.1	*0.2	65	18	0	5	30	2.95	†1.57	1.22	9.0	6	9	6	16	NW	
Wilton Junction	Muscatine	....	..	35.6	....	67	18	5	5	33	3.21	.....	1.16	5.0	8	11	5	15	E, NW	
Whitten	Hardin	....	..	31.5	...	62	18	- 2	5	35	.70	.....	.50	5.5	2	9	14	8	SE	
Average	.....	....	...	34.3	*1.2	66.2	.....	2.1	... .	36.7	2.70	†1.10	.	12.4	6	10	8	14	NW	

CLIMATOLOGICAL DATA FOR MARCH, 1901—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT.							PREC. IN INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.	DATES OF THUNDER-STORMS.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted.)		Number clear days.	Number partly cloudy days.	Number cloudy days.		
Afton	Union	....	....	35.0	....	68	18	5	5	39	3.19	.....	.90	16.5	8	7	10	14	SW	
Albia	Monroe	945	..	35.0		68	20	7	5	41	2.74	.....	.89	8.0	9	9	6	16	NW	
Atlantic	Cass	....	9	36.0	*1.6	76	17	8	11	49	3.02	†1.17	1.00	26.0	6	4	11	16	NW	
Bedford	Taylor	....		34.8		72	17	9	5	45	3.09	.....	.93		6				NW	
Belknap	Davis.	857	..	38.8	...	68	18	8	5	33	2.73	...	.77	4.0	13	11	10	10	NW	
Bonaparte	Van Buren	.....	9	37.4	-1.0	70	18	10	5, 6	35	2.50	-.38	1.00	2.0	4	...			....	
Burlington	Des Moines	.....	..	39.0	...	70	18	10	5, 6	31	3.30	.....	1.33	2.5	11	5	10	16	.....	
Bussey	Marion		....		...				...	....	2.05	....	.50	6.5	7	...		..	..	
Chariton	Lucas	1,030	....	36.4		66	18	7	5	35	2.95	.. .	.77	11.2	12	10	8	13	NW	13
Clarinda	Page	1,069	10	37.4	*2.5	75	17	10	5	46	3.64	†1.93	1.80	18.0	9	8	11	12	NW	
College Springs	Page	...	9	36.5	-0.8	70	17	8	21	37	2.42	†.62	.80	6.8	11	17	5	9	NW	
Columbus Junct(*a*)	Louisa	.....		37.0	....	69	18	5	5	34	3.00	....	.85	3.5	10	8	9	14	.....	12
Corning	Adams	1,127	8	35.2	-1.5	65	18	7	5	38	2.80	†1.08	1.30	10.8	7	8	10	13	NW	
Council Bluffs	Pot'wat'mie	989	...	37.2	....	75	17	8	5	48	3.74	....	1.10	25.5	8	12	2	17	NW	
Crawfordsville	Washington	...	..		....	....	.....	.....	.....	...	....		...	...	..				... ..	
Cumberland	Cass			..		....	...	.....	...		1.55	....	1.42	11.0	4	12	4	15	S	
Danville	Des Moines	715				...	....	....	...	.....	2.65	.....	1.75	2.0	3	6	0	25	.... ..	
Eldon	Wapello	...	....	37.7	....	69	18	6	5	39	2.82	.....	.99	2.9	11	11	4	16	NW	12, 19
Emerson	Mills	.....	....	....	...	..	.....	.....	.....	.....	4 50	.....	2.00	...	3	..	..	..	.. ..	
Fort Madison	Lee	516	52	..	....						3.75	† 98	1.55		5	4	7	20	SW	18, 19
Glenwood	Mills	979	30	37.4	*4.1	71	17	7	5	38	1.75	†.38	.35	15.2	8	2	19	10	NW	
Greenfield	Adair	..	9	36.2	*2.2	68	18	5	5	36	2 32	-.08	.51	10.5	9	15	4	12	NW	
Hedrick	Keokuk	....	....	35.6	....	68	18	5	5	34	2.40		.70	7.0	11	15	2	14	NW	
Hopeville	Clarke	....	..	35.6	....	66	17, 18	7	5	36	2.76		1.37	..	10	3	16	12	SE, NW	12
Indianola	Warren			36.5	....	66	18	4	5	37	2.47		.67	10.8	11	2	8	21	NW	19, 20, 24
Keokuk	Lee	618	29	38.6	*1.0	70	18	10	6	30	2.59	†.26	1.22		12	6	9	16	SW	
Keosauqua	Van Buren	...	8	38.8	-0.2	69	18	11	6	37	3.12	†.63	1.06	..	8	..			....	
Lacona	Warren	.. .	...	.....	.....	..	.....	.....	.....	....	3.85		1.00	.	11	6	18	7	.....	
Lenox	Taylor		....	36.0	..	67	17	6	5	36	2.50	.....	.75	4.5	9	15	6	10	NW	
Melrose	Monroe	856	....	.....	...	....	.....						....	.	....				.....	
Mooar	Lee	..		32.6		59	19	5	6	46	2.56	.....	1.78	...	8	12	12	7	NW	
Mt Ayr	Ringgold	1,236	7	35.8	-0.6	69	17	7	5	36	3.04	†.91	.96	15.5	10	5	15	11	NW	
Mt. Pleasant	Henry	725		37.0	.....	69	18	8	6	34	2.33	.....	.95	.	8	12	12	7	SW	12
Murray	Clarke	1,183		....	.....	...	.....	.....	. .		...	.....	....						.....	
Omaha	Douglass	1,113	31	36.9	*1.0	75	17	6	5	39	2.07	†.60	.70	15.6	10	8	10	13	NW	
Oskaloosa	Mahaska	850	17	36.1	-1.8	69	18	5	5	43	2.84	†.86	.65	4.9	11	11	6	14	NW	12, 19
Ottumwa(*c*)	Wapello	630	6	38.0	-0.9	70	18	12	4, 5	35	3.40	†1.00	1.30	8.0	5	12	4	15	SE	
Ovid	Wayne	..	7	35.2	-2.2	69	18	9	6	37	2.75	†.56	.99	8 7	14	8	7	16	NW	12, 24
Pacific Junction	Mills	960		36 4	.....	71	17	7	21	44	2.70	.....	1.00	21.5	10	2	18	11	NW	18
Pella (*d*)	Marion	...	....	36.2	.....	78	18	5	20	36		... ..				13	0	18	NW	
Red Oak	Montgom'ry	1,033	..	36.1		71	17	5	5	41	5.25	.....	2.00	23.0	10	11	6	14	S	19
Sigourney	Keokuk	.....		37.0	..	70	18	5	5	38	3.41	. ..	1.03	7.2	11	9	14	8	SE, NW	12, 19
Stuart (*b*)	Guthrie		..	34.0	....	67	17, 18	2	4, 5	42	2.00	....	.60	15.0	7	13	2	16	SW	
Thurman	Fremont			36.2		70	17	1	11	41	2.81		.70	..	11	10	6	15	NW	19
Villisca	Montgom'ry	1,058	7	37.2	*1.0	70	18	7	21	42	4.35	†2.21	1.25	23.0	8	11	6	14	NW	18
Wapello (*a*)	Louisa	578	.	36.9		66	18	11	5, 6	28	2.40	.....	.95	4.0	6	...	..	.	SE, SW	12
Washington	Washington	..	10	36.2	*1.0	69	18	4	5	36	1.67	†.58	.62	....	6	..		....	NW	
Winterset (*b*)	Madison	.....	9	34.8	*0.6	64	18	0	13	34	4.13	†2.30	2.20	19.0	6		..	....	... .	
Average		.....	....	36.4	*0.6	69.3	.....	6.7	...	38.1	2.91	†.80		11.2	9	9	8	14	NW	
Av. for the state.		.....		34.2	*1.1	65.4	...	2.0		36.7	2 64	†.87	....	12.6	7	10	8	13	NW	

*Means determined from 7 A. M., 2 P M, and 9 P. M observations, and maxi num and minimum are taken from eye readings. ‡Received too late to be computed with means. *a*, One day missing; *b*, two days, etc.

†Is used to indicate plus sign (†).

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR MARCH, 1901.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean.
Afton	Max.	58	55	46	41	15	37	60	64	..	27	40	49	..	34	35	53	62	68	..	28	36	53	56	59	48	38	35	42	41	35	42	44.9
	Min.	28	33	35	15	5	9	21	29	27	23	23	35	29	27	20	20	29	38	20	10	10	19	37	39	32	30	28	27	24	27	25	25.0
Albia	Max.	52	53	49	42	33	35	56	62	57	33	39	60	56	37	40	51	62	68	60	..	38	55	63	62	52	..	..	45	45	37	44	49.5
	Min.	12	17	18	12	7	8	18	22	24	18	14	18	20	26	23	19	23	27	29	16	15	20	22	23	26	26	30	29	25	27	26	20.6
Algona	Max.	55	47	43	..	14	33	50	46	35	32	39	39	36	30	34	49	54	53	..	26	37	42	57	56	47	35	31	35	37	35	42	40.3
	Min	26	28	34	9	-3	7	20	34	30	21	11	29	28	25	16	22	34	36	19	14	12	26	37	40	32	28	21	24	26	27	23	23.7
Alta	Max.	63	46	44	34	15	34	54	48	32	30	42	44	33	30	36	58	59	54	30	28	38	50	58	48	38	34	30	37	38	33	40	40.6
	Min.	30	27	32	8	-2	6	18	31	28	21	11	29	28	25	16	25	30	30	18	11	8	23	38	38	30	28	26	27	26	26	19	23.1
Amana	Max.	44	42	43	36	14	34	48	46	38	33	38	42	42	35	37	47	57	65	56	32	33	48	60	55	49	40	38	43	48	38	43	45.9
	Min.	27	28	35	14	4	8	19	36	31	25	19	29	32	29	23	22	29	40	32	17	19	22	35	44	34	34	32	32	26	29	24	26.8
Ames	Max.	52	44	46	36	14	34	58	53	43	32	40	44	42	33	35	45	61	67	56	26	35	43	59	56	52	37	33	39	40	39	45	43.5
	Min.	24	31	31	13	1	1	17	35	31	20	13	30	31	28	22	25	38	40	23	16	15	23	35	42	35	32	30	28	27	27	13	25.1
Atlantic	Max.	66	60	48	39	19	41	59	59	41	35	43	59	40	33	39	56	76	68	51	30	40	55	56	58	45	37	36	43	39	39	47	47.0
	Min.	26	27	37	15	9	12	14	36	30	25	8	33	30	28	20	22	27	41	23	12	13	19	43	40	32	31	26	29	25	28	14	25.0
Bancroft	Max.	57	49	45	35	-12	36	50	46	35	33	45	40	35	33	35	55	63	54	40	26	46	50	60	46	45	35	35	40	35	35	43	41.7
	Min.	27	25	33	7	-5	6	18	33	27	20	10	28	28	23	15	23	27	33	18	10	9	18	35	39	33	28	25	25	20	25	14	21.8
Baxter	Max.	64	49	47	40	15	40	58	63	42	35	52	44	49	36	43	55	60	72	56	32	40	52	60	58	55	40	40	48	42	42	54	47.8
	Min.	47	35	..	14	5	10	16	20	30	25	14	30	30	28	24	24	32	40	24	15	13	22	36	42	33	31	30	29	24	26	22	25.7
Bedford	Max.	..	..	46	34	22	44	57	59	..	33	47	65	40	40	44	58	72	71	..	32	45	62	62	58	45	38	38	44	38	38	55	45.6
	Min.	..	..	32	14	9	32	55	62	50	..	45	60	57	35	39	52	64	68	49	34	18	17	28	40	44	35	35	32	32	28	33	29.3
Belknap	Max.	52	54	50	41	19	40	55	62	50	35	39	55	44	30	34	49	54	53	..	26	37	42	57	56	47	35	31	35	37	35	42	40.3
	Min.	30	35	35	18	8	10	22	37	35	27	19	35	33	29	25	23	32	49	34	18	..	33	48	60	55	54	..	38	43	42	38	44.0
Belle Pl'ne	Max.	47	43	42	..	..	..	32	51	..	..	32	36	42	..	34	36	43	55	65	..	28	15	18	20	32	39	33	33	31	28	26	27	24.6
	Min.	14	29	30	12	3	8	15	36	30	30	17	20	32	28	22	20	26	38	28	15	35	37	55	60	58	48	41	38	45	40	36	45	46.3
Bonaparte	Max.	50	47	48	40	18	35	54	58	44	35	44	63	50	35	39	50	63	70	57	35	18	18	27	39	44	36	35	32	31	27	32	30	28.6
	Min.	26	31	34	18	10	10	21	37	32	27	22	34	33	30	27	21	28	43	35	18	18	27	39	44	36	35	35	36	42	36	42	40.8
Britt	Max.	55	50	42	35	13	34	53	47	36	33	37	43	36	32	32	45	55	58	39	25	35	44	61	51	47	35	35	36	42	26	12	21.3
	Min.	25	27	29	8	-4	4	13	33	30	20	7	29	29	25	16	20	26	31	19	11	4	11	36	40	32	29	27	21	23	26	45	47.6
Burlington	Max.	50	47	51	40	19	37	54	54	47	36	42	60	53	35	40	48	62	70	61	46	39	57	64	60	53	44	39	44	42	42	36	30.3
	Min.	27	33	37	19	10	10	23	40	33	27	22	35	34	31	28	23	33	47	44	20	21	27	42	45	41	34	32	33	37	32	..	30.3
Carroll	Max.	67	60	48	40	15	40	59	55	42	34	42	44	42	30	41	57	63	66	50	30	42	54	60	59	50	36	34	40	41	37	45	45.9
	Min.	27	32	33	14	1	8	16	36	30	28	5	21	29	26	17	22	30	39	19	12	9	20	38	40	33	31	28	29	28	28	15	24.0
Cedar Rap	Max.	47	42	43	39	14	35	48	45	38	34	38	41	41	37	41	50	59	63	54	33	33	52	62	55	48	44	36	43	43	39	44	43.4
	Min.	27	27	29	13	1	9	18	36	30	25	19	24	31	28	22	21	28	39	32	17	18	22	36	40	35	33	31	32	26	27	24	25.8
Chariton	Max.	56	54	50	40	18	34	56	62	51	37	42	64	51	35	37	53	65	66	61	28	36	58	60	61	50	38	35	40	42	35	45	47.1
	Min.	22	32	35	16	7	10	20	39	30	24	13	33	31	28	23	22	30	43	24	16	16	25	42	55	50	48	..	34	38	40	37	40	39.6
Charles Cy	Max.	44	42	39	37	10	32	45	43	34	30	36	39	36	33	35	45	61	67	56	26	35	43	59	56	52	37	33	39	40	39	45	43.5
	Min.	24	22	33	9	-3	6	17	34	32	22	12	26	31	28	22	25	38	40	23	16	15	23	35	42	35	32	30	28	27	27	13	25.1
Clarinda	Max.	69	66	50	44	20	46	62	62	36	31	24	17	35	40	38	56	76	68	51	30	40	55	56	58	45	37	36	43	39	39	47	47.0
	Min.	26	32	35	15	10	12	22	36	33	34	40	40	33	33	35	55	63	54	40	26	46	50	60	46	45	35	35	40	35	35	43	41.7
Clear Lake	Max.	50	45	48	39	12	30	46	45	32	30	20	10	21	30	25	17	27	41	23	12	13	19	43	40	32	31	26	29	25	28	14	25.0
	Min.	27	22	..	5	-5	5	32	48	42	37	35	36	45	42	36	37	45	58	68	55	41	19	18	20	33	42	34	36	32	32	22	30	28	26.0
Clinton	Max.	41	41	43	34	14	32	48	42	34	32	27	21	26	32	29	25	21	26	68	49	31	38	59	53	54	42	38	40	43	35	38	48	46.4
	Min.	17	26	31	13	5	7	16	34	32	27	21	26	32	39	33	39	58	70	33	42	21	10	8	23	41	41	33	31	27	29	30	29	23	26.6
College Sp.	Max.	64	63	50	40	15	40	58	63	42	35	52	44	49	36	43	55	60	72	56	32	40	52	60	58	55	40	40	48	42	42	54	47.8
	Min.	26	36	40	15	10	9	23	37	30	24	18	36	30	28	21	22	33	40	24	15	13	22	36	42	33	31	30	29	24	26	22	25.7
Columbus J	Max.	46	43	48	38	15	35	..	28	..	32	25	..	..	31	30	26	29	52	64	30	55	65	56	62	55	43	36	41	37	36	42	44.6
	Min.	28	30	32	15	5	40	57	58	44	32	37	37	59	40	33	36	54	55	39	20	10	21	40	55	40	33	32	28	29	27	28	25.7
Corning	Max.	61	57	47	42	17	7	19	36	30	24	16	34	29	29	35	40	65	75	65	45	32	58	55	50	40	39	36	41	38	36	45	47.6
	Min.	27	32	35	10	7	21	48	62	57	40	37	44	56	39	35	40	65	75	45	23	11	12	20	44	39	33	32	28	30	30	30	26.7
Co Bluffs	Max.	73	67	50	45	16	8	14	14	35	30	27	12	37	31	28	23	25	32	50	33	21	27	39	51	44	49	41	34	37	39	34	41.0
	Min.	29	33	38	16	8	6	30	42	40	34	30	35	37	34	32	32	41	48	33	16	13	11	35	38	32	29	38	27	23	22	22	23.6
Cresco	Max.	40	37	37	31	4	-6	4	17	32	28	20	13	25	28	25	27	38	46	58	55	42	34	52	62	59	49	40	38	39	41	45	46.3
	Min.	21	23	31	4	36	11	34	48	49	36	35	37	48	48	34	34	29	26	25	43	38	19	17	26	41	45	39	35	32	33	29	28.3
Davenport	Max.	42	40	45	34	10	4	8	24	36	32	24	22	30	31	36	37	34	26	25	43	32	24	29	42	56	49	39	54	41	32	28	43	40.4
	Min.	26	33	34	26	..	30	45	45	38	30	37	43	33	16	13	12	23	51	57	29	24	14	14	9	33	39	30	24	28	21	18	26	7	20.7
Decorah	Max.	46	43	40	34	8	-4	4	12	30	30	23	15	25	35	34	44	56	64	30	50	20	29	45	57	48	47	28	35	45	25	43	36	43	39.7
	Min.	15	28	34	8	-4	4	12	30	30	36	32	34	42	24	35	32	34	28	30	30	13	10	15	30	40	30	28	28	25	22	23	14	44	20.9
Delaware	Max.	40	37	40	34	10	32	43	42	30	26	21	14	48	40	32	20	59	67	63	39	26	10	9	19	44	57	10	32	30	25	..	32	29	15	44.2
	Min.	17	22	20	9	-1	3	14	30	52	37	31	40	48	40	18	37	19	28	39	26	10	9	36	59	60	42	39	37	41	40	32	34	42	22.0
Denison	Max.	69	57	47	37	15	40	56	52	24	28	32	6	33	18	38	11	29	64	66	45	30	36	56	59	42	42	32	39	32	32	42	44.4
	Min.	28	31	30	-8	4	..	14	36	57	36	32	37	55	38	36	39	54	64	44	19	17	37	51	60	42	35	32	36	32	28	24	27.2
Des Moi'es	Max.	58	48	47	41	14	35	56	56	36	32	25	15	36	30	27	25	24	30	66	57	30	17	29	40	60	44	38	39	34	36	42	45.3
	Min.	25	35	36	13	4	12	20	57	56	41	32	44	57	44	34	34	53	60	66	25	17	16	29	40	62	38	34	36	32	32	26	29	24	27.6
De Soto	Max.	57	53	45	37	16	7	12	19	39	31	24	15	33	32	28	23	47	57	63	49	24	32	45	59	52	49	36	39	39	39	42.1
	Min.	25	34	37	16	7	12	36	53	50	42	37	40	40	38	33	33	47	57	63	49	21	14	18	15	35	40	34	30	28	21	22	25	17	22 9
Dows	Max.	56	45	46	37	8	-4	6	16	35	30	21	7	28	40	39	34	45	54	65	37	28	19	48	61	51	48	40	33	30	43	42	32	45	40.2
	Min.	26	27	33	8	8	32	45	41	36	36	33	36	40	39	34	37	45	54	30	37	28	19	16	24	38	44	35	33	30	38	27	27	23	25.5
Dubuque	Max.	43	38	42	38	8	-2	6	21	35	29	24	21	24	32	29	23	42	53	65	69	60	35	41	58	62	59	54	42	38	42	31	48.0
	Min.	20	31	32	8	18	34	63	54	38	..	34	44	63	54	38	42	53	65	46	33	17	32	43	37	43	31	34	31	30	46	45	38	51	43.4
Eldon	Max.	52	51	48	42	16	6	9	30	36	31	26	19	34	31	42	28	19	48	58	30	18	33	51	62	49	50	41	34	29	33	36	46	26	23.3
	Min.	27	28	35	37	10	36	51	43	37	..	45	43	42	37	27	42	19	25	31	16	48	12	17	48	35	43	29	34	33	25	40	21	40	40.8
Elkader	Max.	46	41	43	33	10	0	5	14	35	30	20	17	43	32	27	35	55	57	31	38	42	48	12	58	35	50	42	33	30	40	18	20	18	19.8
	Min.	24	25	33	38	12	37	50	40	33	30	40	25	43	35	30	20	20	20	31	10	12	30	12	35	37	49	48	38	30	35	49	35	42	40.4
Estherville	Max.	60	45	44	6	6	-6	5	12	30	26	22	25	38	42	35	20	46	54	61	40	20	30	12	34	67	49	41	32	38	27	..	39	35	23	11	22.2
	Min.	26	25	34	36	..	32	37	47	35	30	30	15	24	31	25	18	24	53	37	20	15	12	33	42	38	41	38	32	28	28	21	40	22	39.7
Fayette	Max.	43	37	31	10	-4	6	15	34	34	29	28	15	37	39	32	34	45	53	55	45	21	9	15	33	67	33	32	31	30	32	25	38	43	43.6
	Min.	24	23	41	38	9	34	48	46	36	33	19	37	9	19	39	45	30	33	17	12	9	34	50	62	38	50	40	38	31	55	37	30	29	40	22	42	22	26	12	21.3
Forest City	Max.	50	46	41	38	5	-6	5	37	32	42	32	19	35	6	19	45	30	38	62	58	27	14	34	11	38	55	16	39	60	40	30	40	43	45	45.0
	Min.	26	28	30	5	40	15	37	9	14	30	15	35	38	30	35	18	39	47	28	21	14	38	55	65	42	34	32	40	33	30	22	30	25	27.3
Ft. Dodge	Max.	62	48	46	15	40	13	9	14	52	18	60	55	31	36	20	35	32	39	18	61	37	49	18	23	41	41	33	31	29	29	27	35	45	43.2
	Min.	25	28	32	13	34	14	5	9	38	60	33	36	20	34	42	36	37	17	23	60	26	45	15	39	54	44	40	49	39	32	29	40	39	42.9
Fruitland	Max.	47	44	43	32	14	36	8	14	55	31	36	30	29	42	30	36	19	49	23	43	29	39	54	59	37	41	41	25	27	41	25	27	22	25.0
	Min.	25	25	32	46	36	8	48	59	57	49	32	51	60	46	34	39	22	39	60	26	45	15	47	21	56	64	40	32	24	30	30	42	..	24	15	22.6
Galva	Max.	65	55	46	19	-2	15	38	8	14	59	57	37	30	34	27	39	22	39	60	26	45	15	28	56	64	33	32	24	27	30	32	40	46	39	44	41.1
	Min.	29	30	19	8	25	7	48	59	57	49	32	51	60	46	34	39	22	39	60	26	45	15	47	21	56	64	40	32	24	30	30	42	..	24	15	22.6
Glenwood	Max.	69	64	..	45	17	7	13	25	37	29	25	18	36	30	36	41	30	36	56	28	32	56	62	55	43	36	39	46	32	32	27	34	41	23	42	37	44	41.3
	Min.	32	33	37	36	..	31	45	45	40	..	30	35	41	30	35	25	35	15	56	32	62	34	68	23	14	12	16	36	60	51	40	34	46	39	51	40	24	41	23	12	23.2
G. Meadow	Max.	44	44	40	31	10	37	3	15	32	30	24	15	21	37	33	23	14	15	48	23	14	14	15	33	60	40	33	34	30	28	23	24	25	42	43	47.1
	Min.	32	30	40	37	11	-2	7	18	48	33	30	41	40	27	31	33	38	56	60	40	33	38	56	60	40	58	46	39	36	48	41	42	43	19	40	42.9
Greene	Max.	50	45	33	11	-2	16	38	59	58	41	..	24	15	46	60	32	40	30	33	27	38	27	19	19	49	20	40	56	54	40	32	35	42	41	25	36	40	22	27	25.7
	Min.	25	28	47	35	16	5	8	21	37	28	24	33	35	15	43	36	19	49	23	43	34	32	20	58	26	15	33	15	33	50	23	29	35	41	41	24	27	35	44	42.9
Greenfield	Max.	60	57	34	12	5	14	33	52	54	44	30	24	16	31	22	36	49	23	43	18	32	36	49	20	60	30	27	41	41	25	27	41	25	27	22	36	43	41.4
	Min.	24	35	34	40	14	4	33	21	53	36	30	24	34	43	30	44	30	30	37	27	35	38	26	30	43	24	25	30	41	24	25	40	42	24	39	25	28	37	25	13	24.0
Grinnell	Max.	46	45	43	40	13	4	8	16	35	30	25	15	38	30	37	31	36	48	20	40	26	14	33	48	20	35	41	33	32	30	41	24	39	25	40	29	26	27	29	51	46.1
	Min.	27	30	26	13	4	14	34	53	54	44	30	34	43	30	44	30	32	49	23	36	22	33	50	29	58	42	33	32	30	35	40	29	26	27	37	46	24.7
Grin'l (nr.)	Max.	46	43	41	38	14	2	7	16	35	30	25	15	38	30	37	31	36	48	20	40	26	14	33	48	20	35	41	33	32	30	41	24	39	25	38	43	41.4
	Min.	25	30	34	14	2	12	35	50	50	39	32	38	39	37	31	32	27	38	65	40	26	14	33	48	20	35	41	33	32	30	40	24	39	25	38	44	45.9
Grundy C'r	Max.	48	44	41	35	12	0	5	32	35	30	32	24	11	51	51	40	30	38	47	19	20	54	64	26	42	19	15	33	12	19	48	62	40	38	41	29	25	45	27	16	23.8
	Min.	26	28	32	12	0	25	32	63	57	30	32	24	10	31	41	30	29	47	54	20	48	22	59	20	49	20	58	29	68	30	61	27	66	32	56	56	34	64	33	45	45.4
Guthrie C'r	Max.	40	53	56	40	13	6	10	11	53	16	38	51	10	31	41	30	38	59	67	59	33	17	18	22	36	40	35	41	34	31	25	27	39	25	28	37	40	39.6
	Min.	30	35	22	13	..	12	37	53	51	38	21	..	43	41	21	34	23	33	47	49	32	33	23	41	18	53	57	41	63	36	56	40	60	36	60	33	58	43	42	45	45.9
Hampton	Max.	54	47	42	..	9	-3	8	20	32	29	20	12	..	29	21	28	39	57	65	46	29	9	31	35	53	23	54	24	48	35	62	36	58	34	30	28	33	32	25	12	23.1
	Min.	27	28	32	39	17	4	41	9	35	32	40	32	43	7	34	49	26	32	39	21	46	17	26	10	35	54	24	40	60	33	42	58	41	32	35	38	27	39	30	51	48.4
Harlan	Max.	66	59	47	35	12	4	9	35	34	59	46	32	38	16	27	35	26	34	57	29	17	26	13	35	54	24	37	30	32	28	21	40	22	38	25	35	23	40	18	26.3
	Min.	25	31	45	38	17	5	8	34	58	34	30	24	32	16	31	20	35	28	34	16	28	12	24	34	58	37	33	32	28	27	38	42	39	30	29	37	50	40.2
Hedrick	Max.	48	46	32	15	41	16	7	10	37	50	42	32	24	33	39	32	35	48	28	32	39	56

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR MARCH, 1901—CONTINUED.

STATIONS		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Iowa City.	Max...	48	43	43	37	12	30	52	50	42	36	39	44	42	35	38	49	66	68	58	..	35	53	66	59	51	41	38	43	45	38	47	44.9
	Min...	27	26	32	10	8	8	17	33	32	27	19	27	31	31	25	20	26	38	37	18	17	22	36	..	33	31	31	31	23	29	25	25.7
Iowa Falls.	Max...	51	43	42	35	10	34	51	49	34	30	36	40	37	33	32	46	56	63	40	20	30	45	58	54	44	35	33	39	40	34	40	39.8
	Min...	26	27	32	8	-2	7	15	32	29	22	11	28	29	25	20	21	27	34	19	14	11	12	35	40	34	30	28	23	24	26	14	22.6
Keokuk ...	Max...	52	51	56	41	15	35	38	59	36	38	48	62	37	34	39	50	64	70	56	27	38	57	60	59	48	41	39	43	39	41	41	45.6
	Min...	29	35	40	21	11	10	26	36	34	28	24	38	33	30	28	24	24	50	46	20	21	30	45	44	48	36	33	33	30	33	31	31 5
Keosauqua	Max..	52	51	49	39	21	35	55	60	54	33	46	60	53	35	39	52	64	69	64	38	40	57	60	57	51	43	39	48	40	38	50	48.1
	Min .	30	33	39	19	12	11	24	38	33	28	22	36	33	31	27	22	29	50	37	20	20	20	39	39	37	36	33	32	26	26	31	29.5
Lansing ...	Max...	46	43	46	41	16	34	46	44	..	37	44	41	38	37	45	47	57	58	42	27	35	46	57	..	52	..	38	42	45	42	48	42.6
	Min...	16	31	28	15	-2	4	16	34	30	25	27	16	30	27	20	13	25	30	26	17	15	12	32	40	34	33	28	25	20	26	34	23.5
Larch w o'd	Max...	66	52	47	40	16	34	53	44	35	40	51	40	33	32	40	60	67	50	35	35	45	61	55	51	35	41	33	41	38	38	45	43.6
	Min...	31	32	10	5	-7	4	17	32	28	25	15	30	27	21	14	25	15	32	21	-5	8	23	43	33	32	28	27	28	25	25	25	21.6
Larrabee ..	Max .	65	49	47	38	16	26	57	46	37	32	40	47	..	33	37	57	58	54	..	32	40	53	57	47	58	37	34	40	38	36	43	43.2
	Min...	30	28	21	12	-2	5	17	30	28	22	8	30	16	20	14	22	29	30	22	11	9	20	38	38	31	29	27	22	22	25	16	21.6
LeMars....	Max .	68	55	48	42	18	37	55	46	35	38	44	46	36	32	37	63	68	63	48	31	42	58	59	47	42	40	36	39	39	37	43	44.9
	Min...	32	30	34	12	1	8	15	30	29	24	9	32	28	25	15	25	27	27	21	9	12	22	43	40	32	31	27	29	25	27	17	23.8
Lenox.. ..	Max...	59	56	49	41	18	39	55	57	49	32	36	59	42	33	36	53	67	66	57	26	36	51	52	56	56	56	43	41	37	34	42	46.3
	Min..	26	35	37	16	6	9	22	35	30	23	16	33	29	28	20	24	34	38	21	10	8	21	39	40	33	31	28	28	27	27	22	25.7
Logan.....	Max...	70	59	44	40	15	45	42	50	40	37	43	58	45	38	35	60	70	61	45	30	39	58	64	52	40	57	38	35	40	38	45	46.2
	Min...	32	36	28	15	8	14	23	35	30	28	11	40	32	22	20	30	34	40	31	27	10	24	46	42	33	32	31	28	32	31	38	28.5
Maquoketa	Max..	42	44	48	46	24	39	48	46	44	41	38	43	45	41	39	51	59	66	60	42	40	55	64	56	59	48	44	48	44	45	50	47.1
	Min...	14	25	31	15	1	5	14	34	30	23	18	22	31	28	23	19	26	37	32	18	16	20	31	42	32	34	30	30	24	26	22	23.6
Marsh'l't'n	Max...	51	47	45	40	15	36	53	55	44	33	41	43	40	37	38	52	61	67	61	26	35	52	61	55	52	39	35	44	43	39	45	44.7
	Min...	28	29	34	14	2	8	19	36	31	24	14	29	30	28	23	24	28	37	25	15	14	20	35	42	33	32	30	26	24	27	19	25.2
Monticello.	Max...	44	39	42	37	25	33	49	47	42	38	35	48	52	42	40	45	55	65	60	30	32	48	62	53	48	40	40	43	43	30	41	43.5
	Min...	30	21	28	22	5	-2	10	14	15	12	14	30	28	17	16	18	26	27	27	17	14	30	..	35	32	38	30	24	28	29	15	21,7
Mooar	Max...	55	55	53	30	13	32	53	46	36	36	48	55	34	34	39	50	35	62	59	26	35	40	46	44	46	51	35	42	45	39	50	42.7
	Min...	9	23	27	25	9	5	19	22	18	33	20	28	30	28	25	19	18	32	46	13	15	22	19	20	25	25	20	22	24	25	27	22.4
Mt. Ayr	Max...	60	58	49	40	17	37	58	58	46	32	40	64	46	33	37	55	69	68	56	26	34	55	53	58	..	36	36	41	38	33	47	46 0
	Min...	24	36	33	16	7	9	20	35	30	22	16	35	26	27	21	21	34	42	20	11	8	23	40	40	33	31	28	28	28	28	26	25.7
Mt. Plea'nt	Max...	49	47	47	40	22	35	50	55	43	35	42	57	55	36	39	48	60	69	63	42	36	53	63	60	53	43	40	43	41	39	43	46.7
	Min...	26	30	35	18	9	8	17	34	32	26	19	30	32	32	..	20	26	41	39	18	18	22	36	43	34	35	30	30	25	30	26	27.4
Mt.Vernon	Max...	45	47	40	33	18	33	42	46	37	30	42	40	34	31	39	47	60	66	52	32	32	55	62	59	49	42	38	38	41	40	50	42.6
	Min.	22	28	31	18	0	5	16	35	28	21	15	25	27	26	24	14	28	39	32	17	14	21	38	41	33	32	29	29	23	24	21	24.4
NewH'pton	Max...	42	40	39	..	8	30	45	43	37	33	36	39	35	32	34	43	51	58	40	22	28	42	56	50	48	..	35	39	42	37	41	38.8
	Min...	21	27	32	7	-4	4	15	34	29	22	14	13	30	26	18	18	..	33	19	12	12	15	35	39	33	29	28	23	22	25	14	21.5
Newton....	Max...	48	46	44	40	17	34	53	56	47	32	35	47	45	35	37	50	59	66	58	25	34	51	60	57	52	38	36	42	41	37	43	44.0
	Min...	24	31	33	5	3	9	17	35	30	24	14	29	31	28	23	20	21	40	25	15	14	20	26	42	33	31	29	28	25	25	23	24.3
Northwood	Max...	56	48	44	39	12	37	48	45	38	37	45	42	39	36	46	59	60	54	46	24	36	50	56	47	46	39	35	40	42	42	49	43.1
	Min...	25	26	31	7	-5	6	19	32	30	21	12	22	30	25	18	16	28	32	20	13	13	12	32	38	31	29	26	22	23	25	20	21.9
Odebolt....	Max...	66	60	46	44	16	38	56	50	39	31	44	46	40	33	38	60	65	60	..	29	38	53	69	51	45	36	35	40	40	37	44	45.0
	Min...	29	32	35	14	3	9	16	35	30	24	6	28	29	26	18	25	30	35	21	12	9	21	39	40	34	31	29	29	27	27	14	24.4
Ogden... ..	Max...	60	51	44	..	16	36	57	54	44	36	40	45	..	34	34	49	60	64	52	30	36	50	59	60	49	36	32	..	42	36	44	44.6
	Min...	19	30	21	12	0	5	14	33	28	21	7	28	28	26	19	17	27	34	21	14	10	20	35	41	33	27	27	28	24	25	15	22.5
Olin..	Max...	42	38	41	35	16	31	45	41	38	32	34	40	38	38	35	44	64	..	54	34	31	44	60	55	51	40	39	41	42	39	41	40.8
	Min..	16	24	31	15	2	5	14	31	31	24	18	23	33	29	23	20	..	..	33	19	15	20	32	43	33	35	31	31	36	27	20	24.6
Om'ha Neb	Max...	76	65	49	46	19	47	60	54	36	36	44	64	37	34	38	65	75	61	38	30	39	56	53	47	38	40	35	40	37	35	44	46.3
	Min...	35	36	38	12	6	14	28	36	30	27	20	32	30	24	22	30	36	38	21	10	14	25	45	37	32	32	29	30	30	29	25	27.5
Onawa.....	Max...	73	62	54	42	23	44	57	53	40	39	44	57	42	35	40	68	72	64	42	33	38	55	57	50	42	42	40	44	40	37	46	47.6
	Min ..	29	32	34	14	5	12	19	33	30	25	12	33	28	25	18	24	30	34	22	9	12	21	41	40	32	30	28	28	26	29	16	24.9
Osage.....	Max...	42	40	40	34	7	30	43	41	35	32	33	37	35	32	30	41	50	50	36	24	29	40	51	44	42	36	33	35	39	36	40	36.7
	Min...	25	22	26	7	-5	5	17	32	28	22	11	26	28	25	18	18	27	31	20	12	13	14	34	38	33	30	26	21	22	25	15	21.5
Oskaloosa..	Max...	54	46	48	32	16	37	59	61	45	33	40	59	45	33	40	52	63	69	58	29	36	55	62	61	49	44	37	45	43	36	48	46.3
	Min...	26	29	32	14	5	8	16	37	30	24	16	31	30	28	24	20	26	44	24	16	17	24	35	43	33	31	30	30	27	28	26	25.9
Ottumwa ..	Max...	56	59	49	39	15	35	54	57	..	39	40	60	..	36	38	52	62	70	62	..	37	53	58	52	46	43	39	43	40	38	44	47.0
	Min...	30	24	32	12	12	..	..	41	30	26	20	..	34	30	25	24	35	..	35	20	20	28	44	41	33	35	32	31	30	31	29	29.0
Ovid.....	Max...	57	51	48	34	18	33	56	65	34	34	42	64	35	35	42	35	66	69	36	29	41	59	58	62	44	40	37	47	40	35	46	44.9
	Min...	25	31	35	14	7	9	19	38	30	24	13	34	29	26	21	23	30	40	22	14	15	25	39	38	31	31	28	26	24	28	26	25.6
Pacific Jct.	Max...	68	64	51	41	22	49	61	57	45	34	41	62	42	35	40	60	71	68	48	31	40	54	55	48	41	40	42	40	40	42	44	47.6
	Min...	25	30	37	17	10	11	17	33	30	26	8	35	30	28	17	23	30	37	23	10	7	18	42	39	32	32	30	28	30	30	20	25.3
Pella....	Max...	53	53	43	..	18	36	55	62	..	30	50	56	38	38	41	52	59	78	..	41	50	55	..	50	48	42	57	46	42	36	45	47.3
	Min...	43	38	38	18	6	10	18	35	29	28	30	..	31	28	24	28	30	43	16	5	15	..	18	22	19	16	30	..	27	26	28	25.0
Perry.....	Max...	60	50	45	38	..	38	57	56	..	33	43	47	44	38	36	51	61	66	48	30	40	50	62	62	56	41	36	42	44	42	42	46.8
	Min ..	34	31	27	16	4	10	17	37	32	24	10	31	31	28	22	21	28	37	22	11	..	20	..	42	25	15	..	30	27	27	17	24.1
Plover.....	Max...	60	56	46	32	12	37	55	48	45	40	43	39	38	36	35	59	26	53	40	31	36	53	60	53	48	36	33	36	38	35	43	39.6
	Min...	31	26	35	22	0	4	15	33	30	19	15	27	24	..	22	20	30	36	22	20	9	16	..	40	33	30	28	24	20	22	13	23.0
Primghar..	Max...	60	48	46	45	15	35	40	41	35	32	40	45	..	..	..	55	62	52	..	..	..	55	45	45	40	35	..	43	37	36	43	43.2
	Min...	30	..	..	..	..	..	..	17	29	22	9	30	30	27	15	40	..	..	..	10	12	10	25	..	20	33	25	23	27	28	18	22.5
Red Oak...	Max...	66	66	64	44	18	44	60	50	32	30	44	64	35	33	39	59	71	69	48	29	49	59	54	54	46	36	37	42	39	37	44	47 2
	Min...	26	27	26	15	5	10	19	32	30	26	15	33	28	23	25	24	31	40	22	10	9	19	42	40	31	32	28	28	31	29	19	25.0
Ridgeway .	Max ..	46	41	42	35	9	33	46	42	39	33	40	37	37	36	43	46	56	56	36	25	32	45	56	44	50	40	39	47	45	37	47	40.6
	Min ..	23	33	33	8	-2	6	17	34	30	24	15	25	33	26	16	19	29	36	22	15	14	16	35	38	32	32	28	23	23	25	20	23.5
Rockwell C	Max...	60	55	44	..	15	39	57	50	43	34	42	44	39	..	35	51	58	56	47	29	38	48	66	53	47	48	32	41	42	47	43	44.9
	Min..	26	30	30	13	1	8	20	34	30	28	7	29	30	26	17	23	31	34	20	15	15	21	34	40	34	30	..	30	26	20	26	24.3
Ruthven..	Max...	57	..	..	..	13	31	45	..	32	..	40	39	..	..	39	52	..	..	28	23	36	45	54	..	..	..	30	35	35	..	40	37.4
	Min..	31	25	32	10	-5	-2	22	29	29	22	8	28	24	25	15	20	30	20	11	6	18	26	35	39	31	27	25	28	25	27	17	21.9
Sac City....	Max...	63	51	45	38	15	37	55	50	42	32	39	44	40	32	38	57	60	57	47	29	36	48	57	52	44	35	33	39	39	35	42	42.9
	Min ..	27	29	34	12	1	8	18	34	30	24	10	30	29	26	18	24	30	32	21	13	9	17	37	40	33	30	28	29	27	27	15	23.9
Scranton ..	Max ..	62	56	45	38	15	37	54	51	45	30	36	43	41	33	33	50	58	62	54	30	34	49	57	56	50	37	33	38	40	34	40	43.3
	Min...	25	32	32	15	3	10	21	32	29	24	13	30	30	27	20	23	31	41	21	15	11	23	35	41	35	32	30	30	27	26	20	25.3
Sheldon ...	Max...	65	..	41	..	16	40	50	45	35	33	40	40	33	32	37	60	62	52	35	30	40	50	58	50	41	37	36	40	38	38	43	41.5
	Min ..	31	28	32	10	-4	7	15	30	29	23	28	30	22	22	12	25	28	27	12	12	10	10	34	36	32	28	28	25	25	25	15	22.1
Sibley	Max...	65	50	45	42	15	..	52	41	..	33	44	42	33	31	37	59	62	53	34	40	..	57	58	49	43	35	33	38	36	34	45	43.1
	Min. .	20	27	32	9	-4	..	4	27	..	22	8	29	27	21	14	14	29	32	22	11	..	20	40	37	31	29	26	24	25	25	17	22.4
Sigourney .	Max. .	52	50	46	39	18	36	55	62	47	33	41	56	50	36	41	52	64	70	60	33	37	56	64	60	51	39	38	45	47	39	47	47.2
	Min ..	30	31	34	15	5	9	18	..	32	25	16	30	31	29	24	20	26	45	32	17	17	22	38	43	32	34	31	31	24	29	27	26.8
Sioux Cen.	Max,.	65	55	40	43	..	36	50	45	36	36	44	45	35	35	38	57	60	..	..	..	..	..	57	54	45	39	33	39	37	35	42	44.0
	Min ..	31	30	33	12	-3	6	20	32	28	23	17	30	27	22	15	30	31	..	..	..	..	..	35	37	32	29	28	29	27	26	20	24.9
Sioux City.	Max. .	70	57	47	27	19	39	55	47	35	39	44	48	34	34	38	66	69	54	30	31	41	55	56	49	36	41	35	41	37	34	41	43.5
	Min...	39	33	36	11	4	13	19	33	30	26	21	33	29	25	18	29	34	34	24	9	14	26	46	38	31	31	28	29	29	28	21	26.5
Storm L...	Max..	62	54	45	38	14	35	52	47	34	30	36	44	36	32	37	58	56	54	..	27	37	47	55	49	41	34	31	37	37	31	38	40.9
	Min ..	28	28	34	9	-2	6	19	33	29	22	11	29	28	22	16	26	32	38	19	11	9	22	38	37	29	29	27	28	26	26	18	23.5
Stuart	Max ..	62	65	..	25	12	34	50	55	..	23	55	38	35	35	37	55	67	67	62	30	40	55	60	64	52	35	35	40	40	35	47	45.2
	Min...	36	28	10	2	2	8	21	30	15	12	..	..	30	20	20	22	30	40	20	12	12	23	38	43	34	28	30	29	25	22	23	22.9
Thurman ..	Max ..	68	63	56	44	19	47	58	57	47	34	40	58	39	34	58	59	70	65	48	30	40	56	56	[illegible]	40	36	37	40	36	37	43	47.2
	Min...	24	31	36	16	9	12	18	35	30	26	1	37	30	27	22	21	29	38	24	11	10	17	45	36	32	32	27	30	29	30	20	25.3
Toledo.....	Max ..	53	..	40	43	46	..	55	58	..	..	42	42	35	38	44	54	62	70	..	..	37	54	63	55	..	39	38	47	43	..	47	48.0
	Min...	20	27	13	5	4	2	12	37	30	29	16	30	32	28	22	21	24	44	27	11	15	17	36	38	35	33	30	29	23	27	20	23.8
Villisca ...	Max...	48	64	48	40	16	45	59	58	42	32	43	61	44	35	40	57	69	70	57	57	40	54	55	57	51	43	42	43	43	43	44	48.4
	Min...	36	38	32	14	10	10	20	35	34	25	36	34	30	30	20	23	27	40	22	10	7	17	41	41	34	32	25	29	29	29	20	26.1
Wapello ...	Max...	39	49	43	35	18	34	47	47	..	34	38	58	50	35	37	44	58	66	59	43	39	52	60	57	50	43	39	41	40	39	49	44.8
	Min...	28	29	33	15	11	11	22	36	..	28	23	32	32	31	28	23	30	45	39	23	22	27	37	45	38	31	32	32	28	31	28	29.0
Washi'gt'n	Max ..	48	44	45	..	..	35	53	54	..	33	39	55	..	35	40	51	62	69	..	..	36	54	64	59	..	..	38	43	41	..	46	47.5
	Min...	27	28	31	10	4	6	17	32	30	24	16	29	32	27	22	19	26	41	28	15	19	21	36	42	33	32	30	26	24	27	21	25.0
Waterloo..	Max ..	46	40	44	37	12	35	45	48	39	37	36	41	38	36	39	49	56	65	42	..	33	47	61	55	47	40	35	44	44	35	44	42'3
	Min ..	21	27	32	10	0	7	16	26	20	25	16	26	31	27	22	22	26	35	26	15	16	19	36	43	32	31	30	26	24	26	19	23.9
Waverly ...	Max ..	46	45	42	35	10	35	48	46	38	34	39	42	37	36	37	47	55	63	45	32	33	47	61	54	47	39	36	41	43	37	44	41.7
	Min ..	24	27	33	10	-1	7	16	35	30	24	10	27	31	27	21	21	27	36	23	15	15	17	36	41	35	33	29	26	24	25	18	23.9
Whitten...	Max ..	48	51	43	36	12	30	48	50	37	34	34	40	49	34	34	48	55	62	54	25	30	31	52	52	40	34	42	41	40	42	41.5
	Min ..	32	..	31	10	-2	..	..	..	28	21	16	..	..	..	20	20	23	35	22	14	12	16	[illegible]	..	32	30	28	25	24	15	25	21.5
Wilton Jc..	Max ..	44	43	42	39	18	34	50	45	39	33	35	51	44	36	37	40	58	67	59	..	34	[illegible]	59	52	40	45	..	44	39	43	44.5
	Min ..	29	27	33	17	5	8	17	35	31	26	20	28	34	29	25	21	27	42	37	20	17	[illegible]	44	34	25	29	33	29	29	23	26.8
Winterset .	Max ..	56	52	45	..	25	..	55	58	..	..	50	45

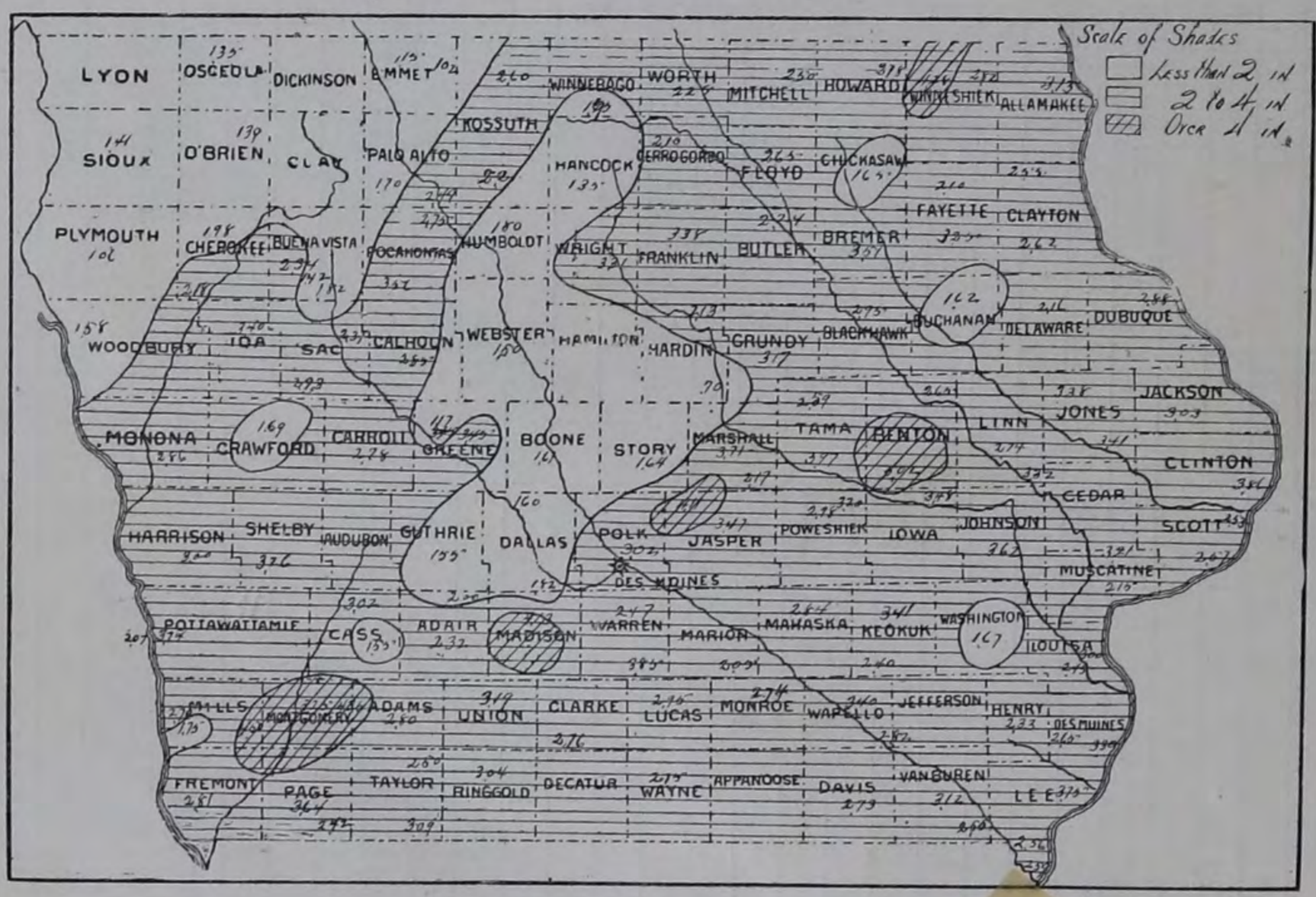
DAILY AND MONTHLY PRECIPITATION FOR MARCH, 1901.

STATIONS.	DAY OF MONTH.																													TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	....	T.	...	....	T.	...	....		.90	.30	..	....	T.	.05	....	....	....	....	.40	.20	....	....	T.	.14	.50	....	..	....	T.	.70	....	3.19
Albia	...	..	..	...	....	...	...	...	.89	.20	....	....	.10	....	..	..	...	....	.40	.15	....	..	.52	.05	.08	..	....	....	....	.35	....	2.74
Algona	....	..	..	....	....	...	...	....	....	.90	....	..	..	.10	..	....	....	....	..	.40	T.	....	....	.21	.20	....	....	....	....	.40	....	2.21
Alta	....	T.	....	....	T.	....	....	..	..	.63	..	T.	.04	..	..	...	....	....	.60	.08	..	..	...	.36	.05	..	...	...	.28	.30	....	2.34
Alta (near)	..	....	....	....	...	...	....	....		.20		05		....		....	..	....	.40		...	..	.22	.05	..	....	....	....	.30	.20	....	1.42
Amana	....	....	..	....	...	..	....	..	.05	1.06	.02	.03	.34		T.	..	..	..	1.29	.07	....	..	.03	.21	.01	..	....	....	....	.37	....	3.48
Ames	....	....	..	....	..	...	....	....	..	.50	....	.	.34	T.		..	...	....	.20	.05	....	.	...	.19	.20	....	...	....	....	.16	...	1.64
Atlantic	..	...	....	..	T.	....	....	...	...	.80	..	.06	....	..	..	....	....	....	....	1.00	....	....	..	.16	.20	....	..	....	....	.80	..	3.02
Audubon	....	....	..	..	.	..	..	...	...	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Bancroft	..	..	..	...	T.	...	....	....	T.	.60	....	.10	.30	.10	....	....	....	..	.30	.20	..	....	.10	.30	.10	....	....	....	....	.50	..	2.60
Baxter	....	....	..	..	.	..	..	...	....	....	....	..	....	....	....	....	....	..	.30	.20	..	....	.10	.30	.10	....	....	....	....	.38	....	4.11
Bedford	..	..	..	...	T.	...	....	....	1.00	1.50	...	...	.10	....	....	....	....	..	.38	.10	.	....	....	.25	.40	....	....	....	....	.30	...	3.09
Belknap	....	....	...	....	..	....	....	...	.80	.93	..	..	.05	T.	....	..	..	...	..	.93	..	..	..	.08	T.	T.	..	..	....	T.	.30	....	2.73
Belle Plaine	....	....	...	....	..	..	..	....	.10	.77	..	.05	.10	....	...	....	..	..	.76	.10	...	.10	.20	.10	.05	....	T.	....	....	.05	.40	..	5.02
Bonaparte	..	....	..	.05	.05	....	....	..	2.00	.80	..	.25	.10	....	....	....	....	....	1.10	.22	.10	....	....	..	..	....	....	....	....	T.	.25	...	2.50
Britt	..	...	..	....	..	....	..	....	....	1.00	....	....	T.	T.	....	..	....	....	1.00	T.	T.	...	....	.25	..	....	....	....	....	....	.23	...	1.35
Buckingham	..	....	..	....	..	....	..	....	....	.27	....	....	.33	....	....	....	....	...	.20	.10	..	.	.	.19	.03	....	....	..	.63		...	2.59
Burlington	..	....	....	....	..	....	....	....	..	.80	.13	...	...	T.	....	....	....	..	.65	.20	...	..	.02	.14	.02	...	....	..	....	.18	....	3.30
Bussey	..	.04	..	T.	T.	..	.	..	T.	1.04	.10	..	.23	T.	T.	..	..	....	1.33	.04	.05	..	.18	.08	.03	...	....	..	....	....	....	2.05
Carroll	....	T.	...	T.	.	..	....	....	.50	.20		..	.16	.05	....	....	....	..	.47	T.	....	....	T.	.10	.13	.	..	...	....	.70	....	2.78
Cedar Falls	....	....	..	.	T.	..	....	....	..	1.00	....	..	T.	.05	....	..	....	....	....	.80	....	....	....	....	....	....	....	....	....	....	....	....
Cedar Rapids	....	....	..	..	....	...	....	....	....	....	....	..	..	..	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Chariton	....	T.	....	T.	T.	T.	..	...	.37	.60	....	.36	.13	..	..	....	...	.06	.51	.05	....	...	04	.11	.01	....	T.	....	....	.50	...	2.74
Charles City	....	....	..	....	....	....	....	....	.40	.77	....	T.	.21	.03	....	..	....	....	.62	.05	T.	..	.07	.15	.11	.02	..	....	.02	.50	....	2.95
Clarinda	..	T.	.	T.	T.	T.	..	...	..	.70	..	T.	30		..	..	..	..	.70	27	....	...	....	.15	.08	..	. ..		...	.45	..	2.65
Clarion	....	..	..	.05	. ..	..	..	...	...	1.80		..	.08	....	..	..	...	..	.13	.77	.	....	T.	.20	..	....	....	...	....	.61	..	3.64
Clear Lake	....	..	..	...	..	..	..	.	...	.50		..	.25	.05	..	..	...	..	.30	.20	...	....	.06	.30	.20	..	T.	....	....	.30	....	2.10
Clinton	....	....	..	...	..	..	....	..	.05	.77	....	T.	.45	.06	..	....	....	....	.80	.04	..	..	.01	.14	.02	...	....	....	.11	.68	..	3 86
College Springs	..	....	..	.01	..	..	..	..	.80	.78		..	.03	T.	...	....	....	....	.34	.04	...	..	.45	.05	.02	..	T.	....	T.	.14	..	2.42
Columbus Junction	T.	T.		T.		T.	..	..	T.	.70	....	.05	.13	...	....	..		....	.85	.04	....	...	T.	T.	.20	...	T.	....	.10	.70	.01	3.00
Corning	..	..	...	T.	..	..	..	....	1.30	.30	....	..	.15	T.	....	....	..	..	.35	..	..	...	10	.18	T.		...	....	.28	.40	....	2 80
Council Bluffs	....	...	....	..	....	...	..	..	.23	1.09	..	T.	T	.	....	..	....	..	1.10	.40	..	..	T.	.20	T.		...	..	....	.36	..	3.74
Cresco	..	..	....	T.	T.	...	....	..	..	.50	...	T.	.41	.02	..	..	....	..	1.15	.25			T.	T.	....		...	..	....	.25	..	2-78
Cumberland	....		...	T	T.	....	..	..	.c6	1.42		..	T.		..	..	..	..	01				T.	T.	....		....	..	.06		...	1.55
Danville	....		..			...	..	...	T.	1.75	T.	..	....	T.	..	..	..	..	.70	T.	T.	T.	T	T.	T.	T.	T.	....	....	.20		2.65
Davenport	....	T.		..	T.		....	....	.02	.77	.06	T.	.14	.08	T.	....	...	....	.92	.04	T.	....	.04	.01	.12	T.	T.	....	....	.37	T.	2.57
Decorah	..	..	T.	....	..	....	..	..		.65	...	....	.32		..	..	....	.60	..	.90	..	..		.06	.37	..	..	....	....	.52	..	2 82
Delaware	....	..		....	..	..	..	..		.39		.46			..	..	....		..	.42	..	..		12	.10	..	..	....	....	.07	....	2.16
Denison	..	..		..	....	..	..	..	.20	.15	....		T.	.02	....	..	....	.40	.20	..			.12	.10	..	T.	.	..	40	.20	....	1.69
Des Moines	....			....	...	...	....	...	.36	1 11	...	T.	.27	.08	T.		....	.33	.11	....	...	.01	.12	23	T.	T.	..	.01	.39	T.	3.02
De Soto	....	T.	.	..	T.	..	..	..	T.	.60	..	..	T.	.10	..	..	....	.20	.30	....	..	T.	T.	.20	.02	....	..	10	30	....	1.82
Dows	..	..	..	...	T.	....	....	...	..	.70	....	T.	.80	....	..	...	..	..	60	.40	T.	..	.05	.11	.17	.01	T.	....	....	.42	.01	2.88
Dubuque	.		..	T.	T.	T.	..	T.		.63	.03	T.	.36	01	T.	...	....		.94	.14	T.	..	.05	.17	.03	....	....	....	T.	.37	..	2.82
Eldon	..	T.	....	....	..		..	....	.04	.93	....	.13	.06	.01	....	....	....	....	99	02	..	..	.07	.10	T.	....	....	....	....	.45	....	2.62
Elkader	....	...	....	..	....	...	...	..	.10	.75		.26	.20	....	....	..	....	.	.70	T.	..	..	.06	.10	T.	....	....	....	....	2.00	....	4.50
Emerson	..	T.	....	....	....	....	....	.	T.	.25	1.00	....	.10	.02	T.	..	..	....	10	.02	....	....	....	T.	.21	.05	..	..	....	....	.40		1.15
Estherville	..	T.	....	....	....	....	....	....	....	.27	.56	....	.40	T.	....	....	....	T.	1.10	T.	..	....	.20	.11	07	.	..	..	.55	..	..	3.25
Fayette	....	T.	T.	T.	....	..	....	....	1 15	...	..	..	.15	.23	T.	....	..	....	....	40	.25	....	....	....	.15	T.	..	....	....	....	.30	....	3.56
Fonda	...	T.	..	....	....	....	....	.	..	.35	..	....	.50	..	....	..	..	....	....	.20	.20	....	....	..	..	T.	....	....	....	....	.50	...	1.95
Forest City	..	....	....	....	....	....	....	..	T.	.50	..	....	.10	T.	....	..	....	..	....	.20	.20	....	....	..	..	T.	....	....	....	....	.50	...	1.50
Fort Dodge	.		..	....	..	....	....	..	T.	.55	..	..	T.	.05	....	..	....	..	1.52	....	....	..	.37	T.	T.	....	....	....	....	....	26	....	3 75
Fort Madison	...	T.	....	..	T	...	.	..	T.	1.55	..	..	T.	T.	..	....	....	....	.90	T.	....	..	T.	T.	T.	..	....	....	....	.40	....	2 15
Fruitland	...	T.	...	....	T.	..		..	.10	.75	..	...	T.	T.	..	....	....	....	....	.20	....	..	.70	.30	.70	..	....	..	.40	...	....	3 40
Galva	...	..	...	..	....	..	..	.	....	.40	..	..	.70	..	..	....	....	....	....	.61	.20	...	....	.27	.06	....	....	....	...	17	....	2.17
Gilman	...	....	....	....	....	....	..	..	.	.77	....	T.	.05	.04	....	....	....	T.	.35	....	....	....	T.	.20	.15	T.	T.	....	.20	.30	....	1.75
Glenwood	....	....	....	T.	T.	...	...	....	.20	.30	..	T.	.05	T.	....	....	....	....	.80	.25	...	....	....	.28	....	.07	..	...	....	.40	....	2 55
Grand Meadow	....	...		T.	....	..	....	..	....	.45	....	....	.30	....	....	....	....	....	.50	.16	...	....		.42	.12	....	....	....	....	.14	....	2.24
Greene	....	..	..	....	..	..	..	....	....	.68			.19	.03	....	....	..	..	.50	.16	...	....		.42	.24	T.	T.	....	.16	.50	..	2.32
Greenfield	....	T.	...	....	...	T.	....	...	.43	.51	....	T.	T.	.07	....	....	..	..	.30	.10	..	.	.01	....	....	....	....	....	.32	....	..	2.98
Grinnell	..	....	..	....	..	..	..	....	1.28	....	....	..	.07	....	....	..	..	....	67	....	.34	....	.18	.07	.05	....	....	....	....	.30	....	3.20
Grinnell (near)	..	T.	.	....	T.	....	...	....	....	1.28	....	..	.10	.10	...	..	....	....	.60	.35	....	..	.18	.18	.11	T.	....	....	....	.45	....	3.17
Grundy Center	..	....	....	....	....	....	....	....	....	1.18	....	.04	.09	.06	....	..	....	....	.80	.25	....	..	T.	14	.15	.01	....	....	....	....	....	....	3.48
Guthrie Center	....	....	....	..	....	..	....	....	.80	....	..	..	..	....	....	....	....	..	....	.30	..	....	.18	.26	.06	....	....	....	.45	....	....	1 55
Hampton	..	T.	....	....	T.	T.	..	..	.82	.58	..	.18	05	....	..	..	....	..	.68	.	..	....	T.	20	.13	T.	T.	T.	.52	.05	....	3.38
Harlan	....	....	....	....	....	....	....	....	.40	.70	....	..	.02	.01	....	....	..	....	1.20	.10	....	..	....	....	.20	....	....	..	.20	.30	..	3.26
Hawkeye	....	T.	....	....	....	....	....	....	....	.90	..	..	..	.20	....	....	....	....	....	.40	....	..	.05	.17	.07	....	....	....	....	....	.40	2.10
Hedrick	..	T.	..	....	....	....	..	....	T.	.70	05	.05	.08	T.	....	....	....	....	....	.05	.05	..	.05	.17	.07	....	....	....	T.	.60	....	2.40
Hopeville	....	..	....	....	....	....	..	....	..	.82	.55	....	....	.03	03	....	....	....	....	....	....	....	T.	....	.28	....	....	....	.10	.30	....	2.76
Hoprig	....	..	....	....	....	....	..	....	..	..	.12	..	..	....	..	..	....	....	T.	.53	.05	.05	..	.05	.17	.07	....	....	....	....	.25	....	1.02
Humboldt	..	..	....	....	....	..	....	..	T.	T.	.70		T.	....	....	....	....	....	....	.65	....	..	T.		.28	....	....	....	....	.75	..	1 80
Independence	....	....	....	....	T.	....	....	....	.20	.50	..	.10	18	....	..	..	....	....	T.	.30	.10	....	....	.19	.08	..	....	....	....	.50	..	1.62
Indianola	...	T.	...	...	.03	....	....	....	.36	.67		..	.15	T.	....	....	....	....	.03	.10	....	....	.01	.14	19	.01	....	....	.05	.65	...	2 47
Iowa City	....	T.	..	....	..	..	....	....	....	.92	..	.	.75	T.	....	....	....	....	.21	T.	....	....	....	.27	.06	....	T.	....	....	.27	....	3.62
Iowa Falls	T.	....	....	....	T.	...	..	....	05	.55	....	.02	.22	....	....	....	....	....	1.20	.15	....	..	....	.13	.21	T.	T.	..	T.	.45	...	2.13
Jefferson	....	....	..	....	..	....	....	..	....	1.05	....	....	.70	....	....	....	....	....	10	.40	..	....	T.	.13	.21	T.	..	..	..	1.25	...	3.45
Keokuk	....	..	...	.06	.02	....	....	..	T.	.70	T.	T.	.06	.02	.01	..	....	....	..	.35	....	....	.03	.02	.05	...	....	..	.15	....	....	2.59
Keosauqua	....		....	T.	T.	....	....	....	T.	1 00		.14	.10	T		..		..	1.22	T.	.01	....	.23	.08	T.	T.	....	....	T.	.01	.17	..	2.25
Lacona	....	T.	....		T.	....	....	....	1.00	75	..	..	.15	.10	....	....	....	..	1.00	.06	T.	....	.15	.33	T.	.10	T.	....	..	.10	.34	....	3.12
Lansing	....	....	T.	T.	T.	...	..	..	....	.86	.34	T.	.35	.05	....	....	....	....	.70	.20	T.	....	.10	.15	.10	T.	....	....	....	.50	...	3 85
Larrabee	....	....	..	....	..	....	....	..	20	.36	..	.12	.15	.10	....	....	....	..	.70	.20	....	....	.10	.15	.10	T.	....	....	....	.21		3.73
Le Claire	..	....	..	....	T.	....	....	....	....	41	.38	..	.08	.11	.02	..	....	....	.42	.70	T.	....	....	.60	.20	T.	....	....	....	....	....	....	1.98
Le Mars	....	....	..	....	....	..	..	....	....	.22	..	.20		....	..	....	....	..	.34	.11	....	....	....	.15	.10	..	....	....	....	.20	.16	2 53
Lenox	....	..	...	..	....	....	....	....	....	.40		...	..	.20	....	T.	....	....	.17	.46	.03	..	T	.25	.14	T.	....	....	....	.25	....	1 06
Logan	....	....	..	....	....	....	....	....	....	.63	.10	..	.32	.05	T.	....	....	....	T.	..	....	..	T.	.10	.05	....	....	....	....	.17	..	2 50
Maquoketa	....	....	....	....	....	....	....	....	....	.80	..	....	....	....	....	....	....	....	.50	.10	....	....	....	.10	.30	....	....	....	....	.60	....	3.00
Marshalltown	....	....	....	....	....	....	....	....	.18	1.05	....	.04	.37	....	....	....	....	....	.60	.40	....	....	....	.18	.14	....	T.	....	..	.40	....	3.03
Monticello	....	..	....	....	....	....	....	....	....	.72	....	.45	....	....	T.	..	....	....	....	.06	....	....	....	.15	.24	.10	..	..	....	.55	..	3 71
Mooar	....	....	....	.06	.02	....	....	....	T.	24	T.	....	..	02	.01	..	....	....	1.78	....	....	....	....	....	....	....	....	....	.10	.25	....	3.38
Mount Ayr	....	..	....	.02	....	..	....	....	.50	.96	....	....	.02	..	....	..	....	....	.95	....	....	....	.04	.07	.06	....	....	....	....	.19	....	2.56
Mount Pleasant	....	..	..	....	....	....	....	..	T.	.88	.	....	.12	....	....	..	....	....	.95		.05	..	.02	.10	.02	....	....	....	....	....	....	3.04
Mt. Vernon	....	...	....	....	....	....	T.	....	.25	.45	....	..	.30	10	....	....	....	....	1.30	.30		...	.02	.18	.02	...	T.	....	....	40	....	2.33
New Hampton	..	..	..	....	T.	..	...	....	....	.30	..	.20	....	.	....		...	....	.25	.10	....	....	....	.15	.05	....	....	....	....	....	.87	....	3.32
Newton	....	....	..	....	....	..	..	....	1.08	.35	....	.20	.05	...	....	....	..	....	.28	.38	..	..	.11	....	.30	.05	...	....	....	....	.30	....	1.65
Northwood	....	....	T.	T.	....	...	..	....	....	.40	..	T.	.40	....	..	..	....	....	.30	.50	....	....	....	.15	.05	..	....	..	....	....	.87	....	3.47
Odebolt	..	....	....	..	T.	....	....	..	.05	.32	....	..	22	T.	T.	...	.	...	.50	.38	..	..	....	.30	.05	...	....	....	....	.30	....	2.25
Ogden	....	T.	....	..	T.	....	....	....	..	1.02	...	....	.40	.10	..				.30	.50	....	..	....	.15	.05	..	..	T.	.71	...	2.93
Olin	..	T.	....	T.	T.	....	....	....	.10	.29	....	T.	.07	T.	T.	...	....	....	....	.48	....	....	T.	.07	.08	.01	T.	...	T.	.68	T.	1.61
Omaha	....	....	....	....	....	....	....	...	.10	.40	..	.03	.30	T.	..	...	..	..	....	.05	...	....	....	.30	T.	T.	....	..	..	.40	....	3.41
Onawa	....	....	....	..	..	....	..	..	....	.69	..	....	-18	.05	....	...	....	T.	1 16	.03	....	....	....	.36	.11	...	....	....	.15	.28	....	2.07
Osage	..	....	..	..	....	..	....	..	.08	.60	....	60	.06	.03	.	.	....	..	.63	.07	....	....	01	.36	.40	..	...	...	.10	.80	....	2.86
Oskaloosa	....	T.	....	....	..	....	....	..	.70		..		....	....	....	....	.	..	.30	.10	....	....	T.	.33	.40	..	....	....	....	.42	....	2 50
Ottumwa	....	....	....	....	..	....	....	..	....	.51	.99	..	.04	.05	.03	....	....	....	.69	.15	....	....	....	.21	.11	....	....	....	....	....	.30	....	2.84
Ovid	....	....	....	.05	.01	....	....	....	....	....	.33	...	T.	.09	....	....	..	....	....	.10	....	....	.10	.28	.04	..	....	....	....	....	....	3.40
Pacific Junction	...	....	....	....	T.	..	....	..	....	.80	..	....	..	....	....	....	..	....	.65	.10	..	....	....	....	....	....	....	.15	....	....	....	....
Perry	..	T.	...	...	..	..	..	..	....	....	....	..	.20	T.	....	....	....	....	.80	....	...	....	.10	1.30	.45	....	..	....	....	.05	.25	...	2.75
Plover	....	....	..	..	....	....	....	....	....	1.30	....	..	.20	....	....	....	....	....	.28	.18	...	. .	.12	.15	.04	....	..	....	....	28	.10	..	2.70
Red Oak	....	....	....	....	....	....	....	....	2.00	.65	..	....	.20	....	....	....	....	....	.60	40	....	....	.02	.30	.23	..	..		....	.40	..	1.60
																				.40	....	..	T.	....	..				....	.40	..	2.75
																				.30	....	....	....	....	....	....	....	....	.40	.30	....	5.25

DAILY AND MONTHLY PRECIPITATION FOR MARCH, 1901—CONTINUED.

STATIONS.	DAY OF MONTH.																														TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Ridgeway		.01		.01	.01			T.		.59		.08	.43						1.11	.35			.10	.12	.01	T.			.10	1.36		4.28
Rockwell City									.10	1.00									.60	1.00				.10	.05						2.85
Ruthven					T.					.50			T.	.10					.10	.30					.10				.60		1.70
Sac City		T.							T.	.64			T.						.40	.25			T.	.41	18	T.			T.	.43		2.31
Scranton										.47			T.						.20				T.		T				T.	.50		1.17
Sheldon				T.						.20		.20	.10						.05					.60	.04					.20		1 39
Sibley										.10		.05	.15	T.					.05				.01	.27	62	T.			10		1.35
Sigourney		T.			T.	T.			.08	.91		.09	.17	T.					1.03	.06	.04		.10	.22	.04				.67		3.41
Sioux Center						T.				.20			.30		T			T.	.05				T	.48	.08				.30		1.41
Sioux City		T.			T.				.02	.45		.03	.03	T.					.01	.01			.01	.36	.14	.01		T	.10	.41		1.58
Spirit Lake																															
Storm Lake		T.			T.			.05	.30		T.	.02		.02					.42	.10			.06	.36	.03	.01			.05	.40		1.82
Stuart									T.	.60			.03	T.					.30	.05			T.	T	.50	T.	T.		.02	50		2.00
Thurman				.04					.60	45		T.	.02	T.					.70	.05			.15	.10	.25	T.			.30	.15		2 81
Toledo									1.00											2.00			.32	.25						.40		3.97
Villisca			.10						1.25	.65			.40	T					1.05	T			.20		.20	T.			.50			4.35
Vinton									T	.50			.15						1.40	.10				.10	T.					.40		2.65
Wapello								T.		.95			.15	T.					.81	.05			08		T.					.36		2.40
Washington										.62			.22						.21				02	.15						.45		1 67
Washta		T.			T.	T.				.60		.50	.05	.05					.20				.13	.15					.50	T.		2.18
Waterloo					T.					.66			.51	T.					1.22	.13			T.	T.	.07		T.			.36		2.95
Waverly					T.					.84	.01		.36	.05					1.25	.25			.05	.05	.25					.40		3.51
Webster City																															
West Bend				T.						.80			.20						.60	.20			.28	.08	.03					.30		2.49
Whitten									T.	.50		T.	T.						.20													.70
Wilton Junction		.05		T	T.					.80			.43	T.					1 16	.10			.08	.04	.15					.40		3.21
Winterset									T.		2.20		T.	.25					T	.60		.30		.10						.68		4.13
Woodburn																															

Precipitation Chart March 1901.



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DES MOINES:
BERNARD MURPHY, STATE PRINTER
1901.

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U. S. DEPARTMENT OF AGRICULTURE—WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XII. APRIL, 1901. No. 4.

CLIMATE AND CROPS.

The crop season of 1901 opened ten days to two weeks later than usual, the beginning of farm operations being delayed by frequent storms of snow, sleet and rain in March, and continued wet, cold and cloudy weather through the first half of April. Except in limited areas in the northwest district, field work was practically impossible in March, and the conditions of the soil were not generally favorable for seeding and plowing prior to April 15th. Seeding operations progressed slowly through the first and second decades in April, the work being retarded by light rains and a prevalence of cloudy weather. Spring wheat seeding was about completed prior to April 20th, though the acreage was materially lessened by unfavorable conditions of the soil. Throughout the last decade in April the weather was about all that could be desired for completing the work of seeding oats and barley, and preparing the ground for planting corn. During that dry and warm period in the last decade of the month very rapid progress was made in general field work, and in some favored localities in the southern and central sections the corn planters were started as early as the 27th of April under conditions favoring germination. The season was quite favorable for grass, and pastures were generally well advanced at the close of the month, affording sufficient forage for the support of stock. The season was nearly as early as usual in the output of foliage and blossoms in orchards, gardens and forests, at close of month. The prospects were quite flattering for the fruit crop.

NOTE AND COMMENT.

Winter released its grasp quite summarily, with but few days of genuine spring weather to mark the transition from snowdrifts to violets and peach-bloom.

* * *

One of the worst features of the agricultural situation in Iowa is the general scarcity of desirable farm hands to be hired by the month or year. This is a most serious drawback in a season when farm work is retarded by adverse weather conditions in early spring, and then comes on "all in a heap" when the turn is called. Many a well-to-do farmer is greatly overworked at such time, though he would cheerfully pay high wages to be relieved of a portion of his heavy burden.

* * *

In New York, April was the wettest month of which the Weather Bureau has record since 1874.

* * *

The Oskaloosa *Globe*, of April 6th, said: "We must have in this country either good roads or flying machines." It was a condition and not a theory that confronted the people about that time. Twice a year, as a rule, the good roads problem is vigorously discussed.

A recent Washington press dispatch says: A new plan, having for its object the distribution of young trees throughout the country, will be put into practical operation by Secretary Wilson, of the Agricultural Department, next year. Preparations for this work are now in progress by the department, and many of the seedlings will be propagated in the grounds of the office here. An investigation has been made to discover the varieties which will thrive best in the various localities, and the distribution will be made in a manner somewhat similar to that employed in the seed distribution authorized by congress. Especial attention will be given to trees of the nut-bearing, shade and lawn variety, and oaks, ash and lindens also will constitute a prominent portion of the distribution. The secretary believes the idea will prove popular and in view of the rapidly diminishing forest reserves will be a decided benefit to the country.

* * *

The fiscal year 1901 seems likely to exceed any preceding year in its record of exports from the United States. The steady growth of our exports from 392 million dollars in 1870 to 835 million dollars in 1880, 1,030 million in 1892 and 1,394 million in 1900 has been a subject of much attention and much favorable comment, but it seems that 1901 is to surpass the record of the year 1900, and bring the export figure nearly, if not quite, to the billion and a half mark. The March import and export figures, just completed, show a total exportation from the United States in the nine months ending with March, 1901, of $1,140,170,728, or $86,540,332 in excess of last year which hold the highest record in the history of our export trade. The farmers are apparently the chief beneficiaries in this remarkable increase in our exports, and are in the fiscal year 1901 showing greater gains in their exports than are the manufacturers, whose record in 1889 and 1900 showed a greater percentage of growth than those engaged in agriculture.—*Ex.*

* * *

Professor Samuel Calvin, the able state geologist of Iowa, in his latest report, gives some valuable information in relation to the probability of finding any considerable amount of gold, oil or gas in the rocks or soil of this state He says: 'The highest living authority on the distribution of oil and gas, the man who has done more than any one else for the successful and profitable development of all the interests related to these two products, declares that the most valuable service which science has been able to render in this connection has been the determination of the fields wherein exploration is hopeless. Iowans will do well to remember that, even in a state as munificently endowed as theirs, there are some things and some favoring conditions which nature has failed to provide, and there are some drafts on nature's apparently limitless bounty which must go unhonored, there are some enterprises looking to the development of natural resources which in the very condition and structure of things are absolutely hopeless.

Let them rather preserve all of their capital and energies for the development of the splendid resources which do exist, and not waste any in the useless search for geological products which all enlightened experiences show could not, by any known possibility, be developed in the state "

FEATURES OF TORNADOES.

FROM YEAR BOOK U. S. DEPARTMENT OF AGRICULTURE.

The formation of tornadoes is attended by two features, namely, the counterflow of two horizontal currents of air, and the vertical convection, which is of local origin. They are of small dimensions, but particularly vicious and destructive. They occur during the summer when the warm weather is at its maximum. The interior of the country is heated; the ocean districts are comparatively cool. The great Atlantic high area, produced by the general circulation, protrudes upon the southeastern districts; in the same way the Pacific "high" overlays the northwestern districts of the plateau. Hence, between these, in the Mississippi and Missouri valleys, there is a region of encounter for the southern winds produced by the Atlantic "high," and for the northern winds maintained by the Pacific "high." The southern winds are warm and charged with aqueous vapor; the northern winds are cool and comparatively dry. The meeting of these two types of winds in the central valleys, the same conditions extending along the Ohio valley to the lower lakes, is attended by two or three typical local effects. In the first place, there are calms at intervals, local pools of stagnant atmosphere, into which these opposing currents have not penetrated; in the second place, the intense radiation of the sun superheats the strata of air near the ground and causes relatively unstable equilibrium, with its tendency to overturn the strata in a vertical direction; in the third place, the cool currents from the north, borne aloft in the general eastward drift, tend at times to overlay this stagnant atmosphere in the ground stratum and to increase the unstable equilibrium.

The above are the conditions that always favor the formation of local storms, tornadoes, thunderstorms and showers, in which precipitation generally occurs during the summer. Masses of air of different temperatures in the great north and south currents may thus approach a stagnant and calm region, such as the later hours of the afternoon develop, the increase of cloudiness being merely a symptom of the existence of rising and cooling currents, which portend a storm, and finally set the entire mass into a mixed congested state. The cool air comes down and the warm air rises but they both resist mixing intimately. Rather they tend to be drawn out into long bands or ribbons before such mixing is accomplished, and these are the conditions for local showers. When the condensation is rapid in the strata a mile high the formation of thunder storms and electric discharges is caused In certain peculiar formations of the circulation a tornado tube is projected downward. This is a simple vortex and obeys the laws of the movement of fluids in gyratory circulation. If a mass of air 6,000 feet in diameter is rotating at the half mile level, and it runs into a vortex so that the tube is 100 feet in diameter, and supposing the outer edge of the upper part of the vortex makes seven miles per hour, then, at the rim near the bottom of the vortex, we would have a velocity of 200 miles per hour. This causes an enormous centrifugal force in the lower tube, a partial vacuum of low temperature It is accompanied by a forward movement of the entire vortex system. The vacuum tube causes the explosive and disastrous effects upon the objects in its path, as noticed in the tornado accidents; the wind at great velocities prostrates every obstacle; the cold generates the sheath of vapor that makes the tube visible; the same sudden condensation causes electric discharges, just as in thunder storms on a large scale. There is no real mystery about the formation of tornadoes, or respecting their terrible destructive power. It all goes back to the same principle that discharges a gun, in which case there is a sudden formation and expansion of gas; but in the tornado it is the reverse process, namely, the sudden production of a vacuum into which outside air discharges itself, that is, into the hollow vortex tube, and with the further result of quickly cooling the heated air drawn into the vortex.

There is no practical way of warding off tornadoes when conditions are favorable for their development. The tubes resist an explosive discharge in the air outside, they having often been fired upon by cannon at sea. They sweep readily through a forest or a city. There seems to be no annual increase in the number of them. Some have sought to connect their recurrence with the frequency of sun spots, and it is possible that there is some indirect connection, just as in all the other elements of the weather, but only through the general circulation.

There are some portions of the United States which are free from tornadoes, such as the Rocky Mountain plateau and slope. In the central valleys they are of annual occurrence, and they are likely to visit almost any of the states east of the Mississippi River. In the winter months tornadoes occur only in the Gulf states, but as the weather grows warmer they extend northward, and in summer they are of the greatest frequency in Nebraska, South Dakota, Iowa and Minnesota. This variation is evidently to be referred to the average probability of cool currents of air from the north encountering warm, moist currents from the south, in the intermixture which is always going on throughout the lower strata, farther north in summer than in winter. More tornadoes occur in the months of May and June than in the other parts of the year, and this is due to the same principle of contrast in temperatures, which is greater locally in the spring than in the summer, when heat prevails generally, or in the winter, when cold is widely distributed.

The annual average number of tornadoes which are well defined and destructive is about twenty-five, and their frequency is quite uniform from year to year. Of this number the destructive tornadoes of great violence have been twenty-four in eight years, that is, three each year. The record shows that from 1889 to 1896 property to the value of $31,000,000 was wrecked. As much as $23,000,000 of this must be attributated to three tornadoes, or tornadic hurricanes, which passed through the regions of dense population, namely that which visited Louisville, March 27, 1890, destroying property to the value of $3,000,000; that which visited St. Louis, May 27, 1896, from which the loss was $13,000,000, and that which traveled from Cedar Keys to Washington, D. C., September 29, 1896, from which the damage was $7,000,000. The latter was more strictly a hurricane, but many of its features were very close to a large tornado in type. Previous to 1889 the record shows that there were three destructive local storms annually for each of the preceding eighteen years.

It has not been easy to secure exact data for the computation of the wind velocities which accompany tornado vortices, but the great waterspout of August 19, 1896, which developed in Vineyard Sound, about seven and one-half miles northeast of Cottage City, and of which very good photographs were taken, to some extent supplies this defect. The bearings of the spout were noted from several places, so that its place can be plotted accurately on the map and its dimensions computed. It was found that the tube extended from the cloud to the surface of the sea, 4,200 feet, was 3,400 feet in diameter at the top, 170 feet at the narrowest part, which was 1,500 feet above the sea, and about 250 feet at the sea. The expansion near the surface was due to the retardation caused by contact with the water and the suction of air into the tube from below. The radial velocity was outward from the top to the narrowest part, ranging from seven to three-tenths miles per hour, and very feebly inward in

the lower third; the rotation velocity at the cloud was fourteen, and near the sea 350 miles per hour, this being the velocity of a body falling freely from the height of the cloud to the sea; the vertical velocity was one-tenth at the cloud, and thirty-five miles per hour at the sea.

The effect of these motions is to strike a very severe blow laterally upon any object upon which the tube impinges, and to lift vertically at the same time. The air outside the tube is undisturbed and the sudden contact with the tube is like a stroke from a heavy hammer. The formula shows that this is equivalent to a sudden pressure of 330 pounds to the square foot at the maximum. The destructive effects at St. Louis upon the bridge and upon heavy buildings indicate a pressure of sixty to ninety pounds per square foot as that which must have been exerted to produce the observed effects. This would imply a rotary velocity of about 175 miles in the St. Louis tornado. It is evident that the Vineyard waterspout was one of the largest of its class. Contrary to common experience, it occurred on a day when the humidity of the air was low, instead of high, as usually supposed. This shows that the origin was chiefly dynamic, rather than due to heat processes wherein aqueous vapor is turned into water. The inference regarding the structural strength of buildings is that they ought to be able to resist at least forty pounds per square foot applied laterally, for extraordinary storms, such as hurricanes, but that nothing which can be built is likely to withstand the vortex of a tornado when it operates in full power.

HOW THERMOMETERS ARE GRADUATED.

Thermometers are graduated by plunging them bodily into melting ice, and after the mercury has contracted to the full, marking its position by a scratch on the glass; then by hanging them in the vapor of boiling water at ordinary atmospheric pressure, and when the mercury has expanded to the full, marking its new position by a scratch. Between the two fixed points any kind of subdivision might be made, but only three ways of dividing the space into "degrees" or steps are in use. On the centigrade scale (often erroneously named after Celsius) the freezing point is marked 0, the boiling point 100, and the space between is divided into 100 equal degrees, which are continued above 100 and below 0 as far as may be necessary. On Fahrenheit's scale, used popularly in English-speaking countries, the freezing-point is called 32, the boiling-point 212, the space between being divided into 180 equal degrees, which are continued downward and upward. On the Reaumur scale, used popularly in Germany and Russia, the space between freezing and boiling point is divided into 80 degrees. The centigrade scale is used in scientific work all over the world, except for meteorological observations in English-speaking countries, for which the Fahrenheit scale presents too many advantages to be discarded. Since mercury freezes at —40 (a temperature which happens to be expressed by the same figure on both centigrade and Fahrenheit scales), alcohol thermometers are used for measuring lower temperatures. No two common thermometers read exactly alike. and those employed for accurate obsarvations are always compared with standard instruments, and have their error ascertained and allowed for.—*Mill's Realm of Nature*.

AN OBSERVER'S NOTES AND COMPARISONS.

BY ARTHUR BETTS, RIDGEWAY, IOWA.

My station is on the south line of Orleans township, Winneshiek county, twelve miles south of the state line—latitude 43° 19′ 36″, longitude 92°.

I was the pioneer voluntary observer for Dakota territory, serving in that capacity at the town of Webster fifteen years. Finding the struggle too hard, I came back to my native state, and to me there is no state as good as Iowa.

The average annual temperature at Webster, Dakota, was 42.3°. The coldest year was 37.9°; the warmest year, 45.8°. At Ridgeway the average temperature for three years has been 47.6°. September nights here are as July nights in Webster. Webster has annually forty-seven more days with frost than Ridgeway. The nights in Webster are generally clear, and I have seen ice one inch thick on 6th of June, freezing all night and every green thing killed to the ground. This was in 1897, and the minimum temperature on the night of the 5th of June was 23°. Frost is expected there as late as June 10th, and as early as August 20th. There the nights are generally calm and days windy.

At Webster the days were not as sunny as in Iowa. Three years—1893–94–95—gave 2,779 hours of sunshine per year; while in Ridgeway the average has been 2,863 hours per year. They call South Dakota the "sunshine state," but all records give Iowa more hours of sunshine annually. Arizona is the true sunshine state.

Webster had 13 inches less precipitation than the annual average at Ridgeway; and more cloudy weather. The month of January averages 19° colder at Webster than at Ridgeway. That place is beyond the corn belt.

Young men who go in quest of homes should stick to their own latitude, or they will rue it; though this does not apply to the Pacific coast.

While in Webster we had lots of snow in winter, with extreme cold and blinding blizzards; and we were subject to terrible drouths and hot gales in July, August and September.

CLIMATOLOGY OF THE MONTH.

BAROMETER.—The mean pressure for the month was 30.12 inches; highest observed, 30.53 inches at Dubuque on the 9th; lowest, 29.18 at Keokuk on the 5th; range for the state, 1.35 inches.

TEMPERATURE.—The first half of the month was unusually cold; last half much warmer, bringing the mean up to about the normal. The monthly mean, as deduced from records of 113 stations was 49.9°. The highest monthly mean was 52.6° at Council Bluffs and Keosauqua; lowest monthly mean, 46.7° at Ruthven. The highest temperature reported was 92° at Sigourney and Fruitland on the 29th and 30th; lowest reported, 15° at Monticello on the 1st. By sections the monthly means were as follows: Northern section 48.9°; central section, 49.9°; southern section, 50.9°.

For the state the average monthly maximum was 86.1°; average monthly minimum, 23.9°; the greatest daily range was 50° at Fruitland; average of greatest daily ranges, 36.8°.

PRECIPITATION.—The average precipitation for the state, as shown by records of 131 stations, was 1.79 inches, which amount is 1.41 inches below the normal for April. The averages by sections were as follows: Northern section, 1.56 inches; central section, 1.65 inches; southern section; 2.16 inches. The largest amount reported for the month was 3.47 inches at College Springs. The greatest daily rainfall reported was 2 inches, at Clarinda on the 5th; average number of days on which .01 inch or more of precipitation was reported, 5.

WIND AND WEATHER.—Prevailing direction of wind S. E.; highest velocity reported, 48 miles per hour, from the N. W., on the 5th at Sioux City. Average number of clear days, 14; partly cloudy, 8; cloudy, 8.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date
Davenport	30.09	30.49	9	29.21	5
Des Moines	30.12	30 52	9	29.37	5
Dubuque	30.12	30.53	9	29.36	5
Omaha, Neb	30.06	30.44	9	29.44	5
Keokuk	30.09	30 49	9	29.18	5
Sioux City	30.13	30 49	9	29 60	5
Means	30.12	30.53	9	29.18	5

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,651	29	E	2
Des Moines	6,201	32	SW	30
Dubuque	5,716	28	SE	27
Keokuk	5,503	28	NW	1
La Crosse, Wis	4,891	24	NW	17
Omaha, Neb	6,750	40	N	5
Sioux City	10,776	48	NW	5

OBSERVERS' NOTES.

ALBIA—*R. Moore.* Month wet and cold, except latter part; roads impassable in some parts of county.

ALTA—*David E. Hadden.* During first half of month the roads were very wet and muddy; warm and dry during the last decade and ground in good condition for farming.

AMANA—*Conrad Schadt.* Hot weather on last four days of month; plums and peaches blooming; a fine lunar corona on evening of the 30th, with rainbow colors.

BANCROFT—*E. G. Bailey.* April, as a whole, was a good month; work better advanced than last year.

BATTLE CREEK—*E. H. Wasmund.* Only one thunderstorm in April; large solar halo on morning of 28th.

BAXTER—*W. T. Thorp.* Seeding wheat and oats begun on 4th and completed on 25th.

BONAPARTE—*B. R. Vale.* First and second decades cold, cloudy and backward; last ten days ideal weather for agriculture and vegetation.

BRITT—*Geo. P. Hardwick.* First half of month unseasonably cold; frost remaining late in ground and little farm work done; last half warmer and more rapid growth of vegetation.

CLINTON—*Luke Roberts.* April gave normal temperature but was almost stormless; only one other April during last twenty-three years gave less rainfall. This year it was .80 of an inch; in 1895 it was only .28 of an inch and that month was 4° higher in temperature. Dust and not mud prevailed at close of this month.

CRESCO—*Gregory Marshall.* Seeding began on 8th but work was much retarded by wetness of soil; stand of grain good at close of month; too dry for hay lands.

FOREST CITY—*J. A. Peters.* Farmers commenced seeding 10th, but ground was wet; last half of month quite dry; cattle on pastures with full feed at close of month.

GRAND MEADOW—*F. L. Williams.* Farm work began on 9th. Ground frozen too hard to be plowed on morning of 18th; last seven days extremely warm.

GRINNELL—*A. O. Price* First half of month backward, and all farm work belated; at the close vegetation was nearly up to average and work was well in hand.

GRUNDY CENTER—*E. S. King.* Cherry and plum trees in full bloom on 30th; small grain looking vigorous.

HUMBOLDT—*H. S. Wells.* Small grain all in at close of month; pastures started nicely; fruit prospect good.

IOWA FALLS—*J. B. Parmelee.* On 30th at 9 P. M. a very beautiful lunar corona appeared, with rainbow colors.

MONTICELLO—*C. E. Heisey.* First part of month unusually cold; but much warmer last part, with some complaints of dryness.

OLIN—*Nathan Potter.* First half exceedingly backward; last half fine for farm work, which was about up to average at end of month.

OSKALOOSA—*Jos. Boyd.* The month was colder than usual up to 17th; from that time till the close weather was all that could be desired.

OVID—*H. C. Miller.* First and second decades cold and wet, and but little farm work was done; last part was very warm; at close of month peach, plum, apple and cherry trees were in bloom, only four days later than last year.

RIDGEWAY—*Arthur Betts.* A fine April, 1.7° above normal; no precepitation after 16th; 303 hours of suushine, or 74 per cent; month came in muddy and cool, but went out hot and dusty; last five days like June; first anemones on 10th; whippoorwill heard on 27th.

STORM LAKE—*Prof. M. L. Fuller.* Season advanced rapidly last two weeks; maple leaves opened, and grass was ample for pasturage.

VILLISCA—*C. E. Matteson.* Excessive rainfall in March, followed by dry and warm weather last half of April caused the soil to bake; grass and small grain look well; good outlook for fruit crop.

WEST BEND—*Phil. Dorweiler.* Month commenced unfavorably, but at close all vegetation had reached normal state: on 26th willows were leafing, and cottonwoods on 28th; first thunderstorm of season on 27th.

BELATED REPORTS.

KNOXVILLE.—January. Mean temperature, 25.2°, highest, 56° on the 23d; lowest, 4° on the 12th. Total precipitation, .55 inch; greatest amount in 24 hours, .30 inch on the 9th; prevailing direction, northwest; number of clear days, 21; partly cloudy, 2; cloudy 8; rainy, 4.

SPIRIT LAKE.—March. Mean temperature, 32.4°; highest, 61° on the 1st; lowest, 8 on the 5th. Total precipitation, .50 inch; greatest amount in 24 hours, .20 inch on the 10th and 20th; prevailing direction, northeast; number of clear days, 12; partly cloudy, 1; cloudy, 16; rainy, 3.

ERRATA IN MARCH REVIEW.

Baxter—March. Total snowfall recorded, 6 inches, on page 9, should have been 8.0 inches.

Decorah—March. Total snowfall recorded, 18.0 inches, on page 9, should have been 15.0 inches.

IOWA WEATHER AND CROP SERVICE.

CLIMATOLOGICAL DATA FOR APRIL, 1901.

NORTHERN SECTION.

STATIONS	COUNTIES	Elevation, feet	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., IN INCHES				Number rainy days	SKY			Prevailing direction of wind	DATES OF THUNDER-STORMS.
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall (unmelted)		Number clear days	Number partly cloudy days	Number cloudy days		
Algona	Kossuth	1,500	8	49.5	*1.5	85	30	24	18	32	2.02	†1.92	.70	4.5	7	9	16	5	SE	16, 27
Alta	Buena Vista	1,519	9	48.5	*1.1	86	29	22	18	31	1.61	†2.43	.80	1.5	4	11	12	7	SE	27
Alta (near)	Buena Vista										1.58		.64	2.0	6					
Bancroft	Kossuth			48.9		85	29, 30	23	1, 18	37	1.80		1.00	3.0	4	11	10	9	SE	11
Britt	Hancock	1,230		48.1		85	29	22	18	34	1.84		.80	2.5	6	8	16	6	SE	
Charles City	Floyd	1,012	9	48.6	*1.7	86	29	23	2	31	1.33	†2.05	.78	T.	4	12	12	6	SE	
Clear Lake	Cerro Gordo	984		50.1		88	29	21	18	43	1.40		.60	1.0	3	20	7	3	SE	
Cresco	Howard	1,280	28	48.0	*3.6	85	29	23	18	33	.99	†1.60	.57	T.	4	15	8	7	SE	16
Decorah	Winneshiek	900	7	48.2	†1.0	88	29	20	19	38	1.22	†2.10	.76		3					
Dows	Wright			48.0		86	29	20	18	37	2.09		.91	2.0	6	21	5	4	SE	27
Elkader	Clayton		19	50.6	*2.6	90	28	22	1	43	.88	†2.08	.55	T.	3	15	11	4	SE, NW	
Estherville	Emmet			45.6		87	30	17	18	43	1.49		.70	6.0	8	12	12	6	S	27
Fayette ‡	Fayette	1,000	10	47.6	*0.4	87	29	21	1	43	1.46	†2.16	.70	1.1	8	14	10	6	SE	
Fonda	Pocahontas	1,237									2.81		.96	1.5	10	14	10	6	SE	27
Forest City	Winnebago	1,220		48.4		85	29	22	18	34	1.67		.70	T.	5	19	2	9	NE	
Grand Meadow	Clayton		9	49.0	*1.8	86	29	23	1	31	1.17	†2.41	.74		3	12	13	5	NE, SE	
Greene	Butler	943		49.5		88	29	23	18	42	1.66		.54		6	15	8	7	SE	16
Hampton	Franklin	1,240	10	50.2	*3.4	88	29	24	18	36	2.10	†2.03	.90	1.5	6	8	16	6	SE	
Hawkeye	Fayette		7								1.55	†1.42	.95	T.	4					
Hoprig	Emmet										.75		.75	T.	1	18	8	4	SE	
Humboldt	Humboldt	1,082	7	49 1		86	29	24	18	36	1.75	†2.28	.70	6.2	7	18	5	7	SE	
Lansing	Allamakee			51.4		89	29	22	1	38	1.04		.36		4	15	12	3		
Larchwood	Lyon			49.6		89	30	23	18	47	2.19		.75		7	10	13	7	SE	
Larrabee	Cherokee		9	48.9	*0.4	88	29, 30	20	18	38	.85	†2.98	.47	2.5	4	9	16	5	SE	
Le Mars	Plymouth			49.8		88	26	17	1	42	1.70		.79	T.	6	12	12	6	S	27
New Hampton	Chickasaw	1,166		48 6		85	29	24	18	34	1.13		.60		4	17	5	8	SE	
Northwood	Worth	1,210		50.2		85	29	22	18	35	1.57		.60	T.	4	11	13	6	SE	
Osage	Mitchell	1,178	9	46.8	*2.0	83	29, 30	24	18	34	1.87	†1.03	.72		5	3	18	9	SE	
Plover	Pocahontas			49.0		89	30	21	18	37	1.22		.67	1.5	6	14	1	15	SE	
Primghar	O'Brien					89	30				2.00		1.00		3	11	0	19	S	
Ridgeway	Winneshiek			50.5		90	29	25	18, 19	38	1.19		.65	0.1	6	18	5	7	NE	16
Ruthven	Palo Alto			46.7		88	30	25	3	33	1.48		.88	5.5	3	15	10	5	SE	
Sheldon	O'Brien	1,406		49.2		87	30	20	18	42	1.56		.82	0.5	6	15	7	8	SE, S	
Sibley	Osceola	1,506	7	48 5	*0.3	88	30	21	18	38	1.78	†1.70	.90	T.	6	7	19	4	SE	
Sioux Center	Sioux			48 7		88	26	23	18	38	2.07		.82		8	14	9	7	S	27, 28
Storm Lake	Buena Vista		11	48.3		82	30	23	18	34	1.41	†1.08	.74	1.4	7	15	8	7	SE	27, 28
Washta	Cherokee										1.28		.50	T.	4	14	10	6	NE	
Waverly	Bremer	942		50.0		88	29	25	18	38	1.47		.60	1.0	7	14	8	8	E	16
West Bend*	Palo Alto		7	47.7	*115	84	29, 30	28	18		1.61	†1.81	.64	0.3	5	11	12	7	SE	
Average				48.9	*0.9	83.8		2.26		37.0	1.56	†1.94		1.6	5	13	10	7	SE	

CENTRAL SECTION

Amana	Iowa		24	50.4	*2.0	87	29	27	18	33	1.69	†1.25	.75	..	8	13	10	7	NE	5, 16
Ames	Story	936	20	49.0	†0.1	87	29, 30	26	18	36	1.82	†1.03	.48		6	20	2	8	S	
Baxter	Jasper			49.4		86	29	24	18	36	1.74		.85		5	9	11	10	NE, SE	
Belle Plaine	Benton	840	10	49.2	†0.4	87	29	25	18	33	1.90	†1.60	.85	0.5	6	7	17	6	SE	
Buckingham	Iowa										1.89		.78		5	10	15	5		
Carroll	Carroll		10	49.7	*0.9	85	29, 30	22	18	37	2.83	†1.04	1.06	1.0	8	17	1	12		16, 27
Cedar Rapids	Linn	744	18	51.2	*7.4	90	29	28	1, 18	35	1.17	†1.99	.58		8	15	2	13	NE	3
Clinton	Clinton	609	9	49.4		90	29	22	1, 4	46	.80	†2.39	.28		5	12	8	10	NE	
Davenport	Scott	615	30	50.5	*0.3	87	29	29	1	32	.88	†1.88	.32	T.	7	14	7	9	NE	
Delaware	Delaware	1,048	9	48.0	*1.3	86	30	20	1	37	1.18	†1.88	.46	1.0	4	17	6	7	S	
Denison	Crawford	1,192	7	48.8	†0.5	86	29	19	4	41	3.14	†2.30	1.00	..	5	23	4	3	N	
Des Moines	Polk	867	23	50.5	†0.5	84	29	28	3	31	2.26	†.75	1.08	5.3	6	8	13	9	SE	16
De Soto	Dallas	866		50.6		88	27	25	3	36	1.84		1.00	2.0	4	18	6	6	SE	
Dubuque	Dubuque	655	28	50.1	*1.5	86	29	26	1	30	1.01	†2.00	.54	T.	7	12	13	5	E	
Fort Dodge	Webster			48.1		85	26, 29	20	18	45	2.88		1.50	T.	3	18	2	10	SW	
Fruitland	Muscatine			51.6		92	30	20	20	50	1.53		.55		5	16	5	9	E, SE	
Galva	Ida		7	49.7	*0.4	87	26, 30	20	18	41	1.40	†2.20	.70		3	21	1	8	SE	
Gilman	Marshall	1,053									1.73		.83	T.	5	17	7	6	S	
Grinnell	Poweshiek	1,011	10	49 4	†1.3	84	29	25	18	33	1.46	†2.27	.75		3	10	10	10	E	
Grinnell (near)	Poweshiek			49.8		89	29	23	18	35	1.79		.71		7	8	11	11	SE	
Grundy Center	Grundy	966	9	49.0	*c.2	87	29, 30	22	18	37	1.45	†2.55	.35	1.3	7	18	3	9	SE	
Guthrie Center	Guthrie	1,269									2.02		.82	T.	4	12	5	13	SE, S	
Harlan	Shelby			49.8		87	26, 29	23	18	41	1.97		.91	3.0	8	5	15	10	SE	27, 28
Independence	Buchanan	921	38	48.6	*1.4	86	29	24	1	36	1.55	†.89	.80		4	16	10	4	SE	
Iowa City	Johnson	644	10	51.0	*0.2	89	29	26	1	38	2.36	†.82	1.01		4	17	4	9	NE	
Iowa Falls	Hardin		7	48.2	*1.2	85	29	23	18	33	1.80	†2.42	.73	2.5	5	16	6	8	NE	16
Le Claire	Scott										.66		.21		6					
Logan	Harrison	928	35	51.0	†0.9	88	30	24	2, 16, 18	37	1.44	†1.54	.73	2.0	7	....	..	..		13
Maquoketa	Jackson		7	50.1	*1.8	87	29	21	1, 9, 18	44	1.04	†2.18	.43	....	4	13	8	9	S	
Marshalltown	Marshall	898	9	50.4	*1.3	89	29	25	3	36	1.82	†1.81	.70		8	18	5	7	NE	
Monticello	Jones	800	46	49.6	*1.3	88	28	15	1	41	1.24	†1.44	.69		7	16	6	8	SE	
Mt. Vernon	Linn			50.3		87	29	22	1	39	1.43		.65	0.2	3	17	5	5	SW	
Newton	Jasper	958	13	49.7	*1.1	89	29	24	18	35	1.94	†1.56	.84	2.0	6	16	5	9	N	
Odebolt	Sac			49.9		87	29	21	18	40	1.91		.95	....	3	20	4	6	NE, SE	
Ogden	Boone	1,109		49.4		86	29	23	18	36	1.57		.70	2.0	6	16	4	10	SE	
Olin	Jones			49.2		86	29	25	1	38	1.20		.48		4	16	8	6	N	16
Onawa	Monona			51.2		87	29, 30	24	18	42	1.27		.58		7	16	8	6	SE	16, 28
Perry	Dallas			50.2		85	30	24	18	37	1.45		.75		3	14	8	8	NE	27
Rockwell City	Calhoun	1,219		49.2		84	29	25	18	35	1.75		1.10	0.5	4	25	1	4		
Sac City	Sac	900	21	49.2	†0.5	85	29, 30	23	18	35	2.01	†1.36	.83	T.	5	17	5	8	SE	
Scranton	Greene			48.9		84	29, 30	25	18	34	1.62		.78		4	19	7	4	SE	
Sioux City	Woodbury	1,122	12	50.4	†0.6	88	26	22	17	40	1.50	†1.47	.26		7	12	7	11	SE	
Toledo	Tama		6	51.0	*0.1	90	29	24	18	41	2.12	†1.30	.65		6	19	5	6	SE	
Vinton*	Benton	800	10	51.6	*2.7	87	29	29	7		1.74	†1.41	.84		3	19	10	1	SE	
Waterloo	Black Hawk	862	21	49.6	†0.7	88	29	24	18	37	1.56	†.92	.63	T.	7	19	3	8	N	
Wilton Junction	Muscatine			50.0		87	29, 30	25	1	35	1.56		.45		6	17	4	9	E	
Whitten (*a*)	Hardin			50.0		87	29	21	18	39	.82		.80	T.	2	13	13	4	SE	
Average				49.9	*0.8	87.0		23.5		37.5	1.65	†1.64		1.1	5	15	7	8	SE	

CLIMATOLOGICAL DATA FOR APRIL, 1901—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PREC. IN INCHES				Number rainy days.	SKY.			Prevailing direction of wind.	DATES OF THUNDER-STORMS
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted.)		Number clear days.	Number partly cloudy days.	Number cloudy days.		
Afton	Union	...	....	49.6	....	85	27, 29	24	18	34	3.21	.....	1.44	6.0	5	11	9	10	NW	
Albia	Monroe	945		49.3		87	29	25	3, 18	33	2.65	.....	1.00	4.0	5	18	4	8	SE	16
Atlantic	Cass	....	9	49.2	*0.2	86	29	22	18	38	2.85	† .68	1.50	T.	5	1	18	11	SE	5, 16, 27
Bedford	Taylor			50.1		89	29	21	1	38	2.83	.....	1.75	3.0	7	6	16	8	NE	16
Belknap	Davis	857		51.7	...	86	29	27	18	33	1.73	.....	71	4.0	5	13	12	5	E	
Bonaparte	Van Buren	.....	9	50.6	†1.4	88	29	28	18, 20	36	1.34	†2.46	.70		5	...			...	
Burlington	Des Moines	.....		52.8	....	89	29	29	18	33	1.86	.....	.79	T.	5	14	5	11	....	
Bussey	Marion	...	..	...	....	....	.....		.....		2.12	....	1.60	1.0	3	..				
Chariton	Lucas	1,030	...	49.4		84	29, 30	22	15	40	2.02	...	.87	4.5	5	11	8	11	E	16
Clarinda	Page	1,069	10	51.4	*0.6	89	26	25	3	40	3.33	* .09	2.00		11	15	9	6	SE	27
College Springs	Page	....	9	50.4	†0.3	87	26	25	18	43	3.47	† .59	1.71	0.1	8	12	11	7	SE	
Columbus Junct(*a*)	Louisa	.....		52.4		90	29	27	1, 18	35	1.69	.....	.66		6	16	6	8	SE, NW	
Corning	Adams	1,127	8	48.8	†2.3	83	26, 30	25	3	31	2.87	† .69	1.33	3.0	4	9	10	11	SE	5, 27
Council Bluffs	Pot'wat'mie	989		52.6	.....	91	26	26	18	36	.82	...	.59	....	4	13	4	13	NW	
Cumberland	Cass	.....		...	.....	....	.....	.....	.....		2.22		1.50	..	4	16	4	10	S	
Danville	Des Moines	715					....	....			2.21	....	.88		6	19	1	10		
Eldon	Wapello	....	508	50.8		91	29	26	3, 20	40	1.49		.54	0.3	5	22	1	7	N	
Emerson	Mills	.....		....	....	....	....	....	.....	.....	2.21		.86	...	4				.....	
Fort Madison	Lee	516	52	..	..		....				2 51	† .71	1.19		5	10	10	10	NE	
Glenwood	Mills	979	30	52.2	*3.4	87	26	29	3, 7, 17, 18	34	1.83	† .70	.78	3.0	4	5	18	7	SE	
Greenfield	Adair		9	50.1	†0.7	87	27	25	18	37	2.86	† .74	1.52	4.8	8	17	5	8	SE	5, 12, 27
Hopeville	Clarke	....	..	49.8		84	26, 29	27	3, 18	30	2.33		1.49		5	8	13	9	S	5, 16, 27
Indianola	Warren			50.4		85	29	25	18	33	2.36		1.00	4.1	5	6	11	13	SE	
Keokuk	Lee	618	29	51.6	†0.4	88	29	30	18	30	2.29	†.92	1.02	...	8	13	8	9	E	
Keosauqua	Van Buren	...	8	52.6	†0.4	90	29	28	1,3 4, 18,20	38	1.95	†2.57	.83		7		....		.....	
Lacona	Warren	...	...		....	...		.....	....	.....	2.35		1.10		5	9	12	9	.....	
Lenox	Taylor		....	49.5		84	29	27	3	25	2.35	....	1.50	1.3	6	17	6	7	E	27
Mooar	Lee	....	....	.....				.....	.....		1.42		1.02	..	2	22	5	3	NE	
Mt Ayr	Ringgold	1,236	7	49.8	†2.4	84	26, 29	27	3, 18	31	2.22	†1.54	1.12	4.0	9	8	12	10	E	27
Mt Pleasant	Henry	725	....	50.2		86	29	26	1	38	1.98	.....	1.09		4	10	13	7	SE	
Murray	Clarke	1,183		.....	....	.....			.....	....	1.13	...	.60	0.3	4	....			.....	
Omaha	Douglass	1,113	31	51.9	†0.1	88	26	30	17	33	.89	†2.24	.40	0.6	7	9	11	10	E	
Osceola	Clarke	1,123		51.0	.....	85	29	20	1	30	2.88	...	1.65	4.0	8	14	4	12	E	15, 27
Oskaloosa	Mahaska	850	17	50.4	*0.2	89	29	25	18	34	1.47	†1.27	.58	1.3	7	14	7	9	.....	
Ottumwa	Wapello	630	6	51.0	†2.5	88	29	30	2, 19	31	1.29	†2.59	.60	....	3	11	13	6	SE	
Ovid	Wayne	..	7	49.6	†3.0	85	29	23	18	40	2.00	†1.64	.75	4.0	6	12	7	11	SE	16
Pacific Junction	Mills	960	..	51.8		87	26	23	18	42	.93	...	.35	0.2	6	10	13	7	S	
Pella	Marion	....	....	51.2	..	88	29	26	18	35		..	....	...		20	0	10	NE	
Red Oak	Montgom'ry	1,033		51.0	.....	88	26, 30	21	6	38	2.88	.....	1.83	1.0	4	13	10	7	S	11, 27
Sigourney	Keokuk	...	..	52.3	.....	92	29	26	1, 18	39	1.58	.....	.56	0.5	5	15	12	3	E	16
Stuart	Guthrie	...		51.4	.	88	27, 29	23	17	37	3.16	...	1.50	4.0	6	18	5	7	NE, E, S	
Thurman	Fremont		..	50.8	..	87	26	24	3	38	2.62		1.20	0.2	5	11	11	8	NE	16
Villisca	Montgom'ry	1,058	7	50.9	*1.1	88	27	24	18	39	2.91	†1.03	1.83		6	12	11	7	S	27
Wapello[(*b*)	Louisa	578	..	52.0	.....	91	29	29	18	36	1.52	.....	.61		5	..	..	...	SE	
Washington	Washington	...	10	50.4	*1.9	90	29	25	1, 18	36	1.66	†1.05	.87	....	5			....	NE	16
Winterset	Madison	.....	9	50.4	*1.0	89	29	25	3, 18	37	3.13	†1.30	1.68		6		..	....	.....	
Woodburn	Clarke	.....	....		...	....	.....	.....	.....	.....	1.85	.....	.91	....	4	13	8	9	E, NW	5, 15
Average	.....	.....		50.9	-0.8	87.6	.....	25.5	....	35.8	2.16	†1.27		2.3	5	13	8	9	SE	
Av. for the state	.....			49.9	*0.3	86.1	.....	23.9	.....	36.8	1.79	†1.62	....	2.0	5	14	8	8	SE	

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. ‡Received too late to be computed with means *a*, One day missing; *b*, two days, etc.

†Is used to indicate minus sign (†).

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR APRIL, 1901.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Afton	Max.	42	39	..	61	55	43	58	58	61	64	..	49	52	58	66	61	47	53	55	62	63	66	66	74	76	84	85	83	85	84	62.5
	Min.	29	30	26	31	31	32	31	33	32	43	41	41	37	34	32	34	28	24	29	29	33	32	38	40	44	51	55	52	53	54	36.6
Albia	Max.	45	47	51	58	54	43	58	56	60	65	58	53	58	61	65	68	47	52	55	61	61	67	64	73	74	80	85	85	87	85	62 5
	Min	27	30	25	28	30	26	33	33	32	35	38	41	40	34	32	35	26	25	28	28	30	34	38	44	45	50	55	54	54	54	36. 1
Algona	Max	44	47	52	59	54	43	52	53	60	62	52	48	53	51	61	55	43	45	53	63	61	64	64	72	76	81	78	81	84	85	59.9
	Min	35	32	32	34	31	32	31	32	35	43	41	39	38	39	32	33	26	24	32	42	38	32	40	46	47	49	58	61	60	59	39. 1
Alta	Max.	41	45	52	60	47	40	57	56	60	60	49	43	53	54	62	47	42	45	54	63	65	68	69	73	75	85	72	80	86	85	59.5
	Min.	27	31	28	32	32	32	31	32	35	42	42	38	37	38	31	30	25	22	32	32	38	38	38	45	48	50	52	47	59	60	37.5
Amana	Max.	45	43	54	58	52	48	56	56	62	62	59	53	60	60	66	59	44	47	54	58	59	68	64	73	72	78	83	84	87	84	61.6
	Min.	28	34	28	34	44	38	39	32	29	40	37	42	41	38	35	43	32	27	36	29	31	35	48	40	44	48	58	51	55	55	39.0
Ames	Max.	43	47	55	60	54	45	57	57	59	61	55	48	53	56	61	61	45	47	57	63	61	67	61	72	74	83	81	83	87	87	61.3
	Min.	29	33	27	34	30	33	33	34	34	33	33	42	40	35	30	37	30	26	33	30	34	35	41	36	42	49	50	54	55	53	36.0
Atlantic	Max.	40	44	53	61	54	45	60	60	61	59	53	47	56	52	66	52	49	52	53	64	67	68	71	73	77	85	82	81	86	85	61.9
	Min.	29	32	23	33	35	34	25	31	32	43	44	43	39	32	24	37	27	22	32	24	27	26	33	35	45	53	57	56	60	58	36.4
Bancroft	Max.	53	50	52	60	42	47	55	55	63	65	..	..	55	55	63	53	43	47	57	69	63	64	68	70	75	80	77	82	85	85	61.9
	Min.	23	32	27	35	33	33	28	33	31	40	39	38	38	34	30	34	25	23	30	30	36	33	31	37	43	47	55	50	53	56	35.9
Baxter	Max.	45	46	55	60	45	45	60	58	62	62	57	50	57	61	65	56	47	47	54	63	63	69	64	73	75	82	83	84	86	84	61.9
	Min.	27	32	26	31	34	33	35	30	31	41	38	41	38	33	31	36	29	24	34	31	32	33	42	40	45	44	55	54	52	57	37 0
Bedford	Max.	43	45	54	62	44	34	62	64	58	60	56	51	55	61	69	61	56	55	54	64	69	72	73	74	80	84	85	86	89	87	63.6
	Min.	21	23	23	34	32	49	32	38	38	34	42	43	36	34	29	35	28	23	30	28	29	28	37	38	52	54	54	52	52	49	36.6
Belknap	Max.	44	35	57	59	50	45	58	59	61	65	57	55	60	61	66	66	47	54	57	60	62	68	67	75	72	80	83	82	86	85	62.5
	Min.	32	33	29	37	44	36	40	36	37	43	40	45	42	39	40	46	31	27	35	31	35	37	44	48	48	51	56	53	54	58	40.9
Belle Pl'ne	Max.	46	43	54	59	54	43	52	53	60	62	52	48	53	51	61	55	43	45	53	63	61	64	64	72	76	81	78	81	84	85	61. 1
	Min.	28	33	28	33	36	37	38	32	30	35	35	39	38	39	31	39	30	25	33	30	33	34	38	40	47	49	58	61	60	59	37.4
Bonaparte	Max.	43	41	54	58	52	47	55	57	60	63	57	52	60	63	65	62	48	50	52	49	59	68	68	73	73	79	81	85	88	87	61.6
	Min.	29	32	29	34	43	43	40	34	32	39	37	43	41	42	39	48	33	28	33	28	32	35	45	45	47	48	55	50	52	55	39.7
Britt	Max.	48	49	52	58	49	45	52	53	63	64	58	47	54	52	64	50	41	48	56	65	60	64	68	76	72	79	84	80	85	83	60.8
	Min.	28	32	26	32	32	31	29	30	32	34	40	40	37	34	28	33	26	22	28	27	34	27	35	36	44	47	56	50	55	55	35. 4
Burlington	Max.	45	43	59	60	52	49	57	59	63	67	58	55	64	61	68	63	59	50	53	59	57	64	66	73	75	79	81	85	88	87	63.4
	Min.	32	33	31	35	46	43	36	34	34	40	37	43	42	45	47	49	34	29	37	32	30	42	42	43	60	50	52	52	59	65	42.2
Carroll	Max.	42	45	53	63	50	45	59	59	63	59	55	45	55	59	63	54	48	49	56	65	66	68	69	72	76	84	81	85	85	85	63.1
	Min.	28	30	25	30	32	32	32	31	35	40	41	40	38	35	30	34	30	22	28	31	34	31	38	39	45	43	50	52	56	56	36.3
Cedar Rap	Max.	46	43	56	60	54	49	55	56	61	64	59	54	60	60	65	60	46	47	54	56	58	67	64	70	73	79	83	84	87	87	62.1
	Min.	28	33	30	35	43	40	40	33	31	45	37	41	41	38	39	45	33	28	36	33	38	38	47	44	45	49	60	52	55	56	40.2
Chariton	Max.	42	40	52	59	53	43	57	57	60	63	55	50	55	55	65	63	48	49	52	63	62	67	64	70	70	82	82	81	84	84	61.0
	Min	28	32	27	34	33	32	32	34	33	43	40	42	40	35	22	37	29	26	30	29	34	34	41	45	44	53	57	56	56	56	37.7
Charles Cy	Max	45	40	53	59	54	50	56	55	61	64	58	53	60	60	66	59	44	47	54	58	59	68	64	73	72	78	83	84	87	84	60.6
	Min.	26	23	25	32	42	39	30	30	28	38	39	42	41	38	35	43	32	27	36	29	31	35	48	40	44	48	58	51	55	55	36.5
Clarinda	Max.	43	45	57	65	55	48	62	64	57	59	59	58	63	63	69	61	45	47	57	63	61	67	61	72	74	83	81	83	87	87	61.3
	Min.	33	32	25	38	33	36	28	38	38	45	45	48	53	56	61	61	45	47	57	63	61	67	61	72	74	83	81	83	87	87	61.3
Clear Lake	Max.	45	50	52	55	49	47	57	52	60	65	56	53	56	56	66	52	49	52	53	64	67	68	71	73	77	85	82	81	86	85	61.9
	Min.	25	32	25	30	33	33	31	30	30	29	36	39	38	35	30	37	30	26	33	30	34	35	41	36	42	49	50	54	55	53	36.0
Clinton	Max.	42	41	46	62	54	53	54	53	58	63	57	56	60	61	69	61	56	55	58	64	67	68	70	75	77	85	82	81	86	85	61.9
	Min.	22	35	28	22	43	42	39	60	57	59	52	50	58	59	64	55	52	58	53	63	66	70	71	74	77	84	87	83	89	87	36.4
College Sp.	Max.	42	43	53	63	57	48	57	58	60	64	57	52	60	61	69	61	56	55	58	64	67	68	70	75	77	84	87	83	89	87	63.6
	Min	32	31	26	38	31	35	28	38	37	45	42	43	39	36	33	37	27	25	35	32	33	36	43	43	44	44	58	54	54	52	36.6
Columbus J	Max.	47	43	..	32	45	40	42	42	33	32	39	34	40	42	42	38	47	32	27	31	47	59	66	69	74	83	80	86	84	85	62.5
	Min.	27	32	..	32	45	40	42	33	32	39	34	40	45	55	56	62	56	47	51	47	59	62	66	66	69	74	83	80	86	84	59.8
Corning	Max.	40	42	51	59	54	45	55	56	55	57	..	42	43	39	37	31	36	28	26	32	30	32	31	37	39	46	52	56	55	55	40.9
	Min.	31	31	25	35	32	34	30	35	35	43	42	51	50	59	59	63	53	47	58	57	65	70	72	75	76	82	91	81	87	88	37.8
Co Bluffs	Max.	42	45	57	64	56	49	62	63	63	60	42	45	45	40	45	42	29	36	27	26	35	34	39	38	40	48	53	55	60	58	64.0
	Min.	33	34	28	38	34	36	35	40	35	42	45	45	40	45	42	29	36	27	26	35	34	39	38	40	48	53	60	60	61	60	41.1
Cresco	Max.	44	46	51	56	50	38	33	30	31	31	37	37	39	37	31	29	34	28	23	29	31	29	33	43	43	66	70	76	80	83	59.9
	Min.	25	25	27	33	59	51	51	54	57	61	63	58	48	63	57	63	59	46	47	51	55	57	57	60	44	48	55	53	55	63	36.0
Davenport	Max.	46	39	55	59	53	46	43	42	36	35	42	36	42	40	45	38	46	36	30	34	34	30	40	40	45	48	55	54	52	57	60.1
	Min	29	34	31	30	46	43	42	36	35	42	36	42	40	45	38	46	36	30	34	34	38	40	47	52	58	67	65	75	74	77	40.9
Decorah	Max.	49	51	55	57	50	52	53	56	61	64	62	53	57	62	66	50	42	47	50	52	58	67	65	75	74	77	85	85	88	87	61.7
	Min.	24	33	23	27	39	35	28	25	22	35	35	41	39	33	30	42	31	24	33	26	26	33	46	42	36	44	52	46	54	52	34.8
Delaware	Max.	32	42	52	59	..	49	53	55	59	64	59	52	59	59	58	55	56	47	47	51	55	58	67	68	71	75	85	80	86	86	60.4
	Min	20	26	26	29	37	35	36	28	30	36	31	49	44	39	32	41	29	24	49	27	29	28	27	42	45	40	43	75	78	79	35.7
Denison	Max.	41	45	53	61	54	45	58	57	60	59	51	..	56	51	64	54	44	49	55	64	65	68	69	71	75	85	88	86	89	88	61 4
	Min.	29	31	25	19	30	31	28	34	37	43	43	41	37	40	31	34	21	23	28	32	32	27	35	39	45	50	60	48	60	60	36. 1
Des Moi'es	Max	43	45	53	60	48	46	58	57	59	60	55	47	53	54	64	59	47	46	54	61	62	68	62	70	73	82	84	82	84	84	60.7
	Min.	32	32	28	36	32	33	36	37	38	46	41	42	41	47	36	31	33	31	30	34	31	37	40	45	45	49	52	61	59	59	40.2
De Soto	Max.	45	43	51	60	55	44	58	56	62	64	55	50	55	59	64	59	45	52	56	62	61	66	66	75	74	82	88	86	89	88	62.0
	Min.	31	33	25	35	33	33	34	36	33	47	44	44	49	56	54	61	37	31	27	33	61	61	67	72	73	80	80	80	83	84	60.2
Dows	Max.	43	48	52	60	51	46	56	56	61	61	38	39	39	39	32	26	34	27	20	32	30	35	30	32	35	43	47	55	59	59	39.1
	Min	28	32	25	33	32	31	29	28	31	38	39	58	48	62	53	62	56	42	46	52	54	58	65	62	65	70	75	81	82	84	60.2
Dubuque	Max.	46	42	55	59	51	51	53	56	62	62	40	37	42	43	43	36	41	32	29	31	36	30	41	41	49	44	49	57	52	54	61.0
	Min.	26	34	32	33	42	40	42	36	38	61	66	59	53	60	62	67	66	47	53	53	61	62	70	67	75	76	81	85	91	87	63.7
Eldon	Max.	45	41	61	59	53	47	59	58	60	63	55	50	55	55	63	55	40	44	53	59	60	70	65	74	77	80	88	90	87	88	64.8
	Min.	27	32	26	31	39	37	39	31	28	40	38	42	40	41	35	44	31	27	31	26	30	35	45	42	43	47	45	53	56	55	36.5
Elkader	Max.	50	47	60	62	53	50	39	34	28	25	35	36	40	40	42	32	43	32	26	25	29	26	35	46	43	37	37	41	45	42	60.8
	Min	22	30	26	26	60	42	..	45	55	62	64	52	45	45	50	63	..	44	48	52	65	65	66	70	74	74	81	84	87	87	60.8
Estherville	Max.	46	48	52	60	24	34	31	28	26	29	35	41	39	37	37	22	..	24	17	22	34	27	32	40	37	37	38	79	85	84	30.3
	Min.	24	29	24	58	52	44	55	55	61	63	55	51	55	52	60	50	41	44	57	60	61	65	67	75	72	78	56	58	85	84	60.2
Forest City	Max.	45	48	52	30	32	30	32	31	33	41	39	38	39	37	31	34	25	22	47	23	55	62	67	68	75	77	85	80	84	85	36.7
	Min.	29	31	29	62	55	47	58	58	62	62	55	50	50	55	53	62	60	44	20	35	36	30	27	35	34	40	40	48	48	56	62.1
Ft. Dodge	Max.	45	48	53	62	55	50	55	59	63	66	62	55	64	64	68	35	47	34	27	50	53	70	60	67	76	68	75	82	87	86	34.1
	Min	27	32	22	34	30	3.0	29	29	29	39	41	39	40	39	34	25	65	..	27	28	20	27	39	38	41	42	49	55	75	50	64.9
Fruitland	Max.	49	42	56	62	51	50	55	59	63	66	62	55	64	64	44	35	47	34	45	54	59	67	69	69	73	75	77	87	84	85	38.3
	Min.	36	29	29	31	45	42	40	30	31	38	35	40	40	54	57	68	54	45	20	31	29	29	29	40	37	47	50	57	47	55	63.2
Galva	Max.	45	48	56	63	53	42	60	59	69	64	41	42	40	38	27	33	25	20	31	29	29	29	40	37	47	50	87	79	80	85	36.2
	Min.	29	32	24	31	32	32	27	32	36	41	58	55	52	40	38	57	52	59	58	64	68	71	73	74	78	87	79	80	85	85	63.7
Glenwood	Max.	44	45	54	63	60	49	58	61	58	58	46	46	43	46	39	33	36	29	29	33	33	41	37	38	47	51	53	58	61	60	40.7
	Min.	33	32	29	37	33	35	29	40	41	60	64	59	52	61	62	64	50	44	44	50	56	56	66	61	72	71	75	81	55	57	61.0
G. Meadow	Max.	47	46	54	57	..	52	37	32	28	32	38	33	38	39	36	35	42	30	25	26	39	26	34	34	44	41	44	81	86	87	37.1
	Min.	23	32	27	29	39	37	32	55	56	64	66	60	50	53	59	66	60	44	45	58	62	60	67	64	78	77	81	45	54	52	62.8
Greene	Max.	45	49	57	60	31	39	34	30	30	30	38	38	39	39	32	37	28	23	29	30	32	32	37	38	36	38	45	54	55	58	36.2
	Min.	27	32	26	31	62	53	45	59	58	60	67	57	47	57	67	58	49	55	57	62	62	67	68	74	76	85	87	84	82	84	62.8
Greenfield	Max.	43	43	53	62	53	33	32	31	33	34	43	44	41	38	32	35	27	25	30	29	36	32	36	42	45	48	55	54	55	54	37.4
	Min.	28	31	26	33	33	32	31	33	33	34	43	44	41	38	32	35	27	25	30	29	36	32	36	42	45	48	55	54	55	54	60.0
Grinnell	Max.	44	44	52	58	52	46	55	55	58	61	56	50	58	58	67	58	45	45	51	58	59	66	66	71	71	77	81	83	87	86	38.7
	Min	29	32	28	34	40	34	37	33	35	43	36	41	37	39	33	33	29	25	33	33	33	33	46	44	48	49	56	54	57	57	61.8
Grin'l (nr.)	Max.	44	43	57	59	52	45	55	54	61	63	57	50	58	59	64	58	45	48	53	60	60	68	63	75	75	77	82	87	89	87	37.9
	Min.	28	32	27	32	40	34	37	33	33	42	36	40	38	34	32	38	28	23	33	30	33	33	47	40	47	47	57	54	57	57	61.0
Grundy C'r	Max.	43	46	53	59	49	50	55	56	63	61	56	56	60	58	63	52	37	28	45	48	54	59	63	65	68	64	77	76	81	83	37.1
	Min.	26	32	26	32	39	33	31	30	31	39	36	40	..	39	31	56	63	55	45	48	59	63	65	68	64	77	76	81	83	85	63.3
Hampton	Max.	45	50	55	60	..	47	58	60	64	64	39	38	39	39	35	32	35	28	24	32	34	32	32	42	42	45	46	53	56	56	37.2
	Min	28	32	28	31	33	33	32	30	32	39	58	52	47	57	55	67	50	48	53	55	65	71	71	75	77	87	80	82	86	87	62.7
Harlan	Max.	41	47	54	61	54	45	59	59	61	61	58	52	58	57	67	55	34	26	37	39	46	52	55	59	62	68	75	77	80	82	36.8
	Min.	30	31	24	33	32	34	27	35	37	42	43	41	39	40	26	30	26	23	31	26	30	30	31	36	39	46	52	53	56	56	60.6
Hopeville	Max	41	37	51	59	55	42	56	56	57	62	53	49	52	52	62	57	47	49	57	61	63	67	63	71	74	84	82	83	86	85	39.0
	Min.	30	32	27	36	33	34	33	37	36	45	42	43	35	35	34	36	29	27	31	26	30	35	40	43	46	54	59	54	57	57	60.5
Humboldt	Max.	44	48	53	59	..	46	56	56	63	62	58	52	54	55	63	55	44	45	55	63	64	68	65	74	75	84	83	83	86	85	37.7
	Min	30	34	27	34	33	32	32	33	42	41	41	40	35	29	62	55	44	45	51	57	58	67	61	71	72	76	81	83	50	56	60.9
In'pen'nce.	Max.	45	46	55	60	31	40	56	55	60	64	57	52	60	60	68	60	46	46	52	61	63	68	65	71	73	77	82	82	85	84	36.4
	Min.	24	33	27	52	60	56	43	57	56	58	61	58	51	59	61	68	36	30	25	32	33	36	35	44	44	46	53	59	59	58	61.0
Indianola	Max.	42	42	29	34	60	56	43	57	58	63	56	52	60	62	68	62	48	53	59	63	66	68	68	73	75	84	86	86	89	85	39.9
	Min.	31	32	29	34	34	33	33	39	38	47	42	42	40	40	36	39	33	28	35	36	30	28	37	47	41	47	55	48	51	53	63.5
Iowa City	Max.	48	41	58	62	51	48	59	59	63	67	61	52	63	63	68	61	52	40	47	56	59	60	66	63	74	74	79	82	84	84	38.6
	Min.	26	33	28	32	45	38	41	56	55	61	57	56	61	63	68	36	47	34	28	31	28	31	33	41	34	43	47	54	58	55	60.3
Iowa Falls.	Max.	44	48	53	59	48	45	56	55	61	63	57	50	58	58	64	58	45	48	53	60	60	68	63	75	75	82	87	87	89	87	36.0
	Min	27	32	25	32	33	32	31	30	29	30	38	42	39	38	34	39	28	23	33	30	33	33	47	40	47	47	57	52	54	54	60.6
Keokuk	Max.	45	37	54	58	52	46	56	56	60	64	64	55	..	54	64	54	44	49	55	64	65	68	69	71	75	85	88	86	89	88	37.1
	Min	31	33	32	36	46	39	42	38	36	42	39	45	43	45	43	34	21	23	28	32	32	27	35	39	45	50	60	48	60	58	63.3

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR APRIL, 1901—CONTINUED.

STATIONS.		DATE																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Keosauqua	Max.	44	38	58	58	50	46	59	58	62	64	57	52	59	63	67	64	51	53	56	60	60	67	70	78	77	79	83	85	90	88	65.6
	Min	28	33	28	28	46	39	41	34	29	31	39	40	42	43	41	51	34	28	35	28	32	35	47	45	43	52	58	52	52	57	39.7
Lansing	Max	48	54	61	59	59	53	58	60	62	67	63	59	59	65	66	52	51	50	55	60	62	71	68	72	75	76	83	85	89	86	64.3
	Min	22	30	24	29	40	37	39	29	34	37	32	44	43	43	40	43	31	27	23	32	25	40	48	47	40	50	61	47	55	60	38.4
Larch w o'd	Max	48	48	53	60	55	46	56	59	61	58	53	..	55	54	57	57	43	46	59	67	71	71	75	73	80	88	82	75	82	89	62.8
	Min	24	28	29	29	30	32	30	33	37	42	42	39	35	35	30	30	25	23	31	32	36	35	36	43	45	41	51	40	55	57	36.5
LeMars	Max	45	50	54	63	52	43	58	59	62	62	56	45	54	55	65	50	46	53	57	65	68	70	73	74	79	88	80	78	85	86	62.5
	Min	17	32	29	33	33	33	24	36	32	42	42	39	38	38	29	32	26	23	32	32	36	32	31	42	45	56	56	49	59	61	37.0
Lenox	Max	42	41	52	60	56	44	57	56	56	58	54	48	54	56	63	59	48	51	48	60	62	66	64	68	74	83	81	80	84	83	60.3
	Min	31	31	27	35	32	34	31	35	36	44	42	42	38	34	33	36	29	28	32	34	37	34	40	42	49	53	56	53	56	56	38.7
Logan	Max	43	45	56	64	56	48	60	61	62	63	58	48	41	57	51	49	52	59	52	65	70	71	74	76	77	87	80	82	87	88	62.7
	Min	33	24	28	38	38	37	32	44	39	32	44	41	35	38	34	24	26	24	36	28	33	34	50	52	54	54	59	51	57	60	39.3
Maquoketa	Max	49	49	60	63	59	56	55	62	64	65	60	58	65	62	64	61	61	55	56	62	64	67	65	71	75	75	82	84	87	85	64.8
	Min	21	32	29	27	41	40	39	29	21	34	32	41	41	42	30	43	33	21	28	28	26	38	39	42	36	45	50	41	43	50	35.4
Marsh'l't'n	Max	46	48	56	60	54	49	59	59	64	62	58	52	57	62	64	60	47	46	54	62	63	69	64	75	75	81	85	86	89	87	63.1
	Min	28	33	25	35	39	34	30	30	30	39	39	41	40	34	30	38	29	27	35	29	32	35	45	39	45	47	57	51	53	60	37.6
Monticello	Max	45	42	60	62	60	60	56	58	65	64	58	63	62	64	63	62	63	58	57	..	68	66	68	67	72	77	82	88	85	87	64.9
	Min	15	18	28	29	39	40	29	28	25	28	35	37	39	32	33	45	28	26	25	27	27	29	40	42	35	38	43	58	62	51	34.4
Mt. Ayr	Max	40	40	53	60	55	44	59	58	55	61	53	50	52	58	63	62	48	52	51	61	63	67	64	71	75	84	82	81	84	82	60.9
	Min	30	31	27	36	32	34	32	36	36	44	42	42	39	35	36	36	28	27	31	32	38	36	41	44	49	53	56	53	55	52	38.8
Mt. Plea'nt	Max	47	46	53	68	53	49	59	55	60	60	60	53	60	62	62	63	57	48	51	58	57	56	68	73	72	78	82	83	86	85	62.1
	Min	26	31	39	31	..	40	41	32	30	38	32	40	40	42	39	47	37	28	30	28	29	36	44	37	43	45	55	45	53	53	38.3
Mt. Vernon	Max	46	44	64	63	49	47	57	65	67	67	58	50	65	58	67	55	44	54	58	64	63	73	69	73	78	82	84	86	87	82	64.0
	Min	22	26	27	33	41	37	37	30	31	39	32	37	36	37	35	40	31	25	31	30	28	34	42	43	43	44	53	51	52	52	36.6
NewH'pton	Max	44	49	53	57	51	49	55	56	62	63	57	50	55	58	62	52	42	43	53	57	60	67	61	73	73	76	83	83	85	83	60.4
	Min	26	32	29	33	38	34	32	30	33	41	35	38	38	34	32	37	28	24	26	31	31	34	45	46	43	43	54	51	51	55	36.8
Newton	Max	49	44	53	58	52	43	57	57	60	62	58	51	56	60	64	59	46	38	53	62	61	68	64	73	74	80	85	85	89	85	61.5
	Min	29	32	26	33	36	33	36	32	32	42	38	41	38	34	31	39	29	24	33	32	33	34	45	44	43	49	55	54	54	55	37.9
Northwood	Max	49	55	57	59	52	47	58	66	67	63	57	53	58	55	68	56	47	46	66	69	70	71	72	78	76	77	82	84	85	84	64.2
	Min	28	33	28	30	35	32	32	31	30	41	37	39	38	35	33	34	27	22	26	31	32	31	31	43	44	44	54	50	55	56	36.1
Odebolt	Max	44	49	53	63	56	43	60	60	61	62	55	45	55	54	65	55	45	48	58	65	70	69	74	75	77	86	83	81	87	86	62.8
	Min	27	32	26	32	32	33	29	32	35	42	42	40	39	38	31	35	26	21	32	31	31	29	36	40	45	51	57	49	59	59	37.0
Ogden	Max	42	47	53	66	..	45	57	56	58	59	56	47	56	55	64	54	47	48	54	64	64	67	65	72	74	83	83	83	86	85	61.8
	Min	30	31	27	33	31	31	30	35	35	45	40	40	39	33	28	34	28	23	31	30	34	32	39	37	45	50	56	54	57	55	37.1
Olin	Max	45	43	52	59	53	50	54	54	59	61	58	53	63	58	63	58	56	45	50	55	56	66	64	69	69	76	82	82	86	83	60.4
	Min	25	34	29	35	42	40	40	30	27	37	35	40	40	43	40	45	33	26	33	38	27	36	40	45	48	45	45	45	48	50	38.0
Om'ha Neb	Max	41	44	54	63	46	48	57	61	57	57	52	48	56	55	60	53	47	57	55	63	68	71	73	73	78	88	71	79	85	85	61.5
	Min	32	32	32	40	34	36	32	41	44	48	44	44	41	40	37	33	30	31	35	37	43	44	40	51	53	57	59	56	64	62	42.4
Onawa	Max	42	47	54	61	57	48	61	63	60	59	55	47	58	59	64	53	49	56	59	67	72	74	77	74	79	89	84	81	87	87	64.1
	Min	30	31	26	33	35	34	25	37	40	43	45	41	38	39	28	33	25	24	33	31	34	34	35	44	45	54	61	53	61	59	38.4
Osage	Max	43	42	50	56	..	48	52	54	60	63	58	49	52	56	60	49	40	43	54	57	60	65	63	73	74	77	81	81	83	83	57.5
	Min	27	29	27	31	36	33	31	31	32	39	36	38	38	32	36	35	28	24	26	30	31	31	40	40	40	45	54	51	54	56	36.0
Osceola	Max	50	59	57	60	56	44	56	56	56	52	53	52	54	59	52	52	47	51	50	60	61	67	64	71	74	84	81	82	85	83	60.9
	Min	20	..	30	37	32	33	32	37	42	41	41	43	40	35	37	37	36	30	32	..	36	40	44	49	50	55	60	58	61	62	41.1
Oskaloosa	Max	46	41	56	61	51	45	62	58	64	65	58	51	57	59	66	64	48	50	55	61	60	68	66	75	75	80	84	86	89	85	62.9
	Min	28	31	25	33	36	34	38	32	30	40	37	41	39	34	34	40	29	25	32	27	32	36	45	45	47	49	56	53	55	55	37.9
Ottumwa	Max	46	39	53	51	50	50	52	56	59	63	52	50	60	60	62	64	45	46	50	55	58	60	65	70	71	72	81	84	88	86	59.9
	Min	31	30	33	40	39	40	40	37	38	46	41	39	38	41	40	41	32	32	30	39	42	43	42	49	47	51	62	63	57	60	42.1
Ovid	Max	44	39	53	60	45	43	60	60	58	63	56	52	56	69	65	66	54	56	51	65	67	71	67	71	75	82	82	83	85	84	62.7
	Min	28	30	24	34	32	32	30	35	34	42	38	41	38	33	30	36	27	23	29	28	32	31	40	41	45	51	55	53	53	54	36.6
Pacific Jct.	Max	44	46	55	64	59	52	64	70	61	60	58	57	58	55	66	57	51	59	56	72	66	71	72	72	77	87	73	86	86	86	64.7
	Min	33	32	25	35	35	36	25	39	43	47	45	43	40	35	30	36	26	23	31	30	34	34	33	43	48	54	60	63	56	52	38.9
Pella	Max	41	44	54	56	60	50	58	59	60	62	56	53	58	60	61	64	49	51	53	66	62	71	66	72	74	82	85	85	88	86	62.9
	Min	33	30	29	36	34	35	37	33	35	43	38	41	40	41	40	38	30	26	..	30	32	39	46	48	48	47	55	51	55	55	39.5
Perry	Max	44	47	53	62	..	45	60	57	62	62	54	48	57	57	65	56	47	50	56	64	63	67	65	74	74	74	82	84	84	85	62.0
	Min	31	31	25	32	33	33	30	34	36	44	42	42	41	36	29	36	29	24	27	..	35	33	54	37	45	40	63	54	50	64	38.3
Plover	Max	43	40	53	60	45	43	58	54	65	63	54	53	54	50	64	54	40	52	58	65	63	64	68	75	76	84	86	84	88	89	61.2
	Min	28	33	27	30	40	29	30	29	33	40	42	45	38	33	29	40	25	21	32	30	32	31	35	40	44	54	49	54	59	55	36.9
Primghar	Max	43	40	53	60	52	46	57	33	58	38	50	51	57	60	48	41	45	47	57	65	67	71	75	72	75	85	82	80	85	89	58.7
	Min	..	..	..	..	..	.	..	..	..	..	..	.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Red Oak	Max	43	46	55	63	59	59	61	62	58	60	56	49	60	55	65	53	52	55	52	64	68	72	73	74	79	88	83	81	87	88	64.0
	Min	31	29	24	32	34	21	27	36	27	45	44	43	39	35	29	33	27	24	34	30	30	33	.	41	51	72	59	57	61	56	38.1
Ridgeway	Max	47	50	55	58	47	56	56	62	65	68	58	51	60	66	65	55	47	48	59	59	63	70	69	75	75	80	84	84	90	88	63.7
	Min	27	34	28	31	40	34	30	29	32	40	36	39	36	35	35	36	29	25	25	32	30	32	45	44	44	45	57	54	57	59	37.3
Rockwell C	Max	43	47	53	58	54	45	57	57	61	62	58	46	55	52	65	60	46	49	53	63	63	65	69	72	75	82	82	80	84	83	61.3
	Min	28	31	28	32	32	37	41	31	34	37	41	40	39	37	39	35	28	25	36	33	34	35	37	37	45	48	55	50	58	36	37.2
Ruthven	Max	39	44	48	55	..	42	50	51	56	57	..	49	53	55	57	..	56	62	..	55	58	63	65	..	68	71	..	73	79	88	58.1
	Min	29	31	25	33	30	32	30	30	35	40	41	39	38	34	32	33	34	41	40	36	36	41	40	34	43	45	42	46	51	55	37.2
Sac City	Max	41	46	52	61	55	43	56	56	60	60	60	46	54	52	64	57	43	45	55	63	64	67	68	72	73	84	83	81	85	85	61.0
	Min	29	32	27	33	32	33	30	32	35	42	42	40	38	38	29	34	27	23	32	32	34	34	37	42	44	51	54	50	59	57	37.4
Scranton	Max	41	45	50	59	53	43	54	54	58	59	56	45	53	50	62	55	43	47	53	60	61	64	64	72	74	83	83	81	84	84	59.7
	Min	30	32	28	32	33	33	32	33	36	43	41	40	39	38	33	35	28	25	31	32	35	35	38	42	44	49	57	54	58	58	38.1
Sheldon	Max	41	49	52	62	47	42	56	57	60	60	50	45	57	55	63	50	43	43	57	65	68	72	73	71	78	87	76	80	85	87	61.0
	Min	27	31	36	37	37	32	28	30	33	40	40	39	35	37	28	32	25	20	28	32	33	31	31	43	41	49	56	68	58	65	37.4
Sibley	Max	47	51	53	62	..	41	54	57	61	61	..	44	57	..	63	..	43	46	58	65	59	..	73	75	79	86	..	80	68	88	61.2
	Min	29	30	28	31	33	32	29	32	39	40	41	39	36	36	28	32	25	21	29	28	31	32	38	37	43	50	56	43	56	58	35.8
Sigourney	Max	51	40	60	61	61	47	62	62	68	70	62	51	65	64	70	62	47	52	57	63	62	70	69	80	80	81	87	88	92	88	65.7
	Min	26	32	27	32	44	37	39	30	30	41	34	40	41	37	55	45	31	26	32	29	30	34	45	41	46	48	56	50	54	56	38.9
Sioux Cen.	Max	45	48	53	62	54	42	56	57	59	59	52	44	52	53	61	50	43	44	56	63	68	69	73	69	78	88	..	75	82	86	60.0
	Min	30	31	29	32	33	34	29	34	36	42	43	39	37	37	30	30	26	23	31	32	35	36	37	42	44	50	55	50	57	59	37.4
Sioux City	Max	42	47	53	61	38	46	55	58	58	58	50	44	54	56	60	39	46	53	56	63	78	71	71	73	77	88	66	76	84	85	60.4
	Min	34	32	32	37	33	32	29	39	43	43	45	41	40	40	34	33	22	27	30	37	38	40	39	52	55	56	56	52	62	64	40.6
Storm L	Max	40	46	49	58	51	40	55	57	58	58	51	44	53	52	60	52	42	44	52	62	63	66	68	69	71	81	73	77	81	82	58.5
	Min	30	32	30	33	32	32	29	31	35	43	42	39	37	44	34	32	25	23	32	35	38	32	36	44	49	50	57	46	59	61	38.1
Stuart	Max	44	44	55	63	55	42	63	64	65	62	52	50	55	55	66	..	48	55	59	69	70	69	72	76	80	85	88	82	88	83	64.1
	Min	29	31	28	40	30	31	32	33	34	41	41	41	39	36	34	35	23	25	30	32	35	34	40	43	45	57	55	57	62	58	38.7
Thurman	Max	42	44	52	63	60	49	55	59	55	57	53	48	57	54	62	55	48	57	56	61	65	71	70	72	76	87	79	79	85	84	61.8
	Min	33	32	24	38	34	36	26	39	41	45	45	44	40	40	29	36	29	25	32	30	32	33	36	41	50	54	64	60	63	59	39.7
Toledo	Max	45	45	58	60	46	53	60	59	65	62	57	47	62	66	67	..	..	51	59	66	65	73	68	77	76	80	85	87	90	87	64.9
	Min	27	32	25	35	42	35	36	29	37	37	..	39	34	28	30	29	24	35	28	35	32	46	38	44	49	56	54	56	58	37.2
Villisca	Max	43	44	55	62	63	50	60	61	61	60	56	51	59	52	66	56	53	58	60	62	69	70	70	73	76	79	88	86	85	86	63.8
	Min	27	31	25	35	31	38	27	27	37	44	44	44	40	34	27	37	26	24	25	25	33	38	39	42	57	53	58	54	56	63	38.0
Wapello	Max	42	42	57	58	51	49	54	..	61	59	57	54	61	64	67	61	56	55	..	61	61	67	70	72	76	72	81	84	91	97	65.0
	Min	30	34	30	39	46	42	41	..	31	40	37	42	41	45	40	48	35	29	..	33	32	41	43	42	47	49	50	65	55	64	41.8
Washi'gt'n	Max	46	38	56	59	49	49	56	58	62	64	..	..	62	62	66	63	..	49	54	60	61	70	67	75	73	80	83	86	90	87	63.9
	Min	25	31	26	32	43	37	39	31	29	38	33	38	38	37	37	40	30	25	32	29	28	34	43	40	45	46	47	49	54	55	37.0
Waterloo	Max	46	48	54	61	52	48	55	56	63	63	58	50	57	62	64	52	45	46	52	60	60	68	62	73	74	78	82	84	88	86	61.6
	Min	28	32	26	31	41	36	31	30	29	39	38	41	40	33	32	37	30	24	33	29	32	34	46	40	46	46	57	52	51	60	37.5
Waverly	Max	48	50	56	61	51	50	55	57	63	66	59	52	55	60	64	65	46	47	55	60	60	62	61	73	74	78	86	85	88	86	62.5
	Min	26	31	26	33	40	35	32	32	30	40	38	40	41	33	31	37	30	25	32	30	33	34	46	41	44	48	54	55	50	56	37.4
Whitten	Max	40	44	55	57	49	45	53	54	60	61	51	48	53	54	60	..	50	45	53	60	59	65	60	72	72	79	83	84	87	85	61.5
	Min	..	..	22	31	35	32	32	32	30	40	36	40	38	39	30	..	40	21	34	30	31	38	44	33	46	45	54	62	63	64	38.6
Wilton Jc	Max	47	42	55	60	56	51	55	56	62	65	60	55	63	60	67	63	57	47	52	57	57	65	65	72	72	77	81	83	87	87	62.5
	Min	25	33	28	32	44	41	41	30	28	38	33	39	37	43	33	47	34	26	32	28	26	36	37	40	40	47	53	48	52	55	37.5
Winterset	Max	43	43	53	64	..	44	59	58	60	63	..	48	55	62	66	60	50	52	50	64	65	69	65	79	77	84	86	85	89	87	62.1
	Min	30	32	25	35	32	32	32	35	35	43	41	42	39	35	31	47	29	25	30	29	33	35	49	42	47	53	58	53	59	57	38.8

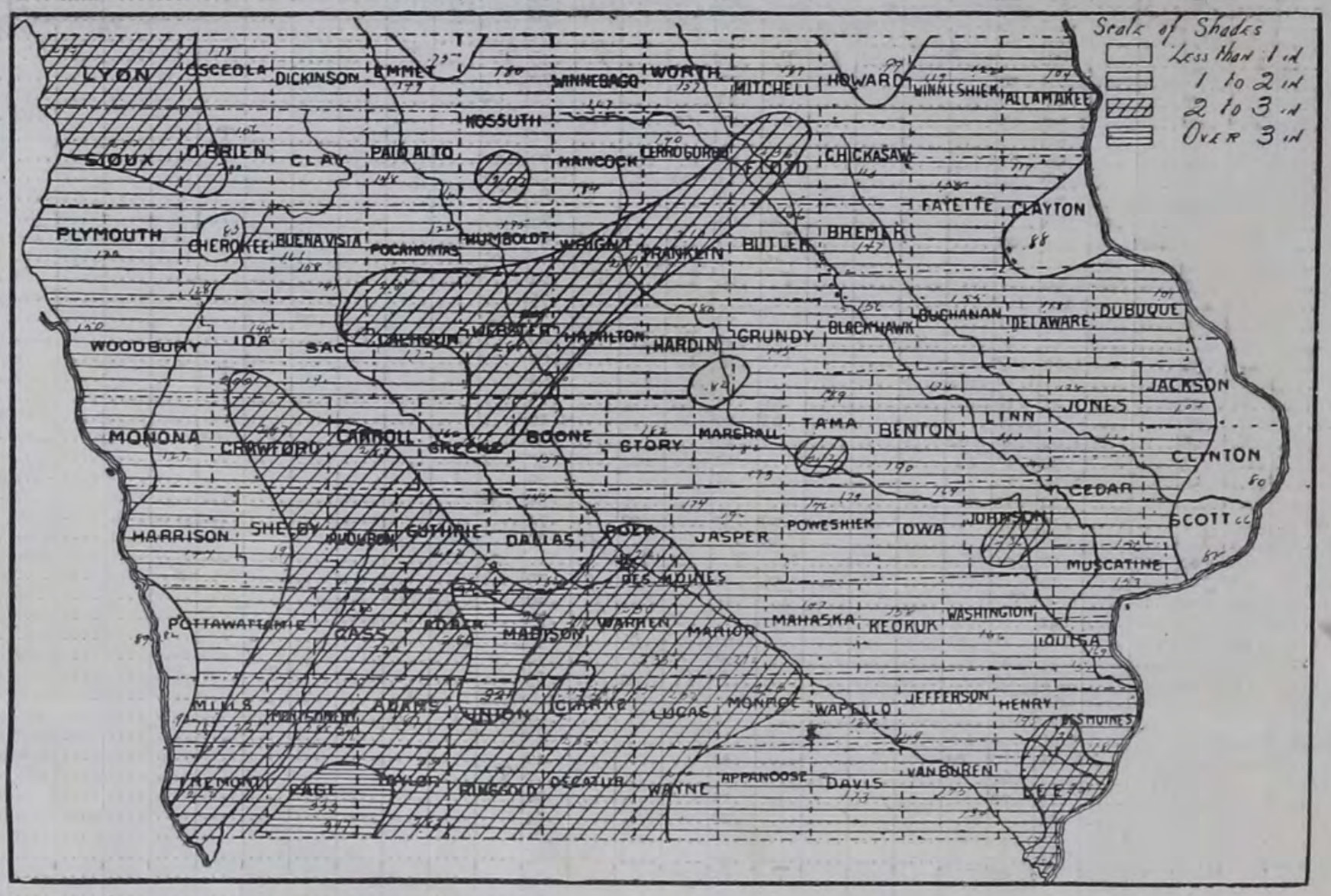
DAILY AND MONTHLY PRECIPITATION FOR APRIL, 1901.

STATIONS.	DAY OF MONTH.																													TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Alton	T.	.60	....	...	1.44	.. .	....	....	....	....	....	.35	....	....	.. .	.46	....	....	....	....	....	....	....	....	....	....	....	.36	....	....	3.21
Albia	....	.40	....	....	1.00	.34	....	....	....	....	....	.31	....	....	....	.60	....	....	....	....	....	....	....	....	....	....	.35	.02	....	....	2.65
Algona	.05	....	....	....	....	.70	....	....	....	....	....	.30	....	....	....	.60	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	2.02
Alta	....	.05	....	....	.53	....	....	....	....	....	....	.23	....	....	....	.80	T.	....	....	....	....	....	....	....	....	....	T.	....	....	....	1.61
Alta (near)	....	.20	....	....	.35	....	....	....	....	....	.19	.04	....	....	.64	.16	...	....	....	....	....	....	.01	....	....	....	....	....	....	....	1.58
Amana	....	.18	....	....	.75	.08	....	....	....	....	....	.10	....	.02	....	.48	.07	....	....	....	....	....	....	....	....	....	....	....	....	....	1.69
Ames	....	.14	....	....	.48	.13	....	....	....	....	....	.30	.07	....	....	.70	T.	....	....	....	....	....	....	....	....	....	T.	....	....	....	1.82
Atlantic	....	1.50	....	....	.60	....	....	....	....	.....	.07	....	....	....	.10	.58	T.	.....	....	....	....	....	....	....	....	....	....	.10	T.	....	2.85
Bancroft	....	....	....	....	1.00	....	....	....	....	T.	T.	.20	....	....	....	.50	....	....	....	....	....	....	....	T.	....	....	.05	....	....	....	1.80
Battle Creek	....	.45	....	....	.38	....	....	....	....	....	.01	.42	....	T.	.02	.67	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	2.00
Baxter	....	.10	....	....	.64	.10	....	....	....	....	....	T.	.05	....	....	.85	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.74
Bedford	....	.25	....	....	1.75	T.	....	....	....	....	.02	.36	....	....	....	.30	....	.07	.08	....	....	....	....	....	....	....	....	....	....	....	2.83
Belknap	....	.31	....	....	.71	.20	....	....	....	....	....	.10	....	....	....	.41	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.73
Belle Plaine	....	.15	....	....	.10	.50	....	....	....	....	T.	.20	....	....	....	.85	.10	....	....	....	....	....	....	....	....	....	....	....	.....	....	1.90
Bonaparte	....	....	....	....	.70	.10	.02	....	.....	....	....	.10	T.	....	.42	....	....	....	....	....	....	....	....	....	....	....	.06	.12	....	....	1.34
Britt	....	T.	....	....	.50	.11	....	....	....	....	....	.25	....	T.	....	.80	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.84
Buckingham	....	....	.25	....	....	.75	.03	....	....	....	....	....	.08	....	....	....	.78	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.89
Burlington	....	.22	....	....	.79	.23	T.	....	....	....	....	.08	T.	....	....	.54	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	1.86
Bussey	....	.10	....	....	1.60	....	....	....	....	....	....	....	....	....	....	.42	....	....	....	....	....	....	....	....	....	....	....	.85	....	....	2.12
Carroll	....	.10	....	....	T.	.50	....	....	....	....	.32	T.	....	....	....	1.06	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.83
Cedar Rapids	.21	.03	....	.06	.58	.05	....	....	....	....	T.	.08	T.	....	.06	.10	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	1.17
Chariton	T.	.53	....	....	.87	.09	....	....	....	....	....	.26	T.	....	....	.27	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.02
Charles City	....	....	....	....	.60	.70	....	....	....	....	....	.28	T.	....	....	.78	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	2.36
Clarinda	....	.31	....	....	2.00	....	....	....	....	....	.11	.36	....	....	....	.17	.03	.04	.10	....	....	....	....	....	....	....	.21	....	....	....	3.33
Clear Lake	....	T.	....	....	.50	.05	....	....	....	....	....	.25	....	....	....	.60	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.40
Clinton	....	.08	....	....	.28	....	....	....	....	....	....	.03	....	....	....	.40	....	....	....	....	....	....	.01	....	....	....	....	....	....	....	.80
College Springs	.01	.16	....	....	1.71	....	....	....	....	....	.15	.78	....	....	....	.17	T.	....	.17	....	....	T.	T.	....	....	....	.32	....	....	....	3.47
Columbus Junction	....	.30	....	....	.66	.11	T.	....	....	....	T.	.23	.09	....	....	.30	....	....	....	....	....	T.	T.	....	....	....	....	....	....	....	1.69
Corning	T.	.40	..	....	1.33	....	....	....	....	....	....	T	T.	....	T.	.44	T.	T.	T.	....	....	....	....	....	....	....	.70	....	....	....	2.87
Council Bluffs	....	....	....	....	.05	....	....	....	....	....	.10	.08	....	....	T.	.59	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	.82
Cresco	....	T.	....	....	.30	.10	....	....	....	....	....	.02	....	....	....	.57	....	....	....	....	....	....	....	....	....	....	.20	....	....	....	.99
Cumberland	.02	....	....	....	1.50	....	....	....	....	....	T.	....	....	....	....	.50	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.22
Danville	.19	.60	T.	....	.88	.18	T.	..	....	....	....	.18	....	....	....	....	.18	....	....	....	....	T.	....	....	....	....	....	....	....	....	2.21
Davenport	....	.18	....	....	.28	.08	....	....	....	....	....	.02	....	.01	....	.30	....	....	....	....	....	.01	T.	..	....	....	....	....	....	....	.88
Decorah	....	T.	...	....	.26	.20	-	....	....	....	....	T.	....	....	....	.76	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.22
Delaware	....	.09	....	....	.45	....	....	....	....	....	....	.18	....	....	....	.46	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.18
Denison	....	1.00	....	....	1.00	.02	....	....	....	..	T.	.27	....	....	....	.85	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	3.14
Des Moines	....	.36	....	...	.83	.25	....	....	....	....	T.	.22	T.	....	....	.59	.01	....	....	....	....	....	....	....	....	....	....	T.	....	....	2.26
De Soto	....	T.	....	....	1.00	....	....	....	....	....	....	T.	.19	....	....	.62	.03	....	....	....	....	....	....	....	....	....	.07	....	....	..	1.84
Dows	....	.14	....	....	.54	.13	....	....	....	....	....	.30	....	....	....	.91	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.09
Dubuque	....	05	....	....	.29	.26	T.	....	....	....	....	.03	T.	.02	....	.35	.01	....	....	....	....	....	T.	T.	....	....	....	....	....	....	1.01
Eldon	....	.54	T.	....	.49	.14	....	....	....	....	....	.08	....	....	....	.24	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	1.49
Elkader	....	....	....	....	.30	....	....	....	....	....	....	.03	....	....	....	.55	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.88
Emerson	.50	....	....	....	.60	....	....	....	....	....	....	.25	....	....	.86	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	2.21
Estherville	...	.01	...	....	.38	.07	....	....	....	.04	.03	.25	....	T.	....	.70	.01	....	....	....	....	....	....	....	....	....	....	.02	....	....	1.49
Fonda	.25	.10	....	T.	.96	....	....	....	....	.02	.24	.06	T.	....	.86	.27	.03	....	....	....	....	....	....	....	....	....	....	.10	....	....	2.81
Forest City	....	T.	....	....	.46	.21	....	....	....	....	....	.20	....	....	....	.70	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.67
Fort Dodge	....	T.	....	....	1.50	....	....	....	....	....	T.	T.	....	....	....	1.37	01	....	....	....	....	....	....	....	....	....	....	....	....	....	2.88
Fort Madison	....	.48	....	....	1.19	T.	T.	....	....	....	....	.31	T.	....	....	.48	....	....	....	....	....	....	.05	....	....	....	.....	....	....	....	2.51
Fruitland	....	.25	....	....	.55	.20	....	....	....	....	....	.01	....	....	....	.52	....	....	....	....	....	....	T.	....	....	....	....	....	....	....	1.53
Galva	....	....	....	....	.40	....	....	....	....	....	....	.30	....	....	....	.70	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.40
Gilman	T.	T.	....	....	.34	.29	....	....	....	....	T.	.23	T.	....	....	.83	.04	....	....	....	....	....	....	T.	....	....	T.	T.	....	....	1.73
Glenwood	T.	....	....	....	.78	....	....	....	....	....	T.	.30	....	....	T.	.45	T.	....	T.	....	....	....	....	....	....	....	....	....	....	....	1.17
Grand Meadow	....	....	....	....	....	.36	....	....	....	....	....	.07	....	....	....	.74	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.66
Greene	....	.06	....	....	.48	.30	....	....	....	....	....	.23	....	....	....	.54	.05	....	....	....	....	....	....	....	....	....	....	.02	....	....	2.86
Greenfield	T.	.48	....	....	1.52	05	....	....	....	....	T.	.20	.06	....	.04	.49	T.	....	....	....	....	....	....	T.	....	....	....	....	....	....	1.46
Grinnell	....	.06	....	....	.65	....	....	....	....	....	....	....	....	....	....	.75	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	1.79
Grinnell (near)	....	.10	....	....	.50	.21	....	....	....	....	T.	.25	T.	.02	....	.60	.11	....	....	....	....	....	....	....	....	....	....	....	....	....	1.45
Grundy Center	....	.13	....	....	.28	.35	....	....	....	....	....	.13	02	....	....	.52	.02	....	....	....	....	....	....	....	....	....	....	....	....	....	2.02
Guthrie Center	.40	....	....	....	.32	....	....	....	....	....	....	.48	....	....	....	.82	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	2.10
Hampton	....	.15	....	.01	.90	....	....	....	....	....	.26	.03	....	....	....	.75	....	....	....	....	....	....	....	....	T.	....	....	T.	.02	....	1.97
Harlan	T.	.30	....	....	.44	.02	....	....	....	....	T.	.23	....	....	.03	.91	02	....	....	....	....	....	....	....	....	....	....	....	....	....	1.55
Hawkeye	T.	....	....	.15	....	....	....	....	....	....	.45	....	....	....	....	....	.95	....	T.	....	....	....	....	....	....	....	....	.04	....	....	2 33
Hopeville	....	.30	....	....	1.49	....	....	....	....	....	T.	.26	T.	....	T.	.24	....	.....	T.	....	....	....	....	....	....	....	....	....	....	....	.75
Hoprig	....	T.	....	....	T.	T.	....	....	....	....	....	....	....	....	....	.75	....	....	....	....	....	....	....	....	....	....	....	.17	....	....	1.75
Humboldt	....	.12	....	..	.50	.01	....	....	....	....	....	.23	....	....	....	.70	..	....	....	T.	....	.02	....	....	....	....	....	....	....	....	1.55
Independence	....	T.	....	....	.40	.10	....	....	....	....	....	.25	T.	T.	....	.80	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.36
Indianola	T.	.32	....	....	1.00	.03	....	....	....	....	T.	.38	T.	....	....	.63	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	2.36
Iowa City	....	.29	....	....	....	1.15	....	....	....	....	....	.30	....	T.	....	.62	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.80
Iowa Falls	....	.25	....	....	.41	.16	.....	....	....	....	.11	.14	....	....	....	.73	....	....	....	....	....	....	....	....	....	....	....	.05	....	.....	2.18
Jefferson	....	.25	....	....	.55	....	....	....	....	....	.03	.20	....	....	....	1.10	....	....	....	....	....	....	....	T.	.02	....	....	....	....	....	2.29
Keokuk	....	.28	....	....	1.02	.30	.02	....	....	....	....	.28	....	.02	....	.35	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1 95
Keosauqua	....	.53	....	....	.70	.13	T.	....	....	....	....	.16	T.	.04	....	.37	.02	....	....	....	....	....	....	....	....	....	....	....	....	....	2.35
Lacona	....	.50	....	....	1.10	.20	....	....	....	....	....	.25	....	....	....	.30	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	1.04
Lansing	....	....	....	....	.22	.12	....	....	....	....	....	....	....	....	....	.34	.36	....	....	....	....	....	....	....	....	....	....	.75	....	....	2.19
Larchwood	...	....	....	....	.15	.07	....	....	....	....	.09	.37	....	.02	....	.74	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.85
Larrabee	....	T.	....	....	.47	....	....	....	....	....	.10	T.	....	....	.05	.23	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.66
Le Claire	....	.07	.09	....	.06	.21	T.	....	....	....	....	T.	.01	T.	....	....	.20	....	....	....	....	....	....	.02	....	....	....	....	....	....	1.70
Le Mars	....	....	....	....	.10	....	....	....	....	....	05	.30	....	....	.04	.79	....	....	....	....	....	....	....	....	T.	....	....	.10	....	....	2.35
Lenox	....	.10	....	....	1.50	T.	....	....	....	....	T.	.15	....	....	T.	.40	....	....	.10	....	....	....	....	....	....	....	....	....	....	....	1.44
Logan	....	.20	....	....	.42	....	....	....	....	....	....	....	.09	....	T.	.73	....	....	....	....	....	....	....	T	....	....	....	....	....	....	1.04
Maquoketa	....	T.	.15	....	.24	.11	,02	....	....	....	....	.04	....	.05	....	.43	....	....	....	....	....	....	....	....	....	....	.....	....	....	....	1.82
Marshalltown	....	.10	....	....	.45	.23	....	....	....	....	....	.28	.01	....	....	.70	.05	....	....	....	....	T.	....	....	....	....	....	....	....	....	1.24
Monticello	....	T.	....	....	.....	.69	....	....	....	....	....	....	T.	.02	....	.53	....	....	T.	....	....	....	....	....	....	....	....	....	....	....	1.42
Mooar	T.	....	.40	....	1.02	....	....	....	....	....	T.	.50	.17	T.	T.	.07	....	T.	.11	....	....	....	....	....	....	....	....	.10	.02	....	2.22
Mount Ayr	....	.08	....	....	1.12	.05	....	....	....	....	....	.15	....	....	....	.47	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.98
Mount Pleasant	....	.27	....	....	1.09	....	T.	....	....	....	....	.14	T.	....	....	.40	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.43
Mt. Vernon	....	.10	....	....	.65	.10	.04	....	....	....	....	....	....	....	.38	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	1.13
Murray	....	.03	....	....	....	.60	....	....	....	.12	....	....	....	....	....	.60	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.13
New Hampton	....	....	....	....	.28	.20	....	....	....	....	....	.15	....	....	....	.84	....	....	....	....	....	....	....	....	....	....	.....	....	....	....	1.94
Newton	....	.22	....	....	.68	....	....	....	....	....	....	.20	....	....	....	.60	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	1.57
Northwood	...	....	....	....	.35	.45	...	....	....	....	....	.17	....	....	....	.95	....	....	....	....	....	....	....	....	....	....	....	.04	....	....	1.91
Odebolt	....	....	....	....	.56	....	....	....	....	....	....	.40	....	....	....	.70	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.57
Ogden	....	....	.10	....	....	.55	....	....	....	....	T.	.15	.03	....	....	.48	....	....	....	....	....	T.	....	....	....	....	....	T.	....	....	1.20
Olin	....	.10	....	....	.45	T.	T.	....	....	....	....	.17	T.	....	....	.40	.01	....	.03	....	....	....	....	....	....	....	....	....	....	....	.89
Omaha	T.	.17	....	....	.10	....	....	....	....	....	.04	.14	T.	....	T.	.58	.01	....	....	....	....	....	....	....	....	....	....	.01	....	....	1.27
Onawa	....	.15	....	....	.12	....	....	....	....	....	.02	.38	....	....	T.	.72	.03	....	....	....	....	....	....	T.	....	....	....	....	....	....	1.87
Osage	....	....	....	....	64	.26	....	....	....	....	....	.22	....	....	....	.05	....	T.	T.	....	....	....	....	....	....	....	....	.08	....	....	2.88
Osceola	.15	.25	....	T.	1.65	....	....	....	....	....	.30	.15	T.	....	.25	.39	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	1.47
Oskaloosa	....	.13	....	....	.58	09	....	....	....	....	T.	.21	.02	....	....	.48	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.29
Ottumwa	....	....	....	....	.60	....	....	....	....	....	T.	.10	....	....	.59	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	2.00
Ovid	....	.50	....	....	.75	.04	....	....	....	....	.01	.22	....	....	T.	.35	T.	.....	.01	....	.....	....	....	....	....	....	....	T.	....	....	.93
Pacific Junction	....	.02	....	....	.36	....	....	....	....	....	.15	.04	.	....	....	.75	....	....	....	....	....	....	....	....	....	....	....	.10	....	....	1.45
Perry	....	....	....	....	.55	....	....	....	....	....	....	.15	....	....	....	.67	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	1. 22
Plover	....	.05	....	....	.25	....	....	....	....	....	.05	.10	....	....	....	.65	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.00
Primghar	....	....	....	....	1.00	....	....	....	....	....	....	.35	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	

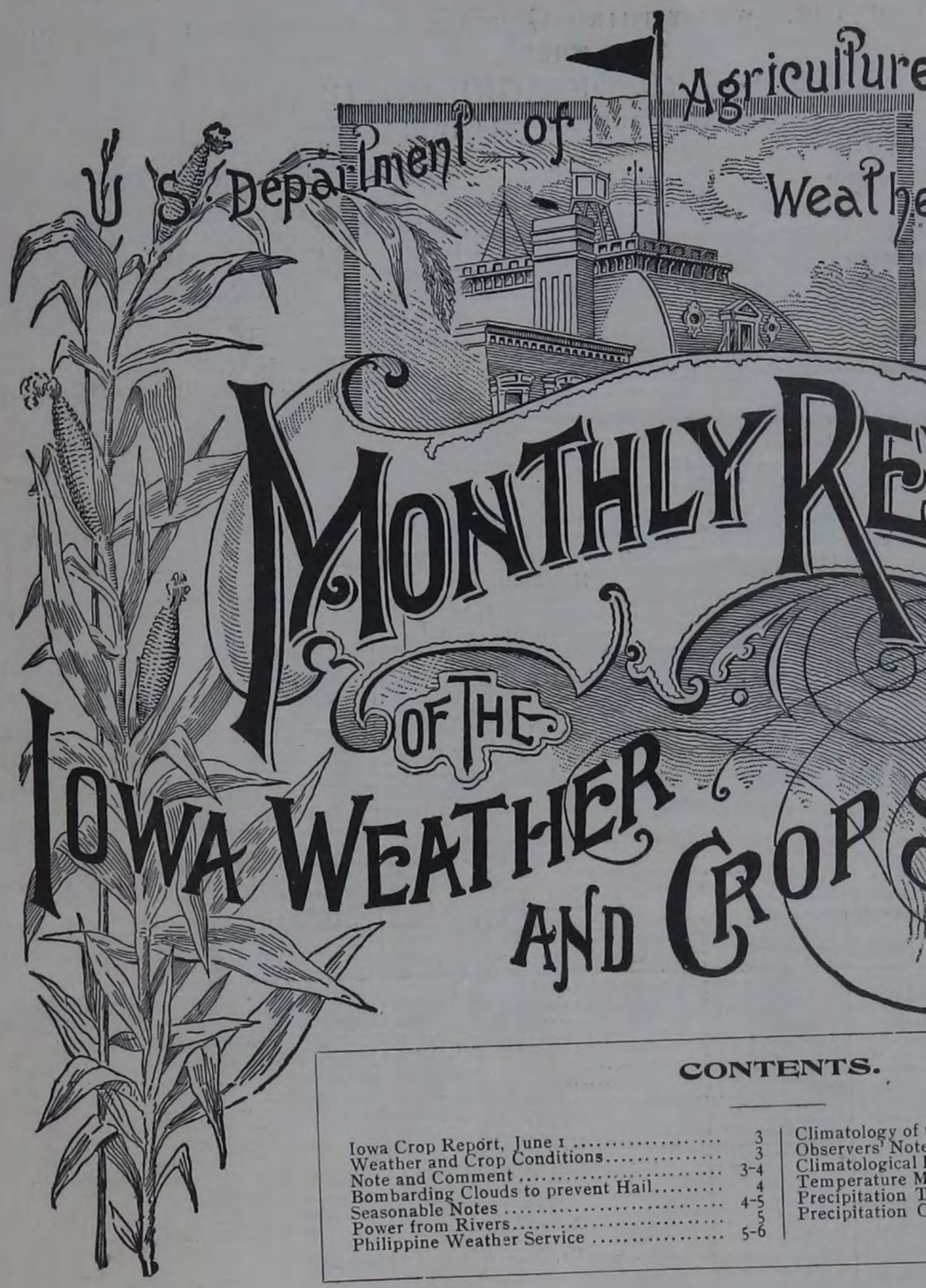
DAILY AND MONTHLY PRECIPITATION FOR APRIL, 1901—CONTINUED.

STATIONS.	DAY OF MONTH.																													TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Red Oak	T.	.30	....	....	1.83	....	....	....	....	....	T	.20	....	.....	T.	.55	T.	....	T.	....	....	....	....	....	....	....	T	....	....	....	2.
Ridgeway	..	.08	....	....	.30	.10	....	....	....	....	04	.02	....	T.	....	.65	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.
Rockwell City	....	.10	....	....	.25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.10	.30	....	....	1.
Ruthven	....	.20	....	....	.40	.	....	....	....	....	....	.88	....	....	..	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.
Sac City	T.	T.	....	....	83	.15	....	....	....	....	.07	.16	....	....	....	.80	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.
Scranton		.20	....	....	....	.40	....	....	....	....	T.	.24	....	....	....	78	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	2.
Sheldon	..	T.	....	....	.04	....	....	....	....	....	.05	.40	....	....	.03	82	T.	....	....	....	....	....	....	....	....	....	....	.22	....	....	1.
Sibley	...	....	....	....	.08	01	....	....	....	....	.08	26	....	....	T.	.90	....	T.	....	....	....	....	....	....	....	....	....	.45	....	....	1.
Sigourney		.26	....	....	.48	.17	....	....	....	....	T.	.11	....	....	....	.56	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.
Sioux Center	..	T.	....	....	.29	.04	....	....	....	....	.04	.22	.....	....	.04	.82	T.	....	....	....	....	....	....	T.	....	....	.10	.52	....	....	2.
Sioux City	...	06	....	....	.04	....	....	....	....	....	.03	.25	....	T.	.12	76	....	....	....	....	....	....	....	....	....	....	....	.24	....	....	1.
Storm Lake	..	.04	....	....	.35	.01	....	....	....	....	.05	.17	....	....	T.	.74	T	....	....	....	....	....	....	....	....	....	T.	.05	....	....	1.
Stuart	....	.40	....	....	1.50	....	....	....	....	....	T.	50	T.	....	.50	.25	....	T.	....	....	....	....	....	....	....	....	.01	....	....	....	3.
Thurman	T.	.12	....	....	1.20	....	....	....		....	.30	40	T.	....	T.	.60	T.	T.	....	....	....	....	....	T.	....	....	....	T.	....	....	1.
Toledo	....	.10	....	....	.28	58	.....	....	....	....	....	.50	.01	....	....	.65	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.
Villisca	T.	.40	....	....	1.83	....	....	....	....	....	T	.18	....	....	.22	.05	....	....	....	....	....	....	....	T.	....	....	.23	....	....	....	2.
Vinton		....	....	....	.80	T.	....	....	....	....	....	.10	....	....	....	84	....		....	....	....	....	....	....	....	....	....	....	....	....	2.
Wapello	..	.29	....	....	.61	.23	....	....	....	....	....	.09	....	....	.30	...	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	1.
Washington	....	.43	....	....	....	.87	....	....	....	....	....	.03	....	....	....	.28	.05	....	.....	....	....	....	....	....	....	....	....	....	....	....	1.
Washta	....	T.	....	....	.20	....	....	....	....	T	....	.33	....	T.	.25	.50	T.	....	....	....	....	....	....	....	....	....	T.	....	....	....	1.
Waterloo	....	.11	....	....	.36	.29	.....	....	....	....	....	.07	.03	T.	....	.63	.07	....	....	....	....	....	....	....	.....	....	....	....	....	....	1.
Waverly	....	.10	....	....	.40	.27	....	....	....	....	....	.05	.02	....	....	.60	.03	....	....	....	....	....	....	....	....	....	....	....	....	....	1.
West Bend	..	.03	....	....	.25	....	....	....	....	..	....	.24	....	T	....	.64	....	T	....	....	....	....	....	....	....	....	.45	....	....	....	1.
Whitten	..	T.	....	....	.02	....	....	....	....	....	....	T.	....	....	.80	....	....	T.	....	....	....	.....	....	....	....	....	....	....	....	....	.8
Wilton Junction	....	.30	....	....	.42	.26	....	....	....	....	....	T.	.08	....	....	.45	....	....	....	....	....	.05	....	....	....	....	....	....	....	....	1.
Winterset	..	.51	....	....		1.68	....	....	....	....	T.	.12	.07	....	....	.63	12	....	....	....	....	....	....	....	....	....	....	T.	....	....	2.
Woodburn	..	.35	....	....	.91	....	....	....	....	....	....	.29	....	....	....	.30	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.

Precipitation Chart April 1901.



Vol. XII. MAY, 1901. No. 5.



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Allerton	James Piper
Alta	Jonas Cushman
Audubon	Hon. A. H. Edwards
Blairstown	T. H. Weil
Bondurant	C. I. Thorp
Burt	R. Jain
Cedar Rapids	Hon. A. J. Fuhrmeister
Centerville	E. P. McFarland
Charles City	W B. Towner
Chariton	C. C. Burr
Clarksville	F. M. Russell
Correctionville	Hon. W. B. Chapman
Corwith	Wm. Oxley
Clermont	Chas. Larrabee
Council Bluffs	L. Prouty
Creston	M. V. Ashby
Danville	Sherman Matthews
Dunlap	Hon. B. F. Roberts
Gruver	E. Dawson
Elliott	C. B. Hamilton
Emerson	D. B. Nims
Fontanelle	Hon. L. M. Kilburn
Ford	J. C. Richards
Fort Dodge	R. W. Blaine
Geneva	Wm. H. Thompson
Harlan	H. B. Kees
Hesper	G E. Dillingham
Humeston	Hon. S. H. Moore
Independence	Geo. H. Wilson
Indianola	H. D. Guthrie
Iowa City	Edward Hummer
Ireton	J. M. Sherman
Le Mars	Hon. Henry Schrooten
Madrid	Geo. Swisher
Manson	J. D. Skinner
Marshalltown	Hon. S. B. Packard
Martinsburg	W. B. Berridge
Mapleton	A. Lamb
Maxwell	J. M. Olinger
Mt. Pleasant	W. S. Wright
Milton	Hon. E. C. Holland
Osage	E. W. Stacy
Orange City	H. J. Vande Waa
Owen	Hon. J. W. Bird
Pittsburg	G. C. Duffield
Rock Rapids	D. E. F. Merrill
Rossville	T. B. Wiley
Rowley	L. Maxson
Sageville	Hon. F. N. Knoll
Seymour	L. B. Sager
Shenandoah	Reuben Mullison
Spirit Lake	E. E. Arey
State Center	E. P. Thompson
Stuart	W. W. Bailey
Tama	W. G. Malin
Van Horne	Spencer Smith
Van Wert	J. I. Walker
Winterset	H. A. Kinsman
West Branch	Wrigley Smith
West Union	H. B. Blackman
Wilton	Thos. Boot
Wiota	I. S. Coomes

U. S. DEPARTMENT OF AGRICULTURE—WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XII. MAY, 1901. No. 5.

IOWA CROP REPORT, JUNE 1, 1901.

The first crop report of the season, giving an estimate of the condition of staple crops and live stock, as compared with the average, has been received from the crop correspondents of the Iowa section. Following are the averages for the state: Corn, 90 per cent; winter wheat, 97; spring wheat, 93; oats, 89; rye, 95; barley, 93; flax, 89; Meadows, 90; pastures, 93; potatoes, 95.

Condition of live stock: Cattle, 100 per cent; sheep, 99; hogs, 97; pig crop, 85; horses, 98; foals, 96.

FRUIT.—According to figures tabulated by Secretary Greene of the State Horticultural Society, the condition of fruit is about as follows: Apples, 52 per cent; American plums, 72; domestic plums, 53; Japanese plums, 63; cherries, 82; currants, 77; peaches, 85; grapes, 84; red raspberries, 60; black raspberries, 77; blackberries, 84; strawberries, 76.

NOTE.—The figures as to the acreage of the staple farm crops will not be tabulated by counties before about July 10th, by which time it is hoped the acreage returns from township assessors will be received As that is one of the most important reports of the year, it is desirable to make the figures substantially correct Meantime crop correspondents are requested to take abundant time, prior to making the next report, to ascertain the percentage of increase or decrease in the acreage of crops this year as compared with 1900.

WEATHER AND CROP CONDITIONS.

The average temperature of May was slightly above the normal, though the prevalence of cool nights, and the frequent occurrence of temperature near the freezing point, caused the general impression that the month was unseasonably cool. The first week was unusually warm, the daily mean temperature ranging 10 to 14 degrees above normal. with six days of brisk winds and very dry weather, closing with showers and lower temperature. The second week was much cooler, the average being 2 to 5 degrees below normal, with frosts on three mornings, and ice reported in many localities The third week was warmer than usual, the daily average being 3 to 6 degrees above normal, with very light rainfall. The fourth week was much cooler again, the daily average deficiency in temperature being 4 to 6 degrees below normal. The closing week brought some measure of relief from the prevailing drought, but there was a general deficiency of moisture throughout the larger part of the month. This was the chief drawback in the crop situation, though the conditions were favorable to farming operations. The work of preparing the ground for corn, and planting the very large area devoted to that crop, proceeded with but slight hindrance by wet weather. Early planted corn came up in good season, and the work of cultivation was begun and carried on without interruption. At the close of the month the corn crop, though somewhat belated and slightly below the normal size, was in fairly promising condition, and the fields were generally clean and in good tilth. But little loss of stand was occasioned by defective seed. but more than the usual amount of replanting was necessitated by destructive worms. The droughty weather in May served to check the growth of grass in meadows and pastures, and at the close of the month oats, spring wheat and barley were somewhat below the normal condition. The condition of fruit at close of month was quite variable, apples being much below the average, and other varieties ranging from medium to fair.

NOTE AND COMMENT.

There was a heavy fall of snow in North Devonshire and Dartmoor, England, May 7th, the change from nearly tropical heat being almost unprecedented.

* * *

A recent Washington press dispatch says: "The industrial and commercial papers of continental Europe are calling attention to the approaching competition of American corn oil. It was stated that this oil is greatly appreciated, from an industrial point of view, and that its fine golden color and agreeable taste make it a possible rival for older and better known varieties of table oil Well directed efforts have been made for some time, notably at the Paris exposition, to establish this product in foreign markets,and from recent indications it would appear that they have been successful."

* * *

The official return of the condition of crops in Hungary, issued May 24th, states that all were suffering from prolonged drought.

* * *

A Washington press dispatch of May 28th says: "The French agriculturists intend to fight frost and grasshoppers, as well as hailstorms, with cannon and smoke. The success that has attended the experiment of firing at approaching hailstorms to prevent their ravages upon French vineyards has prompted steps for a still further extension of the usage of cannon in agricultural society circles. The theory in some quarters prevails that it is not frost itself which blasts the budding fruit, but the sun's rays following a night of frost, which finds the grape, already sensitive from the cold, an easy victim to the heat. Cannon fired horizontally over vineyards at Asti at sunrise produced interesting results. A strip of vineyard 500 feet wide, over which the smoke from two cannon had been spread, was entirely protected from the effects of the frost, while the

vines on either side were badly injured. An invasion of grasshoppers is announced to occur this summer in southern Algeria, and the cannons' mouths are to be turned against them also."

We incline to the belief that a vigorous cannonading on a frosty morning would serve a very good purpose in protecting crops; but the smoke of smudge fires or tar would be preferable to gunpowder smoke. If the explosions over the fields should cause strong air currents there would doubtless be some beneficial results from bombardment. As to an invasion of grasshoppers, we are not entirely sure that the insects would be routed, horse, foot, and dragoons, by that sort of assault. Probably, however, they are more easily scared than hailstorms; so they might possibly be driven away by a big noise.

BOMBARDING CLOUDS TO PREVENT HAIL.

(By Prof. Willis L. Moore, in Orange Judd Farmer.)

The method of bombarding the clouds to prevent hailstorms is undoubtedly based upon popular delusions and has spread throughout Italy, southern Austria and southern France. It is practiced by the owners of vineyards and is especially exploited by the firm of Greinitz, Neffen, manufacturers of iron work, Gratz, Austria. The inventor of the apparatus is Mr. Stiger and the method is ordinarily spoken of as the Stiger method. It consists essentially in sending vortex rings of smoke and air upward toward the clouds; but the most powerful Stiger cannon that have yet been employed do not send these rings higher than 1,200 feet above the ground, and therefore utterly fail to reach the clouds. On this account the distinguished Austrian meteorologist, J M. Pernter, has maintained that if there is any virtue whatever in the idea, the experimenters must use much more powerful apparatus.

But there is no satisfactory evidence that the cannonading of the vortices had any influence whatever on the hail. Both theory and practice agree in this conclusion. Theoretically, it was imagined by Mr. Stiger that hail is formed in quiet spots in the atmosphere, where the atmospheric moisture could crystallize out in large crystals in a manner analogous to the formation of large crystals of salt in liquid solution. But this is a very foolish notion; there are no such quiet spots in the atmosphere, and hailstones are not crystals, but masses of ice with only a feeble or partial crystalline structure Even the perfect crystals of the snowflakes are formed in the midst of rapidly-moving air, so that the whole theoretical basis for hailstorm cannonade falls to the ground.

Practically, it is generally difficult to prove that a specific fall of hail has been especially influenced by the cannonading. Hailstorms are generally very local and erratic; some have maintained that they are controlled by the hills and contour of the ground or by the presence of forests and lakes, but, practically, the whole question is one of ascending and descending currents of air that characterize whirlwinds and thunderstorms. If in the midst of these complex motions with the resulting rain, there occur here and there patches of hail, it would seem absurd to say that we can put our finger upon the precise influence that caused or prevented hail. If in the midst of a hailstorm I fire off a cannon and the hail ceases to fall on my land, but continues to fall on my neighbor's, it would be folly in me to maintain that this is due to the firing of my gun. Nothing but the continued repetition of this phenomenon, under a variety of circumstances, would justify such conclusions.

Now the fact is that in the various reports relative to hail shooting, there has not been a fair presentation of the statistics of the results. Nothing is told us as to where the hailstorms come from or go to, nor even whether there were any hailstorms, but in most cases the record simply says that a threatening cloud was seen approaching, the cannonading began and continued until the cloud went away—and no hail fell on the region supposed to be protected by the cannon. But this is not all, the last congress on the bombardment of hail utterly refused to entertain reports from those who testified that hail fell in spite of the cannonade. In fact, therefore, reports showing that in no case was the cannonading of any avail had to be published independently.

After examining all that has been published during the past two years, my conviction is that we have to do here with a popular delusion as remarkable as is the belief in the effect of the moon on the weather. The uneducated peasantry of Europe seem to be looking for something miraculous. They would rather believe in cannonading as a means of protection and spend on it abundance of money, time and labor, than adopt the very simple expedient of mutual insurance against the losses that must inevitably occur.

After the experience that this country has had during the past ten years with such rainmakers as Dyrenforth, Melbourne, and others, I am loth to believe that the bombardment of hailstorms will ever be practiced or even attempted in the United States much less encouraged by the intelligent portion of the community. Every effort should be made to counteract the spread of the Italian delusion, which seems to have been imported into this country by the unfortunate publication of the reports of the United States consul at Lyons, France.

I trust that the columns of the American Agriculturist weeklies will discuss the subject with sufficient fullness to enable the farmers to see that the great processes going on in the atmosphere are conducted on too large a scale to warrant any man or nation in attempting to control them. The energy expended by nature in the production of a hailstorm, a tornado, or a rainstorm exceeds the combined energy of all the steam engines and explosives in the world. It is useless for mankind to combat nature on this scale. Fortunately the destruction by hail, lightning, floods, etc., is usually confined to relatively small regions.

SEASONABLE NOTES.

(By J. R. S., in the Homestead.)

"This is a peculiar season," we hear remarked. Yes,—and the same will apply to all seasons as they pass. They are all peculiar; that is to say, variable. For several decades we strike a general average, and establish a normal as to monthly, seasonal and yearly temperature, rainfall, humidity, wind movement, etc , and we may with absolute assurance count upon the permanence of these long-time averages. But there is never a year, or a season, that runs upon the line of general averages all through. Variability may be counted upon as a permanent factor, with a wide range of departures above and below the normals. So each season possesses distinctive features, and no two have ever been known to run on exactly parallel lines. Nature may bring forth twins, but never produces exact duplicates. This holds good as to seasons and stars. Paul said: "There is one glory of the sun, another glory of the moon, and another glory of the stars; for one star differeth from another star in glory." So we may say the entire universe is studded with illustrations of this law of diversity.

This wide range of variableness in respect to weather leads many people to the mistaken idea that the climate is steadily changing; that the winters are becoming milder or colder, and the summers drier or wetter, according as the trend may seem to be from time to time. A careful study of meteorological tables covering periods of considerable length will fail to disclose any indication of changes in the climatic averages of any section of this country. General climatic conditions and averages will not be materially changed until the old earth slips a cog, shifts

the plane of the ecliptic, or changes the location of mountains, valleys, and oceans.

June is the nursery maid of the season. If she cares well for the tender plants that are entrusted to her keeping they will become strong enough to withstand the more fervent heat and drying winds of July and August In the old-folk lore relating to the weather, June is referred to as the critical period of the year. One old proverb says: "June, damp and warm does not make the farmer poor." And still another: "A dripping June brings all things in tune" These were wise sayings in the old country where they originated, where grass, oats, barley, and wheat were the principal crops Plenty of moisture is a necessity in the early stage of plant growth. But in the corn belt of the Mississippi valley a dripping June might prevent timely cultivation, and work injury to the staple crop. In the rich soil of this region a warm, damp June generally produces a rank growth of small grain crops, with a tendency to rust and blight. On the average, Jun · is our wettest month the normal rainfall being nearly five inches, or about one-sixth of the average annual precipitation This amount, coming in form of moderate showers each week, would give ideal conditions for all the staple crops, but we seldom get our summer rainfall just when we want it, and in exactly the measure to suit our notions. Generally it may be said we suffer more damage from excess than deficiency in the critical period of crop growth. We get even better than we deserve on the average.

In a meteorological work containing a large collection of ancient weather proverbs there is a big chapter relating to the moon's influences as a weather breeder. In our explorations of ancient literature the further we go backward toward the age of barbarism the more we find of traditional notions concerning the marvelous potency of that insignificant little satelite. Shakespeare set forth the popular idea of his time in these lines:

"Therefore the moon, the governor of the floods,
Pale in her anger, washes all the air
That rheumatic diseases do abound."

Virgil gave expression to the tradition of the period ante dating the Christian era in the following:

"When Luna first her scattered fear recalls,
If with blunt horns she holds the dusky air,
Seamen and swain predict abundant showers."

The different phases of the moon, especially the new moon, and the full moon, were supposed to be the pivotal points on which were turned the weather changes from wet to dry, from hot to cold, or vice versa. In some sections the idea prevailed that if the new moon appeared with the points of the crescent turned up the month would be dry; if turned down it would be wet. Among sailors at other ports the prevailing belief was directly opposite, so the variable sign was verified in one part of the country or the other. Another sign was to the effect that when the old moon was seen in the new moon's arms the weather would be fair. Most likely this was verified quite often, for the atmosphere must have been very clear to show the whole form of the moon in the evening sky when the crescent of the new moon appeared. There was a wide and prevalent notion that the new moon coming on Friday was an omen of very disastrous storms and bad luck generally. This is probably as rational as most of the moon theories of past or present.

In these days of applied science there are comparatively few people who "farm in the moon," but some of the old lunar traditions are still in evidence in various localities. There is not much use attempting to eliminate such notions by direct assault of argument or logic. The thing is in the blood by heredity, and by evolution and the slow process of education it will in due time disappear. Prof. Cleveland Abbe, the dean of the corps of scientists of the Weather Bureau, says: "The relations between the moon and various meteorological phenomena have been studied for a century past with great diligence, but hitherto nothing has been discovered to confirm the popular belief that the weather has a dependence upon or even an indirect relation with the condition of the moon. All studies bearing on European or American weather show that the lunar influence is inappreciable."

Experiments with chemical weed killers do not appear to have brought forth practical results. The best liquid that has been discovered for the extermination of weeds, without harming useful plants, is a certain solution, *aqua perspirio*, commonly known as sweat drops, drawn from the skins of man and beasts in the process of cultivating the crops. Properly applied there is marvelous potency in perspiration, not only in destroying weeds but also in promoting growth of good plants. There is no patent or monopoly to prevent the free use of this exterminator. And just now is the time to make the application. The requisite quantity depends upon the temperature. For more specific directions consult any good corn grower.

POWER FROM RIVERS.

Among the most striking features of the Buffalo Exposition is the use of power generated at Niagara Falls and transmitted over wires. The largeness of the example impresses every visitor and raises the question why the idea of obtaining power from water-courses is not applied more extensively. As a matter of fact the system is making rapid progress. Street cars in Buffalo have been run by electricity sent from Niagara since 1898. Idaho has mines worked by electricity sent over thirty miles of wire. A suburb of San Francisco is running street cars propelled by electricity generated on the Yuba river, 140 miles away, and the same current has been successfully extended to San Jose, 190 miles from the Yuba. A large company has been formed to construct a $6,000,000 electric plant on the Susquehanna river, the object being to distribute power in Baltimore, Philadelphia, Wilmington, and other places in a radius of 100 miles. Large works to produce electricity by water-power are going up at the outlet to Lake Superior on the American side, and at Massena, New York, on the St. Lawrence.

The possibilities of rivers have been much neglected during the last forty years. They are vast storehouses of power as well as arteries of navigation susceptible to immense improvement. Enormous masses of water are constantly descending from the mountains and table-lands to the sea. Nature sends it onward by gravitation and returns it by evaporation to its starting place. The process is perpetual. Coal may fail, but water-power will not. The United States Geological Survey is wisely studying the rivers, the size of their drainage area, their average amount of rain, the volume of flow and the location of water-power and dam sites. It is a commendable, valuable, and timely work.—*St. Louis Globe-Democrat*.

PHILIPPINE WEATHER SERVICE.

The Philippine weather service has now scattered throughout the archipelago some twenty telegraphic stations from which advance warnings of the approach of typhoons can be wired to Manila. Before the revolution of 1897, Spain had a

number of similar stations located at strategic points, but when Dewey entered Manila Bay not one remained outside of the city After the occupation of the islands by the American government, plans were at once formed by the chief of the United States Weather Bureau, aided by Father Joseph Algue. S. J., to reorganize and extend the former service, and now that the pacification of the islands is nearly secured, these plans are rapidly becoming realized. The Philippine service is in charge of the Manila Observatory, with Father Algue as director. It is supported by the funds of the Philippine government rather than those of the United States, and is independent of the United States Weather Bureau, but receives the active co-operation and assistance of the latter. As soon as enough of the islands have been connected by cables the United States government will organize an extensive system, and the Philippine service will be incorporated under federal direction.—*National Geographic Magazine*.

CLIMATOLOGY OF THE MONTH.

BAROMETER.—Mean pressure for the month, 29.91 inches; highest observed, 30.55 inches at Sioux City, on the 25th; lowest observed, 29.56 inches at Davenport, on the 23rd; range for the state, .99 of an inch.

TEMPERATURE.—The monthly mean temperature for the state, as deduced from records of 114 stations, was 60.7°, which is about 1° above normal. The highest monthly mean was 63.4°, at Fruitland; lowest, 57.8, at Larrabee. By sections the means were as follows: Northern section, 59.8°; central section, 60.7°; southern section, 61.5°. The highest temperature reported was 95°, at Clear Lake on the 2d and 17th; lowest temperature reported 28°, at Larrabee, on the 12th. The average monthly maximum was 89°; average monthly minimum, 34°. The greatest daily range was 49°, at Clear Lake, Sheldon and Mooar; average of greatest daily ranges was 38.2°.

PRECIPITATION.—The average precipitation for the state, as shown by records of 130 stations, was 2.35 inches, which is about 1.62 inches below the normal for May. By sections the averages were as follows: Northern section, 2.64 inches; central section, 2.24 inches; southern section, 2.18 inches. The largest monthly amount reported was 4.57 inches, at Belle Plaine; least amount, .72 of an inch, at Belknap. The greatest daily rainfall reported was 2.95 inches, at Fort Dodge, on the 6th. Average number of days on which .01 or more precipitation was reported, 7.

WIND AND WEATHER.—Prevailing direction of wind, NE.; highest velocity, 48 miles per hour, from NW., at Sioux City, on the 10th. Average number of clear days, 16; partly cloudy, 9; cloudy, 6.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date
Davenport	29.88	30.38	25	29.56	23
Des Moines	29.92	30 48	25	29.60	23
Dubuque	29.92	30.45	25	29.57	22
Omaha, Neb	29.89	30.48	25	29.56	22
Keokuk	29 88	30.26	25	29 60	23
Sioux City	29.96	30 55	25	29 58	23
.....	.....	.....	.....	.....	....
Means	29.91	30.55	25	29.56	22-3

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,722	36	W	11
Des Moines	5,668	29	NW	11
Dubuque	5,967	27	NW	12
Keokuk	5,631	28	SW	23
La Crosse, Wis	.....	..	.....	..
Omaha, Neb	6,714	36	N	10
Sioux City	9,012	48	NW	10
.....	.....	..	.....	....

OBSERVERS' NOTES.

ALTA—*David E. Hadden.* An ideal May; no damage by frost; thunder-storms very light.

AMANA—*Conrad Schadt.* Weather for the month was favorable for farm operations and small grain. Latter part of month too cool for corn; apple crop will be short.

ATLANTIC—*J. W. Love.* Numerous warm days and many cool nights; frost on six mornings but no damage.

BATTLE CREEK—*E. H. Wasmund.* Very dry month; frost observed on mornings of 11th, 12th, 13th, 25th, and 26th, but no damage resulted Thunder-storm on 4th.

BONAPARTE—*B. R. Vale.* A cold dry month; less than half the normal rainfall since January 1st.

BRITT—*Geo. P. Hardwick.* Month began warm, but temperature ranged lower during latter half, with much northeast wind; no severe storms.

CLINTON—*Dr. Luke Roberts.* The mean temperature for the month was 0.7 degrees above normal. The greatest departure from normal was in the deficiency of rainfall, and all vegetation was checked in growth thereby. Frosts did but slight damage; planting corn was belated; oats do not promise well.

FONDA—*H. P. Barron.* Ice formed on 11th, 12th, and 25th, but did not damage anything. Corn planting completed by the close of month, with good stand.

GRAND MEADOW—*F. L. Williams.* Plum blossoms were noted May 1st, and apple bloom the 3d. Chinch-bugs were flying May 17th. Prospect of a light hay crop. Corn stand good and fields clean.

GRINNELL—*A. O. Price.* Month favorable for farm work; all crops up to an average.

GRUNDY CENTER—*E. S. King.* Month very cool; pastures and meadows short; corn a good stand.

OVID—*H. C. Miller.* Apple, cherry, plum and quince trees were in full blom on the 1st. A cool, dry month.

RIDGEWAY—*Arthur Betts.* Month half a degree above normal. A delightful month, with 343 hours of sunshine. Past two months have been notable for prevailing northeast wind. Last light frost, April 22d; last killing frost. April 21st. A mirage was seen on 13th, rifting distant hills and distorting objects.

STORM LAKE—*Prof. M. L. Fuller.* Plums were in bloom by 2d; apples in bloom on 6th; frost on 11th, 12th, 13th, and 25th, but not killing.

ERRATA IN APRIL REVIEW.

CHARLES CITY—April. Total precipitation recorded 1.33 inches on page 7, should have been 2 36 inches.

VILLISCA—April. Total snowfall on page 8 omitted, should have been trace.

WOODBURN.—April. Total snowfall on page 8 omitted, should have been 2.0 inches.

IOWA WEATHER AND CROP SERVICE.

CLIMATOLOGICAL DATA FOR MAY, 1901.

NORTHERN SECTION.

STATIONS	COUNTIES	Elevation, feet	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., IN INCHES				SKY				Prevailing direction of wind	DATES OF THUNDER-STORMS.
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall (unmelted)	Number rainy days	Number clear days	Number partly cloudy days	Number cloudy days		
Algona	Kossuth	1,500	8	60 0	†1.6	88	2	32	12	36	2.93	-0.67	2.07	...	6	16	12	3	SE	
Alta	Buena Vista	1,519	9	59.7	†2.1	89	2	32	12	39	1.86	-2.36	0.41	...	8	16	10	5	NE, NW	4, 10, 16
Alta (near)	Buena Vista		..	...	...	..	.....	...	...	.. .	1.80		0.41	..	10	..	..	..	..	
Britt	Hancock	1,230	..	58.3	....	88	2	31	12, 13, 14	37	2.63	....	0.73	..	9	14	15	2	N	3, 4, 5
Charles City	Floyd	1,012	9	60.4	†3.1	90	2	33	12	37	2.20	-1.57	0.84	...	7	10	16	5	N	5
Clear Lake	Cerro Gordo	984	..	62.8	....	95	2, 17	31	12	49	2.10		0.75	....	6	23	4	4	NW	
Cresco	Howard	1,280	28	58.6	†2.1	90	2	32	12	37	2.02	-1.55	0.67	..	10	14	9	8	NE	2, 5, 7, 22
Decorah	Winneshiek	900	7	59.8	†0.0	92	2	32	26	42	3.88	†0.68	1.05	..	8	..	..	..	.....	
Dows	Wright	.....	..	59.1	....	87	2	32	12	40	2.42	...	0.76	....	10	21	2	8	NW	4, 5
Elkader	Clayton	.	19	61 6	†1.0	92	2, 17	36	12, 13, 26	43	2.34	-1. 37	0.82	....	7	9	20	2	NW	2, 5, 6, 7
Estherville	Emmet	....	..	57.4	....	88	2	29	12	42	2.38		1.00	....	8	22	4	5	S	5
Fayette	Fayette	1,000	10	59.0	†2.2	88	2	33	12,13,14,26	39	1.50	-2.48	0.75	....	8	18	6	7	NW	5, 6, 7
Fonda	Pocahontas	1,237	..	....	....	..	.....	....	.....	..	2.85	.....	0.76	....	8	22	5	4	NE	22
Forest City	Winnebago	1,220	..	59 7	....	87	2	30	12	34	2.08	.....	0.68	....	7	18	3	10	N	
Grand Meadow	Clayton		9	59.1	†1.6	86	1,2	33	12	33	2.85	-1.36	1.13		8	10	12	9	NE	
Greene	Butler	943	..	60.6		91	2	33	12, 14	44	1.58	.....	0.59	....	8	7	12	12	NE	5
Hampton	Franklin	1,240	10	61 7	†4.7	92	2	33	12	40	2.06	-1.70	0.62	....	11	10	16	5	NE	
Hawkeye	Fayette	.	7		....	..	....		.....		1.75	-2.05	0.90	....	6	..	..	..	..	
Hoprig	Emmet	.....	..	....			.....		... .	..	.....	.....	.....	....	..	20	7	4	NE	
Humboldt	Humboldt	1,082	7	60.1	....	88	2, 18	33	12	38	3.64	-0.04	2.30	....	8	21	3	7	NW	
Lansing	Allamakee	..	..	61.5	....	93	2	35	26	40	2.97	.....	1.07	....	10	8	20	3		
Larchwood	Lyon	.....	..	59.9		90	2, 18	29	12	36	3.27	....	1.25	....	6	22	2	7	NW	
Larrabee	Cherokee	.....	9	57.8	†0.2	90	1,2	28	12	42	2.57	-1.30	0.64	....	8	16	11	4	NE, SE	
Le Mars	Plymouth	....	..	59.5	....	87	1.2	32	25	37	4.54	...	1.70	....	7	16	10	5	N	
New Hampton (a)	Chickasaw	1,166	..	58 5	.. .	87	2	32	12	37	1.74	.....	0.71	....	7	19	5	7	NW	
Northwood	Worth	1,210	..	59.6	....	88	2	31	12	34	4.09	.....	1.75	....	10	13	12	6	NE	5
Osage	Mitchell	1,178	9	58.0	†1.9	85	2	32	12	32	2.18	-1.91	0.49	....	8	7	11	13	NE	
Plover	Pocahontas	.....	..	60.0	....	91	2	31	12	46	1.36	....	0.38	....	6	21	4	6	NE	
Primghar	O'Brien	....	..	62 4		91	2	33	25	38	2.75	.....	0.75	....	5	22	0	9	S	
Ridgeway	Winneshiek	.....	..	61 0	...	92	2	34	12	39	3.22	....	1.07	....	11	16	10	5	NE	2, 5, 7
Ruthven	Palo Alto		..	...	...	..	.....	30	12		3.60	.....	1.10	....	7	21	3	7	NW	
Sheldon	O'Brien	1,406	..	59 6	....	89	2, 3	31	12	49	4.09		1 62	....	8	14	8	9	....	
Sibley	Osceola	1,506	7	59.6	†1.8	91	2	30	12	41	3.72	†0.36	1.16	.....	7	10	18	3	NE	
Sioux Center	Sioux	....	..	60.0	....	89	2	31	25	33	4.31	.. .	1.44	....	8	18	6	7	N	4, 10
Spirit Lake	Dickinson	....	..	59 3	..	91	2, 18	29	12	42	2.66	....	1.05	....	4	19	9	3	NE	
Storm Lake	Buena Vista	....	11	59 0	....	85	18	32	12, 25	33	1 55	-1.92	0.53	....	8	17	7	7	NE	4, 16
Washta	Cherokee		..		....	..	.....	.. .	... ..		2.86		0.98	....	8	....	....	....	N	
Waverly	Bremer	942	..	60.6		91	2	35	12	36	2.38	.....	1.05	....	9	12	11	8	NE	5
West Bend*	Palo Alto		7	59.1	†0.7	88	17	35	12	..	2.17	-0.67	1.38	....	7	....	....	...	NE, NW	
West Union	Fayette	....	..	.	....	..	....		...	...	2.11	.....	1.00	....	5	21	0	10	NE	
Average	....			59.8	†1.7	89.4	... ...		31.9	...	38.9	2 64	-1.24	....	....	8	16	9	6	NE	

CENTRAL SECTION

Amana	Iowa	....	24	60 8	†1.2	89	2	36	13, 26	36	1 83	-2.37	.59	.....	9	16	10	5	NE	5, 23
Ames	Story	936	20	61.4	†2.4	89	2	37	11, 12	40	3.69	- .15	1 13		8	17	9	5	NE	16
Baxter	Jasper		..	60.6	....	87	18	35	12	39	2.07	.....	.72	.....	6	17	7	7	NE	
Belle Plaine	Benton	840	10	60.6	†2.4	89	2	36	13	33	4 57	† 53	1 50	.....	9	7	16	8	SE	
Battle Creek†	Ida	.....	..	...	....	..	.....	....	....	....	1.51	.....	53	.....	9	17	7	7	NE	4
Buckingham	Iowa	....	..		....	..	.....	....	....	....	3.00		1 22	.....	6	2	19	10	.....	
Carroll	Carroll	.. .	10	59.0	†0 5	88	2, 18	32	12	39	2.20	-2 13	1.42	.....	7	18	5	8	...	5
Cedar Rapids	Linn	744	18	61 8	†2 8	91	2	39	12, 13, 26	33	1.86	-2.62	.45		11	17	6	8	NE	
Clinton	Clinton	609	9	61.0	†0.1	91	2	32	26	42	1.72	-2 42	85	.....	9	8	14	9	NE, W	5, 23
Davenport	Scott	615	30	61.3	†0 3	88	2	40	26	30	1.37	-2 96	67	.....	9	14	9	8	E	5, 10
Delaware	Delaware	1,048	9	58.4	†0 5	88	2	33	13	34	1.70	-2 12	.64		8	9	17	5	NE	
Denison	Crawford	1,192	7	58 7	-1 3	87	2	32	25, 26	39	1.34	-2 90	54	.....	9	21	5	5	N	
Des Moines	Polk	867	23	61.6	†0.6	88	18	36	13	33	1.40	-3.20	.52	....	5	12	13	6	NE	4, 5, 16
De Soto	Dallas	866	..	62.6	....	86	2, 18	38	26	40	3 03	.....	1.50		7	21	4	6	NE	
Dubuque	Dubuque	655	28	60.2	†0.3	88	2	38	26	37	3.10	-1 06	56	.....	12	7	15	9	NW	2,5,6,7,10 22 23
Fort Dodge	Webster		..	60 2	....	90	18	34	11,12 13,14	41	3.75	.....	2.95		6	18	7	6	SW	
Fruitland	Muscatine	. .	.	63 4	....	92	2	38	25, 30	37	1.60	.....	1.00	.....	5	20	2	9	NE	5
Galva (a)	Ida		7	59 3	-0 9	91	2	32	12	43	1.12	-2 43	.64	.....	5	...	....	....	SE	
Gilman	Marshall	1,053	..	....	....	..	.....	....	..	....	2 98		1.60	.....	8	18	5	8	N	
Grinnell	Poweshiek	1,011	10	59 0	-0.4	86	2	37	13	31	2.82	-1 75	1 18	....	9	16	7	8	NE	
Grinnell (near)	Poweshiek		..	61.2		89	2	36	13	32	3.55	.....	1.75		9	15	8	8	SE, NW	5, 6
Grundy Center	Grundy	966	9	59.9	†1.8	90	2	36	14, 25, 26	38	2.84	-1 57	1.76	.....	7	21	2	8	NE	5
Harlan	Shelby	...	..	60.8	....	91	18	30	13	43	1.78	.....	79	.....	9	10	14	7	NE	5, 23
Independence	Buchanan	921	38	59.0	-0.4	87	2	34	25	35	2 00	-2 01	to	.....	7	18	8	5	NE	
Iowa City	Johnson	644	10	62.3	†2 7	88	2, 17	36	13, 26	36	1.54	-2.61	76	.....	7	11	13	7	N	
Iowa Falls	Hardin	....	7	59.8	†0.8	87	2	33	12, 14	41	2.10	-1.58	1.12	.....	9	17	6	8	NE	5, 22
Jefferson†	Greene	...	..	60.0		90	2	36	13	38	1 44	... .	1.12		7	..	....	....	NW	5
Le Claire‡	Scott	.....	..	....		..	.... ..	....	.....		1 72		.91	....	7	....	....	..	....	
Logan	Harrison	928	35	61.6	†0.8	92	2	31	12	40	2.54	-1.85	1.15	..	6	19	6	6	S	4
Maquoketa	Jackson	.....	7	59.8	-0.9	91	2	30	26	44	1 91	-2 04	.41	.....	10	19	4	8	NE	
Monticello	Jones	800	46	61.2	†2.0	90	2	35	25	41	1.56	-2.31	....	.....	....	10	13	8	SW, NW	
Mt. Vernon	Linn	...	..	61.2	....	91	2	35	13	40	1 37	.	.35	.....	9	14	5	12	SW	
Newton	Jasper	958	13	62.2	†1.7	90	2	37	13	36	2.24	-2.26	.67	.....	6	18	7	6	NW	
Odebolt	Sac	...	..	60.8	....	93	18	32	12	40	1 53	....	.87	....	6	22	4	5	....	
Ogden	Boone	1,109	..	60.2	....	88	2	32	12	38	2 72	.....	.85	.....	10	25	1	5	SE, NW	
Olin (a)	Jones		..	59.8	....	86	2	33	26	35	1.69	.....	71	.....	....	....		....	....	5
Onawa	Monona	....	..	61 8	....	90	2	35	11, 13	38	2 95	.....	1 00	.....	9	22	3	6	NW	
Perry	Dallas		..	61 0	....	88	18	34	13	45	.90	.....	.65	.....	2	21	6	4	NW	
Rockwell City (a)	Calhoun	1,219	.	60.4	....	88	2, 18	35	12	37	2 53	.....	.57	.....	7	....		..	..	
Sac City	Sac	900	21	59 8	†0 8	88	2	34	12	37	2.17	-2.01	.72	.....	6	21	5	5	NW	
Scranton	Greene		..	61.0	....	88	2	36	12, 13	36	2 27	.....	1.40		3	21	5	5	NE, NW	
Sioux City	Woodbury	1,122	12	60.8	†0 2	87	1	36	12	33	3.65	- .06	1.30	.	10	14	10	7	SE	
Toledo (a)	Tama		6	62.0	†0.4	92	2	30	12	44	2.87	- .27	88	.....	7	23	4	4	E	
Vinton*	Benton	800	10	61.5	†2.7	90	2	38	12	....	2 42	-1 30	.85	.....	8	22	0	9	NW	
Waterloo	Black Hawk	862	21	60.8	-2.7	91	2	36	12, 13, 26	38	1 79	-1.81	.55		8	16	8	7	NE	5
Wilton Junction	Muscatine		..	60.9	....	89	3	33	13	42	1 63	.....	54	.....	6	14	9	8	NE	
Average	.. ..	..	..	60.7	†0.5	89 1	....	34.7	... .	38.9	2.24	-1.82			8	16	8	7	NE	

CLIMATOLOGICAL DATA FOR MAY, 1901—CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PREC. IN INCHES					SKY.				DATES OF THUNDER-STORMS
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted.)	Number rainy days.	Number clear days.	Number partly cloudy days.	Number cloudy days.	Prevailing direction of wind.	
Afton	Union	....	....	61.0	....	87	2, 18	36	13	40	2.90	.....	1.12	....	7	13	12	6	NE, NW	
Albia	Monroe	945		60.4		88	18	36	26	41	1.46	.....	.48	....	6	17	10	4	NE	5
Atlantic	Cass	.....	9	60.9	†2.5	89	2	29	13	44	2.48	-1.84	.96		5	3	17	11	NE	4, 23
Audubon	Audubon			60.0		92	1	35	12	44	1.00	.....	.45	....	3	18	5	8	N	
Belknap	Davis	857	.	63.0	.....	89	2	38	13	34	.72		.46	....	3	26	2	3	NE	
Bonaparte	Van Buren	.....	9	62.4	†0.1	90	2	35	13	37	1.30	-2 75	.48		6	..				
Burlington	Des Moines	.....	.	63.3	...	91	2	37	26	35	2.10	.....	1.25	....	8	15	7	9	NE	5, 23
Bussey	Marion	.....	..	.....	..				....		1.43	....	.70		4	..				
Chariton	Lucas	1,030	...	60.4		87	18	34	13	38	1.28	.....	.38	....	8	11	13	7	.....	
Clarinda	Page	1,069	10	61.5	†0.7	91	2	35	13	39	2.10	-2.49	1.10		8	14	10	7	NE	
College Springs	Page	....	9	61.0	†0.4	88	2, 18	34	26	36	3.00	-1.55	1.50	....	9	16	9	6	SE	
Columbus Junct	Louisa	.....		63.0	...	90	2	35	13	35	1.95	.....	.69		9	15	10	6	NE	5, 10
Corning	Adams	1,127	8	60.8	-1.1	86	2	34	13	37	4.15	- .50	2.46	....	6	15	5	11	NE, SE	5, 15
Council Bluffs	Pot'wat'mie	989		62.1	...	90	2, 18	35	28, 29	46	2.51	....	.98		6	14	13	4	NW	
Cumberland	Cass	.			....	....		.....	.....		2.33		.84	..	6	17	5	9	S	
Danville	Des Moines	715									2.18	...	1.42		6	20	3	8		
Eldon	Wapello	...	....	62.2		92	18	33	13	40	.99		.35	....	7	19	3	9	NW	5
Emerson	Mills	.....		....	....		....	....	. . ..	.....	3.13	.	1.33		5					
Fort Madison	Lee	516	52	..			....				3.11	-1.28	1.75		9	9	11	11	NE	5, 23
Glenwood	Mills	979	30	61.2	†1.3	87	2	39	26	33	2.31	-2.88	1.07	....	4	6	21	4	NW	
Greenfield (*a*)	Adair		9	61.2	†1.6	88	18	34	13	35	3.28	-1.15	1.30	....	6	17	7	7	N	4, 5
Hopeville	Clarke	....		60.2		85	2	38	13	29	3.22		1.43		6	13	12	6	NE	4, 5
Indianola	Warren	..		61.6		86	2	37	13	33	1.58		.41	....	7	10	9	12	NW	5, 16, 21
Keokuk	Lee	618	29	63.0	‡0.0	87	2, 18	40	13, 26	31	1.95	-2.42	.79	...	5	17	9	5	N	
Keosauqua	Van Buren	...	8	63.2	†1.1	90	2, 18	37	13	38	1.43	-3.30	.34		7		...		.... ..	
Lacona	Warren	... .	..		....			.....		....	2.05		.60		7	11	15	5		
Lenox	Taylor		....	60.0		85	2	36	13	32	2.50	....	.98	....	6	18	6	7	NW	5, 15
Mooar	Lee	....		60.4		88	18	29	5	49	2.18		1.42	.	3	14	13	4	NW	
Mt Ayr	Ringgold	1,236	7	60.4	-1.8	87	18	36	13	34	2.90	-2.87	1.01	....	9	9	17	5	N	5
Mt Pleasant	Henry	725		61.3		88	23	34	13	36	1.37	....	.82		7	17	7	7	NE	
Murray	Clarke	1,183		.....							2.59		1.00	....	4	16	15	0		
Omaha	Douglass	1,113	31	62.5	†0.5	87	2	42	12	29	2.13	-2.23	1.36	....	7	13	8	10	N	
Oskaloosa	Mahaska	850	17	61.3	†1.4	88	2	35	13	33	2.18	-1.53	.83	....	7	19	2	10	NE	
Ottumwa	Wapello	630	6	63.0	‡0.0	88	2	40	14, 25, 26	33	.95	-3.92	.60	....	3	16	5	10	SE	
Ovid	Wayne	.	7	61.2	-0.1	89	18	33	13	38	1.54	-1.88	.53	....	9	16	4	11	NW	3, 10
Pacific Junction	Mills	960	..	61.0		89	2	33	26	39	2.47		1.10	....	7	12	19	0	N	
Pella (*a*)	Marion	...	...	62.0		89	18	36	13	36	1.47	.. ..	.90	....	6	....	....	....	NE	
Red Oak	Montgom'ry	1,033		61.4	....	90	2	39	13	31	3.29	..	2.10	..	7	14	9	8	NE	
St. Charles	Madison	....		61.4	.	87	2	37	13	34	2.45	....	.63	....	9	18	8	5	NW	21
Sigourney	Keokuk		..	62.7		94	18	35	13	42	2.24	.....	.75	....	7	16	13	2	NW	6, 7
Stuart	Guthrie			60.4		87	18	35	13	32	.85	. .	.47	....	4	16	3	12	S	
Thurman	Fremont			61.0		87	2	34	13	39	4.06		1.40	....	8	14	9	8	NE	
Villisca	Montgom'ry	1,058	7	61.0	-0.4	89	2, 3	32	13, 26	40	2.10	-1.78	.90		7	12	10	9	NW	
Wapello (*a*)	Louisa	578		63.3	.....	90	17	37	27	36	2.58		1.28		7	21	5	5	SE	
Washington	Washington	..	10	60.7	-0.3	89	2	34	13	35	2.06	-1.47	.97	...	9	....		....	NE	
Winterset	Madison	.....	9	62.8	†2.4	90	2	35	13	38	2.13	-2.43	.68		6			....	....	
Woodburn	Clarke	.....	....			....	...	.....	....	...	2.67	.....	.81	...	8	17	9	5	NW	
Average	.....	.....		61.5	†0.5	88.6	.....	35.5	....	36.7	2.18	-2.13	..	....	6	15	9	7	NE	
Av. for the state	.....			60.7	†0.6	89.0	.. ....	34.0	.....	38.2	2.35	-1.73	....	....	7	16	9	6	NE	

*Means determined from 7 A. M., 2 P M, and 9 P. M. observations, and maximum and minimum are taken from eye readings. ‡Received too late to be computed with means *a*, One day missing; *b*, two days, etc.

†Is used to indicate minus sign (†).

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR MAY, 1901.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max.	84	87	83	81	71	60	50	55	74	75	67	65	71	81	83	83	84	87	79	76	73	76	76	75	67	72	80	76	74	74	78	74.7
	Min.	52	52	53	56	54	47	44	46	43	47	40	38	36	41	49	57	55	58	53	44	49	45	52	47	42	38	47	52	43	40	45	47.3
Albia	Max.	84	82	85	83	80	72	59	62	73	79	67	59	65	75	84	85	85	88	..	68	70	78	76	69	58	69	77	75	75	72	76	74.3
	Min.	54	57	56	58	56	53	42	52	45	49	38	37	39	39	43	47	52	57	49	44	46	46	51	47	37	36	42	47	43	38	44	46.6
Algona	Max.	86	88	81	81	72	56	50	57	76	67	63	58	56	75	82	83	85	85	74	70	69	74	66	63	54	74	79	74	68	70	77	71.4
	Min	58	59	54	57	55	49	46	48	43	44	38	32	36	37	59	59	60	59	58	48	59	52	55	41	33	43	49	47	43	41	47	48.7
Alta	Max.	87	89	80	80	70	56	49	61	73	65	62	56	63	76	84	82	84	87	77	72	71	71	66	54	58	71	79	76	71	71	75	71.5
	Min.	57	58	55	55	53	44	42	46	45	44	46	32	35	37	56	58	56	59	57	50	51	45	54	41	34	40	50	50	46	42	47	47.9
Amana	Max.	85	89	80	81	76	70	68	64	72	78	65	58	61	74	79	79	86	81	73	68	68	75	74	68	56	71	77	73	69	69	77	73.0
	Min.	57	58	50	57	57	52	57	53	47	49	41	39	36	38	54	54	51	53	49	49	45	53	59	48	39	36	51	50	39	39	46	48.6
Ames	Max.	87	89	83	79	74	63	55	58	75	74	74	60	62	80	82	77	86	88	75	70	70	76	74	69	58	72	78	74	70	69	77	73 5
	Min.	58	60	56	61	55	52	48	51	46	47	37	37	39	40	51	59	54	56	54	47	51	50	56	47	45	39	49	52	42	41	47	49.3
Atlantic	Max.	86	89	83	82	68	57	48	54	72	72	66	61	71	80	81	80	83	87	77	70	70	74	71	..	61	74	81	78	75	74	78	75 2
	Min.	57	58	55	57	54	48	45	46	42	49	31	33	29	38	52	60	51	55	57	45	43	38	55	48	39	30	42	48	35	34	39	45 6
Audubon	Max.	92	89	87	88	70	55	54	56	75	68	65	64	68	78	82	82	84	85	88	75	78	72	75	69	68	72	75	76	72	72	75	74.5
	Min.	48	55	55	59	45	44	45	42	40	45	38	35	40	48	56	60	61	50	46	38	40	42	38	38	40	42	51	50	45	35	39	45.5
Baxter	Max.	85	86	86	80	78	66	61	61	75	76	65	58	63	76	80	75	83	87	75	69	72	74	73	66	59	73	80	74	72	73	79	73 5
	Min.	54	55	52	59	55	49	49	50	45	40	42	35	36	37	55	57	54	56	52	45	46	48	56	47	40	37	47	52	42	39	45	47.6
Belknap	Max.	85	89	86	85	84	70	61	61	73	50	43	42	38	43	53	62	58	60	53	50	48	49	60	60	42	40	50	51	45	41	46	74 8
	Min.	57	59	56	57	61	57	49	53	50	78	76	65	58	58	68	80	75	84	85	80	69	70	73	72	57	69	72	72	68	70	75	51 1
Belle Pl'ne	Max.	85	89	80	79	80	70	65	62	78	76	65	58	58	68	80	75	84	85	87	73	66	75	75	70	..	69	75	74	73	75	74	72.8
	Min.	57	53	48	56	55	50	55	50	48	52	40	38	36	40	51	55	55	57	60	45	46	53	56	52	38	38	40	53	43	42	44	48 5
Bonaparte	Max.	87	90	85	82	78	67	61	68	73	80	70	60	69	77	80	82	85	89	75	68	70	78	78	60	61	71	75	77	74	72	78	75.0
	Min.	56	61	53	60	57	55	51	55	50	49	42	42	35	40	52	..	56	58	52	49	49	50	60	48	42	36	51	53	42	40	46	49 7
Britt	Max.	83	88	81	83	76	59	52	58	76	70	60	55	52	75	82	83	85	85	74	70	69	74	72	58	42	72	79	71	67	70	76	71 4
	Min.	52	53	51	55	50	49	48	48	40	44	33	31	31	31	55	54	53	50	55	45	46	51	55	41	32	35	45	45	40	38	45	45.2
Burlington	Max.	88	91	87	83	80	65	59	66	70	77	71	60	67	72	80	80	85	87	72	66	65	77	80	69	58	68	73	75	69	68	75	73.9
	Min.	65	65	52	61	61	54	52	55	52	53	45	43	38	45	53	65	57	65	54	54	56	52	67	47	43	37	54	53	45	42	48	52.7
Carroll	Max.	86	88	81	80	..	..	51	60	76	..	65	60	67	78	82	83	84	88	77	72	71	75	69	..	63	74	82	74	72	74	78	71.8
	Min.	57	60	52	56	55	45	44	44	39	45	34	32	33	39	56	54	54	51	56	46	49	41	54	44	35	33	44	50	40	36	45	46.2
Cedar Rap.	Max.	89	91	81	83	77	68	68	62	73	77	64	60	62	75	80	80	87	87	81	72	68	76	73	68	57	71	76	72	68	68	76	73.2
	Min.	62	63	49	55	60	52	58	53	48	52	43	39	39	42	53	56	54	56	49	49	47	53	58	49	40	39	54	53	45	45	49	50.4
Chariton	Max.	84	85	85	72	75	64	54	58	74	77	67	59	67	77	83	80	85	87	77	67	70	74	63	59	72	78	74	75	74	77	73	73 1
	Min.	53	57	57	58	56	50	46	50	46	48	40	37	34	39	53	58	55	57	52	46	47	46	55	42	38	37	45	53	44	37	47	47 7
Charles Cy.	Max.	86	90	78	81	78	67	65	63	74	74	60	59	59	72	79	80	86	88	77	70	69	75	72	58	42	72	78	74	70	69	77	72.2
	Min.	60	62	52	55	55	56	55	48	44	44	37	33	36	50	53	53	55	58	49	45	46	52	55	46	36	36	46	46	43	42	47	48.5
Clarinda	Max.	89	91	80	84	70	54	49	51	74	74	72	65	73	80	82	77	86	88	75	70	70	76	74	69	58	72	78	74	70	69	77	73 5
	Min.	50	55	56	56	54	47	46	48	43	46	39	43	35	46	51	57	55	56	54	47	51	50	56	47	45	39	49	52	42	41	47	49.3
Clear Lake	Max.	88	95	84	85	77	68	58	65	81	70	64	41	31	40	51	59	54	56	54	47	51	50	56	47	45	41	50	40	42	42	47	75 2
	Min.	60	62	50	53	55	55	52	48	44	46	66	62	65	73	83	84	89	79	72	64	66	74	78	61	58	71	76	74	67	70	80	74.3
Clinton	Max.	88	91	80	86	87	77	67	62	73	80	50	42	39	34	37	41	47	47	55	50	52	48	52	46	39	32	44	50	44	40	53	47 8
	Min.	55	54	48	52	57	57	56	52	51	50	69	63	70	78	80	80	82	88	74	70	71	78	78	63	63	70	80	76	77	72	79	73.0
College Sp.	Max.	85	88	78	80	70	56	47	57	72	70	48	40	44	37	48	53	57	59	59	50	46	45	52	49	44	34	46	50	48	44	48	48.9
	Min.	52	56	58	57	54	47	45	46	44	48	79	68	61	65	77	80	81	89	84	74	67	67	78	78	67	59	70	76	75	70	71	77	74.8
Columbus J.	Max.	86	90	84	86	77	72	69	64	54	51	59	42	38	35	42	53	56	57	60	51	52	49	52	74	41	40	53	54	53	45	50	51.1
	Min.	59	60	49	58	59	55	54	54	51	59	42	38	35	42	53	56	56	80	84	..	68	79	72	66	65	58	72	78	77	72	71	75	74.6
Corning	Max.	83	86	80	79	68	55	54	56	70	71	66	59	69	76	79	79	80	83	91	60	63	73	75	73	63	61	75	81	81	79	86	77	75.1
	Min.	53	57	55	57	54	47	45	48	39	48	39	41	34	43	50	56	56	86	90	80	74	73	75	63	61	75	81	81	79	86	60	48	49.1
Co Bluffs	Max.	88	90	81	83	67	55	51	64	75	68	38	43	37	52	51	50	50	62	63	60	48	49	43	45	40	35	41	35	35	60	67	78	70.7
	Min.	59	67	61	55	55	48	46	49	44	52	59	60	60	69	78	80	85	76	72	69	65	66	69	58	57	71	77	69	64	42	43	43	46.5
Cresco	Max.	85	90	75	79	73	67	64	60	74	75	43	35	32	35	35	48	52	53	56	45	43	46	50	54	43	34	49	50	42	43	66	77	71.2
	Min.	59	60	49	51	60	55	54	62	42	70	77	66	59	61	71	77	80	86	73	71	63	6	73	76	63	56	69	73	53	46	44	53	51.4
Davenport	Max.	85	88	78	83	79	64	63	52	52	53	44	42	42	46	51	53	56	60	51	53	48	54	72	60	46	41	62	74	81	74	66	71	80	74 1
	Min.	63	62	48	54	60	57	55	64	77	77	61	61	61	73	82	84	89	85	78	74	70	72	71	61	44	37	32	42	42	38	42	43	45.6
Decorah	Max.	87	92	74	79	76	72	56	50	48	53	45	35	34	40	33	43	47	50	54	44	45	43	52	55	43	32	45	45	40	38	45	45.2
	Min.	58	58	48	50	72	69	67	62	71	77	62	58	62	72	77	81	86	76	72	67	65	68	71	52	43	34	35	50	46	39	42	47	45.9
Delaware	Max.	85	88	73	77	55	52	54	49	45	48	36	35	33	38	44	48	52	58	46	42	42	49	65	58	58	71	78	75	76	71	76	76	71.7
	Min.	56	56	46	50	67	60	50	59	70	66	64	57	66	78	81	81	82	85	77	70	72	49	40	39	55	39	32	32	49	40	38	41	45.7
Denison	Max.	86	87	81	80	55	54	47	43	48	41	44	37	34	34	39	56	59	52	83	88	75	68	69	73	71	54	58	72	79	74	71	76	76	72.6
	Min.	55	60	57	55	54	47	43	48	59	70	66	64	37	66	78	81	84	88	61	55	50	53	49	64	45	58	72	79	74	71	76	50	50.7
Des Moi'es	Max.	84	86	84	78	73	64	56	59	74	74	49	41	40	36	42	58	60	60	84	86	78	70	71	80	76	71	58	72	80	75	72	72	76	74.5
	Min.	60	60	58	58	53	49	48	52	47	49	41	40	36	42	58	60	60	86	84	58	50	53	49	76	71	58	72	80	75	72	72	76	45	50 7
De Soto	Max.	85	86	83	82	76	64	52	57	76	76	65	58	79	81	85	84	87	85	80	58	52	48	59	49	45	38	49	50	43	40	68	76	76	71 4
	Min.	59	67	58	63	56	50	47	50	45	50	40	39	40	41	55	81	80	85	85	74	69	68	69	70	63	59	71	78	72	68	68	76	74	71 4
Dows	Max.	85	87	81	80	74	67	55	58	75	69	63	51	59	74	81	58	57	80	53	53	44	49	49	55	44	37	36	45	49	42	37	43	46.8
	Min.	57	58	52	57	53	53	50	48	40	45	35	32	33	34	72	75	80	87	75	69	66	65	66	70	61	56	70	74	70	62	66	76	76	70.4
Dubuque	Max.	85	88	74	81	74	67	68	57	71	76	61	58	61	72	75	80	80	86	75	69	66	70	52	56	45	39	38	54	51	46	47	53	78	50.1
	Min.	64	51	46	53	59	57	56	51	52	52	46	39	40	44	48	53	53	58	51	49	50	52	77	73	62	73	78	78	76	75	73	78	78	77.1
Eldon	Max.	88	90	88	83	82	71	62	67	75	81	72	41	40	33	38	47	61	53	92	56	49	46	47	58	47	39	35	47	49	40	40	35	43	47.4
	Min.	49	55	54	60	57	55	50	52	46	47	41	64	64	68	78	83	85	92	82	76	72	70	70	73	66	61	76	82	77	69	72	47	48	75 7
Elkader	Max.	90	92	78	82	78	72	58	73	65	78	48	38	36	36	37	43	47	49	55	45	46	44	52	56	47	37	37	47	74	69	72	42	76	47.4
	Min.	59	62	49	51	55	58	56	51	62	72	60	60	55	59	72	80	80	83	75	75	70	69	72	65	59	58	72	79	74	69	72	76	70	70 7
Estherville	Max.	85	88	83	82	..	57	57	45	38	51	35	29	32	30	35	48	52	51	53	41	45	50	45	50	40	32	58	71	77	72	69	47	72	44.1
	Min.	59	60	52	55	57	49	67	71	63	73	79	60	59	63	72	80	80	87	72	75	70	68	70	56	45	36	60	33	47	48	40	39	69	71.9
Fayette	Max.	86	88	76	79	75	56	55	51	49	42	48	35	33	33	33	45	50	50	53	48	46	44	50	62	71	66	60	75	82	78	74	72	77	74 1
	Min.	60	61	46	54	82	80	70	50	55	76	70	63	60	62	75	83	83	86	90	85	79	70	62	50	46	43	37	35	43	46	39	37	42	46.3
Ft. Dodge	Max.	85	88	87	80	59	55	50	44	49	40	45	34	34	34	34	58	57	80	85	85	75	72	79	50	54	41	35	44	49	48	42	43	49	48 0
	Min.	57	58	56	59	78	75	60	55	59	73	65	60	55	56	71	79	80	85	57	55	45	50	70	81	60	73	77	65	49	76	76	71	82	76 6
Forest City	Max.	83	87	80	83	78	54	54	..	70	74	45	36	30	44	65	76	83	91	60	84	77	54	70	56	47	38	59	73	40	46	38	45	78	50.1
	Min.	55	53	51	55	54	68	56	48	70	70	81	70	62	43	76	83	52	60	69	51	40	42	53	73	63	44	61	75	81	81	79	86	77	73.5
Fruitland	Max.	90	92	86	90	80	56	52	70	52	52	57	42	43	..	40	..	65	87	89	78	72	73	76	70	60	59	73	79	49	47	39	37	..	45 1
	Min.	50	56	48	55	55	56	52	52	54	55	78	65	60	69	80	..	55	..	..	55	45	39	52	54	45	33	35	72	80	52	46	44	47	74.0
Galva	Max.	89	91	82	82	71	61	52	54	..	39	42	33	32	35	37	..	78	81	86	78	76	73	75	71	68	63	72	39	80	50	76	70	64	69	76	71.2
	Min.	60	55	55	55	53	45	49	50	61	76	61	69	66	70	78	78	76	81	55	60	73	70	67	48	47	40	58	70	48	48	42	43	48	47.0
Glenwood	Max.	85	87	83	79	59	54	47	47	63	74	51	42	41	40	50	76	80	85	55	46	45	43	49	69	54	43	35	60	37	35	45	76	73	69	71	79	74.0
	Min.	60	63	60	59	54	47	45	70	63	74	77	61	58	59	70	76	80	85	53	46	45	43	49	71	63	60	37	75	35	70	38	47	74	69	43	48	47.0
G. Meadow	Max.	86	86	75	78	49	54	55	54	48	46	50	38	33	36	38	45	50	53	89	81	76	73	70	47	70	77	54	71	55	45	63	66	46	39	46	47.3
	Min.	60	64	46	49	54	55	54	48	46	78	72	62	60	63	77	83	82	89	53	54	49	44	47	70	52	74	55	63	45	69	47	38	50	75	72	77	73 7
Greene.	Max.	87	91	80	80	83	78	72	66	62	78	72	62	60	63	33	54	52	53	54	74	71	47	77	74	63	45	66	75	76	75	72	44	41	45	48 7
	Min.	58	62	51	55	56	57	56	56	48	43	48	36	33	34	33	83	82	83	88	74	72	67	65	71	55	45	46	69	47	52	44	41	69	74	68	68.0
Greenfield	Max.	86	87	85	80	74	68	54	44	51	73	75	51	50	34	..	52	47	56	82	84	76	73	74	55	39	32	35	69	50	71	67	45	43	47	50 0
	Min.	58	59	54	54	53	48	44	43	41	47	75	64	60	60	71	77	75	82	84	75	67	67	73	72	57	47	38	69	50	54	45	43	47	69	74	72 6
Grinnell	Max.	83	86	80	80	75	70	62	60	71	75	64	42	40	37	40	57	58	56	61	62	45	67	74	57	69	54	39	69	75	70	54	47	43	49	49.9
	Min.	59	58	51	58	56	53	52	50	47	49	42	59	61	74	82	77	57	86	84	76	52	47	67	49	48	40	39	50	54	72	57	49	72	77	72.6
Grin'l (nr.)	Max.	87	89	83	84	78	62	53	51	50	47	50	40	37	42	57	57	57	85	82	74	69	69	70	52	71	55	46	63	55	72	79	46	49	41	38	45	47.2
	Min.	56	58	51	59	62	53	51	50	61	74	75	63	59	61	74	79	72	55	53	49	43	49	52	71	55	46	36	36	74	83	79	75	72	76	74 7
Grundy C'r	Max.	87	90	80	82	77	70	65	54	49	43	47	38	35	34	36	57	54	80	89	85	82	74	70	73	72	63	38	40	50	50	42	42	77	80	75 3
	Min.	54	56	50	55	54	54	54	61	58	78	71	62	58	62	77	82	80	85	56	49	47	49	52	55	45	62	36	76	85	80	76	77	38	45	46 2
Hampton	Max.	88	92	82	84	80	74	56	53	49	46	50	39	33	36	37	57	54	80	86	54	54	47	49	78	76	62	46	58	57	45	39	38	45	73	70 8
	Min.	57	61	50	55	55	56	53	49	60	76	69	67	61	72	84	82	83	91	56	81	74	73	74	52	55	45	36	33	45	76	73	38	45	49	49.7
Harlan	Max.	87	90	85	82	57	53	46	43	48	39	47	37	32	30	41	51	58	54	80	58	57	73	66	47	37	58	72	65	59	58	43	69	72	76	72 8
	Min.	52	52	55	57	70	59	51	55	71	74	67	62	67	74	80	76	59	83	61	88	54	55	74	48	63	48	43	70	49	48	43	72	76	77	47 4
Hopeville	Max.	83	85	82	57	56	57	48	46	49	45	49	41	41	38	45	52	83	60	74	83	55	45	72	50	48	34	58	73	38	70	46	43	38	45	47 4	71.9
	Min.	54	57	57	83	..	59	50	57	74	67	62	60	60	74	36	77	57	79	55	74	70	68	67	50	71	66	45	56	77	44	68	77	47	74	46 2	72.7
Humboldt.	Max.	86	88	83	56	59	56	49	48	48	42	45	38	33	34	72	77	79	51	78	60	81	53	76	50	46	43	59	34	71	39	73	38	70	48	50.6	
	Min.	57	58	56	59	77	56	55	51	49	42	45	38	33	34	72	77	79	51	78	60	81	53	76	50	46	43	59	34	71	39	73	38	70	48	50.6	
In'pen'nce.	Max.	85	87	78	80	70	56	47	57	72	70	48	40	44	37	48	53	57	59	59	50	46	45	52	49	44	34	46	50	48	44	48	48.9				
	Min.	52	56	58	57	54	47	45	46	44	48	79	68	61	65	77	80	81	89	84	74	67	67	78	78	67	59	70	76	75	70	71	77	74.8			
Indianola	Max.	84	86	83	57	62	58	46	47

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR MAY, 1901—CONTINUED.

STATIONS.		DATE																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Keosauqua	Max...	88	90	87	83	81	69	64	67	77	82	70	61	71	79	83	84	88	90	77	68	70	76	78	69	60	70	74	75	74	70	76	75.2
	Min .	58	61	55	62	59	57	51	56	51	51	43	44	37	41	51	52	56	59	53	50	50	52	61	49	44	39	52	54	46	42	48	51.1
Lansing ...	Max...	89	93	74	79	75	67	71	65	79	78	61	61	66	72	80	84	89	88	76	74	68	67	68	64	63	75	83	75	68	74	81	74.4
	Min...	66	68	49	54	55	58	55	50	55	48	37	36	36	37	43	48	51	60	45	50	44	52	57	46	40	35	47	45	47	45	47	48 6
Larch w o'd	Max..	89	90	83	76	59	55	53	67	73	63	62	57	67	76	85	86	89	90	81	73	76	77	67	60	63	71	83	80	77	76	80	73 5
	Min...	55	57	54	54	52	42	41	41	41	43	30	29	33	39	57	55	57	57	57	47	47	46	54	41	33	37	47	50	45	42	45	46 3
Larrabee ..	Max ..	90	90	82	80	66	57	50	64	67	66	63	57	65	78	85	87	85	87	66	65	68	76	66	55	57	68	75	67	72	67	76	70 9
	Min..	57	57	52	53	51	44	43	46	40	44	36	28	32	36	57	58	53	57	44	46	43	43	48	41	32	36	42	45	43	38	42	44 7
LeMars....	Max .	87	87	81	75	67	56	52	64	73	..	58	60	67	72	83	84	83	86	78	73	74	74	69	63	63	74	80	77	74	73	77	72.8
	Min...	57	59	57	53	54	40	42	46	41	45	35	34	35	42	55	60	53	55	56	47	44	44	55	43	32	38	43	43	42	39	43	46.2
Lenox.....	Max...	83	85	80	79	69	57	49	55	70	71	66	62	58	75	78	76	79	83	78	67	67	73	71	..	58	69	77	74	72	68	74	71.1
	Min..	54	57	57	57	55	49	45	47	43	49	40	41	36	44	52	58	57	60	56	47	49	44	52	48	43	38	47	53	45	40	49	48.8
Logan.....	Max .	82	92	81	81	68	54	50	64	70	68	64	59	69	85	87	85	86	90	81	75	74	80	74	71	62	72	78	81	80	81	78	74.9
	Min...	58	57	60	56	53	46	43	49	50	46	35	35	31	48	54	53	55	58	59	50	43	44	53	48	36	32	39	44	51	54	56	48.3
Maquoketa	Max..	88	91	80	83	77	68	71	..	72	79	66	61	58	73	79	83	89	80	71	67	64	72	75	69	58	71	76	74	66	69	79	73.6
	Min.	52	57	47	50	58	54	55	50	49	47	40	39	35	34	41	45	45	50	44	48	44	50	57	45	36	30	49	46	38	40	50	46.0
Monticello.	Max .	88	90	88	82	.	68	70	70	79	77	65	62	68	75	77	86	87	84	77	74	70	70	72	70	54	76	70	72	65	70	80	74.5
	Min..	52	56	52	50	55	58	55	45	50	52	38	37	36	42	45	45	46	51	52	45	54	52	51	45	35	46	49	52	48	39	48	47.8
Mooar	Max..	72	78	73	79	75	72	83	74	72	78	69	73	68	78	80	75	84	88	87	85	82	83	79	72	74	78	79	81	79	83	79	77.8
	Min ..	32	40	33	30	29	40	42	30	50	53	44	42	33	48	45	42	40	52	48	50	48	49	42	40	39	50	48	50	42	50	52	43.0
Mt. Ayr	Max..	82	85	83	79	73	59	50	55	73	73	66	60	68	78	83	78	81	87	77	72	71	73	74	61	58	71	79	76	74	72	76	72.5
	Min...	50	55	54	56	55	48	45	42	44	48	38	41	36	44	51	57	57	60	55	45	49	45	50	48	42	48	48	54	46	42	48	48 4
Mt. Plea'nt	Max..	85	87	84	84	78	61	63	62	73	79	73	68	65	72	81	83	86	86	73	69	69	78	88	74	60	70	74	74	70	71	77	74.7
	Min...	53	57	48	57	57	52	51	53	49	45	45	46	34	37	49	52	52	59	50	48	45	49	57	47	39	38	50	52	39	37	37	47.9
Mt.Vernon	Max...	86	91	82	85	72	69	69	73	78	78	67	61	64	78	83	78	90	78	78	73	68	76	76	65	63	75	80	78	74	74	79	75.5
	Min.	58	58	44	52	55	50	54	51	47	49	39	37	35	38	48	51	54	54	46	45	42	51	55	44	36	37	49	48	39	39	45	46 8
NewH'pton	Max...	84	87	77	80	76	66	67	62	73	70	59	57	59	71	..	79	84	78	74	71	66	69	69	62	60	72	79	71	65	69	77	71.1
	Min...	58	58	49	52	56	56	54	47	45	48	35	32	34	34	34	..	55	58	48	45	45	45	45	43	35	38	49	48	42	41	47	45.9
Newton....	Max..	87	90	83	81	77	74	62	60	74	77	67	61	65	76	81	77	84	88	76	70	72	78	72	68	59	73	80	75	72	72	77	74.5
	Min. .	58	58	53	61	57	57	49	50	48	49	41	38	37	40	56	56	56	59	52	48	52	50	54	47	40	39	48	55	45	42	49	49.8
Northwood	Max..	86	88	79	80	75	65	60	65	75	66	60	56	57	69	77	80	83	83	74	71	70	66	69	67	60	71	78	73	67	71	75	71.5
	Min...	59	62	48	53	53	55	52	47	45	46	38	31	36	35	54	52	54	59	51	47	50	51	55	42	34	40	48	47	43	43	48	47.7
Odebolt ...	Max...	90	92	83	84	70	63	48	62	71	66	65	62	71	82	86	85	88	93	88	87	76	80	69	65	62	75	84	78	76	77	81	76.1
	Min...	56	60	52	56	54	41	..	42	38	45	35	32	34	38	55	59	53	55	53	47	46	40	55	44	35	36	46	40	38	40	43	45.6
Ogden.	Max...	85	88	83	80	71	59	51	56	76	73	65	57	62	76	83	81	82	86	80	69	69	75	72	..	60	72	81	75	71	71	76	72.8
	Min...	56	60	56	58	54	48	45	49	42	45	35	32	35	38	57	58	56	59	54	46	51	46	55	46	38	36	44	50	44	39	47	47.7
Olin..	Max...	83	86	80	81	79	68	67	63	.	77	69	59	60	65	75	80	84	75	71	67	68	71	72	66	57	68	74	70	65	67	78	71.5
	Min..	55	58	49	51	55	52	56	53	..	48	39	38	35	37	47	57	55	55	50	49	46	52	58	46	37	33	52	51	40	41	47	48.1
Om'ha Neb	Max...	85	87	79	79	64	54	52	63	74	66	69	60	71	80	79	78	82	86	78	71	72	72	70	61	60	73	80	79	76	72	75	72.5
	Min...	62	64	65	55	54	48	45	50	46	50	45	42	42	52	58	60	58	61	63	55	52	52	57	48	42	44	53	54	53	50	51	52.6
Onawa....	Max...	89	90	88	77	65	55	52	64	75	70	69	66	73	79	82	83	83	88	85	80	77	75	72	68	63	74	81	81	79	75	77	75.3
	Min .	57	60	57	57	53	45	43	46	43	48	35	36	35	49	52	59	55	59	61	50	47	46	56	46	37	36	45	51	43	43	47	48.3
Osage.....	Max...	82	85	75	77	74	67	63	59	71	66	58	55	55	67	76	78	81	77	72	68	66	67	67	63	57	69	76	69	64	68	74	69.2
	Min...	56	56	50	53	54	55	53	47	44	46	38	32	37	35	50	53	52	56	48	42	46	51	54	43	34	38	48	48	42	42	47	46 8
Oskaloosa .	Max...	85	88	84	82	77	72	62	60	72	77	67	58	65	75	80	79	84	87	75	73	69	77	75	68	56	70	78	73	74	72	75	73.8
	Min...	55	58	55	58	58	54	49	52	46	50	40	38	35	37	53	60	55	57	51	48	47	51	58	47	39	36	45	50	41	40	45	48.6
Ottumwa ..	Max...	84	88	83	79	79	70	62	60	71	78	69	68	65	73	80	81	83	85	75	66	69	76	75	69	58	70	77	75	71	72	75	73.7
	Min...	59	62	55	63	59	59	50	50	54	53	47	47	46	40	54	63	60	61	54	51	48	51	60	48	40	40	51	53	55	42	47	52.3
Ovid..	Max...	84	86	85	74	72	59	54	60	75	77	68	64	71	77	81	79	83	89	76	67	72	74	74	59	64	75	81	85	79	78	80	74.3
	Min...	52	54	56	58	55	47	45	48	44	48	37	38	33	45	55	60	56	59	52	45	48	48	56	52	37	36	45	55	46	39	45	48.2
Pacific Jct.	Max...	86	89	82	80	68	54	50	64	72	68	70	63	70	80	78	78	82	86	77	72	74	74	74	61	64	72	80	78	76	72	74	73.2
	Min...	53	55	57	55	53	48	45	49	42	52	35	42	34	48	52	65	54	68	61	59	43	44	55	49	41	33	45	46	43	42	43	48.7
Pella. ..	Max...	86	88	85	82	76	70	61	60	76	80	69	61	70	77	83	82	85	89	..	74	73	76	76	67	64	74	80	75	74	75	80	75.6
	Min...	45	56	54	60	59	51	49	50	48	53	41	38	36	39	53	59	55	54	..	41	49	50	56	47	39	46	48	55	42	39	45	48.5
Perry.....	Max...	80	82	85	75	74	75	70	68	70	75	65	57	64	75	85	82	84	88	75	72	74	77	77	64	60	75	76	82	72	73	78	74.5
	Min ..	50	48	57	60	..	..	47	45	46	47	47	36	34	38	40	60	56	58	55	48	50	45	57	48	41	37	51	45	47	40	45	47.5
Plover.....	Max...	88	91	84	83	72	65	46	61	75	63	65	57	55	82	85	85	89	90	75	74	70	79	73	60	58	70	75	71	70	72	76	72.9
	Min..	54	59	55	58	55	50	45	45	44	50	35	31	35	36	58	57	55	55	52	45	50	55	59	40	32	40	47	42	40	39	46	47.2
Primghar..	Max...	89	91	81	80	73	..	48	63	74	71	65	60	69	73	80	80	80	89	80	75	74	77	70	..	60	74	83	80	75	72	86	74.9
	Min...	55	57	57	55	53	45	42	48	45	45	45	36	53	57	60	55	60	59	70	50	48	45	53	40	33	39	45	45	55	40	53	49.8
Red Oak...	Max. .	87	90	87	78	67	60	49	56	68	70	65	..	64	72	..	72	73	79	..	66	..	73	71	67	59	68	79	72	80	70	71	70.9
	Min...	58	59	58	56	54	48	45	47	44	51	44	46	39	51	64	61	60	61	61	61	52	48	59	49	46	40	47	54	48	48	50	51.9
Ridgeway .	Max ..	88	92	78	79	75	66	68	62	75	71	57	68	67	73	80	82	88	82	75	75	67	65	65	60	63	80	79	74	69	70	78	73.3
	Min...	61	62	49	50	55	56	55	47	47	45	38	34	39	38	49	54	58	62	52	45	48	52	54	44	37	41	50	48	43	46	50	48.7
Rockwell C	Max...	84	88	82	81	70	.	50	59	73	68	63	56	61	76	83	82	83	88	75	72	70	78	72	..	58	70	79	75	70	71	76	72.9
	Min..	56	65	55	58	55	47	45	47	43	45	36	35	37	39	56	60	56	58	55	47	53	42	55	43	35	39	46	49	45	41	43	47.9
Ruthven..	Max...	..	..	..	..	..	..	..	.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
	Min..	57	56	55	58	48	39	44	45	40	45	45	30	38	37	48	45	59	62	42	40	47	48	53	35	31	53	43	42	43	41	48	45.7
Sac City....	Max...	87	88	81	79	67	61	48	60	73	68	64	57	64	75	83	81	82	86	82	72	70	74	69	62	62	73	79	75	71	77	82	72.6
	Min ..	56	57	55	57	54	46	44	47	42	45	37	34	35	38	55	60	52	56	57	48	47	45	55	43	35	38	46	48	44	38	47	47.1
St. Charles.	Max...	85	87	86	79	65	63	52	59	73	75	66	59	67	76	82	58	83	86	75	69	70	74	73	62	59	71	78	78	78	71	75	73.1
	Min...	59	59	58	60	56	49	46	49	44	46	41	38	37	42	53	59	59	61	54	46	58	47	55	48	42	39	48	53	44	41	47	49.6
Scranton ..	Max ..	85	88	84	81	74	58	49	56	72	72	64	63	64	77	83	82	85	86	75	74	70	75	70	65	58	73	78	74	70	70	76	72.6
	Min...	57	60	55	59	54	47	45	48	44	46	40	36	36	41	56	61	58	60	55	48	54	48	56	45	39	40	47	60	46	42	47	49.4
Sheldon....	Max...	87	89	89	76	67	57	52	60	73	68	63	57	66	74	84	81	85	89	80	74	76	77	..	..	..	75	81	79	75	73	77	74.4
	Min ..	57	57	52	52	51	44	41	45	40	45	36	31	35	37	35	55	54	..	55	45	44	45	..	..	32	..	46	47	43	37	45	44.7
Sibley	Max..	88	91	82	73	..	..	52	61	76	67	63	58	65	75	87	84	86	88	79	73	73	77	66	59	62	76	81	77	73	74	80	74.0
	Min. .	55	53	53	57	54	44	41	45	41	43	33	30	34	37	55	54	52	56	55	46	44	42	53	40	32	35	45	48	45	39	39	45.2
Sigourney .	Max..	88	91	89	78	84	74	68	65	79	81	68	60	66	81	85	85	90	94	80	73	76	78	78	67	64	74	82	80	77	77	81	77.2
	Min ..	56	58	51	59	56	53	51	53	48	50	40	39	35	39	51	56	54	59	48	47	43	51	58	48	38	37	50	50	40	39	46	48.2
Sioux Cen.	Max	87	89	84	73	63	56	52	61	71	64	62	59	68	83	72	83	84	88	82	74	75	78	70	59	59	73	79	76	72	73	76	72.4
	Min...	57	58	55	54	54	45	41	44	43	45	37	32	36	54	41	55	57	59	58	47	50	47	54	42	31	48	51	51	47	40	48	47.6
Sioux City.	Max. .	87	87	78	74	64	50	53	64	72	62	65	57	69	76	81	82	82	86	78	72	73	74	67	52	58	72	79	77	75	71	76	71.4
	Min...	60	64	62	55	53	45	42	45	43	44	42	36	37	43	60	60	61	64	63	55	46	46	55	44	37	49	56	51	45	44	47	50.1
Spirit Lake	Max ..	85	91	85	82	63	62	50	62	74	53	60	54	54	57	83	85	90	91	82	73	74	73	64	55	66	72	63	79	72	70	75	70.9
	Min ..	55	58	55	51	54	48	45	45	42	42	35	29	35	45	57	53	57	62	68	49	49	49	53	43	35	39	54	37	46	43	45	47.7
Storm L...	Max..	83	84	78	77	77	60	48	60	71	65	61	57	62	72	79	77	81	85	78	69	69	69	65	62	57	71	78	74	70	70	75	70.5
	Min ..	60	61	56	56	54	45	42	46	43	43	37	32	36	39	57	59	53	55	57	50	49	46	54	50	32	40	49	46	42	38	44	47.5
Stuart	Max .	85	85	84	80	69	60	49	55	74	72	65	59	67	79	82	80	82	87	80	68	70	74	78	65	60	73	78	75	70	71	78	72.7
	Min...	56	55	55	52	54	45	43	45	42	45	38	36	35	45	50	50	55	59	53	47	50	45	55	45	42	38	58	51	45	41	57	48.0
Thurman ..	Max ..	86	87	80	80	67	55	49	62	71	67	70	66	70	80	77	77	80	85	78	74	73	75	72	68	62	74	81	80	78	77	76	73.5
	Min...	57	59	63	41	54	48	46	49	42	52	38	46	34	47	52	59	55	59	62	51	44	44	54	50	43	35	42	49	43	44	44	48.6
Toledo.....	Max .	88	92	80	81	78	63	60	64	78	80	75	70	74	79	81	72	88	87	80	70	74	77	76	..	59	77	85	84	75	75	83	76.8
	Min ..	59	59	51	58	57	50	53	51	45	48	39	30	32	35	57	58	52	55	50	43	46	53	57	48	36	35	45	..	43	38	35	47.3
Villisca ..	Max..	87	89	89	84	78	54	50	57	71	74	70	63	72	80	82	83	85	88	77	70	70	78	76	67	64	74	76	77	77	80	78	74.8
	Min. .	57	54	56	54	48	44	45	47	41	51	37	41	32	43	42	58	60	65	53	47	46	41	58	50	38	32	40	48	52	40	47	47.3
Wapello ...	Max...	..	..	81	87	75	68	61	63	69	77	72	62	65	79	77	79	90	88	76	67	63	80	81	67	61	.	77	85	75	74	78	74.2
	Min...	60	62	57	58	59	55	55	55	53	61	45	44	40	43	57	59	56	61	54	55	52	53	59	48	43	..	37	54	47	41	49	52 4
Washi'gt'n	Max .	86	89	83	83	79	66	65	68	72	78	68	59	67	73	79	81	86	86	75	68	69	76	75	59	60	71	75	76	71	69	77	73.8
	Min..	53	57	49	58	55	53	51	50	50	47	39	38	34	38	52	53	54	58	48	47	45	50	57	44	38	37	50	50	41	37	44	47.6
Waterloo..	Max ..	87	91	80	81	77	71	70	63	75	75	63	62	61	73	78	78	86	78	76	70	69	67	70	60	58	74	80	75	68	73	79	73 2
	Min ..	60	62	50	56	57	55	55	50	45	50	39	36	36	38	53	52	53	55	48	47	46	53	56	46	38	36	47	51	44	40	47	48.4
Waverly...	Max ..	87	91	80	82	77	69	68	62	74	73	61	63	62	73	78	77	85	77	74	74	67	69	70	62	58	72	78	72	66	70	75	72.5
	Min ..	59	62	52	57	56	56	56	49	46	49	38	35	36	36	55	54	60	55	50	47	47	53	56	45	40	42	46	..	44	42	41	48.8
Wilton Jc .	Max ..	85	87	89	84	79	72	70	64	74	80	65	60	63	73	81	83	86	80	74	68	68	75	79	73	59	70	76	74	68	70	78	74.4
	Min ..	56	58	47	51	59	52	55	53	51	45	38	40	33	37	48	53	50	54	45	48	46	52	58	47	37	34	50	51	37	41	44	47.4
Winterset..	Max ..	87	90	87	82	78	..	54	57	75	78	68	65	69	80	86	81	88	88	78	70	72	80	70	..	62	78	82	79	77	76	78	76.4
	Min ..	58	58	58	58	55	55	45	48	44	50	40	38	35	42	53	58	53	60	54	47	50	45	55	50	42	39	48	54	44	41	46	49 1
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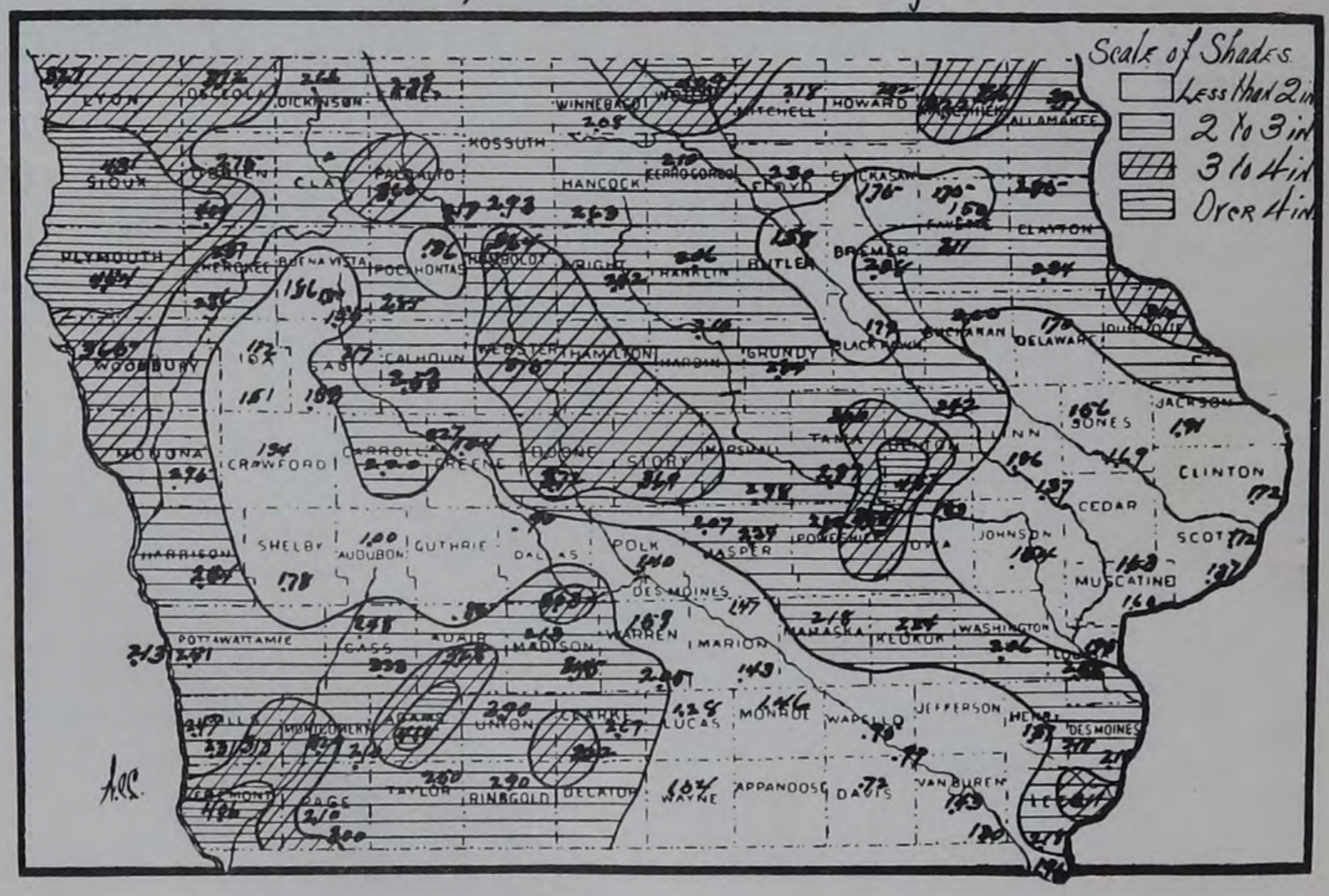
DAILY AND MONTHLY PRECIPITATION FOR MAY, 1901.

STATIONS.	DAY OF MONTH																													TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	....	....	T.	07	1.09	.18	.09	....	....	T.	....	....	....	....	.04	1.12	....	....	....	....	....	T.	.31	....	....	....	....	....	....	....	....	2.90
Albia	....	....	T.	....	.14	.28	.48	....	....	T.	....	....	....	....	....	.15	....	....	....	....	....	T.	.21	.20	....	....	....	....	....	....	....	1.46
Algona	....	T.	.03	....	....	2.07	.25	.23	....	.10	....	....	....	....	....	....	....	....	....	....	....	T.	.25	T	....	....	....	....	....	....	....	2.93
Alta	....	....	T.	.16	.41	.37	.29	....	....	.07	....	....	....	T.	....	T.	....	....	....	....	....	.01	.19	.36	....	....	....	....	....	....	....	1.80
Alta (near)	....	....	.06	.17	.41	.39	.18	....	....	.09	....	....	....	....	....	.02	....	....	....	....	....	.04	.20	.24	....	....	....	....	....	....	....	1.80
Amana	....	....	....	....	.59	.04	.23	.14	....	.11	....	....	....	....	....	....	....	....	....	T.	.10	.22	.37	.03	....	....	....	....	....	....	....	1.83
Ames	....	....	....	T.	1.13	.13	.43	T.	....	.10	....	....	....	....	....	1.10	....	....	....	....	.04	....	.66	.10	....	....	....	....	....	....	....	3.69
Atlantic	....	....	T.	96	....	.62	.20	....	....	....	....	....	....	T.	T.	.25	....	.....	....	....	....	....	.45	....	....	....	....	....	....	T	....	....	2.48
Audubon	....	....	T.	1.	T.	.45	.4-	T.	....	T.	....	....	....	....	....	....	....	....	....	....	....	T.	.15	....	....	....	....	....	....	....	....	1.50
Battle Creek	....	....	T.	.53	.09	.29	.06	T.	....	.04	....	....	....	T.	T.	.02	....	....	....	....	....	.04	.36	.68	....	....	....	....	....	....	....	1.51
Baxter	....	....	....	....	.72	.32	.57	T.	....	....	....	....	....	....	....	.20	....	....	....	....	....	....	.13	.13	....	....	....	....	....	....	....	2.07
Belknap	....	....	....	T.	T.	T.	.46	T.	....	T.	....	....	....	....	....	....	....	....	....	....	....	T.	T.	.16	.10	....	....	....	....	....	....	.72
Belle Plaine	....	....	....	....	.80	.60	1.50	.30	....	.20	....	....	....	....	....	....	....	....	....	....	....	.10	.22	.60	.25	....	....	....	....	....	....	4.57
Bonaparte	....	....	....	....	.23	.48	.25	.10	.....	....	....	....	....	....	....	....	....	....	....	....	....	.10	....	.14	....	....	....	....	....	.....	....	1.30
Britt	....	....	....	T.	.73	.27	.22	.07	....	.09	....	....	....	....	....	....	....	.46	....	....	....	....	.24	.27	.28	....	....	....	....	....	....	2.63
Buckingham	....	....	....	....	....	.97	1.22	....	....	.18	....	....	....	....	....	....	....	....	....	....	....	....	.08	.50	.05	....	....	....	....	....	....	3.00
Burlington	....	....	....	....	1.25	.12	.14	.18	....	....	.07	....	....	....	....	....	....	....	....	....	.04	T.	.08	.22	T.	....	....	....	....	....	....	2.10
Bussey	....	....	....	....	T.	.70	.31	....	....	.17	....	....	....	....	....	....	....	....	....	....	....	T.	.25	....	....	....	....	....	....	....	....	1.43
Carroll	....	.....	....	.10	.17	1.42	.34	....	....	.03	....	....	....	....	.05	....	....	....	....	....	....	T	....	.09	.....	....	....	....	....	....	....	2.20
Cedar Rapids	....	....	....	....	.31	.42	.45	T.	....	.16	....	....	....	....	....	.16	....	....	....	....	.04	.15	.29	.02	....	....	....	....	....	....	.02	1.86
Chariton	....	....	....	.03	.38	.09	.14	.02	....	....	....	....	....	....	T.	....	....	....	....	....	....	T.	.35	.10	.01	....	....	....	....	....	....	1.28
Charles City	....	.....	....	T.	.76	.10	.05	T.	....	.10	....	....	....	....	.26	....	.01	....	....	....	....	....	.12	.84	.33	....	....	....	....	....	....	2.30
Clarinda	....	....	T.	1.10	.11	.10	.06	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.33	.13	....	....	....	....	....	....	....	2.10
Clear Lake	....	....	..	T.	.45	.75	.40	....	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	.10	.30	.10	....	....	....	....	....	....	2.10
Clinton	....	....	....	..	.05	.00	.02	....	....	.48	....	....	....	....	....	.02	....	.10	....	.01	....	.85	.12	....	....	....	....	....	....	....	.03	1.72
College Springs	....	....	.03	.01	1.50	.08	.06	....	....	T.	....	....	....	....	.19	....	....	.32	....	....	.01	....	.80	....	....	....	....	....	....	....	....	3.00
Columbus Junction	....	....	....	....	.04	.11	.69	.13	....	.09	....	....	....	....	....	....	....	....	....	....	.01	.09	.12	.07	....	....	T.	....	....	....	....	1.95
Corning	....	....	....	T.	2.40	.44	.18	....	....	T.	....	....	....	....	.44	....	.10	....	....	....	T	.53	T	....	....	....	....	....	....	....	....	4.15
Council Bluffs	....	....	....	.91	.98	.29	.07	....	....	....	....	....	....	....	.09	....	....	....	....	....	....	.1	.17	....	....	....	....	....	....	....	.01	.02	2.51
Cresco	....	....	....	....	.17	.67	.28	....	....	.02	....	....	....	....	....	....	....	....	....	....	.03	....	.24	.47	.11	....	....	....	....	....	....	....	2.02
Cumberland	....	....	....	....	.71	....	.31	.02	....	....	....	....	....	....	....	.84	....	....	....	....	....	T.	T.	.42	T.	....	....	....	....	....	....	....	2.33
Danville	....	....	T.	.03	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	.02	....	.30	....	....	....	....	T.	....	2.18
Davenport	....	....	....	....	1.42	.04	.33	.07	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.49	.12	T.	....	....	....	....	....	....	1.37
Decorah	....	.96	....	....	.21	.04	.20	T.	....	.03	.09	....	....	....	....	....	....	T.	....	.01	.18	.08	1.05	.30	....	....	....	....	....	....	....	3.88
Delaware	....	....	....	....	.39	.35	.54	....	....	T.	....	....	....	....	....	....	....	.21	....	....	....	....	....	.07	....	....	....	....	....	T.	.03	1.70
Denison	....	....	T.	.16	.21	.54	.08	.01	....	.06	....	....	....	....	....	.08	....	....	T.	.11	.11	.64	....	.19	.01	....	....	....	....	....	....	....	1.34
Des Moines	....	....	....	T.	.52	T.	.27	....	..	T.	....	....	....	....	T.	29	....	....	....	....	....	....	.28	.04	....	....	....	....	....	....	....	1.40
De Soto	....	....	T.	.02	1.50	.58	.26	....	....	....	....	....	....	....	....	.45	....	....	....	....	T.	....	.20	.02	....	....	....	....	....	....	....	3.03
Dows	....	....	....	.26	.76	.18	.30	.00	....	.13	....	....	....	....	....	....	....	....	....	....	....	.04	.11	.40	.18	....	....	....	....	....	....	2.42
Dubuque	....	....	.42	....	.02	.33	.11	.35	....	.56	T.	....	....	....	....	....	....	T	....	.05	.10	.56	.47	.08	....	....	....	....	T.	.05	3.10
Eldon	....	....	....	....	.16	T.	.35	.01	....	T.	....	....	....	....	....	....	....	....	....	.21	.03	.18	.05	....	....	....	....	....	....	....	....	.99
Elkader	....	.15	....	....	.12	.82	.43	....	....	....	....	....	....	....	....	....	....	....	....	T.	.08	.68	....	.06	....	....	....	....	....	....	T.	2.34
Emerson	....	....	....	1.33	....	.30	.35	....	....	....	....	....	....	....	.45	....	....	....	....	....	....	....	.70	....	....	....	....	....	....	....	....	3.13
Estherville	....	....	....	T.	....	1.59	.31	.04	....	.13	....	....	....	....	....	....	....	....	....	....	....	T.	.03	.16	.12	....	....	....	....	T.	....	2.38
Fayette	....	....	.07	....	.30	.06	.75	....	....	T.	....	....	....	....	....	....	....	T	....	.05	....	....	.07	.15	.05	....	....	....	....	....	....	....	1.50
Fort Dodge	....	....	....	....	1.	2.95	.08	.06	....	.06	....	....	....	....	....	....	....	....	....	....	T.	....	.50	.10	....	....	....	....	....	....	....	3.75
Fort Madison	....	....	....	....	1.75	.11	.61	.25	....	.04	....	....	....	....	....	....	....	....	....	....	T.	T.	....	.35	T.	....	....	....	....	....	....	3.11
Fonda	....	....	....	.08	.76	.62	.19	....	....	.03	....	....	....	T.	T.	T.	....	....	....	....	....	....	.66	.04	.47	....	....	....	....	....	....	2.85
Forest City	....	....	....	....	.30	.44	.40	....	....	.10	....	....	....	....	....	....	....	....	....	....	....	....	.16	.46	.22	....	....	....	....	....	....	2.08
Fruitland	....	....	....	....	....	1.00	....	.20	....	....	....	....	....	....	....	.26	....	....	....	....	....	....	.30	.10	1.	....	.....	....	....	....	....	1.60
Galva	....	....	....	....	.04	.64	.14	....	....	....	....	....	....	....	....	.08	....	....	....	....	....	....	....	.04	....	....	....	....	....	....	....	1.12
Gilman	....	....	....	T.	.35	.09	1.60	.09	....	.11	....	....	....	....	....	....	....	....	....	....	....	....	T.	.61	.05	....	....	....	....	....	....	2.98
Glenwood	....	....	T.	.80	1.07	.39	.05	T.	....	....	....	....	....	....	....	....	....	....	T.	T.	....	....	T.	T.	T.	....	....	....	....	....	....	2.31
Grand Meadow	....	.06	....	....	.20	.73	.32	....	....	T.	....	....	....	....	....	....	....	.11	....	.07	T.	....	1.13	.23	....	....	....	....	....	....	....	2.85
Greene	....	....	....	....	.37	.05	.25	....	....	.05	....	....	....	....	....	1.30	....	....	....	....	.06	.07	.59	.14	....	....	....	....	....	....	....	1.58
Greenfield	....	....	T.	1.	.51	.74	.20	.10	....	T.	....	....	....	....	....	.05	....	....	....	.02	.14	T.	.43	T.	....	....	....	....	....	....	....	3.28
Grinnell	....	....	....	....	.05	1.18	.40	....	....	....	....	....	....	....	....	T.	....	....	....	T.	.57	79	.16	.03	....	....	....	....	....	....	....	2.82
Grinnell (near)	....	....	....	T	.10	.23	1.52	.05	....	.07	....	....	....	....	....	....	....	....	....	....	....	.05	.90	.06	....	....	....	....	....	....	....	3.55
Grundy Center	....	....	....	....	.21	T.	1.76	.04	....	.18	....	....	....	....	....	....	....	....	....	....	....	.04	.50	.11	....	....	....	....	....	....	....	2.84
Hampton	....	....	1.	.03	.50	.30	.33	....	....	.10	....	....	....	....	....	.05	....	....	....	.06	.04	.06	.35	.18	....	....	....	....	....	....	....	2.06
Harlan	....	....	.03	.12	.79	.21	.06	.02	....	.02	....	....	....	T.	....	10	....	....	....	....	T	T.	.43	T.	....	....	....	....	....	....	....	1.78
Hawkeye	....	....	....	....	.10	....	.75	....	....	T.	....	....	....	....	....	....	....	....	T.	....	....	....	.90	....	....	....	....	....	....	....	....	1.75
Hopeville	....	....	T.	.01	.64	.36	.13	....	....	T.	....	....	....	....	T.	1.43	T.	.....	....	....	....	T.	.65	....	....	....	....	....	....	....	....	3.22
Humboldt	....	....	....	....	2.30	.56	.11	.06	....	.08	....	....	....	....	....	....	....	....	....	....	T.	.11	.30	.12	....	....	....	....	....	....	....	3.64
Independence	....	....	....	....	.10	.40	.45	....	....	T.	....	.....	....	....	....	....	....	....	....	....	....	.25	.60	.05	....	....	....	....	....	....	....	2.00
Indianola	....	....	....	....	.07	.07	.23	....	....	T.	....	....	....	....	T.	41	....	....	....	....	....	.15	.29	.39	T	....	....	....	....	....	....	1.58
Iowa City	....	....	....	....	.76	20	.11	....	....	....	.08	....	....	....	T.	....	....	....	....	....	....	.12	.19	.12	T	....	....	....	....	....	....	1.54
Iowa Falls	....	....	....	T.	1.12	.08	.26	T.	....	.11	....	....	....	....	.08	.02	....	....	....	....	T.	.08	.19	.12	T	....	....	....	....	....	....	2.10
Jefferson	....	....	....	.03	....	1.12	.16	....	....	.05	....	....	....	....	....	....	....	....	....	....	....	T	.09	.26	.08	....	....	....	....	....	....	1.44
Keokuk	....	....	....	....	.79	.28	.25	.53	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.05	.03	....	....	....	....	....	....	....	1.95
Keosauqua	....	....	....	....	.15	.54	.23	.31	.01	....	....	....	....	....	....	....	....	....	....	....	....	.07	.12	....	....	....	....	....	....	....	....	1.43
Lacona	....	....	....	.40	.10	T.	.20	....	....	.20	....	....	....	....	....	.15	....	....	....	....	....	....	....	.60	.40	....	....	....	....	....	....	2.05
Lansing	....	.47	.06	....	.12	.32	.35	.05	....	T.	....	....	....	....	....	....	....	.08	....	T.	T.	.15	1.07	.30	....	....	....	....	....	....	T	2 97
Larchwood	....	....	....	1.25	.45	.52	.52	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.39	.14	....	....	....	....	....	....	....	3.27
Larrabee	....	....	.08	.30	.37	.64	.18	....	....	.15	....	....	....	....	....	....	....	....	....	....	....	....	.48	.37	....	....	....	....	....	....	....	2.57
Le Mars	....	....	....	1.70	.68	1.00	.33	....	....	....	....	....	....	....	....	.33	....	....	....	....	....	T.	40	.10	....	....	....	....	....	....	....	4.54
Lenox	....	....	T.	....	.98	.33	.11	....	....	....	....	....	....	....	.35	.15	....	....	....	....	....	T.	.58	....	....	....	....	....	....	....	....	2.50
Logan	....	....	.02	1.15	.90	....	.21	.06	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.20	....	....	....	....	....	....	....	....	2.54
Maquoketa	....	....	....	....	.41	.13	.62	.01	....	.39	.06	....	....	....	....	....	....	....	....	.20	.20	.29	.20	....	....	....	....	....	....	....	....	1.91
Monticello	....	....	....	....	....	....	.78	....	.15	T.	.02	....	....	....	....	....	....	....	T.	.02	.04	.20	.33	1.	.10	....	....	....	....	T.	....	1.56
Mooar	....	....	....	....	....	1.42	.44	.32	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.18
Mount Ayr	....	....	T.	.05	.97	.31	.06	T.	....	....	....	....	....	....	.44	.03	....	....	....	....	....	T.	.02	1.01	.01	....	....	....	....	....	....	2.90
Mount Pleasant	....	....	....	....	82	.02	.19	T.	.05	....	....	....	....	....	....	....	....	....	....	....	....	.03	.12	....	.14	....	....	....	....	....	....	1.37
Mt. Vernon	....	....	....	....	.35	.06	.28	.03	....	20	....	....	....	....	T.	....	....	T.	....	.21	.20	T.	.03	.01	....	....	....	....	....	....	....	1.37
New Hampton	....	....	....	....	.20	22	.41	....	....	....	....	....	....	....	....	....	....	....	....	....	.04	.02	.71	.14	....	....	....	....	....	....	....	1.74
Newton	....	....	....	....	.38	....	.67	....	....	.05	....	....	....	....	....	.31	....	....	....	....	....	....	.44	.39	....	....	....	....	....	....	....	2.24
Northwood	....	....	....	....	.49	1.75	.53	T.	....	.12	....	....	....	....	.03	....	....	.04	....	....	....	.01	.44	.51	.17	....	....	....	....	....	....	4.09
Odebolt	....	....	....	.08	.11	.87	.16	....	....	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	.26	....	....	....	....	....	....	....	1.53
Ogden	....	....	....	.02	.60	.57	.30	....	....	.07	....	....	....	....	....	.85	....	....	....	....	....	.05	....	.22	.02	.02	....	....	....	....	....	2.72
Olin	....	....	....	....	.28	T.	.71	T.	....	.25	....	....	....	....	....	....	....	....	T.	....	T.	....	.45	T	....	....	....	....	....	T.	....	1.69
Omaha, Neb.	....	....	T.	.48	1.09	.19	.01	....	....	.04	....	....	....	....	.06	....	T	....	....	....	....	T.	T.	.26	T.	....	.....	....	....	....	....	2.13
Onawa	....	....	.05	1.00	.75	.48	.14	....	....	.16	....	....	....	T.	....	.11	....	....	....	....	....	....	.20	.06	....	....	....	....	....	....	....	2.95
Osage	...	....	....	T.	.49	.38	.22	....	....	.07	....	....	....	....	....	....	....	.....	....	....	....	.17	.10	.47	.28	....	....	....	....	....	....	2.18
Oskaloosa	....	....	....	T.	.62	.30	.83	T.	....	T.	....	....	....	....	....	....	....	....	....	....	.05	T.	.1	.09	02	....	....	....	....	....	....	2.18
Ottumwa	....	....	....	....	.25	.60	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.10	....	....	....	....	....	....	.95
Ovid	....	....	....	.04	.53	.32	.12	....	....	....	....	....	....	....	....	.06	....	....	....	....	....	.09	.05	.26	.07	....	....	....	....	....	....	1.54
Pacific Junction	....	....	T.	.60	1.10	.22	.05	....	....	T.	....	....	....	....	.24	....	....	.13	....	....	....	.13	T.	....	....	....	....	....	....	....	....	2.47
Pella	....	....	....	....	.01	.20	.90	....	....	....	....	....	....	....	....	.20	....	....	....	....	.01	....	....	.15	....	....	....	....	....	....	....	1.47
Perry	....	....	....	T.	....	....	....	....	....	.05	....	....	....	....	....	....	....	....	....	....	....	....	.25	T.	....	....	....	....	....	....	....	.90
Plover	..	....	....	....	.05	.38	.35	.15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.27	.16	....	....	....	....	....	....	....	1.36
Primghar	...	....	....	T.	.75	.70	.35	....	....	T.	....	....	....	T.	T.	.30	.10	....	....	....	....	.03	.20	.75	....	....	....	....	....	....	....	2.75
Red Oak	..	....	....	T.	2.10	.25	.10	....	....	.08	....	....	....	....	....	....	....	.02	....	.04	.03	.34	T.	.33	T	....	....	....	....	....	....	3.29
Ridgeway	....	T.	....	....	.13	1.07	.75	....	....	.06	....	....	....	....	....	.30	....	....	....	....	....	....	.61	.15	....	....	....	....	....	T	T.	.02	3.22
Rockwell City	....	....	....	....	.45	.57	.30	....	....	.25	....	....	....	....	....	....	....	....	....	....	....	....	.56	.10	....	....	....	....	....	....	....	2.53
Ruthven	....	....	....	.30	1.10	.80	.20	.10	....	....	....	....	....	....	....	....	....	T.	....	....	....	T.	.70	.40	....	....	....	....	....	....	....	3.60
Sac City	....	....	T.	....	.43	.72	.30	T.	....	.11	....	....	....	....	....	....	....	....	....	....	....	T.	.46	.15	....	....	....	....	....	....	....	2.17

DAILY AND MONTHLY PRECIPITATION FOR MAY, 1901—CONTINUED.

STATIONS.	DAY OF MONTH.																													TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Saint Charles	....	....	....	.02	.73	.25	.22	.02	....	T	....	....	....	....	T.	.63	....	....	....	....	....	.02	.43	.13	....	....	....	....	....	....	..	2.45
Scranton	....	....	....	....	1.40	....	.80	.07	....	T.	....	....	....	.....	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	....	..	2.27
Sheldon	....	....	T.	.42	.47	1.62	.33	....	....	.22	....	....	....	T.	T.	.08	....	....	....	....	....	T.	.15	.80	....	....	....	....	....	T.		4.09
Sibley	....	....	T.	.11	1.16	.46	.89	....	..	.09	....	....	....	....	T.	T.	....	....	....	....	....	....	.33	68	....	....	....	....	....	....	..	3.72
Sigourney	...	....	....	T.	.27	.75	.75	T.	....	T.	....	....	....	....	T.	...	....	....	....	T.	.11	.23	.08	.05	....	....	....	....	....	....		2.24
Sioux Center	....	....	T.	1.44	.46	1.11	.51	....	....	.02	....	....	....	....	T.	.21	....	....	....	....	T.	....	.42	.14	....	....	....	....	....	....		4.31
Sioux City	..	....	.11	1.30	.48	.74	.30	....	....	.06	.....	....	....	T.	....	.10	T.	....	....	....	....	.04	.49	03	....	....	....	....	....	....		3.65
Spirit Lake		....	....	T.	1.00	1 05	.26	T.	T.	T.	....	....	....	....	....	....	....	T.	....	....	.....	....	.35	....	....	....	....	....	....	....	..	2.66
Storm Lake	..	....	T.	.03	.09	.53	.30	.02	....	.07	....	....	....	T.	....	T.	T.	....	....	....	.....	T.	.23	.28	....	....	....	....	....	....	..	1.55
Stuart	....	....	....	....	....	.01	.45	....	....	....	....	.....	.....	....	....	.28	....	....	....	....	....	T.	.11	T.	T.	....	....	....	....	....	...	.85
Thurman		....	....	.90	1.40	.27	.10	T.	....	.60	....	....	....	....	.12	.03	T.	....	....	....	T.	T.	.64	T.	....	....	....	....	....	....	....	4.06
Toledo	.	....	....	....	.68	.25	.50	.42	....	....	....	....	....	....	.12	....	....	....	....	....	....	....	.88	.02	...	...	....	....	....	....	....	....	2.87
Villisca		....	....	.20	.90	.35	.10	....	....	.05	....	....	....	T.	.10	T.	T.	....	....	....	....	T.	.40	T.	....	....	....	....	....	....	...	2.10
Vinton		....	....	....	.41	.18	.85	.05	....	.19	....	....	....	....	....	....	....	....	....	....	.18	....	.51	.05	....	....	..	....	....	....	....	2.42
Wapello	....	....	....	....	1.28	T	.55	.05	...	....	.18	....	....	....	....	....	....	....	....	T.	T	.30	.15	.07	....	....	....	....	....	....	..	2.58
Washington	...	....	....	....	.97	.08	.58	.04	....	....	.06	....	....	....	....	....	....	....	....	.02	.02	.04	15	.10	....	....	....	....	....	....	..	2.06
Washta		....	....	.98	.27	.53	.20	....	....	.23	....	....	....	....	....	.05	....	....	....	....	....	....	.30	.30	....	....	....	....	....	....	....	2.86
Waterloo	....	..	....	....	.44	T.	.37	.12	....	.06	....	....	....	....	.09	....	....	T.	....	....	....	.10	55	.06	....	....	....	....	....	....	....	1.79
Waverly	....	....	....	....	.39	.16	.48	.02	....	.02	....	....	....	....	....	....	....	....	.....	.05	....	.04	1.05	.17	....	....	....	....	....	....		2.38
West Bend	...	....	....	....	1.38	.26	.15	....	....	.05	....	.....	....	....	....	....	....	....	....	....	T.	.05	.21	.07	....	....	....	....	....	....	....	2.17
West Union	....	....	....	....	26	....	.57	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.16	1.00	.12	....	....	....	....	....	....		2.11
Wilton Junction	....	....	....	.39	....	....	....	.45	....	.12	....	....	....	....	....	....	....	....	....	.05	....	.54	.08	....	....	....	....	....	....	....	....	1.63
Winterset	....	....	....	T.	.49	.65	.18	....	....	....	....	....	....	....	....	.55	....	....	....	....	....	....	23	.43	....	....	....	....	....	....	..	2.13
Woodburn	....	....	....	.57	.39	.10	.12	....	....	.03	....	....	....	....	.81	....	....	....	....	....	T.	T.	.35	.30	....	....	....	....	....	....	.	2.67

Precipitation Chart May 1901



Vol. XII. JUNE, 1901. No. 6.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

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BERNARD MURPHY, STATE PRINTER
1901.

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MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XII. JUNE, 1901. No. 6.

IOWA CROP REPORT, JULY 1, 1901.

NUMBER OF ACRES PLANTED AND AVERAGE CONDITION OF THE STAPLE FARM CROPS.

Reports of county and township correspondents show the following results as to the number of acres planted and the estimated condition of staple farm crops in this state. The acreage estimates are based on returns of township assessors, as made under the law requiring a complete census of crop acreage to be made in odd-numbered years, when real estate is listed for taxation.

CORN. The total number of acres planted appears to be 8,687,480, which is an increase of 68,820 acres over the number credited to the state last year. The figures are made on very conservative lines, and it is believed that they do not exaggerate the actual acreage planted.

WHEAT. Winter wheat acreage 49,060; spring wheat, 1,138,290 acres, a decline of 305,280 acres compared with last year.

OATS. Number of acres, 3,799,220,—a decrease of 192,470 acres since 1900.

BARLEY. Number of acres, 604,160,—increase 102,420 acres.

RYE. Acres, 54,390,—decrease 48,290 acres.

FLAX. Acres seeded, 104,140,--decrease 4,710.

POTATOES. Acres planted, 136,300,—increase 27,450 acres.

MEADOWS. Number of acres, 2,691,550,—increase 142,640 acres.

PRAIRIE HAY. Number of acres, 1,018,010.

PASTURES. Number of acres, 8,107,442.

CONDITION OF CROPS JULY 1st. Corn 90 per cent.; winter wheat, 98; spring wheat, 93; oats, 85; barley, 93; rye, 95; flax, 94; potatoes, 92; meadows, 76; pastures, 80; millet, 93; apples, 51; plums, 70; grapes, 90; peaches, 98.

At corresponding date last year the figures were as follows: Corn, 104 per cent.; wheat, 93; oats, 92; rye, 89; barley, 94; flax, 92; potatoes, 98; millet, 93; meadows, 73; pastures, 84; apples, 76; plums, 68; peaches, 67; grapes, 65.

WEATHER AND CROP CONDITIONS.

June was warmer than usual, the average excess in daily mean temperature being about 2.3°. The first decade, however, was cooler than usual, with general prevalence of cold nights, the minimum ranging quite near the frost line in northern localities. The balance of the month was much warmer, and during the closing decade the temperature was unseasonably high, the heat being intensified by high winds, causing rapid evaporation of the deficient moisture.

The average rainfall for the state was about half an inch below normal, the precipitation chart showing the least amounts in the eastern half of the state, and particularly the counties bordering on the Mississippi river. There was not more than the usual inequality in the distribution of moisture, and the Missouri valley was the favored region in respect to moisture. The cool and dry weather in the early part of the month retarded the germination of late planted corn, but a fair stand was made, and the conditions throughout the balance of June were favorable both for the rapid growth of the crop and cleaning the fields by cultivation. At the close of the month corn was generally in a fairly promising condition, though somewhat smaller than usual at that period. The crops of spring wheat, oats and barley made rapid progress toward maturity in the closing decade, under influence of the excessive heat, and some apprehension was felt that premature ripening might impair the quality of the grain. Hay making was in progress in the closing week of the month, with light yield though the quality of the product was excellent. On the whole June was a favorable month, though the condition of all crops at its close was somewhat below the average of recent years.

GRAIN SWEATING IN STACK OR BIN.

A correspondent of the *American Miller* sends two samples of wheat. This wheat was grown on the farm of M. B. G. Edison, near Greenville, Ohio. It was from the same seed and sown on the same ground in 1899, yet there is seven pounds difference per bushel in the two samples. The correspondent saw this wheat while it was being taken in at the mill and got his information from Edison himself.

The difference between the two samples is that sample 1 tests 63 pounds to the bushel. It passed the "sweat" in the stack before threshing. It is plump, hard, and of a bright red color. Sample 2 tests 56 pounds to the bushel. It was threshed in the field and passed the sweat in the barn. It is not plump and is faded in appearance. The difference shown by the tests is very apparent in the wheat.

Dealers, as well as farmers, are interested in getting the best wheat possible, and here is something that should be brought to the attention of all. The sweating process is a perfectly natural one. It is apparently the end of the ripening process, and should be gone through in the straw. The discrepancy in weight is surely enough to set people thinking.—*Elevator and Grain Trade.*

IOWA CROPS, 1901—NUMBER OF ACRES BY COUNTIES.

COUNTIES.	Winter wheat—acres.	Spring wheat—acres.	Corn—acres.	Oats—acres.	Rye—acres.	Barley—acres.	Flax—acres.	Potatoes—acres.	Meadows—acres	Prairie hay—acres.	Pastures—acres
Adair	173	13,550	98,250	33,830	30	630	.....	1,580	35,460	1,960	92,270
Adams	780	6,060	68,270	18,240	160	720	.....	820	28,430	2,140	78,440
Allamakee	1,320	5,220	45,220	40,840	1,420	6,170	610	1,320	33,980	1,820	94,260
Appanoose	380	.....	50,860	7,250	820	.....	.....	510	40,550	1,320	105,240
Audubon	.....	24,270	88,270	35,190	70	3,170	.....	910	22,300	6,030	64,560
Benton	50	3,180	120,060	67,270	90	17,140	.....	1,480	36,150	9,250	98,610
Black Hawk	15	910	93,110	55,860	1,140	8,490	30	1,660	28,320	10,710	82,420
Boone	.....	7,780	106,420	46,130	440	810	.....	1,090	19,110	20,040	74,720
Bremer	46	890	59,950	51,850	320	1,870	1,490	1,380	20,120	15,120	68,450
Buchanan	13	630	82,910	50,910	110	2,830	270	1,420	32,580	12,520	92,490
Buena Vista	.....	10,570	105,360	56,110	150	7,120	610	1,820	17,620	20,130	70,170
Butler	.....	3,220	106,190	72,610	1,120	4,120	810	1,410	19,160	14,110	87,690
Calhoun	.....	12,970	112,150	55,290	210	4,690	760	1,230	12,610	25,240	66,220
Carroll	.....	24,370	117,320	54,750	150	3,120	90	2,160	19,430	16,170	73,120
Cass	210	21,940	103,230	38,310	140	1,040	.....	2,450	29,390	4,160	78,170
Cedar	330	1,020	107,060	37,140	610	11,020	.....	1,320	42,160	1,070	86,870
Cerro Gordo	.....	3,810	89,120	72,950	530	6,130	3,450	1,450	23,110	13,410	67,380
Cherokee	.....	30,320	107,120	45,940	.....	6,990	320	1,310	21,550	13,610	76,520
Chickasaw	.....	2,180	54,280	59,110	140	6,130	6,640	1,180	24,210	12,210	66,370
Clarke	210	90	53,150	17,430	150	190	.....	430	39,110	590	75,250
Clay	350	10,120	90,640	41,410	810	27,860	2,290	1,190	17,210	24,420	66,380
Clayton	830	6,370	84,290	64,320	2,050	6,910	310	2,120	40,520	4,660	135,110
Clinton	170	2,730	117,570	44,650	1,420	4,450	.....	1,410	46,350	5,040	112,510
Crawford	.....	43,170	120,940	38,830	90	3,350	.....	1,770	31,150	10,310	106,190
Dallas	220	7,210	109,230	38,710	250	840	.....	1,210	25,110	10,640	90,460
Davis	690	.....	59,020	18,570	1,470	.....	.....	610	48,050	.....	117,610
Decatur	1,030	.....	57,560	17,820	330	40	.....	690	40,120	990	104,080
Delaware	20	1,210	91,320	40,980	390	5,470	.....	1,260	36,730	9,850	107,670
Des Moines	2,890	230	65,220	27,360	2,100	120	.....	1,420	21,120	790	68,420
Dickinson	.....	18,810	39,490	20,790	210	24,170	5,720	590	6,970	19,320	34,730
Dubuque	.....	3,280	64,230	45,250	920	2,280	.....	2,140	34,510	3,540	89,470
Emmet	.....	17,920	49,610	24,910	150	19,510	3,030	490	8,370	17,610	36,210
Fayette	165	2,620	94,680	67,220	370	6,860	2,620	1,910	50,170	14,230	121,030
Floyd	19	2,050	83,310	65,610	580	9,010	4,110	1,890	22,150	7,880	62,200
Franklin	.....	6,880	97,240	74,450	460	4,810	2,030	1,270	19,120	14,910	64,810
Fremont	3,470	5,410	115,730	15,650	670	810	.....	1,050	22,170	7,040	55,220
Greene	129	5,140	101,380	51,450	110	3,190	190	1,180	18,550	19,870	69,320
Grundy	73	9,590	98,040	52,820	90	13,440	140	1,810	22,320	11,970	68,680
Guthrie	110	12,330	79,010	33,080	110	1,510	.....	1,020	25,140	7,080	74,290
Hamilton	27	9,450	98,260	53,750	90	1,230	240	1,230	17,910	27,510	76,520
Hancock	.....	13,240	80,480	66,720	410	6,160	3,980	920	16,520	22,410	51,430
Hardin	.....	14,320	94,690	56,690	90	2,250	320	1,210	18,850	17,930	81,490
Harrison	35	43,730	120,830	15,340	190	570	.....	1,740	7,980	16,420	91,710
Henry	1,540	160	67,450	26,980	1,980	360	.....	660	25,450	290	86,240
Howard	24	2,030	50,630	57,370	60	5,460	7,940	1,070	38,910	10,020	55,310
Humboldt	.....	17,990	60,120	32,970	40	2,270	1,750	770	12,230	17,870	43,110
Ida	.....	24,610	84,710	30,130	30	4,010	.....	1,020	21,110	5,850	52,890
Iowa	290	1,390	96,150	39,830	750	5,030	.....	1,430	40,580	2,040	92,810
Jackson	180	3,210	73,650	38,760	1,820	3,270	.....	1,360	42,110	2,610	136,690
Jasper	56	12,140	96,740	40,950	260	690	.....	2,960	27,030	2,180	92,210
Jefferson	1,209	240	71,540	22,850	2,320	1,020	.....	650	26,840	2,410	101,920
Johnson	570	1,310	105,750	38,940	1,710	3,210	.....	1,410	45,820	1,910	107,880
Jones	.....	1,150	82,870	32,210	700	4,010	.....	920	42,750	2,110	108,930
Keokuk	690	930	103,670	35,080	2,250	3,140	.....	1,160	37,550	480	97,150
Kossuth	.....	33,750	120,190	76,690	470	17,630	5,140	1,560	19,330	58,710	95,260
Lee	10,490	.....	55,210	23,070	2,420	.....	.....	1,550	37,110	210	94,240
Linn	73	1,550	108,710	47,850	450	1,850	.....	1,980	50,290	7,810	116,780
Louisa	2,240	510	71,380	23,110	2,510	360	.....	810	15,950	1,130	63,710
Lucas	370	210	53,810	13,570	890	220	.....	480	40,820	410	82,930
Lyon	.....	68,520	70,260	30,350	.....	44,230	910	1,350	5,690	13,700	37,880
Madison	240	6,580	81,910	23,970	290	1,360	.....	1,210	37,130	2,810	105,960
Mahaska	510	2,510	97,340	33,620	50	830	.....	1,510	28,510	1,120	93,310
Marion	390	5,460	94,070	31,380	720	930	.....	1,190	28,390	1,330	107,880
Marshall	.....	16,210	105,040	47,150	70	2,160	90	1,660	31,440	3,470	81,710
Mills	530	14,290	99,490	13,200	350	220	.....	1,130	17,730	5,540	71,900
Mitchell	.....	3,380	61,250	44,510	380	12,310	8,530	1,890	29,710	3,090	54,910
Monona	.....	38,150	115,910	14,120	280	4,560	210	1,370	3,860	22,400	98,850
Monroe	302	110	45,260	10,440	1,010	320	.....	590	31,190	560	99,870
Montgomery	710	17,280	89,260	13,310	170	230	.....	1,070	23,060	1,940	64,730
Muscatine	430	2,160	65,710	20,640	1,540	6,390	.....	2,820	22,950	1,770	69,810
O'Brien	.....	28,980	99,660	41,160	90	31,560	2,130	1,130	15,170	14,020	62,280
Osceola	.....	31,630	53,850	28,540	.....	36,160	2,360	770	10,580	11,610	27,920
Page	5,330	8,460	119,690	23,120	550	1,310	.....	1,070	16,160	3,760	86,740
Palo Alto	.....	8,730	72,410	47,320	510	10,820	3,840	1,420	7,970	40,020	60,340
Plymouth	.....	98,410	133,230	42,810	160	8,990	650	3,310	13,510	30,250	82,850
Pocahontas	.....	8,150	104,970	51,380	430	8,160	2,480	1,370	10,300	37,280	71,180
Polk	143	12,880	106,510	35,030	140	.....	.....	2,710	23,620	11,880	73,970
Pottawattamie	460	48,770	196,120	28,690	500	590	.....	3,280	32,570	15,220	123,790
Poweshiek	.....	3,120	108,630	44,710	130	4,120	.....	1,430	37,130	1,060	110,810
Ringgold	360	60	80,710	24,370	330	410	.....	750	53,980	880	112,010
Sac	100	14,450	118,960	42,860	90	8,570	210	1,220	22,410	17,610	73,870
Scott	430	8,360	75,680	22,060	780	27,010	.....	4,780	25,620	5,280	65,490
Shelby	.....	40,270	114,240	25,790	70	2,610	.....	1,610	29,220	8,530	75,800
Sioux	50	92,620	118,610	41,500	.....	31,630	910	1,400	10,560	21,620	53,950
Story	.....	4,660	108,930	47,220	370	870	410	1,050	22,320	18,380	72,870
Tama	.....	10,720	112,520	45,570	130	27,150	.....	1,620	34,070	6,340	106,020
Taylor	2,675	480	80,270	20,130	610	1,180	.....	1,240	37,580	1,570	91,380
Union	80	560	61,820	19,080	130	270	.....	1,090	38,300	1,380	78,810
Van Buren	3,031	.....	46,480	18,250	1,440	.....	.....	480	38,810	1,710	108,350
Wapello	730	170	60,250	18,020	1,170	350	.....	1,410	32,510	.....	89,780
Warren	90	7,010	87,810	22,540	390	1,180	.....	1,330	37,320	250	96,310
Washington	740	310	93,720	38,210	1,220	3,270	.....	880	35,240	290	93,260
Wayne	90	.....	69,630	15,120	550	.....	.....	520	67,150	540	109,110
Webster	.....	14,190	108,050	66,110	190	2,320	520	1,440	14,390	34,510	86,120
Winnebago	.....	21,170	46,550	34,610	60	4,070	3,460	790	11,410	25,210	41,420
Winneshiek	160	7,690	66,160	67,120	210	11,910	9,230	1,230	42,120	12,450	83,010
Woodbury	.....	63,200	141,110	27,140	160	3,120	690	1,840	11,860	12,160	72,110
Worth	.....	6,210	38,120	46,280	210	9,010	10,210	1,430	17,450	14,240	51,090
Wright	.....	12,410	80,640	59,040	150	5,230	2,410	1,070	16,240	20,160	57,150
Totals for state	49,068	1,138,290	8,687,480	3,799,220	54,390	604,160	104,140	136,300	2,691,550	1,018,010	8,107,440

SEASONABLE NOTES.

BY J. R. S. IN HOMESTEAD.

Cattle should beware of looking upon the clover fields when they are red and waving in the breeze with heads reaching well up on the flanks. A farmer near Ida Grove, Iowa, had a hundred acres of mammoth clover in blossom three feet high, and into that field he turned over three hundred head of steers just to give them a fresh bite for a little while. They disported gleefully and gorged themselves to such an extent that thirty-three head died from bloat within a few hours. The cattle ought to have known better; their owner will in the future.

The farmers who sell cream to distant butter factories are deprived of one of the rare delights of the country home, and that is good, fresh, home-made buttermilk. At its best it excels all the fancy drinks, fizzes, pops, soda-creams, etc., ever invented. It is a triple product of drink, food and medicine. When properly made from well-ripened cream, kept pure and cool, and freely imbibed by old and young, the doctor will have few calls to visit that family.

One of the striking features of June climatology was the excessive rainfall in portions of South Dakota and western Nebraska. A Chamberlain, S. D., special, dated June 23d, says for the past twenty-two days rain has fallen seventeen days, the total precipitation being a trifle over nine inches. At another place in Charles Mix county the paper reported thirteen inches in thirteen days in June, according to records at a government weather station. The old lake beds of that region were refilled and the fields were too wet for farming operations. Heavy downpours occurred in western Nebraska. And now it will soon be in order for some philosopher to project the theory that the climate is changing from dry to wet, and that in due time a marvelous transformation will be seen in the old-time desert regions of the continent. Thus swings the weather pendulum; and wise heads wag as they note the oscillations which seem to them to portend tremendous changes. But all the same the law of averages holds sway, and permanence may be relied upon.

The spring clean-up of gold in Alaska is estimated to be twenty million dollars. This sum will represent the arduous toil, hunger and privation of about two hundred thousand people during the terrible Arctic winter, from October to June. The same number of people engaged in farming in the corn belt will have a fall clean-up of about ten times twenty million dollars, and in respect to comfort and pleasure of living there is no comparison between farming in the central valleys and gold digging in Alaska.

In the heart of the corn belt no one ever saw the corn crop seriously injured by hot winds in the June period of its growth. A June drouth of ten to fifteen days' duration affords the best possible chance to kill the weeds and put the fields in fine condition to be laid by. And the corn plant is benefited by conditions that favor the development of the roots, which penetrate the loosened soil to greater depths when compelled to grow downward to secure needed moisture. The best preparation for a drouth in July is, not a saturated soil in June, but just enough of a drouth in that early period to perfect the root system of the corn plant. Corn will withstand dry weather and hot winds at any time better than the period of tasseling, silking and "shooting" ears. Then it must have a considerable reserve of moisture or it will perish.

All reports indicate that the crop of winter apples, and all late keeping varieties, will be exceedingly light—much lighter than the short crop of 1900. Of early and perishable apples there will be a fair crop, though not more than seventy to eighty per cent. of an average. Probably the markets will be heavily stocked with that class of short-lived fruit, and in view of the coming shortage in late fall and winter it would be well to preserve the choicest that may be obtained in cold storage, or by canning and drying. Apples will cost about as much per dozen as oranges before mid-winter, and canned Duchess, or other good summer varieties, will help to fill an aching void or "long felt want." It will pay big profits to "keep all you can, and can all you can't keep."

The natural habitat of the oats crop is in the zone at the northward of the corn belt. It is a rare thing to produce a bumper corn crop and a big oats crop in the same season, and in close proximity. The two plants originated in widely different zones, and are not exactly adapted to close fellowship in our modern system of farming. But in due time we may breed varieties of oats that will withstand the semi-tropical heat that is exactly suited to the corn plant.

Farmers and other residents of rural districts have a decided advantage over city people during the periods of intense heat of the summer. They are more accustomed to exposure to the direct solar rays, and much less liable to sunstroke or other ill effects of heat. The city toiler suffers tortures of which the farm laborer has no conception, the solar heat being intensified by reflection and radiation from pavements and walls of the city streets. And there is life and health in the pure and free air of the country, even when the mercury climbs up the scale into the nineties. For endurance of summer's heat and winter's cold life in the country is altogether most to be desired.

THE UNITED STATES AND ELECTRICITY.

Prof. Robert H. Thurston, in Popular Science Monthly, says that in 1800 Galvani and Volta sowed the seed, and since has sprung up the whole science and art of electrical physics. Thus, ten years ago we had about 700 miles of electric railway; to-day about 15,000 miles are in operation in the United States alone; a thousand millions of dollars are invested in the business, and an army of 200,000 men is employed, mainly in the great cities, but with steady growth toward all sections and into all aggregations of population. Two thousand millions of dollars are reported to be now invested in apparatus of electrical distributions of energy, converted ultimately into light and power. About two-thirds of a billion of dollars are invested in the property of electric light companies There are between 1,000,000 and 2,000,000 miles of telephone wires, and we can talk from Boston to Chicago, and from Chicago to San Francisco will soon be found an easy conversational distance. The Bell Company alone owns 1,000,000 miles of wire, has 1,500,000 instruments, and receives $6,000,000 a year from its business. The world outside of the United States utilizes not quite so much capital in this most wonderful of the inventions of the nineteenth century as does our own country, having about 500,000 exchanges to our 600,000 or more on the Bell system alone.

CLIMATOLOGY OF THE MONTH.

BAROMETER.—Mean pressure for June, 29.88 inches; highest observed, 30.27 inches, at Sioux City on the 7th; lowest observed, 29.54 inches at Dubuque on the 28th; range for the state, 0.73 inches.

TEMPERATURE.—The monthly mean temperature for the state as deduced from records of 110 stations, was 72.3°; which is about 2.3° above the normal. The highest mean temperature reported was 77.7° at Scranton; lowest mean, 68.4° at Sibley. The highest temperature reported was 106° at Wapello, on the 30th; lowest temperature reported, 30° at Larrabee, on the 7th. By sections the means were as follows: Northern section, 70.3°;

central section, 72.6°; southern section, 73.9°. For the state the average monthly maximum was 98.2°; average monthly minimum, 38.7°. The greatest daily range was 46° at Guthrie Center; average of greatest daily ranges, 35.6°.

PRECIPITATION.—The average precipitation for the state, as shown by records of 130 stations, was 3.71 inches, which is .55 of an inch below the June normal. The average by sections was as follows: Northern section, 3.19 inches; central section, 3.77 inches; southern section, 4.16 inches. The largest amount was 7.84 inches at Logan; least amount, 1.05 inches at Columbus Junction. The greatest daily rainfall reported was 2.95 inches at Iowa Falls on 27th. The average number of days on which .01 of an inch or more rainfall was reported, 9.

WIND AND WEATHER.—Prevailing direction of wind, south; highest velocity reported, 48 miles per hour, from northwest on the 21st at Sioux City. Average number of clear days 15; partly cloudy, 11; cloudy, 4.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date
Davenport	29.89	30.11	9	29.62	28
Des Moines	29 89	30 20	7	29.64	5
Dubuque	29.89	30.15	8	29.54	28
Omaha, Neb	29.82	30.20	7	29.52	5
Keokuk	29 90	30.14	7	29 64	5
Sioux City	29 86	30 27	7	29 57	5
Means	29.88	30.27	7	29.54	28

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,176	36	SW	28
Des Moines	6,002	36	SW	28
Dubuque	4,999	24	NW	6
Keokuk	4,753	36	SE	5
La Crosse, Wis	4,713	36	SW	28
Omaha, Neb	5,717	38	N	21
Sioux City	9,612	48	NW	21

OBSERVER'S NOTES.

AFTON—*N. W. Rowell.* Great windstorm on the 28th at 6:30 P. M., damaging ornamental and fruit trees, barns and sheds; two men hurt in southeast corner of this township.

ALTA—*David E. Hadden.* Cool nights first decade of month, with light frost on morning of 7th; frequent showers, with total of 3.20 inches; last week very hot; as a whole month was very favorable for most of the crops.

ATLANTIC—*J. W. Love.* During thunderstorm on night of 4th eleven head of cattle were killed on one farm, about six miles southwest of this city; last days very hot and dry.

BELKNAP—*A. W. Rankin.* June was dry and hot, following a dry May; crops burning up at close of month.

BONAPARTE—*B. R. Vale.* A few local showers, but a very dry month. Only 9 inches of rain since January 1, and 4.90 inches for crop months, April, May and June.

BRITT—*Geo. P. Hardwick.* High winds were severe on fruit, especially apples and plums; field crops late.

CLINTON—*Luke Roberts.* The mean temperature for the month was 73.2°, being 3.2° above normal, but lacks sixteenths of a degree of reaching the high mark of June, 1894. The coolest day of the month was the 7th, giving a mean of 53.3°, being 2.6° below normal. On the mornings of the 1st, 2d and 7th the minimum was 42°. From the 10th, to and including the 16th, the maximum temperature was about 90°, reaching 95° on the 16th. During the evening of this day the temperature rapidly fell, and no more 90° records were made for six days; then followed six consecutive days, each giving a maximum temperature of from 90° to 95°, the average being 93°. The next five days were slightly cooler; then followed nine consecutive days, lasting to the close of the month, with temperature of 90° or above, the highest of which reached 102° on the 25th. With the exception of the 18th of June, 1887, which gave a temperature of 103°, this was the highest June temperature during the last twenty-three years. The mean maximum temperature for the nine days mentioned above was 97°. Friday, the 28th, was the warmest day with a mean temperature of 87.2°, beating any June record during the last twenty-three years by 1°.

There were seven storm days, which aggregated 3.17 inches of rainfall, being 1.27 below normal. The greatest precipitation during any twenty-four consecutive hours was 1.84 inches, occurring on the 5th. There were five cloudy days, ten partly cloudy, and fifteen clear days.

CRESCO—*Gregory Marshall.* A very dry month; hay only half a crop; pastures brown and cattle turned into meadows.

FAYETTE—*R. Z. Latimer.* Frost on mornings of 7th and 8th doing light damage to low ground.

GRAND MEADOW—*F. L. Williams.* Month closed hot and dry; hay two-thirds of crop; pastures good but growing short

GRINNELL—*A. O. Price.* Rainfall 4.72 inches; corn made rapid growth last part of month and fields well tilled; growth about up to July 1st standard.

HUMBOLDT—*H. S. Wells.* Corn had not quite overcome late planting at close of June; potatoes damaged to small extent by heat; tame hay crop good.

KEOSAUQUA—*J. H. Landes.* Last part of month was a record breaker for heat, so far as my observation extends.

LARRABEE—*H. B. Strever.* Severe windstorm on afternoon of 15th in central part of county, destroying trees and outbuildings and one large barn.

MURRAY—*R. Stafford.* Very heavy wind evening of the 28th blew down six barns, and killed four horses.

OLIN—*Hon. N. Potter.* June was a wonderful month to develop corn; soil in fine tilth.

OVID—*H. C. Miller.* Nearly 2.00 inches of rain fell in 45 minutes on morning of 21st, doing great damage to crops and all plowed fields by washing; high wind lodged grain badly, and stock was killed by lightning during same storm.

RIDGEWAY—*Arthur Betts.* Warmest June recorded here, being 2° excess of heat; 372 hours of sunshine, and nearly 2.00 inches deficiency in rainfall, but showers were well distributed.

SHELDON—*J. B. Frisbee.* Minimum of 33° on 7th may seem low, but it was cold and the thermometer recorded it. Severe windstorm on 15th at 5 P. M. passed up the Floyd river, doing some damage.

STORM LAKE—*Prof. M. L. Fuller.* Every month but March has been short on rainfall; total deficiency January 1st to July 1st, 5.34 inches.

TOLEDO—*Lulu G. Bookwalter.* Corn is flourishing and crops in general give promise of abundant harvest.

VILLISCA—*C. E. Matteson.* A month of extremes in temperature. Plenty of moisture, except last four days of month; fine crop prospect.

CLIMATOLOGICAL DATA FOR JUNE, 1901.

NORTHERN SECTION.

STATIONS	COUNTIES	Elevation, feet	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., IN INCHES				Number rainy days	SKY			Prevailing direction of wind	DATES OF THUNDER-STORMS.
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall (unmelted)		Number clear days	Number partly cloudy days	Number cloudy days		
Algona	Kossuth	1,500	8	71.4	†1.4	96	26	36	7	33	3.82	† .24	2.30	.....	8	11	16	3	SE	15, 18, 21
Alta	Buena Vista	1,519	9	69.4	†6.3	97	30	34	7	37	3.20	-2.16	.70	.....	12	16	11	3	SE, S	2,5,9,10,14,15 20,21,29
Alta (near)	Buena Vista	....	....		.....	....	.....	.....	.....	.....	3.51	.....	.80	.....	9	....	....	....	.....	
Britt	Hancock	1,230	....	70.2	.....	95	14	33	7	36	3.45	.....	1.45	.....	11	10	19	1	S	5, 29
Charles City	Floyd	1,012	9	70.2	†1.6	99	26	34	9	36	2.69	-2.20	1.35	.....	10	13	17	0	SE	
Clear Lake	Cerro Gordo	984	....	72.0	.....	98	27	35	7	37	2.15	....	.55	.....	7	16	12	2	SW	21, 29
Cresco	Howard	1,280	28	69.1	†2 8	99	26	34	8	36	1.52	-3.61	.44	.....	11	15	11	4	SE	5,10,12,16,27, 28,29
Decorah	Winneshiek	900	7	71.2	†2.8	101	27	32	8	42	2.99	-1.36	1.11	.....	9	....	....	....	....	
Dows	Wright	...		70.4	...	97	27, 30	35	7	36	2.28	.....	.74	.....	11	19	8	3	SE	15, 27
Elkader	Clayton	.	19	73.0	†3.5	102	26, 30	34	8	45	1.56	-2.33	.63	.....	5	9	21	0	SE	5,10,11,14,21, 27,28,29
Estherville	Emmet	.....	....	69.4	.....	95	25, 26, 30	35	7	31	3.22	.....	.82	.....	17	15	10	5	S	11,14 15,21,27
Fayette (*c*)	Fayette	1,000	10	70.6	†2.2	98	27, 30	32	8	41	3.59	-2.51	1.04	.....	13	....	.....	....	SE	9,10,12,16,21, 27, 28
Fonda	Pocahontas	1,237	....	.....	.....	....	.....	.....	.....	.....	4.16	.....	1.43	.....	8	16	12	2	S, SW	5,9,10,11,14,15 19,20,21,28,29
Forest City	Winnebago	1,220	....	69.3	.....	93	30	34	7	33	3.43	.....	1.87		9	15	6	9	W	
Grand Meadow	Clayton	..	9	69.8	†2.9	96	27	37	7, 8, 9	33	3.01	-2.23	.70	...	9	9	15	6	SE	
Greene	Butler	943	....	72.0	.....	101	26, 27	35	8	41	2.22	.....	.55	.....	11	14	10	6	SW	21, 27, 28
Hampton	Franklin	1,240	10	72.2	†4.3	99	27	37	7	33	2.46	-2 51	1.12	.....	10	12	16	2	SE	
Hawkeye	Fayette		7	.....	.....	....	.....	.....	.....	.....	2.04	-2 42	.90	.....	7	....	....	....	.....	
Hoprig	Emmet	.....	....	.....	.....	....	.....	.....	.....	.....	1.81	.....	.36	.....	7	12	17	1	S	
Humboldt	Humboldt	1,082	7	72.0	....	97	27, 30	37	7	35	3.69	† .08	1.64	.....	9	18	6	6	NW	15, 28
Lansing	Allamakee	....	....	71.8	.....	101	26	38	8	40	2.63	.....	1.00	.....	7	8	22	0	.....	
Larrabee	Cherokee	....	9	68 8	-0.8	98	30	30	7	37	3 78	-2.38	1.28	.....	9	10	15	5	SW	
Le Mars	Plymouth	.....	....	70.4	.....	97	30	35	7	41	3.26	.....	.70	.....	10	9	18	3	S	
New Hampton	Chickasaw	1,166		69.0	.....	96	26, 27	36	7, 8	36	2.70	.....	.68		9	20	8	2	NW	
Northwood	Worth	1,210	....	68.8	.....	93	26, 27, 30	35	7	31	2.46	.....	.87	.....	11	10	16	4	SE	27, 28, 29
Osage	Mitchell	1,178	9	68.7	†2.2	95	26	34	8	31	1.58	-2.64	.34	.....	13	7	10	13	SE	5,9,10,16,21, 23 27,29
Plover	Pocahontas	....	....	70.2	.....	98	25, 30	32	7	43	3.67	.....	1.25	.....	6	20	5	5	S	
Primghar‡	O'Brien	....	....	.....	.....	....	.....	.....	.....	.....	7.46	.....	3.88	.....	9	15	0	15	SW	
Ridgeway	Winneshiek	.....	....	72 1	.....	101	26	38	7	36	2.71	.....	.50	.....	14	16	13	1	NE	4,5,6,9,10,11, 12,16,21,23, 27.28,29,30
Ruthven	Palo Alto	..	....	.....	.....	....	.....	32	6	.....	7.34	.....	1.40	.....	13	14	4	12	SW	
Sheldon	O'Brien	1,406	....	68.7	.....	96	30	33	7	40	4.93	.....	2.10	.....	14	12	9	9	SW	
Sibley	Osceola	1,506	7	68.4	†1.1	96	30	32	7	38	4.79	† .84	.89	.....	18	9	20	1	S	
Sioux Center	Sioux	...	...	69.8	.....	97	30	33	7	35	5.40.	.....	.84	.....	15	14	10	6	NW	1.2,4,5,8,9, 11 13,14,15,30
Spirit Lake	Dickinson	....	....	69.2	.....	94	25, 26	33	7	35	4.28	.....	1.03	.....	9	10	17	3	SW	6, 7, 15
Storm Lake	Buena Vista	....	11	70.0	.....	95	30	36	7	34	2 87	-1.65	.55	.....	12	16	10	4	S	2.3,5,9,14 15, 19,20,21,29
Washta	Cherokee	..	....	...	...	....	.....	.....	.....	.....	2.82	.. ....	.68	....	9	19	8	3	S	
Waverly (*a*)	Bremer	942	....	71.0	.....	97	26	39	8	30	1.87	.....	.50	.....	12	13	14	3	S	4, 5, 27
West Bend	Palo Alto	...	7	70.0	†1.8	96	30	35	7	35	3.07	- .79	1.26	...	8	17	11	2	S	
West Union	Fayette	....	....	.....	.	....	.....		.....	.....	4 24	.....	1.90	.....	6	24	0	6	SW	
Average		....	...	70.3	†2.0	97.2	.....	34.5	.....	36.4	3.19	-1.73	.....	.....	10	14	12	4	S	.....

CENTRAL SECTION

Amana	Iowa	....	24	73.2	†3.6	99	30	42	7	34	4.36	-.11	2.93	.....	9	16	10	4	S	3 4,5,9,10,12, 19,21,28
Ames	Story	936	20	74 4	†4.4	99	28, 30	39	7	41	2.36	-2.08	.50	.....	9	21	8	1	S	5, 21, 28
Battle Creek	Ida	.....	....	.....	.....	....	.....	.....	.....	.....	3 26	.....	78	.....	8	19	6	5	S	4,5,6,7, 9, 14, 17,19,21,22,23
Baxter	Jasper		....	71.8	.....	95	28, 30	38	7	33	4.53	.....	1 78		7	12	16	2	SW	
Belle Plaine (*c*)	Benton	840	10	72.5	†2.6	97	26, 30	.....	.....		3 04	-.52	1.40		8	4	23	3	....	
Buckingham	Iowa	.....	...	.....	.....	....	.....	.....	.....		2.99	.....	96	.....	9	11	19	0	.....	
Carroll	Carroll	.....	10	71.1	†1.1	97	30	35	7	37	4.41	† 23	1 22	.....	11	19	4	7	.....	9,15,19,21, 23
Cedar Rapids	Linn	744	18	74.2	†3.6	103	30	42	7, 8	35	3.86	†.04	1.24	.....	9	20	8	2	SW	20
Clinton	Clinton	609	9	73.3	†1 8	102	25	39	8	39	3.17	-1.61	1.84	...	7	15	10	5	SE	5,9,10, 13, 14, 19,21,27,28
Davenport	Scott	615	30	74 2	†3.3	97	30	44	9	30	3 02	-1 01	1.19	.....	11	17	11	2	E	5 9,10, 14, 18, 21,26,27,28
Delaware	Delaware	1,048	9	72 3	†3.5	97	27, 30	35	8	36	2.72	-1.56	.75	.....	8	13	15	2	S	
Denison	Crawford	1,192	7	72 2	†3.5	97	30	36	7	37	4 11	†1.16	1.48	.....	12	22	6	2	S	
Des Moines	Polk	867	23	73.5	†2 5	98	28	42	7	30	2.41	-2.58	.79	.....	9	11	16	3	SW	2.4,5,9,10,15, 19 21,27,28
De Soto	Dallas	866	....	75.5	.....	100	27, 28	43	7	34	3.42	.....	.66	....	8	....	....	....	.....	
Dubuque	Dubuque	655	28	72 5	†3.1	98	30	39	8	30	1 23	-3.46	.31	.....	9	10	18	2	SE	5,10,13,18,21, 23,27,28
Fort Dodge	Webster			70.7	.....	96	30	36	7	38	2.95	.....	1.00	.....	8	15	10	5	SW	
Galva (*a*)	Ida	.....	7	72.2	†3.0	99	30	.....	.....	.....	2.35	-1 33	.77	.....	6	....	.....	....	S	
Gilman	Marshall	1,053	....	.....	.....	....	.....	.....	.....	.....	4.88	.....	2.60	.....	6	17	9	4	S	
Grinnell (near)	Poweshiek	....	....	72.9	.....	99	30	40	7	32	4.72	.....	1.96	.....	7	16	8	6	SW	5,9,10, 16, 19, 21, 29
Grundy Center	Grundy	966	9	70.7	†0 9	94	26, 30	37	7	32	5.12	†1.10	1.17	.....	10	16	9	5	S	9,20,21,28
Guthrie Center	Guthrie	.....	....	75.9	.....	96	26, 27, 28	46	1	46	4.74	.....	.98	.....	9	14	14	2	S	
Harlan	Shelby	.. .	....	73.2	.....	100	27	37	7	45	7.29	.....	2 00	.....	11	9	16	5	S	4,5.7,9.10, 15, 16,18,19,21,22
Independence	Buchanan	921	38	70.7	†3 7	100	30	36	8	38	2.81	-1.99	1.05	.....	10	20	10	0	SE, SW	10, 12, 28
Iowa City	Johnson	644	10	73.8	†2.6	102	30	43	8, 9	35	3 33	-.35	1.62	.....	9	12	15	3	S	5, 18
Iowa Falls	Hardin	....	7	70.6	†1 9	96	26, 27	36	7, 8	37	5 24	†1 62	2.95	.....	11	15	9	6	SE	5, 9, 21, 27, 28
Jefferson	Greene	....		.....	.....	....	... .	.....	.....	.....	4.37	....	1.85	.....	10	11	5	14	SE	5, 19, 20, 21
Le Claire	Scott	.....	....	.....	.....	...	.....	.....	.....	.....	2.61	.....	1.41	.....	8	....	....	....	.....	
Logan	Harrison	928	35	71 9	†0.2	98	30	36	7	36	7.84	†2.33	1.83	.....	13	17	8	5	S	
Maquoketa	Jackson	.....	7	71.8	†0.7	98	25, 26, 30	39	9	34	3.11	-3.23	.85	.....	12	23	4	3	SE	
Marshalltown	Marshall	.....	....	73.0	.....	99	26, 30	39	7	33	2.80	.....	1.23	.....	10	14	13	3	S	
Monticello (*a*)	Jones	800	46	70.6	†1.8	100	30	37	8	43	3.56	- .90	2.16	.....	5	13	13	4	SW	
Mt. Vernon	Linn	....	....	74.4	.....	98	26, 28, 30	42	8	30	4.25	.....	2.00	.....	8	20	6	4	SE. S	5,19,21,29
Newton	Jasper	958	13	72.8	†2.2	98	30	41	7	30	3.58	- .48	1.05	.....	7	10	16	4	SW	
Odebolt	Sac	....	....	72.8	.....	100	30	35	7	40	3.72	.....	.74	.....	7	24	1	5	.....	
Ogden	Boone	1,109	....	70.7	.....	97	30	35	7	38	2 76	.....	.54	.....	9	22	3	5	SE	
Olin	Jones		....	72.8	...	98	27, 30	32	8	37	5.09	....	2.20	.....	8	...	...	...	.....	
Onawa	Monona	.....	....	72.0	.....	96	30	39	7	38	5.67	.....	1.35	.....	12	20	8	2	SE	15, 16, 18, 19, 21, 22
Perry	Dallas	....	....	72.9	.....	100	30	39	7	39	2.63	.....	.95	...	7	14	12	4	S	
Rockwell City	Calhoun	1,219	....	68 4		97	26	36	7	35	5.47	.....	1.75	.....	10	20	3	7	.....	
Sac City	Sac	900	21	71.1	-0.6	98	30	36	7	33	2.05	-3 04	.52	.....	8	20	6	4	SE	
Scranton	Greene	....	....	77.7	.....	97	28, 30	37	7	34	4.03	.....	.94	.....	7	21	7	2	SE	
Sioux City	Woodbury	1,122	12	71.5	†1.5	99	30	39	7	36	4.70	† .74	.80	.....	15	12	11	7	S	
Toledo	Tama	.....	6	73.2	†2.7	98	30	38	8	35	4.04	†1.56	2.06	.....	5	21	8	1	SW	
Vinton (*a*)*	Benton	800	10	72.3	†2.4	97	30	44	7	.....	3.20	- .34	1.29	.....	8	....	....	....	SW	5
Waterloo	Black Hawk	862	21	71.8	-1.0	98	27, 30	38	8	36	3.48	- .12	1.01	....	10	18	7	5	S	21, 28
Wilton Junction	Muscatine	....	.....	73.9	.....	101	26	41	8	38	2.04	.....	1.38	.....	6	11	18	1	S	
Whitten	Hardin	...	....	.....		....	.....	.....	.....	.....	....	.....	.....	.....	.....	....	....	....	.....	.....	.....
Average			..	72.6	†2.2	98.2	.....	38.4	.....	35 9	3 77	- .64		.....	9	16	10	4	S	.....

CLIMATOLOGICAL DATA FOR JUNE, 1901--CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PREC. IN INCHES.					SKY.			Prevailing direction of wind.	DATES OF THUNDER-STORMS
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted.)	Number rainy days.	Number clear days.	Number partly cloudy days.	Number cloudy days.		
Afton	Union	....	....	73.4	....	98	24, 26, 29	40	7	41	5.05	.....	1.17	....	11	13	14	3	SW	
Albia	Monroe	943	.	73.2		100	28, 30	42	7	37	2.47	.....	.91	....	7	16	9	5	SE	9, 21, 28
Atlantic	Cass	....	9	72.4	†2.6	99	28	37	7	35	6.70	† .85	2.49		8	6	21	3	SE	4, 5, 9, 10, 17, 18 19, 21
Belknap	Davis	857	....	74.6		98	28, 30	46	7	30	2.43	.....	.46	....	8	18	12	0	S	
Bonaparte	Van Buren	.....	9	74.8	†1.7	102	30	44	7	30	2.26	-2.02	.42	....	9	...	....	..	... .	
Burlington	Des Moines	.....	.	75.4	....	98	30	48	8	30	4.95	.....	1.42		12	16	10	4	S	5, 6, 8, 9, 22
Bussey	Marion	.....	..	.....	.. .	...		.....			3.10	.....	1.55	....	7	....	...	....	...	
Chariton	Lucas	1,030	....	73.2	...	96	28, 30	43	7	35	5.18	....	2.18	...	11	11	14	5	S	5, 21
Clarinda	Page	1,069	10	74.0	†2.1	102	28	44	7	41	5.94	† .89	2.00	....	14	11	15	4	S	
College Springs	Page	.....	9	74 8	†4.0	100	28	44	7	40	4.48	† .10	2.05	...	7	21	8	1	SE	
Columbus Junct	Louisa	....	....	75.6	.. .	104	30	45	8, 9	33	1.05	.....	.31	....	8	19	8	3	SW, W	5, 9, 10, 12, 18, 19, 21, 29
Corning	Adams	1,127	8	72.6	†6.3	98	28	43	7	39	5.34	-.98	1.32		12	14	13	3	SW	4, 5, 8, 14, 19, 21
Council Bluffs	Pot'wat'mie	989	....	74.9	.....	103	28	44	7	41	4.75	...	1.02	....	12	13	3	14	S	
Cumberland	Cass	.....	....	....	....	....	.....	.....	.....	...	5.14	.....	1.27		10	19	8	3	S	
Danville	Des Moines	713	....		....	....	.. ....	.....	.....		1.61		.35	....	7	22	1	7	... ...	
Eldon	Wapello	....	....	75.2	....	102	30	40	7	36	3.15	....	1.98		8	23	5	2	S	19, 23
Fort Madison	Lee	516	52	....	.	....	.....	....	. . ..	.....	4.91	† .63	2.23	....	8	11	9	10	SW	5, 9, 14, 22
Glenwood	Mills	979	30	74.6	†4.1	100	28, 29	43	7	32	4.66	- .19	1.07	...	10	5	24	1	SE	
Greenfield	Adair	. ..	9	72.8	†2.0	97	14	38	7	33	5.71	- .50	1.20	..	9	19	6	5	S	4, 7, 9, 10, 15, 18 19, 21, 28
Hopeville	Clarke	.....	..	72.1	...	96	28	44	7	34	4.85	.....	1.31	....	12	10	18	2	S	5, 9, 10, 15, 19
Indianola (*a*)	Warren	...	..	73.2	....	96	28, 30	42	7	27	....	.....		....	..	..	...	....	SW	2, 4, 9, 10, 20, 21 28
Keokuk	Lee	618	29	76.2	†4.2	100	30	50	7	26	6.34	†2.03	1.84	...	11	15	12	3	SW	2, 5, 9, 10, 12, 19 20, 21, 23, 26
Keosauqua	Van Buren	....	8	76.3	†3.0	101	30	47	8	31	2.31	-1.63	.56	....	10	...	....	....	.....	
Knoxville	Marion	....	...	74.0	....	97	28, 30	43	7	34	4.92	....	1.77	...	11	15	7	8	SE	
Lacona	Warren	....	....		....	..	.....	.....	.....	.....	5.45	.....	1.75	.	7	7	20	3	.....	
Lenox	Taylor	.....	..	71.5	....	94	28	43	7	32	4.96	.....	1.10		11	19	8	3	S	5, 17, 19, 21, 22
Mooar	Lee					99	28	.....	.....	.....	5.00	.....	1.92	....	4	12	9	9	NW	
Mt Ayr	Ringgold	1,236	7	72.8	†1.8	96	28, 29, 30	42	7	38	4.59	- .01	1.82	...	9	10	18	2	S	5, 21
Mt Pleasant	Henry	725		73.4	....	100	30	42	9	35	2.01	.....	.42	....	10	16	14	0	NE	12
Murray	Clarke	1,183		.....	....	....	. . ....		.. ...	.....	4.80	.....	2.50	...	4	25	2	3		
Omaha	Douglass	1,113	31	74.7	†2.7	100	28	45	7	33	5.31	† .01	1.75	....	11	9	16	5	SE	3, 4, 5, 7, 8, 9, 10 15, 17, 18, 19, 21, 27
Osceola	Clarke	.....	.	73.0		97	28	42	7	35	4.81	.....	1.35	....	9	14	6	10	S	4
Oskaloosa	Mahaska	850	17	73.4	†3.5	99	30	43	7	34	3.60	- .40	1.05	....	12	19	3	8	SW	11, 12, 13
Ottumwa	Wapello	630	6	.....	.....	101	30	....	. .....		2.04	-1.36	.45	....	7	19	7	4	....	
Ovid	Wayne	.....	7	73.4	†2.1	97	30	42	7	35	5.01	†1.18	1.95	....	11	17	1	12	SW	2, 3, 4, 5, 9, 12, 15, 16, 17, 19, 21, 22
Pacific Junction	Mills	960	....	73.4	....	100	28	44	6, 7	41	3 75	....	1.03	....	11	12	18	0	SE	4, 5, 8, 9, 10, 12, 17, 18, 19, 21, 22
Pella (*b*)	Marion	.....	....	74.4	....	98	30	42	7	34	4 56	.....	2.25	...	7	....	....	....	SW	
Red Oak	Montgom'ry	1,033		73.9	.....	96	28	47	7	29	4.33	. ...	1.00	....	9	13	16	1	SE	3, 4, 17, 19, 21
St. Charles	Madison	.....	..	73.6	.....	97	28, 30	47	7	31	4.36	.....	.80	....	13	15	13	2	S	2, 9, 18, 21, 29
Sigourney	Keokuk	....	...	76.0	.....	104	25	42	7	44	2.30	.....	.74	....	7	17	13	0	W	5, 9, 10, 12, 19, 21, 29
Stuart	Guthrie	...	..	72.4	....	98	28	38	7	31	4.34	. ..	.87	....	7	19	2	9	S	
Thurman	Fremont		...	74.0		100	28	45	7	40	4.81	.....	1.35		9	13	12	5	SE	
Villisca	Montgom'ry	1,058	7	74.0	†3.0	98	28	42	7	36	5.70	† .81	1.46	....	12	15	12	3	SW	3, 4, 5, 7, 8, 9, 12 15, 16, 17, 19
Wapello (*a*)	Louisa	578	..	75.8	.....	106	30	46	8	33	1.46	.....	.46	....	6	....	....	....	SE	6, 7, 11, 19, 21, 22, 27, 28
Washington	Washington	....	10	73.2	-0.5	100	30	40	7	33	1.61	-1.51	.67		6	....	.	....	SW	
Winterset	Madison	.....	9	73.8	†3.4	98	30	41	7	35	4.83	-1.34	1.50		8		....	....	....	
Woodburn	Clarke	.....	....		...	..	.....	.....	.....	....	4.44	.....	1.40	...	9	21	5	4	S	4, 9, 21
Average		.....	..	73.9	†2.9	99.1	.....	43.2	... ...	34.6	4.16	- .19	...	....	9	15	11	4	S	
Av. for the state		.....		72.3	†2.4	98.2	...	38.7	.....	35.6	3.71	- .85	....	....	9	15	11	4	S	

*Means determined from 7 A. M., 2 P M, and 9 P. M. observations, and maximum and minimum are taken from eye readings. ‡Received too late to be computed with means *a*, One day missing; *b*, two days, etc.

†Is used to indicate minus sign (†).

BELATED REPORTS.

MARSHALLTOWN. May. Mean temperature 62 2; highest, 91, on the 2nd; lowest, 36, on the 13th; greatest daily range 33; total precipitation, 2.89 inches; greatest in twenty-four hours, 1.55 inches on the 7th; prevailing direction, north. Number of clear days, 17; partly cloudy, 8; cloudy, 6; rainy, 8.

OSCEOLA. May. Mean temperature, 61 0; highest, 88, on the 16th; lowest, 38, on the 13th; greatest daily range, 35; total precipitation, 3.20 inches; greatest in twenty-four hours, .85 inch, on the 16th and 23d; prevailing direction, northeast; number of clear days, 15; partly cloudy, 5; cloudy, 11, rainy, 9.

ERRATA IN MAY REVIEW.

ATLANTIC. Mean temperature recorded, 60.9, on page 8, should have been 60.4.

CHARLES CITY. Total precipitation recorded, 2.20 inches, on page 7, should have been 2.30 inches.

FAYETTE. Total precipitation recorded, 1.50 inches, on pages 7 and 11, should have been 2 85 inches.

GLENWOOD. Mean temperature recorded, 61.2, on page 8, should have been 62.2.

GRUNDY CENTER. Minimum temperature recorded, 36, on the 14th, 25th, 26th, on page 7, should have been 34 on the 13th.

OSKALOOSA. Mean temperature recorded, 61.3, on page 8, should have been 61 2. Total precipitation recorded, 2.18 inches, on pages 8 and 11, should have been 2 08 inches.

WEST BEND. Maximum temperature recorded, 88, on the 17th on page 7, should have been 89, on the 18th and 31st. Minimum temperature recorded, 35, on the 12th, on page 7, should have been 33, on the 12th.

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR JUNE, 1901.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Mean.
Afton	Max	84	85	87	88	87	86	72	73	66	92	92	89	91	94	92	83	85	83	74	85	86	85	95	98	96	98	97	96	98	97	87 8
	Min	52	52	54	59	56	54	40	45	49	60	62	63	58	62	62	61	54	58	61	60	60	65	60	67	68	67	68	68	57	67	59.0
Albia	Max	80	82	86	87	87	73	69	69	73	86	90	90	89	92	91	84	85	58	62	61	63	65	60	66	72	72	71	70	58	63	59.6
	Min	48	52	55	60	58	52	42	47	46	50	59	67	61	61	66	67	53	58	74	81	85	86	91	95	95	96	94	93	83	95	83 4
Algona	Max	75	81	85	86	79	66	62	71	66	80	90	84	87	94	90	77	84	78	59	62	62	62	63	71	72	73	71	69	52	62	59 5
	Min	54	53	59	60	62	43	36	41	48	58	62	66	59	65	66	63	54	59	62	58	62	62	63	71	72	72	71	69	52	62	59 5
Alta	Max	82	83	84	80	80	62	65	70	66	76	86	80	88	91	87	69	80	78	66	78	80	83	88	91	92	93	94	93	83	97	81.6
	Min	54	53	59	60	62	43	36	41	48	58	62	66	59	65	66	63	54	59	62	58	62	62	63	71	72	72	70	60	54	60	57.2
Amana	Max	82	83	84	80	80	62	65	70	66	76	86	80	88	91	87	69	80	78	66	78	80	83	88	91	92	93	94	93	83	97	81.6
	Min	50	53	55	58	53	40	34	42	48	56	60	62	58	64	62	58	52	58	55	61	60	60	62	70	72	72	70	60	54	60	57.2
Ames	Max	78	80	86	88	83	72	64	69	69	84	89	86	88	91	90	85	81	82	74	81	87	87	90	94	95	97	96	97	90	99	85.1
	Min	56	46	57	63	62	52	42	43	46	61	67	70	64	62	67	70	58	62	57	55	66	64	62	71	71	74	72	70	60	70	61.3
Amana	Max	78	80	86	88	83	72	64	69	69	84	89	86	88	91	90	85	81	82	74	81	87	87	90	94	95	97	96	97	90	99	85.1
	Min	56	46	57	63	62	52	42	43	46	61	67	70	64	62	67	70	58	62	57	55	66	64	62	71	71	74	72	70	60	70	61.3
Ames	Max	77	81	85	88	82	74	68	71	71	83	88	84	89	92	90	84	84	83	74	85	86	84	92	95	95	97	97	99	91	99	85 6
	Min	56	46	57	63	62	52	42	43	46	61	67	70	64	62	67	70	58	62	57	55	66	64	62	71	71	74	72	70	60	70	61.3
Atlantic	Max	77	81	85	88	82	74	68	71	71	83	88	84	89	92	90	84	84	83	74	85	86	84	92	95	95	97	97	99	91	99	85 6
	Min	50	50	56	62	60	41	39	46	46	61	67	68	56	61	66	65	57	60	55	59	65	67	59	67	69	71	71	68	58	58	59.3
Atlantic	Max	85	79	86	85	81	73	72	72	66	88	89	81	90	95	91	80	85	82	76	85	87	86	91	94	95	95	96	99	92	98	85.8
	Min	44	51	53	59	60	42	37	48	52	60	66	65	53	62	60	61	49	60	62	62	62	63	61	70	73	72	72	72	52	71	59.1
Baxter	Max	75	83	85	85	83	72	68	68	65	81	87	83	87	90	88	79	84	83	75	82	85	86	89	93	92	94	93	95	88	95	83.8
	Min	52	50	58	60	59	46	38	44	47	60	65	69	57	61	65	68	55	60	58	56	66	65	61	70	70	70	70	65	58	71	59.8
Belknap	Max	77	83	87	85	89	77	68	67	73	85	89	87	89	90	89	82	84	84	74	90	90	90	91	95	97	96	95	98	94	98	86.4
	Min	53	56	60	63	61	55	46	51	49	64	68	71	64	66	66	67	60	51	51	60	62	62	64	73	74	73	74	78	65	77	62.8
Belle Pl'ne	Max	72	79	..	..	..	70	56	65	..	..	92	89	91	94	92	83	85	83	74	85	86	85	95	98	96	98	97	96	98	97	87 8
	Min	55	51	..	..	..	48	40	..	..	..	65	70	63	60	64	66	55	63	58	60	60	65	60	67	68	67	68	68	57	67	59.0
Bonaparte	Max	73	84	88	88	81	75	71	64	74	81	90	87	90	91	89	89	85	83	75	85	88	87	91	95	96	97	96	100	95	100	86.7
	Min	53	54	60	63	61	55	46	51	49	64	68	71	64	66	66	67	53	58	62	61	63	65	60	66	72	72	71	70	58	63	59.6
Britt	Max	76	81	86	84	81	62	63	73	72	85	88	86	93	95	92	77	83	78	74	81	85	86	91	95	95	96	94	93	83	95	83 4
	Min	48	52	55	60	58	52	42	47	46	50	59	67	61	61	66	67	53	58	74	81	85	86	91	95	95	96	94	93	83	95	83 4
Burlington	Max	75	81	85	86	79	66	62	71	66	80	90	84	87	94	90	77	84	78	59	62	58	62	62	63	71	72	73	71	69	52	62	59 5
	Min	54	53	59	60	62	43	36	41	48	58	62	66	59	65	66	63	54	59	62	58	62	62	63	71	72	73	71	69	52	62	59 5
Carroll	Max	82	83	84	80	80	62	65	70	66	76	86	80	88	91	87	69	80	78	66	78	80	83	88	91	92	93	94	93	83	97	81.6
	Min	50	50	55	58	53	40	34	42	48	56	60	62	58	64	62	58	52	58	55	61	60	60	62	70	72	72	70	60	54	60	57.2
Cedar Rap	Max	82	83	84	80	80	62	65	70	66	76	86	80	88	91	87	69	80	78	66	78	80	83	88	91	92	93	94	93	83	97	81.6
	Min	50	53	55	58	53	40	34	42	48	56	60	62	58	64	62	58	52	58	55	61	60	60	62	70	72	72	70	60	54	60	57.2
Chariton	Max	82	84	86	85	86	73	67	68	66	86	89	86	90	92	89	80	82	78	75	78	85	84	88	95	96	99	98	93	80	97	83.1
	Min	48	55	57	61	58	49	43	48	48	64	66	67	64	67	64	67	54	58	62	63	78	78	85	88	95	96	99	98	97	97	83.1
Charles Cy	Max	76	79	83	84	80	70	61	63	70	80	89	82	87	92	89	80	82	78	75	78	85	84	88	95	96	99	98	93	80	97	83.1
	Min	55	42	55	64	64	47	39	35	34	35	91	78	91	95	93	79	88	85	73	88	88	88	95	97	98	98	98	102	99	100	88.2
Clarinda	Max	87	90	87	87	86	76	71	74	70	95	67	61	56	62	63	59	52	60	63	62	61	67	61	68	70	68	68	68	58	72	59 8
	Min	49	49	52	60	59	48	44	50	52	69	82	94	91	92	93	90	80	82	75	71	75	84	83	87	94	91	92	98	86	94	85.1
Clear Lake	Max	84	88	89	91	84	72	72	77	45	52	64	65	60	61	64	60	65	62	57	55	66	64	62	71	71	74	72	70	60	70	58.8
	Min	65	50	54	61	59	47	35	37	68	76	87	93	94	92	93	92	95	86	86	81	82	83	90	94	98	102	99	100	91	101	88.1
Clinton	Max	80	81	86	91	85	73	65	68	39	41	59	64	64	61	66	64	65	58	55	54	53	63	64	61	61	70	68	68	58	58	58.6
	Min	42	42	55	62	63	54	42	70	68	69	93	89	80	90	90	91	79	90	83	78	78	90	93	96	90	96	96	100	98	97	89.6
College Sp	Max	86	87	86	86	84	76	70	46	51	53	65	64	59	63	65	58	51	59	60	80	86	88	86	95	98	100	101	97	100	97	89.6
	Min	51	57	55	59	56	53	44	71	73	87	93	88	93	93	92	88	85	84	63	63	58	66	66	64	73	74	75	71	74	64	74	63.1
Columbus J	Max	77	83	78	90	82	80	58	50	45	60	65	70	63	65	67	70	57	83	81	73	83	85	92	94	94	95	94	98	96	97	84.7
	Min	56	51	58	64	64	81	72	69	68	67	90	88	78	88	92	91	77	83	51	59	63	62	61	66	62	69	71	70	72	72	57	73	60.5
Corning	Max	83	81	85	83	..	59	45	43	49	52	60	66	64	56	64	66	60	51	58	76	88	86	87	96	89	98	98	99	103	99	101	87.3
	Min	49	53	..	..	..	87	76	71	71	68	92	93	76	90	95	93	..	86	80	76	67	67	66	68	72	75	75	73	72	70	60	62.5
Co Bluffs	Max	81	87	86	87	87	76	71	51	53	64	67	62	60	70	69	87	84	81	76	73	78	85	86	95	97	99	98	93	85	95	82.3
	Min	51	52	63	61	60	48	44	51	53	65	78	89	83	84	89	87	84	81	76	73	47	53	60	51	69	70	72	70	65	55	61	55 9
Cresco	Max	75	77	80	53	59	42	36	34	44	56	67	63	57	59	65	61	51	53	81	78	81	86	87	90	94	97	96	91	94	64	74	84 7
	Min	49	41	53	85	78	71	64	64	74	85	89	90	91	90	88	89	91	83	81	63	62	61	66	70	66	75	76	73	74	84	97	63.7
Davenport	Max	74	78	84	65	63	54	45	45	44	64	68	67	72	87	93	9	64	67	54	55	59	64	84	91	97	63	72	73	99	97	66	58	65	57 2
	Min	54	54	57	86	89	85	67	61	74	74	84	91	87	87	93	97	67	84	91	89	84	86	89	91	94	96	97	101	70	97	88	97	84.4
Decorah	Max	77	83	86	48	64	62	48	38	32	42	55	67	65	59	58	64	67	80	81	78	81	87	90	94	94	96	97	97	71	63	58.2
	Min	44	38	80	80	85	79	71	61	66	71	87	87	87	91	91	89	87	54	57	53	55	60	63	58	70	71	76	72	74	85	97	82.6
Delaware	Max	77	80	53	64	60	50	39	35	40	57	66	87	66	62	64	89	70	79	80	72	81	82	82	89	92	92	93	93	71	53	65	61 8
	Min	49	44	83	83	77	70	65	70	65	82	87	81	87	87	92	89	57	70	55	62	61	65	63	73	71	73	72	71	93	98	90	97	84 3
Denison	Max	82	84	83	83	59	55	41	36	46	45	58	65	83	89	91	89	75	84	81	78	83	85	86	90	94	93	94	74	72	60	75	62.4
	Min	52	52	58	59	55	41	36	46	45	58	65	88	83	89	91	89	75	84	81	78	83	85	86	90	94	93	94	74	72	60	75	62.4
Des Moi'es	Max	80	79	84	84	84	73	68	68	65	84	64	70	71	90	83	65	75	55	62	61	61	63	66	65	73	74	74	76	100	100	99	98	88.4
	Min	54	55	57	61	60	49	42	48	49	64	90	93	90	93	95	93	83	88	86	80	81	89	92	96	98	96	99	100	75	74	60	75	62.6
De Soto	Max	85	84	86	89	86	73	67	68	73	71	90	88	84	57	65	65	63	55	63	61	63	63	65	89	94	95	96	97	94	84	97	83.1
	Min	51	55	59	64	62	48	43	49	51	64	82	88	84	86	92	89	83	81	78	75	80	82	82	94	68	69	70	69	66	56	61	57.6
Dows	Max	75	79	84	84	84	78	69	64	68	38	45	57	67	68	53	60	63	52	58	50	59	63	63	54	71	72	73	98	67	59	64	57.4
	Min	51	51	57	63	60	42	35	38	64	69	82	90	88	88	90	87	63	81	78	76	78	84	87	87	94	97	98	98	72	59	100	88.2
Dubuque	Max	75	76	81	83	78	69	59	64	39	45	61	70	71	91	87	67	88	87	79	57	78	87	62	68	90	95	99	100	100	98	101	89.3
	Min	49	47	59	65	62	50	41	73	70	76	87	93	91	92	95	93	88	87	87	61	62	61	66	66	61	68	64	74	73	100	71	61 2
Eldon	Max	77	87	89	63	88	90	61	55	40	47	47	62	59	68	59	65	70	54	79	79	84	91	91	93	98	100	102	102	100	90	102	88 2
	Min	51	52	57	89	63	88	70	65	71	70	86	93	90	93	98	93	91	87	52	49	54	58	61	55	67	71	72	68	65	57	65	57.9
Elkader	Max	81	85	87	54	57	62	51	39	34	42	57	67	67	64	84	65	74	86	80	74	80	85	84	89	94	95	95	94	82	93	95	81.9
	Min	47	40	85	82	74	58	62	71	65	70	83	82	91	84	91	89	74	62	51	50	55	60	60	58	72	73	70	70	68	55	65	57 0
Estherville	Max	78	82	62	57	52	43	35	38	40	50	60	62	64	55	64	58	61	84	76	72	80	85	84	87	..	94	96	98	96	85	98	83 1
	Min	52	58	..	88	..	75	60	68	66	81	87	83	86	90	58	65	84	65	53	50	52	61	60	76	70	71	70	70	68	58	63	58 1
Fayette	Max	76	79	..	..	62	..	47	36	32	46	56	68	68	68	86	60	88	81	81	78	82	83	88	94	94	94	94	95	94	86	96	84.4
	Min	50	38	..	..	..	80	77	66	70	70	82	88	88	86	88	90	92	63	64	90	64	65	81	52	56	70	71	71	68	54	62	57.0
Ft. Dodge	Max	81	78	84	84	61	59	44	36	41	48	51	66	61	50	63	64	88	78	52	53	67	76	81	85	91	92	92	95	69	78	93	80.7
	Min	47	48	48	84	84	79	63	60	69	65	80	87	67	58	62	64	78	52	75	67	55	61	60	58	70	71	70	69	65	55	60	57.9
Forest City	Max	74	79	84	55	55	65	43	34	43	47	57	89	82	88	92	99	64	85	83	80	83	87	86	90	95	94	95	94	93	70	61	58.8
	Min	54	51	55	88	89	72	69	65	..	73	..	..	63	49	64	62	58	57	58	52	61	49	85	87	60	60	91	71	70	98	100	98	86 5
Galva	Max	76	88	88	54	59	58	40	..	..	.	91	90	87	88	90	89	87	64	65	80	80	87	85	91	74	76	75	73	100	168	76	62.7
	Min	54	49	54	59	85	79	75	72	74	73	62	70	62	84	59	65	62	68	88	65	64	74	84	62	74	76	75	73	74	87	94	81 7
Glenwood	Max	84	83	83	85	60	60	48	43	51	52	62	89	84	86	89	81	79	74	72	77	77	64	63	60	76	73	71	73	65	57	62	57.9
	Min	53	58	57	80	81	80	68	59	69	66	80	88	84	89	91	87	84	61	53	53	53	77	53	63	87	93	99	101	101	93	97	86.1
G. Meadow	Max	75	74	80	53	63	60	49	37	37	37	56	67	63	61	61	64	83	85	81	72	82	89	87	93	99	99	101	101	93	85	97	67	95	57.9
	Min	49	44	86	86	83	70	65	73	65	85	91	89	86	92	97	94	68	53	55	49	74	63	63	54	70	70	71	71	63	57	67	95	84.7
Greene	Max	79	84	53	64	62	46	37	35	45	57	67	86	86	55	58	65	76	83	82	74	85	85	86	90	92	92	92	81	72	58	72	60.9
	Min	55	43	85	83	84	71	71	68	66	86	86	86	87	97	65	90	60	53	53	60	63	63	65	63	68	70	95	97	95	91	99	84.0
Greenfield	Max	82	86	59	62	59	48	38	48	48	61	67	64	65	59	63	64	83	80	81	78	82	83	86	90	94	96	97	95	73	59	73	61.8
	Min	48	56	87	87	85	73	65	68	65	81	86	85	86	89	90	67	87	80	81	78	82	83	84	83	87	93	94	93	73	84	94	82.2
Grin'l (nr.)	Max	74	82	59	63	61	49	40	44	48	61	82	86	70	83	85	89	61	75	92	73	82	93	94	96	96	96	96	96	70	90	95	89 4
	Min	50	54	59	84	81	69	64	67	64	82	57	64	64	57	75	86	68	53	92	56	59	61	63	94	63	61	70	69	71	78	83	62.4
Grundy C'r	Max	76	79	85	61	60	55	37	38	44	57	90	103	64	96	95	94	92	60	91	58	56	61	86	85	90	97	98	99	94	97	84.9
	Min	54	50	56	92	89	87	82	69	65	83	90	64	96	65	51	90	94	62	50	85	81	73	83	64	89	62	83	85	64	89	62	59.6
Guthrie Cr	Max	86	94	93	57	59	42	36	46	72	62	83	90	86	69	59	65	94	60	91	56	59	64	89	62	83	67	85	63	88	62	69	88.0
	Min	46	49	50	86	81	72	37	39	45	57	92	67	92	96	60	92	63	76	88	59	87	67	92	96	97	99	100	100	99	99	96	58.4
Hampton	Max	77	82	87	63	61	45	37	70	78	69	51	58	92	91	80	62	92	63	76	57	88	82	84	88	94	97	98	91	73	59	70	82.8
	Min	55	53	58	88	79	71	40	37	66	66	86	86	80	66	62	88	76	63	83	81	88	82	83	67	90	94	96	97	96	70	97	61.4
Harlan	Max	86	86	86	82	60	59	49	44	47	50	52	65	66	65	61	65	67	66	68	63	74	77	56	63	67	68	71	73	97	94	70	84.5
	Min	49	54	53	82	83	71	66	66	66	68	82	89	84	88	93	93	64	87	83	61	83	84	85	86	90	94	95	96	97	94	59	59 4
Hopeville	Max	88	80	52	60	59	49	44	44	47	50	52	65	66	65	61	65	67	66	68	63	74	77	56	63	67	68	71	73	97	94	70	83.4
	Min	52	59	84	86	81	70	65	73	70	76	87	93	91	92	95	93	88	87	87	61	62	61	66	66	61	68	64	74	73	100	71	61 2
Humboldt	Max	79	84	58	62	60	45	37	41	48	57	82	86	84	86	84	65	67	81	54	56	56	62	84	85	88	90	93	96	72	99	96	83.5
	Min	49	49	83	85	79	69	61	65	64	42	58	66	65	83	67	81	67	86	59	62	64	73	97	93	96	98	102	100	97	102	73	62.9
In'pen'nce	Max	77	79	52	62	59	49	38	36	42	65	85	87	67	86	67	68	86	83	56	61	80	76	73	96	98	100	73	97	70	94	102	87.1
	Min	52	41	83	84	84	72	67	68	65	85	63	67	86	90	88	84	61	81	53	64	87	64	86	62	63	69	70	68	59	69	94	60.5
Indianola	Max	80	81	57	89	89	86	72	72	43	73	87	60	92	63	68	92	66	68	57	81	79	59	84	64	90	94	94	96	92	84	84	83 6
	Min	61	57	58	63	62	53	44	64	71	43	66	83	89	84	63	91	64	78	53	59	63	64	90	92	93	95	94	96	66	56	62	57.6
Iowa City	Max	80	82	89	58	86	84	61	68	36	48	51	63	64	90	53	58	94	64	89	63	69	71	97	95	96	98	97	95	96	93	98	86.2
	Min	54	45	83	84	81	61	44	36	70	58	73	52	58	81	89	90	64	87	67	68	64	90	69	92	67	68	70	69	75	70	95	66.1
Iowa Falls	Max	74	83	86	84	86	87	65	58	50	53	68	74	52	66	70	89	68	89	91	90	69	64	87	92	95	96	94	98

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR JUNE, 1901—CONTINUED.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Lansing	Max	78	82	81	85	80	67	59	69	69	80	93	88	92	95	90	88	85	77	75	81	86	89	85	97	99	101	97	97	92	99	85 2
	Min	42	42	50	66	63	47	42	38	44	57	69	65	61	61	65	68	59	55	50	58	58	65	57	65	73	69	75	67	59	66	58.5
Larrabee	Max	85	87	87	83	67	63	66	66	65	68	88	82	88	89	89	67	83	83	67	86	82	86	89	93	92	94	95	92	85	98	81.5
	Min	48	50	57	54	55	38	30	40	49	54	56	61	52	60	61	58	51	57	53	60	58	59	60	71	73	72	70	63	54	61	56.2
LeMars	Max	84	85	85	82	76	63	69	72	70	73	87	80	83	83	87	76	80	75	74	80	83	85	90	93	94	96	95	90	81	97	82.4
	Min	43	53	63	57	59	43	35	45	51	58	61	60	57	63	64	58	53	57	54	60	59	59	62	73	74	73	73	67	53	62	58.3
Lenox	Max	82	80	82	80	81	72	66	67	66	85	85	81	85	88	88	81	81	77	75	81	81	83	88	90	91	91	90	94	92	93	82.5
	Min	50	55	56	60	57	49	43	48	52	60	67	66	58	66	66	60	53	60	63	61	61	67	63	69	71	70	71	72	60	63	60.5
Logan	Max	85	82	84	87	84	74	72	74	71	85	90	85	88	95	87	75	84	83	88	89	84	88	92	95	96	96	97	96	97	98	86.6
	Min	56	52	53	52	54	39	36	39	50	54	60	58	54	50	52	55	59	57	60	64	57	64	60	67	69	68	67	66	71	73	57.2
Maquoketa	Max	77	81	82	85	79	72	64	69	72	83	90	90	92	93	92	90	85	83	78	83	85	88	91	95	98	98	96	96	90	98	85.8
	Min	44	39	58	61	60	53	41	35	39	60	60	66	62	62	63	65	58	52	49	54	61	62	68	68	68	72	66	65	57	65	57.8
Marsh'llt'n	Max	77	82	89	88	83	74	67	63	65	85	90	87	89	92	90	85	85	81	77	81	87	87	91	97	97	99	98	98	92	99	85.8
	Min	54	49	59	63	60	48	39	43	46	60	66	71	58	60	65	69	55	62	54	57	66	65	60	68	70	72	72	68	57	69	60.2
Monticello	Max	79	82	80	78	85	79	62	64	72	84	89	88	91	93	90	90	84	80	80	78	86	82	89	95	97	98	97	97	94	100	85.2
	Min	48	39	42	45	60	52	40	37	42	48	60	65	62	60	64	66	57	51	50	52	53	54	53	68	71	72	70	62	52	84	55.0
Mooar	Max	82	83	81	82	84	84	80	81	83	82	88	84	81	84	79	79	82	80	80	75	80	82	79	94	94	92	98	99	96	93	84.7
	Min	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mt. Ayr	Max	82	85	85	85	85	72	76	70	68	90	90	82	90	92	91	83	84	82	76	86	85	88	92	93	94	95	93	96	96	96	85.4
	Min	50	54	56	59	58	47	42	48	51	61	64	65	60	63	65	61	53	59	61	61	61	67	63	68	70	69	68	70	58	71	60.1
Mt. Plea'nt	Max	75	82	88	90	85	75	70	69	78	85	89	90	89	93	89	92	83	83	82	87	89	92	90	94	96	96	99	97	95	100	87.4
	Min	52	48	57	60	60	54	43	46	42	60	60	60	59	62	63	67	55	58	58	57	65	63	59	68	68	71	68	68	60	67	59.3
Mt. Vernon	Max	80	85	89	88	82	71	66	71	70	84	90	84	92	93	90	83	84	81	76	84	86	86	91	94	97	98	96	98	91	98	85.6
	Min	50	58	63	64	60	58	44	42	52	60	74	74	69	66	70	70	57	64	63	62	63	64	69	70	69	71	72	75	64	78	63.3
NewH'pton	Max	76	77	81	83	81	66	60	66	63	81	86	81	86	89	87	81	81	76	72	78	84	84	87	93	95	96	96	92	81	95	81.8
	Min	47	45	45	61	61	45	36	36	44	55	55	..	57	60	65	65	53	54	50	54	60	60	56	70	70	70	68	64	65	62	56 3
Newton	Max	75	83	87	87	83	73	69	69	65	82	88	86	89	91	89	81	85	82	71	82	86	87	91	94	94	95	95	97	92	98	84.9
	Min	52	53	58	62	59	48	41	42	47	61	61	69	61	63	67	62	57	62	60	57	64	64	63	70	71	72	72	70	59	73	60.7
Northwood	Max	74	76	78	81	79	70	60	66	66	78	86	82	84	88	86	80	78	75	74	76	81	79	84	91	92	93	93	90	77	93	80.3
	Min	55	47	52	61	60	45	35	36	45	56	65	64	56	60	63	64	54	56	53	55	62	61	55	69	70	69	68	67	56	62	57.4
Odebolt	Max	87	90	89	88	79	73	70	75	74	85	90	89	94	97	92	72	85	85	75	84	85	89	92	95	95	96	97	95	91	100	86.9
	Min	49	50	53	59	60	42	35	45	50	57	63	63	62	64	62	64	51	60	55	62	61	62	62	71	73	72	69	72	55	60	58.8
Ogden	Max	81	82	84	83	81	73	67	69	66	81	87	84	88	91	90	75	82	79	75	82	83	85	90	93	93	93	94	96	88	97	83.7
	Min	47	50	55	50	57	41	35	45	46	58	64	65	55	53	66	61	51	57	57	60	64	62	62	68	69	70	71	68	54	69	57.7
Olin	Max	76	79	85	86	80	70	61	66	71	84	88	88	89	90	89	88	81	82	80	80	85	85	90	94	97	98	98	96	93	98	84.9
	Min	52	42	55	65	62	54	42	32	43	60	65	67	63	63	65	73	57	66	55	55	61	61	78	69	69	72	67	72	57	81	60.8
Om'ha Neb	Max	84	82	83	84	77	73	69	70	67	91	91	78	86	92	90	74	83	80	75	85	84	85	94	97	97	98	96	100	98	99	85.4
	Min	57	62	60	59	59	51	45	50	54	67	70	62	63	67	70	59	60	61	64	65	61	68	68	74	76	77	76	72	65	77	64.0
Onawa	Max	85	84	85	85	84	72	70	72	71	84	88	87	85	87	89	79	80	79	83	83	88	82	90	94	93	95	94	93	88	96	84.8
	Min	47	56	57	60	62	44	39	48	53	59	67	61	57	65	65	57	54	51	50	50	50	60	66	72	75	74	74	72	57	74	59.2
Osage	Max	73	75	80	81	80	68	58	65	62	78	88	81	84	86	86	79	78	74	70	75	81	81	85	92	93	95	94	90	77	92	80.0
	Min	53	53	51	61	61	46	36	34	44	56	66	66	56	58	64	66	54	55	50	54	61	60	56	69	71	71	68	66	56	61	57.4
Osceola	Max	82	81	86	84	85	76	73	67	70	87	89	87	87	90	91	75	83	81	77	85	85	85	91	94	93	92	92	97	93	96	85.1
	Min	52	54	60	54	60	48	42	46	49	56	63	67	72	61	64	66	55	60	65	64	63	67	61	70	72	69	69	70	58	71	60.9
Oskaloosa	Max	74	84	88	87	86	73	67	70	72	84	89	87	86	91	91	80	84	80	74	81	85	85	91	94	95	96	95	97	93	99	85.3
	Min	50	50	56	60	60	57	43	46	49	62	65	69	62	63	65	71	54	60	61	59	64	65	62	70	73	74	71	70	59	75	61.5
Ottumwa	Max	74	81	86	87	85	75	67	66	62	80	90	90	89	91	90	88	84	81	70	82	87	87	91	96	97	97	96	99	92	101	82.3
	Min	53	55	58	57	55	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	65	61	70	85	78	67	75	....
Ovid	Max	85	85	84	85	87	73	72	69	69	86	89	86	92	92	91	78	87	86	71	83	84	88	90	92	93	94	92	96	94	97	85.7
	Min	50	55	59	61	60	50	42	..	49	..	65	69	61	64	66	69	53	60	61	63	63	65	60	...	70	72	71	71	61	...	61 2
Pacific Jct.	Max	84	85	86	84	78	74	68	68	72	90	90	85	90	91	89	82	84	80	76	86	86	83	93	95	96	97	98	100	98	98	86.2
	Min	47	53	56	59	58	44	44	59	50	63	65	59	57	63	65	59	53	60	60	63	61	66	63	75	73	71	71	73	57	72	60.6
Pella	Max	79	83	89	86	86	75	72	76	..	85	88	89	90	94	92	80	..	86	86	81	86	90	94	95	94	97	96	92	96	98	87.7
	Min	54	52	55	62	59	50	42	46	..	48	65	67	60	67	66	67	..	55	62	63	64	62	67	69	70	71	72	60	68	72	61.2
Perry	Max	83	84	..	85	84	72	67	70	75	86	96	85	86	93	92	78	85	..	70	86	87	85	92	90	85	98	97	99	80	100	85.4
	Min	51	52	56	61	45	50	39	40	45	60	65	68	70	65	67	63	54	61	59	62	64	64	64	75	70	71	71	71	56	72	60.4
Plover	Max	80	87	84	85	82	63	63	73	77	82	88	84	89	94	90	78	82	81	82	83	83	75	80	94	98	96	81	93	85	98	84.3
	Min	50	52	58	60	56	40	32	41	45	56	54	68	56	60	62	60	50	62	56	60	45	48	66	76	74	73	48	55	65	55	56 1
Red Oak	Max	82	80	81	82	81	74	68	69	69	86	86	83	86	89	89	82	83	79	78	80	81	83	88	91	92	92	92	96	92	94	83.6
	Min	53	60	60	62	63	52	47	53	56	64	69	67	60	67	70	62	57	62	61	61	65	72	68	73	76	75	75	76	64	76	64.2
Ridgeway	Max	79	80	82	86	81	69	67	72	66	79	91	83	88	93	88	81	86	78	72	79	89	88	85	96	98	101	100	92	79	98	84 2
	Min	52	50	53	65	63	46	38	40	47	58	69	70	61	64	67	66	56	58	54	60	62	63	59	70	73	75	74	67	58	62	60.0
Rockwell C	Max	80	83	86	85	78	68	65	70	66	82	89	83	89	93	90	85	85	79	67	82	81	88	89	92	93	93	94	93	89	95	80 6
	Min	49	56	56	59	57	42	36	43	47	58	65	62	55	63	62	60	55	58	58	65	62	62	63	72	73	68	67	68	55	60	56.3
Sac City	Max	82	83	85	85	81	66	67	69	64	80	87	82	87	91	89	82	84	81	72	79	83	85	90	93	93	95	95	94	85	98	83.6
	Min	49	51	55	59	58	42	36	44	49	57	63	65	54	64	63	59	53	59	54	62	62	63	62	73	74	73	70	69	56	61	58.6
St. Charles	Max	86	82	84	85	85	72	..	76	65	85	87	84	88	89	90	75	84	82	.	82	84	86	90	93	93	94	92	97	90	97	85.4
	Min	52	56	59	60	60	48	47	48	49	63	66	70	60	63	65	65	66	60	64	63	53	67	63	70	72	72	72	70	60	71	61 8
Scranton	Max	80	80	85	85	81	69	65	74	68	84	89	86	90	93	92	79	82	78	77	84	83	85	92	95	95	95	96	97	91	97	84.9
	Min	51	55	58	60	62	43	37	47	49	59	66	66	57	64	65	60	55	60	59	62	64	64	66	72	73	70	70	70	57	65	60.5
Sheldon	Max	85	85	84	82	77	69	73	73	65	69	85	80	84	81	..	..	80	76	..	80	81	85	90	93	94	95	94	90	80	96	82.4
	Min	48	50	48	48	48	40	33	41	48	57	57	60	52	60	60	52	54	52	52	58	58	58	60	73	73	64	68	66	51	60	55.0
Sibley	Max	84	84	84	81	77	60	67	71	72	70	88	80	79	81	86	72	72	80	74	83	82	85	90	93	93	95	89	90	79	96	81.2
	Min	46	49	58	56	56	40	32	40	48	57	57	59	52	60	59	57	54	54	49	56	57	57	58	71	72	71	68	64	50	59	55.5
Sigourney	Max	78	89	92	91	90	75	70	76	78	90	96	95	96	99	97	85	88	85	77	90	90	90	100	102	104	102	102	102	102	103	91.1
	Min	58	49	55	62	60	52	42	44	44	62	63	69	63	62	64	68	54	65	60	56	65	66	61	69	72	72	71	70	58	73	61.0
Sioux Cen.	Max	83	84	83	82	73	63	64	73	68	69	86	80	81	80	84	73	82	79	73	82	81	87	88	93	91	94	94	89	80	97	81 2
	Min	53	56	59	57	59	42	33	45	52	59	58	61	56	62	63	58	54	58	54	58	59	62	62	72	73	74	70	67	55	62	58.4
Sioux City	Max	84	84	84	84	74	66	62	70	69	75	88	78	84	83	87	73	81	80	68	82	84	85	90	95	96	97	95	91	85	99	82 4
	Min	58	68	63	59	61	46	39	44	49	53	60	60	59	64	64	58	57	62	61	61	60	64	68	71	75	76	67	70	57	63	60.6
Spirit Lake	Max	79	86	85	84	80	..	59	73	64	65	76	81	83	91	92	77	79	78	71	80	79	82	89	92	94	94	93	90	89	92	82.0
	Min	49	56	54	53	60	42	33	40	49	55	57	65	55	..	55	50	50	53	53	57	60	60	62	73	73	73	71	61	56	57	56.3
Storm L	Max	80	79	81	81	75	65	64	67	65	77	84	79	84	87	85	80	80	77	72	77	80	83	84	90	91	92	93	91	82	95	80.7
	Min	50	56	57	62	60	45	36	47	48	56	61	62	56	64	63	58	54	60	53	60	61	63	64	73	73	74	71	72	58	61	59.3
Stuart	Max	89	87	88	86	82	76	67	70	65	85	91	84	87	92	95	75	84	70	79	82	85	83	92	96	94	97	97	98	92	97	85.5
	Min	..	57	57	55	58	56	38	45	47	59	59	67	56	62	65	60	53	45	58	60	60	65	62	67	60	68	70	69	77	68	59.2
Thurman	Max	85	85	84	84	80	75	72	71	71	94	90	86	88	91	91	79	83	82	78	87	84	83	95	96	96	97	96	100	98	98	86.6
	Min	45	55	51	60	59	47	45	51	53	64	69	61	58	62	66	59	50	61	61	65	64	69	64	74	76	75	75	74	57	76	61.5
Toledo	Max	75	82	90	87	84	80	72	74	68	85	87	90	93	93	81	80	89	85	82	91	90	93	92	95	95	98	96	97	89	98	87.1
	Min	47	55	58	62	60	57	39	38	46	54	61	69	59	60	66	68	54	62	54	59	63	62	58	60	72	74	72	67	56	71	59 4
Villisca	Max	86	88	87	85	84	84	78	72	68	92	89	80	89	94	92	86	80	80	77	86	86	86	92	94	95	94	94	98	97	97	87.0
	Min	54	55	60	65	60	62	42	48	52	62	61	67	55	64	67	56	52	60	64	62	62	63	62	69	69	69	68	72	58	72	61.1
Wapello	Max	83	83	89	..	88	81	82	77	70	72	81	91	92	91	89	98	93	86	76	84	80	86	94	99	102	101	90	102	98	106	88.4
	Min	53	56	59	..	65	63	61	46	48	48	61	65	65	67	68	70	61	64	64	60	68	66	65	73	76	76	72	74	65	73	63.2
Washi'gt'n	Max	75	83	86	88	83	72	73	68	73	83	91	86	89	89	91	88	84	81	78	83	86	85	91	95	96	98	97	100	93	100	86.3
	Min	54	49	56	62	60	50	40	43	43	58	62	66	61	63	64	65	54	60	60	57	65	64	60	70	71	72	69	70	60	74	60.1
Waterloo	Max	79	80	85	85	80	70	65	67	65	82	87	85	86	91	89	84	84	75	77	78	86	88	88	93	95	97	98	97	85	98	84.0
	Min	55	44	58	64	60	49	40	38	45	58	65	65	60	60	66	69	56	59	59	57	63	66	59	70	71	72	71	68	60	62	59.6
Waverly	Max	76	77	80	84	80	70	61	67	63	80	87	81	85	89	87	..	82	76	72	78	84	84	86	93	94	97	96	94	83	95	82.1
	Min	56	44	57	64	63	50	40	39	48	58	68	71	60	61	67	..	56	57	52	57	65	65	59	71	73	73	73	68	59	65	59 9
West Bend	Max	77	73	82	86	76	64	64	74	73	83	89	82	89	91	89	74	81	79	69	80	80	84	88	93	93	94	95	94	84	96	82.5
	Min	47	49	52	68	65	43	35	39	49	57	61	63	55	61	60	60	52	58	52	56	62	59	60	70	73	70	69	68	54	61	57.6
Wilton Jc	Max	78	80	82	89	87	73	64	69	75	87	91	90	89	93	92	92	82	86	81	84	89	88	93	97	99	101	96	98	90	99	87.1
	Min	48	42	54	56	62	54	42	41	42	60	65	76	77	61	85	68	55	59	54	60	56	63	62	71	71	73	69	67	58	69	60.7
Winterset	Max	85	89	87	85	89	78	70	69	68	78	89	87	90	90	91	75	86	84	..	90	86	90	92	94	95	96	96	97	91	98	86.8
	Min	50	54	57	59	69	45	41	48	49	62	65	67	58	62	55	62	53	59	64	68	62	65	62	70	70	70	70	69	56	70	60.7
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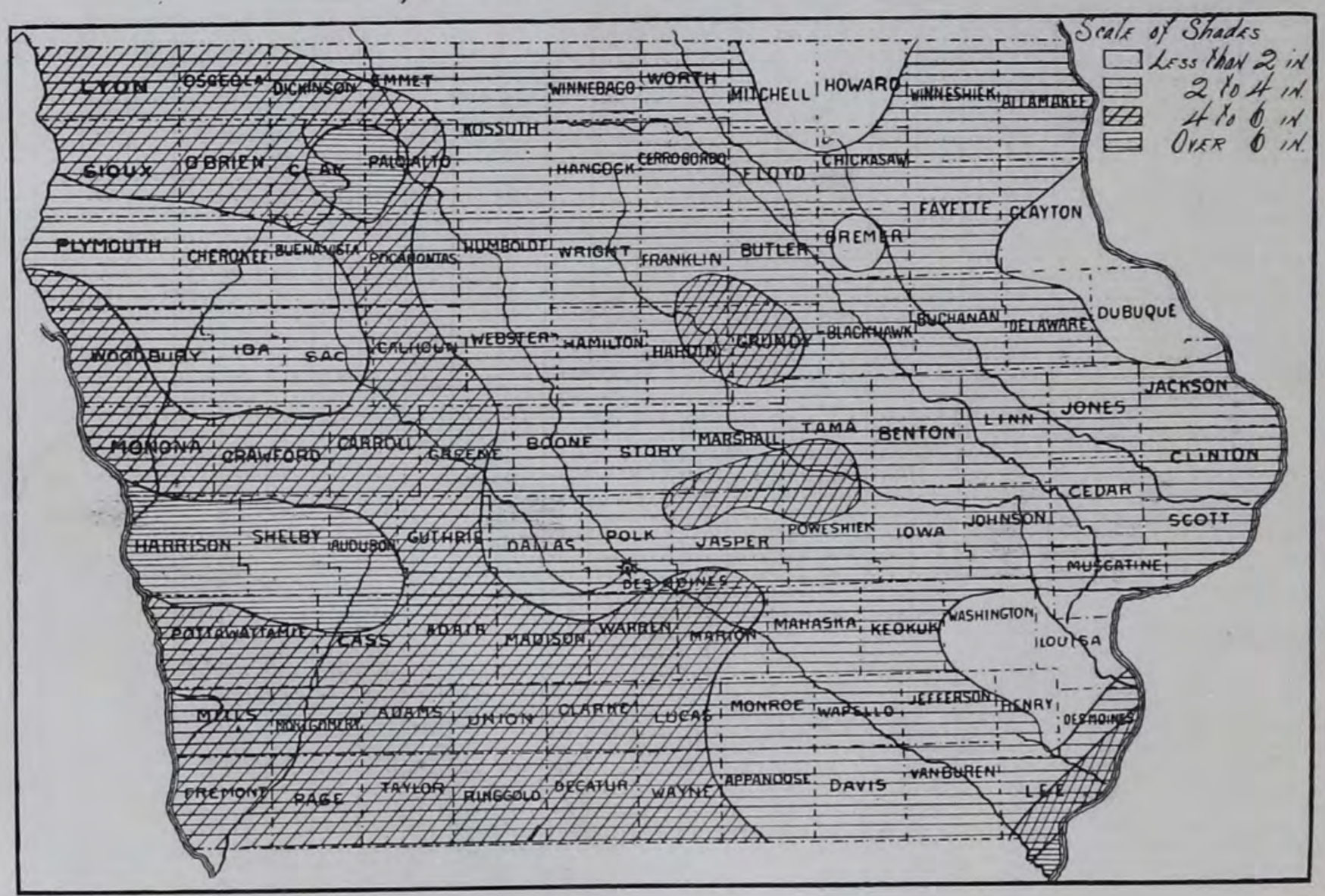
DAILY AND MONTHLY PRECIPITATION FOR JUNE, 1901.

STATIONS.	DAY OF MONTH.																													TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Afton	....	.28	....	.38		...	....	.17	.39	.68	....	....	....	....	....	....	T.	1.17	1.17	.02	.25	.14	..	....	....	....	....	.40	....	....	5.05
Albia	...	.16	..	....	.91	....	....	....	.35	....	..	.10	....	....	....	...	....	.39	.37	....	.19	T.	....	....	....	....	T.	....	T.	....	2.47
Algona	....	....	T.	....	....	....	....	....	.42	....	....	....	....	.07	2.30	....	..	.30	.25	.15	.30	....	....	T.	....	....	....	....	.03	....	3.82
Alta	....	.03	....	.36	.20	....	.02	....	.43	. .	....	....	....	.29	.70	. .	....	....	.22	.34	57	....	T.	....	....	....	....	....	.04	....	3.20
Alta (near)	....	....	....	.43	.18	....	...	....	.56	....	....	....	....	.62	.80	....	....	....	.24	.34	.26	....	....	....	....	....	....	....	.08	....	3.51
Amana	.01	....	.02	....	2.93	....	....	....	.07	.50	....	T.	....	....	....	....	....	.15	.38	....	.27	....	....	....	....	....	....	....	.03	....	4.36
Ames	....	.01	....	T.	.31	....	....	....	.33	.39	....	....	....	....	T.	....	.51	.45	1.48	....	.50	T.	T.	....	....	....	....	.25	....	....	2.36
Atlantic	....	T.	....	1.10	.17	..	T.	....	1.34	1.15	....	....	....	....	....	....	....	....	....	....	.50	....	....	....	....	....	T.	....	T.	....	6.70
Battle Creek	T.	....	....	.38	.07	....	T.	....	.68	T.	....	T.	....	T.	T.	.32	....	T.	.78	.18	.74	.11	T.	....	....	....	....	T.	....	....	3.26
Baxter	....	....	....	....	1.29	....	....	....	.31	1.78	....	.10	....	....	....	....	....	....	.50	....	.35	....	....	....	....	....	....	....	.20	....	4.53
Belknap	....	.03	....	....	.67	....	....	....	.61	.10	....	....	....	....	....	....	....	.21	.46	....	.18	.17	....	....	....	....	....	....	....	....	2.43
Belle Plaine	.10	....	....	....	....	.....	....	....	.10	1.40	....	....	.12	....	....	.10	....	....	.50	....	.60	....	....	....	....	....	....	26	....	....	3.04
Bonaparte	....	....	....	....	.42	....	....	..	.35	.17	....	.25	....	....	....	....	....	.30	.16	....	.16	.19	....	....	....	....	....	....	....	....	2.26
Britt	T.	....	....	T.	.05	....	....	.....	.32	.03	....	....	T.	....	....	1.45	....	.75	.13	.12	.30	....	....	....	....	....	....	.18	.10	.02	3.45
Buckingham	....	.03	....	....	.92	....	....	....	.07	.20	....	.22	....	....	....	.04	....	....	.35	....	.96	....	..	....	....	....	....	.20	....	....	2.99
Burlington	....	....	....	....	1.28	1.42	....	.17	1.17	....	....	.02	....	....	....	....	....	.07	.34	.05	.12	.09	.16	....	....	....	....	.06	T.	....	4.95
Bussey	.07	.07	....	1.55	....	....	....	....	.29	....	....	....	....	....	....	....	.42	....	....	.33	.37	....	....	....	....	....	....	....	....	....	3.10
Carroll	....	T.	....	.28	.14	.08	T.	....	.58	.05	....	....	....	....	.75	....	....	.05	1.00	.20	1.22	....	.06	....	....	....	....	....	....	....	4.41
Cedar Rapids	....	T.	.02	1.16	1.24	....	..	....	.31	.04	T.	.02	....	....	T.	....	....	T.	.27	.73	....	....	....	.....	....	....	....	.07	....	.12	3.86
Chariton	....	.03	.06	T.	2.18	....	....	....	.30	.07	....	.36	....	....	....	T.	....	.79	.73	....	.52	.02	....	....	....	....	....	....	....	....	5.18
Charles City	.04	....	....	....	.05	....	....	.05	.30	....	....	.15	....	....	....	T.	....	.17	T.	....	.30	....	T.	....	....	....	1.35	.18	.10	....	2.69
Clarinda	T.	.....	....	.53	2.00	....	....	1.98	.06	....	....	....	....	....	.12	....	....	.20	.13	.11	.60	.02	....	....	....	....	....	....	.19	....	5.94
Clarinda	T.	....	....	....	.30	....	....	....	.15	T.	....	....	....	....	....	.55	....	.10	.15	T.	.55	....	....	....	....	....	T.	....	.35	....	2.15
Clear Lake	T.	....	....	....	....	....	....	....	.03	.18	....	....	....	....	....	....	....	.58	.09	....	.33	....	....	....	....	....	....	.12	....	....	3.17
Clinton	....	....	....	....	1.84	....	....	....	....	..	....	....	....	....	.09	....	.86	....	.12	....	....	.09	....	....	....	....	....	T.	....	....	4.88
College Springs	....	....	....	.61	2.05	...	....	1.06	....	..	....	....	....	....	....	....	....	.03	.18	T.	.23	T.	....	....	....	....	....	....	.08	....	1.05
Columbus Junction	....	....	....	T.	.31	....	....	....	.03	.16	....	.03	....	T.	....	....	....	.03	.18	T.	.23	T.	....	....	....	....	....	....	.20	....	5.34
Corning	....	....	....	.62	1.32	....	T.	.15	.27	.42	....	T.	....	....	T.	.15	.09	.75	1.18	....	.16	.03	....	....	....	....	....	....	....	....	4.75
Council Bluffs	....	T.	.55	.90	.08	..	T.	.55	.23	.02	....	.11	....	....	.10	....	1.02	.20	.57	....	.42	....	....	....	....	....	....	.20	.03	.10	4.36
Cresco	....	....	..	.03	.18	.02	....	....	....	.44	T.	.32	....	....	....	.02	....	.10	T.	....	.08	....	T.	....	....	....	....	....	....	....	1.52
Cumberland	....	....	....	70	.48	....	....	.01	.49	1.00	....	T	....	....	.01	....	.02	.81	1.27	....	.35	....	....	....	....	....	....	T.	....	....	5.14
Danville	...	....	....	....	.21	.19	....	....	.18	....	.35	....	....	....	....	....	....	.03	....	.35	.30	....	T.	....	....	....	....	....	....	....	1.61
Davenport	T.	....	....	....	.53	.66	....	....	.02	.36	....	....	....	.32	....	....	....	.01	.03	T.	.35	....	....	....	....	.67	T.	....	.05	....	3.02
Decorah	.02	....	T.	....	.26	T.	....	....	....	1.11	..	.51	....	....	....	.28	....	.18	....	....	.17	....	....	....	....	....	.20	.16	.12	....	2.99
Delaware	....	....	....	....	.75	....	....	....	....	.50	....	....	....	....	....	.13	....	.64	.10	....	.41	....	....	....	....	....	.18	.01	....	....	2.72
Denison	....	....	T.	.47	.01	....	.11	....	.51	.11	....	....	....	....	.31	.14	....	.01	1.48	.06	.81	.09	....	....	....	....	....	T.	....	....	4.11
Des Moines	....	.01	....	.06	.52	....	T.	....	.34	.45	....	....	....	....	....	T.	....	.04	.55	....	.43	T.	....	....	....	....	....	T.	.01	....	2.41
De Soto	....	.03	....	.34	.66	....	T.	....	.65	.37	....	....	....	....	....	....	....	.33	.50	....	.54	....	....	....	....	....	....	T.	....	....	3.42
Dows	....	....	T.	....	.04	....	....	....	.15	.24	....	....	....	....	....	.05	....	.11	.04	.30	.74	.04	....	....	....	....	.53	.04	....	....	2.28
Dubuque	.03	....	....	....	.28	.03	....	..	....	.25	....	T.	....	....	....	T.	....	.26	.06	.02	.24	....	....	....	....	....	.06	..	T.	....	1.23
Eldon	....	T.	T.	....	1.98	....	....	..	.22	.08	....	....	T.	....	....	....	.09	.28	.39	....	.09	.05	.06	....	....	....	T.	T	....	....	3.15
Elkader	....	....	....	....	.63	....	....	..	....	52	....	....	....	....	....	....	....	.15	....	....	.17	....	....	....	....	....	T.	.82	.03	.06	1.56
Estherville	....	.10	.03	.05	.50	...	....	....	.25	.01	.02	....	....	.14	.05	.07	....	.12	.01	.53	.43	....	....	....	....	....	.02	.05	....	....	3.22
Fayette	05	....	....	....	....	.57	....	....	.02	1.20	....	48	....	....	....	.79	....	.14	T.	....	.37	....	T.	....	....	....	....	.35	....	....	3.59
Fort Dodge	....	T.	....	....	.53	....	....	....	.55	T.	....	....	....	....	....	1.00	....	....	.15	.13	.26	.03	....	....	....	....	....	....	....	....	2.95
Fort Madison	....	T.	....	....	2.23	....	....	....	.42	.53	....	05	....	T.	....	....	....	T.	.10	.15	1.15	.28	....	....	....	....	....	T.	.02	....	4.91
Fonda	....	....	.02	.08	.47	....	T.	....	.74	T.	....	....	....	T.	1.43	T.	T.	....	.43	.97	....	....	....	....	....	....	.34	T.	.14	....	4.16
Forest City	T.	....	....	....	.05	....	....	....	.35	....	....	....	....	....	....	1.87	....	.10	.11	.12	.35	....	....	....	....	....	....	....	....	....	3.43
Galva	....	....	....	.34	.41	....	....	....	....	....	....	....	....	....	....	.77	....	....	40	.05	.38	....	....	....	....	....	....	.18	....	....	2.35
Gilman	T.	....	....	....	1.20	....	....	....	.10	2.60	....	T.	....	....	T.	....	....	.13	.38	1.07	....	.42	.38	....	....	....	....	....	....	....	4.88
Glenwood	T.	T.	....	.97	.70	....	T.	.66	.04	....	....	.28	....	..	....	50	....	.11	....	....	.40	.03	....	....	....	....	T.	.10	.04	....	4.66
Grand Meadow	....	....	....	.02	.52	....	....	....	....	.70	....	.70	....	....	....	....	.15	....	.15	.10	.32	....	T.	....	....	....	.55	.49	....	....	3.01
Greene	....	....	....	....	.10	....	....	....	.15	.09	....	.02	....	....	....	....	....	....	....	....	.30	....	....	....	....	....	....	T.	....	....	2.22
Greenfield	T.	T.	....	.62	.50	....	.02	....	.53	1.20	....	T.	....	....	....	.17	....	T.	1.05	1.11	....	.51	T.	....	....	....	....	....	.22	....	5.71
Grinnell (near)	T.	....	....	T.	1.00	....	....	....	.22	1.96	....	T.	....	....	....	.38	....	T.	.51	....	.43	T.	....	....	....	....	....	.80	....	....	4.72
Grundy Center	T.	T.	.02	....	.82	....	....	....	.22	1.01	....	.82	....	....	....	.06	....	....	.18	.02	1.17	T.	....	....	....	....	....	....	....	....	5.12
Guthrie Center	....	....	....	.31	.53	....	....	.67	.98	....	....	....	....	....	.18	....	.12	....	.98	....	.78	.19	....	....	....	....	1.12	.05	....	....	4.74
Hampton	T.	....	....	....	.05	....	....	....	.23	....	....	.04	....	....	.14	....	....	.09	.06	.18	.50	..	....	....	....	....	....	....	....	....	2.40
Harlan	....	.05	T.	.43	.52	....	T.	T.	.93	2.00	....	T.	....	....	.04	.13	.02	.82	1.51	...	.84	T.	....	....	....	....	.23	....	.30	....	7.29
Hawkeye	.10	....	....	.28	....	.90	....	....	.08	....	....	....	....	....	....	....	.15	....	....	....	....	....	....	....	....	....	....	.35	....	....	2.04
Hopeville	....	.07	....	.22	1.31	....	....	.14	.38	.31	....	....	....	....	.05	....	T.	.52	.82	....	.66	.02	....	....	....	....	....	.36	....	....	4.85
Hoprig	....	T.	....	....	.10	....	....	....	.35	....	....	....	....	....	.16	....	.36	....	.12	T.	.36	....	....	....	....	....	....	.18	.02	T.	1.81
Humboldt	....	.16	.02	....	....	....	....	....	.65	....	....	....	....	....	....	1.64	....	....	.17	.13	.72	....	....	....	....	....	....	.25	....	....	3.69
Independence	.10	....	T.	T.	.80	.25	....	....	.08	.50	....	.20	....	....	....	.08	....	.10	.10	....	.35	T.	....	....	....	....	....	T.	....	....	2.81
Iowa City	....	....	.02	....	1.62	....	....	....	.07	.33	....	.50	....	....	....	.19	....	.19	.31	....	.10	....	....	....	....	....	....	T.	....	....	3.33
Iowa Falls	T.	....	T.	T.	.08	....	....	....	.22	.12	....	.02	..	....	....	.23	....	.10	.02	.22	.84	T.	....	....	....	....	2.95	.44	....	....	5.24
Jefferson	....	.05	....	.10	.40	....	....	....	....	.80	....	....	....	....	.27	....	..	.20	1.85	.18	.52	T.	....	....	....	....	....	....	....	....	4.37
Keokuk	.02	T.	.06	....	1.84	1 46	....	T.	.48	.39	....	20	....	....	....	....	....	T.	.10	....	.20	1.29	.30	....	....	T.	....	T.	....	....	6.34
Keosauqua	T.	T.	....	....	.45	....	....	....	.56	.08	....	.20	....	T.	....	....	....	.20	.25	07	.19	.05	.26	....	....	....	....	T	....	....	2.31
Knoxville	T.	.16	....	....	1.77	....	....	....	.81	.30	....	.19	....	....	....	....	....	.06	....	.05	.48	T	....	....	....	....	....	....	.20	....	4.92
Lacona	....	1.75	....	....	1.10	....	....	T.	.40	....	....	....	T.	.30	....	....	T.	T.	.60	1.00	....	.50	....	....	....	....	....	....	.10	....	5.45
Lansing	....	....	....	T.	.22	....	T.	....	1.00	....	....	....	....	....	....	1.28	T.	....	T.	.15	T.	....	.10	....	T.	....	....	....	.15	.....	2.63
Larrabee	....	....	....	....	.50	....	....	....	....	....	....	T.	.30	....	....	T.	T.	.15	T.	....	.10	....	T.	....	....	....	.43	....	....	....	3.78
Le Claire	.02	....	....	....	.22	....	T.	....	.42	....	....	....	....	....	....	.42	....	....	T.	T.	.22	.36	.95	....	....	....	....	.21	.10	.02	....	2.61
Le Mars	....	....	....	T.	.22	....	T.	....	.42	....	....	....	....	....	....	....	....	....	T.	T.	.04	....	.41	....	....	....	....	.09	....	T.	....	3.26
Lenox	....	....	....	....	.11	1.41	....	....	....	.70	....	....	.05	....	.12	.22	....	....	....	.12	.35	.40	....	....	....	....	....	.70	....	....	4.96
Logan	....	....	....	.40	.20	....	T.	....	....	....	....	....	....	....	....	....	.04	.01	.50	1.00	....	.33	T.	....	....	....	....	.25	....	....	7.97
Maquoketa	....	....	....	.40	1.10	....	....	.45	.13	.75	....	....	....	....	....	....	.04	.01	.50	1.00	....	.33	T.	....	....	....	....	.17	....	....	7.97
Marshalltown	....	.04	....	.37	.05	....	.10	....	1.02	1.83	....	....	....	....	1.11	.15	.05	....	1.06	1.00	....	1.02	....	....	....	....	.32	.04	.22	....	3.11
Monticello	....	....	....	....	.85	.05	....	....	T.	.60	....	....	....	....	....	....	....	.15	.23	.04	.57	....	....	....	....	....	....	....	.08	....	2.60
Mooar	.04	....	....	....	1.23	....	....	....	.37	.24	....	.03	....	....	....	.02	....	....	.35	.02	.45	.01	....	....	....	....	....	T.	....	T.	....	3.56
Mount Ayr	....	....	....	....	.80	.30	....	....	.25	..	....	T.	....	....	....	....	....	....	T.	T.	2.16	....	....	....	....	....	....	T.	....	....	....	5.00
Mount Pleasant	T.	.05	....	T.	....	.36	1.86	....	....	....	1.92	....	T.	....	....	....	....	....	....	T.	....	.86	....	....	....	....	....	....	T.	....	....	4.59
Mt. Vernon	T.	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.17	.97	....	.55	.10	....	....	....	....	....	....	....	....	....	2.01
Murray	....	T.	....	.25	1.82	....	T.	.54	.02	.17	....	....	....	....	....	....	....	.02	.16	....	.35	.16	....	....	....	....	.04	T.	....	....	....	4.25
New Hampton	....	T.	....	....	.42	....	....	....	.20	.20	....	.40	....	.06	....	....	....	.05	.57	....	1.00	....	....	....	....	....	....	....	.16	....	....	4.80
Newton	....	....	....	....	2 00	....	....	....	....	.28	.01	....	....	....	....	....	.18	....	.05	....	....	2.50	....	....	....	....	....	....	.30	....	....	2.70
Northwood	....	....	....	....	1.00	....	....	....	1.00	....	....	....	....	....	T.	....	....	....	....	....	.37	....	....	....	....	....	.57	.40	.04	....	3.58
Odebolt	....	.18	....	.15	.38	....	....	....	.33	.37	....	....	....	....	....	....	.22	....	.06	.32	.53	....	....	....	....	.....	....	.09	....	....	5.31
Ogden	....	....	T.	T.	1.20	....	....	....	T.	.52	....	....	....	....	....	....	....	....	.49	....	.34	T.	....	....	....	....	....	....	....	....	5.67
Olin	....	....	....	.94	.81	....	T.	.97	.12	T.	....	.11	....	....	.04	....	.30	1.10	1.32	....	.67	.14	....	....	....	....	.16	.06	.21	T.	1.58
Omaha, Neb.	....	T.	....	.75	.07	....	.06	.26	1.35	..	....	.06	....	....	.25	.60	....	.14	.01	T.	.24	....	.01	....	....	....	....	....	.18	....	4.81
Onawa	.03	....	....	.03	.12	....	....	....	....	.07	.18	....	....	....	....	.34	....	.12	.01	T.	.38	T.	....	....	....	....	....	T.	....	....	3.60
Osage	....	.03	.30	....	1.00	T.	.01	T.	....	.48	....	....	....	....	T.	....	....	1.35	1.08	....	.44	T.	....	....	....	....	....	....	....	....	2.04
Osceola	.02	.02	....	T.	1.05	....	....	....	.34	.25	.06	.46	....	....	.15	....	....	.19	.42	20	.20	.20	....	....	....	....	....	....	....	....	5.01
Oskaloosa	....	....	....	.40	....	....	....	....	.40	.10	....	....	....	....	....	....	....	.45	.29	....	.20	.20	....	....	....	....	....	....	....	....	3.75
Ottumwa	....	.02	.09	.02	1.42	....	....	....	.45	.09	....	.01	....	....	....	....	....	T.	.15	.69	1.95	.12	....	....	....	....	....	....	....	....	4.56
Ovid	....	....	....	1.03	.24	....	....	.59	.08	.02	....	.35	....	....	T.	....	.22	.22	.17	.60	....	41	.04	....	....	....	....	....	....	.30	....	2.63
Pacific Junction	....	....	....	....	2.25	....	....	....	....	.60	....	.16	....	....	....	....	.50	....	....	.45	....	.30	....	....	....	....	....	....	....	....	....	3.67
Pella	.13	.15	....	.25	.25	....	....	....	.65	....	....	T.	....	....	....	....	.25	....	....	.95	....	....	T.	....	....	....	....	....	....	....	....	7.46
Perry	....	.91	....	.03	....	....	....	....	.76	....	....	....	....	....	....	....	.37	....	....	.35	1 25	....	....	....	....	....	....	.33	.40	3.88	....	4.33
Plover	....	....	....	....	.75	....	....	....	.40	....	....	....	....	....	.40	..	....	....	....	.35	.50	.45	....	....	....	....	....	....	.04	....	....	2.71
Primghar	T.	....	.69	.80	T.	....	T.	.35	.06	T.	....	T.	....	....	....	23	....	1.00	....	.77	....	.39	....	....	....	....	.50	.20	.11	....	5.47
Red Oak	....	....	....	.07	.48	.08	....	....	.02	.46	.02	.32	....	....	....	....	.17	....	.09	.01	T.	.12	....	T.	....	....	....	....	....	....	7.34
Ridgeway	....	....	....	.40	.85	....	....	. ..	.35	.30	....	....	....	....	....	....	1.75	....	....	.90	.25	.26	.21	....	....	....	....	.50	.74	.03	....	
Rockwell City	....	....	....	....	.70	....	....	....	.50	.20	....	....	....	1.40	....	1.05	....	85	.20	.42	.25	....	....	....	....	....	....	....	....	....	....	
Ruthven	....	.50	....	....																											

DAILY AND MONTHLY PRECIPITATION FOR JUNE, 1901—CONTINUED.

STATIONS.	DAY OF MONTH.																													TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Sac City	....	T.	....	.21	.58	....	.01	....	....	....	....	....	....	....	....	....	.28	....	.52	.10	.24	.11	....	....	....	....	T.	....	....	....	2.05
Saint Charles	....	.16	.08	.24	.80	....	....	.02	.35	.77	....	....	....	....	....	....	....	.49	.75	....	.58	.01		....	..	....	....	T.	.11	....	4.36
Scranton	....	....	....	.30	.20	....	....	....	.78	....	....	....	....	....	.86	.....	....	....	.94	.09	.86	....	....	....	....	....	....	....	....	....	4.03
Sheldon	....	T.	T.	....	.35		....	....	.45	....	.60	....	T.	.30	2.10	.01	....	.30	.09	.25	.42	....	.03	..	....	....	.01	.01	.01	....	4.93
Sibley	....	.21	.07	.09	.03	.30	....	....	.24	.01	.56	....	.20	.10	.89	.34	....	.18	.10	.15	.97	....	....	....	....	....	....	.05	....	.30	4.79
Sigourney	T.	T.	T.	....	.50	...	....	....	.14	.40	....	T.	T.	....	....	.09	....	.13	.39	T.	.74	T.	....	....	..	....	....	....	T.	....	2.39
Sioux Center	.84	.....	T.	.28	.10	....	....	.....	.36	.02	.07	T.	.62	.70	.78	.02	....	.09	.12	.68	.70	....	.02	....	....	....	....	T.	....	....	5.40
Sioux City	....	T.	T.	.48	.06	....	.17	....	.77	....	....	.09	....	.41	.51	.01	....	....	.32	.37	.80	T.	.04	....	....	....	.63	.03	.01	....	4.70
Spirit Lake	....	.15	....	....	.75	....	....	....	.16	....	.12	....	....	....	.65	....	....	....	T.	1.03	.65	....	....	....	....	....	....	.40	....	.37	4.28
Storm Lake	T.	.09	....	.28	.11	....	.01	....	.41	.01	....	....	....	.26	T.	.55	....	T.	.29	.30	.53	....	....	....	....	....	T.	....	.03	....	2.87
Stuart	....	T.	.50	.55	....	....	T.	T.	.87	.40	....	....	....	....	....	T.	.60	....	.77	....	.65	T.	....	....	....	....	....	....	....	....	4.34
Thurman	T.	T.	....	.55	1.35	....	....	.76	T.	....	....	.15	....	....	.40	....	1.10	.15	.20	....	.15	T.	....	....	....	....	....	....	....	....	4.81
Toledo	....	....	....	....	2.06	....	....		....	....	....	....	....	....	....	....	....	.22	1.00	.65	....	....	....	....	....	....	....	.11	....	4.04
Villisca	....	....	....	66	1.46	....	....	.40	.10	....	....	T.	....	....	.10	.35	.10	.93	1.10	....	.25	04	....	....	....	....	....	.21	....	....	5.70
Vinton	....	....	....	T.	1.29	....	....	....	.04	.26	....	.18	....	....	....	.23	....	....	.14	....	.95	....	....	....	....	....	....	.11	....	....	3.20
Wapello	....	....	....	....	....	.33	.22	....	....	....	.46	..	....	....	....	....	....	.08	....	.27	T.	....	....	....	....	....	T.	.10	....	....	1.46
Washington	....	....	....	....	.67	....	....	....	.05	.22	....	....	....	....	....	....	....	.05	.24	....	.38	....	....	....	....	....	....	.....	....	....	1.61
Washta	T.	....	.34	....	.27	.....	.04	....	.62	....	....	....	....	....	.17	....	....	....	.45	.15	.68	....	....	....	....	....	.10	....	T.	....	2.82
Waterloo	.02	....	....	T.	.55	....	....	....	.08	.93	.....	.60	....	....	....	....	....	.04	.14	.17	.43	T.	....	....	....	....	....	.52	....	....	3.48
Waverly	.03	....	....	.01	.20	....	....	....	.20	....	....	.07	....	...	.....	.07	....	.10	.12	.01	.48	....	....	....	....	....	....	.....	.50	.08	1.87
West Bend	....	.15	....	....	T.	....	....	....	.50	....	....	....	....	.09	1.26			.38	.30	.12	.27	...	....	....	....	....	T.	....	T.	....	3.07
West Union	....	....	....	.....	.38	.16	....	....	....	1.90	....	1.36	....	....	.21	....	....	....	....	....	....	.23	....	....	....	....	....	....	....	....	4.24
Wilton Junction	T.	....	....	....	1.38	....	....	....	.06	....	....	....	....	....	....	....	....	T.	.12	....	.30	....	....	..	....	...	.10	.08	....	....	2.04
Winterset	....	....	.24	.42	.79	....	....	T.	....	1.50	....	....	....	....	....	....	....	.63	....	.68	.50	T.	....	....	..	....	....	....	.07	....	4.83
Woodburn	....	.03	.16	1.40	....	....	....	....	.40	.09	....	....	....	....	....	....	.82	....	.82	....	.38	.06	....	....	....	....	....	.28	....	....	4.41

Precipitation Chart June 1901.



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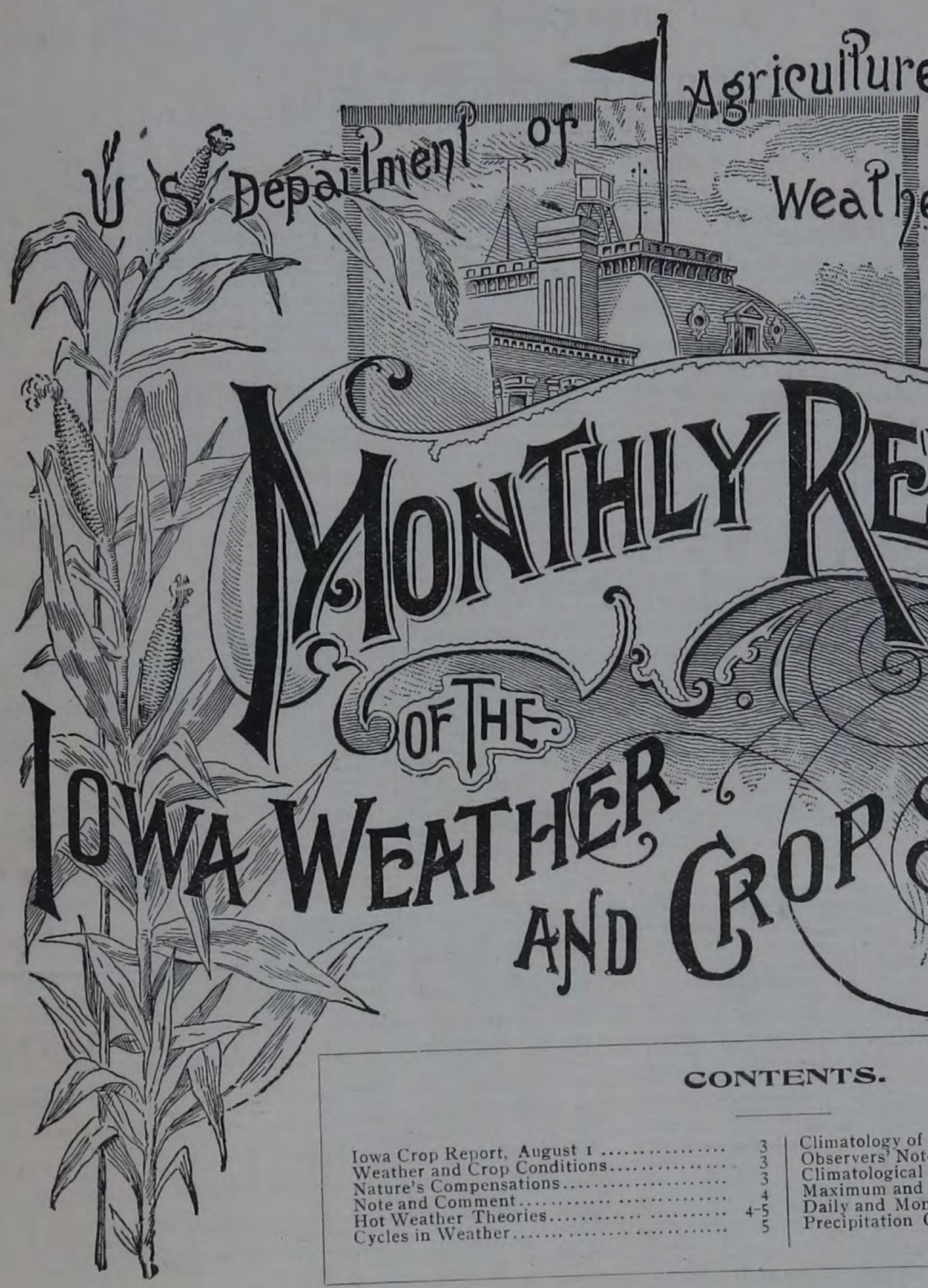

MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

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DES MOINES:
BERNARD MURPHY, STATE PRINTER
1901.

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MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XII. JULY, 1901. No. 7.

IOWA CROP REPORT, AUGUST 1, 1901.

Following are the averages of estimates as to the condition of crops, made by correspondents of this service August 1st. The condition of corn is unusually variable in different sections of the state, as shown by estimates ranging from 20 to 90 per cent., and the final output of this crop depends upon future contingencies as to moisture and early or late frosts; therefore the average estimate of condition for the state at large, made at this time, must be taken with due allowance for the unusual circumstances under which it has been put forth. No man at this time is sufficiently well informed as to the actual condition of the crop in all parts of the state to be able to formulate anything better than a guess relative to the final output of merchantable corn. Estimates of condition are as follows: Corn, 55 per cent.; spring wheat, 84; oats, 75; barley, 83; flax, 74; millet, 62; potatoes, 34; pastures, 45; apples, 35; grapes, 70.

The larger number of these reports were made by local correspondents during the last days of July, and before the beneficial effects of the copious showers were made evident. And the fact should be noted that the estimates are made by the larger number of reporters on the basis of 40 bushels per acre as the normal crop, representing 100 per cent. This would indicate an average yield of 22 bushels per acre, as the consensus of opinion of the reporters; or a total for the state of about 190,000,000 bushels. In my judgment the total will not fall short of that amount, but this estimate is subject to revision—when we know more about the matter.

WEATHER AND CROP CONDITIONS.

July, 1901, broke all records of monthly means and daily maximum temperatures in this state. The figures recording sustained high temperatures for the longest period ever experienced in this section will stand for comparison in future years, and it may be hoped the new record will remain unbroken during the coming century. The monthly mean for the state, 82 4°, is 8.7° above the normal, and the daily average temperature for the month has been 6° higher than in July during the great drouth of 1894. The surprising feature in the crop situation at the close of the month was that so large a percentage of corn and other unmatured crops survived the fiery ordeal of the solar rays, intensified by the hot winds and low humidity. As compared with conditions in the drouth of 1894, the destructive effects this season have not been so great because of the fact that the supply of soil moisture was greater at the outset and there has been a much larger amount of rainfall in the state at large. The intense heat and hot winds destroyed the higher tassels on the early planted corn, but the greater portion of the crop was planted later than usual, and when the force of the hot wave was broken, about the 27th, there remained sufficient vitality in stalk and tassel to bring forth the promise of considerable sound corn. And there is remaining a crop of fodder of very high quality that will be very valuable in this season of shortage of other forage crops, if it escapes damage by early frost and is all cut up and utilized. The dry weather was favorable for harvesting hay, oats, wheat and barley, which have been secured in very excellent condition. The small grain is unusually bright in color and the straw is free from damage by rust or the effects of wet weather in the harvest season. So there is more than usual feeding value in the straw that has been properly stacked.

The pastures have suffered great injury from effects of the drouth and overfeeding. The late potato crop will be exceedingly light. Garden truck, blackberries and raspberries, have been nearly all destroyed and apples suffered continual deterioration during the heated period.

NATURE'S COMPENSATIONS.

There are compensations in drouthy seasons that are not usually given due consideration. Some measure of the loss in bulk is made good by improved quality of products, providing there has been sufficient moisture at the outset to give vegetation a fair start. Grains, forage plants and fruits ripened in dry weather and sunshine are sweeter and more nutritious than those grown and ripened in wet seasons. The sugar beet may be ruined for factory use if the sweetness therein is diluted by much wet weather at the finish. A similar injury results under like conditions to sorghum cane, corn fodder and other products wherein sugar is an essential quality. Even the grasses in the pastures in very wet seasons are too sappy for the best results. The bunch grass of the semi-arid plains, though browned by the midsummer heat and dryness, are exceedingly nutritious and fattening to the ranchmen's stock.

The same thing is observed in relation to the flavor and quality of various fruits, sunshine being an essential factor in their perfect development. In very wet seasons they are bulky and somewhat off in flavor. In relatively dry seasons sugar is elaborated in greater abundance and the flavor is more satisfactory. The muskmelon is never at its best in wet seasons, though large and fine in appearance; and even the watermelon may easily be treated to an overdose of water. Sugar is the essential thing in flavor, and that is a product of dry air and sunshine. So of the two extremes a drouthy season is preferable to a very wet summer and autumn for that class of products. Thorough tile drainage will do much to correct the ill effects of excessive wet weather; but the ripening and sweetening effects of abundant sunshine are essential. In view, therefore, of the compensations of nature in drouthy seasons, we may find a measure of literal truth in the saying—"Sweet are the uses of Adversity."—*J. R. S. in the Homestead.*

NOTE AND COMMENT.

Shelled corn, 60 per cent.; all the corn fodder saved and utilized, 40 per cent. That makes 100 per cent., as compared with the years when only the shelled corn was reckoned in the estimate of the corn crop.

***

In the crisis of a battle the wise general brings up his reserves and saves the day. The farmers' reserves in this season of drouth are in his cornfields, in the unbroken ranks of stalks, blades and tassels; and if these are brought out in due time the fruits of substantial victory will be won, though at considerable cost. There will be no loss of stock for want of forage if all the reserves are brought forth.

***

Scientific agriculture formerly meant the practical application of a few well known principles. It has grown to have a wider meaning in these progressive days. Scientific agriculture now means chemical and microscopical research, engineering and physics generally. The scientific agriculturist of 1901 ranges over the field from hydrostatics to bacteria. It is not very many years, as time is calculated, since the discovery was made that clover and other leguminous plants stored nitrogen in the soil. Quickly thereafter it was determined the nitrogen was extracted from the air by multitudes of bacteria infesting the leguminous roots. Long before that, however, the practical farmer had learned that some soils would not grow clover, being "clover sick." But scientific agriculture has discovered a remedy for even this condition. The nitrogen-working bacteria have been cultivated and are supplied in proper medium for application to the land, just as phosphoric acid and potash are supplied to the farmer for the destruction of dangerous scales and other pests. Such is the scientific agriculture of today. It includes the ability to recognize causes by chemical reaction or microscopic investigation and the knowledge of what is needed to produce effects. Every year the requirements of successful agriculture are higher, and every year the attainments of the scientific agriculturist are increased.—*Pittsburg Dispatch*.

***

The solar eclipse of May, 1900, cast a partial shadow, or penumbra, over a belt about 5,000 miles wide, and the shadow moved at the rate of somewhat more than 2,000 miles an hour. H. Helm Clayton has made a summary of the observations, showing that the umbra, or small total shadow, was followed at a distance of 500 miles by a cold area, in which the fall of temperature was over 8° Fahrenheit. A cyclone—that is, a great rotating windstorm, and not a violent tornado—was quickly developed, moved with the eclipse, and was rapidly dissipated. The anti-cyclonic area extended for 1,500 miles from the umbra, beyond which the cyclonic ring had a width of 1,000 miles. This is a true cold air cyclone, and it has suggested that a like atmospheric disturbance must be produced by the shadow of the night, with a hot air cyclone by the heat of day —explaining the double diurnal variations of barometric pressure.—*Ex.*

HOT WEATHER THEORIES.

[J. R. S. IN HOMESTEAD.]

This hot and dry season is likely to bring forth short crops of some farm staples, but it is quite sure to be long on theories to account for the extraordinary heat and aridity. The sun-spot theory has been brought forth and seems to be received with some degree of public favor. This is a very handy theory for use in the solution of a variety of problems relating to the weather, for it has been advanced on occasions to account for wet and cold as well as dry and hot seasons. The convenience of the thing is that it will work equally well in solving the problem as to either extreme. When asked, "Whence this extraordinary heat?" one has only to say, "sun-spots," and that settles it; or, "Wherefore this cold and wet spell?" a like answer may be returned. Not many people are likely to stand on the street corners and argue the question with you, especially when it is extra hot or disagreeably wet and cold. So you may pass for something of a philosopher—among those who don't know you very well.

There is one little drawback, however, to the general use of this somewhat overworked theory, and that is there are no well attested facts to sustain the proposition that sun-spots have any effect upon the temperature of our planet. But for that rather unfortunate shortage of verifying data the theory would be eminently satisfactory and very scientific. It may make the sun hot to have those spots, blotches and deep pits on its face, for though of the masculine gender it is likely that Old Sol has some regard for his facial appearance; but he is not so unreasonable as to turn in and roast (or freeze) his planetary family on account of those unsightly eruptions. They are not to blame for it. And there is no evidence to sustain the charge that our grand solar orb exhibits any infirmities of temper or temperature because of those occasional blotches on his usually handsome countenance. The burden of proof rests upon those who make the allegation.

No, that sun-spot theory, as applied to existing conditions, fails to "hold water." We note this year the usual inequalities in the distribution, some regions being flooded while others have been parched. For the whole northern hemisphere we have no evidence to prove that it has received more than the normal heat, or less than the usual amount of precipi ation. Even within the area of the United States there has been about the usual amount of moisture, and this country is but a small portion of the hemisphere. There has never been a general drouth in this country, and never a year when it could be affirmed on good evidence that there was a general deficiency of rainfall or excess of solar heat for the world at large, or even the northern half of it. Now, if the sun should radiate a great excess of heat, even for a few months, the whole earth would be sensibly affected thereby, the insular regions, as well as the mid-continent areas, would be conscious of the increase in temperature. And the direct effect of an increased heat power would be a corresponding increase in the evaporation of moisture from all portions of the world affected thereby. That would cause increased precipitation instead of less, for whatever goes up in vapor must come down in some form. No, that sun-spot theory fails to "justify" with all lines of fact.

Seriously now, what are sun-spots? Well, honorbright, we don't know; and in that respect we are as well informed as the wisest men living or dead They come on and pass off, and their movements are controlled by some unknown law. Various tentative theories have been put forth as to their nature and origin; one man's theory is about as good as another's and sometimes a little better. The spots are not always equally numerous; at times hundreds may be observed, and again several days have elapsed without a single spot being visible. But, generally speaking, the sun at all times displays more or less spots or freckles on his radiant disk. There is a well defined periodicity in the recurrence of spots, the complete round being about eleven years and one month in duration. The last maximum number of sun-spots occurred in 1893, and the minimum was about 1899. So we are now again slowly approaching the end of the full period, and the next maximum year will be about 1904 to 1905. This signifies that we are not now under the influence of the average number of sun-spots, even if we allow that they have any effect upon our planet. As to the effects of sun-spots upon the earth, it may be said that when most numerous they evidently cause fluctuations of magnetic needles, and produce

what are termed magnetic storms, which are noted in the greater frequency and brilliancy of aurora borealis during the maximum sun-spot period.

Two and three months ago sun-spots were as numerous and as active as today, and yet the spring was cold and backward. Then people were guying the weather observers and asking: "When are you going to turn on the heat and warm things up a little?" Things have been warmed up some, and now they charge it up to the sun spots. One of the best astronomers in this country, Prof. David P. Todd, of Amherst college, author of "A New Astronomy," in answer to the inquiry as to the effect of sun-spots upon the earth, says: "Even in periods of largest and most numerous spots the amount of heat received from the sun is not a thousandth part lessened, and any effect of periodicity of the spots upon the weather is too slight to be detected." This statement, it will be observed, implies that, in Prof. Todd's opinion, the heat would be lessened in the maximum period if the spots caused any effect whatever. Really, now, if it can be proven that the spots are responsible for the increase of heat, the remarks of Lady Macbeth in the sleep walking scene would be in order.

CYCLES IN WEATHER.

When an exceptionally long and hot summer like that of 1900 is followed by such high temperatures as have prevailed for the last few weeks over a large part of the United States there is a strong temptation to suspect that the climate is undergoing a permanent change. Expert meterologists do not sanction that notion, however. They assert that the most marked characteristic of the weather is that it varies much of the time from the proper standards for region and season. Nearly every day is a little hotter or colder than the average for many years previous. And it is common for abnormally high or low temperatures to persist for weeks or months. But these excentricities, we are told, are compensated sooner or later by opposite conditions. And the uninitiated are warned against drawing hasty conclusions from what must after all be regarded as merely temporary meteorological extravagances.

Much is yet to be learned concerning the causes of hot waves. But at least two phenomena are rather closely associated with them. One is a peculiar stagnation of the atmosphere which prevails over the central part of the continent, where they originate. This unusual sluggishness gives the heating action of the sun a longer time to operate on the mass, and it prolongs the effects of the wave when the latter once starts eastward. Secondly, it is noticeable that the most intense heat prevails in the northeastern part of the country when a great high pressure area which is out at sea moves in over the South Atlantic States, giving New York southwesterly instead of southerly breezes. One wave traverses hot land, while the other flows over a cool sea. Both the inertness of the surface air and the displacement of the ocean anti-cyclone are probably due to the behavior of the upper currents, by means of which an interchange is kept up between the tropics and polar regions. And the power behind the general circulation, of course, is solar radiation. But that is about as far as it is possible to go in explaining hot waves.

The fact that the sun influences the weather both directly and indirectly naturally excites speculation as to the possibility of fluctuations in the thermal output of that body. The differences of temperature which any locality experiences from day to day are caused mainly, if not altogether, by changes of wind direction, humidity and cloudiness, rather than variations in solar energy. It is not unlikely that the latter occur, however, and astronomers and physicists have for years been trying to detect and measure them. Thus far but little definite information has been secured. The task is complicated but not necessarily hopeless. Langley's new method of investigation, for instance, may prove exceedingly fruitful. From an instrument that registers differences of a millionth of a degree it is not unreasonable to expect much.

A number of people have thought that they have found cycles in the weather corresponding to the eleven year sun-spot period or to longer periods of solar activity, which are less conspicuous. Much of this work is open to the objection that it represents only a single place, or a comparatively limited district, instead of the whole world. If there are systematic fluctuations in solar energy they should produce effects all around the earth. No periodicity in weather due to changes in the sun can be satisfactorily proved without data from the Arctic and Antarctic, South America and Africa, as well as from North America, Europe and Asia. The records should extend over a long term of years, too, and unless the observations are made with high grade instruments, exposed under uniform conditions, they would not afford a sound basis for comparison. Nevertheless, the supposition that exceptionally hot weather comes in cycles of eleven, thirty-five or sixty years is entirely credible, and some day may be established conclusively.—*New York Tribune*.

CLIMATOLOGY OF THE MONTH.

BAROMETER—The mean atmospheric pressure for July was 29.90 inches; highest observed, 30.17 inches, at Des Moines, on the 31st; lowest observed, 29.53 inches, at Sioux City, on the 4th; range for the state, .64 inch.

TEMPERATURE—The monthly mean temperature for the state, as deduced from records of 108 stations, was 82.4°, which is 8.7° above the normal, and 6° above the highest mean temperature in any previous July of record, which was in 1894. For the sections the monthly means were as follows: Northern section, 81.1°; central section, 82.2°; southern section, 83.8°. The highest temperature recorded in the state was 113°, at Sigourney, on the 22nd; lowest recorded, 46°, at Maquoketa, on the 8th. The average monthly maximum was 106.8°; average monthly minimum, 53.8°. The greatest daily range was 48°, at Guthrie Center; average of greatest daily ranges, 38.1°.

PRECIPITATION—The average rainfall for the state, as shown by records of 127 stations, was 2.34 inches, which is 1.34 inches below normal. By sections the averages were as follows: Northern section, 2.61 inches; central section, 1.89 inches; southern section, 2.53 inches. The distribution of moisture was about as usual, the west central district receiving less than the average of other districts. The largest amount reported at any station was 5.97 inches, at Ridgeway; least amount reported, 0.22 of an inch, at Denison. The greatest daily rainfall reported, was 4.83 inches, at Ridgeway, on the 4th. The average number of days on which .01 inch or more precipitation was reported, 5.

WIND AND WEATHER—Prevailing direction of wind, southwest; highest velocity reported, 39 miles per hour from the northwest, on the 4th, at Dubuque. Average number of clear days, 21; partly cloudy, 9; cloudy 1.

For reference and comparison there is given below a table showing the monthly mean temperatures, and average rainfall, for the state in the month of July, for the 12 years, from 1890 to 1901, inclusive.

YEARS.	MEAN TEMPERATURE.	AVERAGE RAINFALL.
1890	75.6°	1.98 inches
1891	68.6°	4.22 inches
1892	73.0°	5.29 inches
1893	75.0°	3.33 inches
1894	76.4°	0.63 inches
1895	72.1°	3.40 inches
1896	73.6°	6.90 inches
1897	75.6°	3.26 inches
1898	73.4°	2.98 inches
1899	73.1°	3.07 inches
1900	73.4°	6.15 inches
1901	82.4°	2.34 inches

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES. Highest reduced barometer.	Date.	Lowest reduced barometer.	Date
Davenport	29.91	30.15	8	29.60	4
Des Moines	29 91	30.17	31	29.56	4
Dubuque	29 93	30.16	8	29.59	4
Omaha, Neb	29.85	30.11	31	29.55	4
Keokuk	29 91	30.12	8	29 61	4
Sioux City	29 90	30 16	31	29 53	4
.....	.....	.....	.....	.....	....
Means	29.90	30.17	31	29.53	4

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity	Direction.	Date.
Davenport	5,151	26	W	6
Des Moines	5,109	32	SW	4
Dubuque	5,535	39	NW	4
Keokuk	4,879	24	NW	6
La Crosse, Wis	4,716	30	W	25
Omaha, Neb	5,062	32	SW	16
Sioux City	8,452	38	NW	28
.....	.....	..		....

OBSERVERS' NOTES.

AFTON—*N. W. Rowell.* To make an estimate on corn at this time is only guess work; will require thirty days for all conditions to develop.

ALTA—*David E. Hadden.* Mean temperature 9° in excess of normal; rainfall 2.61 inches below the eleven years' average.

AMANA—*Conrad Schadt.* July, 1901, may perhaps excel the record of the century in respect to high temperatures. During ten days, seven of which were continuous, the mercury rose above 100°; no dew was visible in the mornings for about two weeks. Corn, potatoes, apples and garden truck suffered intensely. Rye, barley, wheat and oats yielded good crops.

BELKNAP—*A. W. Rankin.* Hottest month ever known here; not half a crop of anything.

BONAPARTE—*B. R. Vale.* The driest and warmest July on record; seventeen days 100° or over, and on the 22d the mercury rose to 112°; average maximum, 100°. The rainfall record to date shows 2.30 inches less than in 1894, following a drier year.

BRITT—*Geo. P. Hardwick.* Very hot and dry till 28th; potatoes almost a failure; corn on dry soils fired.

CLINTON—*Dr. Luke Roberts.* For extreme heat, mean daily temperature, number of hot days, consecutive or otherwise, all former records have been broken by July, 1901. There was rain at each end of the month, with twenty-one rainless days between, and yet crops are not ruined. The precipitation for the month was 4 26 inches, being three-tenths of an inch above normal.

COLUMBUS JUNCTION—*H. E. Simpson.* Crops and fruit seriously damaged by local hailstorm six miles south and west of station on the 12th. Drouth broken by heavy rain on 28th.

CRESCO—*Gregory Marshall.* The great heat and lack of rainfall have been very hurtful to crops; corn and potatoes suffered most heavily.

FOREST CITY—*J. A. Peters.* Hot wind on 21st very damaging to corn; the rain on 28th will probably insure two-thirds of a crop of corn.

GRAND MEADOW—*F. L. Williams.* Highest temperature ever recorded here; on the 16th 102°, on 20th 104°, and on the 21st 108°.

GREENFIELD—*J. G. Culver.* The warmest month, with greatest percentage of sunshine ever recorded here. Greater part of county had 3 inches of rain since the 27th but it continues dry at Greenfield.

GRINNELL—*A. O. Price.* Temperature on twenty-five days over 90°, and eleven days 100° or over. Hottest month on record; corn not so much injured by lack of moisture as by hot winds.

GRUNDY CENTER—*E. S. King.* Very hard on corn but rain came just in time to save 85 per cent of the crop.

KEOSAUQUA—*J. H. Landes.* Abnormal and persistent heat, with drouth and hot winds, made the month a record breaker.

LARRABEE—*H. B. Strever.* July has made a record in high temperatures for the new century. Corn, potatoes, pastures and gardens suffered severely from extreme heat and lack of moisture.

LOGAN—*Mrs. M. B Stern.* My husband and myself have kept the weather record here for thirty-seven years but never recorded so many days with the mercury at 100° and above. There were twenty days with the maximum at or above 100°, and the highest was 110° on the 24th. Rainfall, .71 of an inch.

OLIN—*Nathan Potter.* Crops injured by hot winds and not lack of moisture in the soil.

OVID—*H. C. Miller.* Eighteen days the mercury was 100° or above, the range for seventeen days being from 101° to 112°; average maximum for seventeen days 105.2°.

PERRY—*Dr. Theo. F. Johnson.* On the 1st a thunderstorm, with wind strongly characteristic of a tornado, unroofed houses and tore up trees.

RIDGEWAY—*Arthur Betts.* Temperature 8° in excess of normal; rainfall 2.58 in excess; tremendous downpour nearly all day the 4th. In nineteen years have never recorded so hot a month. Sunshine 86 per cent. On the 21st and 24th a thermometer in the sun went up to 127° and matches touched to a stone would ignite without friction.

TOLEDO—*Lulu G. Bookwalter.* Hottest month within memory of the oldest settlers. For seventeen days thermometer registered 100° or over, recording 109° on 21st and 24th. Crops saved by rain; hay crop fine.

VILLISCA—*C. E. Matteson.* Eighteen consecutive days recorded maximum temperature 100° or above. Corn withstood the drouth well and was damaged not more than one-third.

WEST BEND—*Ph. Dorweiler.* Hottest month for fifty years; grain below average; corn probably half a crop.

WANTED—ANNUAL REPORTS FOR 1890 AND 1894.

We are in receipt of requests for copies of the annual reports of the IOWA WEATHER AND CROP SERVICE for the years 1890 and 1894, which are now out of print. If any persons possess copies of those reports for the years named and do not desire to keep them for reference, they will confer a great favor by sending them to this office to complete the collections that are being made.

CORRECTION OF JUNE REVIEW.

FAYETTE.—June. Total precipitation recorded 3.59 inches on pages 7 and 11, should have been 3.69 inches.

IOWA WEATHER AND CROP SERVICE.

CLIMATOLOGICAL DATA FOR JULY, 1901.

NORTHERN SECTION.

STATIONS	COUNTIES	Elevation, feet	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., IN INCHES				Number rainy days	SKY			Prevailing direction of wind	DATES OF THUNDER-STORMS.
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall (unmelted)		Number clear days	Number partly cloudy days	Number cloudy days		
Algona	Kossuth	1,500	8	82.2	†8 6	106	21	52	7	34	4.80	†2.57	3.50	.....	6	20	11	0	SE	17, 27
Alta	Buena Vista	1,519	9	81.2	†8.8	105	21, 24, 25	54	7	37	1.55	-2.05	.86	.....	6	20	10	1	S	1, 16, 17, 22, 27, 28
Alta (near)	Buena Vista	....	....	.....	.....	.....	.....	.....	.....	.....	2.25	.....	1.12	.....	7	....	....	....	.....	
Britt	Hancock	1,230	....	79.4	.....	104	24	48	7	36	4.98	.....	3.43	.....	7	15	16	0	S	24, 25
Charles City	Floyd	1,012	9	81.1	†7.6	108	21	55	31	37	2.65	- .11	1.82	.....	5	13	17	1	SW	25, 28
Clear Lake	Cerro Gordo	984	....	80.9	.....	106	21	52	7	33	3.70	.....	1.40	.....	6	24	7	0	SW	
Cresco‡	Howard	1,280	28	78 6	†7.7	106	24	48	7	38	4.08	† .18	3.35	.....	6	24	5	2	SW	1, 2, 3, 12, 17, 24, 25, 27
Decorah	Winneshiek	900	7	80.4	†10.1	107	21, 24	48	7	42	3.30	† .91	1.94	.....	5	....	....	....	.....	
Dows	Wright	...		80.5	.....	106	21, 24	50	7	48	2.17	.....	.97	.....	8	25	5	1	SW	1, 3, 4, 8, 17, 18, 25, 27, 28
Elkader	Clayton	.	19	81.8	†8.1	111	24	48	8	46	2.95	-1.16	2.00	.....	5	17	13	1	SE	4. 12, 17, 24, 27
Estherville	Emmet	....	....	80.4	.....	107	25	50	31	42	1.41	.....	.62	.....	7	22	9	0	SW	27
Fayette ‡	Fayette	1,000	10	82.2	†10.5	110	24	48	7	43	.62	-2.53	.44	.....	4	24	7	0	SW	
Fonda	Pocahontas	1,237	....	.....	.....	.....	....	.....	....	.....	4.38	.....	3.32	.....	3	23	7	1	SW	1, 2, 3, 4, 16, 17, 26, 27
Forest City	Winnebago	1,220	....	82.6	.....	106	21	49	7	35	4.00	.....	3.25		8	21	10	0	S	
Grand Meadow	Clayton	....	9	80.8	†10.7	108	21	49	7	36	1.56	-2 28	.88	.. ..	5	16	12	3	SW	27, 28
Greene	Butler	943	....	82.6	.....	111	24	50	7	42	2.84	.....	1.50	.....	8	20	8	3	W	
Hampton	Franklin	1,240	10	82 4	†10.7	109	21, 24	52	7	45	2.89	- .44	1.73	.....	9	16	15	0	SE	
Hawkeye	Fayette	.....	7	.....		.....	.....	.....	.....	.....	1.22	-1.48	.70	.....	3	....	....	....	.....	
Hoprig	Emmet	.....	...	.....	.....	.....	.....	.....	.....	.....	2.15	.....	1.27	.....	4	....	.....	....	S	
Humboldt	Humboldt	1,082	7	83.0	.....	108	21, 24	51	7	36	2.47	- .67	2.20	.....	7	29	1	1	SE	24
Larrabee‡	Cherokee	.....	9	82 0	†9.8	108	22	53	7	39	1.13	-2.81	.77	.....	5	23	8	0	SW	
Le Mars	Plymouth	.....	....	81.4	.....	105	21	52	6	38	2.10	.....	.82	.....	5	20	11	0	S	27
New Hampton (*b*)	Chickasaw	1,166	..	79.6	.....	103	25	48	7	40	1.82	.....	1.00	.....	5	19	12	0	SW	
Northwood	Worth	1,210	....	79.8	.....	105	24	49	7	34	1.18	.....	.37	. .	7	16	13	2	SW	4, 5, 25, 27, 28
Osage	Mitchell	1,178	9	77.8	†7.9	101	21, 24	48	7	33	2.53	- .93	1.04	.....	6	11	11	9	SW	4, 5, 17, 27
Plover	Pocahontas	.....	....	81.8	.....	109	24	50	7	39	2.27	.....	1.20	.....	9	29	2	0	SW	
Primghar	O'Brien	.....	....	83.6	.....	110	22	55	7	35	.85	.....	.75	.....	2	25	0	6	S	
Ridgeway	Winneshiek	.....	....	80.9	.....	105	21, 24	52	7	34	5.97	.....	4.83	.....	7	21	9	1	NE	1, 2, 4, 5, 12, 17, 24, 28
Ruthven	Palo Alto	...	....	81.8	.....	104	14, 23	50	7	38	2.36	.....	.72	.....	7	10	10	11	SW	16, 17, 28
Sheldon (*a*)	O'Brien	1,406	....	79 6	.....	104	22, 25	48	8	47	1.82	.....	.82	.....	8	18	10	3	SW	
Sibley	Osceola	1,506	7	79.5	†9.2	106	22	52	7	41	2.85	- .16	1.08	.....	8	15	16	0	S	
Spirit Lake	Dickinson	.....	....	82.2		108	25	52	7	41	.89	.....	.30	.....	3	21	9	1	S	
Storm Lake	Buena Vista	....	11	81.5		104	22	54	7	33	1 67	-2.12	.78	.....	7	23	7	1	S	1, 4, 17, 22, 27
Washta	Cherokee	....	....	.....	.....	.....	.....	.....	.....	.....	2.55	.....	1.30	.....	4	25	6	0	S	
Waverly	Bremer	942	....	81.6	.....	106	21	53	7	36	1.66	.....	.74	.....	8	14	15	2	SW	3, 24, 25, 28
West Bend	Palo Alto	....	7	81.4	†9.2	109	24	50	7	42	3.66	† .70	2.65	.....	9	16	15	0	S	1, 2, 4, 5, 8, 16, 17, 27, 29
West Union	Fayette	.....	....	.....	.....	.....	.....	.....	.....	.....	3.10	.....	2.40	.....	4	26	0	5	SW	
Average	.....	....	....	81.1	†9.0	106.5	.....	50.8	.....	38.6	2.61	- .56	.....	....	6	20	9	2	SW	

CENTRAL SECTION

Amana	Iowa	....	24	82.0	† 8.3	104	21, 24	52	8	38	1 35	-2.76	.47	.....	6	21	8	2	S	1, 3, 12, 17, 25, 28
Ames	Story	936	20	78.8	† 3.8	109	24	55	7, 8, 9	47	2.26	-2.19	1.10	.....	6	27	3	1	SE	1, 3, 18, 23
Battle Creek	Ida	.....	....	.....	.....	....	.....	.....	.....	.....	.60	.....	.15	.....	6	29	2	0	S	1, 4, 17, 25, 27, 28, 29
Baxter	Jasper		....	82.2	.....	105	22, 24	54	7	35	2.15	.....	.60		6	17	12	2	SW	
Belle Plaine	Benton	840	10	81.6	† 8.8	104	21, 24	55	8	38	1.68	-1 51	.75	...	5	9	22	0	S	
Buckingham	Iowa	.....	...	.....	.....	....	.....	.....	.....	.....	1.59	.....	.85	.....	7	20	10	1	.....	
Carroll	Carroll	.....	10	83.0	† 9.9	109	22	54	7	40	.74	-2 48	.47	.....	4	27	3	1	.....	2, 25, 28, 29, 30
Cedar Rapids	Linn	744	18	83.0	† 8.4	107	21	55	7, 8	38	2.74	-1.01	1.00	.....	6	26	4	1	SW	
Clinton	Clinton	609	9	80.6	† 6.5	106	21	49	8	40	4.26	† .92	2 82	..	5	20	8	3	S	1, 3, 24 25, 28, 29
Davenport	Scott	615	30	83.0	† 7.6	106	24	57	8	35	1.48	-2.07	.96	.....	5	25	5	1	S	1, 24, 25, 28
Delaware	Delaware	1,048	9	81.0	† 9.4	108	24	49	7	40	1.52	-1.78	1.25	.....	4	17	13	1	SW	
Denison	Crawford	1,192	7	82.4	† 9 6	106	22, 24	51	7	41	.22	-3.52	.08	.....	4	28	3	0	S	
Des Moines	Polk	867	23	84.0	† 8.0	109	22	59	8	35	1.72	-1.67	.78	.....	4	15	15	1	SW	1, 2, 3, 8, 17, 18, 22, 23, 27, 28, 29
De Soto	Dallas	866	....	85.1	.....	109	22	59	7	36	1.58	.....	1.00	.....	3	29	0	2	SW	
Dubuque	Dubuque	655	28	82.2	† 8.0	106	21	54	7	37	2 31	-1.92	1 86	.....	5	20	8	3	SE	3, 4, 24, 25, 28
Fort Dodge	Webster			81.3	.....	107	22, 24	50	7	41	4.82	.....	4.00	.....	4	23	8	0	SW	
Galva	Ida	....	7	82.3	† 8.8	106	22	54	7	37	.69	-2.73	.36	.....	3	....	....	....	S	
Gilman	Marshall	1,053	....	.....	..	.....	....	.....	.....	.....	3 51	.....	2.18	.....	8	19	12	0	S	
Grinnell (near)	Poweshiek	....	....	83.0	.....	103	20, 21, 22, 24	56	7	30	1.46	.....	.70	.....	6	22	7	2	SE	3, 8, 12, 17, 18. 23 24, 25, 27, 28
Grundy Center	Grundy	966	9	80.2	† 8.4	105	24	50	7	35	2 13	-1.60	.98	.....	8	24	5	2	SE	1, 3, 5, 8, 18, 28
Guthrie Center (*a*)	Guthrie	.....	....	81.8	.....	106	22	50	29	48	1.76	... .	1.26	.....	3	24	6	1	SW	
Harlan	Shelby	.. .	....	82.4	.....	111	22	53	6	45	.76	.....	.62	.....	4	16	12	3	S	1, 2, 16, 28, 30
Independence	Buchanan	921	38	81.2	†10. c	106	24	48	7	40	2.07	-2.22	.50	.....	6	24	5	2	S	4, 17, 25, 27
Iowa City	Johnson	644	10	83.2	† 9.3	108	24	53	8	41	1.29	-2 84	77	.....	5	24	6	1	S	
Iowa Falls	Hardin	....	7	80.0	† 7.7	104	24	51	7	36	3.47	† .65	1.24	.....	8	24	6	1	SE	1, 3. 4, 8
Jefferson	Greene	....		.....	.....	.....	.....	.....	... .	.....	1.07	.....	.35	.....	5	13	12	1	S	3, 22
Le Claire	Scott	.....	....	.....	.....	.....	.. ....	.....	.....	.....	4.12	.....	3.11	.....	3	....	....	....	.....	
Logan	Harrison	928	35	83.4	† 8.6	110	24	51	6	40	.71	-4.15	.28	.....	5	26	5	0	S	
Maquoketa	Jackson	.....	7	80.6	† 4.9	108	24	46	8	46	2.15	-1.04	.94	.....	4	27	3	1	SE	
Marshalltown	Marshall	.....	....	82.6	.....	108	24	54	7, 8	37	2.79	.....	1.07	.....	6	20	9	2	SE	1, 8, 23
Monticello	Jones	800	46	.....	.....	108	24	.....	.....	.....	.59	-3.55	.59	.....	1	25	5	1	SW	
Mt. Vernon	Linn	....	....	84 8	.....	107	22	57	7, 8	35	.61	.....	.43	.....	5	25	5	1	SE	3, 17, 24, 27, 28
Newton	Jasper	958	13	83.1	† 8.3	107	21, 22, 24	57	7 8	36	2.89	- .30	1.99	.....	6	21	10	0	SE	
Odebolt	Sac	....	....	84.2	.....	109	22	55	7	39	.30	.....	.13	.....	4	29	1	1	.....	
Ogden	Boone	1,109	....	82.2	.....	108	22, 24	56	7, 8, 9	37	2.41	....	1.25	.....	6	22	5	4	SE	
Olin (*g*)	Jones	.	....	81.2	.....	103	21, 24	51	15. 16	36	1.08	.....	.59	.....	....	....	....	....	.....	
Onawa	Monona	.....	....	82.4	.....	103	21, 22	56	6	32	.92	.....	.25	...	5	26	3	2	S	1, 4, 25, 27, 28
Perry	Dallas	...	....	84.1	.....	110	24	55	6	44	1.10	.....	.65	.....	3	21	9	1	S	1, 23, 24, 28
Rockwell City	Calhoun	1,219	....	81.4	.....	106	21	53	7	34	1.45	.....	.90	.....	4	29	2	0	.....	
Sac City	Sac	900	21	82.8	† 6.7	108	21, 24	54	7	38	.35	-3 38	.22	.....	4	26	4	1	S	
Scranton	Greene	....	....	82.2	.....	105	24	57	7	37	1 12	.....	.58	.....	4	18	13	0	SW	
Sioux City	Woodbury	1,122	12	82.6	† 7.6	106	21	58	7	34	1.24	-2.03	.57	.....	6	22	8	1	SE	
Toledo	Tama	....	6	83.3	† 9.5	109	21, 24	53	7	41	2.56	- .52	1.25	.....	7	27	4	0	E	
Vinton (*a*)*	Benton	800	10	81.2	† 8.0	103	22, 24	57	7	....	4.04	†1.45	1.54	....	6	29	2	0	SW	17, 24
Waterloo	Black Hawk	862	21	81.8	† 4.0	107	24	51	7	38	3 04	- .94	1.26	.....	7	24	5	2	S	25, 28
Wilton Junction	Muscatine	....	.....	82.2	.....	108	24	50	8	40	3.60	.....	2. 58	.....	7	23	7	1	S	29
Whitten	Hardin	...	....	81.9	.....	106	24	53	7	37	2.46	.....	.86	.....	5	17	10	4	SW	1, 3, 28, 29
Average	.....	...	..	82.2	† 7.9	106.0	.....	53.5	.....	38.4	1.89	-1.73	.....	.....	5	23	7	1	S	

CLIMATOLOGICAL DATA FOR JULY, 1901--CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PREC. IN INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.	DATES OF THUNDER-STORMS
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted.)		Number clear days.	Number partly cloudy days.	Number cloudy days.		
Afton	Union	....	....	82.6	.....	107	22	55	8	40	4.42	.....	1.70	....	7	19	11	1	SW	
Albia	Monroe	945		83.8		110	22	55	7	44	2.75	.....	1.01	....	5	22	8	1	SE	1, 7, 28, 29, 31
Atlantic	Cass	.....	9	82.3	†9.5	110	24	51	7	44	1.44	-2.13	.97		4	8	21	2	SW	1, 2, 4, 28
Belknap	Davis	857	....	85.0	.....	107	22	58	7, 8	37	2.07	.....	.85	....	5	26	5	0	SE	
Bonaparte	Van Buren	.....	9	84.8	†8.9	112	22	54	8	41	.94	-2.80	.37	....	5	....	....	....	.....	
Burlington	Des Moines	.....	..	83.6	.....	107	24	60	7	31	2.15	.....	1.51		8	22	6	3	SW	3, 13, 17, 24, 29
Bussey	Marion	.....	..	.....	.....	....	.....	.....	.....	.....	2.56	.....	.99	....	6	....	....	....	.....	
Centerville (2)	Appanoosa	1,013	....	85.2	.....	106	21, 22	58	8	36	2.09	.....	1.89	..	3	....	....	....	S	12, 17
Chariton	Lucas	1,030	....	83.7	.....	109	22, 24	56	7	39	4.25	.....	2 39	....	7	20	10	1	SW	24, 28, 29, 30
Clarinda	Page	1,069	10	83.6	†7.8	110	24	57	7	41	5.18	†.85	2.34	..	4	17	14	0	S	1, 2, 28, 29
College Springs	Page	....	9	83.2	†8.8	107	24	59	6, 7	35	5.57	†.23	2.68	....	6	24	7	0	SE SW	
Columbus Junct	Louisa	....	....	84.8	.....	109	24	58	7	39	1.82	.....	1.16	....	7	24	4	3	SW	1, 2, 3, 12, 17, 28 29, 30
Corning	Adams	1,127	8	80 7	†7.2	106	24	55	7	43	1.91	-2.12	.79		5	19	12	....	SW	1, 2, 25, 29
Council Bluffs	Pot'wat'mie	989	....	85.8	.....	108	22	62	6, 7	40	2.11	.....	.85	....	6	26	2	3	S	27, 28, 29
Cumberland	Cass	.....	.....	.....	.....	....	.....	.....	.....	.....	1.39	.....	.44		5	27	3	1	S	
Danville	Des Moines	715	....	.....	.....	...	.....	.....	.....	.....	2.37	.....	1.59	...	4	20	9	2	...	
Eldon	Wapello	....	....	85.1	.....	112	22	55	8	41	1.24	.....	.68		3	28	2	1	S	
Emerson	Mills	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.87	.....	1.00	....	3	..	....	....	.....	
Fort Madison	Lee	516	52	.....	.....	.....	.....	.....	.....	.....	2.19	-.71	1.20	..	4	9	19	3	SW	1, 12, 13, 24, 28
Glenwood	Mills	979	30	.....	.....	...	.....	.....	.....	.....	.....	.....	.	.	....	....	..	.... ..		
Greenfield	Adair	. .	9	82.4	†8.4	106	24	58	7, 8	31	2.26	-2.18	.85	....	6	24	5	2	S	1, 2, 16, 17, 23, 24, 28, 30
Hopeville	Clarke	.....	....	83.0	.....	105	22	59	8	34	1.79	.....	1.13	....	7	21	9	1	S	23, 24, 27, 28, 29 30
Indianola	Warren	...		84.6	.....	109	22	61	8	33	1.43	.....	.74	....	8	15	9	7	SW	1, 2, 17, 22, 24, 28, 30
Keokuk	Lee	618	29	85.0	†8.0	108	22	57	8	37	2:02	-2 31	1.84	..	5	19	11	1	SW	
Keosauqua	Van Buren	....	8	85.8	†9.4	110	22	57	8	37	2.79	-1 03	.71	....	6	....		..	.....	
Lacona	Warren	....	....	.....	.....	....	.....	.....	.....		3.35	.....	2.50	...	6	21	8	2	.....	
Lenox	Taylor	....	....	82.0	.....	104	24	59	6	31	1.81	.....	65		5	27	3	1	S	1, 24
Mooar	Lee	.....	....	79 7	.....	110	22	48	6	40	1.96	.....	1.60		3	25	6	0	SW	
Mt Ayr	Ringgold	1,236	7	82 9	†7.7	109	24	56	8	36	3.62	-1.21	1.55	....	8	19	11	1	S	
Mt. Pleasant	Henry	725	..	82.0	.....	109	24	50	8	41	2.91	.....	2.15	..	4	14	16	1	NE	12, 22
Murray	Clarke	1,183		.....	...		.....	.....	.....	...	4 73	.. ....	2.50	....	5	22	9	0	....	
Omaha	Douglass	1,113	31	85.1	†9.1	105	24	64	5	30	2.98	-1.57	.78	..	8	20	11	0	SE	1, 4, 15, 16, 24, 25, 27, 28, 29
Osceola	Clarke	1,123	.	84.1		107	22, 24	57	8	37	2.92	....	1.22	....	5	....	....	..	S	
Oskaloosa	Mahaska	850	17	84.0	†9.3	107	21, 22	56	7	39	1.64	2.08	.56	....	6	28	2	1	SW	13
Ottumwa	Wapello	630	6	86.0	†10.4	108	22	60	8	30	1.58	-2.27	1.40	....	3	26	4	1	SE	
Ovid	Wayne	....	7	85.2	†9.9	112	22	58	8	39	3.08	-.45	1.38	....	4	26	1	4	SW	24, 27, 28, 29, 30
Pacific Junction	Mills	960	....	83 3	....	107	24	57	7	36	2.68	.....	1 70	....	5	19	12	0	SE	1, 2, 5, 15
Pella (*b*)	Marion	.....	....	84.8	.....	110	22	60	6, 31	41	2.15	.....	1.10	..	4	....	....		SE	
Red Oak	Montgom'ry	1,033		83.0	.....	101	24	62	7	27	2.80	.....	1.10	....	6	16	15	0	SE	1, 2, 23, 28, 29, 30
Sigourney	Keokuk	.....	..	85.4	.....	113	22	51	8	47	1.37	.....	.61	....	7	22	9		SE	1, 3, 8, 12, 17, 18 24, 30
Stuart (*a*)	Guthrie	....	...	86.1	.....	108	22, 24	62	6, 7	31	1.22	.....	.65	....	3	23	7	1	S	
St. Charles	Madison	....	..	83.9	....	108	22	59	7, 8	33	2.42	.....	1.13		7	22	8	1	SW	1, 3, 18, 26, 28, 29, 30
Thurman	Fremont		..	82.7	.....	102	21, 24, 25	58	7	39	2.11	.....	1 56	....	3	22	7	2	SW	24
Villisca	Montgom'ry	1,058	7	80 6	†6.6	104	22	53	4	41	4 24	-.51	2.12	....	5	17	13	1	SW	1, 2, 23, 24, 26, 27, 28, 29
Wapello (*a*)	Louisa	578	...	85.6	.....	111	10	56	8	41	1.50	.....	1.13		3	....	....	....	SE	1, 2, 3, 11, 28
Washington	Washington	..	10	82.0	†6.4	106	21, 22	53	8	40	.97	-2.87	.33	....	6	....	...		SW	
Winterset	Madison	....	9	83.8	†10.4	109	22	58	7	34	4.27	-1.04	1.35	....	8	....	....		.....	17, 23, 30
Woodburn	Clarke	.....	....	.....	.....	....	.....		.....	.....	3.85	.....	2 07	....	6	25	4	2	SW	28, 29
Average	....	.....	..	83.8	†8.6	107.9	.....	57.1	.....	37.3	2.53	-1.42	.....	..	5	21	9	1	SW	
Av. for the state.	.....		..	82.4	†8 5	106.8	.....	53.8	.....	38.1	2.34	-1.24	.....		5	21	9	1	SW	

*Means determined from 7 A. M., 2 P M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. ‡Received too late to be computed with means *a*, One day missing; *b*, two days, etc.

†Is used to indicate minus sign (†).

IOWA WEATHER AND CROP SERVICE.

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR JULY, 1901.

STATIONS.		DATE.																															Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max...	98	98	100	101	89	89	87	86	103	104	102	104	102	102	102	105	101	98	102	104	106	107	103	106	103	101	95	89	93	90	89	98.7
	Min..	72	67	68	72	65	58	56	55	63	70	63	67	69	62	62	66	68	68	67	69	72	73	72	72	68	70	69	70	64	59	61	66.4
Albia	Max...	101	98	102	103	97	91	89	92	104	105	103	107	103	101	102	103	103	96	99	106	108	110	104	109	101	101	95	87	91	84	84	99.3
	Min...	70	68	73	74	69	58	55	57	60	65	66	70	72	71	67	69	71	66	70	73	76	72	74	70	74	75	72	70	69	60	59	68.2
Algona	Max..	85	92	96	95	84	87	80	90	100	93	67	71	72	76	70	73	66	66	69	73	75	71	73	74	70	74	101	96	88	86	82	84	95.1
	Min ..	71	66	71	72	66	61	52	69	71	74	67	71	72	76	70	73	66	66	69	73	75	71	73	74	75	67	77	71	63	60	62	69 2
Alta	Max...	84	88	92	94	82	84	82	91	98	95	68	68	70	73	70	68	72	68	66	70	72	70	72	73	76	66	70	67	61	61	59	67.1
	Min...	65	65	70	70	61	54	54	60	68	73	97	99	96	97	96	100	92	94	96	101	104	103	101	104	101	100	95	88	91	84	85	95.5
Amana	Max...	98	94	92	99	91	87	80	85	101	103	97	99	96	97	96	100	92	94	96	101	104	103	101	104	101	101	95	88	91	84	85	95.5
	Min..	73	69	72	75	73	59	55	52	63	70	71	68	72	66	58	65	70	68	69	71	74	73	72	72	76	72	74	75	73	65	55	68.4
Ames	Max...	93	91	96	99	92	88	88	93	102	102	104	105	105	102	102	103	103	100	101	107	108	107	103	109	106	102	99	96	90	87	86	99.0
	Min...	67	67	67	68	....	63	55	55	55	77	70	71	71	70	62	64	72	67	68	70	72	71	74	70	73	73	73	69	68	65	61	67.6
Atlantic	Max...	94	93	95	99	86	92	88	93	101	102	101	102	105	104	102	96	102	97	104	104	106	109	105	110	104	104	96	87	96	91	93	98.7
	Min...	71	63	71	73	66	56	51	59	67	69	56	67	67	74	64	64	67	65	64	65	70	67	67	66	66	75	72	69	67	65	60	65.9
Baxter	Max..	94	90	94	97	94	88	80	90	100	100	100	101	100	98	100	98	98	94	97	102	104	105	100	105	100	98	94	85	90	86	85	95.7
	Min...	63	66	70	71	68	58	54	56	65	72	71	70	73	71	75	75	75	70	71	72	72	70	74	72	73	75	71	69	66	65	57	68.7
Belknap	Max...	97	99	102	102	98	92	84	88	104	104	102	104	97	101	99	103	98	93	96	101	105	107	103	103	99	96	92	88	91	86	84	97.4
	Min...	77	70	78	77	74	64	58	58	67	78	78	74	78	72	72	72	76	70	73	73	78	79	78	79	74	76	74	74	71	71	64	72.5
Belle Pl'ne	Max ..	95	91	91	99	85	88	77	81	99	102	96	98	97	96	100	102	87	93	94	102	104	102	101	104	101	101	95	90	88	82	82	94.3
	Min...	71	68	71	72	71	60	56	55	61	72	71	69	72	70	66	65	70	68	69	72	73	76	72	76	76	76	73	72	70	65	59	68 9
Bonaparte	Max...	99	100	100	105	94	96	85	87	107	108	107	104	98	97	97	104	101	98	99	106	110	112	107	107	103	100	94	90	94	87	90	99.6
	Min. .	75	71	74	76	74	60	60	54	66	74	65	71	73	64	64	68	69	70	69	70	73	75	74	73	77	77	74	73	75	72	68	70 o
Britt	Max...	91	95	95	95	81	82	81	89	96	94	91	97	100	98	98	101	91	91	96	101	102	100	103	102	104	104	101	97	95	91	91	85	87	95.6
	Min...	70	65	70	66	64	56	48	55	64	66	66	68	70	73	62	68	65	63	66	70	68	68	77	69	68	66	73	72	75	74	72	65	62	71.7
Burlington	Max...	95	94	94	100	93	91	80	85	100	104	101	99	95	94	95	98	90	95	96	100	106	105	104	107	100	98	92	74	75	72	65	63	63	69 2
	Min...	75	74	73	77	75	64	60	65	69	77	74	70	74	65	70	73	66	66	69	73	75	71	73	74	75	67	77	71	63	60	62	60	62	68.1
Carroll	Max...	88	91	94	98	86	89	86	92	101	101	101	101	102	98	100	94	100	103	105	104	107	101	104	105	103	98	88	89	67	61	61	59	67.1
	Min...	74	63	68	76	63	56	54	59	71	75	65	63	72	81	72	68	71	67	65	67	72	70	72	75	76	66	70	67	61	61	59	67.1
Cedar Rap	Max...	99	96	92	103	91	85	80	86	104	103	96	98	98	99	97	102	94	95	99	105	107	101	104	107	102	99	95	89	90	84	85	96.3
	Min..	78	70	71	76	72	67	55	55	66	71	70	70	72	68	62	67	70	69	69	74	77	74	72	75	71	74	76	71	74	66	60	69.7
Centv'le (2)	Max ..	98	100	102	103	92	91	83	90	103	105	103	105	72	79	72	64	71	80	69	70	80	81	82	75	74	80	79	72	73	68	64	66	64	72 8
	Min...	67	72	80	82	76	67	60	58	70	80	74	72	102	101	101	101	102	97	101	105	106	109	105	109	103	99	95	86	92	86	87	98.4
Chariton	Max...	95	95	97	101	90	91	88	94	103	103	102	105	102	101	101	101	102	97	101	105	106	109	105	109	103	99	95	86	92	86	87	98.4
	Min...	72	67	72	74	67	60	56	57	68	72	97	85	93	100	102	100	101	96	93	97	104	108	103	106	107	103	100	95	85	69	62	62	69 o
Charles Cy.	Max. .	93	89	90	90	80	81	76	74	102	97	85	93	100	102	100	101	96	93	97	104	108	103	106	107	103	100	95	81	85	83	84	93.5
	Min...	74	68	70	70	68	60	56	56	66	76	69	70	71	75	65	66	76	67	67	70	71	71	75	71	73	74	75	72	65	64	55	68.5
Clarinda	Max..	100	95	99	101	88	94	92	97	103	104	102	104	105	104	102	102	102	100	104	106	107	109	106	110	106	104	96	90	93	88	92	100.2
	Min...	66	66	69	73	65	59	57	60	63	67	59	67	68	72	66	66	69	67	69	68	69	74	69	68	70	71	73	67	63	63	67	67 o
Clear Lake	Max .	91	93	93	89	82	85	62	82	97	94	88	96	100	101	102	103	102	98	96	102	106	103	103	104	104	104	96	87	82	83	84	93.4
	Min...	75	68	70	70	66	62	62	56	67	76	67	67	70	71	71	72	73	66	64	65	70	67	67	66	66	75	72	69	67	65	64	68.4
Clinton	Max...	101	91	91	101	88	88	80	87	100	104	96	96	96	97	96	100	97	98	99	103	106	104	100	105	100	98	94	85	90	86	85	95.7
	Min...	70	68	72	71	67	60	55	49	60	65	68	66	64	57	62	65	69	68	64	64	68	71	74	72	73	75	74	69	66	65	57	68.7
College Sp.	Max...	101	94	96	96	84	90	....	94	98	99	99	102	103	103	105	100	98	97	98	102	104	105	101	104	102	101	97	94	91	88	86	97.4
	Min...	68	65	66	73	65	59	59	60	65	68	62	71	70	72	70	70	73	69	73	72	72	74	76	72	75	75	74	73	72	70	68	64	67	72.5
Columbus J	Max...	100	94	94	104	92	89	80	90	105	106	105	101	99	99	102	104	87	93	94	102	104	103	106	102	102	99	93	84	75	92	....	87	90	94.3
	Min...	74	71	70	77	69	62	58	62	66	76	72	68	73	65	66	70	74	72	70	72	77	76	72	75	75	77	74	72	75	71	61	62	61	68 9
Corning	Max...	95	91	91	96	89	89	84	93	100	100	99	100	103	102	72	100	103	104	107	108	112	107	107	103	106	102	94	90	94	87	90	99.6
	Min...	69	68	71	74	66	59	55	60	68	73	63	72	71	73	72	68	68	70	72	74	77	76	78	84	76	76	73	72	70	68	64	67	68	71 9
Co. Bluffs	Max...	99	92	96	101	87	89	92	98	102	104	103	103	105	105	78	78	77	78	78	77	78	76	78	78	77	75	73	72	73	71	68	67	68	71 2
	Min...	72	65	....	70	65	62	62	65	65	72	69	63	75	95	96	94	100	93	94	97	101	105	101	106	105	104	102	101	99	97	95	91	91	85	87	95.6
Davenport	Max...	96	91	91	100	86	88	79	83	98	104	95	71	68	97	64	69	73	72	70	76	80	78	100	105	107	105	103	99	89	93	92	98 o
	Min. .	71	72	73	77	72	65	58	57	67	75	71	92	97	99	99	99	101	96	98	98	105	107	100	105	106	104	103	102	101	94	93	89	93	92	94	98 o
Decorah	Max...	97	96	96	92	83	67	59	85	100	97	92	65	68	67	65	63	101	96	98	105	107	104	106	109	105	106	105	103	99	89	93	92	94	98 o
	Min...	75	68	70	75	67	48	49	65	70	90	97	98	100	101	105	97	65	68	70	73	74	75	77	78	75	72	67	63	62	60	68.1
Delaware	Max .	96	93	92	101	87	85	77	81	101	103	96	98	98	99	97	102	94	95	99	105	107	101	104	107	102	99	95	89	90	84	85	96.3
	Min ..	72	65	72	73	66	56	49	50	61	69	64	66	66	63	62	65	70	65	67	69	74	73	74	75	71	74	76	71	74	66	60	69.7
Denison	Max...	88	90	95	98	83	87	85	93	102	100	101	102	103	102	102	99	97	94	95	99	101	104	107	101	104	102	99	94	90	85	84	97.7
	Min..	68	62	71	73	62	54	51	64	68	76	62	61	72	72	76	72	69	68	71	67	65	67	76	69	68	70	78	75	72	67	63	62	60	68.1
Des Moi'es	Max ..	90	94	96	99	86	89	86	92	101	101	101	101	102	102	102	97	103	97	101	104	106	109	105	109	103	102	99	95	92	90	85	84	85	96 3
	Min ..	68	70	72	77	70	63	61	59	72	79	68	68	72	74	72	69	68	64	67	70	73	74	75	76	74	73	69	68	64	62	59	60	62	68.1
Dows	Max...	92	89	93	95	82	84	54	50	56	53	72	68	70	79	70	64	67	64	64	67	69	71	73	74	75	76	73	72	71	69	68	69	68	69 9
	Min...	68	65	70	70	66	54	50	80	102	103	86	94	94	96	97	101	95	94	96	97	101	106	101	104	105	104	100	99	93	91	88	88	88	93 9
Dubuque	Max...	96	91	88	99	84	83	77	55	65	77	67	69	69	68	67	69	74	69	70	74	81	80	70	74	73	74	74	73	72	70	72	72	72	72 3
	Min...	76	71	73	77	68	63	54	88	106	107	107	107	101	76	99	100	106	100	98	101	105	108	112	109	108	103	98	94	86	90	94	88	89	98 9
Eldon	Max...	100	102	102	105	98	93	85	88	106	106	107	76	72	76	65	61	67	71	69	71	73	76	71	76	75	74	73	73	74	72	70	62	54	64 7
	Min...	77	69	76	76	75	57	57	55	66	77	76	72	76	102	105	105	107	102	99	103	107	110	107	111	106	105	104	98	94	84	83	86	96 0
Elkader	Max...	100	96	97	103	85	86	69	81	105	105	90	90	104	104	59	63	75	69	68	75	76	74	75	75	75	74	73	72	70	68	64	64	50	64 7
	Min ..	78	68	73	76	69	69	50	48	67	68	96	66	67	66	100	102	66	65	64	65	65	62	63	65	74	70	69	68	66	63	57	55	85	96 6
Estherville	Max...	80	90	96	98	86	84	83	92	101	96	66	90	104	66	70	72	97	93	94	96	101	106	103	103	104	104	103	101	95	84	82	85	55	68 5
	Min..	68	60	70	72	62	58	51	58	68	72	87	66	67	100	100	97	99	93	94	96	101	106	103	103	104	104	103	101	95	84	82	86	59	68 5
Forest City	Max...	86	91	92	91	86	80	82	85	98	92	72	65	68	102	100	66	71	65	64	70	72	70	74	71	74	74	71	70	68	64	62	55	86	97 2
	Min...	72	76	70	71	64	59	49	56	55	72	97	100	102	103	104	100	99	68	65	71	74	74	75	74	77	76	74	73	72	66	62	55	89	65 4
Ft. Dodge	Max...	93	91	94	95	93	65	53	62	75	97	97	68	97	103	67	103	100	101	97	101	103	105	106	104	105	104	105	98	92	85	86	63	89	97 6
	Min...	62	62	62	73	65	89	91	96	103	97	70	102	97	68	75	103	67	66	70	68	67	69	71	72	69	69	76	68	101	85	64	90	69	67 0
Galva	Max...	90	92	98	97	85	61	58	54	61	69	70	68	95	98	100	100	102	94	95	97	104	108	102	104	107	101	101	94	88	88	69	60	83	94 4
	Min. .	64	64	70	65	61	82	76	78	100	98	76	88	64	67	66	64	67	74	65	62	72	76	72	68	72	72	70	74	68	66	57	85	86	67 2
G. Meadow	Max..	96	95	94	95	81	67	59	49	57	69	76	64	67	105	106	103	105	64	65	72	97	98	103	106	111	106	106	100	75	68	66	61	86	97 4
	Min...	76	68	65	72	81	83	82	82	101	101	76	90	101	69	70	64	65	72	93	95	100	104	106	110	106	101	99	93	90	88	68	61	85	67 7
Greene	Max...	93	94	95	94	75	86	87	59	82	56	65	69	69	70	70	70	69	73	72	74	78	75	77	77	78	74	74	72	69	67	61	85	83	95 2
	Min...	70	69	68	75	86	87	59	82	89	97	97	97	99	100	100	99	95	70	74	78	75	77	77	78	74	76	74	74	72	69	67	88	70	69 5
Greenfield	Max...	95	93	92	94	62	59	58	58	68	75	68	100	73	74	74	97	72	74	70	74	98	103	98	103	103	98	78	74	73	83	70	88	83	70 6
	Min...	69	67	70	71	99	95	86	78	87	100	101	100	101	100	98	67	72	98	97	99	103	104	103	104	105	100	98	92	94	83	67	65	88	94 0
Grin'l (nr.)	Max...	95	90	91	91	74	71	61	56	57	70	71	72	76	74	71	98	99	94	70	72	73	75	74	75	71	72	75	72	72	67	65	98	60	66 4
	Min...	69	69	70	74	71	84	79	82	99	98	99	96	98	97	97	68	63	65	70	73	75	71	72	75	71	72	75	72	72	67	83	70	86	97 3
Grundy C'r	Max ..	93	88	91	97	91	66	55	50	54	63	72	99	67	70	104	100	63	95	101	105	106	105	96	69	67	55	75	57	70	88	87	65	91	66 3
	Min...	65	66	69	73	66	92	94	93	88	99	100	99	103	104	100	100	95	101	95	101	103	105	106	109	105	109	105	103	97	73	67	83	67	96 7
Guthrie Cr	Max. .	94	96	98	....	....	64	56	54	54	78	78	72	65	79	73	63	64	95	98	100	104	109	106	105	109	105	103	97	73	67	90	91	65	68 1
	Min...	66	66	70	....	....	84	85	84	85	103	100	98	102	102	101	103	103	71	95	67	67	74	75	71	73	74	74	70	73	70	68	88	89	99 6
Hampton	Max...	93	89	94	97	76	68	60	52	56	58	75	69	68	69	73	104	102	103	104	105	108	111	107	110	106	106	67	71	72	68	61	83	61	65 1
	Min.	69	67	70	76	68	60	90	91	97	102	107	102	102	105	104	104	102	103	66	66	68	68	68	68	68	68	100	97	92	72	82	72	84	95 1
Harlan	Max..	92	94	100	99	87	90	91	97	102	107	102	102	105	67	70	63	66	66	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	70 9
	Min...	68	63	68	70	63	53	54	58	62	65	57	65	65	70	63	66	66	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	70 9
Hopeville	Max...	94	92	95	99	85	89	81	91	100	100	98	101	100	99	98	94	98	95	95	98	101	103	105	104	105	104	103	102	101	100	100	100	100	100 0
	Min ..	72	71	72	72	67	62	61	59	66	74	70	73	74	73	67	72	73	71	72	74	76	78	76	81	76	73	72	72	72	72	72	72	72	72 0
Humboldt	Max..	89	89	96	97	96	87	82	93	103	99	103	103	104	104	103	102	100	96	96	96	103	105	104	104	106	100	100	94	92	92	92	92	92	92 0
	Min...	69	64	70	75	66	56	51	59	79	75	71	95	97	98	98	100	102	96	96	65	68	70	72	68	91	68	69	72	68	69	69	69	69	69 2
In'pen'nce.	Max ..	96	91	91	102	84	84	79	82	102	100	100	102	103	102	102	100	99	98	94	100	104	105	109	101	107	103	99	94	87	92	89	89	89	89 2
	Min...	71	65	71	72	67	58	48	52	62	65	68	66	68	65	62	64	67	66	65	68	70	72	75	76	75	79	76	73	71	69	65	65	65	65 0
Indianola	Max. .	93	93	96	99	90	89	83	93	101	101	101	101	103	102	100	100	99	98	94	100	104	105	106	107	107	108	105	102	96	87	93	89	89	89 2
	Min ..	72	69	72	75	69	67	62	61	71	75	68	73	76	73	72	71	76	75	71	72	75	79	76	75	78	75	74	74	75	74	74	74	64	64 5
Iowa City	Max...	98	97	94	102	85	87	82	88	103	105	101	103	101	76	76	73	75	71	69	73	75	76	73	74	74	75	74	74	75	74	74	74	80	80 5
	Min...	76	68	71	73	73	60	58	53	62	72	70	67	72	64	65	68	74	70	70	75	76	74	75	70	74	74	71	70	71	73	68	73	69	69 5
Iowa Falls.	Max ..	93	90	94	94	81	82	80	85	96	102	95	98	100	99	98	62	65	67	69	73	74	76	77	79	80	78	75	73	74	75	75	75	71	71 0
	Min. .	66	66	70	74	65	58	51	57	66	70	69	68	70	70	62	65	67	64	65	67	69	72	73	75	74	72	76	78	82	75	79	80	78	78 0
Keokuk	Max,..	97	98	94	103	92	94	82	85	102	105	104	102	104	105	104	102	102	102	100	104	106	107	109	110	107	107	107	100	97	93	89	93	89	89 3
	Min .	80	75	76	80	78	66	62	57	65	78	72	70	76	76	66	66	69	67	69	68	69	74	77	77	79	79	76	76	76	74	74	74	70	70 2
Keosauqua	Max ..	100	99	97	103	97	94	85	86	106	106	101	106	97	97	97	97	68	66	71	73	74	77	75	74	77	79	76	76	76	74	74	74	84	84 9
	Min...	78	74	72	78	78	65	64	57	67	76	69	75	99	100	100	97	100	97	93	98	103	105	104	66	68	69	74	74	66	74	64	59	59	59 8
Le Mars	Max..	80	85	95	97	85	86	85	92	100

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR JULY, 1901—CONTINUED.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Marsh'llt'n	Max...	98	89	95	100	85	88	82	86	102	103	102	102	101	100	100	103	99	97	99	105	107	106	103	108	104	102	96	90	92	87	87	97.4
	Min...	66	62	69	72	69	59	54	54	65	73	70	69	71	70	63	67	73	66	71	69	74	73	73	71	74	75	72	69	68	64	56	67.8
Monticello.	Max ..	97	93	90	101	86	87	83	84	102	104	95	98	98	98	100	105	96	97	99	104	107	104	105	108	102	101	95	92	90	88	88	96.7
	Min...	....	....	....	....	....	....	....	.....	.....	....	...	....	....	....	....	....	....	...	....	....		....	....	....	....	....	....	....		....	....	....
Mooar	Max .	86	84	82	84	84	81	86	85	102	104	104	106	100	99	97	99	96	100	98	103	108	110	108	107	98	95	97	93	92	82	89	95.5
	Min...	60	62	70	64	52	48	62	58	64	69	70	72	65	67	58	67	58	60	68	70	70	66	73	71	69	67	63	....	59	56	58	63.9
Mt. Ayr	Max...	97	93	95	97	84	88	86	92	101	102	100	103	104	104	101	100	102	99	102	105	105	108	102	109	104	101	92	89	91	87	88	97.8
	Min..	69	66	71	72	64	58	60	56	66	67	64	71	71	71	65	69	71	67	70	71	72	73	74	75	72	72	70	70	66	63	63	68.0
Mt. Plea'nt	Max. .	99	98	96	102	....	90	85	88	103	105	102	100	96	96	102	101	99	99	100	105	108	106	104	109	101	100	97	94	91	89	84	98.3
	Min...	68	69	70	72	69	56	56	50	62	66	63	66	68	58	61	63	67	66	66	69	71	72	68	72	74	68	70	73	69	61	57	65.8
Mt.Vernon	Max..	97	96	92	99	85	86	84	85	102	102	100	100	99	102	99	100	103	100	99	104	105	107	105	105	102	100	97	89	97	88	89	97 4
	Min...	78	80	72	74	75	62	57	57	67	75	72	70	71	69	80	84	79	77	70	72	74	79	70	79	76	76	74	72	70	66	60	72.2
NewH'pton	Max .	93	90	91	90	80	81	76	81	101	98	88	95	98	99	99	101	98	94	97	102	107	102	....	....	103	100	94	81	88	83	83	92.9
	Min...	70	67	71	70	67	58	48	53	61	63	....	68	69	68	...	66	73		65	65	70	78	70	72	73	72	72	68	65	60	53	66.2
Newton....	Max..	97	95	93	100	88	90	82	90	102	104	102	104	102	99	99	102	97	95	98	105	107	107	101	107	101	101	94	88	88	88	86	97.2
	Min ..	73	69	67	68	70	62	57	57	66	72	69	71	70	71	65	71	74	68	72	72	72	74	74	74	73	73	72	70	66	68	60	69.0
Northwood	Max..	88	88	91	87	80	81	77	81	98	92	84	92	99	99	98	100	95	92	96	102	103	99	104	105	103	100	94	84	85	81	82	92 3
	Min...	74	67	66	71	66	59	49	56	64	70	67	71	69	68	67	70	75	67	64	68	72	68	75	75	76	71	71	67	64	60	55	67.2
Odebolt....	Max..	93	93	97	101	90	89	90	95	103	101	104	103	105	105	106	101	105	101	105	106	107	109	107	108	107	106	101	94	90	91	93	100.2
	Min...	69	64	71	75	61	66	55	62	70	75	69	69	72	70	71	68	69	67	66	72	71	70	69	70	73	70	73	69	68	62	59	68.2
Ogden. . . .	Max...	91	92	93	96	84	86	82	91	100	100	101	102	103	102	99	98	99	95	99	104	105	108	100	108	104	.01	98	84	88	85	86	96.6
	Min.	65	66	69	76	65	56	56	56	66	75	69	69	70	72	67	67	70	65	68	70	72	71	74	74	74	70	74	66	64	64	60	67.7
Olin..	Max...	....	....	....	....	....	....	....	85	98	100	92	96	94	94	96	100	90	95	94	100	103	101	102	103	97	96	93	93	89	79	....	95.2
	Min...	....		....	....	....	....	....	51	63	67	70	68	68	63	60	64	70	68	66	66	72	72	69	72	70	76	75	74	73	65	53	67 3
Om'ha Neb	Max..	94	88	95	99	84	89	87	94	102	103	100	101	100	101	97	100	98	96	98	103	105	104	102	105	102	100	95	90	88	89	90	96.7
	Min.	71	68	77	69	64	65	66	68	73	78	72	79	79	80	77	76	76	74	72	78	80	77	80	78	77	79	72	72	69	67	67	73.5
Onawa.....	Max..	94	94	93	98	85	86	85	91	99	96	97	99	99	99	96	97	100	96	98	101	103	103	100	101	99	99	97	90	90	87	90	95.5
	Min...	73	65	72	72	62	56	57	61	68	76	65	71	71	73	73	72	70	74	68	73	74	75	72	71	73	73	74	71	66	65	62	69.3
Osage.....	Max..	90	86	89	85	77	78	73	77	96	90	84	92	94	95	93	95	91	89	92	93	101	96	99	101	99	97	92	82	83	79	80	89.5
	Min..	72	66	67	69	67	58	48	55	63	69	67	68	68	69	65	66	69	66	62	68	71	67	73	71	72	72	74	67	64	60	54	66.0
Osceola....	Max...	93	94	97	100	85	90	84	94	102	101	101	104	103	102	101	101	101	97	102	104	105	107	104	107	103	100	94	83	90	86	86	97.5
	Min...	75	69	71	76	68	61	65	57	70	73	70	76	76	70	64	67	73	70	70	73	78	76	78	74	74	76	71	71	67	70	62	70.7
Oskaloosa..	Max...	99	94	97	101	92	90	87	90	103	103	104	105	102	101	101	104	102	94	99	105	107	107	102	103	104	102	94	87	92	87	87	98 2
	Min..	74	67	72	75	72	59	56	57	66	75	65	75	74	73	59	67	76	70	72	75	74	69	78	72	76	77	74	72	69	66	57.0	69.0
Ottumwa ..	Max...	96	98	97	103	88	91	80	85	104	106	102	102	97	98	98	101	98	95	97	103	107	108	103	104	100	99	92	80	90	85	86	96.5
	Min...	82	78	79	80	75	74	66	65	75	76	74	80	78	70	70	75	77	74	72	76	79	78	79	81	81	80	79	78	77	67	70	75 5
Ovid.....	Max..	97	97	99	101	91	94	89	94	104	105	104	106	103	102	104	105	104	101	102	106	108	112	108	109	104	99	94	82	91	86	90	99.7
	Min .	74	70	74	75	68	61	57	58	70	74	68	72	73	70	65	68	75	70	73	75	76	75	76	77	76	75	72	69	71	70	63	70.6
Pacific Jct.	Max..	96	90	94	96	84	90	87	94	101	100	98	101	102	102	102	102	100	99	102	105	106	106	104	107	105	103	98	93	90	91	93	98.1
	Min...	68	64	71	74	65	59	57	62	65	67	63	70	71	73	70	74	70	67	67	70	70	73	73	71	69	73	73	72	69	69	63	68.5
Pella. .. .	Max...	97	96	100	102	90	93	....	92	105	105	105	107	104	100	103	105	103	96	99	106	109	110	103	108	100	99	94	90	92	88	89	99.7
	Min...	70	68	72	72	70	60	...	61	69	68	70	72	70	69	69	64	74	68	72	75	78	75	76	68	74	76	72	....	71	65	60	69.9
Perry.....	Max...	98	94	96	100	99	99	87	84	103	104	105	105	105	104	103	103	100	105	102	107	109	108	103	110	103	103	100	85	92	87	87	99.7
	Min...	65	66	64	65	68	55	58	60	71	76	73	72	73	73	66	67	69	73	70	71	71	71	71	76	72	74	74	76	64	60	60	68.5
Plover.....	Max...	94	92	97	98	84	85	83	95	101	97	104	103	105	105	100	103	101	95	101	106	108	106	106	109	107	104	100	92	87	83	85	97 9
	Min...	58	64	73	70	65	57	50	56	63	78	67	67	68	81	72	67	70	63	65	67	69	60	67	70	72	67	70	67	62	61	54	65.8
Primghar..	Max...	87	87	93	97	85	85	83	93	102	99	99	101	100	103	102	99	98	96	102	105	106	110	103	104	106	101	100	93	84	89	90	97.2
	Min...	67	65	70	85	69	....	55		....	...	63	....	70	....	72	64	72	65	69	72	75	77	73	76	76	82	72	70	65	59	60	70.1
Red Oak...	Max..	92	89	91	94	85	86	83	89	94	95	93	96	96	98	95	95	95	95	96	98	99	100	98	101	98	97	92	90	88	85	86	93 2
	Min...	72	70	73	77	69	64	62	66	71	76	66	74	74	78	73	74	76	74	73	74	76	80	78	77	75	78	78	76	71	67	68	72.9
Ridgeway..	Max...	91	92	96	84	80	79	80	82	100	98	88	89	98	100	99	95	95	90	98	102	105	98	102	105	101	99	95	86	88	83	84	93.0
	Min ..	75	70	72	76	70	60	52	56	66	72	66	67	70	70	68	70	77	69	65	70	76	70	70	75	73	74	75	71	67	62	60	68.8
Rockwell C	Max...	92	92	96	95	82	86	86	90	99	99	100	100	100	100	101	99	99	95	98	102	106	103	101	105	103	100	97	89	86	83	84	95.7
	Min...	68	65	70	75	66	55	53	56	67	73	68	67	69	70	70	69	69	66	67	68	75	69	74	71	75	68	68	66	62	63	60	67.2
Ruthven ..	Max...	78	89	94	93	93	81	77	88	100	94	93	100	102	104	96	96	93	90	97	102	99	100	104	103	98	97	98	95	82	84	82	93.6
	Min...	62	78	70	73	60	56	50	68	83	78	74	79	82	83	72	70	72	67	70	70	79	74	76	65	72	70	68	62	62	60	61	69.9
Sac City....	Max. .	87	89	97	98	85	88	82	92	102	100	102	103	104	103	103	100	104	95	101	104	108	106	106	108	105	103	99	92	87	88	99	98.1
	Min...	67	65	70	75	64	56	54	61	70	75	67	68	70	72	69	67	71	66	66	68	75	68	70	70	76	68	72	68	63	61	58	67.4
St. Charles.	Max ..	92	93	96	100	89	87	83	92	101	101	101	102	102	101	100	98	100	95	100	104	105	108	101	106	102	100	95	86	91	86	87	96.9
	Min ..	71	69	73	76	68	61	59	59	72	76	68	73	74	73	69	69	74	71	71	74	78	75	78	75	77	76	72	72	70	63	63	70.9
Scranton ..	Max ..	90	92	95	98	86	86	85	92	100	101	100	101	104	103	102	97	100	94	101	103	104	103	102	105	104	101	98	88	87	86	86	96.6
	Min..	71	66	71	76	67	60	57	60	68	68	67	68	70	70	65	67	70	67	67	70	70	69	72	69	74	73	74	67	64	65	62	67.9
Sheldon	Max...	85	89	....	96	85	84	86	92	99	93	96	99	99	100	99	97	99	94	98	102	103	104	101	102	104	101	95	90	85	85	90	95.1
	Min..	62	62	....	70	58	57	49	48	52	72	66	68	65	70	70	65	70	64	67	67	73	67	71	68	71	64	70	68	63	55	53	64.2
Sibley	Max...	80	88	96	96	82	84	83	92	99	94	93	100	101	102	101	98	95	90	100	103	104	106	104	103	104	93	94	94	86	86	91	94.9
	Min ..	72	64	69	66	59	53	52	58	67	70	66	66	66	69	67	66	68	63	63	66	68	65	67	66	67	61	68	67	62	55	51	64.1
Sigourney .	Max...	103	106	103	107	96	91	87	91	107	107	108	111	101	104	105	108	101	101	103	109	110	113	111	111	107	106	97	87	95	91	90	102.2
	Min...	72	68	71	74	73	59	56	51	66	75	66	67	71	65	62	61	70	67	68	72	77	75	72	75	73	78	72	72	72	66	57	68.5
Sioux City.	Max ..	80	88	93	98	84	87	86	92	101	95	97	100	100	99	99	98	100	94	97	103	106	105	101	102	101	99	97	88	83	87	89	95.1
	Min ..	69	66	71	77	61	59	58	63	67	74	73	74	75	76	75	69	73	72	71	76	78	75	74	70	77	70	70	71	66	64	62	70 2
Spirit Lake	Max..	78	91	96	100	82	85	82	92	98	99	90	101	101	102	101	102	105	97	104	102	105	106	106	106	108	97	95	93	87	86	86	96.3
	Min ..	66	65	70	73	62	59	52	65	65	71	75	70	72	72	73	69	72	70	67	72	75	65	88	74	64	62	70	....	66	60	60	68.1
Storm L...	Max..	89	86	92	94	82	84	80	89	98	94	98	97	98	98	100	95	100	93	98	101	103	104	100	103	102	100	96	88	85	85	86	94.1
	Min. .	63	65	71	76	62	58	54	61	73	78	68	71	73	76	72	68	74	64	68	73	79	71	75	75	79	67	72	68	63	62	58	68.9
Stuart	Max..	94	93	94	98	98	88	92	101	....	100	101	104	105	....	101	102	101	96	104	103	104	108	101	108	103	101	96	87	93	88	88	98.3
	Min ..	64	70	72	72	75	62	62	75		80	78	88	80	77	76	75	77	75	74	77	78	82	77	81	72	75	72	71	62	68	72	73.9
Thurman..	Max...	95	90	97	99	86	91	88	97	100	100	100	100	101	99	97	100	98	98	99	101	102	101	100	102	102	97	96	88	92	89	90	96.6
	Min...	68	66	74	77	67	59	58	65	72	73	61	74	66	72	70	63	74	66	67	66	71	70	70	69	68	76	73	72	71	70	65	68.8
Toledo.....	Max. .	97	94	93	105	....	92	85	85	103	105	103	102	99	100	100	106	100	96	100	107	109	108	105	109	103	101	94	85	95	89	91	98 7
	Min...	70	67	69	75	71	59	53	55	62	72	74	69	67	70	59	67	68	67	70	74	76	74	73	70	72	76	72	70	67	63	55	67.9
Villisca ...	Max ..	97	92	99	85	89	88	85	94	100	101	100	100	101	101	101	101	101	100	100	102	103	104	100	103	101	100	93	90	88	85	86	96 5
	Min ..	71	66	67	53	55	57	57	62	66	60	65	66	66	72	65	63	67	65	64	72	67	68	70	68	66	67	68	65	65	62	62	64.7
Wapello ...	Max..	99	90	92	105	97	97	88	87	107	111	107	103	98	97	96	102	93	99	98	104	109	109	106	106	106	98	....	96	90	88	....	99 2
	Min ..	76	76	74	78	77	65	63	56	66	79	70	70	74	66	64	72	67	72	71	74	79	78	74	78	82	81	.	78	66	66		72.1
Washi'gt'n	Max ..	99	95	93	102	88	90	81	86	104	106	103	102	95	96	96	101	94	96	98	104	106	106	104	103	102	99	94	88	92	87	87	96.7
	Min...	72	69	68	73	66	59	56	53	65	72	67	67	69	63	63	68	68	66	66	71	74	73	69	73	73	72	72	73	71	65	55	67.4
Waterloo..	Max ..	98	88	91	100	85	88	80	84	103	103	97	98	99	101	100	103	93	96	94	103	106	104	103	107	101	101	93	85	90	85	86	95.6
	Min...	72	68	70	74	70	59	51	54	69	71	70	68	71	69	62	66	79	68	68	68	74	74	73	72	72	71	74	69	69	62	56	68.0
Waverly ...	Max...	94	88	90	94	88	83	77	82	102	99	93	95	98	99	98	99	93	95	95	102	106	102	103	105	101	99	93	88	87	83	84	94.0
	Min...	73	69	71	76	71	59	53	62	66	72	70	70	70	71	64	67	71	68	70	72	73	73	75	73	74	73	75	70	69	64	58	69 1
West Bend	Max...	89	96	96	96	83	86	83	92	100	95	97	103	104	105	101	102	99	94	101	104	108	106	108	109	108	105	100	90	84	82	84	97.1
	Min...	70	64	69	69	64	54	50	56	66	74	67	66	67	71	65	67	64	65	66	69	74	68	66	68	68	67	74	68	64	61	55	65.7
Whitten ...	Max...	95	90	95	98	84	84	82	87	100	100	98	99	100	99	100	102	98	94	97	102	105	101	100	106	102	98	95	81	85	82	83	95.5
	Min...	68	67	68	72	69	59	53	55	72	72	84	71	74	73	71	65	70	66	67	85	72	72	72	72	60	61	60	66	64	62	55	68.3
Wilton Jc .	Max ..	100	94	92	101	89	88	79	87	103	105	98	101	98	98	100	101	91	98	99	103	106	103	104	108	100	102	98	96	91	84	85	96 8
	Min...	72	67	70	73	72	58	55	50	63	70	72	67	69	65	60	68	69	72	65	69	72	71	68	72	73	73	73	75	72	63	55	67.5
Winterset .	Max ..	92	95	97	99	86	90	85	91	101	101	104	104	104	102	101	100	100	95	100	104	105	109	99	108	105	103	98	85	95	87	90	97 9
	Min ..	74	68	73	75	67	60	58	59	68	76	64	69	73	....	63	65	70	65	68	71	73	75	83	77	79	....	75	74	....	65	65	69.7

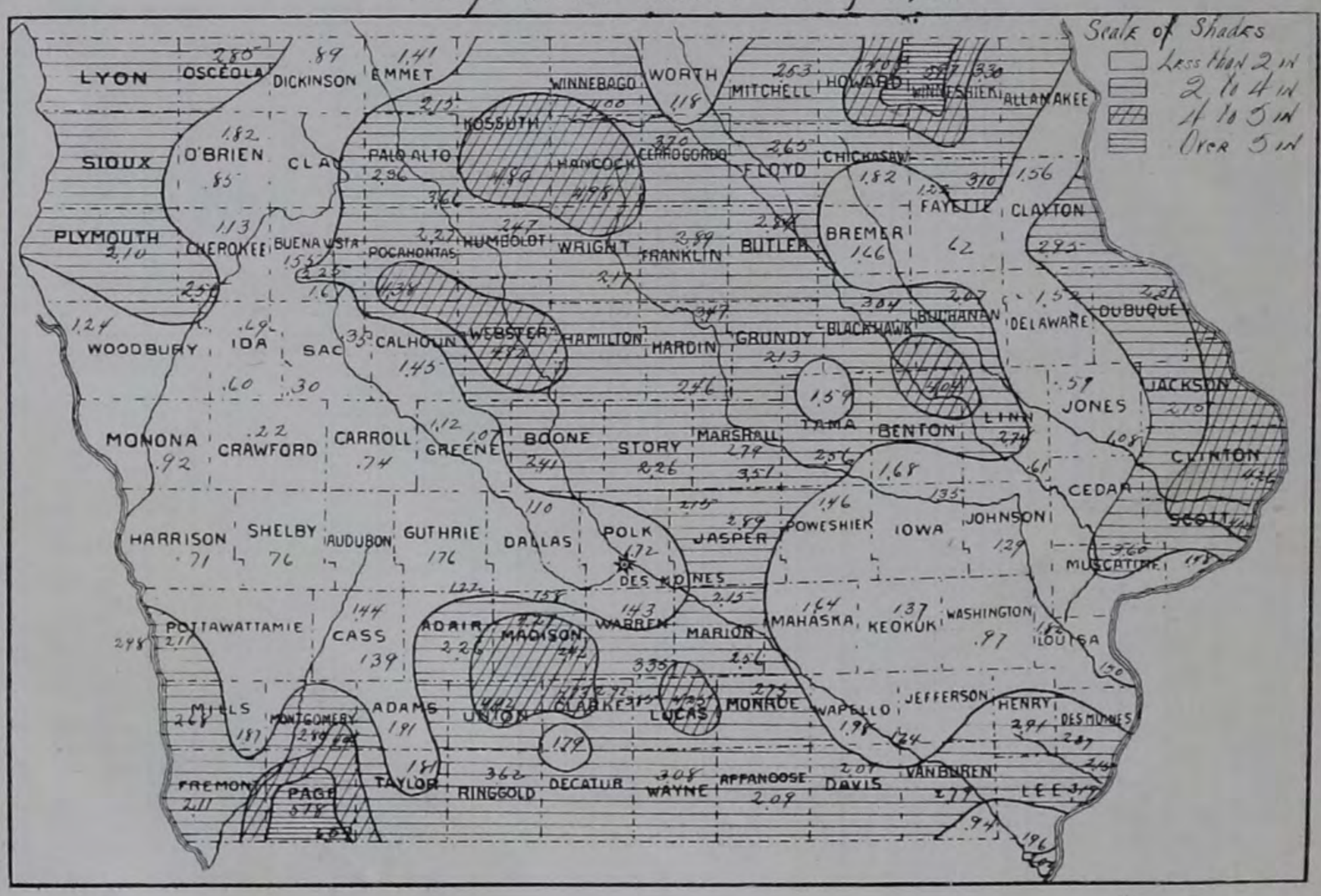
DAILY AND MONTHLY PRECIPITATION FOR JULY, 1901.

STATIONS.	DAY OF MONTH.																													TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	.08	14	....	....	....	..	....	..	...	....	....	....	....	....	....	....	....	....	....	....	....	....	.08	.45	....	....	....	1.60	1.70	.37	....	4.42
Albia	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	T.	T.	.35	....	....	....	....	....	....	.15	....	....	....	.57	.67	1.01	....	2.75
Algona	.03	....	....	.25	.50	....	....	T.	....	....	....	....	....	....	....	T.	.50	....	....	....	....	....	....	....	....	....	3.50	....	.C2	....	....	4.80
Alta	.86	....	.05	.02	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	T.	....	....	....	....	....	.52	.10	....	....	1.55
Alta (near)	1.12	....	.06	.03	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	....	T.	.60	.25	....	....	2.25
Amana	.03	....	.46	....	....	....	....	....	....	....	....	.01	....	....	....	....	.05	....	....	....	....	.14	....	....	....	....	....	.47	....	....	....	1.35
Ames	.55	....	.54	....	T.	....	....	T.	.....	....	....	....	....	....	....	....	.33	.05	....	....	....	....	....	....	....	....	....	1.10	.01	T.	....	2.26
Atlantic	.09	.24	....	.14	....	....	....	....	....	....	....	....	....	....	....	....	....	.05	....	....	....	....	.01	....	....	....	....	.97	....	....	....	1 44
Battle Creek	.12	T	T.	T.	.15	....	....	....	....	T.	....	....	....	....	T.	....	T.	.....	....	....	....	....	....	....	.06	....	.05	.09	.13	....	....	.60
Baxter	.20	....	.50	....	....	....	....	T.	....	....	....	....	....	....	....	....	....	.60	....	....	....	....	.15	T.	....	....	.15	.55	....	....	....	2.15
Belknap	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.77	....	....	....	....	....	.24	....	....	....	.05	.85	.16	....	2.07
Belle Plaine	....	..	.50	....	....	....	....	....	....	....	....	T	....	.. .	....	....	.15	.08	....	....	....	....	....	....	T.	.. .	..	.75	.20	....	....	1.68
Bonaparte	.23	....	....	....	....	....	....	....	....	....	....	.03	.20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.37	.11	..	.94
Britt	.01	....	.07	.55	.66	....	....	....	....	....	....	....	....	....	....	....	.20	....	....	....	....	....	....	.03	....	....	....	3.43	.C6	....	....	4.98
Buckingham	.14	....	.15	.10	....	....	....	T.	....	....	....	....	....	....	....	....	27	....	....	....	....	....	....	.01	....	.07	....	.85	.05	....	....	1.59
Burlington	....	.12	.36	....	....	....	....	....	....	....	....	....	.02	....	....	....	.03	....	....	....	....	....	....	.05	..	....	....	1.51	.03	....	....	2.15
Bussey	.38	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.12	....	....	....	....	....	....	T.	T.	....	....	.99	.95	.07	....	2.56
Carroll	....	.47	.12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.11	.04	....	....	.74
Cedar Rapids	T.	.07	1.00	....	....	....	....	....	....	....	....	....	....	....	....	....	.11	....	....	....	....	....	....	.62	....	....	.38	.56	....	....	.....	2.74
Centerville	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	.16	....	....	....	2.39	.97	.64	....	2.09
Chariton	.02	.01	.06	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	.03	....	....	1.82	....	....	....	4.25
Charles City	T.	....	.30	.35	.15	....	....	T.	....	T.	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.93	1 85	....	....	2.65
Clarinda	....	2.34	.06	....	....	....	....	....	....	....	....	....	....	....	....	T.	.65	....	....	....	....	....	....	....	.50	....	1.40	....	....	....	....	5.18
Clear Lake	....	....	.30	.45	.40	....	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.64	....	....	1.47	1.35	....	....	3.70
Clinton	.63	....	.17	....	....	....	....	....	....	....	....	....	....	....	....	.05	....	....	....	....	....	....	....	....	....	....	....	1.71	.46	.57	....	4.26
College Springs	2.68	.10	..	....	....	....	....	....	....	....	....	T.	....	....	....	....	.05	....	....	....	....	....	....	....	....	....	T.	.15	1.16	.03	....	5.57
Columbus Junction	.03	.04	.36	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	T.	T.	....	....	.66	.09	.10	....	1 82
Corning	.79	.27	....	....	..	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	....	T.	....	....	.04	.18	.85	.11	....	1.91
Council Bluffs	65	T.	....	.28	....	....	....	....	....	....	....	....	....	....	....	.20	....	....	....	....	....	T.	....	....	....	....	....	.44	.09	.26	....	2.11
Cumberland	T.	.40	....	..	....	....	....	....	....	....	....	T.	T.	....	....	....	.16	....	....	....	....	....	....	T.	....	....	....	.24	1.59	T.	....	1.39
Danville	T.	.38	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	T.	....	....	....	....	....	....	....	T.	....	....	.13	.87	....	....	2.37
Davenport	.35	.01	.12	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	....	....	....	.12	....	....	....	.32	....	....	....	1.48
Decorah	T.	.45	....	.47	1.94	....	....	....	....	T.	....	....	....	....	....	....	.10	....	....	....	....	....	....	....	.04	....	....	1.25	....	....	....	3.30
Delaware	....	....	....	.13	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	.03	....	....	....	1.52
Denison	.04	....	.07	....	.08	....	....	T.	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	T.	....	....	.10	..	.72	T.	T.	....	.22
Des Moines	.78	T.	.12	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	T.	T.	....	....	....	1.00	....	....	....	1.72
De Soto	.50	....	.08	....	....	..	....	....	....	....	....	....	....	....	....	T.	.28	T.	....	....	....	....	T.	....	.10	....	....	.96	.01	....	....	1.58
Dows	.24	....	.22	.21	....	....	....	.15	....	....	....	.01	....	....	....	..	T.	T.	....	....	....	....	....	.01	T.	....	T	1.86	.20	....	....	2.17
Dubuque	....	....	.23	T.	T.	....	....	....	....	....	....	....	....	....	....	....	....	.38	....	....	....	....	....	T.	....	....	....	....	.68	.18	....	2.31
Eldon	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	.07	....	....	....	....	....	....	T.	....	....	2.00	.13	....	....	....	1.24
Elkader	....	....	....	.65	....	....	....	....	....	....	....	.10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.60	.27	....	....	2.95
Emerson	....	1.00	....	....	....	....	....	T.	....	T.	T	....	....	....	T.	.05	.01	....	....	....	....	....	....	....	....	T.	T.	.50	.62	.15	....	....	1.87
Estherville	.05	....	.03	T.	....	....	....	....	....	....	....	....	....	....	....	T.	T.	....	....	....	....	....	....	....	....	....	..	3.32	.96	....	....	1.41
Fonda	.10	T.	....	T.	....	....	....	....	....	....	....	....	....	....	....	T.	T.	....	....	....	....	....	....	....	.09	....	....	3.25	.20	....	....	4.38
Forest City	....	....	.03	.18	.18	....	....	.07	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4.00	.40	....	....	4.00
Fort Dodge	....	....	.14	.28	....	....	....	....	....	....	....	.04	T.	....	T.	....	T.	....	....	....	....	....	....	.70	....	T.	T.	1.20	....	.25	....	4.82
Fort Madison	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	T.	....	....	....	....	.36	.07	....	....	2.19
Galva	.26	....	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	.13	T.	.02	....	.32	2.18	T.	....	.69
Gilman	.27	.43	....	....	....	....	....	13	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	T.	.25	....	....	....	88	....	....	3.51
Grand Meadow	....	T.	.01	.39	....	....	..	....	....	....	....	T.	....	....	....	....	.03	....	....	....	....	....	....	....	....	....	1.50	.25	....	....	....	1.56
Greene	.03	....	.42	.29	.18	....	....	....	....	....	....	....	....	....	....	T.	.14	.03	....	....	....	....	T.	....	....	....	....	....	.36	....	.03	....	2.84
Greenfield	.85	.51	....	....	..	....	....	....	....	....	....	....	....	....	....	.04	47	....	....	....	....	....	....	....	....	....	....	.70	....	....	....	2.26
Grinnell (near)	.12	....	.43	....	....	....	....	.08	....	....	....	....	....	....	....	....	T.	.10	....	....	....	....	.03	T.	....	....	....	.98	.11	....	....	1.46
Grundy Center	.41	T.	.21	....	.12	....	....	.14	....	....	....	....	....	....	....	....	....	.03	....	....	....	....	....	....	.13	....	....	1.26	....	....	....	2.13
Guthrie Center	.12	....	....	....	....	....	....	.08	....	....	....	....	....	....	....	T.	.33	....	....	....	....	....	.38	....	....	....	....	.05	....	....	....	1.76
Hampton	.02	.08	.04	.51	....	....	....	.08	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	.05	....	1.73	.62	....	.11	....	2.89
Harlan	T.	.01	.02	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.62	....	....	....	.76
Hawkeye	T.	T.	....	....	.35	....	....	T.	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	.05	.17	....	....	.70	....	....	....	1.22
Hopeville	.05	.02	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	.01	....	....	.01	....	....	....	....	....	T.	.19	1.13	.15	.20	....	1.79
Humboldt	.07	....	....	.08	.06	....	....	T.	....	....	....	....	....	....	....	....	.40	....	....	....	....	....	.02	....	.03	....	....	2.20	.04	....	....	2.47
Independence	....	....	.12	.50	....	....	....	....	....	....	....	....	....	....	....	....	....	.09	....	....	....	....	....	....	....	.40	....	.25	....	....	....	2.07
Indianola	.19	....	.05	....	....	....	....	T.	....	....	....	....	....	....	....	....	.08	....	....	....	....	....	....	....	....	....	.40	.74	.29	.02	....	1.43
Iowa City	.03	T.	.77	....	....	....	....	....	....	....	....	....	....	....	....	T.	.42	....	....	....	....	....	....	....	....	....	....	.37	.04	....	....	1.29
Iowa Falls	.84	T.	.47	.33	.03	....	....	.12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.25	....	....	....	....	1 24	.02	....	....	3.47
Jefferson	.22	....	.25	T.	....	....	....	....	....	....	....	T.	T.	....	.02	T.	.08	....	.30	....	....	....	....	....	.71	....	T.	.35	....	....	....	1.07
Keokuk	....	....	....	....	....	....	....	T.	....	....	....	T.	.23	....	....	....	....	....	.10	....	....	....	....	....	....	....	....	.06	1.84	.02	..	2.02
Keosauqua	.70	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	....	....	T.	.60	.25	....	2.79
Lacona	....	.05	.10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.50	.10	.50	....	3.35
Larrabee	.08	....	.11	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.10	....	....	....	....	....	....	....	....	.77	.17	....	....	1.13
Le Claire	....	.93	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.08	....	.....	3.11	....	....	4.12
Le Mars	.55	....	.09	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.82	.59	....	....	2.10
Lenox	.20	.41	....	....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.04	.21	....	....	....	....	1.81
Logan	.11	.07	....	....	.28	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	....	....	.81	.....	.94	.15	....	....	.71
Maquoketa	....	....	.25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	.14	....	T.	....	1.07	....	....	....	2.15
Marshalltown	.40	....	.77	....	.28	....	....	.13	....	....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	.59	....	....	....	2 79
Monticello	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	T.	.06	....	....	....	....	....	....	....	.30	....	....	1.60	....	T.	....	.59
Mooar	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.09	....	....	....	....	.05	.04	T.	....	....	1.55	.26	.70	....	1.96
Mount Ayr	.35	.58	....	....	....	....	....	....	....	....	....	....	.27	....	....	....	T.	....	....	....	....	....	....	....	....	....	T.	2.15	....	.06	....	3.62
Mount Pleasant	.43	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	.01	....	....	....	....	....	....	....	.01	....	....	.01	.15	....	....	2.91
Mt. Vernon	....	....	.43	....	....	....	....	....	....	....	....	....	....	....	....	....	.06	....	....	....	....	T.	....	....	....	....	....	.34	1.00	.....	....	.61
Murray	.10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	....	....	....	....	....	....	....	.06	....	....	....	1.99	.16	....	4.73
New Hampton	.04	....	10	.34	....	....	....	....	....	....	....	....	....	....	....	....	....	.11	....	....	....	....	....	....	....	.07	....	.37	.20	.08	....	1.82
Newton	.14	.43	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	T.	....	....	....	....	....	.11	....	....	....	....	....	.04	.02	....	2.89
Northwood	T.	....	....	.26	.15	....	..	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	09	T.	T.	....	....	1.25	.05	....	....	1 18
Odebolt	.....	....	....	....	.13	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.19	.14	....	....	.30
Ogden	.41	....	.56	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	.16	....	....	....	....	....	....	....	.59	....	....	.60	.42	.17	....	2.41
Olin	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	.78	....	....	....	....	....	....	....	....	.03	....	....	.20	....	....	....	2.98
Omaha, Neb.	.69	.05	....	T.	.24	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	....	....	....	.20	....	.25	.66	....	....	....	.92
Onawa	.07	....	....	.20	....	....	....	....	....	....	....	....	....	....	....	....	....	.05	....	....	....	....	....	....	....	T.	....	....	1.22	1. 20	.38	....	2.53
Osage	....	.06	.15	1.04	.57	....	....	T.	....	T.	....	....	....	....	....	....	....	....	T.	....	....	....	....	.04	.08	....	....	....	.48	.05	.04	....	2.92
Osceola	T.	....	T.	....	....	....	T.	....	....	....	....	....	....	....	....	....	.56	....	....	....	....	....	....	....	T.	....	....	....	....	1. 40	30	....	1.64
Oskaloosa	.25	....	.26	....	....	....	....	T.	....	....	....	....	....	....	....	....	....	.28	....	....	....	....	....	....	.10	....	....	....	1.06	1. 38	.54	....	1.98
Ottumwa	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	....	....	.49	....	....	....	3.08
Ovid	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	.08	....	....	....	....	....	....	....	....	1 10	....	....	....	.60	....	....	....	2.68
Pacific Junction	1 70	.15	....	....	.26	....	.....	....	....	....	....	....	....	....	....	....	....	.25	....	....	....	....	....	T..	35	....	....	....	.65	....	....	....	2.15
Pella	.20	...	....	..	....	....	..	T.	....	....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.10	1. 20	.22	....	....	1.10
Perry	.10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.07	.09	..	....	....	.....	.10	....	....	....	T.	.75	....	....	....	2.27
Plover	28	.08	....	.14	.09	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	....	....	....	.47	.32	.14	....	.85
Primghar	.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	T.	.24	.18	....	.52	.10	....	....	2.80
Red Oak	.74	1 10	.03	....	....	....	....	....	....	....	T.	T.	....	....	....	....	....	.08	....	....	....	....	....	....	....	....	....	....	.90	.25	....	....	5.97
Ridgeway	....	T.	....	4.83	.02	T.	....	....	....	....	....	....	....	....	....	.10	T.	....	....	....	....	....	....	....	....	....	....	....	.72	.25	....	....	1.45
Rockwell City	.20	....	....	....	....	....	....	....	....	....	....	....	.10	.....	....	.60	.28	.30	....	....	....	....	....	....	....	....	....	....	.08	.03	....	....	2.36
Ruthven	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	T.	....	....	....	....	....	T.	....	T.	....	....	....	....	....	....	.35
Sac City	.22	....	....	....	.02	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	

DAILY AND MONTHLY PRECIPITATION FOR JULY, 1901—CONTINUED.

STATIONS.	DAY OF MONTH.																														TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Saint Charles	.29	....	.17	....	....	....	....	T.	....	....	....	....	....	....	....	....	....	.04	....	....	....	....	T.	T.	....	.04	....	1.13	.29	.46	....	2.42
Scranton	....	.58	....	....	....	....	....	....	....	....	....	....	....	....	....	.22	....	....	....	....	....	....	T.	....	....	....	....	.17	.15	....	....	1.12
Sheldon	.08	....	.82	.01	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.06	....	....	T.	.02	.07	.35	.41	....	....	1.82
Sibley	.16	..	....	1.08	....	....	....	....	....	....	.....	....	....	....	.12	.07	....	....	....	....	....	....	....	....	.05	.41	....	.03	.93	....	....	2.85
Sigourney	T.	.....	.61	....	..	....	....	T.	....	....	....	.26	....	....	....	....	.06	.12	....	....	....	....	....	T.	....	....	....	.25	.03	.04	....	1.37
Sioux City	.21	..	....	.04	..	....	....	....	....	.01	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	....	....	.01	.52	.40	....	....	1.24
Spirit Lake	.16	....	....	....	....	....	....	T.	....	....	....	....	....	....	T.	T.	....	....	....	....	....	....	....	....	.....	.19	.24	....	.30	....	....	.89
Storm Lake	.78	....	.03	.01	.02	....	....	T.	....	....	....	....	....	....	....	T.	.01	....	....	....	....	T.	....	....	T.	....	T.	.77	.05	....	....	1.67
Stuart	.65	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	....	....	....	.12	....	....	....	....	.45	....	....	....	1.22
Thurman	.35	T.	....	....	.20	....	....	....	....	....	....	....	....	....	T.	....	....	....	...	....	....	....	....	....	...	....	....	1.56	....	....	....	2.11
Toledo	.24	.35	....	....	....	....	....	....	....	.....	....	....	....	....	....	....	.23	.01	....	....	....	....	....	.38	.10	1.25	.....	....	....	....	....	2.56
Villisca	2.12	.57	T.	....	....	....	....	....	....	....		....	....	....	....	....	....	....	....	....	.....	....	T.	T.	....	T.	.92	.30	.13	....	....	4 04
Vinton		....	.74	.08	....	....	....	....	....	....	....	....	....	....	....	....	1.54	....	....	....	....	....	....	.25	....	....	.48	.95	....	....	....	4.04
Wapello	....	T.	.20	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	....	....	.17	1.13	....	....	1.50
Washington	....	....	.33	....	....	....	....	....	....	.		.30	.10	....	....	.04	02	....		....	....	....	....	....	....	....	....	.18	....	....	....	.97
Washta	1.30	....		.14	....	...	T.	....	....	....	....	....	....	....		....	....	....	..	....	....	....	....	....	....	....	.99	..	12	....	....	2.55
Waterloo	.04	....	.44	....	.16	....	....	....	....	....	....	...	....	....	....	....	.81	....	....	....	....	....	T.	....	.33	....	1.07	.19	....	.....	....	3.04
Waverly	.03	....	.52	.12	.12	....	....	....	....	....	....		....	....	....	....	.07	....	....	....	....	....	T.	T.	.05	....	.74	....	....	....	....	1.66
West Bend	.12	.12	....	.25	.04	...	....	.01	....	T.	....	....	....	....	T.	.09	.27	...	....	....	....	..	....	....	....	....	2.65	..	.11	....	....	3.66
West Union	....	....	....	.34	....	....	....	....	....	....	....	.....	....	....	....	....	.26	....	....	....	....	....	....	....	....	2.40	.10	....	....	....	....	3.10
Whitten	.45	....	.80	.20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.86	.15	....	....	2.46
Wilton Junction	.25	....	.39	....	....	....	....	....	....	....	....	....	....		....	....	.13	....	....	....	....	....	....	....	....	....	....	.25	2.58	....	....	3.60
Winterset	.85	....	.09	....	....	....	....	....	..	....	....	....	....	....	....	....	....	.66	....	....	...	....	.33	.03	....	....	....	1.35	.12	.84	....	4.27
Woodburn	T.	.04	...	....	....	....	....	....	....	....	....	....	....	....	..	....	.11	....	....	....	....	....	.02	....	....	....	....	1.20	2.07	.41	....	3.85

Precipitation Chart July 1901.



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Algona ..... C. D. Pettibone
Alta ..... D. E. Hadden
Alta (near) ..... W. J. Minard
Amana ..... Conrad Schadt
Ames ..... Exp. Station
Atlantic ..... J. W. Love
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Burlington ..... I. S. Shontz
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Carroll ..... Moses Simon
Carson ..... Agent C. B. & Q. Ry
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Washta ..... H. L. Felter
Waterloo ..... M. L. Newton
Waverly ..... H. S. Hoover
Whitten ..... Dr. Frank P. Butler
Wilton Junction ..... J. M. Rider
Winterset ..... W. W. McKnight
West Bend ..... Phil. Dorweile
West Union ..... J. M. Lisher
Woodburn ..... C B. McDonough

*U. S. Weather Bureau

WEATHER-CROP OBSERVERS.

Reporting for the Weekly Bulletin.

Agency ..... J. H. Van Zandt
Albia ..... Wm. Mercer
Algona ..... J. H. Zanke
Allerton ..... James Piper
Alta ..... Jonas Cushman
Audubon ..... Hon. A. H. Edwards
Blairstown ..... T. H. Weil
Bondurant ..... C. I. Thorp
Burt ..... R. Jain
Cedar Rapids ..... Hon. A. J. Fuhrmeister
Charles City ..... W B. Towner
Chariton ..... C. C. Burr
Clarksville ..... F. M. Russell
Correctionville ..... Hon. W. B. Chapman
Corwith ..... Wm. Oxley
Council Bluffs ..... L. Prouty
Creston ..... M. V. Ashby
Danville ..... Sherman Matthews
Dunlap ..... Hon. B. F. Roberts
Gruver ..... E. Dawson
Elliott ..... C. B. Hamilton
Emerson ..... D. B. Nims
Fort Dodge ..... R. W. Blaine
Geneva ..... Wm. H. Thompson
Harlan ..... H. B. Kees
Hesper ..... G E. Dillingham
Humeston ..... Hon. S. H. Moore
Independence ..... Geo. H. Wilson
Indianola ..... H. D. Guthrie
Iowa City ..... Edward Hummer
Ireton ..... J. M. Sherman
Le Mars ..... Hon. Henry Schrooten
Madrid ..... Geo. Swisher
Manson ..... J. D. Skinner
Marshalltown ..... Hon. S. B. Packard
Martinsburg ..... W. B. Berridge
Mapleton ..... A. Lamb
Mt. Pleasant ..... W. S. Wright
Milton ..... Hon. E. C. Holland
Osage ..... E. W. Stacy
Orange City ..... H. J. Vande Waa
Owen ..... Hon. J. W. Bird
Pittsburg ..... G. C. Duffield
Rock Rapids ..... D. E. F. Merrill
Rossville ..... T. B. Wiley
Sageville ..... Hon. F. N. Knoll
Seymour ..... L. B. Sager
Shenandoah ..... Reuben Mullison
Spirit Lake ..... E. E. Arey
State Center ..... E. P. Thompson
Stuart ..... W. W. Bailey
Tama ..... W. G. Malin
Van Horne ..... Spencer Smith
Van Wert ..... J. I. Walker
Winterset ..... H. A. Kinsman
West Branch ..... Wrigley Smith
West Union ..... H. B. Blackman
Wilton ..... Thos. Boot
Wiota ..... I. S. Coomes

U. S. DEPARTMENT OF AGRICULTURE—WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XII. AUGUST, 1901. No. 8.

WEATHER AND CROP CONDITIONS.

The month of August was warmer than usual, with a large excess of sunshine, and less than half the normal amount of rainfall. The average daily excess of temperature was 2 7°, and on the average there were twenty cloudless days and nine partly cloudy. The rainfall was an average of 1.29 inches, and this was quite unequally distributed, the northern section receiving an average of 2.10 inches, the central section 1.14, the sou hern section only .64 hundredths of an inch, and considerable areas therein only traces of rain. The bulk of the rainfall came in the first decade, leaving the balance extremely dry, especially in the central and southern belts. There was sufficient moisture in the western half of the northern section and portions of the central section to revive pastures and help the potato crop to some extent, but in two thirds of the state it was very dry, and feeding stock from the corn fields or other forage was quite general. In the counties touching the Mississippi river, and the larger part of the southern tier, the drouth remained unbroken throughout August, though the tempera ture was lower than in July. But despite all adverse conditions in three fourths of the state the corn crop showed remarkable vitality in maintaining its color and in the development and filling out of ears, giving promise of a much larger yield of grain, and a better quality of fodder, than was deemed possible at the beginning of the month. Except in the northern section the soil has been generally too hard for plowing, and but little preparation was made for fall seeding. Early corn was rapidly brought to maturity, and binders were at work in the fields about the close of August. The high temperature was beneficial to late corn, but detrimental to pastures, meadows, potatoes, and all late maturing vegetables. The second crop of clover developed much better than was expected, and the yield of clover seed will be of extra quality though materially less than in recent years.

NOTE AND COMMENT.

J. S. Trigg, in the Rockford *Register*, says: "If the continued and destructive drouth could only have been anticipated by growers of corn many a fine field might have been carried safe through by continued surface cultivation with a single horse, but the hind sight as to this matter was better than the foresight. We saved a large bed of newly set strawberries and kept them thrifty and growing all through the dry time by running a garden hoe through the field every three days during the drought."

It might be worse. A few years ago the Iowa farmers had overflowing corn cribs, with the price ranging from 15 to 20 cents per bushel. Then came the cholera, sweeping away about 30 per cent of the hogs of the state, and causing the enforced sale of millions of immature hogs of all sizes. Now the herds are healthy and high-priced, with an ample supply of grain of various kinds to fatten them. Conditions are very much better all around than in 1896 when the corn crop amounted to 313 million bushels. Yes, things have been much worse than now, and there was no drouth to bear the burden of blame.

A farmer who has a good crop of corn writes: "This corn shows three points, first, good land; second, the land is well tile-drained; third, the land is well and carefully farmed—no weeds or grass allowed to grow to take the sap from the crop. The land was a blue grass sod five years ago. This is the fourth crop of corn. Where the corn is the poorest in this county is where the balers have been at work. The man who bales all his hay and straw and sells it will soon have no hay or straw to bale or sell."—*Mt. Pleasant Free Press*.

In a newspaper paragraph it is stated that snow visited some unusual places last winter. In Mexico City it fell for the first time in fifty years; also in Madrid, where it had not been seen in eight years. And the hills near Jerusalem were covered with snow to the depth of twelve inches. And yet it is not true that the winters are becoming colder.

Exact tests of the several methods of influencing plant growth by electricity have been undertaken near St. Petersburg by Dr. Spyeshneff and Prof. Kravkoff. In the first experiments electrified seeds were planted, and they not only germinated more rapidly than others, but yielded crops from two to six times as large. Potatoes and turnips were next grown in soil electrified by copper and zinc plates placed vertically in the ground and connected by wires. The crops were three times as heavy as those grown on non-electrified soil from the same seed, with exactly the same treatment. In a third series of experiments barley was grown under a network of wires through which a constant current was passed, and the ripening was twelve days earlier than on an adjoining plot. The effect on the soil of currents passed through it was investigated. The soil temperature was considerably increased, the moisture was decreased at first, but afterward increased, and the decomposition of vegetable matter was hastened —*Ex.*

SEASONABLE NOTES.

J. R. S. IN HOMESTED.

Dr. J. M. Shaffer, of Keokuk, Iowa in an interesting letter to the Daily Gate City, makes mention of the fact that there is a notable absence of the common insects, both of the useful and injurious varieties. This fact has been noted elsewhere in the sections most severely scorched by the desiccating winds and drouth. The common house flies are not so much in evidence as in other years, the shortage probably resulting from drying up their breeding places. The song of the mosquito is not heard as frequently as in the wet season of 1900. And very

many varieties of the predacious bugs of the garden are absent, or seen at rare intervals. But there are in places swarms of black crickets, which multiply greatly in dry and warm seasons. This scarcity of insects has caused more or less of chatter and some notes of distress among the birds in the vicinity of the writer's home and an attempt has been made to supply from the larder some crumbs of comfort for the hungry warblers. Unquestionably there will be enough insects left for seed, and next season we may have occasion to remark upon the myriads of man's humble relatives of earth and air.

The acting chief of the Bureau of Forestry of the Department of Agriculture is quoted as expressing the opinion that the recent hot weather in the middle West was caused, in part, by the destruction of the forest, especially in Michigan and Minnesota, about the headwaters of the streams. He said: "If the people of the West continue to alter the face of nature they must expect to change natural conditions." That is about as untenable and far-fetched as the sun spot theory, or the Jupiter and Saturn hypothesis. No doubt some harmful results follow the extensive destruction of forests at the headwaters of streams, but it is extremely absurd to cite that as a possible factor in causing excessive heat and drouth in the valleys of the Missouri and Mississippi, a region extending well nigh from the Gulf to the lakes and far out on the southwestern plains. It is a good thing to preach the gospel of forest salvation and restoration, but it is not best to attempt to scare people into good works by irrational and sensational yarns. Due regard should be had to the law of cause and effect.

The Iowa Experiment Station at Ames, through Prof. James Atkinson, has given out some useful suggestions to corn growers. Observations in the corn belt this year will convince one that the shortage is not due wholly to the effects of heat and drouth. Poor seed is in part responsible for the deficient stand and lack of vitality. The seed time was unfavorable in a degree, but that made it more than usually necessary to plant the best of seed. Preparations for 1902 should begin at once in the fields where the earliest and best matured ears may be found for seed. Ears should be selected from such stalks as show vigor and bear the ears well up on the stalks All ears selected should be well filled out at butt and top, and this perfect filling is oftener found on medium short than long ears. Nothing less than nine inches should be chosen, the preferable length being ten to eleven inches. The circumference should be about seven to seven and one-half inches, with rows straight and well packed together. Ears that yield readily to a twisting pressure should be rejected. Nothing should be saved that shows a tendency toward the flint type; the well defined dented character should be preserved. The seed should be stored where freezing and thawing cannot affect it. The best corn growers are they who have the best gumption in selecting and caring for their seed.

RECLAIMING SWAMP LANDS.

S. C. Bradford is busily engaged making improvements upon his land which is situated near Laurens in Pocahontas county. Mr. Bradford has about 3,000 acres around that thriving little city aside from owning in the counties of Buena Vista and Palo Alto 4,300 acres more, making 7,300 acres in all. This land is worth on an average $60 per acre. But three or four years ago Mr. Bradford's land in the vicinity of Laurens was practically all swamp, and when he bought it he was laugh d at by his friends in Pocahontas for being so easily "bilked." Most of this land practically adjoins the town, but on account of its wet, swampy nature in the past no one had the nerve except Mr. Bradford to undertake its drainage, improvement and development. Thus far he has put in about twenty miles of tile under the direction of the best drainage engineer in the west—J. F. Parrish of this city. Aside from this he has subdivided it into farms of a convenient size and equipped each with first class farm dwellings and outbuildings of all kinds, the outlay for the erection of which this year will aggregate the sum of $18,000. The whole tract is now in all kinds of crop, and as an absolute and conclusive proof of the superiority of low land soil, under the trying ordeal of a long dry spell and a period of excessive heat, these crops are really in a first class condition.—*Storm Lake Tribune.*

A HAILSTONE HOAX.

The following story of the perpetration of a practical joke on an amateur scientist, copied from the *New York Tribune*, serves as an illustration of the credulity of mankind, including some of the most earnest scientific investigators; and it also illustrates the manner in which big stories gain volume by repetition:

George Ward, of Cleveland, Ohio, formerly spent some time in Johannesburg, South Africa, where he was engaged in mining. When seen at the Fifth Avenue hotel yesterday he told the following story of an experience which he had there: "One day, at the Primrose, Barney Barnato's banner mine, at Johannesburg, where I was employed, a tremendous hailstorm came up. Hailstorms, as you know, are prevalent in South Africa; indeed, so large are the stones that they frequently drive the cattle off the field in distress, and have even been known to knock them down.

"As it was summer, we had a water cooler in theoffice, and after the storm died down an idea occurred to me, so I sent for a file, and, fishing out the single lump of ice that was in the cooler, which was some six or seven inches in diameter. I filed it roughly into the shape of a gigantic spherical shaped hailstone. My idea in doing this was to play a practical joke on our paymaster, who was a crank on all meteoric problems. It was payday and the Kaffirs were all in the kraal awaiting the end of the storm, in order to come up to the office and obtain their week's wages.

"When I had got my piece of ice into a satisfactory shape I rolled it into the center of the path by which the Kaffirs would come to the paymaster's office. I then laid low and awaited developments. Pretty soon a Kaffir comes along and sights the stone (lump of ice). He at once begins to jabber, and a lot of other Kaffirs join him, and they all talk excitedly together, and finally one of them picks up the stone and carries it to the paymaster's window, all the rest accompanying him. That particular Kaffir carrying the stone was as proud as Punch, and felt himself much raised above his fellows by the wonderful discovery he had made. The paymaster was an awfully decent old chap, about 65, and his hobby was meteorology. When the Kaffir showed him the stone he not only told him where he picked it up, but also swore that he had seen it fall, a statement which a lot of the other Kaffirs confirmed as eye witnesses. The paymaster at once ceased paying off, and began to examine the ice. He carefully made transverse and cross measurements of the spheroid, and, after taking all other possible measurements, sat down and wrote a detailed description of its general appearance. All this time he had held the men up on their pay.

"'The measurements and descriptions finished,' continued Mr. Ward, 'he came to me, and, telling me of the object that had been found, asked me if he might not have the balance of the day off. He was as excited as a girl on the eve of her first ball. I, of course, gave him the time he wanted, and that very day he wrote a description of the marvelous hailstone, which shortly appeared in the Johannesburg *Star*. This article attracted widespread attention. Men from all over the world entered into correspondence with him, and the discovery that he had made created much excitement in scientific circles. I ought to say that he was a scrupulously honest man, and had the highest sort of a reputation for truth, which caused his statement about the hailstone to be accepted without contradiction by those who knew him.

"After some time he finally wrote an essay on the subject of his hailstone, which he sent to London, where it is today part of the archives of the meteorological department of the academy of sciences, and has officially been accepted as a record of the greatest hailstone that ever fell, so far as is known, upon the face of the earth. It is not extraordinary that the society accepted his statement. The wish is, as you know, father to

the thought, and when he wrote this essay he specifically stated in it that he personally had seen the stone fall. He told of the number of negroes who had seen it fall, and gave their testimony in detail, and altogether he brought a mass of evidence to bear that was practically irrefutable. In fact, today there is no way to contradict the story, and my personally manufactured hailstone will probably stand for all time as the record breaking Jumbo of hailstones. I am willing to wager large quantities of wealth that never again will one approaching it in either size or beauty of appearance be discovered."

CLIMATOLOGY OF THE MONTH.

BAROMETER.—The mean pressure of the atmosphere for August was 29.99 inches; highest observed, 30 21 inches, at Davenport, Dubuque and Sioux City on the 4th and 24th; lowest observed, 29.72 inches, at Dubuque on the 2nd; range for state, 0.49 of an inch.

TEMPERATURE.—The monthly mean temperature asdeduced from records of 115 stations, was 73.8°, which is about 2.7° above normal. By sections the means were as follows: Northern section, 72.6°; central section, 73.6°; southern section, 75.3°. The highest temperature reported was 105° at Pacific Junction, on the 1st; lowest, 40° at Forest City and Washington, on 10th and 31st. The average monthly maximum was 95 1°; average monthly minimum, 50°. The greatest daily range was 48° at Ames; average of greatest daily ranges, 36.8°.

PRECIPITATION.—The average rainfall for the state, as determined from records of 132 stations, was 1.29 inches, or 1.78 below normal. The averages by sections were as follows: Northern sections, 2.10 inches; central section, 1.14 inches; southern section, .64 of an inch. The largest amount reported was 4.46 inches, at Sioux Center; least amount reported, a trace, at Danville and Emerson. The greatest daily rainfall reported was 2.40 inches, at Sioux Center, on the 13th; average number of days on which .01 inch or more of rainfall was reported, 5.

WIND AND WEATHER.—Prevailing direction of wind, south, southeast and northeast; highest velocity reported, 30 miles per hour, at Sioux City, on the 9th. Average number of clear days, 20; partly cloudy, 9; cloudy, 2.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date
Davenport	29.98	30.21	24	29.76	17
Des Moines	30.01	30.20	24	29.82	17
Dubuque	29.99	30 21	24	29.72	2
Omaha, Neb	29.95	30.17	4	29.77	17
Keokuk	29 96	30.19	21	29 76	17
Sioux City	30 03	30 21	4	29 75	9
	.....	.....	.....	.....	....
Means	29.99	30.21	4.24	29 72	2

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity	Direction.	Date.
Davenport	4,308	23	SE	17
Des Moines	4 203	20	SE	8
Dubuque	4.221	28	NW	....
Keokuk	4,136	26	NE	17
La Crosse, Wis	3,699	20	NW	2
Omaha, Neb	4,279	24	NE	3
Sioux City	7,016	30	NW	9
	.....	..	..	....

OBSERVERS' NOTES.

AFTON—*N. W. Rowell.* Less precipitation than in any August in last seven years; have never seen pastures so poor as now, and I have been in this county forty-three years.

ALGONA—*C. D. Pettibone.* A very fine month for farm operations, with 3 61 inches of rainfall.

ALTA—*David E. Hadden.* The rainfall on the afternoon of the 13th was one of the heaviest showers on record at this station,—2.25 inches in one hour and ten minutes.

ATLANTIC—*J. W. Love.* A peculiar August—hot days, cool nights, little rain and very little dew; with the least amount of lightning I have known in any August.

BONAPARTE—*B. R. Vale.* Rain 0.31. We are 3.60 inches short of 1894 to date; 24 days gave a maximum average of 90° or more; farm work possible, only feeding and watering stock.

BRITT—*Geo. P. Hardwick.* Ideal weather for belated corn, no cloudy days.

CENTERVILLE—*J. S. Hamilton.* The soil is driest I ever saw it, and the crops the poorest.

CLINTON—*Dr. Luke Roberts.* Lightest rainfall for August in 23 years. Mean temperature 0.8° above normal.

CRESCO—*Gregory Marshall.* Very warm and dry with absence of usual number of thunderstorms and slight variation in barometer. Corn half a crop and potatoes a failure.

ESTHERVILLE—*Leslie Littell.* On the 22nd the M. E. church was struck by lightning, and on the 25th the Luthern church was struck.

FAYETTE—*R. Z. Latimer.* The storm on 14th was very heavy, the rainfall 1.50 inches in 45 minutes, extending over an area 6 miles wide and 15 long.

FOREST CITY—*J. A. Peters.* The rains kept pastures in good condition: Corn will be up to the average.

GRAND MEADOW—*F. L. Williams.* Month very dry, but not extremely warm; pastures bare, and farmers feeding stock.

GRINNELL—*A. O. Price.* Weather of month perfect for threshing, and grain secured in fine order, of excellent quality and yield.

GRUNDY CENTER—*E. S. King.* Month dry and hard on potatoes and fall feed; corn withstood drouth much better than farmers expected.

HOPEVILLE—*M. T. Ashley.* A hard month on pastures and meadows; stock water scarce and pastures brown.

LOGAN—*Mrs. M. B. Stern.* The warmest and driest time we have any record of in Harrison county.

OLIN—*Nathan Potter.* Very dry and dusty; most all stock being fed green corn, which is giving good results, and cheaper feed to those who hire pasture.

OVID—*H. C. Miller.* Pastures bare and ground too hard to plow; late potatoes a failure; fall grain not sowed yet; old corn selling at 60 cents; cattle and hogs going out of country as fast as possible.

RIDGEWAY—*Arthur Betts.* Temperature normal; rainfall half of normal; 21 days, or 389 hours of sunshine, or 90 per cent; delightful weather.

TOLEDO—*Lulu G. Bookwalter.* Corn has improved beyond expectation; pastures not much improved; potatoes light in yield.

WEST BEND—*Ph. Dorweiler.* A fine month; corn has been improving and corn is an average yield; pastures poor and wells low.

CLIMATOLOGICAL DATA FOR AUGUST, 1901.

NORTHERN SECTION.

STATIONS.	COUNTIES	Elevation, feet	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT							PRECIP., IN INCHES				Number rainy days	SKY			Prevailing direction of wind	DATES OF THUNDER-STORMS.
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall (unmelted)		Number clear days	Number partly cloudy days	Number cloudy days		
Algona	Kossuth	1,500	8	72.6	†3 3	92	20, 21	48	31	31	3 61	† 77	1 35	..	5	15	16	..	SE	21, 24, 28
Alta	Buena Vista	1,519	6	72.9	†2 9	98	1	51	31	35	3.70	- 06	2.25	....	7	17	14		S	7, 9, 13, 21, 24, 25
Alta (near)	Buena Vista	..	....	.....	.. ..	..	.. ..	....	.. .	.	2.55	.....	1.30	..	7					
Britt	Hancock	1.230	....	70.2	.....	92	21	46	8, 31	36	1.94	....	76	..	6	17	14	.	S	
Charles City	Floyd	1,012	9	72 4	†2.2	93	20	48	8, 31	37	2.08	-.17	1.15		4	11	20		SE	
Clear Lake	Cerro Gordo	984	....	74.7	.....	100	19	49	31	39	1.45	.. ...	65		3	27	4		SW	
Cresco	Howard	1,280	28	71 2	†2.6	93	20	44	8	39	1.36	1.53	.66	....	5	24	7	..	NE SE	24, 29
Decorah	Winneshiek	900	7	71.6	†2 1	96	13	44	8	44	1.02	-.36	.75		4					
Dows	Wright	..		70.8	.....	94	20, 21	48	31	39	2.22	.....	1.09	.	5	27	2	2	NW	3, 7, 8, 9, 24, 25, 29
Elkader	Clayton	..	19	74 4	†4.2	98	21	48	31	46	.82	-2.03	.40		5	21	10	....	SE	22, 29
Estherville	Emmet	....	....	70.4	.....	94	20, 21	41	3	40	4.28	....	1.44	.	8	20	11		S	9, 22, 25, 29
Fayette	Fayette	1,000	10	72 0	†3.3	94	13	44	5	45	3 04	†.29	1.93		7	25	3	3	SW	7, 13, 20,
Fonda	Pocahontas	1,237	....	.....	.....		....	....	....		1.02	.....	.78		3	24	7		S	7, 8, 13
Forest City	Winnebago	1,220	....	71.4	.....	93	19, 20	40	10	39	2 15	...	.95		5	24		7	SW	
Grand Meadow	Clayton	..	9	72.5	†4.6	94	13	48	31	36	99	-1.37	.42		5	14	15	2	NW	
Greene	Butler	943	....	73.6	.....	98	20	48	8	41	2.17	...	.80		5	16	15	....	NE	
Hampton	Franklin	1,240	10	74 6	†5.9	99	19	50	31	40	1.84	-1.19	.93	..	5	13	18		NW	
Hawkeye	Fayette	.....	7	.....			.....	....	.....	....	1.47	-1.09	.68	.	3			.		
Hoprig	Emmet	.....	..	.....	.....	....	.. ..	....	. .....		2 78	...	.90	....	7	22	9		S	
Humboldt	Humboldt	1,082	7	72.0	.....	95	21	47	31	36	1.74	-1 09	.66		8	27	4	.	SE	
Larrabee‡	Cherokee	....	9	72 9	†2.7	98	1	50	4, 8, 11, 23, 31	37	1.90	-1.29	1 06		7	20	11		SW	
Le Mars	Plymouth	....	....	72.9	.....	98	1	48	23	37	1 09	.....	.45	..	4	15	16		S	
New Hampton (c)	Chickasaw	1,166		72 0	.....	93	21	48	31	35	1.68	.. ...	.80	..	4	23	8		NW	
Northwood	Worth	1,210	....	71.9	.....	93	20	46	8	38	1.83	.....	.77	....	5	18	12	1	SW	25, 29
Osage	Mitchell	1,178	9	70.4	†4.3	89	18, 19, 20, 21	47	31	33	1.80	-.94	.69	..	5	12	15	4	S	24, 29
Plover	Pocahontas	....	....	71.1	.....	98	21	45	31	41	2 90	.....	1.10	....	7		....	...		
Primghar	O'Brien	....	....	76.2	.....	96	18	50	31	38	2 05	.....	1 00	..	4	..	.	...	SE	
Ridgeway	Winneshiek	.....	....	73.7	.....	92	20, 21	50	31	33	1.51	.....	.83	....	7	24	7		NE	6, 13, 25, 29
Ruthven (a)	Palo Alto	..	....	75.2	.....	92	20	53	10	....	2.62	.....	1.02	..	8	14	7	10	NW	
Sheldon (a)	O'Brien	1,406	....	72 4	.....	94	1 21	46	23	38	1.73	.....	1.04	....	4	16	11	4		
Sibley	Osceola	1,506	7	72.6	†5.0	98	1	47	23	42	2 58	†.55	.85	.	7	11	20		SW	
Sioux Center	Sioux	....	....	72.3		96	1	52	30	34	4.46	.....	2.40	..	6	19	11	1	S	7, 9, 10, 11, 13
Spirit Lake (a)	Dickinson	. ..		74.4	....	98	20	50	31	42	2.46	.	.86		6		..		S	
Storm Lake	Buena Vista	....	11	73.4	..	95	1	49	31	34	2.15	-.51	1.07		7	20	10	1	S	7, 9, 13, 21, 24
Washta	Cherokee	..	....	.....	.....	....	.. ..	... ..	.....		2.04	... ..	1.14	.	5	23	8	....	N	
Waverly	Bremer	942	....	73.2	.....	93	19, 20	51	8, 31	35	1.80	.... ..	.70	..	7	16	15	....	NE	8, 13, 14, 25, 29
West Bend	Palo Alto	....	7	71.8	†2.6	96	21	47	31	39	2 20	-.39	.81	..	6	13	15	3	S	9, 13, 21, 24, 25, 29
West Union	Fayette	....	....	.....	.....	.....	.....	....	. .....	....	.73	.....	.47	...	2	25		6	NW	
Average		..	....	72.6	†3.5	95.1	.....	47.6	... . ..	36 9	2.10	-.65			5	19	11	1	S	.

CENTRAL SECTION

Amana	Iowa	...	24	72.8	† 2.5	93	7	50	31	36	.98	-2.42	.52	.....	6	15	12	4	NE	8, 18, 22, 25
Ames	Story	936	20	72.8	† 0.8	97	21	48	28	48	1.21	-2 19	.72	.....	6	25	5	1	NW	25, 26
Battle Creek	Ida	.....	....	.....	.....	....	.....	.....	.....	.....	3.17	.....	1.74	....	4	27	3	1	SE W	7, 9, 13, 25
Baxter	Jasper		....	73.4	.....	94	19, 20	49	31	42	.87	..	.37	..	4	19	11	1	NE	
Belle Plaine	Benton	840	10	72.8	† 2.9	92	19	51	31	32	1.27	-1.76	.45	.....	6	6	21	4	SE	
Buckingham	Iowa	.....	...	.....	...	.....	.....	.....	.....	.....	1.06	.....	.44		4	22	9			
Carroll	Carroll	.....	10	74.0	† 3.8	97	1	50	31	42	2.24	- .57	.93	.....	5	19	8	4		3, 8, 13, 21
Cedar Rapids	Linn	744	18	74.2	† 2.7	94	28	48	31	38	.42	-2.56	.25	....	5	22	2	7	NE	
Clinton	Clinton	609	9	73.4	† 0.7	93	14	48	31	37	.48	-1.51	.37	..	3	15	9	7	NE	8, 9, 18, 22, 26
Davenport	Scott	615	30	74.2	† 1 0	92	14	52	31	28	.46	-3.03	.19	..	5	16	11	4	NE	8, 17, 18
Delaware	Delaware	1,048	9	72.5	† 3 7	95	7	46	31	35	.62	-2.26	.30		5	17	14	..	N	
Denison	Crawford	1,192	7	74.5	† 3 8	101	1	48	23	40	.65	-2.35	.54	.....	2	25	5	1	S	
Des Moines	Polk	867	23	75.0	† 2.0	95	21	56	31	33	.67	-2.63	.16	...	7	13	15	3	NE	7, 8, 22, 25, 29
De Soto	Dallas	866	....	75.1	.....	96	28	55	4, 31	36	.72	..	.26	....	5	22	7	2	NE	
Dubuque	Dubuque	655	28	73.5	† 1.5	92	13	52	31	31	.25	-2.74	.17	....	5	20	7	4	NW	
Fort Dodge	Webster			71.6	.....	97	21	47	31	42	1.33	.....	.54	....	4	24	7	..	SW	
Galva (a)	Ida	....	7	73.8	† 3.8	100	1	47	23	40	1.45	-1.45	1.03	..	3			....	S	
Gilman	Marshall	1,053	....	.....		.....	.... ..	.....	.....	.....	.86	..	.22	..	6	23	5	3	N	
Grinnell (near)	Poweshiek	..	....	74.1	.....	92	29	54	31	28	1.27	..	.60	...	6	21	6	4	NE	8, 25, 28
Grundy Center	Grundy	966	9	72.4	† 2.6	93	18, 19, 20	49	31	36	1.86	-1.13	.83	.. .	7	25	6		S	
Guthrie Center	Guthrie	.....	....	73.8	.....	95	21	50	31	42	1.25	... ..	.84	....	4	18	8	5	N	
Harlan	Shelby	.. .	....	73.9	.....	98	1	50	23	37	.81	.. ..	.54	.	3	8	20	3	SE	9, 14, 25, 26
Independence	Buchanan	921	38	72.6	† 4.5	94	19, 20, 21	49	31	38	1.37	-1.77	.45	....	4		....	..	SE	8 29
Iowa City	Johnson	644	10	74.8	† 4.1	97	13, 14	49	31	39	.66	-1.69	.26	....	4	17	13	1	NESWNW	
Iowa Falls	Hardin	...	7	70 8	† 1.8	92	20, 21	47	31	39	1.83	-1.09	1.01	....	5	24	5	2	SE	7, 8, 25
Jefferson	Greene	...		.....	.....	.....	.....	.....	.....	.....	1.01	.....	.80	.....	4	..	..	....	SE	8, 9
Le Claire	Scott	.....	....	.....	.....	.....	.....	.....	.....	.....	.54	..	.30	.....	6					
Logan	Harrison	928	35	76.2	† 4.1	98	21, 28	50	31	39	.77	-3.11	.41	...	4	21	4	6	S	
Maquoketa	Jackson	.....	7	72.2	† 0.6	96	14	46	31	44	.76	-2.44	.43	....	5	27	1	3	NE	
Marshalltown	Marshall	.....	....	74 2	.....	96	19, 28	50	31	39	1 16	.. ..	.37	.....	7	23	5	3	NW	7,
Monticello	Jones	800	46	70.4	† 0.4	96	14	45	31	45	.97	-2.69	.63	....	2	...			SW	
Mt. Vernon	Linn	...	...	76 7	.....	98	20	52	31	35	.80	.....	.45	.....	6	20	8	3	S	3, 8, 13, 17, 22
Newton	Jasper	958	13	73.8	† 2.0	93	20	52	31	33	1.30	-2.25	.72	...	5	18	11	2	S	
Odebolt	Sac	....	....	75.7	.....	102	1	48	23	42	1.29	.....	.40	.....	4	30	....	1		
Ogden	Boone	1,109	....	73 2	.....	96	21	50	10	38	1.38	.....	.53	....	5	24	5	2	SE	
Olin (a)	Jones		....	70.9	.....	92	14	47	31	37	.64	... ..	.23	.....	6	19	12	....	E	22,
Onawa	Monona	....	....	75.0	.....	100	1	55	23	35	2 24	.. ....	1.07	.....	6	27	2	2	SE	3, 8, 9, 21, 22, 25
Perry	Dallas	....	....	74.2	.....	96	21, 28	50	31	39	1.49	..	.75		4	27	4	....	S	3, 8, 9, 22
Rockwell City	Calhoun	1,219	....	73.0	.....	95	20	50	31	34	.55	.....	.30		4	26	5	....		
Sac City	Sac	900	21	73.9	† 1.4	98	1	50	31	41	1.21	-2.11	.44	....	6	29	1	1	S	
Scranton	Greene	...	....	73 6	.....	95	1	51	31	32	1.84	.....	1 12	....	4	20	11	..	N	
Sioux City	Woodbury	1,122	12	74.4	† 2.4	102	1	53	23	36	1.75	-4.01	.68	..	9	18	11	2	SE	
Toledo	Tama	....	6	74 0	.....	98	18	48	31	42	1.58	- .98	.58	....	6	25	5	1	SE	
Vinton	Benton	800	10	72.8	† 3.2	93	18, 19	52	31	....	.76	-1.45	.28	..	4	30	1	...	SW	
Waterloo	Black Hawk	862	21	73.0	- 1.4	95	19, 20	49	31	40	1.40	-2 19	.54	...	5	23	5	3	SW	
Wilton Junction	Muscatine	..	.....	73.4	.....	95	14	47	31	36	.67	.....	.20	....	6	25	2	4	E	
Whitten	Hardin		....	.....	.....	.....	.....	.....	.....	.....	. ....	.. ..	.....	..	...	...	....	.		
Average			..	73.6	† 2.3	95.7	.....	49.9	.....	37.5	1.14	-2.10	....	.....	5	21	8	2	SE	.

CLIMATOLOGICAL DATA FOR AUGUST, 1901--CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PREC. IN INCHES				Number rainy days.	SKY.			Prevailing direction of wind.	DATES OF THUNDER-STORMS
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted.)		Number clear days.	Number partly cloudy days.	Number cloudy days.		
Afton	Union	....	....	73.6	.....:	97	25	50	31	37	.44	.. ...	.15	....	4	14	14	3	NE	
Albia	Monroe	945	....	73.6	.....	94	13, 28	51	31	33	1 25	.....	91	....	5	20	8	3	SE	
Atlantic	Cass	.....	9	74 7	†4.1	101	25	47	23	45	1.13	-1.53	.95	....	2	7	19	5	NE	3, 9
Belknap	Davis	857	....	75.8	.....	96	28	55	31	33	.33	.....	.21	....	2	26	5	0	E	
Bonaparte	Van Buren	.....	9	77.2	†3.1	98	2	53	31	38	31	-3.58	31	....	1	....	....	....	.....	
Burlington	Des Moines	.....	.	76 4	.....	94	2, 28	54	31	29	.36	.....	.31		2	20	5	6	NE	18
Bussey	Marion	.....	..	.....	.....	...	.....	.....	.....	.....	.95	.....	43	....	4	....	....	....	.....	
Centerville (2)	Appanoose	....	...	76 0	.....	95	25	53	31	36	.21	.....	.12		3	....	....	....	S	
Chariton	Lucas	1,030	....	74.3	.....	96	25	51	31	34	61	.....	25	....	5	20	10	1	NE	
Clarinda	Page	1,069	10	76 1	†2.3	100	1, 28	52	31	40	.65	-2.70	.23		6	24	6	1	NE	
College Springs	Page	...	9	75.6	†2 1	97	28	55	4, 31	35	74	-1 95	.35	....	6	26	3	2	SE	
Columbus Junct	Louisa	...	....	75.0	.....	97	14	51	31	36	1.75	.....	.49	...	10	19	6	6	SE	14 25
Corning	Adams	1,127	8	74 1	†2.1	95	1	49	23	36	.70	-2.43	27	....	4	18	8	5	NE	
Council Bluffs	Pot'wat'mie	989	....	77 1	.....	102	1	55	5	35	.88	.....	.56		5	24	3	4	S	
Cumberland	Cass	.....	.....	.....	.....	.....	....	.....	.....	.....	.71	.....	.39	....	3	24	2	5	N \ ESES	
Danville	Des Moines	715	....	.....	.....	.....	....	.....	.....	.....	T	.....	T		0	24	0	7	... .	
Eldon	Wapello	...	....	75.9	.....	96	4. 13, 28	50	31	41	.60	.....	.42	..	2	28	1	2	E	15
Emerson	Mills	.....	...	.....	.....	.....	....	.....	.....	.....	T	.....	T		0	....		....	.....	
Fort Madison	Lee	516	52	.....	.....	....	.....	.....	.....	.....	05	-3 60	05	....	1	13	12	6	NE	14, 17, 18, 25
Glenwood	Mills	979	30	76.5	†4 4	103	1	52	4	38	.98	-2 39	.34		5	7	24	0	NW	
Greenfield	Adair	.	9	75.2	†3 0	97	25	53	23, 31	32	1. 17	-1.42	61		4	....	....	....	.....	3, 7, 13, 25, 29
Hopeville	Clarke	.....	..	75.3	.....	97	25	54	31	33	55	....	.16	..	6	13	16	2	NE	
Indianola (*a*)	Warren			75.8		95	21	53	31	31	.57	.....	20	....	8	....	..	....	SE	7 25, 29
Keokuk	Lee	618	29	77.2	†2.2	96	2	56	31	29	15	-2.78	.15	....	1	21	9	1	NE	17, 18
Keosauqua	Van Buren	...	8	76.6	†2.5	95	2, 7	55	31	38	.41	-2 94	.34	....	2	....	..	....	.....	
Knoxville	Marion	.....	..	74.9	.....	93	7 14 20, 21	53	31	35	.50	. ....	.25	....	3	21	8	2	NE	
Lacona	Warren	....	....	.....	.....	.....	.....	.....	.....	.....	.70	.....	.20		5	11	17	3	....	
Lenox	Taylor	....	....	75.1	.....	94	20, 21, 25	54	31	30	90	.....	.25	....	6	26	4	1	S	
Mooar	Lee	.. .	. .	73.4	.....	98	8	49	12	47	.13	.....	.09	..	2	21	10	0	NE	
Mt Ayr	Ringgold	1,236	7	75.8	†2.8	99	25	53	31	33	75	-2.26	.26		6	17	11	3	NE	
Mt Pleasant	Henry	725	..	72.2	.....	92	2. 7, 13, 14	47	31	37	.48	.....	48		1	21	8	2	NE	
Murray	Clarke	1,183		.....	...	....	.....	.....	.....	.....	.22	.....	.22	....	1	29	2	0	.....	
Omaha, Neb	Douglas	1,113	31	77.0	†5 0	99	1	58	4	31	.65	-2.69	.45	.	6	13	13	5	SE	
Osceola	Clarke	.....	.	74 6	.....	98	25	52	31	41	.40	....	.16	....	3	18	7	6	NE	
Oskaloosa	Mahaska	850	17	74 5	†3.4	96	28	53	4	38	.81	-1.92	.51	.	6	24	1	6	NE	
Ottumwa	Wapello	630	6	75 8	†2 0	94	13	58	4	31	1 36	-1 99	80	....	3	26	3	2	SE	
Ovid	Wayne	...	7	76.3	†2.6	98	21, 25	52	31	39	.91	-2 95	.21	....	7	24	2	5	SE	8, 22, 29
Pacific Junction	Mills	960	....	75 6	....	105	1	51	4, 5, 23	38	1 26	.....	.53	...	6	16	14	1	E	
Pella	Marion	...	....	74.6	.....	98	14	50	31	38	.....	.....	....	....	....	27	1	3	NW	
Red Oak	Montgom'ry	1,033		76 2	.....	93	1	59	23	26	1.07	.....	31	....	7	8	21	2	SE	13, 18, 21, 25
St. Charles	Madison	....	..	75 2	.....	95	21 25	54	31	33	.33	.....	.33	..	2	17	13	1	NE	
Sigourney	Keokuk	...	..	75.8	.....	100	19, 20	49	31	43	48	.....	.28	....	3	19	12	0	SE	8, 14, 22, 29
Stuart (*a*)	Guthrie	...	..	75.3	.....	96	21	57	4 5, 9, 23	34	.20	.....	.20	....	1	22	1	8	S	
Thurman	Fremont	...	..	74.2	.....	95	23	52	5, 6, 23	43	1.50	....	63	....	7	18	10	3	SW	
Villisca	Montgom'ry	1,058	7	73.2	†2 2	103	29	51	23, 24	40	69	-3 73	30		4	18	11	2	NW	3, 8, 14, 18 21 25
Wapello (*d*)	Louisa	578	..	75 9	.....	96	7, 15	55	4, 31	40	.18	.....	.18		1	24	6	1	.....	
Washington	Washington	.	10	73 3	†0.2	95	14	40	31	39	.24	-2.32	.24	..	1	....	....	....	SE	
Winterset	Madison	....	9	75.4	†4 0	99	25	53	31	36	.86	-2.21	.32	....	7	....	....	....	.....	
Woodburn	Clarke	.....	....	.....	.....	.....	.....	.....	.....	.....	.53	.....	.15		5	26	4	1	NE, E	
Average	.....	....		75 3	†2.8	94.6	.....	52 4	.....	36.1	0 64	-2.52	....	....	4	20	8	3	NE	
Av. for the state	.....		....	73.8	†2.9	95.1	.....	50.0	.....	36 8	1.29	-1 76	.....	....	5	20	9	2	S SE, NE	

*Means determined from 7 A. M., 2 P M, and 9 P. M observations, and maximum and minimum are taken from eye readings. ‡Received too late to be computed with means *a*, One day missing; *b*, two days, etc.

†Is used to indicate minus sign (†).

ERRATA FOR JUNE REVIEW.

EMERSON. Total precipitation should be 4.42 inches, instead of 4.62 inches.

COLLEGE SPRINGS. Total precipitation, page 8, should have been 4.88 inches, instead of 4.48 inches.

LOGAN. Total precipitation recorded, 7.97 inches, on page 7, should have been 7.84 inches.

SIGOURNEY. Total precipitation recorded, 2 39 inches,on page 8, should have been 2.30 inches.

SCRANTON. Mean temperature recorded, 77.7, on page 7,should have been 72.7.

PRIMGHAR. Minimum temperatures should have been left blank, too high.

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR AUGUST, 1901.

STATIONS.		DATE.																														Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	Max...	94	92	72	80	85	88	92	85	86	87	85	88	91	91	91	89	89	90	91	94	95	84	85	91	97	90	90	95	90	84	77	88.3
	Min..	59	70	59	54	58	54	58	60	57	55	60	56	60	62	59	58	55	61	59	61	58	67	55	58	63	59	60	58	64	56	50	58.8
Albia	Max...	89	91	79	81	85	88	93	88	83	82	75	87	94	91	92	88	90	91	91	93	92	88	85	90	89	91	88	94	85	83	77	87.5
	Min...	58	60	59	55	57	59	61	64	62	55	55	57	59	61	59	58	57	59	62	63	60	63	55	58	60	62	61	63	67	67	51	59.6
Algona	Max..	87	83	74	80	86	86	82	83	84	79	85	82	85	86	85	90	88	90	89	92	92	80	82	88	84	85	88	85	84	76	72	84.3
	Min	62	72	62	54	55	59	62	53	65	54	62	63	64	62	62	60	68	62	58	64	64	64	56	59	62	62	62	66	66	56	48	60.9
Alta	Max...	98	84	71	81	88	89	80	84	81	81	84	89	91	84	86	89	86	90	90	93	92	80	82	90	89	88	90	92	87	81	74	85.9
	Min...	60	65	58	54	58	62	62	54	63	53	58	57	61	60	62	60	59	61	60	65	66	61	55	59	63	62	61	67	64	55	51	59.9
Amana	Max...	90	90	80	84	86	89	93	83	82	79	73	87	90	92	90	88	89	90	91	91	89	86	85	89	84	88	86	92	83	82	75	86.3
	Min..	54	72	62	53	56	54	58	61	66	55	60	51	56	58	58	52	56	65	63	59	59	67	61	55	65	65	59	61	68	60	50	59.3
Ames	Max...	92	88	79	82	87	90	89	80	87	84	81	90	91	89	89	91	92	90	95	95	97	83	86	94	92	90	90	96	90	80	75	88.2
	Min...	54	72	62	56	58	54	54	53	67	56	64	56	55	58	55	57	57	62	60	59	58	58	56	54	65	62	49	48	57	56	52	57.5
Atlantic	Max...	98	93	78	85	90	91	96	88	88	88	88	93	92	93	95	96	93	94	97	98	97	88	90	93	101	94	93	96	94	87	79	91.8
	Min...	62	70	62	50	50	59	57	62	65	54	63	54	58	55	53	54	49	58	52	56	59	65	47	53	67	60	59	59	68	56	49	57.6
Baxter	Max...	88	88	75	84	85	87	90	82	85	82	77	87	90	93	91	90	91	93	94	94	93	86	88	91	91	90	90	93	88	84	78	87.7
	Min...	54	72	62	53	56	53	72	57	65	52	62	57	58	51	58	59	56	62	60	62	60	64	55	57	63	60	58	60	66	57	49	59.0
Belle Pl'ne	Max...	89	90	78	83	87	88	91	83	81	78	73	86	90	90	87	86	89	91	92	91	90	88	84	85	83	84	85	90	81	81	74	85.4
	Min...	59	62	65	56	61	59	61	60	65	56	60	54	59	62	59	54	58	66	64	64	61	67	58	59	59	64	60	65	64	58	51	60.3
Bonaparte	Max ..	92	98	85	85	88	92	97	94	92	89	81	93	96	97	96	93	93	90	93	94	92	93	90	91	95	93	90	96	92	88	80	91.5
	Min...	57	72	63	57	55	57	60	70	70	58	60	55	60	64	72	65	70	65	66	64	66	65	59	59	63	68	59	63	70	62	53	62.8
Britt	Max...	85	81	78	80	84	86	83	81	84	81	81	84	90	85	84	88	86	90	89	91	92	79	82	88	86	86	86	88	85	77	75	84.4
	Min...	52	64	58	50	50	56	60	46	64	51	58	54	57	58	56	52	51	57	55	56	61	63	51	55	55	61	60	65	61	54	46	56.0
Burlington	Max...	86	94	84	82	84	85	93	85	92	85	79	89	93	92	93	88	90	89	88	86	84	91	87	90	92	89	89	94	90	87	81	88.1
	Min...	61	71	67	59	60	58	64	69	70	65	64	59	54	66	67	61	66	67	67	72	61	68	63	63	69	67	62	65	69	65	54	64.6
Carroll	Max...	97	90	72	84	94	90	89	80	88	85	87	90	90	91	94	93	90	93	94	96	94	84	88	90	95	91	90	94	92	85	79	89.3
	Min...	61	69	58	51	52	60	65	56	65	53	62	55	60	58	57	60	53	58	61	58	64	63	52	55	63	60	60	64	63	55	50	58.7
Cedar Rap	Max...	90	89	80	82	85	89	92	85	83	81	75	91	91	91	88	88	89	88	91	90	90	89	85	91	84	88	88	94	86	81	76	86.8
	Min...	56	73	64	55	57	57	63	64	64	57	60	53	59	60	61	53	59	66	64	62	62	79	61	56	64	66	60	62	69	61	48	61.5
Centv'le (2)	Max...	90	90	78	81	82	84	92	91	83	84	78	87	92	91	90	88	90	90	91	81	91	87	86	90	95	90	87	94	90	90	89	87.8
	Min..	62	76	62	58	60	62	67	67	67	62	67	59	73	77	69	64	60	65	66	63	61	66	58	65	62	64	60	65	70	60	53	64.2
Chariton	Max ..	91	90	78	82	85	89	93	86	83	84	75	86	92	92	91	89	89	91	92	93	93	87	86	92	96	92	90	94	85	85	77	88.0
	Min...	60	73	61	55	56	58	61	64	67	56	63	58	65	60	58	57	55	62	58	62	61	66	55	62	66	59	60	65	67	57	51	60.6
Charles Cy.	Max...	88	83	76	83	86	85	84	84	84	77	82	86	90	88	85	88	89	91	91	93	93	83	85	91	85	87	87	90	82	78	76	85.5
	Min...	73	69	63	53	54	57	60	48	63	54	60	60	59	61	60	53	54	58	57	63	60	67	57	54	63	64	60	64	65	57	50	59.4
Clarinda	Max...	100	93	80	85	84	91	93	88	89	91	87	92	91	94	95	95	94	94	96	98	99	89	92	94	99	96	96	100	92	90	75	92.0
	Min...	66	69	61	55	56	53	63	64	67	56	61	57	60	59	58	58	54	60	60	61	62	64	53	59	67	61	65	61	66	57	52	60.2
Clear Lake	Max...	85	83	75	87	88	88	88	83	82	83	81	89	91	95	91	94	95	99	100	97	97	83	94	94	90	91	90	92	98	86	..	89 6
	Min...	57	67	61	54	57	57	64	51	63	54	60	60	64	63	63	55	56	60	62	64	62	62	57	60	64	63	60	63	65	58	49	59.8
Clinton	Max .	86	91	76	83	87	85	92	86	83	80	74	87	92	93	90	68	90	87	90	87	86	91	85	87	84	86	86	93	82	79	78	87.8
	Min...	54	66	66	57	53	52	55	63	65	56	55	52	55	58	59	56	60	66	63	58	64	65	63	55	60	63	57	61	62	62	48	59.0
College Sp.	Max...	94	90	78	80	85	88	95	87	88	88	85	89	88	91	92	91	88	92	93	96	96	86	87	92	94	92	95	97	89	85	77	89.3
	Min...	64	68	58	55	59	56	60	66	66	60	60	63	64	60	60	62	60	64	65	66	64	66	57	62	66	62	66	63	68	58	55	62.0
Columbus J	Max...	88	92	81	83	85	88	96	84	82	82	86	88	95	97	92	91	88	90	92	91	90	89	88	92	88	91	91	96	92	85	79	88 7
	Min...	61	72	63	56	57	56	65	59	66	60	58	57	67	62	63	60	60	62	64	60	63	66	61	60	64	65	59	60	61	65	51	61.4
Corning	Max..	95	89	78	79	84	89	91	84	86	86	82	87	89	89	90	89	90	91	93	94	83	85	90	94	90	91	93	91	81	75	87.6
	Min...	64	72	58	54	56	57	61	64	68	56	63	56	67	60	55	57	52	61	55	64	66	67	49	59	67	61	65	64	71	53	52	60 5
Co. Bluffs	Max...	102	91	82	84	90	91	92	91	87	90	89	93	84	90	90	95	92	88	97	95	96	82	91	91	97	93	93	95	94	87	79	90.7
	Min...	70	71	60	57	55	60	66	66	66	65	64	63	64	58	58	62	60	63	62	66	70	62	56	65	69	67	68	72	72	60	61	63.5
Cresco	Max...	87	85	78	81	89	89	87	83	85	74	81	85	91	87	84	87	87	89	91	93	91	85	84	92	82	86	88	92	88	78	74	85.6
	Min...	49	66	57	49	56	56	55	44	61	52	59	55	60	58	59	49	56	57	57	63	58	63	57	53	62	61	59	63	63	54	46	56.7
Davenport	Max..	86	92	73	80	82	85	92	82	85	81	72	86	92	92	91	86	89	85	89	85	82	87	84	86	81	85	84	90	86	80	74	84.6
	Min. .	61	72	65	59	60	59	66	64	67	59	59	60	64	66	62	65	66	67	64	66	70	62	62	67	66	62	67	71	62	52	63	8
Decorah	Max...	92	82	80	84	90	92	86	87	76	85	88	96	87	84	88	91	90	93	95	92	87	86	94	88	90	91	95	90	78	77	87.7
	Min...	58	56	62	46	50	53	60	44	57	50	59	55	54	58	57	48	49	59	58	58	55	55	57	50	63	60	55	60	67	55	48	55.4
Delaware	Max .	90	88	77	81	85	89	95	88	82	76	79	88	93	93	88	87	89	88	90	89	90	91	83	91	86	86	88	93	85	78	75	86 5
	Min ..	54	69	61	54	53	54	60	56	61	52	55	52	59	64	59	55	57	63	63	61	60	66	59	56	63	60	56	61	66	58	46	58.5
Denison	Max...	101	99	75	83	85	89	88	84	86	87	88	90	90	90	92	94	91	93	94	97	97	83	87	87	96	91	91	95	93	85	77	89.6
	Min..	61	68	56	51	54	59	67	62	66	51	65	57	60	56	54	55	53	56	54	62	68	60	48	50	..	62	64	69	66	55	51	59.4
Des Moi'es	Max ..	90	88	71	82	85	86	91	80	88	82	75	88	90	91	90	89	89	92	92	93	95	88	86	91	94	89	88	93	88	81	76	87.1
	Min ..	60	71	63	59	63	58	64	63	68	60	64	60	66	66	62	60	59	66	63	64	62	67	60	59	66	64	64	61	69	61	56	62.9
De Soto	Max...	93	88	78	81	86	89	94	84	86	83	81	88	91	89	90	87	88	92	91	93	93	85	83	89	94	89	89	96	88	82	87	88.0
	Min...	62	64	65	55	62	56	64	63	71	58	66	59	60	66	60	59	56	63	60	60	60	72	59	57	69	64	63	60	80	60	55	62 2
Dows	Max...	87	83	74	81	86	86	83	82	85	80	80	86	90	88	88	89	90	92	93	94	94	81	85	91	87	86	86	91	86	85	74	85.9
	Min..	52	63	59	49	50	54	55	50	52	50	59	53	58	62	57	52	51	57	54	57	59	65	57	53	59	61	59	63	57	54	48	55.8
Dubuque	Max...	85	87	74	81	82	86	90	84	80	77	76	87	92	90	87	87	87	86	90	88	88	84	83	88	81	84	85	90	88	78	76	84.5
	Min...	60	71	63	57	58	58	66	64	65	57	59	56	63	66	62	57	60	68	66	64	63	70	64	61	63	65	60	66	73	61	52	62.5
Eldon	Max...	90	92	..	96	90	90	97	89	86	87	80	93	96	95	93	93	92	92	94	95	94	91	89	92	95	94	92	96	88	87	80	91 3
	Min ..	55	72	64	58	56	60	58	68	69	56	61	54	55	61	60	58	59	65	64	60	58	63	67	55	58	65	61	57	67	60	50	60.5
Elkader	Max...	91	91	81	88	90	92	92	88	87	82	85	93	97	96	92	95	95	94	97	95	98	89	89	95	89	92	92	96	87	83	88	91.2
	Min..	53	73	62	53	53	54	58	51	61	56	58	53	55	63	56	49	52	59	60	58	55	66	59	52	65	63	55	58	68	57	48	57.5
Estherville	Max...	90	82	78	87	89	86	83	83	83	79	85	89	91	87	86	92	90	90	92	94	94	80	83	87	85	85	86	85	81	78	77	85.7
	Min..	51	55	60	48	57	57	60	45	46	51	51	59	59	59	58	56	52	56	58	54	58	59	50	53	53	63	60	62	60	55	41	55.0
Forest City	Max...	85	80	77	81	86	84	83	83	83	79	82	85	86	87	84	90	89	91	93	93	92	81	87	89	86	87	86	86	85	87	77	85 3
	Min...	56	63	50	54	56	56	56	51	63	40	52	57	57	60	60	58	58	57	60	62	61	61	57	57	67	62	62	64	64	55	47	57.5
Ft. Dodge	Max...	90	91	81	83	87	88	85	80	85	84	85	88	91	89	92	90	90	92	94	95	97	89	85	92	91	90	91	93	90	85	80	88 5
	Min. .	55	53	60	50	50	50	55	50	50	51	61	52	52	57	53	58	52	55	54	54	55	63	58	51	51	51	60	64	67	54	47	54.6
Galva	Max..	100	90	73	84	89	89	89	88	83	86	87	90	93	93	90	92	..	92	92	95	96	83	87	92	92	88	92	93	91	82	68	88 6
	Min...	61	66	60	52	74	60	64	56	..	54	59	57	60	59	57	58	..	56	52	60	64	60	47	56	65	57	59	69	63	52	50	58.9
Glenwood	Max...	103	97	84	85	88	91	95	85	89	88	87	91	84	90	94	95	92	92	95	96	97	85	91	92	97	95	93	96	96	89	80	91.4
	Min ..	69	72	60	52	53	57	65	63	66	58	62	58	62	57	58	59	56	60	61	62	67	66	53	62	67	64	66	67	73	57	57	61.6
G. Meadow	Max...	86	85	76	84	89	86	93	84	86	76	82	88	94	90	81	89	91	92	93	93	92	86	84	91	81	88	88	91	84	76	75	86.5
	Min...	55	70	62	54	55	55	63	52	62	59	58	55	59	62	61	54	56	61	63	60	58	66	59	55	62	61	57	61	62	55	48	58.5
Greene	Max...	90	86	80	86	91	90	87	88	86	82	84	89	92	91	88	91	92	94	97	98	96	84	89	94	86	90	90	94	89	81	78	88.8
	Min...	54	70	62	54	53	56	60	48	62	54	60	58	59	63	62	51	54	59	57	62	60	68	55	53	63	63	59	63	65	57	49	58.5
Greenfield	Max ..	93	89	77	83	87	88	92	85	86	81	82	87	90	91	90	90	90	92	92	95	96	88	85	90	97	91	91	95	91	84	80	88.6
	Min...	64	70	58	54	55	60	65	61	66	62	60	57	62	64	62	63	61	61	60	67	71	65	53	62	66	61	64	66	65	58	53	61 8
Grin'l (nr.)	Max. .	87	86	81	80	84	88	90	77	81	80	76	86	88	89	88	85	88	89	89	90	89	86	83	89	88	87	87	86	92	83	75	85.4
	Min...	60	74	64	57	58	61	63	59	68	56	62	59	69	64	63	63	62	66	66	67	64	69	58	62	64	63	61	68	64	60	54	62.8
Grundy C'r	Max...	86	87	75	84	88	87	88	82	85	80	86	87	90	90	90	88	90	93	93	93	92	85	88	90	87	88	87	91	88	82	77	87.0
	Min...	55	70	60	52	53	53	58	55	64	50	56	55	56	61	57	54	54	58	57	63	59	64	55	58	62	61	58	62	65	56	49	57 7
Guthrie Cr	Max...	91	89	77	81	86	88	92	83	85	88	84	90	92	89	90	91	88	91	91	91	95	87	89	88	94	89	91	97	91	82	75	88.2
	Min...	56	71	58	55	51	58	61	60	67	55	73	54	57	58	56	54	52	58	58	56	61	64	61	59	52	60	59	60	64	51	50	58.4
Hampton	Max...	89	84	76	88	89	88	85	86	86	84	83	89	94	93	90	94	95	97	99	98	97	82	93	94	90	92	92	94	93	86	81	89.6
	Min ..	55	68	62	55	55	57	60	51	64	54	60	56	62	64	62	56	55	60	60	62	60	67	58	59	62	64	60	64	65	58	50	59.5
Harlan	Max...	98	90	76	82	85	89	90	87	86	85	88	89	89	90	91	91	89	92	91	95	97	83	87	91	96	90	93	97	92	83	77	89.0
	Min...	63	70	57	52	53	54	58	61	65	55	64	56	59	56	54	55	55	58	58	58	62	65	50	56	67	62	60	64	66	56	54	58.8
Hopeville	Max...	91	88	77	78	83	86	90	83	84	83	80	87	90	90	90	88	88	90	91	93	93	83	86	95	97	90	90	94	87	82	75	87 2
	Min...	64	74	62	58	63	60	66	64	69	59	62	60	66	64	62	63	60	65	64	68	63	70	56	62	68	64	63	63	69	59	54	63.4
Humboldt	Max...	90	83	75	80	86	88	80	80	84	79	83	87	90	86	87	90	88	90	90	94	95	82	83	90	89	86	88	91	88	79	77	85.7
	Min ..	56	67	60	52	52	58	62	50	65	53	61	57	61	60	59	56	54	58	56	58	61	64	54	56	61	60	62	65	68	55	47	58 3
In'pen'nce.	Max...	87	89	78	84	87	88	90	87	83	80	78	87	91	91	89	89	92	93	94	94	94	87	86	90	85	91	89	92	86	81	..	87.8
	Min...	52	70	59	50	53	52	57	55	62	53	58	51	57	61	57	51	56	60	63	60	56	66	57	55	62	62	58	60	65	57	47	57.5
Indianola	Max...	90	89	80	84	85	87	92	83	87	86	..	88	91	92	91	90	..	93	94	93	95	83	88	92	96	91	90	94	89	85	77	88.8
	Min...	61	75	63	59	62	58	63	63	70	58	64	61	66	61	63	59	..	66	63	67	64	70	58	61	66	62	60	64	69	59	53	62 9
Iowa City	Max...	92	93	81	89	89	91	96	86	85	85	73	90	97	97	93	91	92	91	93	93	92	91	88	92	86	91	91	96	88	86	80	89.5
	Min .	54	72	62	52	55	54	57	63	67	56	59	53	58	58	59	53	62	67	63	62	62	65	59	57	63	65	67	63	66	61	49	59.9
Iowa Falls.	Max...	87	83	75	81	85	87	82	83	85	81	80	87	89	87	86	89	90	89	91	92	92	80	85	89	87	86	86	89	87	79	74	85.3
	Min...	52	67	61	52	49	53	57	51	62	51	59	50	55	61	55	50	52	58	55	59	56	62	55	50	61	61	57	63	65	57	47	56.2
Keokuk	Max..	89	96	82	81	83	87	93	95	93	86	83	90	94	93	91	88	88	87	89	89	87	93	86	89	92	89	87	93	96	86	78	88.8
	Min...	64	73	68	63	61	61	64	68	73	64	61	61	65	67	68	67	68	67	68	67	66	68	64	65	63	70	62	65	71	67	56	65 6
Keosauqua	Max...	90	95	85	84	86	89	95	93	88	87	82	91	93	93	93	92	91	90	91	92	91	92	88	91	92	92	90	94	91	87	80	89.9
	Min...	59	74	65	61	58	57	57	71	72	64	62	56	60	60	62	61	65	68	68	66	64	64	62	59	65	65	62	62	71	65	55	63 2
Larrabee	Max...	98	89	76	85	87	88	86	87	82

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR AUGUST, 1901—CONTINUED.

STATIONS.		DATE																														Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Lenox	Max...	93	90	82	78	81	85	90	83	85	84	80	86	88	90	88	88	87	89	89	94	94	83	84	89	94	88	89	93	93	82	74	86.5
	Min...	66	71	59	56	61	61	63	63	68	58	62	60	73	63	63	65	60	64	63	68	64	69	58	63	68	63	65	65	75	60	54	63.7
Logan	Max ..	92	91	80	86	89	93	91	88	92	89	90	92	90	91	93	95	92	93	95	97	98	92	..	96	98	90	97	98	90	85	87	94.3
	Min...	64	60	58	54	54	57	60	54	58	60	61	62	60	65	60	55	54	56	57	54	56	50	54	..	60	59	64	65	62	65	50	58.1
Maquoketa	Max .	88	91	80	86	88	89	94	89	78	82	73	91	93	96	93	93	90	90	94	92	91	90	86	90	87	90	89	94	88	83	79	88.3
	Min...	52	68	60	49	49	48	52	61	62	56	54	47	53	59	54	50	54	66	63	55	57	63	59	52	60	58	53	58	61	61	46	56.1
Marsh'llt'n	Max...	90	89	73	85	88	92	94	94	87	87	83	90	94	94	94	93	94	95	96	95	95	88	89	94	90	91	90	96	90	85	79	90.1
	Min..	54	63	63	55	56	54	58	60	62	54	57	53	55	61	59	55	55	62	59	62	60	67	56	55	63	61	58	59	66	58	50	58.4
Monticello	Max. .	87	93	80	86	84	88	94	90	80	80	82	89	92	96	92	91	89	90	93	90	92	90	89	90	91	88	89	92	90	83	78	88.3
	Min...	50	50	60	47	49	50	55	60	60	55	54	48	54	55	52	46	47	58	60	58	55	51	53	53	50	48	50	54	50	49	45	52.5
Mooar	Max..	90	97	83	83	87	70	93	98	83	90	89	96	96	93	96	94	92	94	93	94	94	93	96	94	93	94	93	96	94	92	94	91.7
	Min...	54	56	55	56	54	55	51	56	54	59	56	49	58	56	59	60	52	52	56	58	55	58	55	58	57	56	55	54	54	52	50	55 2
Mt. Ayr	Max..	94	90	79	82	87	89	92	90	85	88	83	90	90	91	91	91	92	92	96	97	92	86	88	92	99	95	94	96	93	87	78	90.0
	Min...	62	70	60	56	58	57	61	64	67	57	60	59	64	64	61	62	59	63	62	65	61	66	56	62	67	63	65	63	68	58	53	61.7
Mt. Plea'nt	Max..	88	92	86	80	83	85	92	88	91	82	79	86	92	92	90	88	90	86	88	88	85	87	85	86	89	88	85	91	87	84	77	86.8
	Min...	55	67	60	53	53	52	55	62	67	55	56	52	58	61	59	55	58	61	63	59	55	61	57	56	57	61	52	57	65	58	47	57.6
Mt.Vernon	Max..	92	92	76	90	91	92	93	83	80	87	82	93	93	96	91	96	92	97	97	98	95	92	95	92	90	96	93	96	92	86	80	90.9
	Min...	62	69	68	65	57	58	58	65	65	58	58	58	65	65	63	62	59	65	69	65	66	67	60	60	64	62	59	65	67	65	52	62 5
NewH'pton	Max...	88	85	77	82	..	86	86	85	84	77	81	86	90	89	..	88	90	91	92	92	93	83	85	91	83	87	88	91	87	79	75	85.9
	Min...	55	68	61	66	..	67	60	52	61	52	52	..	60	60	..	51	63	61	61	69	65	65	57	56	60	62	59	59	64	56	48	58.2
Newton	Max...	87	88	75	82	87	88	92	78	83	81	74	87	90	92	90	87	88	91	91	93	92	87	82	90	90	89	88	93	85	83	77	86.5
	Min.	58	58	63	55	59	56	62	56	67	56	61	58	58	66	60	59	58	65	63	64	61	69	59	69	69	62	63	60	67	59	52	61.0
Northwood	Max...	86	84	78	81	86	85	84	84	84	77	83	85	88	86	84	88	88	91	91	93	92	83	85	90	84	85	86	85	85	78	75	85 0
	Min...	54	68	61	53	57	56	62	46	63	53	59	57	61	62	61	55	56	59	59	64	61	66	56	55	63	63	60	62	66	56	48	58 8
Odebolt	Max...	102	88	85	86	91	92	89	87	85	89	93	95	95	90	93	97	95	93	97	99	98	94	90	95	97	94	93	96	94	88	80	92.3
	Min. .	60	68	60	52	53	57	66	57	66	52	62	57	59	59	60	57	54	57	58	60	64	63	48	58	64	61	61	69	65	54	51	59.1
Ogden	Max...	90	87	71	82	86	88	92	90	79	85	82	80	91	91	91	91	92	90	92	95	94	96	82	87	92	92	90	90	95	91	86	87.9
	Min...	56	64	59	52	52	56	51	57	65	50	61	68	60	59	56	59	54	62	60	61	60	65	54	54	63	61	60	61	69	54	51	58.5
Olin..	Max...	83	90	77	81	84	83	90	89	79	77	75	84	90	92	88	86	89	88	89	89	87	86	83	85	83	85	..	90	85	79	76	84.5
	Min...	53	70	62	51	52	51	56	61	56	54	57	50	56	60	56	52	52	56	64	61	60	66	61	54	65	55	65	..	61	47	57 3
Onawa	Max...	100	95	81	82	85	85	85	85	83	86	86	90	90	86	89	92	90	86	92	94	93	82	84	90	91	89	90	92	91	86	84	88.2
	Min...	65	71	59	56	57	61	66	63	67	57	66	60	63	60	57	60	60	59	62	64	63	64	55	63	65	63	62	68	67	58	57	61.9
Osage	Max...	84	82	76	78	84	83	82	82	82	74	81	83	87	84	81	85	85	89	89	89	89	81	83	88	81	82	83	87	84	76	73	82 8
	Min..	53	68	59	51	52	55	61	49	62	53	58	57	59	61	62	63	55	57	59	62	60	66	55	56	62	62	56	55	65	55	47	57.9
Osceola	Max...	92	89	79	80	84	86	93	91	86	85	78	89	91	92	91	89	89	92	93	94	95	86	86	86	98	92	91	95	95	84	78	88.7
	Min..	61	75	62	56	60	57	63	64	60	56	56	58	62	63	62	59	56	57	63	63	64	69	57	56	57	61	61	61	66	58	52	60.5
Oskaloosa	Max..	90	91	80	85	88	90	93	85	80	83	77	89	94	93	93	89	90	91	93	94	93	90	86	93	94	93	90	96	87	82	76	88.6
	Min .	62	74	63	53	57	53	59	63	68	54	63	57	58	60	60	55	58	65	63	62	56	67	58	55	64	64	61	60	66	60	54	60.4
Ovid..	Max...	91	94	78	85	87	90	95	91	83	87	75	90	93	95	95	94	94	95	97	97	98	91	92	94	98	93	93	96	86	89	81	90 9
	Min...	61	72	62	57	58	60	61	66	69	58	63	59	63	62	60	59	55	64	62	67	61	67	54	61	66	61	62	64	69	57	52	61 7
Pacific Jct.	Max...	105	92	83	84	88	92	95	85	88	88	87	91	85	89	89	92	91	94	93	96	92	84	89	92	96	92	96	96	94	86	79	90.4
	Min...	70	68	64	51	51	55	62	65	65	57	63	60	63	56	57	58	56	59	59	64	63	63	51	63	65	63	63	66	70	57	56	60.7
Pella. .. .	Max ..	88	90	76	88	89	89	95	81	82	85	74	90	94	98	95	90	92	93	96	95	96	90	89	90	92	93	96	90	96	88	85	79	89 3
	Min..	56	74	61	54	56	57	58	61	67	56	62	58	60	60	62	55	54	61	65	62	59	64	59	59	63	62	57	60	62	59	50	59 8
Perry	Max...	93	93	..	83	88	88	94	84	86	82	82	88	90	90	90	92	92	93	93	95	96	82	85	89	92	90	96	92	86	80	80	89.0
	Min...	58	58	60	54	53	58	62	59	68	56	62	57	56	58	60	63	62	63	60	58	60	67	53	61	56	60	62	61	69	58	50	59 4
Plover	Max...	93	82	81	82	84	89	83	82	83	80	88	90	92	86	87	86	87	86	91	92	95	98	79	82	89	86	87	90	93	84	79	70	86.1
	Min...	60	50	60	52	52	55	60	49	59	50	55	60	59	58	58	55	56	58	56	57	57	61	54	52	56	54	59	62	65	50	45	56.1
Primghar..	Max..	100	87	85	88	88	90	84	83	84	80	85	93	86	89	91	95	91	95	95	95	95	87	90	90	90	94	93	94	95	88	80	89.5
	Min...	65	65	62	54	65	62	79	55	65	50	78	..	65	60	87	89	62	87	87	89	90	91	82	85	88	91	89	88	91	91	84	..	86 9
Red Oak...	Max...	93	90	84	79	86	84	90	83	84	84	83	86	84	63	63	88	61	61	64	66	70	69	59	66	70	67	71	68	74	64	..	65 9
	Min ..	70	78	61	67	67	60	64	67	70	62	67	63	66	89	89	84	88	88	89	91	92	92	85	85	90	84	85	85	90	86	79	77	85 7
Ridgeway..	Max..	90	85	78	83	87	87	85	85	82	77	83	88	89	89	84	88	88	89	91	92	94	95	85	85	90	91	88	90	92	90	81	76	86.7
	Min..	58	72	64	57	60	60	65	52	63	56	60	60	63	64	64	60	60	62	64	66	64	63	61	60	64	63	63	60	65	68	57	50	58 8
Rockwell C	Max...	91	84	76	80	85	87	82	65	55	66	54	60	57	61	60	60	61	56	63	59	61	60	63	52	56	63	60	60	66	55	50	59 3
	Min...	61	68	60	54	58	55	65	55	66	57	60	57	61	60	60	60	61	59	63	61	60	61	60	85	93	93	89	91	95	92	82	75	88.8
Sac City....	Max. .	98	88	76	82	88	90	57	65	54	60	52	60	57	60	58	60	59	55	59	59	60	64	61	64	93	92	89	91	95	91	86	78	87.9
	Min...	62	68	60	53	54	57	66	57	66	52	62	57	59	59	60	57	54	57	58	60	64	63	48	58	64	61	61	69	65	54	51	59.1
St. Charles.	Max ..	91	88	77	83	85	86	92	84	85	83	76	87	90	91	91	90	89	93	92	93	92	95	90	92	93	90	90	92	91	86	84	88.2
	Min ..	64	75	58	57	62	59	64	62	68	58	63	59	66	65	60	69	59	64	62	67	64	55	63	65	63	62	68	67	58	57	61.9
Scranton ..	Max...	95	85	70	80	87	89	87	80	84	82	84	90	90	90	88	86	90	88	89	89	89	89	81	83	88	81	82	83	87	84	76	73	82 8
	Min..	63	71	57	55	55	60	64	57	66	54	63	58	62	62	62	63	55	57	59	62	60	66	55	56	62	62	56	55	65	55	47	57.9
Sheldon ...	Max...	94	92	74	85	87	86	86	86	86	80	85	88	88	88	90	90	91	91	93	94	95	86	86	86	98	92	91	95	95	84	78	88.7
	Min..	62	64	57	52	56	60	60	49	59	51	54	55	60	92	87	88	93	91	89	93	97	95	85	89	94	..	88	92	95	86	83	80	88.3
Sibley . ..	Max...	98	85	77	84	90	88	84	85	64	64	87	90	92	87	88	91	90	91	93	94	95	94	89	92	94	62	62	59	67	62	54	52	57 0
	Min ..	57	63	56	51	51	59	62	49	64	50	55	55	95	99	98	97	96	97	97	100	100	90	90	86	95	98	99	95	98	86	89	83	92.6
Sigourney .	Max...	97	95	78	92	94	95	97	84	61	66	50	59	52	58	60	59	54	57	64	64	63	94	57	60	64	85	63	56	60	49	58 9
	Min...	58	54	60	54	57	54	59	61	84	79	80	83	87	87	84	87	88	88	85	89	89	90	81	83	87	87	85	88	81	79	82	84 9
Sioux Cntr.	Max ..	96	87	74	82	83	58	64	62	53	65	54	57	60	60	60	60	60	60	65	58	61	65	56	56	66	61	60	69	55	52	54	59.7
	Min ..	62	65	57	56	58	84	84	83	80	82	82	85	89	90	85	88	91	89	83	91	93	70	82	85	90	92	89	89	92	90	85	74	86 4
Sioux City.	Max..	102	84	72	80	56	57	63	65	58	63	57	60	61	64	61	63	64	66	64	59	70	62	53	67	67	62	68	68	65	58	56	62.5
	Min .	66	67	56	56	57	63	65	58	63	57	60	61	64	61	63	59	64	95	94	94	95	93	89	93	86	86	90	92	83	80	69	88.8
Spirit Lake	Max..	97	..	91	88	91	88	84	90	81	83	86	90	97	83	95	96	95	94	94	95	96	93	89	94	94	61	66	66	62	62	57	59	59 9
	Min. .	60	..	59	54	62	56	64	..	..	62	59	60	63	59	60	86	89	86	89	89	92	93	81	84	89	89	87	89	90	88	80	73	86.0
Storm L....	Max..	95	91	74	82	85	86	80	82	82	80	94	88	89	84	62	66	64	61	56	68	68	61	54	63	62	59	64	70	61	53	49	60 9
	Min ..	68	67	59	54	62	62	62	55	66	52	60	61	61	59	60	90	89	..	92	92	95	96	82	91	92	95	90	91	90	92	90	92	89 0
Stuart	Max...	94	89	68	82	85	87	93	85	88	88	82	89	90	63	64	62	62	..	64	61	67	64	68	57	58	65	62	60	61	62	60	61	61 6
	Min...	64	70	58	57	57	60	63	62	57	59	62	62	58	62	64	62	62	86	88	91	91	90	83	95	88	92	88	88	91	92	90	79	87.9
Thurman ..	Max. .	98	92	81	82	85	88	92	84	87	87	85	89	90	89	89	89	89	57	55	59	61	60	63	65	52	60	65	63	63	62	72	59	54	60.5
	Min...	69	67	61	55	52	52	65	65	67	86	80	80	92	93	97	95	92	93	98	96	96	97	92	87	93	87	91	92	96	93	91	79	90 4
Toledo.....	Max ..	89	92	75	88	89	91	96	57	60	57	52	61	50	55	59	56	50	53	60	60	59	55	65	57	53	63	63	59	62	103	85	76	89.0
	Min ..	53	73	62	54	55	84	87	92	86	85	87	85	88	90	92	92	92	88	93	92	95	96	87	86	91	94	91	60	60	64	52	55	57 3
Villisca ...	Max..	95	90	67	82	84	89	83	82	84	80	80	87	91	94	90	91	93	94	95	95	94	89	89	92	85	90	89	93	87	82	77	87 9
	Min ..	62	67	57	52	54	52	57	57	57	54	56	57	57	92	93	96	91	52	57	57	58	56	57	58	58	62	64	63	63	59	55	77	88.3
Wapello ...	Max ..	..	..	..	95	85	88	96	83	64	68	61	60	59	65	65	65	61	65	68	67	67	58	52	55	70	64	65	64	65	73	50	63.0
	Min...	..	..	..	55	65	59	63	64	68	61	60	59	65	65	65	61	65	68	67	67	65	64	57	61	66	62	64	58	61	67	58	40	58.6
Washi'gt'n	Max ..	89	94	74	84	87	88	95	81	81	83	71	89	93	95	93	91	91	90	93	93	90	90	88	90	91	92	89	94	84	86	79	86.6
	Min...	53	69	60	53	54	53	59	58	65	53	57	52	60	61	59	57	59	63	62	61	60	64	57	58	62	64	58	61	67	58	40	58.6
Waterloo..	Max...	87	89	75	83	88	88	91	82	84	80	80	87	91	94	90	91	93	94	95	95	94	89	89	92	85	90	89	93	87	82	77	87 9
	Min ..	54	72	61	52	55	54	58	54	64	54	60	53	56	62	58	57	54	59	60	60	58	67	57	54	63	63	59	60	64	58	49	58.2
Waverly ...	Max..	87	87	79	82	87	87	87	83	85	78	81	86	90	87	87	88	90	92	93	93	92	83	86	91	84	88	87	91	86	80	76	86 2
	Min. .	55	71	64	59	55	58	59	51	64	55	57	58	59	64	61	54	55	62	61	65	60	68	60	56	64	65	61	65	66	59	51	60.1
West Bend	Max ..	90	81	76	83	88	88	85	85	83	82	85	89	92	86	87	93	91	91	93	95	96	80	83	90	86	87	87	89	90	85	79	75	86 5
	Min...	55	66	61	52	50	55	62	49	65	51	60	55	60	58	58	54	53	57	57	56	58	63	52	54	63	61	59	63	64	56	47	57.2
Wilton Jc .	Max .	89	92	82	83	85	84	92	89	86	80	75	87	92	95	88	88	90	88	90	88	85	88	89	82	88	88	93	87	86	77	86 9
	Min..	72	68	62	52	63	52	64	53	66	54	57	53	57	63	58	62	55	64	70	58	59	61	54	53	66	64	57	65	63	61	47	59 8
Winterset .	Max ..	92	90	70	87	90	90	96	87	86	86	78	91	93	94	94	93	91	93	95	98	98	86	90	95	89	93	94	98	91	87	81	90 5
	Min ..	58	72	65	55	55	55	62	61	68	55	63	58	61	63	60	58	58	63	60	62	62	62	55	58	..	61	61	61	70	57	53	60 4
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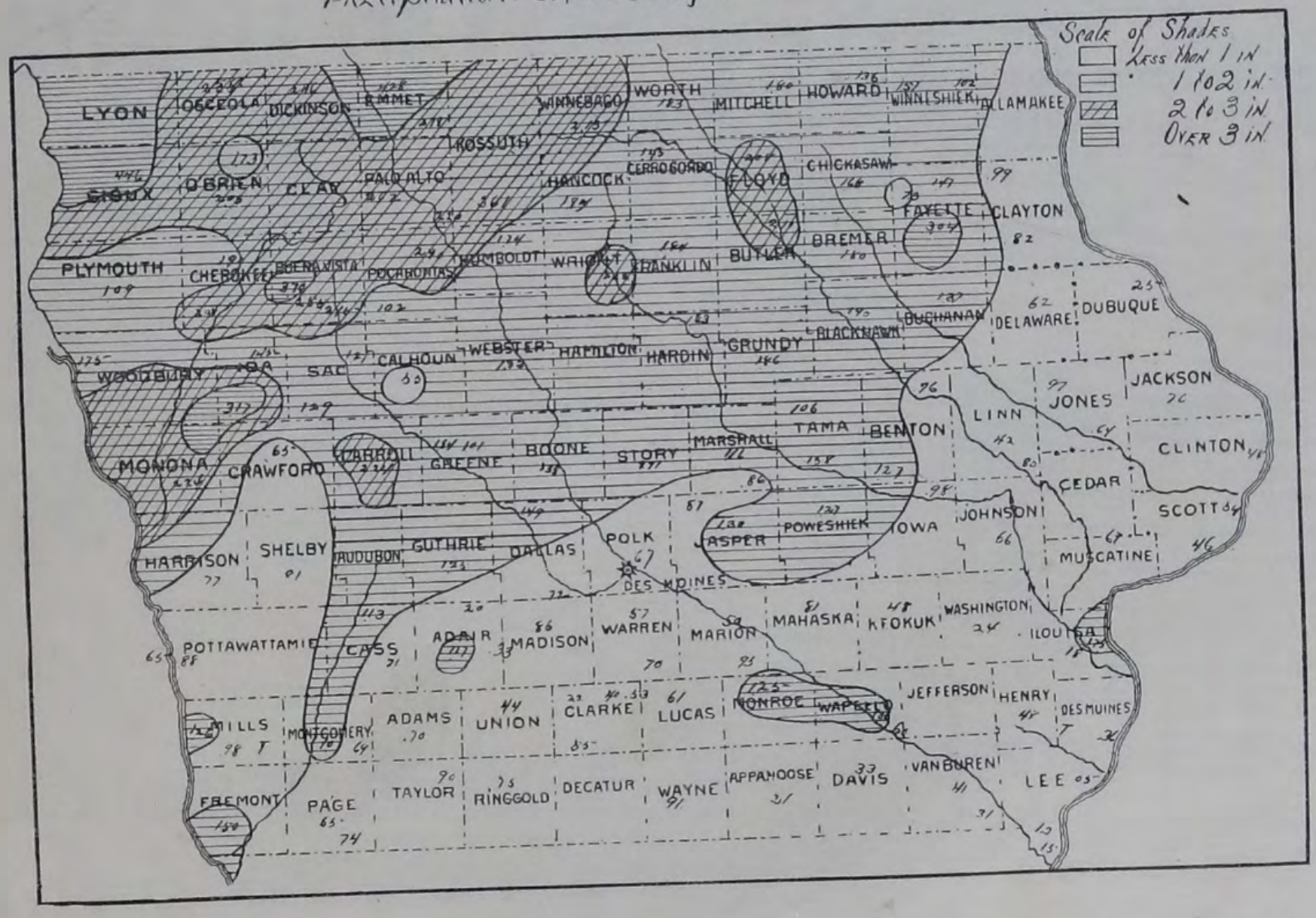
DAILY AND MONTHLY PRECIPITATION FOR AUGUST, 1901.

STATIONS.	DAY OF MONTH.																													TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	....	....	.15	....	....	....	....	T.	.17	....	T		....	T.	....	...	....	....	....	....	....	.06	....	....	....	.06	....	....	....	....	....	.44
Albia	...	....	.08	....	....	....	....	.91	.08	....	.13	....	....	....	....	....	....	....	....	....	....	T.	...	....	T.	....	....	....	.05	....	....	1.25
Algona	....	....	.03	....	....	....	....	....	1.00	..	....	....	T.	....	....	....	....	....	....	....	1 35	....	....	....	.90	....	....	.33	....	....	....	3.61
Alta	.. .	....	.17	....		....	.14	.15	.84	.04	.02	....	2.25	....	....	...	....	....	....	....	.09	....	....	....	....	....	....	....	....	....	....	3.70
Alta (near)	....	....	.18	....	....	....	.11	.16	.70	.05	....	....	1.30	.....	....	....	....	....	....	....	.05		....	....	....	....	....	....	....	....	....	2.55
Amana	....	....	.01	....	....	....	....	.52	.07	....	T.	....	....	T	...	..	....	....	T.	....	....	.25	....	....	.12	....	....	....	.01	....	..	.98
Ames	....	....	.12	....	....	....	....	.11	.72	....	....	....	....	....	....	....	....	....	....	....	. ..	.01	....	....	.15	....	....	....	.10	....	....	1.71
Atlantic	....	....	.18	....	....	....	....	T.	.95	....	T.	....	....	....	....	....	....	....	..	....	....	....	....	....	T	....	....	....	....	....	..	1.13
Battle Creek	....	....	.52	....	....	....	.25	T.	.66	T.	T.	....	1.74	....	....	....	....	....	....	....		..	....	....	T.	....	....	T.	....	....	....	3.17
Baxter	....	....	.05		....	...	....	.15	.30	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	.37	. .	....	....	....	....	....	.87
Belle Plaine	.. .	....	....	....	....	....	.01	.20	.25	....	T.	....	.....	.35	....	....	. ..	....	....	....	....	.01	....	....	....	....	....	....	.45	....	....	1.27
Bonaparte	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.31	....	....	....	....	....	...	....	....		....	....	....	....	....	.31
Britt	....	....	.09	....	....	..	.02	.76	....	.....	....	...	....	....	....	....	..	....	....	....	....	.15	....	....	.81	....	....	....	.11	....	....	1.94
Buckingham	....	....	....	....	....	....	T.	.08	.40	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.44	....	....	....	.14	....	....	1.06
Burlington	....	....	T.	....	....		....	T.	....	....	T.	....	....	....	....	....	.05	.31	....	....	....	....	....	....	....	T.	....	....	T.	....	....	.36
Bussey	. .	....	....	....	....	....	...	....	.25	....			....	....	....	....	....	....	....	....	.12	..	....	....	.10	....	....	....	.48	....	....	.95
Carroll	....	....	.32	....	....	....	...	.50	.24	....	....	....	.25	....	....	....	....	....	....	....	.93	....	....	....	....	....	....	....	....	....	....	2.24
Cedar Rapids	....	....	.04	....	....	....	....	.25	.06	....	T.	....	....	....	....	....	....	....	....	....	....	T.	....	....	.04	....	....	....	.03	....	....	.42
Centerville	....	....	.07	....	....	....	....	.12	02	....	T.		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.21
Chariton	....	....	.13	.02	....	....	....	.25	.13	....	.08	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	T.	....	....	T.	....	....	61
Charles City	....	....	.10	....	....	....	....	T.	1.15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.55	....	....	T.	.28	....	....	2.08
Clarinda	....	....	.06	....	....	....	...	.05	.13	....	23	....	.03	....	.....	....	....	T.	....	....	.15	....	....	T.	....	....	....	....	T.	....	....	.65
Clear Lake	....	....	T.	....	....	....	....	....	65	....	....	....		....	....		....	....	....	....	....	....	....	....	.60	....	....	....	.20	....	....	1.45
Clinton	....	...	....	....	....	....	....	....	.07	....	T.	....	....	....	....	....	....	.37	....	....	....	.04	....	....	....	T.	....	....	....	....	....	.48
College Springs	....	....	.11	....	....	....	....	.01	.20	....	.05	....	.05	....	. .	....	....	....	....	....	....	....	....	T.	....	....	....	....	.02	....	....	.74
Columbus Junction	....	....	.01	....	....	....	....	.47	.08	T.	.05	.01	....	.49	....	....	.36	.18	....	....	....	....	....	....	.02	....	....	....	.08	...	...	1.75
Corning	....	....	.27	....	....	....	T.	T.	.23	....	.05	....	....	....	....	....	....	....	....	....	....	.15	....	...	T.	T	....	....	T.	...	....	.70
Council Bluffs	....	....	.14	....			....	.09	.56	....	.04	....	....	....	....	....	....	....	....	....	....	....	.05	....	..	....	....	....	....	....	....	.88
Cresco	....	....	.03	...	....	T.	....	.09	.66	....	....		....	....	....	....	....	....	....	....	....	T.	....	.17	....	....	....	....	41	....	. .	1.36
Cumberland	....	....	.21	....	....	....	....	.11	.39	....	....	....	....	....			....	....	....	....	....	....	....	....	....	T	....	....	..		....	.71
Danville	T.	T.	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.
Davenport	....	....	T.	....	....	....	....	.13	.03	....	.03	T.	....	....	....	....	.08	19	T	....		T.	....	....	T.	....	....	....	T.	....	....	.46
Decorah	....	....	....	....	....	....	...	....	75	....	....	....	.02	....	....	..	....	....	....	....		....	....	....	.03	....	....	....	.22	....	....	1.02
Delaware	....	....	.01	....	....	....	....	....	.30	....	....		....	....	....	....	....	....	....	....	....	....	T.	....	.03	.06	....	....	.22	....	....	.62
Denison	....	....	.54	....	....	.....	T.	T.	.11	...	....		T.	T.	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	...	....	.65
Des Moines	....	....	.15	....	...	....	....	.04	.15	....	.01	....	....	....	....	....	....	....	....	....	....	.11	....	....	.08	....	....	....	.13	....	....	.67
De Soto	....	...	.12	....	....	....	....	.25	.26	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.05	....	....	....	.04	....	....	.72
Dows	....	....	.09	..	. ..	..	.06	T.	.87	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	1.09	....	....	....	.11	....	....	2.22
Dubuque	....	....	.01	....	....	....	T.	....	.05	....	T.	....	....	T.	....	....	....	T.	....	....	....	.17	....	....	....	....	....	....	....	....	....	.23
Eldon	....	....	T.	....	....	....	....	18	T	....	T.	....	....	....	-42	....	....	T.	....	....	....	....	....	....	....	....	....	....	T.	....	....	.60
Elkader	...		.08	....	....	....	....	.40	....	....	....	....	....	...	....	....	....	.07	....	....	....	T.	....	....	12	....	....	....	.15	....	....	.82
Emerson	....	....	T.	....	....		....	....	T.	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.
Estherville	.....	....	.14	....	....	.10	....	....	.76	....	....	....	....	....	..	....	....	...	....	....	.44	1.00	....	.07	1 26	...	....	....	.51	...	....	4.28
Fonda	....	....	.12	....	....	....	T.	.78	....	....	....	....	.12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	..	1.02
Forest City	....	T	09	....	....	....	....	T	95	....	....		....	....	....	....	....	....	....	....	....	.16	....	....	.90	....	....	....	05	....	....	2.15
Fort Dodge	....	....	16	....	.....	....	T.	....	.43	....	....	....	....	....	....	....	....	....	....	....	....	.54	....	....	20	....	....	....	....	....	....	1.33
Fort Madison	....	....	T.	....	....	....	....	....	T.	....	T.	....	....	T.	....	....	05	T.	....	....	....	T.	....	....	T.	T.	....	....	....	....	....	.05
Galva	....	...	.27	T.	....	....	....	....	1.03	....	....	....	.15	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	.....	....	....	....	1.45
Gilman	....	....	.11	....	....	...	.14	.13	.22	....	T.	....	....	...	....	....	....	....	....	....	....	T.	....	....	.16	.	....	.10	....	....	....	.86
Glenwood	....	....	.12	....	....	....	....	.18	.34	....	.10	....	.24	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	T.	....	....	....	.98
Grand Meadow	....	....	.03	.....	....	....	....	....	.40	....	....	....	....	....	....	....	....	....	....	....	....	.07	.....	....	.07	....	....	....	.42	....	....	.99
Greene	.	....	.15	....	....	....	....	....	80	....	....	....	....	07	....	....	....	....	....	....	....	....	....	....	70	....	....	....	45	....	.. .	2.17
Greenfield	....	....	.22	....	....	....	....	61	....	.33	....	....	.01	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	T.	....	....	1 17
Grinnell (near)	...	.06	....	....	....	....	T.	44	16	..	03	....	....	....	....	....	....	....	....	....	....	....	....	....	.18	....	.40	....	....	....	....	1 27
Grundy Center	...	....	.04	....	....	....	02	08	62	....	....	....	....	.. .	..	....	....	....	....	....	....	.02	....	....	83	....	....	....	.25	....	....	1.86
Guthrie Center	....	...	.03	.....	....	....	....	....	.84	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	08	....	....	....	.30	....	.....	1 25
Hampton	....	T.	.05	....	....	T.	...	.93	....	....	....	....	.07	....	....	....	....	....	....	....	....	....	....	.74	....	....	....	....	.05	....	....	1.84
Harlan	....	....	.24	....	....	....	....	T.	54	....	....	....	....	T.	....	....	....			....	....	....	....	....	T.	03	....	T.	....	....	....	81
Hawkeye	....	....	....	...	....	....	....	....	.65	....	....	....		....	....		....	....	...	....	....	14	....	68	....	....	....	....	....	....	....	1 47
Hopeville	....	....	.15	....	....	....	....	02	.09	....	07	....	....	....	....	..	....	....	....	....	....	06		..	T.	....	....	....	.16	....	....	55
Hoprig	....	....	....	....	....	02	.02	....	.58	T.	....	....	.36	....	....	....	....	....	....	....	75	....	....	....	90	....	....	...	.15	....	....	2 78
Humboldt	....	....	.13	....	....	...	.02	.03	66	....	.04	....	....	....	....	....	....	....	....	....	....	34	....	....	.51	....	....	....	01	....	....	1.74
Independence	....	....	T.	....	....	....	T.	.40	.45	....	....	....	....	....	....	....	....	....	....	....	....	T.	..	....	.22	....	....		.30	....	....	1.37
Indianola	....	....	.02	....	....	....	06	.04	.20	....	.01	....	....	....	....	....	....	....	....	....	....	.10	....	....	.06	....	....	....	08	....	....	.57
Iowa City	....	....	T.	....	....	...	...	26	.23	....	T.	....	....	....	....	..	....	....	....	....	....	T.	....	....	10	....	....	....	07	....	....	.66
Iowa Falls	....	....	.08	....	....	....	T.	02	63	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.01	....	....	T.	.09	....	....	1.83
Jefferson	....	....	.05	....	....		....	.15	.80	....	....	....		....	....	....	....	....	....	....	01	....	....	....	....	....	....	....	....	....	....	1 01
Keokuk	....	....	T.	....	....	....	....	....	T.	....	....	....	....	....	....	....	15	T.	....	....	....		....	....	....	....	....	....	....	....	....	.15
Keosauqua	....	....	T.	....	....	....	....	....	....	....	T.	....	....	....	....	....	.34	.07	....	....	....	....	....	....	T.	....	....	....	T.	....	....	.41
Knoxville	....	....	T.	....	....	....	....	14	.11	....	T.	....	....	....	....	....	....	....	.....	....	....	....	....	....	T.	....	..	....	.25	.	....	.50
Lacona	....	....	.01	....	....	....	..	.20	.20	....	.10	....	....	....	....	....	....	..	....	....	T.	....	....	....	T.	T.	....	...	.10	....	....	70
Larrabee	....	....	.18	....	....	T	.18	1.06	....	07	....	..	.05	....	....	....	....	....	....	....	.33	....	....	03	....	....	....	T	....	....	....	1.90
Le Claire	....	....	....	....	....	....	.01	....	.01	.02	....	T	....	....	....	..	.01	.19	....	....	....	.30	....	....	T.	T.	....	....	T.	....	.54	
Le Mars	....	....	.28	....	....	....	.08	....	.45	....	.28	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.09
Lenox	....	....	.25	....	....	....	....	.02	.13	....	.15	....	....	.23	....	....	....	....	....	....	....	.12	....	....	....	....	.. .	....	....	....	....	.90
Logan		....	....	.41	....	...	....	.11	.23	....	....	....	....	....	....	....	....	....	..	....	....	....	....	....	.02	....	. ..	....	....	....	....	.77
Maquoketa	...	....	.03	....	....	....	....	.08	.19	....	....	....	....	....	....	....	....	.03	...	....	....	.43	....	....	T.	....	....	....	....	....	....	.76
Marshalltown	....	....	.12	....	....	....	03	.13	.36	....	....	....	....	....	....	....	....	....	....	....	....	.03	....	....	37	....	....	....	.12	....	....	1 16
Monticello	....	....	T.	....	....	....	T.	T.	34	....	....	T.	....	T.	....	....	....	T.	....	....	....	T.	....	....	....	63	....	....	....	....	....	.97
Mooar	....	....	T.	....	....	....	....	....	T.	....	....	....	....	....	....	....	04	.09	..	....	....	....	....	....	....	....	....	....	....	....	....	.13
Mount Ayr	....	....	.09	....	....	....	....	.08	.13	....	.26	....	....	....	....	....	....	....	....	....	....	.05	....	.....	T.	14	....	....	....	....	....	.75
Mount Pleasant	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	....	.48	T.	....	....	....	....	....	....	....	....	....	....	T.	....	....	.48
Mt. Vernon	....	....	.09	....	....	....	.. .	.45	.11	....	T.	....	T.	....	....	....	T.	....	....	....	....	.05	....	....	05	....	....	....	.05	....	....	.80
Murray	....	. ..	T.	....	....	....	....	....	....	22	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	....	....	.22
New Hampton	....	...	.08	..	....	...	....	.	....	80	....	....	....	....	....	....	....	....	...	....	....	....	....	....	.35	....	....	....	.45	....	....	1 68
Newton	....	....	.11	....	....	....	....	72	12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.16	....	....	19	....	....	....	1.30
Northwood	....	....	.06	....	....	T.	....	....	70	....	....	....	.04	....	....	....	....	....	....	....	....	T.	....	....	77	..	....	T.	26	....	....	1.83
Odebolt	....	.37	....	....	....	....	....	....	.36	....	....	.....	.40	....	....	...	....	....	....	....	.16	....	....	....	.. .	.....	....	....	....	....	....	1.29
Ogden	....	...	.12	....	....	....	.07	.53	.14	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.52	....	....	....	....	....	....	1 38
Olin	....	....	T.	....	....	....	....	.23	.14	....	T.	....	....	....	....	....	....	.11	....	....	....	08	....	....	07		....	.01	....	....	....	.64
Onawa	....	...	.83	....	....	....	....	.09	.13	....	....	....	T.	....	....	....	....	....	....	....	1.07	10	....	....	.02	....	....	....	....	....	....	2.24
Osage	. ..	....	.05	....	....	....	.01	....	.69	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.68	....	....		.37	....	....	1.80
Osceola	....	....	.16	....	. ..	....	....	.....	....	....	.14	...	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	.10	....	....	40
Oskaloosa	....	.02	....	....	....	....	....	.15	10	....	.10	....	....	....	....	....	....	....	....	....	....	T.	....	....	.02	....	....	....	51	....	....	.81
Ottumwa	....	....	....	....	....	....	....	28	....	....	....	....	....	28	....	....	.80	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.36
Ovid	....	....	.11	....	....	....	....	.21	.11	....	.21	....	....	....	....	....	....	....	....	....	....	....	....		.04	.11	....	...	.12	....	....	91
Pacific Junction	....	....	.07	..	...			17	.34		.01	.	.53		...		..	..	.....	....	.	..	T		..		T.		..	05	1.26
Perry	....	....	.15	.	..	...	..	.47	.75	..	..	....		..	....	...	..	..	.	....	.12	..	....	..	..	...		....	.	....		1.49
Plover	....	....	.16	....	....	....	..	.	1 05	....	.04	..	.02	..	..	..		..	...	....	1.10		.	...	26	.		.27		....	..	2 90
Primghar	....	....	....	....	....		.45		1.00	30	30	..		..	....	..		..	..	....	....	..	...		.	....	..		..	..	..	2.05
Red Oak	....		.18	...			..	.16	.31	..	.07	...	T.	..	..	....	....	.02		.	.30	.03	..	....	..	T.			...	....	....	1.07
Ridgeway	....	....	.03	..	...	T.	.01	..	.83	...			T.	...	....	..	..	..	....		..	08	..	..	.14	....	...	.	.42	..	...	1.51
Rockwell City	....	....	.30	..	...	....	T	....	....	....	..	....	....	T.	.	..	....	....	....	....	....	.05			.05		..	....	.15	.....	....	.55
Ruthven	....	....	.10	...	..		20	..	1.02	.	.12	..	.38	....	....	....	....		..	.	.32		..	.	.42	..	....	.....	.06	..	...	2.62
Sac City	....	....	.30	....	..	..	.04	...	.44		.04	.	.15	....	..	...	....	....			24		....	....				....			....	1.21
St. Charles	....	....	T.	....		..	T.	.08	.25	T.	....	....	....		....		....	....	....			..	....	....	T.	. .	..		T.	....	....	.33

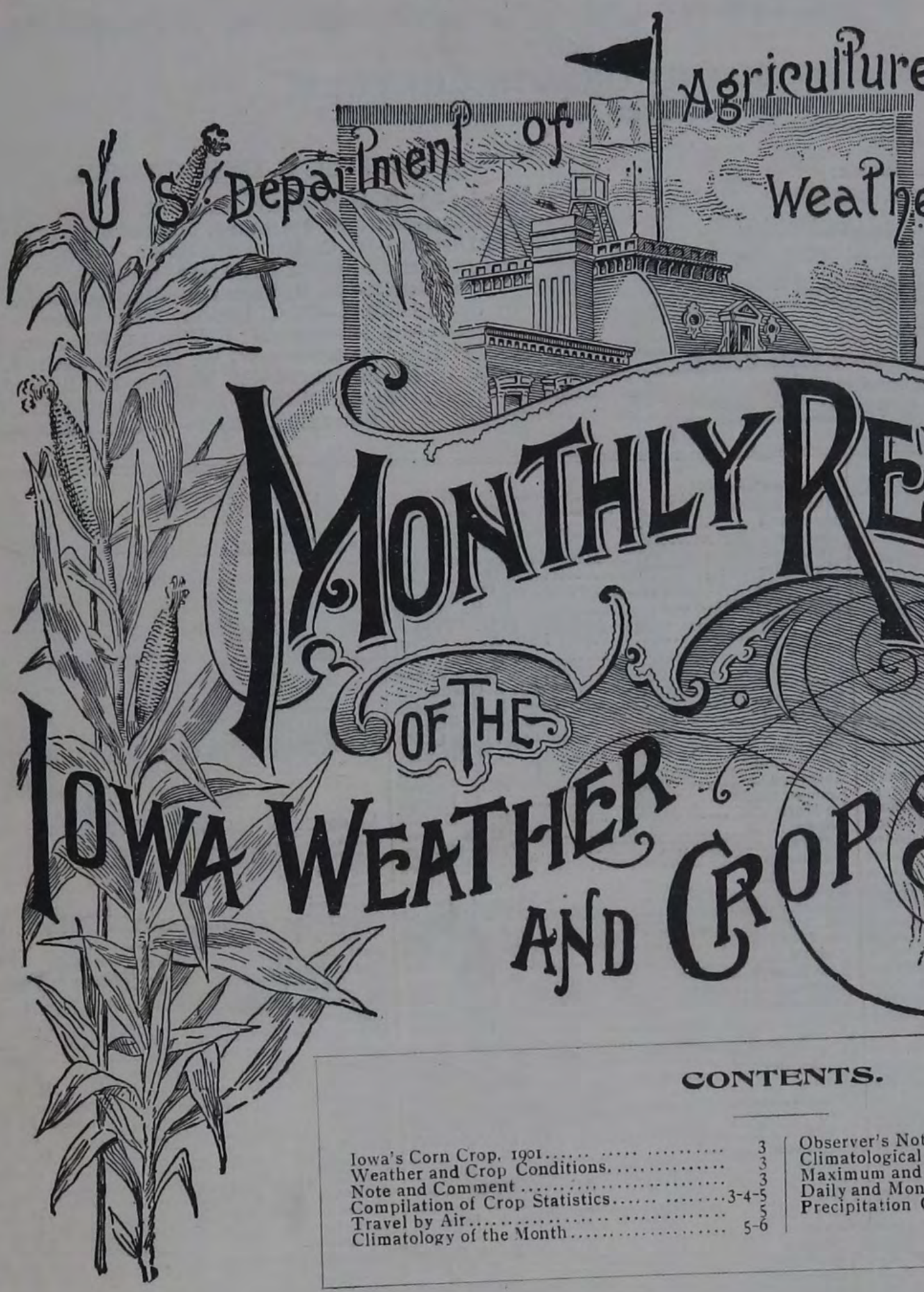
DAILY AND MONTHLY PRECIPITATION FOR AUGUST, 1901—CONTINUED.

STATIONS.	DAY OF MONTH.																														TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Scranton	....	....	.12	....	....	.....	....	.17	.43	....	....	....	....	....	....	....	....	....	....	....	1.12	..	....	....	....	....	.....	..	....	....	....	1.84
Sheldon	....	....	.15	....	....	....	....	....	1.04	.04	....	...	.50	....	....	....	....	....	....	....	....	....	....	....	.37	....	....	....	T.	....	....	1.73
Sibley	....	....	.17	.....	....	.25	....	....	.85	.18	.03	....	....	.73	....	....	....	....	....	....	....	T.	....	....	T.	....	....	....	T.	....	....	2.58
Sigourney	....	....	T.	T.	....	....	....	.28	.16	....	.04	....	....	T.	....	....	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	.48
Sioux Center	....	....	.25	....	....	T.	.11	....	1.22	.14	.34	....	2.40	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4.46
Sioux City	....	....	.68	....	....	....	.05	....	.54	.02	.02	....	.36	.02	....	....	....	.01	....	....	T.	....	....	....	.05	....	....	....	....	....	....	1.75
Spirit Lake	....	....	.17	....	....	.15	....	....	.86	....	....	....	.37	....	....	....	....	....	....	....	.10	....	....	T.	.81	....	....	....	....	....	....	2.46
Storm Lake	....	...	.13	....	....	....	.14	....	.76	....	.02	....	1.07	.01	....	....	....	....	....	....	.02	....	....	.....	T.	....	....	T.	....	....	....	2.15
Stuart	....	....	.20	....	....		T.	T.	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	T.	....	....	....	....	....	T.	.20
Thurman	....	....	.05	....	....	....		.05	.63	....	.15	....	.32	T.	....	....	....	....	....	....	....	....	....	.15	T.	.15	....	....	....	....	T.	1.50
Toledo	....	....	.13	....	....	....	....	.10	.40	....	.01	....	....	....	....	....	....	....	....	....	....	....	....	....	.58	....	....	....	.36	....	....	1.58
Villisca	....	....	.16	....	....	....	....	.15	.08	....	....	....	....	T.	....	....	....	.30	....	....	....	....	....	T.	T.	....	....	....	T.	....	....	.69
Vinton	.....	....	.09	....	....	....	....	T.	.28	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	.23	....	..	....	.16	....	....	.76
Wapello	...	....	....	....	....	....	....	.24	....	....	...	....	....	....	....	....	....	.18	....	....	....	....	....	....	T.	....	....	....	....	....	....	.18
Washington	....	....	....	....	....	....	.20	.32	....	.10	....	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	....	.24
Washta	....	....	.28	....	....	....	T.	.18	.54	....		....	....	....	....	....	....	....	....	....	1.14	....	....	....	.35	....	....	....	.17	....	....	2 04
Waterloo	....	....	.16	....	....	....	....	.08	.70	..	....	....	.04	.12	....	....	....	....	....	....	....	....	....	....	.52	....	....	....	.24	....	....	1.40
Waverly	....	....	.10	....	....	....	..	....	.79	....	....	....	.04	....	....	....	....	....	....	....	.81	....	....	....	.36	....	....	T.	.10	....	....	1.80
West Bend	....	....	.10	....	....	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	T.	....	....	....	.26	....	....	2.20
West Union	.....	....	.....	....	....	....	....	.47	....	....	....	..	....	.....	....	....	T.	.20	....	....	.10	....	....	....	.05	....	....	....	....	....	....	.73
Wilton Junction	....	....	T.	....	....	....	....	.15	.12	....	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.10	....	....	....	....	....	.67
Winterset	....	....	.10	....	....	....	.15	....	.06	32	03	T	....	....	....	....	....	....	....	....	....	....	....	....	....	.12	....	....	....	....	....	.86
Woodburn	....	....	.15	....	....	....	....	.08	.13	....	.05	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.53

Precipitation. Chart. August 1901.



Vol. XII. SEPTEMBER, 1901. No. 9.



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

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DIRECTOR.

GEO. M. CHAPPEL,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

ALLIED PRINTING TRADES UNION LABEL COUNCIL DES MOINES

DES MOINES:
BERNARD MURPHY, STATE PRINTER.
1901.

THE IOWA WEATHER AND CROP SERVICE

WAS ESTABLISHED BY ACT OF THE TWENTY-THIRD GENERAL ASSEMBLY, AND IS UNDER SUPERVISION OF THE

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U. S. DEPARTMENT OF AGRICULTURE—WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XII. SEPTEMBER, 1901. No. 9.

IOWA CORN CROP, 1901.

The crop correspondents of the Iowa Weather and Crop Service, have made a preliminary estimate of the yield of corn for the season, expressed in bushels per acre, instead of percentages as during the past month. It is understood, of course, that this estimate is subject to revision in the final report of the season, after the crop has been harvested. The average for the state appears to be about 26 bushels per acre, which would indicate a total output of 225,570,000 bushels. The shortage caused by the hot winds and drouth, as compared with the yield of last year is over 100,000,000 bushels; and the product this year is about 35,000,000 bushels below the state average for the past twelve seasons.

WEATHER AND CROP CONDITIONS.

September was slightly cooler than usual, the daily mean temperature for the state being about one degree below normal. The general conditions as to sunshine and warmth were quite favorable for the needs of all crops, and for the germination of fall sown grain. The average rainfall for the state was 4.77 inches, which is 1.76 above normal. The distribution by sections was unequal, the northern section receiving 7.07 inches; central section, 4.24 inches; southern section, 2 99 inches, or the normal amount. The bulk of the rainfall came in the second week, and from the 25th to 28th. In the northern districts the excessive rainfall hindered threshing, plowing and corn harvesting to some extent, but generally very fair progress was made in all farm operations. Cutting corn, with harvesters and by hand, was in progress from the beginning of the month till the necessary amount was secured for fodder, and put in shock in excellent condition.

The corn crop was quite generally matured by the middle of the month. The first frost was reported on the morning of the 17th, and was followed by frosts at various localities on the 18th and 20th. Some late corn was at that time green, and in portions of the western districts slight damage resulted from killing the blades. The percentage of damage from September frosts, however, was exceedingly small, and the mouth, as a whole, was favorable, both in respect to temperature and moisture. There was no killing frost during the month,—that is, frosts sufficiently severe to be "destructive to vegetation and the staple crops." The pastures were greatly improved during the month, insuring a considerable supply of fall feed for stock. Good progress has been made in plowing. The late potato crop was much benefited by rains, and the output of that useful crop will be better than anticipated. The fall sown grain has made a ready start and a fair stand. The winter apple crop, while generally very light, is better than has been anticipated in the commercial orchards of the southwest district.

NOTE AND COMMENT.

Potatoes are said to contain more starch than usual this season. That accounts for the stiffening of the price.

Geo. W. Barclay, voluntary observer at Tipton, under date of Sept. 27, makes the following interesting notes on the migration of birds southward: "Bluebirds have been moving in flocks for past ten days. Crows and blackbirds have been flying southward for a week. Robins left two weeks ago. Nighthawks and Whippoorwills were all gone September 1st. Bluejays were passing over to-day in large flocks. The house-wren is still here."

Dry seasons have one thing to their credit, and that the superior quality of all farm products grown and saved. The entire hay crop of the central west was saved this year bright and fragrant and entirely undamaged by rain, no insignificant item when in some seasons it is more than half spoiled.

J. S. TRIGG.

Western farmers in the vicinaty of beet sugar factories are in luck this season if they are numbered among the beet producers. The sugar beet has fully justified the claim that it possesses high quality as a drouth-resisting plant. Reports from all sections where the industry has been established indicate that the yield is large, and the grade high in the scale as to the percentage of saccharine content. The fact affords an added reason why the farmers of the West, wherever it is practicable, should co-operate with capitalists who are ready to build and operate factories wherever they are given assurance of an ample supply of the product. The need of diversified farming is generally conceded, and beet growing offers strong inducements, for the reason that it yields large returns and is measureably certain to do well in seasons when other crops fail. And another consideration of importance is the fact that the by-products of the beet sugar industry are exceedingly valuable in feeding stock. In drouthy seasons such an addition to the supply of succulent feed for milk cows and other stock would be very welcome on many farms. A good sized field of beets, within reach of a factory, would most likely yield more net profit, acre for acre, than any crop on the farm, especially in a year of shortness from drouth.

COMPILATION OF CROP STATISTICS.

A paper read before the National Grain Dealers' Association, at Des Moines, Iowa, October 3, 1901, by J. R. SAGE.

This is distinctively an age of applied science, and far-reaching statistical inquiry. Scientific researches are mainly directed towards practical resuits, and statistical inquiries are pursued along lines of production to secure reliable facts, figures and estimates, as a basis of operations in our complex industrial and commercial system. Having a paternal form of government we are enabled to do collectively many things that

could not be accomplished by individual efforts, or even by large associations of men.

The Department of Agriculture, with its scientific bureaus and divisions, is the most helpful agency of the government in the service of the people engaged in agriculture and commerce. In no other country on earth is there so large a corps of eminent scientists and specialists, aided by millions of money, engaged in researches and experiments and in dissemination of facts and practical results for the benefit of all the people. That is, indeed, paternalism in its most beneficent form. There may be some people who deem this a waste of the Nation's money, and who do not appreciate the helpfulness of this great department of the government; but they would certainly be made to realize its practical value if its manifold activities were suddenly brought to an end. It is an outgrowth of this age of high achievements and marvelous expansion of commerce and industry, and it has become indispensable to the people whom it serves so efficiently. It has received unqualified praise from public men in Europe, well expressed in the words of Sir Richard Armstrong, of England, who said the department includes "the ablest aggregation of agricultural scientists in the world." And it is certainly most fitting that such a Department of Agriculture should be maintained in this country, which produces nearly 80 per cent. of the total corn of the world, and exports annually about $800,000,000 worth of agricultural products, constituting about 70 per cent. of our total exports. Our Uncle Sam has given free homesteads in his best grain and grazing lands, and now with prodigal liberality is expending millions annually in teaching the science of farming, in extending the range of our foreign markets, in observing the elements of the air and giving timely warnings of destructive storms and floods, in the issue of maps and bulletins and in collecting and disseminating statistics of farm products and their disposal and consumption at home and abroad. And now our benignant old Uncle says: "If you want anything that is not in sight, please ask for it."

From the point of view of this assemblage the most useful branches of the Agricultural Department are the Weather Bureau and Division of Statistics. The various maps, forecasts, storm warnings, bulletins and statistical reports issued therefrom are eagerly looked for and closely studied by grain dealers, and all classes engaged in commerce, transportation, manufacturers and the production of food supplies. From the outset to the close of each season, the burden and refrain of the songs heard in the marts of trade and on the farms is: "What will the harvest be?" And the answer to this depends upon the answer to another most anxious inquiry: "What will the weather be?" After the experiences of the past summer one may well feel quite certain that the weather is a most potent factor in the production of the staple farm crops.

With our marvelous resources of soil and great diversity of climate, there is no reason to fear total failure of crops or a general famine in this country. The divine promise that "While the earth remaineth seed time and harvest shall not cease," has been well fulfilled in this favored land. But as a result of nature's law of variability in the distribution of heat and moisture, there has been in the past and will be in the future a corresponding variability in the output of the harvests. Within limited areas of our broad domain there have been drouths and relative shortage of crops in nearly every season. And it is this constant swinging of nature's pendulum from excess to deficiency of heat and moisture that causes anxiety from the time of planting till the crops are safely garnered, giving intensity to the refrain, "What will the harvest be?"

In the occasional seasons when droughts and hot winds strike this great central valley, which is fitly termed "the granary of the continent," there is more than usual alarm excited in commercial centers and among the Granger railways. A hard blow at the corn belt strikes below the belt, in the language of the ring. For it is here the surplus must be produced for shipment to regions of scant production, and general failure of the staple crops in this vast producing area would reduce millions of people to short rations. During the period of extreme heat and aridity in last July, when the hot winds were killing the tassels in the corn fields, and strong blasts of hot air were sweeping through the corn pit in Chicago, there was some real occasion for the panic that caused many people to lose their heads. But the outcome, as in the experience of former seasons, proves that the scare was greater than the actual calamity. When we have finished taking account of stock we shall find a mighty big quantity of cereals and forage on hand for the approaching winter, though for the whole country the output of merchantable corn is probably 500,000,000 bushels below the average of our best seasons.

Like all midland regions this valley is subjected to great extremes of temperature and marked fluctuations in the amount and distribuiton of the seasonal rainfall. The Gulf of Mexico supplies the moisture for the irrigation of our fields, and the motive power for its transportation is furnished by the cyclones that traverse the continent from west to east. And whether or not we have our full quota of rainfall in due season, depends upon the normal or abnormal movement of these great cyclonic storms. During the past decade we have had severely damaging drouths in two seasons, and plenty of scare reports to make lively work on the boards of trade in nearly every season. The most destructive drouth in this section occurred in 1894, causing a shortage of about one billion bushels in the output of cereals, compared with the general average.

So it goes without saying that all crops are weather crops. And this justifies the statement that the work of the Weather Bureau serves as the basis of the whole structure of reliable crop reports and estimates, whether made by the government or other agencies. An absolutely normal season, in respect to temperature and rainall, will certainly produce normal crops. But here as elsewhere in nature's domain, variability is the rule. The general averages of rainfall and temperature are maintained for long periods, but no two seasons have ever been observed to run on exactly parallel lines. This holds good especially in the amount and distribution of rainfall during the crop season. The corn and wheat belt is watered mainly by local showers and not by general rains. These showers occasionally run in narrow belts, and with such frequency that portions of the state suffer from excess while other parts are being injured by drouth. During the past season nature's watery favors were bunched in a way to verify the scriptural rule, "To him that hath shall be given, and from him that hath not shall be taken even that he hath."

The newspapers and grain dealers tell us the corn crop this year is good only in spots and narrow belts; this is true, and the reason is found in the fact that the showers fell in spots and belts in the critical period of growth. And the close observer of the facts and records as to the rainfall during the season was best prepared to make an estimate as to the final yield. Throughout this corn and wheat belt the really competent crop experts are the men who have made the most thorough and comprehensive study of climatic conditions as well as crop statistics. It follows, then, that improvements in the crop reporting system may be made only through bringing it into closer connection with the Weather Bureau, and by enlarging the scope of the Bureau's work in its Climate and Crop Division. My experience in this line of work has deepened the conviction that the weather service and crop reporting service naturally and logically should be conjoined; and what nature's law hath thus joined together let not man put asunder.

For the benefit of producers, dealers and consumers there is need of improvements on this line, especially in the way of obtaining more full data as to rainfall in the critical months of the crop season. In so far as may be practicable all our township

crop reporters should be provided with rainguages, and in times of special stress and anxiety we should have daily reports by telegraph from every county wherein showers have fallen. In other words the corn and wheat region reports should be greatly enlarged in scope whenever the conditions are deemed critical enough to warrant the extra expense. There is positive need of more full and complete rainfall data.

In times of doubt and fear, when the staple crops seem to be in imminent danger of destruction, reliable facts and figures relative to weather conditions over the entire area of production are worth a thousand fold more than the opinions and theories of men who are more or less "overcome by the heat." The officials employed in compiling crop estimates and statistics are fully aware of the obstacles encountered in securing reliable data as a basis of reports. The co-workers and observers in the fields are fallible men, subject to bias by self interest, and liable to be stampeded by a panic or blasts of hot air, just like the excited bulls and bears in the corn pit. All men are about alike in respect to the influences and impulses that sway them.

One of the chief drawbacks in the crop service is in the system of estimates by percentages; and yet there is no better method at hand. What is 100 per cent., as applied to the corn crop or the other staples? We know what it should signify; but we find by actual experience in handling reports of a great number of crop correspondents that it is a variable quantity. If we say a hundred per cent. signifies the average or normal yield, then we discover that different men in different localities have diverse figures to represent their averages. As regards corn the normal or average yield from one reporter's point of view is fifty bushels per acre, while another man in the same county will have thirty-five to forty bushels as the standard of estimates. There is absolutely no uniformity among crop reporters as to the standard in the percentage system and it seems to be an impossibility to remedy the trouble. We are obliged to take them as they come, selecting the best material obtainable, and then strike an average of the mass.

In a season of severe drouth, which may be alleviated in scattered localities by occasional showers of variable amount, I had rather have the records of 200 raingauges and thermometers distributed over the state to serve as the basis of crop estimates, than the percentage figures from 2,000 crop correspondents or even grain dealers. The raingauges and thermometers are not liable to be panic stricken or stampeded in time of general despondency.

And yet I would not disparage the estimates of crop correspondents, by any means. They are human, and liable to err. They often tell doleful tales of disaster during the crop season, but in the final report they generally come up manfully and confess to having harvested bumper crops! Our system of reports may be somewhat below the 100 per cent mark of absolute perfection, but it beats nothing away out of signt!

The immense volume of farm products in this country constitute our principal stock in trade among ourselves, and in our exchanges with other nations of the world. Hence, like good business men, we should, with scrupulous care, take account of our stock, to ascertain the extent of our merchantable surplus. And in this general estimate of crop production there is absolute need of greater exactness in securing data as to the acreage of the more important products. The chief statistician of the Department of Agriculture uses the returns of the U. S census as the basis of crop acreage. That is all right when the census figures are fresh and new; but after the lapse of eight to ten years the figures are back numbers, and liable to be a good deal off.

In various states, as in Iowa, Kansas, Ohio and Michigan, the township assessors make annual or biennial returns of crop acreages. It appears to me that the chief statistician would do well to keep in closer touch with the state officials in this line, to the end that his acreage figures may be up to date. While there is some measure of stability in the acreage of cereal crops, yet we know it is impossible to keep track of the fluctuations from year to year without a systematic canvass after the manner of a census.

In Iowa we have had just cause of complaint against the statistician at Washington, especially in respect to the acreage of the corn crop. Ten years ago the government credited this state with over two million acres that were never planted; and in recent years our acreage has been reduced more than half a million acres below the area planted, as shown by the township assessors. This discrepancy in figures might be remedied by getting together a little more closely.

In conclusion I beg to say that I have a very high regard for the grain dealers of America. They are the agents of distribution of cereal products to all parts of the continent and distant lands. And you, gentlemen, are representatives of commercialism, in the best sense of that term. This commercialism is the advance agent of cvilization in all lands. The Gospel of Push must go hand in hand with the Gospel of Peace So go ye forth into all the world with food for the people, while the evangelists break to them the bread of eternal life.

TRAVEL BY AIR.

J. R. S. IN THE HOMESTEAD.

Many people believe that rapid transit by air will be made practicable and measurably safe within the early part of the new century. It is certainly a very desirable and devoutly to-be-wished for consummation of the strenuous efforts now being put forth to that end. There are times and conditions when nearly impassable highways cause many mud-bound people to cry out with the Psalmist, "Oh, that I had wings like a dove!" But will it be attained? Possibly flying machines or air ships may be constructed sufficiently strong, light and controllable to traverse short distances, at moderate elevations, when the air is calm and all conditions are favorable to change of direction and guidance of the craft. But there are well-nigh insurmountable obstacles in the way of very extensive navigation of the air. The chief drawback is the instability and irregularity of the air movements near the surface of the earth, and the almost continuously high velocity of the winds in the upper atmosphere. Explorations of the air by means of kites and balloons, and observations on the summits of mountains, attest the fact that the elements are not at all favorable for smooth sailing, or for the guidance of airships within the "upper depths of space." At the top of Eifel tower in Paris a meteorological station is maintained, and the records of wind velocity show that for 50 per cent of the year the speed exceeds eighteen miles an hour. The tower is about 1,000 feet high, and the velocity of the wind at that elevation is more than three times as much as at a level of seventy feet above the earth. On Mt. Washington, 6,279 feet high, the mean hourly velocity of the wind for the month of January, 1885, was forty-nine miles. At numerous stations on the sea coast, and in the mid-continent region, the mean hourly wind movements, for single months, have been from eighteen to twenty miles. No craft of man's device will ever be able to make headway against these tremendous upper currents. They may float in the air, but will not be able to move at will against the wind. So with all our vehicles of transportation we will be compelled to keep on or very near terra firma.

CLIMATOLOGY OF THE MONTH.

BAROMETER. Mean-pressure for the month, 29.99 inches, highest observed, 30.39 inches, at Sioux City on the 18th;

lowest observed, 29,47 at Sioux City on the 22d; range for the state, 0.92 inch.

TEMPERATURE. Monthly mean as deduced from reports of ninety-one stations. The highest monthly mean was 67.6° at Burlington; lowest monthly mean, 58° at Estherville. The highest temperature reported was 102° at Sigourney, on the 7th; lowest, 26° at Atlantic and Logan on 18th. The average monthly maximum was 91.6°; average monthly minimum, 31.9°. The greatest daily range was 51° at Elkader; average of greatest daily ranges, 39.5°. By sections the monthly means were as follows: Northern section, 60.8°; central section, 63.4°; southern section, 65.6°.

PRECIPITATION. The average precipitation for the state was 4.77. By sections the averages were as follows: Northern section, 7.07 inches; central section, 4.24 inches; southern section, 2.99 inches. The largest amount reported was 13.62 inches at Fonda; least amount, 1.71 inches at Amana. The greatest daily rainfall reported was 5.49 inches at Plover on the 27th. Average number of days on which .01 inch or more of rain was reported, 9 days.

WIND AND WEATHER. Prevailing direction of wind, south; Highest velocity reported, 50 miles per hour, from S. W. at Sioux City on the 11th. Average number of clear days, 13; partly cloudy, 9; cloudy 8.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date
Davenport	30.00	30.29	19	29.55	14
Des Moines	30.01	30 36	18	29.62	11
Dubuque	30.01	30.31	19	29.52	12
Omaha, Neb	29.94	30.36	18	29.53	22
Keokuk	30.00	30 29	19	29 59	11
Sioux City	29.99	30 39	18	29 47	22
.....	.....	.....	....	.....	....
Means	29.99	30.39	18	29.47	22

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity	Direction.	Date.
Davenport	5,189	29	W	15
Des Moines	5,789	32	SW	22
Dubuque	5,172	32	SE	22
Keokuk	4,933	28	NW	12
La Crosse, Wis	4,699	28	W	15
Omaha, Neb	5,492	26	SW	26
Sioux City	9,404	50	SE	11
.....	.....	..	.....	....

OBSERVERS' NOTES.

ALBIA. *R. Moore.*—No killing frost during month; vegetation green and growing.

ALTA. *David E. Hadden.*—First light frost on 17th; kiliing frost on 20th, but slight damage resulted; grass green and growing well.

BONAPARTE. *B. R. Vale.*—Only 3.71 inches of rain in last three months, and 13.32 inches since January 1st, as against 21,78 in 1894.

CLINTON. *Dr. Luke Roberts.*—September was a fine month; temperature, .4 of a degree above normal; rainfall, .55 inch below normal; temperature uniform, except cold spell the 17th to 21st, inclusive.

ESTHERVILLE. *Leslie Littell.* — An unusual month; the danger period from 17th to 21st was passed without any damage from frost.

FOREST CITY. *J. A. Peters.*—Pastures better than at any time since June. Late corn slightly hurt by frost the 20th.

GRINNELL. *A. O. Price.*—One light frost, with no injury. Fine weather during the month.

GUTHRIE CENTER. *W. F. Brown.*—Corn matured in fine shape; little damage by frost; but little fall wheat sown.

LOGAN. *Mrs. M. B. Stern.*—The grateful rains came at last, and lawns and pastures are green as in spring.

RIDGEWAY. *Arthur Betts.*—This month was 1 to 3 degrees cooler than normal; rainfall excessive; 7 days without a sun, and 8 days perfect.

WASHTA. *H. L. Felter.*—Light frost on 17th; killing frost September 20th.

BELATED REPORTS.

[Received too late to be entered in the tables.]

BRITT.—Sept. Mean temperature, 60.0; highest, 92, on the 6th; lowest, 29, on the 20th; greatest daily range, 39; total precipitation, 8 37 inches; greatest in 24 hours, 2.05 inches, on the 28th; prevailing direction, south; number of clear days, 8; partly cloudy, 16; cloudy, 6; rainy, 14.

CARROLL —Sept. Mean temperature, 60.7; highest, 93, on the 5th; lowest, 29, on the 18th; greatest daily range, 42; total precipitation, 8.34 inches; greatest in 24 hours, 2.60 inches, on the 29th; number of clear days, 18; partly cloudy, 3; cloudy, 9; rainy, 10.

CRESCO.—Sept. Mean temperature, 59.2; highest, 93, on the 6th; lowest, 32, on the 18th; greatest daily range, 40; total precipitation, 6.40 inches; greatest in 24 hours, 1.42 inches: prevailing direction, southwest and northwest; number of clear days, 12; partly cloudy, 6; cloudy, 12; rainy, 11.

DENISON.—Sept. Mean temperature, 62.1; highest, 94, on the 5th; lowest, 29, on the 20th; greatest daily range, 48; total precipitation, 7.45 inches; greatest in 24 hours, 1.48 inches; prevailing direction, north and south; number of clear days, 20; partly cloudy, 4; cloudy, 6; rainy, 10.

GILMAN.—Sept. Total precipitation, 2.64 inches; greatest in 24 hours, 1.21 inches; prevailing direction, south; number of clear days, 13; partly cloudy, 7; cloudy, 10; rainy, 9.

KNOXVILLE.—Sept. Mean temperature, 60.8; highest, 95, on the 7th; lowest, 36, on the 18th; greatest daily range, 40; total precipitation, 2.43 inches; greatest in 24 hours, 1.07 inches; prevailing direction, southeast; number of clear days, 9; partly cloudy, 10; cloudy, 11; rainy, 5.

MARSHALLTOWN.—Sept. Mean temperature, 64.2; highest, 95, on the 7th; lowest, 33, on the 18th; greatest daily range, 45; total precipitation, 2.62 inches; greatest in 24 hours, .95 inch; prevailing direction, southwest, west and northwest; number of clear days, 14; partly cloudy, 4; cloudy, 12; rainy, 15.

MT. PLEASANT.—Sept. Mean temperature, 63.6; highest, 96, on the 6th; lowest, 32, on the 18th; greatest daily range, 40; total precipitation, 2.64 inches; greatest in 24 hours, 1.27 inches; prevailing direction, southwest; number of clear days, 12; partly cloudy, 16; cloudy, 2; rainy, 6.

SIOUX CENTER.—Sept. Mean temperature, 61.0; highest, 90, on the 6th; lowest, 31, on the 18th; greatest daily range, 36; total precipitation, 6.03 inches; greatest in 24 hours, 1.70 inches; prevailing direction, east and southeast; number of clear days, 14; partly cloudy, 5; cloudy, 11; rainy, 13.

WAPELLO.—Sept. Mean temperature, 64.9; highest, 95, on the 7th; lowest, 39, on the 18th; greatest daily range, 41; total precipitation, 2.44 inches; greatest in 24 hours, 1.00 inch; pre-

vailing direction, southeast; number of clear days, 16; partly cloudy, 10; cloudy, 4; rainy, 4.

LE CLAIRE.—Sept. Total precipitation, 1.75 inches; greatest in 24 hours, .69 inch; number of rainy days, 8.

LARRABEE.—Mean temperature, 60.6; highest, 92, on the 5th; lowest, 29, on the 20th; greatest daily range, 38; total precipitation, 10.77 inches; greatest in 24 hours, 5.00 inches; number of clear days, 14; partly cloudy, 11; cloudy, 5; rainy, 9.

SPIRIT LAKE—Sept. Mean temperature, 59.8; highest, 92, on the 3d and 5th; lowest, 32, on the 17th; greatest daily range, 38; total precipitation, 8.02 inches; greatest in 24 hours, 2.20 inches; prevailing direction, southwest; number of clear days, 13; partly cloudy, 5; cloudy, 12; rainy, 9.

BELATED REPORTS FOR JULY.

GLENWOOD.—Mean temperature, 84.8; highest, 106 on the 24th; lowest, 60, on the 7th; greatest daily range, 35; total precipitation, 2.31 inches; greatest in 24 hours, 1.25 inches; prevailing direction, southeast; number of clear days, 12; partly cloudy, 19; cloudy, 0; rainy, 4.

KNOXVILLE.—Mean temperature, 84.7; highest, 109, on the 22d; lowest, 57, on the 8th; greatest daily range, 36; total precipitation, 2.66 inches; greatest in 24 hours, 1.76 inches, on the 28th; prevailing direction, southeast and southwest; number of clear days, 22; partly cloudy, 8; cloudy, 1; rainy, 3.

ERRATA IN JULY REVIEW.

AMES.—Mean temperature recorded 78.8, on page 7, should have been 83.3.

RIDGEWAY.—Observers' Notes—Next to last line on page 6, should read 131 degrees instead of 127 degrees.

CLIMATOLOGICAL DATA FOR SEPTEMBER, 1901.

NORTHERN SECTION.

STATIONS.	COUNTIES	Elevation, feet	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIP., IN INCHES				Number rainy days	SKY			Prevailing direction of wind	DATES OF THUNDER-STORMS.
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall (unmelted)		Number clear days	Number partly cloudy days	Number cloudy days		
Algona	Kossuth	1,500	8	60.6	-3.0	90	5	33	18, 20	31	9.40	†7.58	3.75	...	10	10	9	11	NE, SE	28,30
Alta	Buena Vista	1,519	6	60.4	-4.2	92	5	32	20	33	6 53	†4.52	2 06	....	11	14	9	7	S	10, 11, 25, 27
Alta (near)	Buena Vista		....	.....	.....	.....	.....	.....	.....	.....	7.31	.....	2.88		12	....	....		.....	
Charles City	Floyd	1,012	9	61.6	-2.0	91	5	33	18	40	5.21	†2.93	1 60	....	9	8	13	9	SE	
Clear Lake	Cerro Gordo	984	....	61 4	.....	95	6	34	18	32	6.00	.....	2 00		8	10	12	8	SW	
Decorah	Winneshiek	900	7	60.6	-2.6	92	6	34	18, 20	46	7.28	†4 37	1.98		9	....		....	.....	
Dows	Wright	...		61 1	.....	91	5, 6	31	18, 20	42	6.52	...	2.52	....	11	12	10	8	NW	
Elkader	Clayton	....	19	62 8	†0 6	97	6	33	18	51	4.04	† .13	.90		9	11	9	10	SE	14, 15, 25, 27
Estherville	Emmet	.....	....	58.0	.....	87	5	31	20	41	6 14	.....	1 20		13	11	9	10	SE	
Fonda	Pocahontas	1,237	....	.....	.....	....	.....	.....	.....	.....	13.62	..	5.32		11	13	14	3	SE	8, 27
Forest City	Winnebago	1,220	....	60.8	.....	90	5	29	20	38	9.48	.....	3.45		9	10	9	11	W	
Grand Meadow	Clayton		9	59.2	-3.8	93	6	36	20	40	5 96	†3.07	1.42		9	..			.....	
Greene	Butler	943	....	62 4	.....	92	5	32	18	43	4.79	.....	1 40		9	5	9	16	S	
Hampton	Franklin	1,240	10	63.6	†1 2	95	4.5	34	18, 20	46	6 38	†3.51	1.27		11	9	15	6	SW	
Hawkeye‡	Fayette	.....	7	.....	.....	.....	.....	.....	... .	.....	5.83	†3 17	.....		...	...	....	....	.....	
Humboldt	Humboldt	1,082	7	61.6	.....	92	5	34	18	40	8.24	†6 14	2.76	...	12	14	4	12	SE	
Larchwood	Lyon	.....	....	.....	.....	.....	.....	.....	.....	.....	4 77	.....	1.25	.	7	17	0	13	S	
Le Mars	Plymouth	.....	....	60.6	.....	89	5, 6	29	18	40	6.97	.....	2.33	....	7	17	9	4	S	
New Hampton	Chickasaw	1,166		60.9	.....	91	6	32	18	32	4 98	.....	85		9	12	6	12	NW	
Northwood	Worth	1,210	....	60.4	.....	90	5	31	20	34	9.37	..	2.44	..	11	11	8	11	SW	25, 27, 28
Osage	Mitchell	1,178	9	59 4	†0.1	86	5, 6	32	20	32	5.70	†2.32	1.81		13	10	3	17	S	9, 11, 14, 25, 27
Plover	Pocahontas	....	....	61.4	.....	95	6	31	20	41	13 55	..	5.49	...	9	15	3	12	S	
Primghar‡ (*b*)	O'Brien	....	....	62 6	.....	95	5	35	15, 18	41	.....	... ..	.....	....	....	...		....	SW	
Ridgeway	Winneshiek	.....	....	61.4	.....	90	5, 6	33	18	30	7.06	.....	1 55	....	15	10	9	11	NE	9, 14, 15, 25, 27, 30
Ruthven	Palo Alto	..	....	.....	.....	.....	.....	...	.....	....	7.77	.....	2.08	..	10	13	4	13	SW	
Sheldon	O'Brien	1,406	....	60.8	.....	91	5	31	18	42	6 04	..	1.16	....	13	8	4	18	W	
Sibley	Osceola	1,506	7	60.3	-1.9	94	5	31	17	47	6.37	†3.98	1.21	..	15	8	17	5	S	
Storm Lake	Buena Vista	....	11	61.4	.....	90	5, 6	33	17, 20	35	6.92	†4.26	3.06	...	11	12	10	8	SE, S	11, 25, 27
Washta	Cherokee		....					.....	.....	.....	6 58	.....	1.52	..	10	15	8	7	S	
Waverly	Bremer	942	....	62.8	.....	93	6	34	18	38	4 78	....	.84	....	12	10	11	9	S	6, 27, 28
West Bend	Palo Alto	...	7	60.8	-0 7	93	5	31	18, 20	43	9.77	†7.61	4 05		8	10	8	12	S	7, 8, 11, 13, 14, 19, 25, 28, 30
Average	.....	..	....	60 8	-1 6	91.6	.....	31.9	.....	39.5	7.07	†4.12		...	10	11	9	10	S	.....

CENTRAL SECTION

Amana	Iowa	....	24	63.8	†1 9	93	6, 7	35	18, 19	40	1.71	-1.66	.75	.....	7	15	7	8	NW	9, 25
Ames	Story	936	20	61.6	-2.0	93	5, 6	35	18	46	3.45	- .06	.85	.....	10	16	7	7	SE	27
Battle Creek	Ida	.....	....	.....	.....	.....	.....	.....	.....	.....	5.45	....	1.20	....	11	20	2	8	S	6, 25, 27
Baxter	Jasper		....	63.4	.....	95	7	34	18	37	2.79	..	1.25	....	8	15	4	11	SE	
Belle Plaine	Benton	840	10	65.2	†1.1	94	7	35	18	36	2.50	- .27	.75	.....	7	1	20	9	S	
Buckingham	Iowa	.....		.....	.....	.....	.....	.....	.....	.....	2 23	..	.84	...	8	11	16	3	.....	
Cedar Rapids	Linn	744	18	65.4	†2.0	93	6	35	18	37	2.64	- .31	75	.....	7	14	7	9	SE	
Clinton	Clinton	609	9	63.2	-2.2	93	6	33	19	42	2.52	- .47	1 23	.....	5	15	5	10	S	14
Davenport	Scott	615	30	65.4	†0.2	93	6	36	18	32	2.29	- .77	.96	...	8	16	3	11	S	14
Delaware	Delaware	1,048	9	61 7	-0.1	93	6	32	18	34	3 77	† .41	1.12	...	8	10	12	8	SE	
Des Moines	Polk	867	23	64.8	-0.2	93	6	36	18	36	2.60	- .39	1 22	.	8	9	12	9	S	8, 9, 11, 14 25, 27
De Soto (*a*)	Dallas	866	....	64.8	.....	93	6	35	18	37	2.64	.... ..	1.15	.....	8	...	....	....	SE	
Dubuque	Dubuque	655	28	63.0	‡0 0	91	6	38	18	29	3.72	- 37	1.22	....	12	12	11	7	SE	
Fort Dodge	Webster			62.8	.....	94	5	30	18	49	7.13	...	3.30	.....	8	12	10	8	SW, NW	
Galva (*b*)	Ida	.....	7	62.8	-2 7	92	5	29	20	41	7.12	†5 16	2 66	....	11	....		....	S	
Grinnell	Poweshiek	1,011	10	64 4	†1.0	92	7	34	18	32	2.29	† .25	.95	.....	6	8	15	7	S	
Grinnell (near)	Poweshiek	..	....	64.6		92	6, 7	34	18	30	2 53	... ...	1.20	....	7	12	6	12	SE	9, 14, 25, 28, 30
Grundy Center	Grundy	966	9	62 4	-1.4	91	6, 7	31	18	39	2.97	† .11	.78	...	14	13	10	7	S	27, 30
Guthrie Center	Guthrie	.....	....	62.8	.....	91	5, 6, 7	30	18, 20	45	4 17	.....	1.68	....	9	....	..	..	NW	25, 28
Harlan	Shelby	....	....	64.2	.....	92	5	28	18	43	8.02	.....	2 04	.. .	10	10	11	9	S	6, 9, 11, 13, 25, 27, 28
Independence	Buchanan	921	38	62.1	†2 1	93	6	32	18	41	3.18	-1.11	.95	....	8	13	8	9	S	14
Iowa City	Johnson	644	10	65.7	†0.5	101	7	36	18	45	2 56	- .14	.68	.. ...	7	14	4	12	S	
Iowa Falls	Hardin	....	7	61 0	-1.5	92	6	32	18	43	4.36	†1.37	1.14	.....	10	12	5	13	SE	9, 14, 25, 27
Jefferson	Greene	...		.....	.....	.....	.....	...	. .	.....	6.12	....	2.82	.....	9	..	..	....	SE	
Logan	Harrison	928	35	62.3	-4.0	93	5	26	18	39	7.66	†4.60	1.74	.....	13	12	6	12	S	
Maquoketa	Jackson	.....	7	63.6	-1.1	97	6	32	19, 21	47	3.27	† .49	.94	.....	9	16	4	10	SE	
Monticello	Jones	800	46	62.3	†0.6	95	6	34	18	49	3 22	- .56	1.47	.....	6	15	9	6	SW	
Mt. Vernon	Linn	....	....	65.8	.....	96	7	36	18	35	2.74	.....	1.00	...	8	16	4	10	S	9, 15, 25
Newton	Jasper	958	13	64.2	†1 3	94	7	35	18	34	2.98	- .32	1 25	.....	7	9	15	6	SE	
Odebolt	Sac	....	....	62.3	..	94	5	30	18, 20	44	7 93	.....	1.92	.....	11	21	2	7	.....	28
Ogden‡	Boone	1,109	....	62.4	....	92	5, 6, 7	31	17	38	6.87	.....	3.18	....	12	23	1	6	SE	
Olin	Jones	...	....	62 4		90	6, 7	35	18	39	2.85	... .	.85	.....	5	15	7	8	S	
Onawa	Monona	.....	....	63.6	.....	92	5	28	18	38	8.29	.. ...	2.40	....	15	19	5	6	SE	7, 8, 9, 11, 13, 19, 25, 28
Perry	Dallas	....	....	63.6	.....	98	7	33	17	45	4 45	....	1.50	.....	10	14	11	5	S	
Rockwell City	Calhoun	1,219	....	62.4	.....	91	5	33	20	42	7.06	....	2 25	.....	10	19	3	8	.....	
Sac City	Sac	900	21	62.0	-1.9	94	5	32	17, 20	48	10.15	†7.06	3.78	.....	11	15	7	8	SE	27
Scranton	Greene	...	....	62.6	....	91	5	33	18, 20	34	4.66	.....	1 64	.....	8	13	10	7	S	
Sioux City	Woodbury	1,122	12	62.3	-1.7	91	5	30	18	32	7.99	†5.78	2.03	.....	14	16	7	7	SE	7 10 11 14 25 27
Tipton	Cedar	.....	....	65 8		94	7	36	18	30	2.00	.....	.90	.....	5	9	9	12	W	9, 14, 25
Toledo ‡	Tama	.....	6	63 6	-1.0	98	7	32	19	45	3.15	† .04	1.00	.....	6	13	5	12	S	
Vinton *	Benton	800	10	62.5	-0.7	92	7	35	18	.....	2.95	† .23	.88	..	5	21	1	8	SW	
Waterloo ‡	Black Hawk	862	21	62 8	-3.2	94	6	33	18	43	3 57	- .67	1.12	..	12	10	14	6	SE, S	
Wilton Junction	Muscatine		.....	63.6	.....	95	7	32	17, 18	41	2 56	.....	1.10	.....	4	15	3	12	S	
Average	.....		..	63.4	-0.5	93.3	.....	33 0	.....	39.1	4.24	† .77	.....	.....	9	14	8	8	S	.....

CLIMATOLOGICAL DATA FOR SEPTEMBER, 1901--CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PREC. IN INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.	DATES OF THUNDER-STORMS
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted.)		Number clear days.	Number partly cloudy days.	Number cloudy days.		
Afton‡	Union	....	....	62.9	.....	95	7	29	18	36	3.56	.....	1.85	....	8	6	13	11	NW	
Albia	Monroe	945		64.6	.....	98	7	31	18	42	2.36	.....	1.17	....	6	12	14	4	SE	
Atlantic	Cass	.....	9	63 4	-2.3	94	5	26	18	51	3 71	†.91	1.16	....	10	8	12	10	S	8, 10, 11
Belknap	Davis	857	....	67.0		95	7	34	18	34	2 40	.....	1 13	....	7	....	....	....	S	
Bonaparte	Van Buren	.....	9	67.2	-1 6	97	6, 7	35	18	42	2.46	-1.94	1.75	....	5	....	....	....	.....	
Burlington	Des Moines	.....	.	67 6		97	7	37	18	36	2.26	.....	1.06		6	16	4	10	SE SW	
Centerville (2)	Appanoose	....	....	66 9	..	94	6, 7	32	18	36	2.43	.....	1.15	....	8		....	....	N	
Chariton	Lucas	1,030	....	65.2	.....	96	7	32	18	41	2.03	.....	1.09	....	6	9	13	8	S	
Clarinda	Page	1,069	10	66.1	-1 5	96	5, 7	29	18	47	4.89	-2.76	3.00	....	9	14	12	4	S	
College Springs	Page	....	9	65.4	-3.4	95	7	24	18	35	3.18	†.81	2 00		5	14	14	2	SE	
Columbus Junct	Louisa	....	....	66.7		97	6	36	18	34	2 54	.....	.93		8	18	4	8	SE, S SW	
Corning	Adams	1,127	8	63.9	-2.5	92	7	29	18	36	3 34	†1 07	2 00	....	8	13	11	6	SW	11, 12, 13
Council Bluffs	Pot'wat'mie	989	....	65.8	.....	95	5	30	18	37	5 35	.....	1.25		13	14	4	12	S	
Cumberland	Cass	.....	....	...	.....	....	.....	.....	.....	.....	2.87	.....	1 20	.....	7	17	4	9	S	
Danville	Des Moines	715	....		.....	...	.....	.....	.....	.....	2.47	.....	1 12	....	6	15	3	12	.....	
Eldon	Wapello	....	....	66 4	.....	99	7	33	18	46	2 72	.....	1.07	..	6	23	1	6	S	9
Emerson	Mills	.....	....		.....	....	.....	.....	.....	.....	3 66	.....	2 06	....	4	....	...	....	.....	
Fort Madison	Lee	516	52	.....	.....	....	.....	.....	.....	.....	2.20	-1.65	1.15		8	11	11	8	SW	
Glenwood‡	Mills	979	30	65 0	†2.6	94	5	27	18	44	3.43	†1.20	.54	..	10	5	22	3	SE	
Greenfield	Adair		9	64 4	-1.7	96	6	29	18	34	3.53	†.50	1.51	....	10		...	....	SE	
Hopeville	Clarke	.....	..	64 8	.....	94	7	32	18	30	2.61	....	1 30	....	7	11	17	2	S	8, 10, 11, 13
Indianola	Warren			64.9	.....	97	5	33	18	35	4.53	..	2 36	...	7	8	14	8	SW	10, 11
Keokuk	Lee	618	29	67.4	‡0 0	95	7	35	18	34	2 14	-1 65	.70		6	17	9	4	SE	8, 11
Keosauqua	Van Buren	....	8	67.3	-0.7	95	7	38	18	39	2.94	-2 19	1.72	....	8	....	....	....	.....	
Lacona	Warren	.....	....	.....	.....	.....	.....	.....	.....	.....	1 90	.....	1.00		5	11	15	4	.....	
Lenox	Taylor	.....	....	64 5	....	91	5, 7	29	18	30	4 46	.....	3 55	....	7	17	6	7	S	11
Mooar	Lee	....	..		..		.....	.....	.....	.....	2.18	.....	.78	....	4	19	9	2	NE	
Mt Ayr	Ringgold	1,236	7	65.5	-2.7	96	7	30	18	37	3 12	†.35	1 90	..	10	9	16	5	S	11
Mt Pleasant‡	Henry	725		63 6	.....	96	6	32	18	40	2.64	.....	1 27	....	6	12	16	2	SW	
Omaha, Neb‡	Douglas	1,113	31	65.4	†0.6	92	5	32	18	32	6.83	†3.86	1 40		13	8	12	10	SE	6, 7, 8, 10, 11, 13, 26, 27, 28
Osceola	Clarke	.....	.	63 6	.....	95	7	32	18	41	2.42	.....	1.00	..	7	15	5	10	NE	
Oskaloosa	Mahaska	850	17	65.0	†0 5	98	7	34	18	43	2.29	-.62	84	....	7	17	4	9	NW	
Ottumwa	Wapello	630	6	67 0	-0.9	91	5, 6	35	18	30	4.15	† 79	1.50	....	7	....	....	....	SE	
Ovid	Wayne	....	7	66.8	-1 0	97	6	30	18	42	2.23	-1.51	1 29	....	11	15	5	10	S, SE	11, 12, 13, 15, 22, 25, 29
Pacific Junction‡	Mills	960	...	65 2	....	95	5	27	18	40	2 62	... ..	.51		11	9	19	2	SE	25
Pella(g)	Marion	.....	....	63 5	....	97	7	34	18	44	....	.....	.....	....	....	...	....	....	.....	
Red Oak	Montgom'ry	1,033		65.6	.....	90	4	34	18	30	3.79	.....	1.15	....	10	6	21	3	SE	6, 8, 10, 12, 25, 28
St. Charles‡	Madison	.....	..	65 1	....	95	7	34	18	33	2.85	.... ..	1 30	....	9	14	12	4	SE	
Sigourney	Keokuk	...	..	66.0		102	7	35	18	45	2.02	.....	.98		7	12	15	3	SE	9, 25
Thurman	Fremont	....	..	64 0	.....	90	5	28	18	39	5 25	....	2.42	....	9	14	9	7	NW	11
Washington(g)	Washington	....	10	64 2	-2.5	97	7	33	18	40	1.74	-.88	.96		6	....	...	....	.....	
Winterset	Madison	.....	9	66 2	†0.3	100	7	32	18	40	2.84	-.26	1 40		10	....	..		... .	11, 25, 30
Woodburn	Clarke	.....	....	.....			.....	....	.....		2 59	.. ....	1.23	..	6	20	2	8	.....	
Average		.....	..	65 6	-1.0	95.5	.....	32.0	.....	38.3	2.99	-.49	..	....	7	14	9	7	S	.....
Av. for the state		.....	..	63.3	-1.0	93 5	.....	32.3	.....	39.0	4.77	†1.47	....	....	9	13	9	8	S	.....

*Means determined from 7 A. M., 2 P M, and 9 P. M. observations, and maximum and minimum are taken from eye readings. ‡Received too late to be computed with means *a*, One day missing; *b*, two days, etc.

†Is used to indicate plus sign (†).

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR SEPTEMBER, 1901.

STATIONS.		DATE.																														Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton.....	Max...	81	84	86	89	92	94	95	78	68	76	76	73	78	75	71	65	55	55	49	62	73	81	83	81	76	84	81	79	66	82	.	76.3
	Min..	48	49	50	54	62	59	60	56	55	50	56	53	50	53	47	45	33	29	38	33	38	39	55	53	61	48	59	57	47	48	....	49.5
Albia.....	Max...	81	84	85	89	92	96	98	84	76	79	72	75	80	77	74	68	55	57	51	60	73	82	85	88	83	84	83	84	68	80	....	78.1
	Min...	52	48	50	52	57	55	56	58	60	59	53	53	49	55	51	47	37	31	37	37	39	48	55	58	62	58	62	54	53	50	....	51.2
Algona	Max..	74	82	85	85	90	82	74	64	56	63	67	62	72	72	70	63	48	55	45	63	71	82	77	71	75	78	83	70	60	72	....	70.4
	Min ..	49	51	56	59	64	64	60	53	51	51	53	53	50	53	49	41	34	33	40	33	44	56	51	61	58	46	66	50	46	46	...	50 8
Alta	Max...	81	86	88	89	92	90	66	58	57	61	68	72	70	64	68	60	50	52	47	62	72	83	78	85	72	79	81	61	62	76	....	70 9
	Min...	48	52	56	61	62	66	56	54	50	51	54	53	51	49	48	42	32	36	35	32	44	58	52	58	51	48	61	46	38	52	.....	49.8
Amana ...	Max...	80	83	86	89	91	93	93	76	66	65	72	69	78	74	71	66	55	56	46	59	72	81	84	85	77	83	83	83	69	76	....	75.4
	Min..	46	43	50	55	64	63	59	58	58	55	55	57	48	60	53	47	39	35	35	45	39	55	59	56	65	53	64	55	54	45	....	52.3
Ames.....	Max...	85	87	88	90	93	93	92	72	62	68	71	76	77	74	66	64	57	57	56	65	74	83	84	87	87	82	84	74	60	80	....	76.2
	Min...	49	46	45	44	64	59	67	57	56	54	52	55	47	55	53	48	63	35	39	38	39	38	54	59	59	47	45	45	49	49	....	47.0
Atlantic ...	Max...	85	90	90	91	94	93	92	70	66	77	76	75	71	70	71	64	56	59	49	63	75	85	88	86	75	85	90	..	65	83	....	77.0
	Min...	41	39	41	58	67	62	60	53	52	51	58	56	46	50	50	44	33	26	40	28	43	54	64	63	57	42	65	53	48	49	....	49.8
Baxter.. ..	Max..	83	86	88	90	90	92	95	75	63	66	75	75	79	75	69	62	55	55	45	60	72	82	83	86	74	84	85	78	58	79	....	75.3
	Min...	60	50	51	58	63	60	63	55	57	53	53	55	48	57	52	45	35	34	38	39	34	56	56	56	60	48	60	55	51	47	....	51.6
Belknap...	Max...	82	84	86	88	94	93	95	84	75	76	78	75	80	77	74	67	54	58	50	63	73	82	87	87	80	84	85	85	83	82	....	78.7
	Min...	54	50	57	58	65	67	65	63	62	53	57	57	51	61	54	51	41	34	42	43	41	55	57	59	69	65	63	60	54	52	....	55.3
Belle Pl'ne	Max...	83	81	85	87	91	92	94	88	64	62	65	69	78	76	72	65	51	55	47	58	70	80	82	85	82	83	84	81	60	75	...	74.9
	Min...	47	49	53	58	61	64	64	63	56	56	55	53	50	54	51	46	39	35	37	40	45	46	58	58	63	51	59	58	54	48	....	55.4
Bonaparte.	Max ..	85	88	88	93	94	97	97	82	79	80	76	72	82	79	79	62	56	58	50	59	76	84	88	89	79	88	85	87	73	82	....	79 9
	Min...	50	46	56	59	65	63	64	61	64	49	56	59	48	61	55	54	40	35	38	43	39	55	59	60	69	63	63	56	56	47	.....	54.4
Burlington.	Max...	82	86	87	93	91	95	97	80	83	79	76	73	83	81	80	65	58	60	47	61	76	83	88	90	81	89	85	86	69	80	....	79.5
	Min...	54	50	56	63	66	62	64	60	62	53	55	59	52	60	61	50	41	37	40	43	42	54	59	62	70	63	70	62	57	48	....	55.8
Cedar Rap	Max...	81	84	87	91	91	93	..	94	..	67	73	72	81	73	71	65	58	57	49	61	74	83	86	88	79	85	85	85	74	77	....	77 3
	Min...	46	47	52	58	67	60	58	62	56	54	54	59	59	59	55	49	40	35	38	43	40	56	59	56	64	54	65	56	54	51	....	53.5
Centv'le ..	Max...	80	84	85	88	92	94	94	85	78	77	75	75	79	74	73	66	66	57	50	60	72	81	85	86	80	82	82	82	66	81	....	77.6
	Min...	50	48	53	56	67	66	63	62	65	55	..	57	52	60	55	57	39	32	38	43	41	58	62	60	66	62	65	56	60	50	....	55.1
Chariton...	Max...	84	86	87	89	91	95	96	81	72	75	77	75	79	72	74	64	55	58	49	63	74	82	87	87	77	85	85	82	67	85	....	77.8
	Min...	50	45	52	58	65	64	62	59	58	51	56	54	47	57	52	47	36	32	38	40	41	55	60	58	56	66	63	57	50	50	....	52.6
Charles Cy.	Max...	80	84	87	88	91	90	79	67	58	60	64	68	74	75	66	61	50	51	47	60	69	80	80	79	72	80	83	73	67	71	....	71.8
	Min..	45	44	47	74	78	60	64	52	52	51	54	55	45	55	51	47	36	33	37	35	41	55	53	60	59	41	66	53	49	51	.....	51.4
Clarinda...	Max...	88	92	91	93	96	95	96	77	76	85	81	78	72	71	78	61	61	62	52	68	77	86	89	89	81	87	87	87	68	88	....	80.4
	Min...	56	45	47	56	68	62	60	62	56	53	61	53	48	53	49	47	35	29	42	32	41	57	57	61	54	50	63	56	52	50	....	51.8
Clear Lake	Max...	..	..	..	90	92	95	76	64	56	60	67	71	78	78	69	61	55	58	49	61	70	81	83	86	75	78	82	66	59	72	....	71.6
	Min...	49	49	52	58	64	65	60	52	52	51	50	54	54	55	52	47	37	34	38	35	40	55	55	58	58	48	65	52	45	50	....	51.1
Clinton...	Max, .	81	85	86	90	92	93	94	74	74	65	68	68	80	68	75	67	55	61	49	60	72	79	83	86	85	85	83	85	65	76	.....	76.1
	Min...	48	43	52	54	54	56	58	58	59	57	53	54	47	57	54	46	40	36	33	39	34	50	57	52	59	60	58	53	48	43	....	50.3
College Sp.	Max..	83	86	87	90	91	94	95	81	75	84	77	74	73	71	75	62	62	57	54	64	75	84	86	87	87	87	84	75	70	87		78.6
	Min...	58	52	52	59	59	59	64	61	57	54	63	53	50	53	48	48	32	24	42	32	41	55	57	60	60	55	62	58	50	50	....	52.3
Columbus J	Max .	84	85	85	88	94	97	89	79	76	70	75	71	83	79	75	65	54	60	50	61	76	83	87	88	87	88	85	84	70	79	....	78.2
	Min...	50	51	57	60	65	64	63	60	59	56	56	55	51	57	55	51	39	36	39	43	42	55	61	65	65	64	64	62	63	48	....	55.2
Corning ...	Max...	81	84	86	88	90	89	92	72	70	79	76	73	72	70	71	66	55	55	49	61	72	81	84	85	74	82	81	74	68	83	....	75.1
	Min...	49	48	54	58	68	66	62	61	57	61	60	54	47	53	49	42	33	29	42	32	56	57	57	61	60	50	53	57	49	57	....	52.7
Co. Bluffs..	Max...	86	90	91	91	95	91	82	71	69	75	77	75	65	69	71	66	57	59	52	60	78	90	89	90	87	87	87	69	72	85	....	77.5
	Min...	61	55	54	65	65	68	66	62	56	57	58	54	52	52	51	47	38	30	39	31	48	61	59	68	52	50	58	55	50	57	....	54 0
Davenport.	Max. .	80	84	84	88	88	93	92	74	72	65	72	67	79	70	74	63	51	58	48	56	72	78	83	87	82	84	82	84	71	77	....	75.3
	Min...	52	52	60	62	67	64	66	59	59	57	56	58	53	60	57	50	42	36	41	46	42	55	61	62	59	62	65	61	53	49	....	55.5
Decorah....	Max...	80	85	87	89	91	92	74	72	58	59	65	75	72	68	66	62	50	53	47	60	68	72	78	68	72	77	80	68	66	70	....	70.8
	Min...	39	39	48	54	70	70	54	53	56	51	52	48	49	51	50	48	39	34	38	34	43	48	57	55	67	40	67	57	50	52	....	50.4
Delaware..	Max...	79	82	88	89	92	93	87	70	61	62	66	66	75	68	69	62	55	57	45	57	68	80	82	79	73	80	81	80	67	72	....	72.8
	Min...	46	48	54	57	65	60	68	51	52	50	51	53	49	57	51	45	36	32	35	37	38	52	55	56	56	50	61	56	52	45	..	50.6
Des Moi'es	Max...	82	84	85	88	90	93	92	68	67	68	77	76	78	75	67	63	52	58	47	62	74	82	85	87	77	83	84	75	60	81	...	75.3
	Min. .	54	48	53	59	68	64	66	58	58	55	55	59	52	58	53	49	37	36	42	38	44	61	63	61	60	54	66	56	50	51	....	54.3
De Soto....	Max...	79	82	84	86	90	93	92	77	67	70	75	73	78	73	68	63	58	54	50	60	71	80	81	84	78	81	83	73	..	78	....	75.2
	Min...	49	45	47	58	71	74	61	61	60	56	58	60	51	53	55	50	39	35	44	40	46	60	63	63	65	48	66	58	..	51	....	54.4
Dows	Max .	81	84	86	87	91	91	87	64	58	65	77	73	75	74	70	62	54	53	47	61	72	82	81	84	77	79	83	74	60	75	....	73.8
	Min ..	40	42	46	57	64	59	63	54	53	52	52	42	45	55	48	43	32	31	38	31	40	43	53	59	59	42	63	52	48	47	....	48.4
Dubuque ..	Max...	81	84	86	88	89	91	78	66	63	61	69	62	79	64	70	64	52	56	46	57	70	78	81	77	76	82	82	82	60	72	....	72.2
	Min..	47	50	55	60	68	64	66	55	55	54	54	56	50	58	56	49	41	38	39	44	41	55	61	58	59	55	66	59	50	48	....	53.7
Eldon	Max ..	85	88	90	91	94	96	99	87	87	78	78	76	81	78	77	68	56	59	51	61	75	84	88	89	80	87	84	85	72	82	....	80.2
	Min ..	49	42	50	54	63	62	59	61	60	51	55	59	46	60	53	49	39	33	37	41	39	55	60	57	66	62	61	54	54	45	....	52.5
Elkader....	Max...	87	92	93	94	94	97	86	64	63	62	62	63	83	69	74	66	55	62	45	65	73	83	87	79	75	85	85	79	60	75	...	75.2
	Min...	40	41	48	51	64	55	64	53	55	53	51	57	44	58	60	48	38	33	35	37	38	57	59	53	58	43	66	57	53	47	....	50.5
Estherville	Max...	78	82	85	85	87	81	..	..	56	60	64	72	72	68	67	60	..	47	43	62	72	81	75	..	..	76	79	79	..	73	....	71.0
	Min. .	43	43	45	44	55	60	56	50	50	50	51	52	46	47	48	42	33	33	34	31	47	47	47	46	46	41	43	49	49	41	....	45.6
Forest City	Max...	82	86	87	88	90	87	77	60	55	60	65	70	73	78	69	61	50	54	48	53	72	85	80	83	72	78	82	62	57	75	..	71.3
	Min...	50	49	49	58	61	67	60	51	51	51	52	53	48	58	48	43	34	31	38	29	44	55	54	57	60	46	60	54	47	49	....	50.2
Ft. Dodge.	Max...	87	88	88	90	94	91	86	64	60	65	71	74	76	76	72	74	52	56	46	64	75	85	84	88	86	83	86	77	65	77	....	76.0
	Min ..	44	39	55	60	65	58	62	55	53	52	52	50	45	46	47	47	34	30	40	34	43	57	49	60	60	40	65	50	46	54	....	49.7
Galva.....	Max...	81	88	90	90	92	91	78	61	61	66	75	73	75	72	70	63	52	..	..	63	73	85	82	87	77	82	81	64	64	79	....	75.5
	Min..	42	47	49	58	64	65	57	56	53	52	55	54	48	47	41	45	33	..	..	29	45	57	53	53	54	42	64	50	40	51	....	50.1
Glenwood..	Max...	85	87	88	91	94	91	87	75	72	77	78	75	69	69	73	63	58	69	53	66	77	89	87	88	80	83	85	76	68	85	....	77.9
	Min..	58	49	47	47	65	65	64	61	56	54	62	54	50	51	49	46	36	27	42	30	45	60	55	56	58	47	66	57	49	54	....	52.0
G. Meadow	Max...	74	84	87	89	90	93	76	67	59	61	64	65	75	66	66	63	55	53	45	56	66	77	78	72	72	77	79	75	60	69	...	67.1
	Min...	47	49	53	55	56	62	66	51	52	50	56	55	55	56	50	46	37	39	38	36	40	56	58	56	58	45	62	55	50	50	....	51.3
Greene....	Max...	84	88	90	90	92	90	77	67	59	66	67	71	77	72	70	63	54	55	48	62	72	82	83	86	74	83	85	77	55	76	....	73.8
	Min. .	45	45	48	56	65	59	65	55	55	52	53	55	48	57	52	47	35	32	35	36	40	55	55	60	60	42	65	54	50	50	....	50 9
Greenfield.	Max..	80	86	87	92	93	96	94	74	67	73	75	73	75	76	73	63	59	57	49	62	72	82	83	87	84	84	83	76	62	82	....	76.6
	Min...	50	57	58	69	66	62	63	57	56	52	58	56	54	54	49	38	34	29	41	32	42	56	60	59	52	50	62	54	48	50	....	52.3
Grinnell...	Max...	78	83	86	88	86	90	92	79	65	64	73	73	76	73	68	63	60	53	47	58	70	80	82	84	79	82	82	78	60	75	....	74.2
	Min...	64	54	58	62	65	58	62	66	56	54	53	56	53	60	53	48	38	34	40	40	42	55	59	60	65	58	65	59	53	49	....	54.6
Grin'l (nr.)	Max..	78	83	86	88	89	92	92	80	67	64	73	73	76	73	67	62	57	54	49	59	72	81	85	86	78	84	85	77	63	78	....	75.1
	Min...	54	54	58	62	65	63	66	58	58	54	54	56	51	60	53	48	37	34	40	41	41	55	59	60	65	54	65	59	53	50	....	54 2
Grundy C'r	Max...	81	85	86	88	89	91	91	69	61	64	73	73	77	76	70	62	54	58	46	62	72	81	84	86	73	83	85	74	56	74	....	74.1
	Min...	47	46	52	54	63	60	61	55	54	52	53	54	47	53	49	45	35	31	37	39	40	54	53	58	62	46	62	56	51	48	....	50.8
Guthrie Cr	Max...	81	85	87	89	91	91	91	70	65	72	74	74	75	72	66	62	55	52	49	61	73	83	82	85	78	82	85	75	60	80	....	74.8
	Min...	44	42	43	53	65	66	56	58	55	54	56	56	46	50	50	45	33	30	41	30	41	58	68	61	60	41	63	55	47	55	....	50.7
Hampton..	Max...	89	94	92	91	95	95	82	68	58	71	69	73	79	79	71	62	51	55	45	65	74	83	85	87	77	84	85	72	66	77	....	75.8
	Min...	48	48	50	58	67	63	67	54	54	52	52	54	51	55	51	47	36	34	37	34	42	56	54	58	61	45	64	54	49	50	....	51.5
Harlan.....	Max. .	81	89	87	89	92	88	85	66	65	75	74	72	74	67	66	61	53	54	49	62	73	82	82	85	76	83	84	73	65	81	....	77 8
	Min...	46	46	47	55	63	62	66	60	54	53	58	56	47	50	46	46	33	28	42	29	43	57	52	61	56	45	62	53	47	52	....	50.5
Hopeville..	Max...	81	84	86	87	90	91	94	74	70	77	76	73	76	70	72	62	55	55	47	61	73	82	85	84	75	82	82	76	67	81	....	75.6
	Min...	54	54	57	59	67	64	66	61	58	53	58	54	52	57	52	49	36	32	42	38	42	57	59	60	58	56	63	59	50	53	.....	54 0
Humboldt.	Max...	61	84	87	89	92	89	76	66	59	66	68	75	77	73	68	66	52	54	46	62	73	83	80	84	80	80	84	72	58	74	....	72.6
	Min...	46	44	47	57	64	63	66	56	53	52	54	55	48	51	50	48	35	34	40	35	45	45	52	62	60	61	60	50	46	48	....	50.9
In'pen'nce.	Max...	83	86	88	89	90	93	92	73	63	62	70	69	78	71	70	62	55	55	46	60	71	81	82	86	73	82	83	77	59	74	....	74.1
	Min ..	45	45	52	56	63	58	66	53	52	50	51	55	46	56	50	45	35	32	35	38	36	54	53	56	59	47	62	55	50	48	....	50.1
Indianola..	Max..	83	86	86	89	97	94	91	78	67	72	76	76	78	73	70	64	58	56	47	64	75	83	87	87	78	84	84	75	60	82	....	76.7
	Min...	54	51	53	61	64	64	62	56	59	55	56	58	51	57	53	46	36	33	40	38	41	59	62	58	54	52	64	57	51	49	....	53.1
Iowa City..	Max...	87	90	91	94	94	97	101	77	67	68	72	71	82	77	73	65	57	60	47	61	76	84	88	90	80	88	87	88	73	79	....	78.8
	Min...	46	45	52	55	61	60	60	59	58	55	55	58	48	59	54	48	40	36	37	44	38	55	56	55	64	59	63	55	55	48	....	52.6
Iowa Falls.	Max...	81	84	86	87	89	92	85	66	59	67	72	73	76	76	69	61	55	54	45	61	71	80	81	85	73	81	82	72	60	75	....	73.3
	Min ..	43	41	46	54	64	55	61	56	54	52	54	54	44	55	50	48	33	32	36	37	40	41	53	60	50	39	63	53	47	46	....	48 7
Keokuk ...	Max...	81	84	85	89	89	93	95	83	82	85	77	75	75	79	78	60	55	57	47	57	74	83	86	88	82	87	83	85	66	82	....	78.1
	Min...	57	55	60	63	66	65	60	61	67	55	56	60	60	61	57	51	42	35	41	45	40	57	63	63	64	64	63	64	58	49	....	56.7
Keosauqua	Max...	83	86	87	88	92	94	95	87	79	79	75	74	78	77	75	68	56	58	52	59	72	80	85	86	80	85	83	85	75	79	...	78.4
	Min...	54	47	54	54	67	64	67	62	67	55	58	60	51	62	58	53	43	38	40	45	42	57	62	62	70	65	67	59	57	51	....	56.2
Le Mars...	Max...	81	85	86	89	89	89	72	60	58	67	68	72	71	68	69	64	50	51	48	64	74	84	84	80	72	79	80	61	64	75	....	72.0
	Min .	43	50	46	59	61	65	59	55	52	51	54	52	49	48	48	43	32	29	41	33	45	52	59	53	54	53	57	49	35	53	....	49.2
Lenox.....	Max ..	80	84	85	87	91	90	94	76	71	79	74	73	72	71	71	70	55	54	50	60	71	81	83	84	80	82	82	77	67	81	..	75.7
	Min...	52	54	58	58	68	66	61	60	57	52	59	54	51	55	50	45	35	29	42	34	43	56	58	61	61	53	62	59	49	52	....	53.3
Logan.	Max...	87	85	90	85	93	84	86	73	70	75	74	76	72	66	64	61

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR SEPTEMBER, 1901—CONTINUED.

STATIONS		DATE																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Monticello.	Max ..	82	83	87	90	92	95	93	72	73	63	66	67	80	72	69	70	..	58	58	59	72	83	84	82	83	84	82	85	80	76	....	77.2
	Min...	42	40	38	52	54	53	52	55	54	54	53	50	46	47	48	46	38	34	35	38	45	47	50	50	52	50	53	54	50	43	..	47.4
Mt. Ayr .	Max .	84	89	90	90	92	94	96	80	73	83	76	74	79	71	73	65	55	57	48	63	74	83	86	87	79	84	84	79	70	84	....	78.1
	Min...	52	52	54	58	66	66	65	61	57	51	58	53	54	55	48	50	34	30	41	34	42	55	59	59	59	55	61	58	49	51	....	52.9
Mt.Vernon	Max...	85	87	90	93	92	95	96	73	63	68	70	66	81	76	70	65	56	61	43	63	73	81	85	89	78	86	86	84	60	77	....	76 4
	Min..	53	52	58	62	66	65	66	57	58	54	58	59	52	58	55	48	40	36	40	43	40	54	61	66	64	57	62	56	55	57	....	55.1
NewH'pton	Max. .	80	83	87	88	89	91	77	69	60	61	66	68	75	73	68	61	55	52	48	59	68	80	80	76	67	79	82	74	56	72	....	71 5
	Min...	48	51	64	58	63	59	65	..	52	49	49	53	46	53	..	51	...	32	37	35	35	46	53	56	56	45	63	..	39	51		50 3
Newton....	Max..	80	85	87	89	91	91	94	78	65	67	74	74	79	76	66	62	56	55	46	59	72	81	74	86	78	84	84	78	62	78	....	75.1
	Min...	52	60	53	58	64	61	63	57	58	54	53	56	57	59	50	45	36	35	38	38	41	57	57	60	67	51	63	58	52	47	....	53 3
Northwood	Max..	80	82	85	87	90	87	74	62	57	61	63	71	75	74	69	62	53	52	47	62	70	80	77	79	72	77	81	65	58	71	....	70.8
	Min...	46	49	52	56	63	62	60	52	51	51	52	53	49	56	50	45	37	32	37	31	40	55	53	57	58	44	62	52	47	50	....	50.1
Odebolt....	Max..	87	90	91	91	94	92	82	62	59	69	70	74	73	66	68	62	55	56	50	64	74	85	83	86	81	82	81	66	63	80	....	74 5
	Min...	44	46	47	57	60	64	66	57	53	52	55	42	47	48	50	46	33	30	41	30	45	58	53	64	58	44	67	51	44	52	....	50.1
Ogden....	Max..	83	87	87	89	92	92	92	68	68	65	72	75	76	75	69	63	56	56	46	63	73	83	86	83	77	75	82	82	61	80	....	75.2
	Min...	51	49	51	56	66	63	65	56	55	53	54	54	47	52	48	44	31	33	40	34	41	41	60	55	60	48	63	54	47	49	....	50.7
Olin..	Max...	78	81	82	86	89	90	90	70	65	63	69	68	75	69	71	64	53	57	46	54	68	77	80	84	76	80	80	81	..	70	....	73 0
	Min...	42	42	50	52	56	60	57	63	55	55	54	55	46	59	54	47	39	35	36	43	36	53	69	53	69	56	62	54	56	45	.	51.7
Omaha, N.	Max...	84	87	87	88	92	90	79	69	69	75	76	75	66	71	69	63	55	57	52	64	78	89	86	87	74	82	84	65	71	85	..	75.6
	Min.	63	60	60	63	66	66	67	63	56	57	58	56	55	51	54	49	39	32	43	36	46	60	60	67	57	56	59	54	47	57	....	55 2
Onawa.....	Max...	84	86	87	89	92	88	83	67	64	72	73	72	70	68	66	64	57	54	52	64	77	87	83	86	57	47	65	54	44	56	....	52 1
	Min...	54	52	49	55	64	67	63	59	54	54	59	54	52	48	48	48	35	28	42	32	45	58	55	66	70	76	80	62	55	70	....	69 0
Osage.....	Max...	77	80	83	85	86	86	74	63	56	61	63	69	72	73	67	60	51	50	47	60	68	78	74	75	70	76	80	62	55	70	....	69 0
	Min. .	46	48	51	58	65	60	61	51	51	50	51	54	50	56	50	44	37	33	36	32	40	55	54	57	56	44	62	51	46	49	....	49.9
Osceola....	Max...	83	87	86	90	91	94	95	..	69	75	77	75	78	73	73	62	56	..	48	62	74	82	87	83	78	85	84	78	77	83	....	78.0
	Min...	50	50	50	49	57	58	56	50	60	53	55	55	47	48	52	48	34	32	33	40	38	44	60	47	58	53	54	48	49	50	....	49.1
Oskaloosa .	Max...	81	86	86	90	92	93	98	76	69	69	77	75	80	75	71	63	55	55	50	60	72	82	86	87	79	84	84	84	65	81	....	76.8
	Min...	49	43	50	55	66	61	62	59	62	55	55	55	47	59	53	47	37	34	36	40	41	56	60	60	67	59	65	57	53	49	....	53.1
Ottumwa ..	Max...	74	86	86	84	91	91	90	87	73	74	74	76	80	76	86	67	56	57	50	..	69	81	..	87	78	80	82	82	77	80	....	77.7
	Min...	59	56	59	58	69	68	70	60	62	56	55	58	50	57	60	50	44	35	43	42	47	60	61	62	68	62	59	57	54	50	....	56.4
Ovid.....	Max...	88	91	89	90	92	97	96	82	75	79	79	78	81	72	76	64	59	61	49	66	76	83	89	87	77	86	84	84	74	83	....	79.6
	Min..	50	49	55	60	66	66	65	61	60	51	58	56	50	58	52	48	35	30	40	41	41	55	60	59	69	65	63	55	51	50	.....	54.0
Pacific Jct.	Max...	85	87	89	88	95	92	80	78	70	76	76	74	64	68	72	64	58	58	56	64	76	88	88	89	80	85	85	75	68	84	....	77 1
	Min...	60	50	49	59	65	65	63	63	56	55	63	53	49	50	47	44	31	27	43	30	45	58	57	64	67	57	66	58	50	55	....	53 3
Pella. .. .	Max..	84	88	88	90	90	88	97	76	73	76	78	76	80	70	72	68	66	58	50	52	62	86	88	..	..	..	..	..	..	..	....	76.3
	Min .	48	44	52	57	65	56	62	58	59	60	54	58	48	62	60	52	38	34	38	38	40	40	42	..	..	..	..	..	..	..	..	50.7
Perry.....	Max...	82	86	87	90	94	95	98	74	65	71	78	75	80	76	67	65	57	50	48	63	74	87	85	86	78	83	80	75	60	81	....	76 3
	Min...	46	44	45	55	68	64	65	58	57	55	55	58	48	54	56	47	33	35	42	37	47	57	55	59	55	47	50	55	44	51	....	50 8
Plover.....	Max...	80	84	86	89	93	95	83	62	56	69	68	70	75	71	65	62	52	58	54	72	73	84	83	85	72	80	84	69	60	75	....	73.6
	Min...	45	47	46	60	62	60	60	53	48	49	52	50	46	47	45	42	33	50	46	31	40	55	50	61	44	40	60	55	45	52	...	49 1
Primghar..	Max...	85	80	90	90	95	93	85	55	55	60	65	60	61	55	70	81	..	58	75	64	75	84	80	84	80	82	75	..	65	78	....	74.3
	Min...	56	60	..	60	63	63	61	53	50	50	50	50	..	50	35	40	50	35	40	36	45	..	50	54	53	57	63	48	..	52	....	50.9
Red Oak...	Max...	79	83	84	90	88	86	87	73	74	76	74	72	70	68	68	65	56	58	58	60	72	80	83	84	81	82	82	79	64	78	....	75.1
	Min...	59	54	54	62	72	68	66	64	59	57	63	57	54	56	53	51	39	34	46	37	47	59	61	65	63	54	67	57	52	56	....	56.2
Ridgeway..	Max...	78	82	88	88	90	90	73	65	61	59	66	64	73	72	65	60	53	53	48	58	68	78	80	73	70	77	81	68	58	70	....	70.3
	Min...	51	54	60	60	66	63	60	53	50	50	51	56	53	59	51	46	38	33	42	37	42	56	57	61	55	47	65	56	50	50	....	52.4
Rockwell C	Max...	81	85	87	87	91	87	78	65	61	65	72	74	75	74	70	64	53	55	49	63	73	83	81	86	81	81	84	80	71	77	....	74.4
	Min...	50	49	49	55	62	62	63	50	53	55	55	55	51	50	50	46	35	39	47	64	74	84	81	86	80	82	83	71	59	79	....	73 7
Sac City....	Max...	84	87	89	91	94	93	78	60	56	64	71	74	72	70	70	61	53	55	47	64	78	89	86	87	74	82	84	65	71	85	..	75.6
	Min...	45	47	46	56	63	65	60	55	52	52	54	54	49	50	49	46	32	36	41	32	42	58	52	61	59	48	61	50	42	51	..	50.3
St. Charles.	Max...	83	85	86	89	90	93	95	77	67	73	77	75	79	72	69	62	55	56	46	62	74	82	86	87	78	85	84	77	63	81	....	76.3
	Min...	53	53	55	60	67	67	63	58	59	55	56	53	52	57	53	48	36	34	40	38	42	58	62	60	63	52	65	57	50	50	....	53.9
Scranton ..	Max...	80	84	86	89	91	90	85	68	62	66	72	72	75	70	65	61	56	53	48	60	72	83	82	86	80	82	82	60	..	76	....	73.6
	Min...	50	51	52	56	58	64	64	57	54	53	55	56	50	51	50	47	34	33	42	33	42	56	57	60	61	50	65	52	46	50	....	51.6
Sheldon	Max...	84	87	89	89	91	90	76	58	55	63	67	73	72	68	70	61	48	54	47	65	75	85	80	85	78	80	78	63	80	78	....	73.0
	Min...	42	50	52	57	60	62	50	53	50	50	52	50	47	47	47	43	33	31	38	32	42	58	52	50	55	45	62	46	46	52	....	48 5
Sibley	Max...	85	90	93	92	94	89	79	56	55	65	64	74	76	69	70	58	47	55	49	68	76	85	77	84	75	80	79	64	68	76	....	73.1
	Min...	46	46	46	54	57	62	50	52	49	50	53	51	45	46	47	40	31	34	37	30	43	55	50	54	55	49	63	47	34	49	....	47.5
Sigourney .	Max...	88	92	92	94	86	99	92	82	70	74	76	74	84	81	75	66	58	61	48	63	75	85	89	93	80	90	86	86	68	83	....	80.0
	Min..	48	47	52	55	56	60	62	59	59	55	54	58	47	60	52	48	38	35	37	44	39	55	59	56	58	55	62	53	53	46	....	52.1
Sioux City.	Max...	82	84	86	88	91	89	165	60	61	69	70	73	69	69	68	60	50	51	50	37	48	59	89	81	85	72	81	79	60	65	81	....	72 3
	Min..	50	54	58	59	63	66	60	56	53	53	53	54	54	48	50	50	35	30	43	37	48	59	54	67	55	52	57	51	41	59	....	52.3
Storm L...	Max...	81	85	86	87	90	90	76	59	57	61	69	72	70	68	68	60	50	62	48	61	70	82	80	82	76	78	80	64	61	76	...	71.7
	Min ..	46	61	59	60	64	65	57	54	50	51	54	53	52	49	49	47	33	36	39	33	45	57	49	60	55	52	62	48	37	52	....	51.0
Thurman ..	Max...	79	83	84	88	90	86	86	75	70	78	73	73	65	69	71	63	57	55	53	62	75	87	85	86	80	82	82	75	64	82	...	75.3
	Min...	60	47	45	55	65	65	48	63	57	55	62	53	53	49	53	48	45	34	28	44	30	48	60	62	65	59	48	68	57	51	53	....	52 6
Tipton	Max ..	90	91	89	90	91	92	94	75	68	65	73	73	74	74	70	70	65	59	52	58	69	77	80	83	78	80	80	80	75	74	...	76.3
	Min ..	64	62	59	65	62	67	69	58	57	54	54	58	49	55	53	50	40	36	37	44	41	55	60	59	64	60	69	56	57	49	...	55.4
Toledo.....	Max..	87	88	89	91	93	97	98	65	61	66	70	76	83	80	70	65	57	54	50	65	74	85	83	85	88	86	87	86	61	80	....	77.3
	Min ..	45	43	48	54	65	61	60	55	50	..	..	..	46	60	52	45	37	34	32	40	45	49	58	60	58	45	50	57	53	48	....	50.0
Washi'gt'n	Max..	82	86	87	91	92	94	97	78	..	..	..	..	..	..	74	62	55	57	47	58	74	82	86	89	87	84	85	63	..	79	....	77.8
	Min. .	47	46	53	57	62	61	62	58	..	..	..	..	..	..	48	46	37	33	36	40	35	52	59	57	58	63	55	49	..	45	....	50.5
Waterloo..	Max..	84	88	90	90	92	94	93	59	62	64	70	70	79	74	72	64	57	57	45	62	70	82	83	88	76	83	86	76	60	75	....	74.8
	Min ..	45	45	49	54	62	58	64	55	54	53	52	53	47	57	52	49	37	33	35	37	40	57	52	56	61	43	63	59	52	51	....	50.8
Waverly...	Max...	81	85	88	89	91	93	82	66	66	63	68	68	76	76	69	64	56	54	45	61	70	80	81	85	74	81	83	73	56	74	...	73.3
	Min...	47	47	50	59	66	63	66	55	54	53	54	56	47	58	53	50	37	34	37	38	43	57	54	60	60	49	64	54	51	51	..	52 2
West Bend	Max. .	82	85	88	91	93	85	67	61	57	65	68	75	75	72	69	69	49	54	49	63	73	83	80	86	70	80	84	53	62	75	....	72.1
	Min...	47	46	46	54	62	62	60	56	51	52	53	54	47	50	48	43	33	31	40	31	42	56	50	58	58	41	66	50	45	49	....	49.4
Wilton Jc .	Max ..	81	83	85	88	90	92	95	78	76	74	72	69	79	73	74	66	58	61	47	58	70	78	82	86	81	85	80	83	71	78	....	76.4
	Min ..	53	42	50	54	58	58	59	58	56	48	45	55	47	59	51	46	32	32	36	42	38	52	58	56	61	62	59	53	57	45	....	50.7
Winterset .	Max...	85	90	90	92	95	98	100	71	66	74	78	76	82	77	74	65	56	60	47	69	75	83	85	88	79	86	86	82	66	85	....	80.0
	Min...	50	50	52	59	68	64	60	58	58	54	47	57	49	54	50	45	34	32	41	36	43	57	60	61	63	50	63	60	49	49	...	52 4
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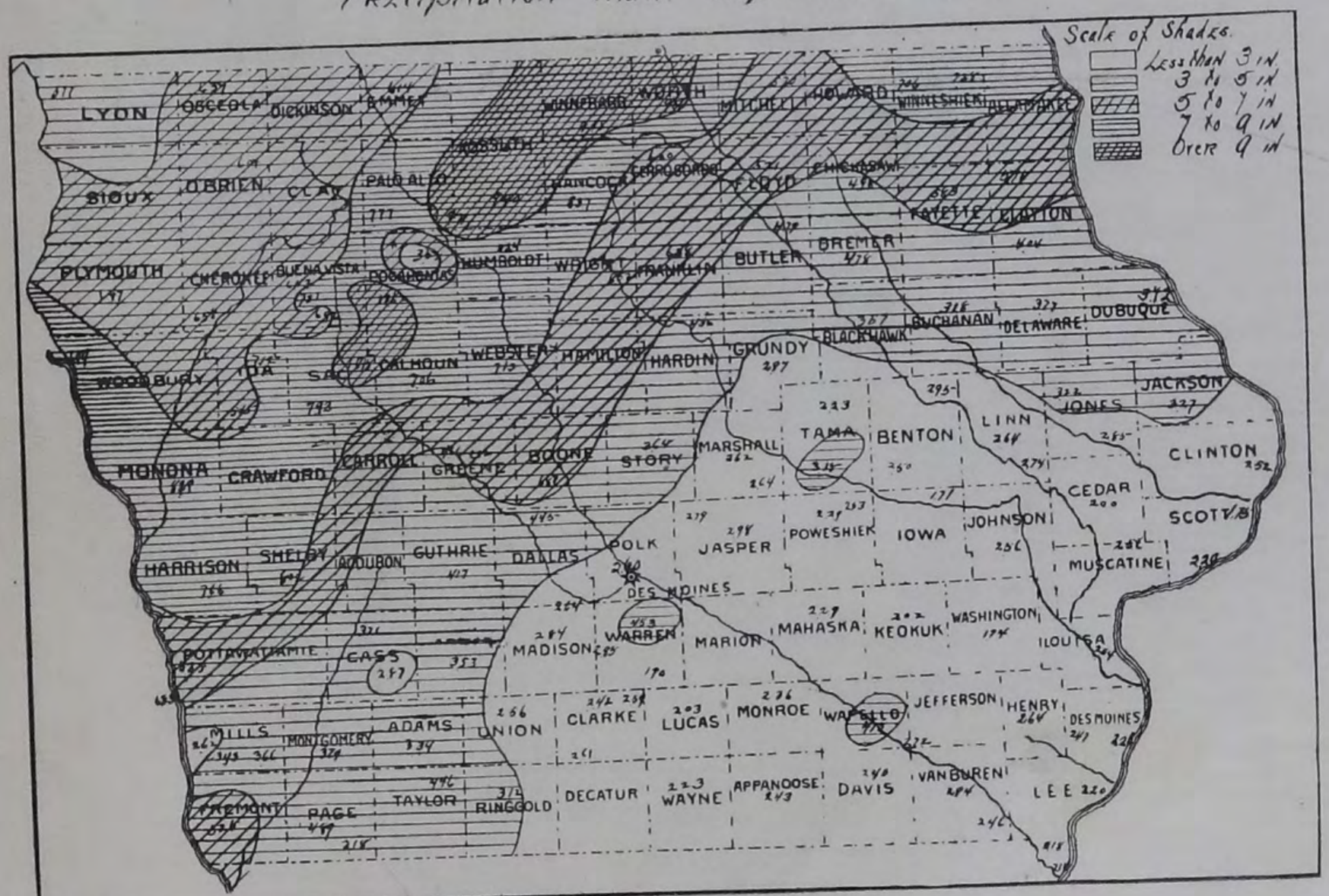
DAILY AND MONTHLY PRECIPITATION FOR SEPTEMBER, 1901.

STATIONS.	DAY OF MONTH.																													TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	....	....	....	....	T.	....	....	.05	.50	....	1.85	.09	....	.07	....	....	....	....	.62	....	....	....	....	....	.35	....	....	.03	....	....	....	3.56
Albia	....	....	....	....	....	....	....	....	.18	....	.17	....	....	.22	....	....	....	....	.23	....	....	....	....	....	.38	....	....	.18	....	....	....	2.36
Algona	....	....	....	....	....	....	.45	3.75	....	....	1.00	....	.03	.05	....	....	....	....	.75	....	....	....	....	..	.75	....	....	1.95	.65	.02	....	9.40
Alta	..	....	....		T.	T.	.16	.48	1.07	....	1.03	....	.42	.04	....	....	....	....	.80	....	....	....	....	....	.26	....	2.06	.21	....	....	....	6.53
Alta (near)	....	....	....	....	.02	T.	.11	1.48	....	....	.93	....	.40	.04	T.	....	....	....	.80	....	....	....	..	....	.27	....	2.88	.38	....	....	....	7.31
Amana	....	....	....	....	....	....	....	.02	.36	....	.75	....	....	.15	.03	..	....	....	.32	....	....	T.	....	....	.08	....	....	....	....	....	....	1.71
Ames	....	....	....	....	....	....	....	.32	.47	....	.75	....	T.	.10	T.	.14	....	....	.67	T.	..	....	....	....	.25	....	.05	.85	....	.05	....	3.65
Atlantic	....	....	....	....	....	....	....	.38	.05	.34	1.16	....	.19	.02	....	....	....	.09	.71	....	....	....	....	....	.46	....	....	.31	....	T.	..	3.71
Battle Creek	....	....	....	....	T.	.12	.07	.61	.89	....	1.02	T.	.31	T.	T.	.05	....	....	.84	...		..	....	....	.25	....	.09	1.20	....	....	....	5.45
Baxter	....	....	....		....	....	....	.37	T.	....	1.25	....	T.	.20	T.	....	....	....	.60	....	....	....	....	....	.10	.05	....	.15	....	.07	....	2.79
Belknap	..	....	....	....	....	....	....	....	.42	....	1.13	....	.....	.28	....	.12	....	....	.27	....	....	....	....	....	.08	....	....	.10	....	....	....	2.40
Belle Plaine	....	....	....	....	....	....	....	.20	.65	....	.75	....	....	.10	.10	....	....	....	.50	....	....	....	....	....	....	....	....	.20	....	....	....	2.50
Bonaparte	....	....	....	....	....	..	....	....	.....	...	1.75	....	.24	T.	....	.10	..	....	.17	....	....	....	....	....	.20	....	....	....	....	....	....	2.46
Buckingham	....	....	....	....	....	....	....	15	.25	....	.84	....	....	.36	T.	....	....	....	.45	....	....	....	....	....	.06	....	.04	....	.08	....	....	2.23
Burlington	....	....	....	....	....		....	....	.06	....	1.06	....	....	.69	....	.08	....	....	.35	....	....	....	....	....	T.	....	....	....	.02	....	....	2.26
Cedar Rapids	..	....	....	....	....	....	.56	....	.58	....	.75	....	....	.25	T.	....	....	....	.26	....	....	..	....	....	.22	....	....	T.	.02	T.	....	2.64
Centerville	....	....	....	....	....	....	....	.04	.44	1.15	....	....	....	.15	T.	.16	....	....	.15		....	....	....	....	.28	....	....	.06	....	....	....	2.43
Chariton	....	....	....	....	....	....	....	.07	.28	....	1.09	....	....	.14	T.	....	....	....	.32	....	....	....	....	....	.13	....	....	T.	T.	....	....	2.03
Charles City	....	....	....	....	....	....	T.	.54	.76	T.	1.45	.04	....	.25	.10	....	....	....	.35	....	....	T.	....	....	T.	....	T.	1.60	.12	....	....	5.21
Clarinda	....	....	....	....	....	.06	....	.12	....	3.00	.37	....	16	.02	....	....	....	.65	.07	....	....	....	....	....	.44	....	T.	....	....	....	....	4.89
Clear Lake	....	....	....	....	T.	.10	T.	.55	1.75	....	.80	T.	T.	.05	T.		....	....	.40	....	..	....	....	....	.35	....	T.	2.00	....	..	....	6.00
Clinton	....	....	....	....	....	....	....	....	.16	....	1 23	....	....	.80	.....	....	....	....	.18	....	....	....	....	....	.15	....	....	....	..	....	....	2.52
College Springs	....	....	....	....	....	T.	T.	.12	....	....	2 00	....	.28	....	....	..	....	....	.50	....	....	....	....	....	.28	...	....	....	....	....	....	3.18
Columbus Junction	....		....	....	....	....	....	.02	.04	....	.93	....	....	.46	....	.03	....	....	.26	....	....	....	....	....	.40	....	....	....	.40	....	....	2.54
Corning	....	....	....	....	T.	T.	.10	.04	T.	T.	2.00	.15	.12	.03	T.	T.	....	....	.60	....	....	....	....	....	.30	....	....	....	....	....	....	3.34
Council Bluffs	....	....	....	.04	....	.15	.08	.95	....	1.25	.35	....	.61	....	....	....	....	.10	.57	....	....	....	....	....	.62	.06	.01	.56	....	...	...	5.35
Cumberland	....	....	....	....	....	....	....	T.	T	1.20	.22	20	.01	T.	....	...	....	.60	...	....	....	....	....	....	.32	....	....	.32	....	....	....	2.87
Danville	.05	....	....		..	....	.45	....	....	....	....	....	1.12	....	....	....	....	.35	T.	....	....	....	....	....	.45	....	....	.05	....	....	....	2.47
Davenport	....	....	....	....	....	....	T.	....	.09	..	.78	....	....	.94	.02	T.	....	....	.18	.02	....	....	....	....	T.	.22	....	....	.04	....	....	2.29
Decorah	....	....	....	....	....	....	....	1.98	1.02	....	1.18	....	....	.26	.95	.08	....	....	.20	....	....	....	....	....	.23	....	....	1.38	..	....	....	7.28
Delaware	....	....	....	....	....	....	....	.60	.23	....	1.03	.12	....	.25	....	....	....	....	.39	....	....	....	....	....	1.12	....	....	....	....	.03	....	3.77
Des Moines	....	....	....	....	T.	....	....	.44	.04	....	1.22	....	T.	.16	T.	....	....	....	.47	T.	..	....	....	....	.21	....	....	.02	....	.04	....	2.60
De Soto	....	....	....	....	....	....	....	.29	16	....	1.15	....	T.	16	....	....	....	....	.52	.01	..	....	....	....	.22	....	....	.13	....	....	....	2.64
Dows	....	....	....	....	....	T.	T.	.50	.64	....	1.04	.04	T.	.34	.35	....	....	....	.62	....	....	....	....	....	.29	....	.15	2.52	.03	....	....	6.52
Dubuque	....	....	....	....	....	.....		.06	1.17	...	.99	.01	....	.56	.20	T.	....	....	.15	.01	....	....	....	....	.17	.33	....	....	.06	.01	....	3.72
Eldon	....	....	....	....	....	....	....	....	.33	....	1.07	....	....	.41	....	....	....	....	.61	....	....	....	....	....	.23	....	....	T.	.07	....	....	2.72
Elkader	....	....	....	....	....	....	.56	.85	.04	....	.70	....	....	.65	.03	....	....	....	.25	....	....	....	....	....	.90	....	....	....	.06	T.	....	4.04
Emerson	....	....	..	..	..	....	....	T.	T.	2.06	.20	....	...	....	....	....	....	1.00	....	....	....	....	....	.40	.	....	....	T.	T.	....	....	3.66
Estherville	....	....	....	....	....	.01	.65	.40	1.20	....	.59	...	.10	.18	.01	T.	....	....	.47	....	....	....	....	....	.34	...	.85	1.04	T.	T.	....	6.14
Fonda	....	....	....	....	....	T.	.40	5 32	T.	T.	.64	T.	.24	.14	....	....	....	.87	.32	....	....	....	....	.67	....	.08	4.22	.72	T.	T.	....	13.62
Forest City	...	....	....	....	....	.42	....	2.00	1.45	....	.71	....	T.	.17	....	....	....	....	.44	....	....	....	....	....	.55	....	.78	2.96	....	....	....	9.48
Fort Dodge	....	....	....	....	....	T.	.24	.30	85	....	1.00	....	....	....	....	....	....	....	1.10	....	....	....	..	....	.30	.	T.	3.30	.04	....	....	7.13
Fort Madison	.....	....	....	....	....	....	....	.01	....	....	1 15	...	....	.48	.05	.08	....	....	.28	....	....	....	....	...	.10	...	....	.05	....	....	....	2.20
Galva	....	....	....	....	....	.07	.18	.47	.91	..	1.11	....	.34	.02	....	....	....	....	.85	....	....	....	....	....	.17	....	34	2.66	....	....	....	7.12
Glenwood	....	....	....	....	....	18	T	23	.38	.43	.50	.23	.18	T.	T.	....	....	....	.54	....	....	....	....	....	.48	....	T.	.28	....	T.	....	3.43
Grand Meadow	....	....	....	....	.....	....	....	.42	1.42	....	1.29	....	.32	....	.70	....	....	....	....	.25	....	....	....	....	.74	....	14	....	.68	....	....	5.96
Greene	....	....	....	....	....	....	T.	35	.95	....	1.35	....	....	.06	....	....	....	....	.43	....	....	....	....	....	.12	....	04	1.40	.09	....	....	4.79
Greenfield	....	....	....	....	....	T.	.43	...	.02	....	1 51	.10	....	.30	.04	....	....	T.	.65	....	....	....	....	....	.20	....	....	.22	....	.06	....	3.53
Grinnell	....	....	....	....	....	....		.14	.35	....	.95	....	....	....	.30	....		....	.40	....	....	.....	....	....	.15	..	....	....	....	....	....	2.29
Grinnell (near)	....	....	....	....	T.	....	T.	.12	.28	....	1.20	....	....	.09	.30	....	....	....	.43	....	....	....	....	....	.11	....	....	T.	....	T.	....	2.53
Grundy Center	....	....	.....	....	....	....	.02	.19	.20	....	.70	.02	....	.78	.08	....	....	....	.57	.03	....	.....	....	....	.12	....	.04	.05	.08	.09	....	2.97
Guthrie Center	.	....	...	....	....	T.	.05	.29	....	....	1 68	....	.16	.12	....	....	....	....	.75	....	....	....	....	....	.22	....	.13	.77	....	....	....	4.17
Hampton	....	....	....	....	....	.09	.61	93	.05	....	1.22	....	.05	.35	....	....	....	....	.62	....	....	....	....	.35	....	....	.84	1.27	....	....	....	6.38
Harlan	....	....	....	....	T.	.57	T.	.25	1 35	T.	2 04	....	39	.04	T.	....	....	....	.92	....	....	....	....	....	.16	....	.60	1 70	....	....	....	8 02
Hawkeye	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5.83
Hopeville	....	....	....	.....	....	....	....	.01	.12	....	1.30	.06	...	.11	....	....	....	....	.43	....	....	....	....	....	58	....	....	T.	....	....	.....	2 61
Humboldt	....	....	....	....	....	.56	01	.70	1.68	....	1.07	....	.13	.12	....	....	....	....	.78	....	....	....	....	....	.36	....	.02	2.76	....	.05	....	8.24
Independence	....	....	....	....	....	....	T.	.35	.45	....	.95	....	....	70	....	....	....	....	.48	.02	....	....	....	....	T.	....	10	.10	....	.03	....	3.18
Indianola	....	....	....	....	T.	....	....	.14	.11	....	1.21	....	T.	.23	T.	....	....	....	.40	....	....	....	....	....	2 36	....	....	.08	....	....	....	4 53
Iowa City	....	....	....	....	....	..	....	....	.54	....	.68	....	....	.25	.17	..	....	....	.29	....	....	....	.	....	50	....	....	....	.13	....	....	2.56
Iowa Falls	..	....		....	T.	....	.08	.12	.63	....	1.14	T.	.02	.08	T.	....	....	....	.65	....	....	T.	....	.	.32	...	.24	1 08	....	T.	....	4.36
Jefferson	...	.	....	....	...	.....	..	....	33	....	1.12	....	.07	.08	....	....	....	1 07	..	....	....	....	....	....	.10		.53	2.82	....	....	....	6.12
Keokuk	...	.	....	....	....	....	....	....	.26	....	.70	...	....	.36	14	.44	....	....	.24	....	....	....	....	....	T.	....	....	....	....	....	....	2.14
Keosauqua	....	..	....	....	....	....	....	T.	.32	....	1.72	....	.50	....	....	.17	....	..	.14	.01		T.	....	....	.06	.02	..	....	..	....	....	2.94
Lacona	....	....	T.	....	....	..	T.	.30		....	1.00	....	....	.40		....	..	....	....	....	T.	....	....	....	..	....	....	.10	....	.10	....	1.90
Larchwood	....	....	....	....	....	....		1.25	.50	....	1.25	.75	....	.25	.02	....	....	....	....	....	....	....	....	75	....	....	....	....	....	....	....	3.77
Le Mars	....	....	....	....	....	....	.57	1.00	.50	....	....	....	.45	....	....	....	.....	..	.77	....	....	....	....	....	....	....	2 33	1.35	....	....	..	6.97
Lenox	...	....	....	....	....	....	....	.01	....	....	3.55	.12	.10	.04	T.		....	....	.54	....	....	....	....	....	10	..	....	....	....	....	....	4.46
Logan	....	....	....	....	.04	.08	.05	1.06	1.74	1.11	.72	....	.02	.03	....	....	....	....	.91	....	....	..	....	....	.55	....	.05	1.30	....	....	....	7.66
Maquoketa	....	...	....	....	....	....	....	....	.68	....	.94	T.	....	.85	.26	.01	....	....	.22	.02	..	....	....	....	.20	....	....	.09	.	T.	....	3.27
Monticello	....	.	....	....	....	....	....	T.	1.47	....	.97	T.	....	20	.15	....	....	....	33	....	....	..	....	....	.17	....	....	....	T.	T.	..	3 22
Mooar	....	....	....	....	....	....	....	....	....	.78	....	....	.48	....	....	....	...	.50	.42	....	....	....	....	....	....	T.	T.	....	....	....	....	2.18
Mount Ayr	....	...	....	....	T.	....	T.	.11	.11	....	1 90	.07	T.	.29	...	.02	....	...	.35	.02	....	....	....	....	.24	....	....	.01	....	....	....	3.12
Mt. Vernon	....	....	....	....	....	....	....	T.	.45	....	1.00	....	.	.23	.13	....	....	....	.30	....	....	....	....	....	.60	....	....	.02	....	.01	....	2.74
New Hampton	....	....	....	....	....	....	....	.66	.93	...	.74	.02	....	....	.81	....	....	....	.21	....	....	....	....	....	.31	....	.85	.45	....	....	..	4.98
Newton	....	....	....	....	....	....		.14	05	....	1.25	....	....	.90	....	....	....	....	.40	....	....	....	.....	....	.09	....	....	.15	....	....	....	2.98
Northwood	..	..	....	....	....	.12	.02	2.16	1.94	....	1.00	T.	....	.11	....	T.	....	....	.31	....	....	....	..	....	.33	....	.90	2 44	....	.04	....	9.37
Odebolt	....	....	....	....	....	.06	.09	1.00	1.92	....	1.14	....	.35	.02	....	....	....	....	.97	....	....	....	....	....	.20	....	.48	1.70	....	....	..	7.93
Ogden	....	....	....	....	....	....	.61	.10	.46	..	1.03	....	....	.10	.15	.03	....	....	.74	....	....	....	....	....	....	.33	....	.08	3 18	.06	....	6.87
Olin	....	....	....	....	....	....	....	....	.45	....	.85	....	....	.63	...	....	..	....	.32	....	....	....	....	....	.62	....	....	....	T.	. ..	....	2.85
Omaha, Neb	T.	....	....	....	.02	.27	T.	.72	.31	.49	.79	.16	.71	.01	T.	....	....	....	.71	....	....	....	....	....	.52	....	1.40	.72	....	....	....	6.83
Onawa	....	....	....	....	.04	.10	.70	1.31	30	....	2.40	....	.72	.02	.02	....	....	....	1.47	....	....	....	.01	.65	....	.04	.48	.03	....	....	....	8 29
Osage	.....	....	....	....	....	.04	.03	.51	1.21	....	1.18	.03	....	.34	....	....	....	....	.29	....	....	.....	.	....	.11	....	.04	1.81	.07	.04	....	5 70
Osceola	....	....	....	....	....	....	....	T.	.20	T.	1.00	.12	....	25	.05	....	....	....	.25	.23	....	....	....	....	....	.32	....	....	....	....	....	2.42
Oskaloosa	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2.29
Ottumwa	....	....	....	....	....	....	....	....	.30	...	....	1.50	.30	....	.80	....	....	....	.60	....	....	....	....	....	.30	....	....	35	....	....	....	4 15
Ovid	....	....	....	....	....	....		.04	.10	....	1.29	....	.12	....	.02	.03	....	....	.18	....	....	.10	....	....	.17	....	....	.05	.13	.	....	2.23
Pacific Junction	....	....	....	....	T.	.03	T.	.51	.16	.05	.38	.18	18	...	....	....	....	....	.50	....	....	....	....	..	.25	....	....	.29	09	.	....	2 62
Perry	....	.....	....		....	....	T.	.15	.15	....	1 20	.	T.	.15	T.	...	..	....	.75	.10	....	.10	T.	....	.25	....	....	1 50	T.	.10	..	4.45
Plover	....	..	..	....	....	.	.21	.67	3.10	....	1 36	...	.16	.27	....	....	....	....	98	....	....		....	....	.37	..	5.49	.94	....	....	..	13.55
Red Oak	....	....	..	....	T.	.03	T.	.20	....	.19	1.15	.20	.22	T.	T.	....	....	....	.62	.	....	....	....	....	.51	....	....	66	....	.01	...	3.79
Ridgeway	....	..	..	..	....	.03	.34	.33	1.38		1.36	.04	....	.71	.02	.01	....	....	.22	....	....	T.	....	....	.99	.....	.02	1.55	.01	.05		7.06
Rockwell City	..	....	....	....	....	T.	T.	.50	1.50	....	.98	....	.21	10	....	.15	.....	....	1.00	....	....	..	....	....	.25	..	12	2 25	....	.	..	7 06
Ruthven	....	..	..	....	....	....	.30	.78	.86	1.08	....	.15	50	...	....	....	....	.83	...	....	....	..	....	....	.57	....	62	2.08	....	....	....	7.77
Sac City	....	....	....	....	.03	....	.02	1.08	3 78	....	1.04	....	.28	.08	T.	....	....	....	.86	....	....	..	....	....	.17	...	.88	1.93	....	....	....	10.15
St. Charles	....	..	....	T.	....	....	T.	.37	...	....	1.30	....	.01	.20	.01	T.	....	....	.45	..	....	....	....	....	.29	.....	....	.16		.06	....	2.85
Scranton	....	..	....	.	....	T.	....	.85	....	....	.80	....	.12	.15	T.	....	..	....	.85	....	....	....	....	.03	.18	....	.07	1.64	....	....	....	4.66
Sheldon	..	....	....	....	T.	.01	1.16	1.05	.53	T.	1.30	....	.14	.03	.01	T.	....	..	.60	....	....	....	....	.03	.43	....	.10	.65	....	....	..	6.04
Sibley	....	....	....	....	.01	.10	1.21	1.10	.51	....	1.21	.03	.23	.06	T.	.04	....	....	.41	....	..	....	....	T.	.51	.06	.19	.70	..	....	....	6.37
Sigourney	..	....	....	....	....		..	T.	.19	....	.98	.	....	.03	.17	T.	....	..	.29		....	T.	....	....	.30	....	....	T.	.06	T.	....	2 02
Sioux City	....	....	..	..	.02	.04	.55	1.28	.15	...	2.03	..	.11	.06	T.	.03	..	..	.78	...		...	.	.01	.02	..	1.43	.88	..	T.	...	7.99
Storm Lake	..	....	....	..	T.	.01	.03	.62	.76	...	1 02	.	.32	.06	T.	...	..		.81	..		...	..	..	.16	..	.13	3.00	....	..	...	6.92
Thurman	...	..	..	.	T.	.30	.10	.82	T.	.28	2.42	T.	.28	...	...		....	..	.40	..	..	..	..	..	.60	...	..	.05	T.	...		5.25
Tipton	..	..	..	..	....	...	..		.25		.90	.	....	.10	..	....	....	....	.50	..	..	..	....	...	.25				T.		..	2 00
Toledo	....	.	..	..	1.00	.50	...	....	...	..		....	....	.65	..	....	....	....	.60	.	..	....		..	.05	..	.	..		.35	..	3.15
Vinton				..	..	..	....	..	...	.64	...	.88	....	....	.63	.	.....	..	.45	..		..	..		.35	..		..	....		..	2.95

DAILY AND MONTHLY PRECIPITATION FOR SEPTEMBER, 1901—CONTINUED.

STATIONS.	DAY OF MONTH.																													TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Washington	..	....	..	T.	....	T.	.40	.63	.50	....	1.35	..	.28	T.	.02	..	..	..	.72	..	T.	....	..	..	.38	....	.78	1.52	..	....	..	6.58
Washta	..	...	..	T.	....	..	.21	.24	.40	..	1.12	.02	T.	.61	..	..	..	..	.48	..	....	T.	....	....	.07	..	.03	.12	.21	.06	....	3.57
Waterloo	...	..	.	..	....	..	.09	.64	.83	..	.76	..	..	.74	.15	..	....	..	.37	...	..	....	....	....	.11	..	.02	.84	.18	.05	..	4.78
Waverly	..	..	..	..	..	..	..	1.05	..	..	1.06	....	..	.13	12	...	....	..	.61	..	..	..	....	..	.25	..	..	3.45	.	.10	..	9.77
West Bend	...	..	..	..	..	..	..	..	..	..	1.10	..	...	.82	..	..	..	....	.38	..	..	..	....	..	.26	...	..	..	..	..	..	2.56
Wilton Junction	..	....	.	..	..	..	..	.20	.16	....	1.40	.13	.....	.05	.09	..	..	..	.55	..	....	..	....	..	.18	...	..	..	.05	.63	..	2.84
Winterset	...	.	.	..	..	..	..	.09	.22	....	..	1.23	...	.21	..	..	....	..	.48	..	..	.	....	..	.36	..	..	....	T.	..	..	2.59
Woodburn	..	...	..	..	....	..	..	.09	.22	....	..	1.23	...	.21	..	..	....	..	.48	..	..	.	....	..	.36	..	..	....	T.	..	..	2.59

Precipitation Chart September. 1901.



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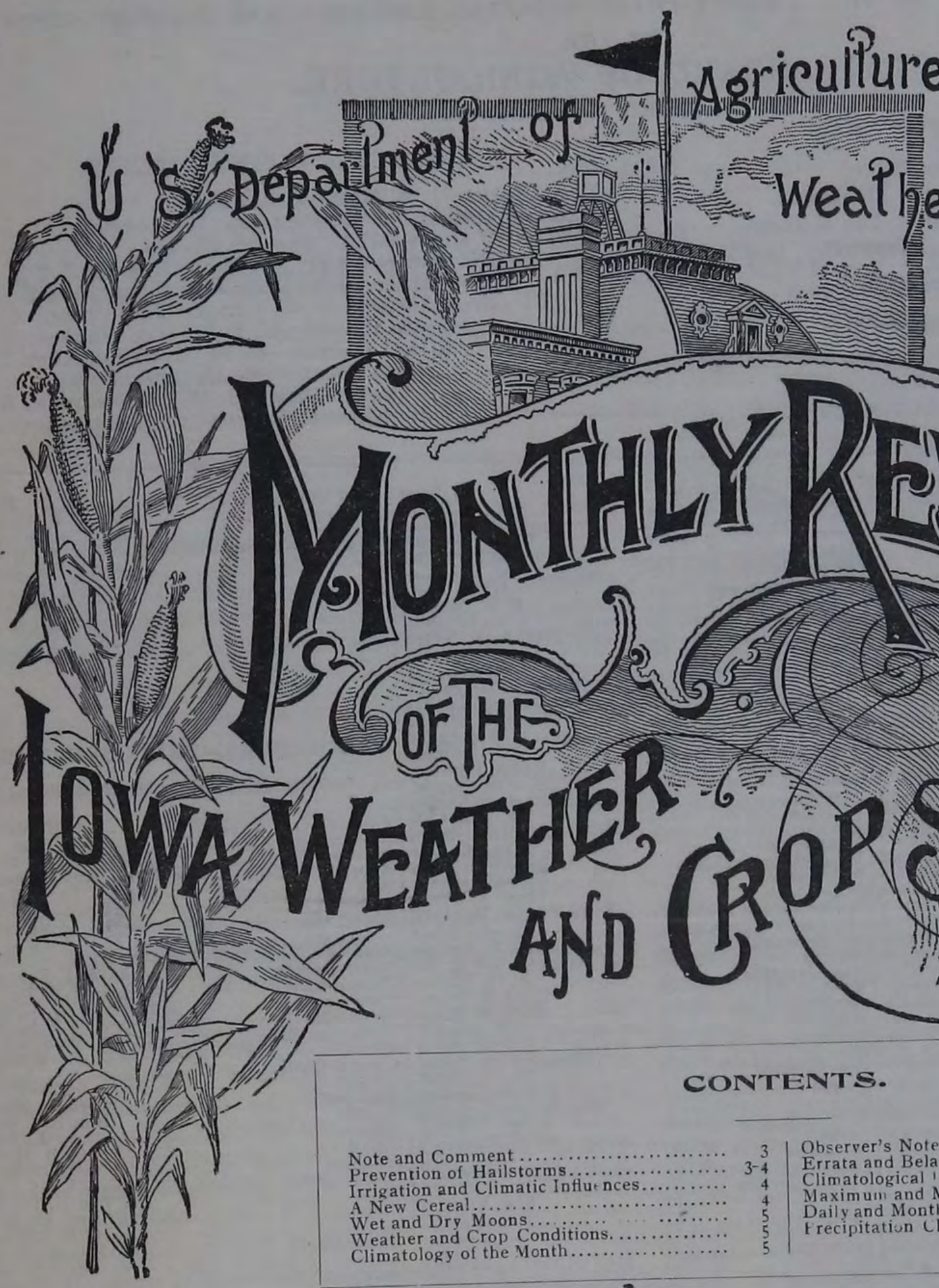

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CENTRAL STATION, DES MOINES, IOWA.

J. R. SAGE,
DIRECTOR

GEO. M. CHAPPEL,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

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DES MOINES:
BERNARD MURPHY, STATE PRINTER
1901.

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U. S. DEPARTMENT OF AGRICULTURE—WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XII. OCTOBER, 1901. No. 10.

NOTE AND COMMENT.

Prof. Hollrung, of Halle, an expert on sugar beet culture, and one of Germany's largest individual beet raisers, says; "The United States will in a very few years produce from beets all the sugar needed for their home consumption. They will be independent both from the cane sugar and beet sugar imports."

* * *

The season's yield of honey is larger than for several years.

* * *

Winter thunder is considered throughout Europe to be of very ill omen, but April thunder is considered to be very beneficial. In Devonshire and other cider counties of England there is a saying that "when it thunders in April you must clean up the barrels"—in readiness, that is, for a plentiful crop of apples. The French consider Apr l thunder to be indicative of a good yield from their vineyards and cornfields.—*Ex.*

* * *

During the past year the state of Pennsylvania has purchased more than 100,000 acres of land to be used as a forestry reservation. The policy of using land that is not adapted to agriculture for the purpose of timber culture has been adopted by both Pennsylvania and New York, the objects being to preserve the purity of mountain streams, to provide for the even flow of streams, the power of which is utilized by manufacturers and the like.

* * *

A strange story, with cooling and refreshing features, is told by a Vinalhaven citizen, a man whose "word is as good as his bond." On the morning of July 13th he arose early and at about 4 o'clock he went into his field to mow. The grass was wet with dew and the air was crisp and cool, but not cold enough for the forming of ice or frost. He had mowed but a few minutes when he thought it best to whet the scythe. In doing so he grasped the snath of the scythe and to his surprise found it covered by a thin coat of ice for about a foot from the end where the scythe is fastened on to the snath. He rubbed off the ice with his hand and resumed mowing. After mowing for ten or fifteen minutes he found the snath again ice coated. He removed the ice and proceeded with his work and the third time the ice appeared. He can in no way acconnt for this, unless it was caused by the rapid motion of the scythe as it swung through the cool morning air, causing rapid evaporation.—Kennebec (Me.) *Journal.*

* * *

Many people are often puzzled to know whether they are eating oleomargarine or butter. An ingenious but simple test has been devised by C. L. Parsons, who gave a recent account of the method before a meeting of the American Chemical Society. About half a pint of sweet milk is heated to boiling and a piece of the suspected substance about as large as the end of the thumb is dropped into the hot liquid, which is stirred with a light stick until the fat is all melted. The vessel containing the mixture is now placed in cold water and stirred until the fat has hardened. At this point the fat, if oleomargarine, can easily be collected together in one lump by means of the stick, while if butter it will granulate and cannot be collected.

* * *

From 1883 to 1898 the temperature in Manila ranged from 77 in December and January, and 78 in February, to 83 in April and May. The rainfall in July, August, and September averaged about fourteen inches.—*Ex.*

* * *

One fact brought out by the Twelfth Census is of more practical importance than all the rest put together. It is that within the last ten years the average term of life enjoyed by a citizen of the United States has increased perceptibly, the death rate having decreased one and one-half per annum for every 1,000 of population. Dr. George M. Kober, Professor of Hygiene in Georgetown University (D. C.), calls attention to the fact that in 300 years the average length of human life has been doubled. In the sixteenth century it was between eighteen and twenty years; at the close of the eighteenth it was a little over thirty years, and to-day it is over forty years. Indeed, the span of life has been lengthened about six years since 1880, thanks to modern sanitation and medical discoveries. Dr. Kober believes that no two factors have contributed so much to the lengthening of human life as the air we breathe and the water we drink. Indeed, we have ample evidence that, with the introduction of sewers and public water supplies, the mortality of large cities in the last forty years has been reduced fully one-half.

PREVENTION OF HAILSTORMS.

A recent press dispatch from Washington D. C., says that Professor Willis L. Moore has issued a statement relative to the attempts being made in foreign countries to prevent hailstorms by the use of explosives from specially designed cannon.

Brief reference is made to the renewed interest in the subject lately manifested in France and Italy, and to the apparatus now in use in conducting the experiments. The professor says:

"Scientists both in America and in Europe declare that hailstorms cannot be prevented by the use of cannon and explosives of even greater power than have been used, or it is possible for men to use, and they base their belief upon such knowledge of the forces of nature as science has revealed.

"Several thousand shooting stations have been established in Italy and France during the past two years, but reports received from them give no definite data in support of the success of

the experiment, although there is no doubt that the cannonading is believed to be effectual by the farmers who do the work. Waves of irrational enthusiasm sometimes sweep over a community only to be regretted in subsequent years, when calmer judgment has come to prevail. We have only to remember the experience in our own country only a few years ago with rainmakers and how firm was the belief of thousands of people in the subarid and arid regions of the West that the use of powerful explosives would produce rainfall. Thousands of dollars were expended in these experiments before the absurdity of the claim was demonstrated. It is a fact worthy of remark that the hail shooters are now using practically the same methods to dissipate the clouds that the rainmakers used to produce them.

"Time and experiment probably will demonstrate that hail prevention by such means is as impracticable as rain production. There is no way of telling by the sight of an approaching cloud whether it is accompanied by hail. Therefore, if the cannon be used every thunder storm would have to be bombarded, although statistics have demonstrated that only one thunder cloud out of a great number contains hail. In other words, there would be a tremendous waste of time, money, and energy in unnecessary bombardments.

"After examining all that has been published during the past two years on the subject of hail prevention I have to repeat the opinion heretofore expressed that we have here to do with a popular delusion, and that efforts should be made to prevent its spread in this country. The great processess going on in the atmosphere are conducted on too large a scale for any man or any nation to attempt to control them. The energy expended by nature in the production of a hailstorm, a tornado, or a rainstorm probably exceeds the combined energy of all the steam engines and explosives in the world. It is useless for man to attempt to combat nature on this scale."

IRRIGATION AND CLIMATIC INFLUENCES.

(*Murray's Price Current.*)

The press of the country is responsible for dissemination of a great deal that is bad with the vast extent of good, and it is not always possible to distinguish between the bad and the good. The following is contributed by J. Warren Smith, Section Director for Ohio, of the Climate and Crop Service of the United States Weather Bureau, which is calculated to correct erroneous conclusions from careless statements concerning climatic influence of irrigation:

COLUMBUS, OHIO, October 4, 1901.—An article entitled "Nature's Revenge," by Mr. E. B. Dunn, of New York City, has recently gained a wide circulation through the medium of the press. Mr. Dunn asserts that the track of low barometer areas, during the summer months, has changed, and that they now hover over a region from Utah northeast to South Dakota, and that the region where these areas come to a standstill corresponds with that where irrigation is being practiced to a marked extent.

With these assertions he advances the theory that the moisture set free by irrigation is sufficient to generate low pressure areas, but not sufficient to give them the necessary energy for further eastward movement; and he draws the conclusion that the climate of the central west is being changed by irrigation and that hot waves and droughts will be more frequent in the future because of it.

It will readily be seen that if a theory of this kind gains credence, it will be detrimental to the cause of irrigation, and hence injure not only the sub-arid west, but the more humid districts as well, where people are beginning to realize the value of irrigation.

A man of judgment knows, however, that a theory must be based upon facts and common sense if it is to have any weight.

As to the first condition, it can be said without hesitation, that the records of the Weather Bureau show no change in the path of the summer storms, no increasing tendency to stagnation of the lows over the district named, and no regular increase in the frequency or severity of the hot waves.

In regard to the last condition, any one with even a slight knowledge of the mechanics of the atmosphere and of the laws of gases will brand the theory as unsound. At the end of May, 1890, the total number of acres under irrigation in the whole United States was only 3,631,381, and in the district indicated by Mr. Dunn as the birthplace of the lows, only about 1,060,736. acres. Although this acreage may seem large, if it is reduced to square miles we find that if all the irrigated land in this district were located in one block it would be but a little over forty miles square. Who for a moment would think that a lake forty miles square would evaporate moisture enough to have a material effect upon the formation or movement of cyclonic areas. And even if we consider that the area of irrigated land has increased ten fold in the past ten years the size of the block would still be comparatively small.

And not only this, but when one considers that the usual number of irrigations during the growing season is only from two to five, it will be seen at once that the theory is so absolutely senseless as to be unworthy of a second thought.

I am authorized to say that the entire scientific staff of the Weather Bureau condemns the theory as being absurd in the extreme.

A NEW CEREAL.

(*Modern Miller.*)

The extremely variable climatic conditions in some of the western states have made it desirable to give particular attention to crops resistant especially to cold and drouth. Among such crops Mr. Carleton, the cerealist of the department of agriculture, shows that emmer, a grain from Russia, holds high rank, and should become one of the permanent crops for stock feeding.

Emmer is a variety of wheat, and its origin as a cultivated plant dates back to prehistoric times. It was probably derived from einkorn, a still simpler form of wheat, which apparently originated in southwestern Europe. Emmer seems to have been found first in Switzerland and is grown in that country at present. It is also grown in Servia, Germany, Russia, Spain and Abyssinia. A rather large quantity of emmer of excellent quality is produced in Russia each year. The best seed is obtained from that country, and when grown in the northwestern plains yields a grain entirely equal in quality to that of the original. The average annual production of emmer in Russia is about 16,000,000 bushels.

The uses of emmer are yet in an experimental stage in this country. But the indications are that it will become a regular and valuable crop for stock feeding. The grain is said to compare well with oats and barley for this purpose, while the straw is considered by some to be of much value. Very little use has been made of emmer for human food in this country, although the high protein content would indicate that it will make a very nutritious bread. In Russia a very large amount of the grain is used for human food. Special machines are in use for hulling it. The grain is then crushed into a kind of coarse grits (krupa) and used for poridge, called "kasha;" or for other kinds of breakfast foods. Little cakes from the coarse meal are sometimes used with soups. A large portion of the food of the peasants of the northern Volga river region is made from emmer. In the portions of Germany, Switzerland and Italy where no wheat is raised this grain is rather important and is used for grits and "pot barley."

WET AND DRY MOONS.

To the Editor:

From boyhood we have heard of "wet moons" and "dry moons." The old theory was that if the new moon appeared on its back, with the points at or near an equal elevation, there would be a wet period; but if one point was elevated much above the other, it would be dry. It cannot be said that this notion did not make an impression on my mind. Recently it occurred to me that it might be tested by observations. So in January, 1898, I began a monthly record of the relative position of the new moon, whether north or south of west at its appearing and its position as indicating wet or dry spells, and for more than three years the record has been kept. In the month of February I have found the new moon appearing farthest north and on its back, with points at equal elevation. Then for six months and until the new moon in August, I have noted its appearance farther to the southward, the right hand point being elevated gradually until it reached its farthest southern position, with the points nearly or quite perpendicular, one to the other. For the next six months there was a reversal toward the northward until the next February; and so on, changing in like manner semi-annually. Now this may not be new to scientists, but to me it was a revelation in nature's laws. Since noting the facts I can see why it is so, and must be so. The relative position of the sun at sunset, and the moon, when new, and our relative position to each of them necessitates the phenomena I have recorded.

N. W. ROWELL.

Afton, Iowa, Oct. 21, 1901.

From the above it will be seen that an ounce of scientific observation will outweigh a ton of ancient traditions.

WEATHER AND CROP CONDITIONS.

October was somewhat warmer than usual, the average temperature being about four degrees above the normal for the state. The rainfall was slightly below normal, but with copious rains in September the amount of moisture was ample for growth of grass and germination of fall grain, except in some of the southern, southeastern and eastern counties. The skies were clear and weather conditions were well nigh perfect the larger part of the month. During the dry and warm period in the last half of the month good progress was made in cribbing corn, plowing, harvesting potatoes and other fall work. The pastures were green and afforded considerable feed for stock at close of the month. Except in the limited dry area fall wheat and rye germinated readily and made a vigorous start, and the acreage seeded is somewhat increased as compared with last year. As a whole the output of the season has been much greater than was believed possible during the prevalence of the drouth in July and August. This applies especially to corn and the late potato crop.

CLIMATOLOGY OF THE MONTH.

BAROMETER. The mean atmospheric pressure for October was 30.10 inches. Highest observed pressure 30.42 inches at Des Moines on the 21st; lowest observed, 29.68 at Davenport on the 12th; range for the state, .74 of an inch.

TEMPERATURE. The monthly mean temperature for the state, as shown by records of 106 stations, was 54.2°, which is about 4° above the October normal. The monthly means by sections were as follows: Northern section, 52.1°; Central section, 54.2°; Southern section, 56.2°. The highest monthly mean was 59° at Maquoketa; lowest mean, 49.2° at Estherville. The highest temperature reported was 88° at Elkader, on the 23d; lowest temperature reported, 20° at Dows, on the 3d. The average monthly maximum was 81.3°; average monthly minimum, 27.3°. The greatest daily range was 50° at Dows, Ames, Ft. Dodge and Atlantic; average of greatest daily ranges 39.5°.

PRECIPITATION. The average precipitation, as shown by records of 125 stations, was 1.98 inches, which is about .30 of an inch below the normal for the state. By sections the averages were as follows: Northern section, 2.04 inches; Central section, 1.95 inches; Southern section, 1.96 inches. The largest amount of rainfall reported was 4.23 inches, at Thurman; least amount reported, .45 of an inch at Davenport. The greatest daily rainfall reported was 2.76 inches on 11th and 12th at Clarinda. The average number of days on which .01 inch or more was reported, 6.

WIND AND WEATHER. Prevailing direction of wind S. W. and N. W.; highest velocity reported, 42 miles per hour from the South, at Sioux City, on the 30th. Average number of clear days, 17; partly cloudy, 7; cloudy, 7.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date
Davenport	30.10	30.40	21	29.68	12
Des Moines	30.13	30.42	21	29.84	12
Dubuque	30.10	30.38	21	29.69	12
Omaha, Neb	30.08	30.38	21	29.74	30
Keokuk	30.10	30.41	21	29.72	12
Sioux City	30.12	30.40	21	29.74	30
	.....	.....	....	.....	....
Means	30.10	30.42	21	29.68	12

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity	Direction.	Date.
Davenport	5,258	24	S	18
Des Moines	5,505	33	SW	30
Dubuque	5,164	28	S	18
Keokuk	5,141	25	SW	1
La Crosse, Wis	5,181	25	NW	31
Omaha, Neb	5,589	27	N	15
Sioux City	8,696	42	S	30
	....	..		....

OBSERVERS' NOTES.

ALTA. David E Hadden—First half of month more or less cloudy and damp; last half typical Indian summer weather; sleet fell on 13th.

BONAPARTE. B. R. Vale—This is the driest period within the memory of the oldest people. The wells are unusually low and moisture in the subsoil seems to have been exhausted.

CRESCO. Anthony Marshall—Mean temperature 4.5° above average. Rainfall about 2° year average.

ESTHERVILLE. Leslie Littell—A good month for fall work, though rather wet first half. Corn husking pushed during the last half.

FOREST CITY. J. A. Peters—Pastures fine at close of October; some farmers finished picking corn; month good for all kinds of farm work.

GRAND MEADOW. F. L. Williams—First killing frost October 4; first trace of snow on 16th; month averaged warm and fields were green as in June.

HUMBOLDT. H. S. Wells—Farm work well advanced and more than usual amount of corn harvested; the crop yielding better than reported a month ago.

LARCHWOOD. Ralph Twamley—The warm weather on 22nd to 24th brightened things and even sweet peas were in bloom.

RIDGEWAY. Arthur Betts—First frost on 4th, and ice was ¼ inch thick; first snow on 16th. Interval between frosts of spring and fall 164 days. There were 257 hours of sunshine or 76 per cent; a beautiful month.

CENTERVILLE. Jas. S. Hamilton—Stock water is very scarce here; even the railroad shops and round house were supplied by hauling water. Reports indicate that one-third of the county will have half a crop of corn; one-third about 20 bushels per acre, and the other third about 10 bushels; pastures very short; potatoes almost a total failure. Very little plowing and seeding done. Corn is nearly all in shock to save the fodder. Wide-awake reading and thinking men have learned much from this year's experience, and some have found out that long range weather prophets, like ———, are humbugs. My motto is trust the Lord and save all the fodder; house the stock crush all the corn; feed in good boxes, and see that each animal gets its share.

CLINTON. Luke Roberts. October was deficient in rainfall, the amount being only .81 of an inch, while the normal is 2 39 inches. Mean temperature 2.6° above normal; soil very dry.

ERRATA IN AUGUST REVIEW.

Corning—August. Mean temperature recorded 74.1 on page 7; should have been 74.0.

Indianola—August. Maximum temperature recorded 95 on the 21st, on page 7; should have been 96 on the 25th.

Knoxville—August. Maximum temperature recorded 93 on the 7th, 14th, 20th, and 21th, on page 7; should have been 94 on the 28th.

Primghar—August. Maximum temperature recorded 96 on the 18th, on page 6; should have been 100 on the 1st.

ERRATA FOR SEPTEMBER REVIEW.

Centerville—September. Mean temperature recorded 69.9 on page 9; should have been 66.4.

Knoxville—September. Mean temperature recorded 60.8 on page 6; should have been 65.8.

Ogden—September. Mean temperature recorded 62.4 on page 8; should have been 63.0.

Larchwood—September. Total precipitation recorded 3.77 inches, on page 12; should have been 4.77 inches.

Monticello—September. Total precipitation recorded 3.22 inches, on pages 8 and 12; should have been 3.29 inches.

Winterset—September. Daily amount of rainfall on 30th, page 13, recorded .63 inch; should have been .03 inch.

BELATED REPORT.

West Union—September. Total precipitation 5 04 inches; greatest in twenty-four hours, 1.00 inch on the 9th and 12th; prevailing direction, southwest; number of clear days, 13; partly cloudy, 0; cloudy, 17; rainy, 10.

IOWA WEATHER AND CROP SERVICE.

CLIMATOLOGICAL DATA FOR OCTOBER, 1901.

NORTHERN SECTION.

STATIONS.	COUNTIES	Elevation, feet	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIP., IN INCHES				Number rainy days	SKY			Prevailing direction of wind	DATES OF THUNDER-STORMS.
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall (unmelted)		Number clear days	Number partly cloudy days	Number cloudy days		
Algona	Kossuth	1,500	8	53.6	†5.5	78	22, 23	32	17, 27	32	1.07	-.69	.70	...	3	15	14	2	NW	
Alta	Buena Vista	1,519	6	52.0	†2.9	79	22	29	4, 14, 17	32	1.87	-.44	1.12	....	8	18	7	6	NW	10, 28
Alta (near)	Buena Vista	.....	.....	.....	.....	.....	.....	...	.....	.....	1 84	.....	1.10	....	8	....	....	..	.....	28, 31
Britt	Hancock	1,230	...	50.2	....	79	22, 23	25	4, 17	40	1.49	...	.64	T	7	14	12	5	SW	
Charles City	Floyd	1,012	9	51.0	†1.9	79	23	27	3	41	2.37	†.33	1.09	..	5	16	11	4	SE	31
Clear Lake	Cerro Gordo	984	....	54.0	....	86	23	30	17	37	2.40	.....	1 50	T	5	15	12	4	SW	31
Cresco	Howard	1,280	28	51.0	†4.7	79	31	26	4	36	2.25	-.13	.90	T	5	17	5	9	NW	30
Decorah (*d*)	Winneshiek	900	7	51.2	†2.7	80	22, 23	28	4	41		.....	1.11	....	...	...	....	...	.....	.....
Dows	Wright	1,142	...	52.4	...	81	22	20	3	50	3.00	.....	1.80	T	5	18	3	10	S	31
Elkader	Clayton	600	19	54.0	†5.8	88	23	25	4	48	2.53	-.21	1.69	....	5	13	14	4	NW	1, 10
Estherville	Emmet	1,298	....	49.2	.....	80	23	26	17, 28	42	.94	.....	.45	....	8	17	12	2	SW	28, 30
Fayette	Fayette	1,000	10	51.2	†2.9	80	22	22	4	45	2.32	-.43	1.32	T	7	18	4	9	NW	10
Fonda	Pocahontas	1,237	....	.....	.....	.....	.....	...	.....	.....	2 34	.....	1.24	T	8	14	8	9	NW	28, 30
Forest City	Winnebago	1,220	....	52.6	....	81	21	28	17	36	1.21	.....	.56	T	5	16	6	9	W	
Grand Meadow	Clayton	1,180	9	51.8	†3.6	78	23, 24	29	17	34	2.95	† 41	1.61	....	5	15	8	8	NW	10
Greene	Butler	943		52.6	.....	81	22, 23	27	4	42	3 18	.....	1.00	T	6	16	4	11	W	
Hampton	Franklin	1,240	10	54.2	†6.1	86	22	29	17	38	2.88	† 21	1 52	...	7	16	11	4	SW	
Humboldt	Humboldt	1,082	7	52.6	.....	80	22	29	20	40	1 91	† 15	1 00	....	6	19	3	9	NW	31
Larchwood	Lyon	1,465	....	.....	.....	.....	.....	...	.....	.....	1 00	.....	.50	....	2	27	0	4	E	
Larrabee	Cherokee	1,366	9	51.3	†2 1	80	22	28	4, 14, 17	33	1.75	- 40	1.15	T	4	15	12	4	SW	30
Le Mars	Plymouth	1,224	.	52.4	....	78	22	24	4	40	1 74	.....	.88	....	6	....	....	..	.....	
New Hampton	Chickasaw	.....		51.7	.....	79	22	26	4	37	2 82	.....	1.62	....	4	13	11	7	NW	
Northwood	Worth	1,210	....	52.0	.....	80	23	28	16	34	1.35	.....	.55	T	7	15	7	9	SW	28, 31
Osage	Mitchell	1,178	9	51.4	†7.7	78	23	29	4, 16	34	2.79	†.22	1.41	T	9	11	7	13	NW	10, 28, 30
Plover	Pocahontas	1,426	..	51.6	.....	80	22	27	4, 14	38	2 00	.....	1 32	T	5	20	1	10	S	
Primghar	O'Brien	1,800	...	.....	.....	.....	.....	.....	.. ..		1.65	.....	1.00	....	2	21	....	10	.....	[30
Ridgeway	Winneshiek	1,215	..	53.4	.....	82	22, 23	30	4, 16, 17	32	3.38	.....	1.47	....	13	19	8	4	NW	1, 7, 10, 26, 28,
Ruthven	Palo Alto	1,435	....	.....	.....	...	... ...	...	.....	....	2 17	.....	.90	....	5	11	8	12	SW	
Sheldon (*a*)	O'Brien	1,406	..	51.8		83	22, 23, 24	25	17	44	1 22	..	.40	T	9	....			SW	
Sibley (*a*)	Osceola	1,506	7	51.8	†3.6	81	22	25	4	42	1.04	-.86	.44	T	7				S	
Sioux Center	Sioux	.....	....	52 6	....	78	22	27	4	37	1.26	.....	.37	..	7	17	8	6	S	6, 28
Storm Lake	Buena Vista	1,440	11	52.3	.....	77	22	29	17	30	1.88	†.43	1.15	.....	8	16	7	8	SW	10, 28
Washta	Cherokee	1,157	....	.....	....	..	....	..	.....	.....	1.77	.....	1 20	T	5	18	8	5	N, SE	
Waverly (*c*)	Bremer	942	...	53 8	....	81	22, 23	28	4	42	3.41	.....	1.55	....	10	14	10	7	SW	3, 26, 31
West Bend	Palo Alto	1,197	7	51.7	†6.1	81	22	28	17	41	1.14	-.24	.75	T	6	13	8	10	.....	
West Union	Fayette	1,115	...	....	.....	....	....	.....	.....	.....	2.32	.....	1 10	....	5	22	0	9	W, SW	
Average	.....	.....	....	52.1	†4.3	80.4	.....	27.1	.....	38.5	2 04	-.12	....	T	6	17	7	7	SW, NW	

CENTRAL SECTION

Amana	Iowa	721	24	54 4	†5.9	80	7, 23, 29	24	4	40	1.48	-1 19	.52	...	8	15	12	4	S	1, 10
Ames	Story	936	20	53 9	†4.0	81	22	27	5	50	2 98	† .64	2.00	..	7	21	6	4	SW	
Battle Creek	Ida	1,342		.....	.....	..	....	..	.....	....	1.39	.....	.95	.	5	18	4	9	NW	
Baxter	Jasper	998		55.0	...	83	22	28	4	41	2 28	.....	1.75	..	4	18	5	8	SW	
Belle Plaine (*a*)	Benton	840	10	53 8	†4.7	81	29	28	4	41	1.54	-.98	.80	....	7	6	22	3	SE	
Buckingham	Iowa	.....	...	.....	.....	...	....	.....	.. ..	.....	1 32		.58	....	8	16	14	1	.....	
Carroll	Carroll	1,265	10	54 0	†4.6	82	22, 24	27	4	41	3.12	† 47	1.35	T	5	18	5	8	.....	10, 28, 30
Cedar Rapids	Linn	744	18	55.5	†5 5	82	22, 23	28	4	42	1.37	-1.29	.58		6	21	3	7	SW	
Clinton	Clinton	609	9	53.6	†2 4	83	23	26	17	43	.81	- .77	.21	..	8	16	7	8	W	10
Davenport	Scott	619	30	55 6	†2.4	82	23	31	17	35	.45	-1.96	17	....	8	17	8	6	W	
Delaware	Delaware	1,048	9	51.8	†5.3	78	23, 29	25	4	38	2.17	- .11	1.10	...	6	13	14	4	NW	
Denison	Crawford	1,192	7	52.8	†4 4	80	23	26	4	41	2 26	† .61	1.12	....	5	....		....	S	9, 10, 30,
Des Moines	Polk	867	23	56.1	†3.1	83	22	30	4	39	2.14	- .68	1.43	...	5	13	9	9	SW	1, 10, 11, 30, 31
De Soto	Dallas	866		55.4		78	29	29	4	36	2.55	...	1.50	..	5	22	2	7	SW	
Dubuque	Dubuque	655	28	54.4	†3.5	80	23	31	4	36	1.64	- .96	.80	..	6	15	8	8	SW	1, 10
Fort Dodge	Webster	1,126		53 0	.....	82	22	26	4, 17	50	4 20		1.70		8	14	2	15	NW	
Galva (*e*)	Ida	1,290	7	52 6	†3 8	80	21	26	4, 17	40	1.91	† .77	1.48	....	2		..	...	.....	
Gilman	Marshall	1,053					.....	...	....	....	2 09	.. .	1.55	..	4	19	7	5	S	
Grinnell	Poweshiek	1,011	10	56.6	†9 4	79	29	30	4	33	1.63	- 74	1 10	...	6	15	4	12	W	
Grinnell (near)	Poweshiek	.....	..	55 8	.....	81	22, 29	30	4, 17	39	1.81		1.05	....	10	14	7	10	SW	9, 10, 31
Grundy Center	Grundy	966	9	54.0	†4.2	82	22	25	4	41	2.03	- .67	1.29	..	8	16	7	8	NW	11, 31
Guthrie Center	Guthrie	1,077	..	54.3	.....	82	24	26	17	43	2.15	.....	1.01	....	5	19	7	5	NW	28
Harlan	Shelby	1,192	....	53.7	....	86	19	25	4	45	3.25	...	1 36	....	8	12	11	8	SW	10, 28, 31
Independence	Buchanan	921	38	52 5	†5.4	80	22, 23, 29	25	4	42	2.38	† .01	1.40	..	5	16	11	4	NW	10
Iowa City	Johnson	644	10	55.6	†5 0	83	29	27	4	42	1.78	- .21	91	...	6	16	9	6	S	
Iowa Falls	Hardin	1,107	7	51.8	†3.8	80	22	22	17	39	2 39	† .13	1.20	..	8	19	6	6	NW	26, 30
Jefferson	Greene	1,052	...	. ..	.....	. .	.....	.....	... .	...	2 74	.....	1.73	....	5	15	9	7	NW	10, 30
Le Claire	Scott	576	...	.....	....	....	....	....	.. .. ..	..	.60	..	.22	....	8	...	..	..	....	
Logan	Harrison	928	35	52.2	†0.1	77	23, 29	22	4	39	2 83	† .46	1 30	...	8	21	4	6	S	28, 30
Maquoketa	Jackson	688	7	59.0	†5 8	84	23	23	4	45	1.62	-1.34	.40	....	8	19	6	6	NW	
Marshalltown	Marshall	947	....	55 5	.....	83	22	25	4	44	2.27	.....	1 52	.	9	14	5	12	W	11
Monticello	Jones	800	46	52.6	†4.1	82	22	23	4	46	1 97	- .78	1.00	...	5	16	8	7	SW	
Mt. Vernon	Linn	847		56 8	..	84	22	29	4, 17	38	1.48	.....	.53	....	7	17	9	5	NW	
Newton	Jasper	958	13	55.5	†5.3	80	22	30	17	35	1 80	- .76	1.56	....	7	17	12	6	NW	
Odebolt	Sac	1,356	..	53.2	.....	80	22	27	4	35	.57	.....	.27	...	5	13	12	6	.....	28
Ogden	Boone	1,109	...	53 5	...	83	22	26	17	40	3.31	.... ..	1.53	...	5	23	2	6	SE	
Olin	Jones	760	....	52.8	.....	80	22	25	4	38	1.44	.....	.40	..	8	17	11	3	S	30
Onawa	Monona	1,053	...	54.2	.....	84	22	29	4, 14, 17	40	2 19	... ..	.15	..	10	23	4	4	NW	10, 28
Rockwell City	Calhoun	1,219	....	53 8		80	22	30	4, 17	32	1 95	.. ..	.85	...	5	22	2	7	.....	
Sac City	Sac	900	21	53.2	†2.0	81	22	28	4	35	1 70	- .58	1.02	...	6	17	2	12	SW	28, 31
Scranton (*b*)	Greene	1,172		54.4	.....	80	23	29	4	35	2 34	...	1.16	...	3	....		....	N	
Sioux City	Woodbury	1,122	12	54.6	†2 7	82	22	31	4	37	2.23	† 53	1 45	...	7	16	6	9	SE	
Tipton	Cedar	807	....	55 6	.....	82	23	26	4	39	.95	.....	.90	....	5	13	7	11	NW	10
Toledo ‡	Tama	856	6	54.8	†5 7	84	2, 29	23	5	48	2 01	- .03	1 85	..	4	19	3	9	SE	
Vinton *...	Benton	800	10	53.4	†4 2	83	22	26	4	....	1.31	-1 18	81	....	3	27	1	3	NW	
Waterloo	Black Hawk	862	21	53.7	†1.7	84	22	26	4	44	2.18	- .10	.76	....	9	15	10	6	W	
Wilton Junction	Muscatine	683	....	53 7	.....	80	23	24	4	42	1.18	.....	.45	...	6	22	1	8	W	
Whitten	Hardin	1,036		51.6	.....	80	22	21	4	39	1.69	.....	1.13	T	4	16	8	7	S	
Average	... ...	...	....	54.2	†4 2	81.4	.....	26.2	.....	40.2	1.95	- 42	.....	T	6	17	7	7	NW	

CLIMATOLOGICAL DATA FOR OCTOBER, 1901--CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PREC. IN INCHES.					SKY.			Prevailing direction of wind.	DATES OF THUNDER-STORMS
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).	Number rainy days.	Number clear days.	Number partly cloudy days.	Number cloudy days.		
Afton	Union	1,212	....	55	....	79	22	26	4	38	2.82	.....	1.54	..	6	17	8	6	SW	
Albia	Monroe	945		55.2	..	81	22	28	4, 17	40	1.26	.....	.70	..	4	17	7	7	NW	
Atlantic	Cass	1,164	9	53.4	†3.2	83	22	22	4	50	2.80	†.61	1.33	..	6	12	11	8	SW	9, 10, 28, 30
Belknap	Davis	857	....	57.8		83	22	30	4	34	.93	.....	.36		4	20	10	1	SE	
Bonaparte	Van Buren	.....	9	57	†2.8	83	22, 23, 29	28	4	40	90	-.66	.40		4				.....	
Burlington	Des Moines	544	..	58	....	85	23	32	4, 17	39	1.08	...	.52	..	7	18	5	8	SW	
Bussey	Marion	....	....	...	.. ..	....	....		...		1 33	...	.80		4				.....	
Centerville (2)	Appanoose	1,013	....	57	...	85	22	29	4, 17	43	2 05	.....	1.48	..	3				S	1
Chariton	Lucas	1,030	....	56		85	22	26	4	44	1.70	...	.64	....	9	12	12	7	SW	
Clarinda	Page	1,069	10	57.1	†4.1	86	22	27	4	45	4.03	†2.15	2 76	.	9	18	6	7	S	10, 30
College Springs	Page	.....	9	56.5	† .7	80	18 22,24,29	24	14, 17	41	1.35	-1.27	1 02		6	18	5	8	SW	
Columbus Junct	Louisa	595	....	55		83	23	30	4	43	1 34		.33	T	10	16	11	4	SE	1
Corning	Adams	1,127	8	54.2	†1.5	79	24	24	4	37	3.57	†1 84	1 40		5	17	8	6	SW	1, 10
Council Bluffs	Pot'wat'mie	990	....	56 5	...	83	18, 22	31	14, 17	40	1 88	...	1 09	..	5	18	2	11	S	30
Cumberland	Cass	.....	....	....	..	.....	.. ....		.....	...	2.46	... ..	1 48		4	18	4	9	S	
Danville	Des Moines	715	....		..	....	....		.....		1.56	.....	.46		4	20	11	0	.....	
Eldon	Wapello	630	....	56 2	....	85	22	26	5	48	1.41	.....	.50	..	7	21	5	5	NW	
Emerson	Mills	1,053	....	....		....	.....		.....		2.30	...	1.30	..	2	.	.		.....	
Fort Madison	Lee	516	52	..		....	. ....	..	.....		1.09	-1 66	.40	....	5	13	9	9	SW	
Glenwood	Mills	979	30	56 6	†7.6	82	18	28	4	37	2.64	† 23	1 23		6	7	18	6	SE	30
Hopeville	Clarke	.....	..	56 2	...	80	22	32	4, 17	38	2.39	.. ...	.70	T	8	10	17	4	S	1. 11, 30
Indianola	Warren	969		55 8	..	82	22	27	4	38	2.51	.....	1.68		7	13	9	9	SW	10
Keokuk	Lee	619	29	58.2	†3.1	85	1	35	17	37	.93	-1.75	.46	..	7	18	7	6	SW	1, 7, 28
Keosauqua	Van Buren	664	8	57	†2.4	82	29	30	5, 6	45	.97	- .50	.53	..	5				.....	
Lacona	Warren	....	....		...	.....	.....		.....		1.85	.....	.80		5	9	19	3	.....	
Lenox	Taylor	1,250	....	55.5		78	22	30	4	35	2 77		1.10	.	6	13	13	5	S	
Mt Ayr	Ringgold	1,236	7	56.8	†3.8	81	1, 22	29	4, 14	39	2 36	† .45	.99	...	8	14	10	7	SW	1, 28
Mt Pleasant	Henry	725		53.8		80	7, 23, 29	25	4, 5	41	79	.....	.27		5	18	11	2	SE, SW	
Omaha, Neb	Douglass	1,113	31	57 8	†3.8	83	18	36	14	38	1.96	- .60	1.04	.	8	14	8	9	SW	6, 7, 8, 19, 28, 30, 31
Oskaloosa	Mahaska	850	17	55.8	†5 2	82	23, 29	28	4, 5	44	1 30	- .98	.68	...	5	17	4	10	NW	
Ottumwa	Wapello	630	6	57	†4	81	23	31	4	38	1 35	-1.18	.70	...	5	18	12	1	SE	
Ovid	Wayne	992	7	58.2	†5.5	86	22, 24	27	17	41	2.73	† .39	1.20	.	7	15	1	15	NW	1
Pacific Junction	Mills	960	...	55.6	....	80	18	23	4	37	2.59	.....	1.35	..	8	11	17	3	SE	10, 31
Pella (g)	Marion	877	....	57.2	.....	86	22	27	4	44	1.92	.....	1.02		3	22	1	8	SW	
Red Oak	Montgom'ry	1,033	..	56.4	....	76	29	33	17	34	2 30	.....	.96	..	7	13	12	6	SE	1, 6, 7, 10, 11 28, 31
St. Charles	Madison	1,070	...	57.8	.. ..	85	22	30	4	37	2 78	.. ....	1.65	...	8	17	9	5	SW	1, 10
Sigourney	Keokuk	768	...	55.8	...	82	7,22,23,29	27	4	41	2.29	.....	.52	..	7	19	10	2	W, NW	1, 10, 28
Stockport	Van Buren	.....	....	..	....	. ...	.....	..	....		1.05	.....	.30	..	6	15	7	9	S	1, 28
Thurman	Fremont	..	.....	55	...	80	18	28	4	38	4 23	.....	1.30	..	7	19	7	5	SW	10, 11, 28, 31
Wapello	Louisa	578	..	55 6		80	29	32	4, 5, 17	29	.56	.....	26	....	5	20	7	4	W	
Washington	Washington	769	10	54.6	†2.3	84	23	27	4, 17	42	1 32	- .33	.36	..	6			.	SW	
Winterset	Madison	1,129	9	57	†5 4	83	22	27	4	38	2 95	†1.01	1 74		7		...	.	.....	10, 30
Woodburn	Clarke	961	....	....		....	... ...		.....	....	1.51	..	.65	..	5	17	5	9	SW	
Average		.....	..	56 2	†3.7	82.2	.....	28.7	.....	39.9	1 96	- .08	..	T	6	16	9	6	SW	
Av. for the state		.....	....	54.2	†4.1	81.3	.....	27.3	.....	39.5	1.98	- .21	....	T	6	17	7	7	SW, NW	

*Means determined from 7 A. M., 2 P M, and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A.M. and 7 P. M. observations. ‡Received too late to be computed with means. *a*, One day missing; *b*, two days, etc.

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR OCTOBER, 1901.

STATIONS.		DATE. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean.
Afton	Max.	76	65	59	56	65	64	73	70	72	73	66	54	48	56	55	56	66	76	69	68	76	79	77	74	74	72	63	69	79	76	68	67.5
	Min.	61	44	39	26	29	38	50	55	46	44	49	44	34	30	45	34	28	36	43	34	41	46	49	57	45	47	34	40	55	57	45	42.5
Albia	Max.	72	65	61	55	64	70	80	70	70	78	..	59	51	58	60	56	53	76	70	68	68	81	80	79	74	70	63	67	80	80	70	68.3
	Min.	51	41	36	28	34	40	47	59	50	48	54	42	38	32	38	35	28	38	45	33	42	41	49	47	46	50	35	36	45	44	50	42.0
Algona	Max.	68	56	51	58	62	61	71	66	.	..	58	58	..	56	56	44	58	70	60	68	76	78	78	71	71	64	51	56	75	72	..	63 4
	Min	54	39	36	33	38	42	55	54	48	50	46	42	36	34	44	40	32	38	42	47	46	51	48	44	44	48	32	39	54	60	40	43.7
Alta	Max.	65	56	52	58	64	66	69	60	67	54	54	52	44	58	49	49	57	72	62	69	76	79	77	78	73	63	60	61	74	70	58	62.7
	Min.	47	37	34	29	36	40	54	51	42	45	44	36	33	29	45	40	29	41	42	38	44	48	47	49	45	42	33	39	54	51	39	41.4
Amana	Max.	79	60	58	55	63	70	80	69	64	74	64	60	51	54	58	51	54	73	65	64	76	78	80	65	69	71	58	61	80	79	69	66.2
	Min.	59	42	35	24	28	30	52	60	54	45	49	46	35	35	41	37	29	37	47	31	38	38	47	45	39	51	37	35	59	60	52	42.5
Ames	Max.	72	61	54	61	67	67	71	65	71	70	57	56	49	58	52	46	59	76	68	75	77	81	79	74	72	66	61	61	80	78	74	66.4
	Min.	51	41	38	28	27	27	45	57	51	45	47	44	38	34	33	35	36	31	33	38	32	31	51	45	43	48	35	35	60	62	55	41.4
Atlantic	Max.	70	60	55	59	67	61	73	64	76	68	57	56	44	59	57	58	60	80	69	74	79	83	81	81	75	72	68	71	79	75	61	67.5
	Min.	58	37	31	22	34	40	55	55	43	44	47	43	35	26	35	37	24	42	34	27	30	33	34	35	36	43	30	46	57	64	43	39.4
Baxter	Max.	77	60	60	57	65	71	80	69	70	75	63	59	53	55	60	58	58	75	68	68	78	83	81	73	72	72	60	61	80	78	68	68.0
	Min.	52	37	36	28	30	36	54	55	53	45	45	45	37	32	35	32	29	47	40	34	43	42	41	45	43	50	33	37	59	60	46	42.0
Belknap	Max.	83	62	60	58	58	70	80	71	70	79	71	57	56	55	60	55	60	65	70	68	78	83	81	73	72	72	60	61	80	78	68	68.9
	Min.	61	45	38	30	36	41	55	60	53	48	54	47	40	33	43	37	37	50	50	37	52	49	50	51	44	54	37	38	60	62	55	46.7
Belle Pl'ne	Max.	78	..	58	56	63	70	77	68	65	74	74	58	48	55	58	52	55	73	65	68	75	79	80	68	69	73	58	62	81	80	64	66 8
	Min.	53	41	39	28	32	35		55	52	46	50	47	36	33	35	34	29	.	..	34	40	40	44	44	39	40	37	35	40	56	52	40.9
Bonaparte	Max.	80	65	62	58	67	73	80	72	66	80	69	60	50	59	65	55	57	78	73	70	81	83	83	71	74	62	61	69	83	80	68	69.5
	Min.	60	45	36	30	28	40	56	59	53	48	57	45	41	37	38	40	30	36	51	36	41	43	48	46	39	51	39	35	61	59	51	44.5
Britt	Max.	67	55	51	56	62	67	72	63	66	64	57	53	43	46	48	44	55	70	60	62	76	79	79	58	73	61	56	55	75	72	62	61.5
	Min.	49	35	33	25	31	38	54	53	51	43	45	36	34	26	38	27	25	35	40	27	36	39	40	38	40	45	30	38	51	61	40	38.8
Burlington	Max.	72	67	63	59	69	76	80	71	64	82	71	61	54	58	67	54	58	72	75	70	81	84	85	72	72	65	63	70	82	79	70	69.9
	Min.	62	47	37	32	33	38	56	57	53	49	59	47	41	37	41	40	32	39	53	39	42	46	51	48	40	52	42	36	60	62	56	46.0
Carroll	Max.	60	58	61	68	65	62	74	65	70	61	57	55	44	60	55	53	63	78	68	74	80	82	81	82	76	70	64	62	79	75	62	66.6
	Min.	39	44	37	27	47	45	52	55	44	45	45	39	35	30	40	33	28	43	42	32	44	46	47	44	41	48	34	39	56	46	40	41.5
Cedar Rap.	Max.	79	62	52	58	48	72	80	72	65	74	67	59	51	56	57	47	54	77	68	67	79	82	82	68	70	70	59	62	80	78	70	66.8
	Min.	61	44	38	28	31	34	55	59	55	48	52	50	37	36	44	35	31	39	48	34	40	40	45	46	40	53	38	36	60	61	52	44.2
Centv'le	Max.	67	64	60	57	68	68	82	69	73	80	74	60	50	57	62	57	59	78	72	74	82	85	82	81	76	71	64	70	82	78	70	70.1
	Min.	62	43	39	29	30	40	53	57	50	46	54	47	35	32	32	36	29	42	48	32	41	42	42	50	46	54	35	40	62	61	51	43.9
Chariton	Max.	82	63	60	58	67	67	77	66	74	73	71	60	45	56	60	55	58	78	71	74	81	85	83	83	77	74	65	68	81	77	68	69.6
	Min.	58	41	37	26	35	42	56	40	48	47	47	44	36	30	39	35	27	40	46	32	41	41	48	48	47	54	35	39	61	38	49	42.3
Charles Cy.	Max.	67	55	56	53	68	75	73	67	64	60	55	54	47	52	49	43	52	68	61	64	76	78	79	65	67	63	54	54	73	65	60	61.8
	Min.	54	38	27	34	35	49	53	55	54	48	47	43	38	31	40	29	29	36	43	29	37	37	40	41	40	50	31	36	49	43	31	40.2
Clarinda	Max.	81	68	65	63	72	72	72	68	78	72	58	59	49	63	61	61	66	83	75	79	83	86	83	84	73	75	70	76	82	75	67	71.6
	Min.	56	41	38	27	40	45	55	51	48	45	48	42	37	31	35	31	31	41	42	35	37	41	42	43	41	47	36	48	57	63	47	42.6
Clear Lake	Max.	69	59	57	59	64	67	70	66	68	68	58	60	47	54	56	43	52	70	69	68	79	80	86	70	76	74	64	60	80	74	65	65.5
	Min.	56	39	40	33	37	40	52	54	..	48	47	41	38	34	43	32	30	42	42	38	47	50	49	44	39	49	34	36	50	60	43	42.6
Clinton	Max.	81	60	59	56	67	72	73	70	67	73	68	63	56	57	64	52	53	68	67	67	78	83	81	73	72	72	60	61	80	78	68	66.8
	Min.	56	38	32	30	27	31	44	57	47	45	54	43	35	35	39	35	26	33	45	32	34	37	40	45	32	50	40	33	56	59	45	40.5
College Sp.	Max.	77	66	61	62	69	65	72	67	74	74	60	58	48	59	58	60	61	80	72	73	77	80	78	80	73	75	68	72	80	78	68	69.3
	Min.	57	40	40	38	36	58	55	52	46	49	48	45	35	29	36	31	29	42	46	41	39	39	48	46	46	48	38	48	48	58	45	43.7
Columbus J	Max.	75	62	60	58	67	73	80	70	65	79	68	60	52	57	62	52	56	77	70	70	80	82	83	70	75	65	64	67	82	78	67	68.6
	Min.	62	42	40	30	32	37	56	58	52	44	55	47	39	37	42	37	31	38	51	37	43	42	46	45	32	54	36	33	61	61	53	41.4
Corning	Max.	75	63	56	56	64	62	70	65	73	69	58	53	46	56	55	55	58	77	67	69	74	77	76	76	75	71	64	76	79	74	68	66.4
	Min.	61	44	38	24	35	44	55	52	41	45	49	40	36	38	37	36	29	42	34	35	37	43	43	40	40	45	35	45	56	62	45	42.1
Co Bluffs	Max.	70	63	58	63	69	69	60	70	65	65	63	60	56	47	63	55	60	64	83	71	75	79	83	82	80	79	73	70	80	78	63	68.4
	Min.	49	45	48	45	43	41	58	54	45	51	43	45	37	31	40	38	31	43	43	37	39	43	48	42	45	49	40	50	57	57	45	44.6
Cresco	Max.	66	52	50	54	60	65	72	70	61	64	54	52	47	50	50	42	46	64	60	62	75	78	78	60	64	62	51	52	74	74	79	60.9
	Min.	47	35	38	26	34	38	52	55	49	48	47	42	36	31	32	27	29	39	40	34	49	49	58	43	38	45	31	33	52	56	43	41 2
Davenport	Max.	77	59	58	56	63	71	75	68	64	74	70	58	53	55	62	51	54	69	69	66	79	80	82	66	68	62	58	66	80	77	65	66.3
	Min.	54	43	39	31	36	40	54	58	52	46	52	49	39	39	43	36	31	41	49	40	45	45	51	48	39	49	40	35	61	61	49	45.0
Decorab	Max.	68	52	50	54	62	67	72	65	58	63	52	56	48	52	48	43	47	63	62	63	77	80	80	65	68	64	56	..	..	..	..	60.6
	Min.	45	40	36	28	34	35	53	58	52	46	48	43	40	34	33	30	31	39	40	31	42	39	45	46	38	45	30	..	..	..	..	41.9
Denison	Max.	74	57	54	59	65	65	69	64	72	57	56	54	45	58	53	58	59	75	64	70	76	78	80	77	72	65	62	62	77	72	66	65 2
	Min.	56	41	39	26	38	44	55	54	45	44	46	40	34	30	41	33	27	43	37	32	37	38	39	39	42	45	32	42	54	44	35	40.4
Delaware	Max.	76	56	55	54	63	68	73	69	60	69	62	56	53	53	55	46	55	68	65	61	74	77	78	64	65	68	54	56	78	75	68	63.7
	Min.	54	37	34	25	33	34	35	57	49	43	49	45	36	37	39	32	27	34	32	27	42	45	50	43	33	48	32	30	54	57	45	40 0
Des Moi'es	Max.	77	63	58	58	66	68	76	68	73	73	61	57	43	56	56	52	58	78	68	70	79	83	81	77	75	71	61	68	81	76	64	67.6
	Min.	55	41	40	30	36	40	57	53	53	50	50	43	38	34	43	37	30	43	47	35	44	44	49	47	46	49	40	40	63	63	45	44.7
De Soto	Max.	74	61	56	55	62	66	72	70	70	70	60	55	49	55	54	55	55	75	65	66	73	77	77	75	73	69	60	65	78	77	69	65.7
	Min.	61	46	41	29	32	37	55	59	53	50	51	48	39	35	45	40	30	44	47	33	40	41	50	46	44	51	36	42	60	63	50	45 1
Dows	Max.	76	70	70	56	64	69	72	66	67	63	56	53	47	59	51	44	56	71	63	68	78	81	79	68	72	65	57	57	77	75	70	65.2
	Min.	33	27	20	26	32	39	55	55	52	46	47	38	34	30	40	32	28	37	39	29	44	41	49	41	41	47	31	37	55	59	42	39.5
Dubuque	Max.	79	55	54	55	64	69	72	67	61	68	64	58	52	53	58	45	50	70	64	63	78	80	80	64	67	66	54	60	80	77	65	64.2
	Min.	54	43	37	31	38	36	52	55	51	45	53	48	39	42	44	36	31	40	43	36	48	44	54	47	40	51	39	36	58	62	46	44 5
Eldon	Max.	78	64	61	58	67	72	81	73	70	79	71	62	53	59	64	56	61	79	72	73	82	85	83	75	74	66	62	69	83	80	70	70 4
	Min.	50	43	33	28	26	33	54	58	53	45	53	45	41	34	39	37	29	33	47	32	34	37	39	41	40	53	38	35	59	57	54	41.9
Elkader	Max.	75	64	56	60	70	74	77	68	58	60	72	58	62	54	56	59	45	56	72	74	70	84	84	88	67	71	72	61	62	82	81	63	67.6
	Min.	60	38	33	25	29	31	47	58	53	42	52	44	40	40	34	33	26	39	41	30	37	36	42	43	34	48	28	32	55	60	44	40 5
Estherville	Max.	66	65	51	58	65	65	70	61	63	53	57	53	44	57	45	40	57	74	65	70	78	79	80	70	73	76	58	56	73	73	54	62 7
	Min.	47	35	31	28	30	..	39	41	43	40	37	34	30	33	33	27	26	33	34	34	38	40	38	36	36	33	30	26	50	53	38	35.8
Fayette	Max.	71	54	53	55	64	69	75	64	60	69	..	56	48	58	54	44	50	68	61	63	76	80	79	62	67	66	55	56	78	76	..	63.1
	Min.	50	35	32	30	30	30	48	55	48	42	52	42	34	35	40	32	27	35	38	27	38	35	48	40	35	46	28	31	57	58	48	39.3
Forest City	Max.	69	55	50	57	64	69	70	65	63	..	56	55	56	53	48	41	56	71	63	78	81	79	80	80	71	61	57	53	76	72	..	63.8
	Min.	48	43	36	30	46	42	53	53	51	45	48	37	36	29	40	29	28	39	41	40	43	41	46	44	39	49	37	37	49	60	37	41 5
Ft. Dodge	Max.	74	61	56	60	67	68	72	68	71	60	55	53	49	58	51	46	58	74	68	70	79	82	80	78	75	65	64	59	79	74	71	66.6
	Min.	57	37	32	26	36	33	38	55	44	44	46	40	35	28	41	34	26	39	40	28	40	32	41	38	38	47	29	39	54	63	43	39 5
Galva	Max.	79	..	78	54	67	67	71	60	70	62	57	53	45	59	50	63	60	73	70	76	80	78	77	79	..	..	64	60	74	..	..	66.4
	Min.	50	..	35	26	..	40	53	55	39	42	45	39	33	29	38	33	26	37	30	39	43	42	39	41	..	..	32	41	45	..	..	38.7
Glenwood	Max.	79	65	58	60	66	65	75	64	75	65	60	55	48	62	56	61	63	82	72	73	77	80	79	79	74	71	67	74	80	75	72	68 8
	Min.	58	39	38	28	40	54	57	52	46	48	47	44	36	30	40	47	30	45	42	37	39	43	47	49	43	42	47	36	48	60	63	43	44.4
G. Meadow	Max.	70	54	52	54	60	67	70	63	64	67	57	56	50	52	54	44	44	64	60	63	75	78	78	60	65	65	52	54	77	77	67	61.7
	Min.	56	38	37	30	37	36	51	57	52	45	48	42	39	36	43	30	29	40	43	35	45	45	51	42	37	50	31	33	43	59	43	42.0
Greene	Max.	69	57	53	58	66	70	73	67	62	64	55	55	45	54	54	44	57	69	62	62	80	81	81	66	70	63	55	55	78	73	68	63 4
	Min.	57	37	37	27	35	35	53	57	55	48	48	42	38	32	42	32	28	37	40	30	39	39	50	41	38	50	32	35	53	62	45	41.7
Grinnell	Max.	71	60	55	54	62	69	72	68	66	72	65	56	44	54	55	48	53	72	68	64	73	77	77	68	68	69	..	62	79	76	71	64.9
	Min.	60	42	40	30	36	41	54	60	54	55	51	40	38	34	42	34	32	39	46	38	47	50	52	48	42	52	35	36	60	62	51	48.4
Grin'l (nr.)	Max.	76	59	57	56	65	72	78	70	68	73	69	56	51	56	55	48	55	75	69	67	77	81	80	71	72	70	60	62	81	79	70	66.9
	Min.	59	41	38	30	35	41	55	62	53	48	52	46	38	34	42	34	30	36	46	38	38	47	49	48	42	57	37	36	62	61	50	44.7
Grundy C'r	Max.	74	59	58	58	62	72	80	68	70	72	58	59	48	56	57	46	55	72	66	70	79	82	81	69	70	68	58	59	80	78	70	66.3
	Min.	55	37	34	25	33	37	53	57	52	45	49	43	41	30	40	33	28	37	41	31	41	41	47	43	40	48	31	35	57	62	44	41.6
Guthrie Cr	Max.	77	63	58	59	66	69	74	64	71	68	58	54	47	56	55	55	57	76	70	72	79	80	78	82	77	69	67	64	81	77	70	67.5
	Min.	61	40	38	26	33	34	52	56	46	46	47	43	36	29	42	35	26	40	37	29	41	40	43	42	39	48	31	40	..	65	47	41.1
Hampton	Max.	72	58	53	56	69	73	74	67	70	65	56	56	47	46	56	54	43	59	73	66	71	83	86	81	71	75	66	62	65	79	76	69	66.1
	Min.	40	37	31	30	34	36	52	56	53	48	47	41	37	32	43	32	29	39	34	35	49	48	53	45	39	50	32	35	58	62	45	42.2
Harlan	Max.	69	60	57	58	64	64	71	62	72	68	60	56	43	57	54	57	58	76	86	69	74	79	76	74	72	67	63	69	76	72	64	66.0
	Min.	56	40	37	25	33	43	55	55	42	47	47	41	34	37	37	36	26	39	41	32	37	39	41	40	41	46	34	45	52	62	43	41.4
Hopeville	Max.	77	60	57	57	65	63	72	66	74	71	64	55	42	56	55	56	58	78	67	70	78	80	78	78	73	71	64	70	79	78	66	67.0
	Min.	57	44	40	32	34	43	56	53	49	50	50	42	38	33	38	36	32	40	47	42	49	50	51	52	51	55	38	42	58	61	48	45.5
Humboldt	Max.	72	58	54	57	63	68	70	67	68	62	54	52	47	57	50	46	56	71	64	69	77	80	78	74	72	66	60	56	76	73	68	64.0
	Min.	56	38	33	29	35	38	52	55	44	44	44	40	37	31	42	36	30	39	38	29	43	40	48	40	42	48	30	38	54	63	42	41.2
In'pen'nce	Max.	75	56	54	55	65	70	77	69	64	71	57	58	50	53	54	45	52	70	62	65	78	80	80	65	69	66	56	58	80	77	70	64.5
	Min.	60	38	37	25	30	34	50	56	52	45	49	43	36	33	39	33	28	32	43	36	38	42	41	35	44	32	30	55	57	48	40.5	
Indianola	Max.	77	61	58	59	67	68	77	68	74	73	61	56	47	57	57	51	56	72	69	71	80	82	80	80	75	73	60	67	81	78	68	68.1
	Min.	58	42	38	27	32	41	54	57	50	47	50	45	38	32	41	37	30	40	44	33	42	45	49	50	49	48	34	40	40	63	49	43.4
Iowa City	Max.	80	61	61	60	67	75	81	72	62	78	66	61	53	57	61	51	56	72	71	69	78	82	82	70	73	69	67	63	83	81	72	68.8
	Min.	55	43	35	27	29	33	51	58	53	44	53	45	36	36	39	37	30	34	46	33	36	38	44	45	38	52	39	35	60	60	52	42.5
Iowa Falls	Max.	68	68	54	23	56	63	70	74	66	58	54	44	55	52	44	54	70	62	66	76	80	79	78	71	65	57	60	78	75	61	63.9	
	Min.	50	37	31	23	32	32	53	54	52	45	48	41	36	30	39	31	22	38	37	27	38	35	46	43	42	46	31	36	59	59	42	39.8
Keokuk	Max.	85	62	59	56	66	72	79	68	53	79	67	57	49	57	66	55	56	76	72	69	79	84	82	71	72	64	62

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR OCTOBER, 1901—CONTINUED.

STATIONS.		DATE																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Larrabee..	Max..	68	59	53	56	63	61	67	63	67	67	60	53	58	58	57	50	58	63	62	68	67	80	78	72	68	65	58	60	68	68	58	63.0
	Min...	50	35	30	28	34	38	55	51	40	40	42	35	33	28	37	32	28	37	38	37	42	47	47	44	45	44	32	39	52	50	39	39.6
Le Mars...	Max...	70	57	54	58	64	74	70	65	63	62	52	53	48	60	61	58	60	75	67	72	75	78	77	76	71	65	62	62	75	75	62	65.2
	Min .	51	39	35	24	38	38	42	56	53	40	40	38	32	30	34	34	28	41	37	32	43	43	44	38	43	45	30	42	52	51	32	39 5
Lenox.....	Max..	76	61	57	55	64	61	69	65	70	68	65	53	47	55	55	55	57	76	69	70	75	78	76	77	71	71	63	73	78	74	67	66.2
	Min...	61	42	40	30	36	44	54	54	47	48	49	45	36	31	38	34	31	41	45	42	47	48	47	49	47	57	37	45	56	61	47	44.8
Logan.	Max..	76	64	54	60	63	64	75	66	72	61	60	54	45	49	54	58	59	64	66	69	69	76	77	76	75	65	68	76	77	65	64	65.2
	Min ..	42	44	36	22	24	46	42	54	42	46	45	42	35	29	30	36	28	32	39	35	38	35	42	38	40	46	38	45	54	48	43	39.2
Maquoketa	Max..	82	63	60	59	66	72	75	69	64	74	66	60	64	60	63	54	56	72	71	66	81	82	84	72	70	73	55	63	81	78	74	69.0
	Min ..	58	43	30	23	24	27	42	57	55	40	52	45	33	38	40	35	26	34	45	29	36	35	49	39	31	51	31	29	57	58	52	40.1
Marsh'lt'n.	Max ..	78	61	60	59	68	74	81	70	72	75	60	60	52	57	58	48	56	75	68	69	80	83	82	71	73	70	67	60	82	79	71	68.4
	Min...	60	40	36	25	32	36	51	58	55	45	50	45	38	33	42	33	30	37	43	30	42	39	50	42	42	48	34	36	58	62	48	42.6
Monticello.	Max .	80	64	58	57	65	75	72	70	72	70	68	65	54	50	57	52	52	73	65	72	78	82	75	68	70	62	60	59	80	76	78	67.7
	Min...	43	40	33	23	27	30	33	30	30	38	42	45	35	34	49	34	26	54	41	28	29	36	43	35	48	40	37	33	55	56	33	37 4
Mt. Ayr....	Max...	81	62	60	59	67	63	72	64	75	78	71	55	47	52	57	58	59	79	71	73	80	81	80	80	73	72	66	75	80	76	66	68 8
	Min..	60	42	38	29	34	43	54	55	48	50	49	45	36	29	36	32	31	40	46	39	48	50	50	50	49	53	37	45	58	60	50	44.7
Mt.Ple's'nt	Max...	75	66	61	54	61	71	80	71	65	77	68	61	56	57	63	53	54	75	75	65	76	79	80	71	69	63	60	67	80	77	70	67.7
	Min...	54	41	30	25	25	34	51	55	50	42	54	44	38	32	35	35	27	31	48	32	36	37	47	42	36	30	33	30	56	54	52	39.9
Mt.Vernon	Max..	79	60	58	61	69	75	79	70	68	76	62	61	53	57	60	50	57	74	70	68	82	84	83	68	74	72	63	61	80	78	66	68.3
	Min...	58	41	40	29	34	42	55	58	54	56	54	47	35	36	44	36	29	36	45	36	44	46	53	46	50	52	35	54	61	67	53	45.4
NewH'pton	Max...	68	56	51	55	62	68	73	67	63	66	55	55	50	52	50	44	50	67	63	64	76	79	78	69	66	66	55	53	76	74	72	62 7
	Min...	54	46	37	26	37	37	52	55	50	45	45	42	36	35	41	29	27	35	42	38	39	43	44	44	38	32	32	32	48	57	44	40.7
Newton....	Max...	77	61	58	56	64	69	78	69	68	72	.	55	..	55	56	58	55	74	72	65	76	80	78	71	72	69	61	61	80	72	71	67.3
	Min...	48	41	37	30	33	38	55	60	55	58	48	45	39	33	41	34	30	38	43	36	44	45	49	47	43	50	36	35	59	61	43	43.7
Northwood	Max..	68	58	51	56	64	66	71	66	64	65	58	54	49	53	49	45	53	69	63	66	77	79	80	67	70	63	55	53	75	73	67	62.9
	Min...	55	37	37	30	33	37	52	53	52	45	46	39	37	31	40	28	29	35	40	32	45	46	50	44	39	48	32	35	50	59	41	41.2
Odebolt....	Max ..	74	58	59	58	66	66	69	65	70	61	55	52	44	57	51	55	58	73	65	69	75	80	77	76	74	65	63	59	75	72	67	64.8
	Min...	55	37	35	27	36	39	55	54	44	43	45	39	34	30	41	34	29	43	40	35	46	46	51	41	42	41	32	35	55	62	40	41.5
Ogden...	Max...	70	59	57	60	66	69	72	63	72	68	..	57	44	66	55	50	59	75	74	70	80	83	80	80	76	67	61	60	79	75	63	66.7
	Min.	51	39	34	29	34	38	52	55	46	43	46	38	37	31	40	34	26	39	40	32	40	44	45	40	42	43	35	40	56	40	41	40.3
Olin..	Max...	78	60	66	64	60	66	74	69	63	71	65	67	53	52	56	49	51	69	64	60	74	75	74	64	65	69	67	60	80	75	70	64.2
	Min...	59	43	34	25	29	30	50	57	54	43	53	45	34	35	40	36	27	35	44	31	36	37	43	45	34	51	36	32	56	58	55	41.5
Omaha, N.	Max..	72	61	57	60	68	63	71	64	74	60	59	58	46	62	55	62	62	83	70	74	78	82	80	79	75	70	68	74	79	73	64	67.8
	Min. .	56	47	43	37	46	52	59	56	50	57	48	42	37	36	42	37	36	45	47	45	47	52	56	52	52	52	44	51	59	53	49	47.7
Onawa.....	Max...	78	62	59	64	68	62	71	68	76	66	56	55	47	66	58	62	65	80	71	75	80	84	82	79	73	70	65	69	78	75	67	65.5
	Min...	56	42	37	29	38	47	57	54	41	45	45	41	35	29	42	36	29	41	41	35	40	46	46	44	45	50	35	47	54	63	43	43.0
Osage.....	Max...	66	54	49	54	61	65	72	65	62	65	57	54	53	52	47	42	51	65	58	62	74	77	78	65	65	62	54	53	73	72	64	61.0
	Min...	52	38	37	29	35	39	53	55	53	47	47	41	40	32	40	29	30	37	42	32	41	43	49	45	40	48	32	34	49	60	44	41.7
Oskaloosa .	Max...	77	65	59	58	65	71	80	71	65	74	65	59	51	56	58	53	57	78	69	69	80	81	82	73	74	70	60	67	82	79	69	68.3
	Min...	62	41	35	28	28	37	55	57	51	50	49	47	39	34	41	37	29	40	47	31	37	37	45	42	43	54	37	35	60	62	51	43.3
Ottumwa ..	Max...	73	60	59	55	63	69	79	67	68	76	64	60	52	57	61	55	56	75	71	61	77	80	81	74	70	68	64	67	78	76	73	67.5
	Min..	64	45	40	31	32	40	53	58	56	51	58	50	41	35	43	42	39	46	51	40	41	42	45	50	46	..	41	38	61	63	57	46.6
Ovid.....	Max...	79	64	64	61	70	68	78	65	78	77	..	61	..	59	66	61	63	79	77	76	84	86	82	86	78	74	68	74	82	78	66	72.5
	Min...	65	41	37	28	34	44	55	55	48	48	47	44	36	31	38	36	27	40	44	35	43	45	49	48	50	55	34	39	61	58	49	44.0
Pacific Jct.	Max...	73	64	59	60	67	66	70	63	74	65	60	57	50	60	57	61	61	80	70	70	74	78	78	76	75	72	67	73	79	75	69	67.8
	Min ..	55	40	40	28	41	50	57	53	47	47	49	43	37	29	35	38	39	43	37	35	37	41	43	41	41	48	37	50	57	64	46	43.5
Pella....	Max...	81	65	63	62	68	73	80	76	74	75	60	62	58	58	62	60	63	80	72	80	84	86	85	80	75	75	66	78	82	82	70	72.1
	Min...	45	40	35	27	32	38	43	56	53	47	47	45	32	32	42	36	33	39	45	35	40	42	49	48	46	48	32	36	56	62	47	42.2
Plover.....	Max...	68	54	52	58	62	69	72	60	71	55	70	64	42	58	50	52	58	73	64	70	77	80	78	76	70	63	60	..	69	72	..	64.4
	Min...	55	35	33	27	35	34	50	55	40	44	42	..	32	27	38	34	28	35	40	32	43	44	42	40	42	30	35	38	50	45	38	38.8
Red Oak...	Max...	71	61	57	60	64	63	72	67	70	68	62	62	48	63	62	57	61	74	69	65	74	73	73	72	71	70	63	72	76	74	73	66.7
	Min...	61	46	45	34	42	50	58	57	50	50	50	46	39	36	38	42	33	42	45	40	40	43	45	41	45	50	41	51	60	64	49	46.2
Ridgeway..	Max...	67	53	52	54	62	67	74	67	60	66	56	56	47	49	52	42	52	67	65	65	76	82	82	67	71	71	59	55	79	77	72	63.4
	Min...	51	38	38	30	36	41	53	59	54	48	47	44	38	32	40	40	30	39	45	35	44	50	54	56	39	52	31	34	54	60	46	43.5
Rockwell C	Max...	74	60	65	57	63	69	72	68	71	65	58	54	46	58	51	50	56	..	63	70	75	80	76	76	73	65	60	58	75	71	68	64.9
	Min...	56	39	35	30	35	39	51	58	45	50	45	40	35	31	40	35	30	35	41	40	44	48	49	46	44	50	34	40	52	63	42	42 6
Sac City....	Max..	67	60	55	59	65	67	70	65	71	61	55	56	45	58	51	48	59	73	64	70	77	81	79	78	72	65	61	57	76	72	68	61.7
	Min...	51	38	36	28	35	39	49	53	43	..	44	39	35	30	40	34	29	38	42	35	48	48	52	46	40	50	33	39	56	63	40	41.7
St. Charles.	Max...	79	63	59	60	68	67	75	69	80	73	59	58	47	59	58	55	64	80	71	74	83	85	81	84	78	78	63	68	82	78	68	69 9
	Min ..	61	43	41	30	35	42	55	57	49	49	50	46	38	33	41	37	31	43	47	38	48	50	54	50	45	54	36	41	61	62	48	45.6
Scranton ..	Max..	72	60	54	57	64	65	70	65	68	64	60	54	53	55	..	..	58	60	75	70	75	76	80	75	74	68	60	65	76	73	70	66 1
	Min..	55	40	38	29	35	89	50	56	46	50	45	41	39	32	..	..	30	40	42	37	47	48	50	40	44	52	35	40	45	50	43	42 7
Sheldon....	Max...	67	60	55	60	65	66	70	65	68	55	55	52	48	60	45	46	62	65	67	73	78	83	83	83	74	65	..	57	75	66	61	64.3
	Min...	52	36	32	28	37	56	40	50	39	41	40	37	34	30	34	32	25	37	38	37	42	41	41	39	45	40	..	35	50	50	37	39 2
Sibley	Max. .	66	62	55	63	71	66	68	64	68	56	..	52	50	62	50	43	62	7	66	73	80	81	73	73	77	63	62	57	75	75	58	64 9
	Min...	51	43	33	25	35	36	55	51	39	40	..	36	33	28	34	28	28	35	40	34	39	41	39	39	41	41	29	40	48	57	39	38 6
Sigourney .	Max ..	79	63	62	60	67	75	82	72	69	78	63	60	51	58	61	55	57	77	71	70	79	82	82	74	73	67	63	66	82	80	72	69.4
	Min...	62	41	36	27	30	35	54	58	50	46	48	46	38	34	39	37	29	36	45	35	38	42	47	44	39	36	36	32	60	56	52	42 2
SiouxC'nt'r	Max...	68	58	54	59	66	69	68	68	06	58	56	51	48	59	51	54	60	75	68	72	75	78	77	75	72	62	62	57	74	74	58	64.3
	Min..	50	38	32	27	37	41	57	54	45	44	52	39	30	29	33	32	32	38	43	38	41	45	52	48	46	44	32	42	49	52	40	41.5
Sioux City.	Max...	65	58	54	60	66	63	71	64	69	51	59	51	47	63	49	59	64	79	65	73	77	82	79	76	73	65	64	68	76	74	60	65.3
	Min..	52	42	37	31	34	51	60	52	44	45	44	42	35	33	38	35	33	42	40	40	43	49	54	43	51	51	38	46	55	54	44	43.8
Storm L...	Max...	70	58	52	57	63	63	67	63	66	60	53	51	43	57	51	47	57	71	63	68	74	77	76	76	70	62	60	57	72	69	57	62 3
	Min ..	54	39	34	33	39	42	58	52	43	45	43	39	33	31	36	33	29	41	39	40	47	50	50	49	46	45	34	39	54	54	41	42 3
Thurman..	Max...	76	63	58	58	65	67	69	64	71	65	58	55	49	60	55	60	60	80	68	71	74	77	78	75	70	71	65	74	78	74	68	67.0
	Min...	60	40	40	28	43	51	58	53	42	47	48	45	38	29	37	33	30	43	39	33	36	39	39	40	40	48	39	52	60	63	44	43 1
Tipton	Max ..	80	64	59	54	62	74	71	71	65	73	66	58	56	56	58	52	54	72	70	64	77	78	82	73	67	67	56	64	80	76	70	66 7
	Min ..	63	43	38	26	30	52	32	61	55	48	56	41	36	36	42	35	30	37	47	34	40	41	47	45	35	51	37	33	60	62	55	43.5
Wapello...	Max ..	73	64	58	55	60	70	76	71	62	75	69	60	55	55	53	52	54	71	..	62	71	71	77	66	68	60	59	67	80	75	71	65.3
	Min..	63	46	40	32	32	36	56	58	55	46	59	48	43	40	42	42	32	41	57	41	42	42	49	49	39	41	39	37	61	62	56	45.9
Washi'gt'n	Max..	77	61	61	56	66	73	80	64	64	77	64	59	53	57	62	53	58	76	71	69	80	82	84	71	73	66	61	66	82	79	65	68 1
	Min .	53	41	35	27	32	37	53	56	48	44	45	44	38	34	38	35	27	35	42	33	38	40	43	41	35	48	35	32	59	59	44	41.0
Waterloo..	Max..	76	59	58	58	67	73	76	66	71	70	58	58	50	55	58	45	59	69	65	69	80	84	83	68	69	68	59	61	80	79	65	66 4
	Min. .	56	39	38	26	30	33	52	44	47	56	49	43	38	34	42	33	27	37	38	30	37	40	47	42	39	39	34	33	59	59	39	41 0
Waverly...	Max..	69	56	53	56	64	69	74	69	65	68	58	58	..	55	55	45	55	69	..	62	..	81	81	66	68	65	56	55	78	77	70	64.2
	Min ..	56	41	39	28	33	35	55	57	55	48	49	45	39	38	44	35	30	39	..	44		39	42	42	41	50	35	36	55	60	47	43.3
West Bend	Max,..	67	56	54	57	64	68	71	57	68	50	55	53	45	58	52	45	57	72	62	70	78	81	79	75	74	63	60	59	75	72	58	63.1
	Min...	54	36	34	30	37	35	52	54	43	45	44	38	36	29	41	30	28	35	39	31	..	40	44	40	39	48	30	40	53	63	40	40 3
Whitten...	Max. .	68	60	55	55	60	63	78	70	68	70	57	55	50	55	53	45	58	70	61	65	75	80	68	70	61	63	59	60	58	79	78	63 5
	Min...	59	36	35	21	31	31	52	65	52	45	47	41	35	30	40	33	22	35	43	30	40	41	42	43	41	42	50	42	40	35	35	39 8
Wilton Jc .	Max ..	79	63	58	55	63	70	77	67	65	75	67	59	56	67	61	57	53	72	68	64	76	78	80	67	66	68	68	65	79	76	..	67 3
	Min ..	59	42	33	24	27	30	51	57	50	41	53	43	33	33	35	33	27	34	46	30	36	36	42	44	38	30	34	30	57	56	52	40.1
Winterset .	Max..	81	65	62	61	68	68	78	75	76	74	64	61	43	61	54	55	61	77	71	72	82	83	80	82	82	73	65	68	80	79	68	70 0
	Mfn ..	63	41	38	27	32	41	54	59	47	47	48	46	38	32	29	37	29	42	44	34	46	46	51	47	44	51	36	41	54	60	46	43.9

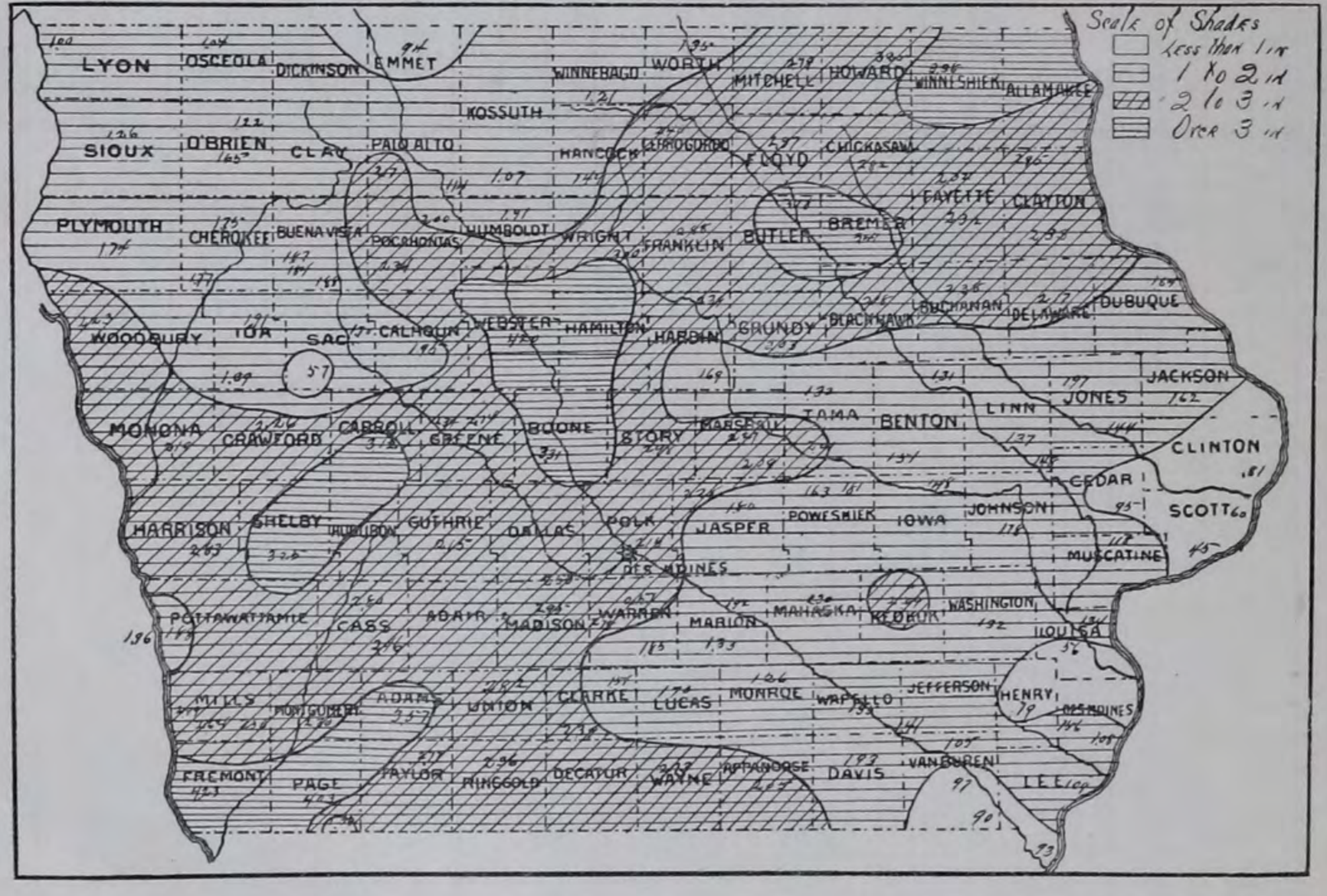
DAILY AND MONTHLY PRECIPITATION FOR OCTOBER, 1901.

STATIONS.	DAY OF MONTH.																															TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton	.20	....	....	....	.	T	.08	T	....	T	1.54	....	.09	..	..	....	....	....	....	....	....	....	....	....	....	....	....	.07	...	....	.84	2.82
Albia	.30	....		....	....		....	.18	....	.08	....	....	T	....	....	....	....	....	....	....	....	....	....	....	....	T	....	....	....	....	.70	1.26
Algona	....	....	....	....		T	.06	...	.06	1.12		...	.08	..	.13	....	....	....	....	....	..	....	..	....	..	.06	....	.36	..	..	..	1.87
Alta	....	..	....	..	....	....	.10	....	.03	1.10	..	T	.09	.	.10	....	..	....	....	....	..	....	....	....	....	.10	..	.32	..	....		1.84
Alta (near)	...	..	....	....	....	....	T	.52	.06	T	.42	.01	.01	..	..	.03	....	....	....	....	..	....	....	....	..	T	..	T	....	....	.40	1.48
Amana	.03	....	T		....	....	.10	....	....	.65	1.35	..	.03	..	....	.11	..		....	....	..	....	....	....	....	....	....	.08	....	..	.66	2.98
Ames	T	..		....		T	T	.07	.10	1.05	....		.12	....	....	....	....	....	....	..	....	....	....	....	....	.08	..	.28	....	1.33	....	2.80
Atlantic	....	....	....	....	....	T	.05	T	T	.75	T	T	.03	....	....	....	..	.....	....	....	....	....	....	....	....	....	....	10	....	..	.38	1.39
Battle Creek	....	....	....	....	....	....	T	.05	..	....	1.75	....	....	....	....	..	....	....	....	....	..	....	..	....	....	T	....	T		..	.36	2.28
Baxter	....	....	....	....	....	....	....	.10	.19	....	..	....	T	....	....	....	....	....	....	....	....	....	....	....	....	....	..	T	T	....	.30	.93
Belknap	.28	....	....	....	....	....	....	.20	.10	.10	.80	....	.02	....	....	.02	....	....	....	..	..	....	....	....	....	....	....	....	....	.22	..	1.54
Belle Plaine	T	....	....	....	..	....	....	.40	....	....	..	....	.08	....	....	....	....	....	....	....	....	....	....	....	....	.20	....	....	.	....	.39	.90
Bonaparte	....	....	....	....	....	....	....	T	T	....	.64	.06		.03	....	....	T	....	....	....	....	....	....	....	....	.21	....	.14	....	....	.30	1.49
Britt	.02	..	....	....	....	....	T	.58	.05	....	.14	....	....	.10	....	.12	....	....	....	..	....	....	....	....	....	T	....	.01		....	.26	1.32
Buckingham	.02	....			....	..	.58	.05	....	.14	....	....	.10	....	....	....	....	....	....	....	....	....	....	....	....	.05	...	T		....	.80	1.08
Burlington	02	....	....	....	...	....	.09	.52	.	....	.04	....	.10	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	.64	1.33
Bussey	.10	....	..	....		....	....	.20	.23	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.36		1.12	....	3.12
Carroll	....	....	..	....	....	T	T	.58	....	1.35	....	.....	.15	....	.14	....	....	....	....	....	....	....	....	....	....	....	....	T	.06	...	.34	1.37
Cedar Rapids	T	....	....	....	....	T	T	.12	...	....	.31	....	.04	T	T	.04	....	....	....	....	....	....	....	....	....	....	....	T	....	..	.45	2.05
Centerville	1.48	....	....	.....	..	.....	T	.03	.31	....	.04	.21	T	.05	.02	...	....	....	....	..	....	....	....	....	....	T	T	..	.06	....	...	64	1.70
Chariton	.34	....		....	....		....	.18	....	T	.70	.30	....	T	T	....	T	....	....	....	....	....	....	....	....	..	.08	....	.02	....	....	.83	4.03
Charles City	.10	....	....	....	....	....	.10	.24	....	....	....	2.67	.09	....	....	....	T	....	..	....	.	....	....	....	....	..	.25	....	T	..	T	1.50	2.40
Clarinda	....	.....	....	....	....	....	T	T	....	.35	.25	....	T		....	T	....	....	....	....	....	....	....	....	....	....	.09	....		..	..	.21	.81
Clear Lake	.05	....	....	....	....	....	.16	.18	.02	.03	.09	....	....	....	.03	..	..	....	....	....	....	....	....	....	....	....	.05	....	.02	...			1.35
Clinton	....	....	....	....	....	.17	....	....	....	.02	1.02	....	.07	....	....	..	..	T	....	....	....	....	....	....	....	....	.14	....	..	.01	.33	..	1.34
College Springs	.23	....	....	..	..		....	.25	....	.02	.10	....	.21	.04	....	.01	....	....	....	....	....	....	....	....	....	.....	....	..	T		.99	3.57
Columbus Junction	T	....	....	....	....	T	T	.10	....	80	1.40	T	.28	....	....	....	....	....	....	....	....	....	....	....	....	.	....	..	.25	....	1.09		1.88
Corning	..	..	....	..	..	.03	.27	....	....	.24		....	....	....	....	....	....	....	....	....	....	....	....	....	....	T	..	T			.58	2.25
Council Bluffs	.18	....	....	....	....		.04		T	.90	.55	....	....	....	....	T	....	....	....	....	....	....	....	....	....	..	....	.01		95		2.46
Cresco	....	....	..	....	....	T	T	T		....	1.48	T	.02	....	....	.	....	....	....	....	....	....	....	....	....	.30			....	....	.30	1.56
Cumberland	....	-	..	..	T	....		.46		....		.50		....	....	....	....	....	....	....	....	....	....	....	....	.10	..		T	..	.17	.45
Danville	T	.....	.02	..	..	....	.02	.10	01	T	.02	....	T	..	..	.01	....	....	....	....	....	....	....	....	....	....	..	.03	....	....	.30	2.17
Davenport	.05	..	....	....		....	....	.40	.29	1.10	....		T	....		....	....	....	....	....	....	....	..	....	..	....	..	....	..	1.12	....	2.26
Delaware	....	....	....	....	....		....	....	....	.80	.14	....	.09	....		.11		....	....	....	....	....	....	....	....	....	....	.05	....	..	.53	2.14
Denison	T	..	....	..	....	..	T	T	....	.13	1.36	T	.07		....	T	....	....	....	....	....	....	....	....	....	....	....	.10	....	..	.60	2.55
Des Moines	....	....	....	....	....	....	T	....	....	.25	1.50	....	.10	....	....	....	..	....	....	..	....	....	....	....	....	..	....	.07	..	..	1.00	3.00
De Soto	....	....	....		....	..	T	T	T	1.80		....	.04	..	....	....	....	....	....	....	....	....	....	....	....	.09	.	....	T	..	.29	1.64
Dows	T		T	....		....	....	.32	.10	.14	.74		.05	....	...	T	....	....	....	....	....	....	....	....	....	.08	....	....	....	..	33	1.41
Dubuque	.19	....	....			....	....	22	.05	.04	....	..	.50	....	....	....		....	....	....	..	....	....	....	....	T	..	....	....	..	.28	2.53
Eldon	.06	....	....		....	....	T	.45	..	1.64	.05	....		....	..	....	....	....	....	....	....	....	....	....	....	..	..	....	....	....	1.00	2.30
Elkader	....	...		....	....	T	T	....		1.30		....		....	....	....	....	....	....	....	....	....	....	....	....	..	..	.12	.07	.05		.94
Emerson	T	....		....	....	....	T	.11		.45	.02	.06	.03	.	....	T	....	....	....	....	....	....	....	....	....	.24		T	....	..	.25	2.32
Estherville	T	..	....	....	....	T	32	.19	.	.85	.47	....	....	....	....	T	....	....	....	....	....	....	....	....	....	..	....	.32	....	.24		2.34
Favette	T		....	.	....	T	T	.02	15	1.24	T	.08	.11	T	.18	T	....	....	....	..	....	....	....	....	....	.23	..	07	.20			1.21
Fonda	..	..	....	....	....	....	T	T	T	.56	T	..	.15	....		T	....	....	....	..	....	....	....	....	....	.10		.16	....	T	1.62	4.20
Forest City	..	....	....	....	....	....	T	....	...	1.70	.46		.04	.04	T	.08	....	....	.	....	....	....	....	....	....	T					.20	1.09
Fort Dodge	....	....	....	....	....	.....	....	.40	....	....	.07	.....	.37	....	.05		....	....	....	....	....	....	....	....	....	....	..	.43	...	..	....	1.91
Fort Madison	.....		....	....	....		T	T	T	1.48	....		....				....	....	....	....	....	....	....	....	....	....	..	T			.43	2.09
Galva	T	....		....	....	....	.10	.26	.10	....	T	1.55	T	.06	....	....	05	....	....	....	....	....	....	....	T		....	.45	....	1.23		2.64
Gilman	....	....	....	....	....	....		.65		....	1.61	....	....	....	....	T	....	....	....	..	....	....	....	....	....	.17	....	T	....	T	.35	2.95
Glenwood	.17	....	....		....	....	T	....	....	.99	1.00	.	.12	....	....	T	....	....	....	....	..	....	....	....	....	.32	....	....	....	....	.73	3.18
Grand Meadow	....	..	.02	..	....	....	.	.03	04	02	1.10	....	....	....	....	....	....	....	....	..	..	..	..	....	....	....	....	....	.04	...	.40	1.63
Greene	....	....	....	....	....	....	.05	.03	..	02	1.05	T	.07		T	.06	....	....	....	....	....	....	....	....	....	....	....	.03	.02		.40	1.81
Grinnell	.08	....	....	....	....	....	.11	T		.12	1.29			....	.05	.15	....	....	....	....	....	....	....	....	....	.04	..	.08		T	.19	2.03
Grinnell (near)	....	....	..		....	....	T	T		79	.	.02	.13	....	....		....	....	....	....	....	....	....	....	....	....	....	20	..		1.01	2.15
Grundy Center	....	....	....	....	....	T	T		....	79	.	.02	.13	....	....		....	....	....	....	....	....	....	....	....	.15	....	.06	..	.92		2.88
Guthrie Center	...			....	....	....	....	.16	1.52		.04	.03	....		..	..	....	.....	....	....	....	....	....	....	....	....	....	19	....	T	1.36	3.25
Hampton	....	....	....	....	....	.10	.01	.10	.20	1.23	....		T	.06	....	....	....	....	....	....	....	....	....	....	....	.09	..	....	08	....	.70	2.39
Harlan	.46	....	..	....	....	T	.07	....	..	08	.80	T	.11		....	....	....	....	....	....	....	....	....	....	....	.06	..	.20		....	.52	1.91
Hopeville		....		....	....			....	....	1.60	.08	....	.05	....			....	....	....	....	....	....	....	....	....	T	....	T	....		.30	2.38
Humboldt	T	....	....	....	....	....	.20	.48	....	1.00	.40	....	T	....	T	T	..		....	..	....	..	....	....	....			.05	....	....	.59	2.51
Independence	T	....		....	....	....	.05			02	1.68	.02	.10	T	....		....	..	....	..	....	..	....	....	....	T	..				32	1.78
Indianola	05			....		....	T	.37	T	.48	.43	T	11	....	....	.02	....	....	....	....	....	....	....	....	....	.16		T		.06	.48	2.39
Iowa City	.04	..	....	....	....	....	T	T	T	1.20	.38	....	.02	..	.05	T	....	....	....	....	....	....	....	....	....	....	..	.15	...	77		2.74
Iowa Falls	..	....	..	....	....	....	....	....		1.73		...	.05	..	.04		....	....	....	.....	..	....	....	....	.....	.02	..		.08	...	.15	.93
Jefferson	T	....	..	....		..	.03	.46			.05	....	.14	....				....	....	..	....	....	....	....	....	.25	..			....	.10	.97
Keokuk	T	....	....	....			....	.51	.01	T	T	T	.09		....	....		....	....	....	....	....	....	....	....	.10	..	.10	..	..	75	1.85
Keosauqua	....			....	....	....	....	T	....	T	.80		.10	T	....	....		....	....	....	....	....	....	....	....			.50				1.00
Lacona			....	....	....	50			....	....		....		....	....	....	....	....	....	....	....	....	....	....	....			.34		.21		1.75
Larchwood	T			....	....	05	....	....	....	1.15	....	....	T	....	....	....	....	....	....	....	....	....	....	....	....	T	.06	....	....	..	.22	60
Larrabee	..	....	02	....	....	....	.13	....	.05	.01	02	T	.	T	....	.09	....	....	....	....	....	....	....	....	....			.20	.13	....		1.74
Le Claire	..	....	..	....	..			53	....	.88	....	.15	....	....	05	....	....	....	....	....	....	....	....	....	....	T				.90	2.77
Le Mars	....	....	.	....		T	T	.25		30	1.10	.10	.12	....	....		....	....	....	....	....	....	....	....	....			.66		1.30	....	2.83
Lenox	....	....		....		.11	11	41	04	....	.12	....	08		....	....	....	....	....	....	....	....	....	....	....				T		.35	1.62
Logan	....	....	....	....	....	....	.07	.24	.05	.30	40	....	18	....	.03		....	....	....	....	....	....	.....	....	....			.06		..	.36	2.27
Maquoketa	.02	....	....	....	....	....	.06	01	....	.06	1.52	....	.03	..	T	.15	....	....	....	....	....	....	....	....	....			T			.34	1.97
Marshalltown	....	....	....	....	....	....		48	....	.10	1.60	T	....	.05	....	T		....	....	....	....	....	....	....	....	T	.25	.10	.....	....	.72	2.36
Monticello	T	....	..		....	.02	.12	.09		T	.99	T	.07	....	....	....	....	....	....	....	....	....	....	....	....	.22	..	03		..	.23	.79
Mount Ayr	04			....	....	....	....	27	....	T	....		....	....	....		....	....	....	....	....	....	....	....	T						40	1.48
Mt. Pleasant	01	....	T	....		T	....	33	.02	T	.45	....	.02		T	.05	....	....	....	....	....	....	....	....	....	.53	..	06			56	2.82
Mt. Vernon	....	....	....		....	....	....	....	....	1.62	....	..	.05	....	....	....	....	....	....	....	....	....	....	....	....		....	.06		....		1.80
New Hampton	.08	....		....	....	....	.04		....	T	1.56	.	....	....	....	.06	....		....	....	....	....		....	....	.15	....	.11		.03	.36	1.35
Newton	..	....	....	....	....	....	T	T	....	.55	.12	....	03	T		T	....	....	....	....	....	....	....	....		.03	....	27	..			.57
Northwood		....	....	....		T	.08	....	..	09	....		.10	....	....	....	....		....	....	....	....	....					.25			.85	3.31
Odebolt	....	....	....		....		....	.22		24	1.53	....	12		....	.10	..	....		....	....	....				T	..	T	..		38	1.44
Ogden	.15	....	T	....	....	....	.06	.34	T	.40	.02	....	01	....	08	....	....	..		....	....		....	....		T	..	.16	....	T	1.04	1.96
Olin	T		....	....	...	.26	1.08	1.14		.04	.20	T	.01	....			....			....	....	....	....	....		.03	....	65		..		2.19
Omaha, Neb			....	...		10	.05	.04		1.15	02	.03	.04	....	....	.08	....	....	....	....	....	....	....	....		.16	....	04		.05	1.41	2.79
Onawa	.03		03		....		....	T	....	.83	23	....	....	.01		T	....	....	....	....	....	....	....	....		.18	..	T	..		.68	1.30
Osage	12	....	....	....	....	....		.26	....	.06	T	....	T		....	.....	....	....	....	....	....	....	....	....						.70	1.35
Oskaloosa	.10	....	....				.15	.25	....	....	....	.15	....	....		....	....	....	....	....	....	....	....	....		.06	..	....		.71	2.73
Ottumwa	1.20		....	....	....	....	06	.50		.13		T	07	....	....		....	....	....	....	....	....	....	....		....	..	.47	..	T	1.35	2.99
Ovid	....	....	....	....	....	.24	.30	.13	....	.33	11	T	.06	....	....	....	....	....	....	....	....	....	....	....			....		....	..	.65	1.92
Pacific Junction	....			....			1	1.02			.25	....	....	....	....	....			....	....	....	....	....	....		.22		24	..		....	2.00
Pella	....	....	....	....	..	....	.04	03	....	1.32	....	..	.15		....	....	....	....	....	....	....	....	....	....	.65		....	.03		T	.96	2.30
Plover	....			....	....	....				1.00		....	....	....	....	....	....	....	....	....	....	....	....	....		.08	....	.04	....	1.47		3.38
Primghar	....		....	....	....	14	T	04	T	35	.73	T	.05		..		....	.	....	....	....	....	....	....	....					T	.40	1.95
Red Oak	.17	....	....			....	.05	....	02		1.41	.04	01	01	....	.04	.04	....	....	....	....	....	....	....	....			.40	....			2.17
Ridgeway	....	....	....		....	....			....	.85	.20	....	.10	....	T		..	....	....	....	....	....	....	....	....			.31	.06	..		1.70
Rockwell City	..	....	....	..	....	....		.50	....	90		....	40	....	....	T	....	....	....	....	....	....	....	....	....	..		.34		.	.12	2.78
Ruthven	..	....	....	....	....	T	05		....	1.02	....	T	.10	..	T	.07	....	....	....	....	....	....	....	....	....		..	07			.67	2.34
Sac City	02	....	....	....	....	....	.03	01		22	1.65	T	.11	....	....		....	..	....	....	....	....	....	....	....			36	...	.82	..	1.22
St. Charles		....	....		....	.....	.....	.....	.....	1.16	.....	.....	.....	.....	.....	.....	....	..	....	....	....	....	....	....	....	T		.34				1.04
Scranton		....	....	....	....	.03	.06	.03	.40	.22	.01	.05	08	.....	....	T	....	....	....	....	....	....	....	....	....	T		.29		....	.	
Sheldon	....		....	....	....	....	.11	.03	.06	44	....	05	06	...		....	....	....	....	....	....	....	..									
Sibley																																

DAILY AND MONTHLY PRECIPITATION FOR OCTOBER, 1901—CONTINUED.

STATIONS.	DAY OF MONTH.																														TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Sigourney	.50						T	.48	.07	.15	.30															.27		T			.52	2.29
Sioux Center						c2	.32	06	T	.37		.03	.14												T			.32				1 26
Sioux City						.06	.16	.07	T	1.45	T	.04	06		T	T										T				T		2 23
Stockport	.04						.13	.28	T	T	T		.05													30		.39	T		.25	1.05
Storm Lake							.07	.02	T	1 15	.01	T	.07		.08	T										.10		.38				1.88
Thurman						05	.15	1.02		1.30	.35	T	T															.26			1 10	4 23
Tipton	T		T			T		.01	.02	.90	01	T	T												T						01	.95
Toledo							.16				1.85																				2 01
Vinton							.43			.81	T				T												.07				1.31
Wapello	.03							.26								.03										.04				20	56
Washington	.36					T	.08		.35		.24		02		T											05				.30	1.32
Washta							.05	.10	T	1.20			.05		T	T									.10		34	T		T		1 77
Waterloo	07						.05	.10		.76	.59		.03		T	T										.09		03			.46	2 18
Waverly	.07	.05	.01				.10			.82	1.55		02			T										.49		.02			.28	3.41
West Bend							T		.03	75		.04	.06			T										10		.16				1.14
West Union							.55	.13		1.10																.23		.31				2 32
Whitten							T	T	T	.24	1.13	.15	T		T	.17														T	1.69
Wilton Junction								45	T		.20		06													.20				.27	1.18
Winterset	05								.03	05	1.74		.11	T														T	.13		.84	2.95
Woodburn	03						T	T	.08	T	.58	T	T																		.65	1 51

Precipitation Chart October 1901.



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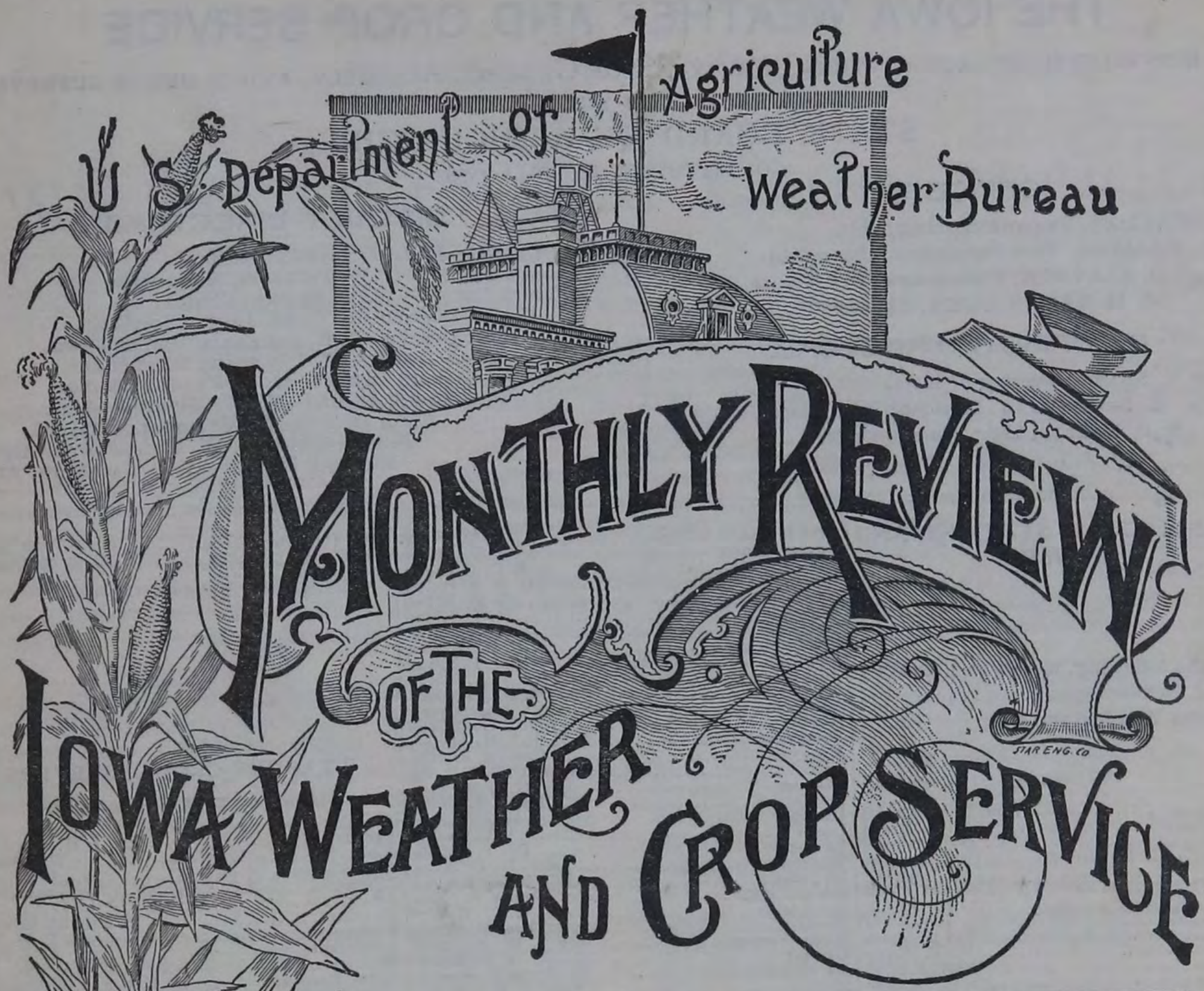

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U. S. WEATHER BUREAU, ASS'T DIRECTOR.

ALLIED PRINTING TRADES UNION LABEL COUNCIL DES MOINES

DES MOINES:
BERNARD MURPHY, STATE PRINTER
1901

THE IOWA WEATHER AND CROP SERVICE

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Wilton	Thos. Boot
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U. S. DEPARTMENT OF AGRICULTURE—WEATHER BUREAU.

MONTHLY REVIEW
OF THE
Iowa Weather and Crop Service.

VOLUME XII. NOVEMBER, 1901. No. 11.

FINAL CROP REPORT, 1901.

AVERAGE YIELD PER ACRE, TOTAL PRODUCTS AND AVERAGE FARM PRICES, DECEMBER 1, 1901.

Final reports for the past season have been received from crop correspondents of this service and the figures are given herewith showing the average yield of staple farm products and the average prices obtainable at the farms on December 1st. This general summary of the total output of the soil will show that, despite the extreme heat and drouth of the midsummer period, the harvests have amply rewarded the farmers of this state.

WHEAT. The area of winter wheat was 49,068 acres, and the total yield 865,770 bushels, or an average of 17.6 bushels per acre. Spring wheat yield is 17,429,230 bushels—an average of 15.3 bushels per acre. Total wheat product 18,295,000 bushels—a loss of 2,983,350 bushels compared with last year on account of decreased acreage. The average farm price is about 60 cents per bushel.

CORN. The reports show unusual variableness in the averages of the corn crop in the different counties, ranging from 18 to 38 bushels per acre, as the result of unequal distribution of rainfall in the critical stage of growth. The general state average is 26.2 bushels per acre, and the total product 227,908,850 bushels, harvested from 8,687,480 acres. The total corn out put of 1901 is about 65 per cent. compared with the crop of 1900, and about 85 per cent. compared with the average product of the past twelve seasons. The average farm price of corn for the state is about 50 cents per bushel, as against 27 cents on December 1, 1900. The cash value of the crop in the markets is about $113-000,000 00, or $20,000,000.00 in excess of the value of the crop last year on the basis of prices obtainable December 1st. In this estimate no account is made of the increment in value resulting from feeding corn on the farms where it is produced.

OATS. The area of oats harvested this year was 3,799,220 acres, which is 192,470 acres less than the acreage in 1900, the decrease resulting from unfavorable weather at the time of seeding; and the average yield per acre is about two bushels below the output last year, but the quality is generally superior. The total product is 114,883,530 bushels,—an average of 32.1 bushels per acre. Though the total is 23,948,000 bushels less than the product last year, it is very close to the 12 year avearage for this state. The average farm price is 35 cents per bushel, as against 20 cents last year.

BARLEY. The barley output this year is 14,654.410 bushels, harvested from 604,610 acres; the average yield being 24 bushels per acre. The returns show an increase of 1,959,210 bushels compared with last year, and the quality is much superior as a result of the dry weather at the time of harvesting and thrashing. The average farm price is 44 cents per bushel as against 33 cents last year.

RYE. The total yield of rye is 859,630 bushels,—an average of 15 8 bushels per acre. The average price is 48 cents per bushel.

TOTAL CEREAL YIELD. The above figures show a total output of corn and small grain amounting to 356,601,430 bushels, which is 43,450,000 less than the average of the preceding eleven years. The cereal output was less than this season in 1890, 1892, 1893 and 1894, and greater in the other years of the decade.

FLAX. Total yield of flax seed, 916,890 bushels on an area of 104,140 acres. Current farm price, $1.29 per bushel.

POTATOES. The potato crop suffered the worst effects of the drouth, the average yield per acre being only 37.4 bushels, and the total output 5,098,460 bushels, or less than half the amount harvested last year. Average price, 90 cents per bushel.

HAY. The average yield of cultivated hay was about 1.4 tons per acre, and the total 3,711,680 tons, which is 102,670 tons in excess of last year's crop; and the quality is vastly superior. The current market price averages about $8.25 per ton for the state.

WILD HAY. Total yield, 1,268,700 tons, an average of 1.2 tons per acre. Average value, $6.30 per ton.

BUCKWHEAT. Average unknown and variable; estimated value of crop, based on census reports, is about $175,000.

SWEET POTATOES. Estimated value, $325,000.

SORGHUM. Estimated value, $225,000.

BROOM CORN. Value (estimated) $45,000.

TIMOTHY SEED. Value (estimated) $950,000.

CLOVER SEED. Value (estimated) $375,000.

CORN FODDER. In shock and fields, worth $20,000,000.

STRAW AND OTHER FORAGE. Worth $4,000,000.

PASTURAGE. Worth $25,000,000.

FRUITS AND VEGETABLES. Value (estimated) $6,500,000.

The reports show that the average price of cows is about $30 and of horses $75. The total average crops of the state, including corn fodder, exceed in value the output of any preceding season.

TABULATED CROP SUMMARY.

CROPS.	Yield per acre.	Total product.	Farm value December 1, 1901.
Winter wheat	17.6 bushels	865.770 bu.	$ 519,462
Spring wheat	15.3 bushels	17,429,230 bu.	10,457,538
Corn	26.2 bushels	227,908,850 bu.	113,954.425
Oats	32.1 bushels	114,883,530 bu.	40,209,235
Barley	24 2 bushels	14,654,410 bu.	6,447,940
Rye	15.8 bushels	859,630 bu.	411,762
Flax	8.8 bushels	916,890 bu.	1,182,788
Potatoes	37.4 bushels	5,098,460 bu.	4,588,614
Hay (tame)	1.4 tons	3,711,680 t'ns	30,721,360
Hay (wild)	1.2 tons	1,268,700 t'ns	7,992,810
Buckwheat			175,000
Sweet potatoes			325,000
Sorghum			225,000
Broom corn			45,000
Timothy seed			950,000
Clover seed			375,000
Corn fodder			20,000,000
Straw, etc			4,000,000
Pasturage			25,000,000
Fruits and vegetables			6,500,000
Total soil products			$ 274,080,934

From the above conservative estimate it appears that the soil products of this state, at current farm prices, in this droughty season, are worth over $274,000,000, which sum is about $44,000,000 in excess of the aggregate valuation at the corresponding date in any previous year. In this estimate no account is made of the profits derived from consumption of soil products in the dairy and live stock industry

FINAL CROP REPORT, 1901.

Average per acre and totals by counties.

COUNTIES.	WINTER WHEAT.		SPRING WHEAT.		CORN.		OATS.		RYE.		BARLEY.		FLAX SEED.		POTATORS.		HAY (tame.)		HAY (wild.)	
	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Bushels per acre.	Total yield.	Tons per acre.	Total yield.	Tons per acre.	Total yield.
Adair	18	3,110	14	189,700	23	2,259,750	29	981,070	20	600	.....	.....	....	.....	22	34,760	1.2	41,350	1.0	1,960
Adams	22	17,160	16	96,960	26	1,775,020	36	756 640	20	3,200	22	15,840	....	.....	20	16,400	1.5	42,640	1.2	2,560
Allamakee	15	19,800	12	62,640	22	994,480	30	1,225,200	15	21,300	25	154,250	9	5,490	30	39,600	1.2	40,770	1.0	1,820
Appanoose	18	6,840		.....	18	915,480	20	145,000	13	10,660	....	.....	..	.....	30	15,300	0.6	24,330	0.9	11,880
Audubon	...	.....	15	364,050	25	2,206,250	28	985,320	18	1,260	28	88,760	....	.....	32	29,120	1.6	45,680	1.0	6,030
Benton	22	1,100	15	47,700	30	3,601,800	29	1,950,830	15	1,350	25	428,500	....	.....	35	51,800	1.4	50,610	1.2	1,580
Black Hawk	20	300	18	16,380	24	2,234,640	33	1,843,380	14	16,960	20	169,800	...	.....	37	61,420	1.5	42,490	1.5	16,060
Boone	..	.....	12	93,360	26	2,766,920	26	1,199,380	14	6,160	20	16,200	..	.....	21	22,890	1.5	28,660	1.0	20,040
Bremer	...	.....	15	13,350	20	1,199,000	32	1,659,200	12	3,840	28	52,360	8	11,920	30	40,400	0.8	16,090	1.0	15,120
Buchanan	16	208	17	10,710	20	1,658,200	26	1,323,660	18	1,980	25	70,750	8	1,960	30	42,600	1.6	52,120	1 2	16,280
Buena Vista	....	.....	15	158,550	21	2,212,560	37	2,076,070	12	1,800	28	199,360	8	4,880	55	99,550	1.2	21,140	1.0	20,130
Butler		.....	11	35,420	24	2,548,560	30	2,178,300	13	14,560	22	90,640	9	7,290	45	63,450	1.1	21,070	1 0	14,110
Calhoun	..	.... .	14	185,580	24	2,691,600	29	1,603,410	18	3,780	30	140,700	9	6,840	25	30,750	1.5	18,910	1.4	35,330
Carroll		. ....	14	341,180	22	2,580,140	25	1,368,750	15	2,250	24	51,840	....	. . ...	23	49,680	1.4	27,200	1.2	19,400
Cass	16	2,360	14	307,160	28	2,890,440	31	1,187,610	15	2,100	25	26,000	....	... ..	20	49,000	1 5	43,980	0.8	3,320
Cedar	27	8,910	19	19,380	31	3,318,860	36	1,337,040	17	10,370	25	275,500	....	.....	55	72,600	1.4	59,020	1 5	1,580
Cerro Gordo		.....	12	45,720	27	2,406,240	28	2,042,600	15	790	22	134,860	8	27,600	49	71,050	1.4	32,350	1.5	20,110
Cherokee	....	.....	18	545,760	22	2,356,640	38	1,745,720		.....	30	209,700	8	2,560	45	58,950	1.3	28,010	1.5	20,410
Chickasaw	....	. ...	12	26,190	19	1,031,320	28	1,655,080	14	1,960	22	134,860	9	59,760	42	49,560	1.1	26,630	0.8	9,760
Clarke	24	5,040	10	900	23	1,220,450	26	453,180	16	2,400	....	.....	....	.....	25	10,750	1.2	46,930	1.8	1,060
Clay	....	.	10	101,200	23	2,084,720	32	1,325,210	12	9,720	25	696,500	7	15,030	60	71,400	1.2	20,650	1.5	36,630
Clayton	16	13,280	16	101,920	22	1,854,380	34	2,186,880	15	30,750	27	186,570	8	2,480	48	101,760	1.4	56,720	1.2	5,590
Clinton	15	2,550	11	30,030	28	3,291,960	27	1,205,550	20	28,400	27	120,150	..	.....	37	52,170	1 2	55,620	1.5	7,560
Crawford	....	.....	15	647,550	22	2,660,680	30	1,164,900	15	1,450	20	67,000	....	.....	25	44,250	2 0	62,300	1.5	15,460
Dallas	13	2,860	14	99,540	27	2,706,210	33	1,277,430	12	3,000	....	.....	....	.....	22	26,620	1.4	35,150	1.5	15,960
Davis	16	11,040	....	.....	19	1,121,380	22	408,540	12	18,640	....	.....	....	.....	20	12,200	0 8	38,440	....	.....
Decatur	21	21,630	...	.....	23	1,323,880	27	481,140	20	6,600	....	.....	.....	.....	24	16,560	1.2	48,140	1.0	990
Delaware	15	300	15	19,300	25	2,283,000	30	1,229,400	15	5,850	23	125,810	..	.....	60	72,000	0 9	33,050	0.8	7,880
Des Moines	16	46,240	...	.....	22	1,434,840	32	874,520	20	42,000	25	3,000		....	50	71,000	1.0	21,120	1.2	940
Dickinson		.....	11	206,910	28	1,105,720	32	665,280	12	2,420	26	628,420	8	45,760	45	26,550	1.0	6,970	0.8	15,450
Dubuque	19	950	18	59,040	25	1,605,750	30	1,357,500	20	18,400	28	63,840	....	.....	40	85,600	1.2	41,410	0.9	3,180
Emmet	...	.....	12	215,040	35	1,736,350	35	871,850	12	1,800	22	429,220	9	27,270	45	22,050	1.7	14,220	1.6	57,930
Fayette	18	2,970	15	39,300	25	2,367,000	30	2,016,600	15	5,150	25	171,500	9	23,580	40	76,400	1 0	50,170	1.0	14,230
Floyd	....	...	12	24,600	20	1,660,600	28	1,836,080	14	8,120	23	207,230	8	32,880	48	90,720	0 6	13,290	0.8	6,200
Franklin		.....	14	96,320	30	3,817,200	33	2,456,850	18	8,280	28	134,680	11	22,330	58	73,660	1.2	22,940	1.0	14,910
Fremont	20	69,400	12	64,920	25	2,893,250	30	469,500	20	13,400	....	.....	....	.... .	20	21,000	0.8	17,730	1.0	7,040
Greene	....	.. ....	13	66,820	20	2,025,600	28	1,440,600	13	1,430	22	70,180	.....	. ....	25	29,500	1.1	20,400	1 0	19,870
Grundy	15	1,090	13	124,670	30	3,841,200	30	1,584,600	18	1,620	22	295,680	11	4,840	65	117,650	1 8	40,170	1.2	14,360
Guthrie	18	1,980	12	147,960	22	1,738,220	26	860,080	15	1,650	22	33,220	....	.....	20	10,200	1.5	37,710	1.3	9,100
Hamilton	..	.....	17	160,650	30	2,947,800	32	1,720,000	15	1,350	21	25,830		.. ..	30	36,900	1 4	15,070	1.2	29,610
Hancock	....	.....	16	211,840	38	3,058,240	40	2,668,800	20	8,200	24	147,840	8	31,840	45	41,400	1 4	23,120	1.2	26,800
Hardin	..	.....	15	214,800	32	3,030,080	31	1,657,390	15	1,350	20	45,000	9	2,880	25	30,250	1.4	26,390	1.2	21,510
Harrison	25	870	15	655,950	22	2,658,260	33	506,220	20	3,800	30	17,100	..	.....	50	87,000	1.8	14,360	1.5	24,630
Henry	21	32,340	14	2,240	28	1,808,600	34	917,320	18	35,640	31	11,160	....	..	30	19,800	1.3	33,080	1.0	290
Howard	17	420	14	28,420	24	1,215,120	23	1,319,510	17	1,020	23	125,580	8	63,520	40	42,800	1.2	46,690	1.0	10,020
Humboldt	..	.....	15	269,650	32	1,923,840	38	1,262,860	18	720	28	63,560	11	19,250	40	30,800	1.6	19,560	1.2	21,440
Ida	....	.....	14	344,540	26	2,202,460	33	994,290	18	540	32	128,320	...	.... ..	28	28,560	1.4	29,550	1 5	8,770
Iowa	30	8,700	20	27,800	23	2,210,450	32	1,274,560	20	600	25	125,750	..	.....	25	35,750	2.0	81,160	1 2	2,440
Jackson	19	3,420	15	48,150	25	1,841,250	26	1,007,760	16	29,120	30	98,100	....	.. ....	38	41,680	1.4	58,950	1.5	3,910
Jasper	18	1,010	15	182,100	30	2,902,200	33	1,351,350	15	3,900	25	17,250	....	.....	55	162,800	1 6	43,240	1.2	2,610
Jefferson	21	25,380	15	3,600	28	2,014,120	30	685,500	19	41,370	27	27,540	..	.....	45	29,250	1.2	32,200	1.0	2,410
Johnson	25	14,250	20	26,200	25	2,643,750	30	1,168,200	19	32,490	26	83,460	....	.....	28	39,480	1 8	82,470	1.5	2,860
Jones	...	.....	15	17,250	26	2,154,620	32	1,030,720	18	12,600	29	116,290		.....	45	41,400	1.5	64,120	1 0	2,110
Keokuk	18	12,420	12	11,100	23	2,384,410	22	771,760	16	36,000	20	62,800	....	.....	20	23,200	1.8	67,590	1.0	480
Kossuth	....	.. ....	12	405,000	35	4,206,650	30	2,300,700	15	7,450	27	476,010	8	41,120	30	46,800	1.0	19,330	1.0	58,710
Lee	13	135,370	....	.....	25	1,380,250	23	330,610	10	24,200	....	.....	....	.....	47	72,850	0 9	33,290	1.0	210
Linn	20	1,460	15	23,250	22	2,391,620	32	1,531,200	17	7,650	28	51,800	...	.....	33	65,340	1.5	75,430	1.2	9,370
Louisa	20	44,800	12	6,120	25	1,784,500	30	693,300	17	42,670	20	7,200	....	.....	38	30,780	1.2	19,140	1 0	1,130
Lucas	14	5,180	12	2,520	22	1,183,820	25	339,250	12	10,680	....	.....	....	.....	20	9,600	1.2	48,980	1.2	520
Lyon	....	.....	13	890,760	33	2,318,580	35	1,062,250		....	22	973,060	8	7,280	60	81,000	1.5	8,530	2.6	21,920
Madison	22	5,280	14	92,120	23	1,880,930	28	671,160	15	4,350	25	34,000	....	.....	30	36,300	2.0	74,260	1.5	4,210
Mahaska	16	8,160	12	30,020	25	2,433,500	25	840,500	15	750	20	16,400	....	.....	25	37,750	1.2	34,210	1 0	1,200
Marion	10	3,900	8	45,180	20	1,881,400	26	815,800	15	10,800	21	19,530	....	.... ..	36	42,840	1.8	51,100	1.0	1,330
Marshall	28	1,120	15	243,150	33	3,466,320	32	1,578,810	18	1,260	25	54,000	....	.....	37	61,420	1 5	47,160	1.5	5,200
Mills	22	11,660	15	214,350	25	2,487,250	30	396,000	16	5,600	20	4,400	....	.....	30	33,900	2.0	35,460	1.5	8,310
Mitchell		.....	11	37,180	22	1,347,500	27	1,201,770	17	6,460	22	270,820	9	76,700	46	86,940	1.0	29,710	1 0	3,090
Monona	20	600	15	572,250	25	2,890,750	33	465,960	20	5,600	30	136,800	....	.....	30	41,100	1.4	5,400	1.4	31,360
Monroe	20	6,040	12	1,320	23	1,040,980	28	292,320	16	16,160	....	.....	....	.....	20	11,800	1.2	37,420	0.5	280
Montgomery	25	17,500	12	207,360	26	2,320,760	25	332,750	15	2,550	20	4,600	....	....	15	16,050	1.5	34,590	1.0	1,940
Muscatine	21	9,030	10	21,600	25	1,642,750	26	536,640	16	24,640	21	21,190		.....	40	112,800	1.4	32,130	1.0	1,770
O'Brien	....	.....	14	405,720	32	3,189,120	32	1,317,120	....	.....	22	694,320	8	17,040	38	42,940	1 0	15,170	1.2	16,820
Osceola	....	.....	13	410,190	35	1,884,750	36	1,027,440	....	.....	30	1,084,800	8	18,880	65	50,050	1.7	17,980	1.5	17,420
Page	20	106,600	11	93,060	24	2,872,560	28	547,360	18	9,900	20	26,200	....	.....	40	42,800	2.0	32,320	1 5	5,640
Palo Alto	....	.....	11	96,030	25	1,810,250	30	1,419,600	12	6,120	25	270,500	8	30,720	20	28,400	1.2	9,560	1.2	48,020
Plymouth	....	.....	15	1,476,150	33	4,396,590	35	1,498,350	20	3,200	30	269,700	8	5,200	25	83,750	1.2	16,210	1.0	30,250
Pocahontas	....	.....	14	114,100	29	3,044,130	40	2,055,200	20	8,600	25	204,000	10	24,800	32	43,840	1.1	11,330	1.2	44,730
Polk	20	2,860	15	193,200	25	2,663,750	28	980,840	18	2,520	-	.....	....	.....	45	141,950	1.6	37,790	1.0	11,880
Pottawattamie	18	8,280	15	731,550	28	5,491,360	27	774,630	16	8,000	20	11,800	..	.....	30	98,400	1.8	58,620	1.5	22,830
Poweshiek	20	640	14	43,680	32	3,476,160	30	1,341,300	16	2,080	31	127,720	....	.....	40	57,200	1.8	66,830	1.0	1,060
Ringgold	18	5,880	12	720	28	2,259,880	30	731,100	14	4,620	15	6,150	....	.....	25	18,750	1.4	75,570	0.8	620
Sac	....	.....	14	202,300	21	2,498,160	35	1,500,100	20	1,800	28	139,960	8	1,680	32	39,040	1.4	31,370	1.4	24,650
Scott	22	9,460	15	125,400	28	2,119,040	25	441,500	16	12,480	24	648,240	....	.....	70	334,600	1.2	30,740	1.5	7,920
Shelby	....	.....	14	563,780	26	2,970,240	30	773,700	15	1,050	25	65,250	....	...	30	48,300	1.5	43,830	1.4	11,940
Sioux	....	.....	13	1,204,060	30	3,558,300	25	1,037,500	....	.....	25	790,750	9	8,190	40	56,000	1.2	12,670	1.2	25,240
Story	22	1,980	15	69,900	25	2,723,250	30	1,416,600	17	6,290	32	27,840	....	.....	45	47,250	1.9	42,400	1.2	22,050
Tama	....	.....	15	160,800	33	3,713,160	29	1,221,530	20	2,600	23	624,450	....	.....	48	77,760	2 0	68,140	1.2	7,600
Taylor	25	66,870	15	7,200	30	2,408,100	28	563,640	18	10,980	20	23,600	....	.....	25	31,000	2 0	75,160	1.0	1,570
Union	16	1,280	12	6,720	30	1,854,600	27	515,160	14	1,820	....	.....	..	.....	25	27,250	1 8	68,940	1.2	1,650
Van Buren	14	42,430	....	.....	23	1,069,040	25	456,250	12	17,280	..	.....	....	.....	28	13,440	1.3	50,450	1.2	2,050
Wapello	15	10,950	12	2,040	25	1,506,250	22	396,440	13	15,210	20	7,000	....	.....	30	42,300	1.4	45,510	1.0	320
Warren	22	1,980	12	84,120	26	2,283,060	25	563,500	12	4,680	20	23,600	....	.....	20	26,600	1 7	63,440	1.2	300
Washington	20	14,800	12	3,720	24	2,349,280	26	993,460	20	24,400	25	81,750	...	.....	20	17,600	1.2	42,280	1.0	290
Wayne	15	1,340	....	.....	22	1,531,860	25	378,000	12	6,600	....	.....	...	.....	30	15,600	1.0	67,150	1.0	350
Webster	....	.....	15	112,850	26	2,808,300	40	2,644,400	12	2,280	20	46,400	8	1,520	40	57,600	1.8	25,900	1.5	51,760
Winnebago	....	.....	12	254,040	27	1,256,850	28	969,080	..	.....	25	101,750	11	38,060	45	35,550	1.2	13,690	1.5	37,810
Winneshiek	15	2,400	15	115,350	28	1,852,480	30	2,013,600	15	3,150	25	297,750	10	92,300	60	73,800	1.3	54,750	1.5	18,650
Woodbury	....	.... ..	14	884,800	24	3,386,640	30	814,200	18	2,880	30	93,600	7	4,830	32	58,880	1.8	21,340	1.2	14,590
Worth	....	....	15	93,150	20	762,400	30	1,388,400	15	3,320	22	198,220	10	102,100	25	35,750	1.2	20,940	1.0	14,240
Wright	....	.....	16	198,560	26	2,096,640	33	1,948,320	15	2,250	25	130,750	11	26,510	40	42,800	1 4	22,730	1.2	24,190
Total for State	....	865,770	....	17,429,230	....	227,908,850	....	114,883,530	....	859,630	....	14,654,410	....	916,890	...	5,098,460	....	3,711,680	....	1,268,700
Av. per acre	17.6	....	15.3	.....	26.2	.....	32.1	.....	15.8	....	24.2	.....	8.8	.....	37.4	.....	1 4	.....	1.2	.....

SEASONABLE NOTES.*

In this initial year of the twentieth century we appear to have entered upon an era of expansion and general uplift of earthly affairs. We note a steady rise in real estate, farm products, mining interests, metals, stocks and bonds; and during the past summer even the usually placid mercury in our thermometers felt the upward tendency and rose to phenomenal heights on the thermal scale. The summer of 1901 has become notable in meteorological annals, breaking all previous records of high temperatures, and scoring mean and maximum figures that are not likely to be overtopped within the next hundred years. So it really seems as if nature set out to signalize the beginning of the new century by striking the century mark of temperature earlier and oftener, and rising to greater altitudes above it, than in any former year of record.

It does not fully describe the eccentric character of the past season to call it abnormal, for all seasons are more or less erratic in respect to some of the elements of climate. The normal line shows somewhat regular seasonal curves, while the records of any season will show irregular or zigzag lines of temperature, humidity, and rainfall, crossing and recrossing the averages above and below; and no two seasons have been exactly parallel from first to last. The past season was more than usually erratic, or, as we may say, abnormally abnormal. Therefore, for future reference and comparison we should make a careful study of these recent phenomenal departures from normal weather conditions.

The records of the state show that the maximum of 100 degrees, or over, was registered on seven days in June and twenty-four days in July. The distinctively torrid period in July was from the 9th to the 26th inclusive—or eighteen consecutive days, with very little abatement by day and scarcely any relief at night. During seventeen days the mercury rose to 100 or above, at over ninety-five different stations in this state, and the minimum temperatures ranged from about seventy to eighty degrees. For all the stations the average of the maximum temperatures for July was 106.8 degrees. The monthly mean for the state was 82.4 degrees, which is 8.7 degrees above the July normal, and six degrees above the highest average in any previous month of record. And we here note the startling fact that the daily average of the extreme northern belt was only about two degrees lower than the average of the southern section; which signifies that the hot wave swept over the state with uniformity, quite regardless of altitude or latitude. The maximum recorded at Spirit Lake was 108 degrees, and the same at Keokuk. The mean maximum of the northern section was 106.5, and of the southern section 107.9. The highest temperature registered was 113 degrees on the 22d of July, and this is likely to stand as the maximum for Iowa for many years to come.

During this torrid period the super-heated air was kept moving at a velocity much above the normal, thereby intensifying the effects of the high temperatures. In July for thirteen days the velocity of the wind reached twenty miles or more per hour, during the portion of the day when the temperature was highest. So in respect to the force and persistence of hot winds, as well as extreme temperature, all former records were broken.

The seasons of 1901 and 1894 have some points of resemblance, sufficient to afford a basis for comparison; but a careful review of the records will show quite marked differences in the two seasons. As a general statement it may be said that the summer of 1901 was the hottest season of which we have record, while the summer of 1894 was much drier, but with less intensity of heat. The drouth of 1894 was the most destructive visitation of the kind ever known in this section, especially in its effects upon late maturing crops, plants, and trees; and yet in respect to extreme heat, mean daily temperature, number of hot days, consecutive or otherwise, the past season scored several points above it.

The highest temperature recorded in 1894 was 109 degrees at a single station on July 26th and 27th. The highest in 1901 113 degrees at a single station on July 22d; and numerous stations recorded maximums ranging from 109 to 112 degrees. The average daily temperature of July, 1894, was 76.4 degrees; and of July, 1901, it was 82.4 degrees, or an excess of six degrees daily, as compared with 1894. The total wind movement in July for the two seasons was about the same, but there were thirteen days with a wind velocity of twenty miles or above per hour in 1901, and only seven days with the same velocity in 1894; that is to say, the hot wind period this season was about twice as long in duration, and averaged six degrees hotter than in the great drouth season seven years ago.

And yet, despite the greater degree of heat and longer duration of the period of hot winds, we find that this season has been far more productive in staple crops, fruit, and vegetables, than the relatively cooler season of 1894. The cereal products credited to 1901 are about one hundred million bushels in excess of the yield in '94, and the forage and other crops are much more abundant this season. Last July the common remark was heard: "This breaks all records, it's vastly more destructive than in '94; the corn crop will be totally ruined; look at these corn tassels; no pollen, no ears, no grain." And the prevalent conditions seemed at that time to justify the discouraging conclusion.

Now how may we account for the fact that the crop output of 1901 so greatly exceeds the yield of soil products in 1894? The solution of the problem is found in the rainfall records of the two seasons. The great drouth that culminated in July, 1894, really began a year previous to that time, in the mid-summer of 1893. In the last half of 1893 the total rainfall for the State was 4.80 inches below the normal amount, and at the beginning of July, 1894, the deficiency for the twelve months amounted to over ten inches. Conditions were radically different in July, 1901. The rainfall for 1900 amounted to 35.60 inches, or 5.30 above the normal; and 20.30 inches of that amount fell in the last half of the year. It came in such a manner that the most of it was stored in the soil and was made available in the time of need. And, besides, the wet weather of March and the early half of April added materially to the storage of moisture. In matter of fact there was at all times a considerable supply of moisture within reach of the roots of plants. The hot winds caused the leaves to curl, but the roots drew sustenance to maintain the life of plants.

Again, despite the greater degree of heat, there was a higher percentage of mean relative humidity of the air in last July than in the corresponding month in 1894. The records of the afternoon observations at the central station show 29.6 per cent in July, 1894, and 39.6 per cent in July of this year. This difference of 10 per cent in favor of this season is not a great amount, but it helped to save the bacon,—or rather the corn crop that makes the bacon. As illustrating the difference between a wet season and a dry season in respect to humidity, the records show the mean relative humidity to have been about 78 per cent in July, 1900, as against about 46 per cent for the same month in 1894. And the minimum of humidity was 13 per cent on the afternoon of July 26, 1894; so the air as well as the soil was extremely dry.

Another point involved in this review and comparison, is the fact that improved methods of soil tillage are to be given some measure of credit for the production of better crops in 1901 than were harvested in 1894. We have more tiles in the soil. Better plowing and more thorough cultivation may be noted. The soil is in better condition for storage and retention of moisture. And thousands of acres of bottom lands have been reclaimed from bogs and the beds of ponds and shallow

*Paper read before Iowa Horticultural Society, Dec. 11, 1901, by J. R. Sage.

akes, and these lands are best adapted to retain moisture and withstand drouths. The up-to-date farmers have profited somewhat by the costly lessons of experience in the disastrous season of the last decade. Yes, we have made considerable progress on these lines during the past seven years, incited thereto by the direful experience of 1894, and under the practical instructions of agricultural papers, lecturers, scientific experts, and experiment station reports. Our farmers would be very dull scholars indeed if they had failed to profit materially by all these lines upon lines, precepts and examples.

Many object lessons have been noted the past season in corn fields, gardens, orchards and groves, and they should be heeded. Corn fields, favorably located on the leeward side of groves, timber belts and ridges, have yielded the best crops, other things being equal. In a single field of forty acres, one portion of which was partially sheltered by a ridge and grove from the southwest wind, and another part exposed to the full force of the hot blast, there was noted a difference of over twenty-five bushels per acre in favor of the protected portion. The tile-drained fields contained more moisture in the soil, and the crops were greener and more productive than similar fields that were undrained. The fields that were kept clean, with the most persistent and long continued stirring of the surface, scarcely showed signs of heat and drouth. A good sized volume could be compiled of all these object lessons of this most phenomenal season.

Within the coming decade we shall probably have about the usual percentage of dry and hot seasons, and years of more than normal moisture. The farmers and fruit growers who hedge against adverse conditions, reap the highest rewards of care and industry by growing products to sell when the supply is short and the prices are high. We need to conserve moisture as well as fertility. Experience shows that when our plants are deeply rooted in rich and moist soil they can withstand the worst blasts of hot air that sweep over these prairies.

All my studies of the climatology of this valley have convinced me that these plains were originally treeless as a direct result of the physiography of the continent, which caused limited rainfall and occasional seasons of extreme heat and drouth. Forests hold their own only where the rainfall is ample and somewhat regular; they are not causes thereof but results. In this prairie region, subjected to conditions which made it treeless, it is only by care and culture that fruit trees, orchards, groves, shrubbery, and small fruits may be produced. The soil conditions must be steadily maintained to conserve moisture, by cultivation or mulching, and the tender trees must be given protection by groups or belts of the hardier varieties.

In my opinion, if these prairies were wholly abandoned by civilized man, and left to the state of nature, the original treeless condition of the plains exposed to the hot winds would be resumed within a century. It is only by continual vigilance and intelligent culture that we may retain what we have planted, and improve our farms, orchards, and home environments.

LOSSES BY LIGHTNING IN 1901 *

In accordance with nature's law of compensation there has been less than the usual amount of damage from wind, hail and lightning during the past season in this section. About the normal conditions prevailed in May and June, bringing the average amount of disaster; but in July and August the tremendous forces of nature were mostly expended in the form of record breaking heat and desiccating winds.

We have received 230 detailed reports of losses by lightning, from officials of about one-fifth of the farmers' mutual associations of the state. It may be assumed that the statistics given in these reports cover not more than twenty per cent of the actual casualties during the season. But the details are sufficient to give us a fairly clear idea as to the conditions under which the losses occur, and that has been the special object of these inquiries.

There were fifty-eight buildings struck, with damage ranging from very slight to total loss of the structure and contents. The number included sixteen dwelling houses, four churches and thirty eight barns. Of the barns reported struck nineteen were consumed with their contents, causing a total loss of $15,087. Not one of the dwellings or churches was consumed, and the damage to that class of buildings was very small. The reports show that only one of the buildings struck was provided with lightning rods. This exceptional case occurred in Lucas county, June 5. It was a frame dwelling house, with two copper rods; one of the points off and the other erect. The amount of damage to the house was three dollars. We have no other particulars as to the method of attaching the rods to the building, or whether they were properly grounded to afford protection It is a significant fact that in a total of fifty-eight buildings struck by lightning only one was provided with even a semblance of a protecting rod.

The reports give details of the killing by lightning of 260 farm animals in the fields, or yards outside of buildings, including sixty nine horses and 191 head of cattle, of all ages, involving a loss of $11,467. Twelve of the sixty-nine horses killed were in contact with wire fences Of the 191 cattle killed, 108, or fifty-seven per cent, were directly in contact with wire fences

This is but a repetition of the same old story of heavy losses directly chargeable to the account of the deadly wires. It is a heavy penalty to pay for slackness or ignorance.

Some interesting notes have been added to the reports made by the insurance officials. In Keokuk county an electric bolt struck and burned a barn and killed a steer standing near a wire fence in the barnyard, the wires connecting with the barn. In Jasper county two steers were killed by a stroke that was conducted half a mile along the wires In Taylor county a wire fence attached to a cottonwood tree received an electric charge therefrom of sufficient force to kill stock in contact with the wires ten rods distant. In Clay county nine steers were killed by a stroke that was conducted over the wires 120 rods.

Numerous other facts of similar import might be cited, but these will suffice The conclusion of the whole matter is that in thunderstorms it is not safe for man or beast to be up against wire fences, or under trees The safest place is under a good roof, protected by well grounded rods.

NOVEMBER METEORS.

Prof. S. J. Buck, of the Iowa College at Grinnell, assisted by three of the students of his astronomy class, witnessed a remarkable flight of meteors on the morning of November 15th. In a letter to the Marshalltown *Times-Republican*, Prof. Buck reported that, by facing different ways, the group of observers counted over 100 meteors between the hours of 5 and 6 A. M. The Professor added: "The exhibit of the Leonids had been expected. November 12th to 15th each year is the time when more than the usual number of meteors are visible. Almost any clear night one is likely to see now and then a shooting star. The famous star shower of 1833, when the people seemed to see the stars of the sky falling, is a matter of history. In 1866 another event of the same sort occurred, but not quite so remarkable. So in 1899 astronomers were waiting expectantly, but for the most part to be disappointed. We shall undoubtedly hear from many directions, but how many have been seen this year will have to be determined when the returns are in. Different theories have been proposed to account for the phenomenon. Some suppose them to be of cometary origin, as the earth comes in its rotation around the sun to encounter a

* Copy of paper read before Iowa Mutual Insurance Convention, Nov. 20, by J. R. Sage.

ring of meteoric matter. This meeting our atmosphere becomes incorporated with it, or treated by friction and developing heat thereby, also becoming luminous and showing a trail of light. Some of the meteors seen here were quite brilliant, leaving a trail for quite a perceptible time. Most of them were of very short duration."

NATIONAL BULLETIN FOR NOVEMBER.

ISSUED BY CLIMATE AND CROP DIVISION OF THE U. S. WEATHER BUREAU.

November, 1901, was milder than usual over the western half of the upper Lake region and in all districts westward of the Mississippi River, the temperature averaging from 3° to more than 6° per day above the normal throughout the Rocky Mountain slope, Plateau regions, and interior portions of the Pacific coast districts, the most marked excess occurring in the central and northern Rocky Mountain districts. Eastward of the Mississippi River, except over the western portion of the upper Lake region, the month averaged cooler than usual, the temperature ranging from 3° to 6° per day below the normal in the Ohio Valley, east Gulf States, and in the Atlantic coast districts, the greatest deficiency being shown over the Carolinas and on the central coast of east Florida.

The highest maximum temperature during the month, 86°, occurred at Los Angeles on the 4th, Phœnix and Jupiter on the 5th, and Yuma on the 5th and 6th; the lowest minimum was—8° at Northfield, Vt., on the 29th.

The southern limit of freezing temperatures extends from central Arizona and southern New Mexico eastward through the northern portions of Texas and Louisiana, touching the east Gulf coast at Mobile and the Atlantic coast between Savannah and Jacksonville, zero temperatures occurring in the extreme upper Missouri Valley and northern New England.

The month was very dry throughout the central valleys, Gulf States, Atlantic coast districts, over the greater part of the Lake region, and Rocky Mountain and Plateau regions. From the Gulf coast northward to the Lake region and throughout the Atlantic coast districts the deficiency amounted to more than one inch, and along the immediate Atlantic coast, in the Ohio Valley, Tennessee, west Gulf States and over the western portion of the south Atlantic States it ranged from two to three inches, being most marked in the lower Ohio Valley, Tennessee, and portions of North Carolina and Texas. Nearly the whole of the central valleys received less than two inches, and portions of the Ohio Valley and south Atlantic States less than one inch. Portions of Western Texas, limited areas in the Lake region, the extreme northern portion of the upper Missouri valley, the north Pacific coast, and portions of northern California, received more than the November average, the total precipitation along the north Pacific coast ranging from six to fourteen inches.

At the close of the month the ground was covered with snow along the southern shores of Lakes Superior and Ontario and in the mountain districts of New England and the northern portion of the Middle Atlantic States, depths ranging from two to twenty-four inches being reported over western and northern New York.

NOTE AND COMMENT.

Moses Simon, voluntary observer at Carroll, Iowa, has drained and reclaimed some marshy land on his farm, and utilized the deep and rich soil in the production of a very superior quality of celery and some other garden truck. He has thus performed a valuable service to the farmers of this state, setting before them an object lesson as to the high value of lands which have been regarded as well nigh worthless.

The *Orange Judd Farmer* says: "Much tile is being put in this fall, farmers realizing as never before that well drained land not only gives larger crops during a wet season, but is enabled to withstand drouths more effectively than undrained. In former years much of the tile was laid without first leveling up the ground, leveling the tile or seeing that it had the correct fall. This method was slipshod, and many lines have since been taken up. The cost of surveying and leveling is insignificant compared with the expense of taking up a line of tile or the loss from several lines of tile which fail to discharge to their full extent. No farmer should attempt to put in a system of tile drains without the aid of a surveyor."

* * *

Prof. H. G. Lamson, of Nevada, Iowa, while on his journey to the Philippines to engage in educational work, was stranded for a time in Guam, in the town of Agana, from which place he wrote an interesting letter, which was printed in a late issue of the *Representative*. The following paragraph clipped from his letter indicates that the natives of Guam, as well as some of the people of this country, entertain the notion that climates may be seriously affected by human devices. The professor says: "Some strange tales are told of the natives at the time the ice plant was first put into operation by the Americans. At that time it happened that the weather turned considerably cooler than usual, and the natives were thrown into the greatest consternation, atrtibuting the change to the ice plant, fearing that the climate of the island was to be permanently changed by the mysterious machine. When the first ice came out of the machine a piece was presented to a native who tied a string around it and hung it in a tree till he should go home. It soon melted and when he came to get it only the string was found. He accused a fellow workman of stealing it and a mix-up nearly resulted."

* * *

Prof. C. A. Young, of Princeton, is quoted as an unbeliever in the theory that the moon's phases and changes have a controlling influence over the weather. He says: "It is quite certain that if there is any influence at all of the sort it is extremely slight, so slight that it cannot be demonstrated with certainty, although numerous investigations have been made expressly for the purpose of detecting it. We have never been able to ascertain, for instance, with certainty whether it is warmer or not or less cloudy or not at the time of the full moon. Different investigations have led to contradictory results. As to the supposed connection between 'changes of the moon' and changes of the weather, it should be enough to note that even within the United States the weather changes are not simultaneous (in Kansas and Maine, for instance), as they should be if they were due to the changing phases of the moon. Since, however, a change of the moon occurs every week, every weather change must necessarily occur within about three days and a half of lunar change, and half of them ought to fall within about forty-five hours, even if perfectly independent. Now, it requires only a very slight prepossession in favor of a belief in the effectiveness of the moon's changes to make one forget a few of the weather changes that occur too far from the proper time. Coincidences enough can easily be found to justify a pre-existing belief."

* * *

Mr. K D. McGeehon, a well known nurseryman and small fruit grower, writes that he has been keeping a record of rainfall during the past season, from June 1st to November 1st, at his farm near Atlantic, Iowa. There was a total rainfall of 9.25 inches in 132 days, the amount being very light in July and August, when the mercury in the thermometer was ranging frequently from 98° to 109°. And yet, despite this great heat and drouth, he says, "I have just finished husking a field of corn that made thirty-five bushels per acre of sound corn, and the field was planted May 24th. An acre of potatoes planted May 25th yielded seventy bushels. I plowed a strawberry field, after

picking the fruit, June 25th, and planted it for corn fodder, and at fifty-two days from planting the fodder was seven to nine feet high. On September 18th I cut it up and there were lots of roasting ears on it; it made an immense amount of feed. The land was plowed nine inches deep, turning under the strawberry vines, mulching and weeds. The corn grew right along through the excessively hot weather, and seldom wilted during that period; showing what western Iowa soil will do under the most unfavorable conditions."

* * *

Whatever may be the cause of the aurora borealis, its height does not appear to be limited by the atmosphere. The rays sometimes touch the earth in Scandinavia, coming between the observer and elevated places, but Flogel thirty years ago obtained data showing that a large aurora seen in northern Germany must have had a height of sixty miles, and that th rays often rise to 450 miles, their points glowing with red light.[e] From observations of an aurora of September, 1898, Herr Schaper has made new determinations. It is now calculated that an immense red stripe, observed over a large part of northern Germany, was more than forty miles high, and it must have stretched from Liverpool to Libau, in Russia. A long red band of rays seen simultaneously at Lubeck and Hirschberg, in Silesia, reached a height of 500 miles; while another band was 400 miles high. The light flickered very much, and one portion of the rays moved at a rate of more than forty miles a second.—*Ex.*

* * *

The bird fauna of Iceland is credited by Henry H. Slater with 103 species. Of these thirty-seven are residents, twenty-seven summer migrants, twenty-one occasional visitors, and eighteen rare stragglers. The land birds are few, including only seven residents and five that come in summer to breed. The great auk once resorted to the island, but the most interesting birds now are probably the northern wren, the great northern diver, and the Iceland falcon. Singing birds are few. There are sixteen species of ducks and geese, and seven birds of prey, but the rock ptarmigan is the only game bird.—*Ex.*

* * *

Many people talk about ozone without so much as knowing what ozone is. There is a prevalent idea that it is something you get at the sea, and that it is good for the lungs. What that something is, however, few people have sufficient curiosity to inquire. Ozone is what chemists call an allotropic form of oxygen—that is to say, it is oxygen in a highly active and concentrated condition. In ordinary pure air ozone exists, but only in what chemists call "traces." Larger amounts are found in ocean and mountain air. It instantly disappears when brought in contact with decaying matter, dissipating itself, as it were, in the act of oxidizing that matter.

Ozone is known to occur more plentifully during thunderstorms, and we have, of course, the analogy of its being artificially produced from oxygen by electrical discharges in the laboratory. On the body ozone is believed to act as a stimulant; hence the popular notion of its beneficial effects as experienced by the sea, but in any greater amount than mere traces it is a violent irritant. One authority goes the length of asserting that it is doubtful whether it is beneficial to animal life at all.—*Ex.*

WEATHER AND CROP CONDITIONS.

November was warmer than usual with a general deficiency of precipitation, and more than the usual number of clear days. The cold snap during the first week damaged unharvested potatoes to considerable extent; but the balance of the month was not cold enough to retard plowing or any kind of field work usual to the season. The dry weather was very favorable for harvesting the corn crop, and the time was well improved, the bulk of the crop being secured in excellent condition. The ground is very dry, and stock water is unusually scarce in many localities. The dry weather checked growth of fall wheat and rye, but generally these crops will go into the winter in fair condition Though the grass was shorter than usual, the month was very favorable for grazing, and the pastures yielded a fair supply of feed for stock.

CLIMATOLOGY OF THE MONTH.

BAROMETER.—The mean pressure for the month was 30.18 inches; highest observed, 30.64 inches at Des Moines, on the 27th; lowest observed, 29.54 inches at Davenport, on the 11th; range for the state, 1.10 inches.

TEMPERATURE.—The monthly mean temperature for the state, as deduced from records of 107 stations, was 35.8°, which is 3° above the normal. The highest monthly mean was 43.6° at Belknap, and the lowest 31.2° at Cresco and Estherville. The monthly means by sections were as follows: Northern section, 33.6°; Central section, 35.5°; Southern section, 38.4°. The highest temperature reported was 77° at Baxter on the 1st; lowest temperature 2° at Decorah and Elkader on the 5th. The average monthly maximum was 66.9°; average monthly minimum, 9.7°. The greatest daily range was 45° at Decorah, Baxter, Monticello and Sigourney; average of greatest daily ranges, 36.1°.

PRECIPITATION.—The average precipitation for the state, as deduced from records of 122 stations was 0.86 of an inch, which is .56 of an inch below normal. The averages by sections were as follows: Northern section, 0.83 of an inch; Central section, 0.84 of an inch; Southern section, 0.90 of an inch. The largest amount reported was 2.30 inches at Lenox; least amount, 0.20 of an inch at Murray. The greatest daily rainfall reported was 2.02 inches at Albia on the 2d; the average number of days on which .01 of an inch or more precipitation was reported, 3.

WIND AND WEATHER.—The prevailing direction of the wind was northwest; highest velocity reported, 44 miles per hour, at Sioux City, on the 6th. The average number of clear days were 18; partly cloudy, 6; cloudy, 6.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date
Davenport	30.16	30.61	27	29.54	11
Des Moines.	30.21	30.64	27	29.62	11
Dubuque	30.18	30.62	27	29.70	11
Omaha, Neb	30.17	30.54	27	29.58	11
Keokuk	30.17	30.61	28	29.71	11
Sioux City	30.20	30 58	15	29.59	6
.....	.....	.....	....	.....	....
Means	30.18	30.64	27	29.54	11

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity.	Direction.	Date.
Davenport	5,414	32	W	6
Des Moines	5,509	42	SW	6
Dubuque	5,859	34	NW	3
Keokuk	5,468	36	SW	11
La Crosse, Wis	5,617	28	S	2
Omaha, Neb	6,060	35	N	2
Sioux City	8,817	44	NW	6
.....	....	..	...	....

OBSERVERS' NOTES.

OBSERVERS' NOTES

BONAPARTE—*B. R. Vale.* Very dry, but mild month, fine for feeding, but much lack of stock water; 15.04 inches of precipitation since January 1, 1901.

BRITT—*Geo. P. Hardwick.* Wintry from 3d to 7th, and first half of month quite changeable; last half mild and ground not frozen to hinder plowing; corn nearly all husked by close of month.

CLINTON—*Dr. Luke Roberts.* A fine month but deficient in rainfall, the amount being only .82 of an inch; mean temperature 1.2° below normal; highest velocity of wind 23 miles per hour.

COLUMBUS JUNCTION—*H. E. Simpson.* A very clear, dry month. There were 59 meteors observed between 1 and 4 A. M. on night of 15th, the most of them radiating from Leo. Probably no more than usual November display.

CRESCO—*Anthony Marshall.* Temperature 2.4° above 20-year average; precipitation 1.31 inches below average for 20 ye .rs

ESTHERVILLE—*Leslie Littell.* Corn husking finished, and farmers are ready for winter. The snowstorm at beginning of month caused men to improve the fine weather that followed.

GRUNDY CENTER—*E. S. King.* A fine month for fall work. The freezing weather on 3d and 4th damaged potatoes badly.

GUTHRIE CENTER—*W. T. Braun.* Weather has been ideal since the 6th; corn all husked; fall wheat fair, but not much sown; good per cent of corn cut up

HUMBOLDT—*H. S. Wells.* A good month for fall work; plowing done; corn nearly gathered; stock doing well.

JEFFERSON—*Isaac Young.* On evening of October 30th John Boyle's barn was struck by lightning and burned, with sheds, corn cribs and warehouses. Nine horses, 6 milch cows, 1 thoroughbred bull, 5,000 bushels of old corn, 300 bushels of wheat, and 70 tons of hay were consumed.

OLIN—*Nathan Potter.* One of the finest Novembers within remembrance, dating from 1844.

RIDGEWAY—*Arthur Betts.* A mild November, and ground not yet frozen on December 1st; grass green; wild flowers observed; a large meteor on early morning of 14th lighted up the skies; 220 hours of sunshine.

BELATED REPORT.

MOOAR—October. Mean temperature, 55.6°, highest, 84 on the 3d; lowest, 27 on the 14th; greatest daily range, 53; total precipitation, 1.52 inches; greatest in 24 hours, .44 inch; prevailing direction, southwest; number of clear days, 21; partly cloudy, 2; cloudy, 8; rainy, 4.

HAILSTORM LOSSES—1900-1901.

Five mutual insurance associations, organized to afford indemnity for losses due to hailstorms in Iowa, have made reports as to the number of claims of losses they have adjusted in the different counties of the state, and the dates on which the storms occurred. These reports have been tabulated, and the exhibit is made in a table published in this issue. The figures in the tables show the number of farms on which losses occurred during the past two seasons—1900 and 1901. It is an interesting showing to those who desire to study the climatology of this region, as well as to the members of the associations organized to protect themselves against loss by that class of casualties. It may be added that the hailstorm losses in 1900 greatly exceeded in number and extent the reports for the current season.

LOSSES BY HAILSTORMS, 1900 AND 1901—DATES AND NUMBER OF CLAIMS ADJUSTED BY FIVE IOWA COMPANIES.

COUNTIES.	APRIL	MAY	JUNE	JULY	AUGUST	SEPT.	Total.
	DATE.	DATE.	DATE.	DATE.	DATE.	D'te	
	24 26 27	4 10 13 14 28 29 30 31	2 3 4 5 6 8 9 10 11 12 15 16 17 18 19 20 21 22 25 26 27 28 29 30	1 2 3 4 5 6 7 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 29	9 10 11 12 13 14 15 16 17 18 20 21 22 23 24 25 31	11 14	
Adams				1			1
Audubon			2	1 6	6 4		19
Adair		4		1 20 1 3	1 2 1 1 2		37
Appanoose		1			1		2
Benton	2		4	2			8
Buena Vista		3	4	15 3 5 3 1	1 1 1 7 1 11		56
Black Hawk			1				1
Boone				1 4 1 2	1 1 2 1 1 6		20
Buchanan				2 1			3
Butler				2			2
Calhoun		2	1 1 1	2 11 3 1 1 2	1 3 1		30
Cherokee	1 27		2 1 3 1	2			46
Crawford				1 5 1 1 1 5	3 1		12
Carroll				20	1 5 1 2 1		36
Clay		1 1	3 18	3 1 1 1 1			40
Cass		1 1 1 4		11 4 4	10 7 2		35
Cedar							7
Chickasaw			2		7		2
Dickinson		1	4	1 2 1	1 1 1 2		14
Dallas							5
Emmet	1	17 1	1	1 3 1	5		42
Franklin			1 1		15 1 1		4
Fayette				3 1			3
Fremont	3 1	1	1 83 44 1 7	1	1		159
Greene			3	4 1 6 90 9 3 9 1 3 2	2 4 1 1 1 1 6		276
Grundy				5 2 1 3	1 13 107 14 6		8
Guthrie			1	1 2			19
Hancock				1 1	1 3 1 8 1		2
Harrison			3 11	32 1 14 29 3 1	1 27 9 3 3	1 9	147
Hardin				2	3		5
Humboldt				6 1			8
Hamilton				2 1	1		4
Ida		3	4 1 1	1 1 3	18 3 21	1	57
Iowa	1 1						6
Jasper		2 1	1 1 1	1 1	1 2 1		9
Johnson					1		1
Kossuth		13	1 1		1		18
Louisa			1	1 2	1		3
Lyon		1 7 1			1		54
Monona	1 1		1 1 1 5 22 1	7 1 1 2 1 2			28
Montgomery		5 1 1	4	2 13	1 6		26
Marion			2 1		1 13 1 1 1		34
Madison			2	1 4 1	7 9 15 2 1		11
Marshall		1	4 2	3 5 1 3 1	1 1		142
Muscatine				3	1 1 109 4 2 1 2 1	1	1
Mills					1		18
Mitchell				3 1		8 1	1
O'Brien	1 1 2 2	11	1 1 4 1	1 44 104 4 2 14 9 4	2 4		204
Osceola		33		3 2 2	1 2		45
Page	1 1		1 6 1	1	3 1		32
Plymouth	1 3	6	6 1 1 5 8	1 23 19 2 2 14 2 3 1 1 11 15	1 1 2 6 13		137
Palo Alto		21 1	1 3	4 1	1 2 5 20 33 4 5 5 2 1 1 6		117
Polk			12 1	3 1	8 1 1		24
Pocahontas	2			1			6
Pottawattamie			3 1	1			2
Poweshiek				1 1		1 2	4
Ringgold				1			4
Sioux	1	15	2	1 5 3 4	3 1		4
Shelby	1		1	78 1 4 13	10 2		45
Sac		1	4 3	1 2 28 13 2 2 1	2 5 6 2 7		100
Scott		11	2	6 1 2	1		1
Tama				1 4 2	6 1 17 1		47
Union	1 1 1	8	63 1 26 2	1 7 1	1		4
Woodbury		6	1	1 2	116 53 43 9 5 3 60 2 1		398
Washington		1	19 1 2 2 1 3 1	1	1		7
Winnebago			10 2	1	1 1 2 1		37
Wright			31 1 27 1 1 1		1 1	1	14
Winneshiek					2 60 1 1 2		62
Webster							66
Warren							

Total - 2,903

CLIMATOLOGICAL DATA FOR NOVEMBER, 1901.

NORTHERN SECTION.

STATIONS.	COUNTIES	Elevation, feet	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIP., IN INCHES				Number rainy days	SKY			Prevailing direction of wind	DATES OF THUNDER-STORMS.
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall (unmelted)		Number clear days	Number partly cloudy days	Number cloudy days		
Algona	Kossuth	1,500	8	33.3	†3.9	64	1	11	16, 17	32	1.17	†.13	.80	1.0	2	14	12	4	NW	23
Alta	Buena Vista	1,519	6	34.0	†5 0	67	1, 2	10	4	38	1.22	† 22	1.12	0 7	4	18	8	4	NW	2
Alta (near)	Buena Vista	....	....	.....		....	.....	...	... .	.....	1.17	.....	1.12	....	3	..	....	....	.....	
Britt	Hancock	1,230	....	32 0	.....	61	1, 2	6	4	33	.81	....	.40	2 0	3	14	13	3	NW	
Charles City	Floyd	1,012	9	32.4	†3.1	63	1	6	5	32	.50	- .84	.35	3 0	2	18	4	8	NW	
Clear Lake	Cerro Gordo	984	....	37.4	....	74	1	9	4	39	.65	....	.40	2.5	2	19	8	3	NW	
Cresco	Howard	1,280	28	31.2	†1.8	67	1	6	5	43	.50	- 95	.20	4 0	3	19	3	8	NW	
Decorah	Winneshiek	900	7	31.4	†1.1	62	2	2	5	45	1.46	- 07	.80	3 0	4	....	....	....	.....	
Dows	Wright	1,142	..	33 0	....	64	1	6	4	33	.58	.....	.40	2 0	2	23	0	7	NW	
Elkader	Clayton	600	19	34.8	†3.5	69	1	2	5	38	.87	- .85	.70	5 0	2	15	10	5	NW	
Estherville	Emmet	1,298	....	31.2	.....	66	1	6	17	38	1.16	.....	.90	1.5	5	23	3	4	SW	2
Fonda	Pocahontas	1,237	....	.....	.....	....	.....	.....	... .		1.22	.....	1.10	0.8	2	19	9	2	S	
Forest City	Winnebago	1,220	....	33.4	.....	66	1	5	5	35	57	.....	.57	0.5	1	21	3	6	W	
Grand Meadow	Clayton	1,180	9	32.6	†2.1	62	2	5	5	27	.70	- .92	.60	7 0	2	14	6	10	SW	
Greene	Butler	943		33 6		66	1	7	5	36	.32	.....	.22	3 0	2	17	3	10	SW	
Hampton	Franklin	1,240	10	35.0	†5.3	61	11	8	4	42	.65	-1.14	.45	1.5	2	14	12	4	NW	
Humboldt (a)	Humboldt	1,082	7	33.9	.....	65	1	8	17	36	.57	- .33	.22	2.0	4	20	6	4	NW	
Le Mars	Plymouth	1,224		35.1	.....	67	1	10	16	37	.60	.....	.55	T	2	22	3	5	S	
New Hampton (a)	Chickasaw	1,166		31 5		61	1	5	5	30	.59	....	.30	4.0	3	13	5	12	NW	
Northwood	Worth	1,210	....	37.6	.....	63	2	7	5	30	.51	....	.30	3 0	3	17	7	6	NW	
Osage	Mitchell	1,178	9	31 9	†5.5	58	1	8	4,5	37	.94	- .54	.55	4.0	3	11	6	13	NW	
Plover	Pocahontas	1,426	..	34.1	.....	67	2	9	4	37	1.22	.....	90	0.8	3	24	0	6	S	
Ridgeway	Winneshiek	1,215		34 4	.....	64	2	8	4,5	42	1.50	.... ..	60	6 5	6	14	12	4	NW	6, 22
Sheldon	O'Brien	1,406	..	33.5	..	70	1	9	16	41	.83	....	60	4.0	3	22	1	7	S	
Sibley	Osceola	1,506	7	33.6	†5.8	69	1	10	4,16	42	.70	- .33	.65	0.5	2	16	10	4	S	
Sioux Center	Sioux	.....	....	34.7	.....	67	1	10	4,16	34	.73	....	.68	....	2	22	2	6	N	
Storm Lake	Buena Vista	1,440	11	34 4	.....	65	1	11	4,16	31	1.18	† .39	.97	0.7	4	19	6	5	S	2
Washta	Cherokee	1,157	....	.....	.....	....	.... ..	...	.. . .	..	90	.....	.90	....	1	20	7	3	S	
Waverly	Bremer	942		33.5	.....	63	1	8	5	36	.48	....	.30	3.0	3	17	6	7	SE	
West Bend	Palo Alto	1,197	7	33 4	†5.7	66	1	10	17	35	.75	- .81	.50	1 0	3	13	12	5	NW	
West Union	Fayette	1,115	..	.....		....	.. ..	.....	. . ....	....	.80	....	.60	8.0	2	15	0	15	NW	
Average		....	....	33.6	†3.9	65 1	.....	7.5	... .	36,3	0 83	- .39	....	2.8	3	18	6	6	NW	

CENTRAL SECTION

Amana	Iowa	721	24	35.1	†3.1	67	11	8	17	34	.93	- .81	.48	1.0	3	20	6	4	NW	
Ames	Story	936	20	37.9	†6.1	68	1	11	5	38	.67	- .55	.52	3.0	4	23	2	5	NW	
Baxter	Jasper	998		35.8	.....	77	1	8	4	45	.43	.....	.23	2.0	2	21	3	6	NW	
Belle Plaine (c)	Benton	840	10	33.7	†1.4	67	11	6	4	31	1.00	- .66	.75	6.0	2	13	12	5	NW	
Buckingham	Iowa	.....	...	...		.....	.....		.....	....	.67	....	.52	....	2	17	9	4	....	
Carroll	Carroll	1,265	10	37.0	†5.9	68	2	11	4,17	37	1.14	† .06	1 14	2 5	1	23	2	5	.....	
Cedar Rapids	Linn	744	18	36.2	†1.6	69	11	12	17	35	.61	- .89	.26	.5	4	20	5	5	NW	
Clinton	Clinton	609	9	33.9	†0.3	67	11	10	16, 17	38	.82	-1 17	.30	T	4	17	6	7	NW	11
Davenport	Scott	615	30	36.8	-0.5	68	11	15	16	35	79	-1.10	.26	T	4	18	6	6	W	
Delaware	Delaware	1,048	9	32 5	†3 0	65	11	7	5	40	.48	-1.28	.22	3 5	4	14	11	5	NW	
Denison	Crawford	1,192	7	35.0	†3 3	66	1, 2	11	17	37	.61	- .39	.51	1.0	2	22	4	4	N	
Des Moines	Polk	867	23	37.6	†0.6	67	1	13	4	33	.40	-1.14	.40	2.0	1	17	9	4	NW	
De Soto	Dallas	866		37.3	.....	65	2	13	17	28	1.20	.... ..	1.20	2.0	1	21	0	9	SW	
Dubuque	Dubuque	655	28	35 3	†0.3	68	11	12	4	39	.67	-1.24	.30	4 7	4	10	12	8	NW	
Fort Dodge	Webster	1,126		34.2	.....	68	1	8	17	38	.90	.... ..	.70	2 0	2	16	7	7	NW	
Galva	Ida	1,290	7	34.6	†4.7	68	2	10	17	37	2.00	† .83	2.00	....	1	23	0	7	.... ..	
Gilman	Marshall	1,053		...	.....		... .	.....	....	.....	.43	.....	25	1.8	2	20	4	6	N	
Grinnell	Poweshiek	1,011	10	35 1	†0.6	65	11	10	4	35	.66	- .87	.50	0.5	2	15	8	7	NW	
Grinnell (near)	Poweshiek	.....	..	34 9	.....	66	1, 11	6	4	34	1.07	.....	.80	4 0	2	15	6	9	SW	
Grundy Center	Grundy	966	9	34 0	†3 4	67	1	3	4	36	.89	- .11	.70	3.0	3	22	3	5	NW	
Guthrie Center	Guthrie	1,077		36.8		68	1, 2	10	4	37	1 33	....	1.13	2.0	1	20	7	3	SW	
Harlan	Shelby	1,192	....	35.7	....	63	1, 2	12	16	35	.67	..	.32	1.5	3	15	9	6	NW	
Independence	Buchanan	921	38	33 2	†1.2	65	11	5	4	34	.32	-1.09	.25	3.2	3	19	9	2	NW	
Iowa City	Johnson	644	10	35 4	-0.4	72	1	9	17	40	.79	- .93	.28	1 0	3	18	8	4	S	
Iowa Falls	Hardin	1,107	7	32.3	†2.6	63	1	6	4	34	.49	- 86	.30	3.0	3	19	3	8	NW	
Jefferson	Greene	1,052	..	....	....	.....	....	...	.....	....	1.41	.....	1.40	....	3	..	....	....	NW	
Le Claire	Scott	576	..	.....	.....	.....	.....		.....	....	1 16	.... ..	.38	0.5	6	....			.....	
Logan (a)	Harrison	928	35	36 4	†1.5	74	11	13	16	40	.94	- .12	.62	3.0	3	....	....	....	S	
Maquoketa	Jackson	688	7	37.0	†1.2	72	11	8	7	42	.51	-1.05	.22		3	22	2	6	NW	
Marshalltown	Marshall	947	....	35.6	.....	67	1, 11	9	4	34	.77	....	.65	3 1	2	15	7	8	NW	
Monticello	Jones	800	46	33.8	†0.6	65	2	9	17	45	.84	-1.41	.48	3.0	3	17	8	5	NW	
Mt. Vernon	Linn	847		36.0	.....	69	1	10	4	35	.97	..... .	.48	4.7	5	20	5	5	S, NW	
Newton	Jasper	958	13	35.5	†2.8	65	1, 11	8	4	35	.83	-1.04	.75	4.0	2	19	6	5	NW	
Odebolt	Sac	1,356	..	35.2	.....	62	30	11	4, 16, 17, 18	33	.88	.....	55	2 0	2	24	1	5	.....	
Ogden	Boone	1,109	....	35.2	.....	67	1	6	4	34	.87	.....	.75	2.0	2	25	0	5	SE	
Olin	Jones	760	....	33 8	.....	67	11	9	17	40	1.co	.....	.63	2 c	4	20	4	6	.....	
Onawa	Monona	1,053	...	37.8	.....	69	1	13	16	34	1.45	.....	1.34	0.5	3	26	3	1	NW	
Perry	Dallas	975	...	37.2	.....	70	1	8	4	33	1 00	.....	1.00	....	1		..		.....	
Rockwell City (a)	Calhoun	1,219	....	35.4	.....	65	1	11	4	30	.73	.....	.48	....	2	22	3	5	.....	
Sac City	Sac	900	21	35.2	†2.1	67	2	8	5	30	1 11	- .05	.52	1.5	3	20	7	3	S	
Scranton	Greene	1,172		36 6		66	2	9	16	43	.82	...	.82	1.0	1	22	6	2	S	
Sioux City	Woodbury	1,122	12	36.8	†2.8	69	1	15	16	34	.56	- .26	.55	0.2	3	16	7	7	NW	
Tipton	Cedar	807	....	36.1	.....	68	11	11	17	32	1.00	....	.60	T	3	17	3	10	NW	
Toledo (a)	Tama	856	6	36.2	†3.2	67	1, 11	5	4	42	.75	- .55	.50	....	2	15	7	8	S	
Vinton *	Benton	800	10	34.2	†1 4	.	.....	8	4		.35	- .84	.30	3.5	2	26	0	4	NW	
Waterloo	Black Hawk	862	21	34.3	-2.3	67	1	8	4	35	.84	- .59	. .69	3 0	2	13	10	7	NW	
Wilton Junction	Muscatine	683	....	35.8	...	67	3	8	17	42	.91	.....	.45	T	3	18	4	8	W	
Average		....	....	35.5	†1.9	67.4	.....	9 4	.....	36.3	0.84	- .70	.....	2 1	3	19	5	6	NW	

CLIMATOLOGICAL DATA FOR NOVEMBER, 1901--CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PREC. IN INCHES.					SKY.			Prevailing direction of wind.	DATES OF THUNDER-STORMS
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).	Number rainy days.	Number clear days.	Number partly cloudy days.	Number cloudy days.		
Afton	Union	1,212	....	38.4	....	66	2	14	4, 17	32	1.17	.....	.77	4.0	3	15	11	4	NW	
Albia	Monroe	945	..	37 0	.....	65	1	8	22	40	2.02	.....	2.02	5 0	1	14	4	12	NW	
Atlantic	Cass	1,164	9	36.7	†4.2	69	2	11	16, 17	36	.72	- .02	.67	0 5	2	13	10	7	NW	
Audubon	Audubon	1,301	....	36.6	.....	67	2	14	4	32	.25	.....	.25	....	1	18	3	9	.....	
Belknap	Davis	857	....	43 6	.....	70	1,11.13,12 21	15	4	43	.93	.....	.67	..	2	25	3	2	NW	
Bonaparte	Van Buren	.....	9	38 2	†2.0	70	11	9	17	39	.82	-1.10	.52	....	2	....	....	....	.....	
Burlington	Des Moines	544	..	39.2	.....	71	1	13	17	37	.77	....	.40	....	3	21	2	7	NW	
Bussey	Marion	....	....	.....	.....	....	.....	.....	.....	.....	.55	.....	.55	3.0	2	....	....	....	.....	
Centerville (*a*)	Appanoose	1,013	....	40.6	.....	69	1	12	17	34	.78	.....	.62	....	3	22	3	5	S	
Chariton	Lucas	1,030	....	37.8	.....	67	1	11	4, 17	37	.58	.....	.55	4 5	1	15	9	6	NW	
Clarinda	Page	1,069	10	39.2	†3.4	71	1, 2	14	17	38	1.30	† .36	1 15	3 5	4	19	5	6	S	
College Springs	Page	.....	9	39.2	†2.1	67	2	13	16	32	1.00	† .22	.90	....	2	24	3	3	SW	
Columbus Junct	Louisa	595	....	36.5	.....	69	11	12	17, 28	37	80	.....	.23	T	6	19	8	3	SE	
Corning	Adams	1,127	8	37.0	†1.2	63	1, 2, 11	13	16	31	1.50	† .62	1.35	4.0	2	19	5	6	SW	
Council Bluffs	Pot'wat'mie	990	....	40.9	.....	68	2	18	4, 16	33	.88	....	.80	....	2	17	6	7	NW	
Cumberland	Cass	.....	....	.....	..	.....	.....	.....	.....	.....	1.24	.....	1.00	.	2	21	3	6	N	
Danville	Des Moines	715	....		.....	.....	.....	.....	.... ..	.....	.72	.....	.50	....	2	22	0	8	.....	
Eldon	Wapello	630	....	37.6	.....	70	1	6	17	38	.75	.....	.52	1.0	2	19	5	6	E, NW	
Fort Madison	Lee	516	52	.....	.....	.....	.....	.....	.....	..	.79	-1.40	.43	....	4	12	9	9	SW	
Glenwood	Mills	979	30	39.5	†5.6	67	2	15	16, 17	40	.60	- .31	.50	1.5	2	7	18	5	NW	
Greenfield	Adair	....	9	37.5	†3.7	66	1	11	4	32	1.39	† .39	1.07	2.6	3	21	7	2	NW	
Hopeville	Clarke	.....	..	37.6	.....	65	1, 2	13	4	31	.88	....	.81	....	3	17	9	4	NW	
Indianola (*b*)	Warren	969		37.3		68	1	12	4, 18	36	.39	.....	.39	2.0	1	....	....	....	NW	
Keokuk	Lee	619	29	39.2	†0.2	70	11	14	17	35	.80	-1.15	.38	0.1	4	18	6	6	NW	
Keosauqua (*a*)	Van Buren	664	8	39.2	†2.1	70	11	10	17	32	1.22	- .07	.72	0.1	5	....	....	....	.....	
Knoxville‡	Marion	910	....	38.3		68	1	12	17	33	.27	.....	.27	....	1	18	8	4	NW	
Lacona	Warren	....	....	.....	.....	.....	.....	.....	... .	.....	.70	.....	.60	2.0	2	11	16	3	.....	
Lenox	Taylor	1,250	....	37.7	.....	67	2	13	4	39	2.30	.....	1.75	1.5	3	24	3	3	SE	
Mt Ayr	Ringgold	1,236	7	38.8	†3.4	68	2	13	4	32	1.28	† .02	1.06	5.0	2	15	9	6	NW	
Mt Pleasant	Henry	725	..	35.4	.....	71	11	6	17	41	.72	.....	.60	T	2	21	6	3	NW	
Murray‡	Clarke	1,183	....	.....	...	.....	....	.....	... .	.....	.20	... ..	.20	2.0	1	....	....	....	.....	
Omaha, Neb	Douglas	1,113	31	40.2	†3 6	67	2	19	16	35	.56	- .45	.48	1.4	4	13	11	6	N	
Oskaloosa	Mahaska	850	17	36.6	†0.9	68	1, 11	8	17	34	.35	-1.31	.30	2.6	3	22	0	8	.....	
Ottumwa	Wapello	630	6	38.6	†2.2	70	11	13	17	33	.68	- .95	.68	T	1	20	7	3	NW	
Ovid	Wayne	992	7	39.2	†3.5	70	1	9	4	40	.87	- .49	.82	4.0	2	10	6	14	NW	
Pacific Junction	Mills	960	...	38.8	.....	67	2	11	17	33	.80	....	.38	1 5	4	16	7	7	S	
Pella	Marion	877	....	38.4	.....	70	1	10	4	38	.53	.. ...	.53	3.0	1	22	0	8	NW	
Red Oak	Montgom'ry	1,033		40.0	.....	68	2	17	16	40	.74	.....	.38	3 0	3	9	17	4	NW	
St. Charles	Madison	1,070	..	39.7	.....	70	1	13	4, 17	34	.55	.....	.50	2.0	2	19	8	3	NW	
Sigourney	Keokuk	768	...	38.2	....	69	11	10	17	45	.81	.....	.51	1.0	3	21	7	2	NW	
Stockport	Van Buren	.....	....	.....	.....	.....	....		.....	.....	.59	.....	.35	T	2	13	8	9	NW	
Thurman	Fremont		.....	37.4	.....	67	2	13	16	37	1.60	.....	1.10	..	2	15	9	6	NW	
Wapello	Louisa	578	..	38.7	.....	65	1. 2	13	17	35	1.10	....	.51	....	4	21	6	3	NW	
Washington (*c*)	Washington	769	10	34.9	-0.7	69	1	8	17	36	.77	- .69	.45	....	3	....	....	....	NW	
Winterset (*b*)	Madison	1,129	9	37.8	†4.1	69	1	12	4	31	1.11	- .07	1 11	4 0	1	....	....	....	.....	
Woodburn	Clarke	961	....	.....	.....	..	.....	.....	.....	.....	.85	.....	.83	2.2	2	27	2	1	NW	
Average		.....	..	38.4	†2.6	68.2	.....	12.1	.....	35.8	.90	- .38	.....	2.8	2	18	7	5	NW	
Av. for the state		.....	....	35.8	†2.8	66 9	.....	9.7	.....	36.1	.86	- 49	.....	2 6	3	18	6	6	NW	

*Means determined from 7 A. M., 2 P M, and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A.M, and 7 P. M. observations. ‡Received too late to be computed with means. *a*, One day missing; *b*, two days, etc.

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR NOVEMBER, 1901—CONTINUED.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Le Mars...	Max,..	67	61	35	28	43	38	37	54	47	55	55	52	52	48	44	38	39	38	46	48	49	40	41	45	45	50	47	58	57	55	....	47.1
	Min .	32	31	21	12	17	18	18	32	20	32	29	28	29	28	15	10	11	26	20	12	34	28	27	27	15	19	20	21	27	33	....	23.1
Lenox.....	Max...	63	67	60	31	34	56	47	55	47	57	63	47	56	48	36	37	39	35	45	48	55	49	41	52	45	48	42	52	57	61	...	49.1
	Min...	37	46	21	13	19	30	25	28	26	33	41	23	32	28	18	14	16	17	20	21	36	28	29	28	17	23	28	21	33	32	....	26.3
Logan.	Max...	62	67	37	..	36	35	55	39	67	56	74	53	58	44	35	37	42	37	46	49	55	37	41	50	44	51	44	55	55	52	....	48.7
	Min ..	40	37	26	16	19	15	..	23	27	30	..	35	20	25	17	13	15	27	20	17	26	29	31	..	17	21	26	24	30	28	....	24.2
M aquoketa	Max...	65	67	64	37	36	68	58	53	52	55	72	52	62	51	40	38	46	49	48	54	56	51	41	41	44	50	42	42	59	58	....	51.7
	Min ..	32	30	22	15	13	27	31	18	26	24	43	26	27	30	24	12	8	11	10	11	13	32	29	33	23	18	21	12	29	20		22.3
Marsh'lt'n.	Max ..	67	59	57	27	31	57	45	56	47	53	67	48	55	43	37	35	36	37	45	49	55	46	39	45	40	49	38	49	52	55	....	47.3
	Min...	33	39	22	9	12	26	26	26	26	28	37	24	33	27	20	14	11	11	14	15	28	28	29	33	18	21	21	19	32	26	....	23.9
Monticello.	Max .	64	65	55	35	35	63	53	54	53	66	48	44	50	52	35	33	38	42	40	45	50	46	35	38	37	42	35	48	45	51	...	46.6
	Min...	35	35	11	10	10	18	30	21	20	37	37	24	28	29	22	22	9	10	13	14	12	28	28	24	20	18	19	13	14	23	....	21.1
Mt. Ayr ...	Max...	66	68	61	32	37	59	49	58	52	58	65	65	58	45	35	39	43	36	47	50	57	47	41	53	44	52	45	53	59	64	....	51.6
	Min..	36	46	22	13	20	29	25	25	27	33	44	23	29	30	19	14	17	16	18	22	36	29	30	28	17	23	28	20	33	32		26.1
Mt.Ple's'nt	Max...	65	66	58	29	37	64	60	56	53	55	71	48	55	48	39	35	35	36	41	45	54	50	40	45	40	48	40	42	53	55	..	48.8
	Min...	30	35	24	12	18	23	29	25	20	19	44	23	23	28	21	11	6	9	12	12	21	34	27	30	20	16	18	11	33	24	....	21.9
Mt.Vernon	Max...	69	65	29	30	32	62	42	52	51	58	66	47	54	38	38	34	41	42	43	49	52	41	36	36	36	47	36	38	48	54	....	45.5
	Min...	34	52	23	10	19	27	31	26	29	30	42	26	33	27	24	16	16	18	19	21	31	32	32	32	21	23	22	19	33	24	....	26.6
NewH'pton	Max...	61	59	25	25	27	50	41	51	45	47	60	41	48	42	35	30	36	..	40	46	52	43	36	37	35	40	33	40	46	48	..	42.0
	Min...	32	32	16	7	5	23	24	24	25	30	36	22	22	26	12	13	11	..	10	18	26	29	26	26	13	20	17	18	17	28	....	21.0
Newton....	Max...	65	58	55	26	32	56	48	56	50	55	65	48	53	47	37	35	35	36	44	48	54	50	39	43	42	48	44	48	51	52	....	47.4
	Min...	35	42	20	8	15	27	27	24	35	30	30	23	22	28	20	13	11	12	17	16	30	28	26	32	18	20	23	16	32	28	....	23.6
Northwood	Max..	61	63	43	24	33	48	37	52	40	48	56	44	50	42	34	32	35	32	45	46	52	43	39	43	35	43	36	46	49	52	....	43.4
	Min...	32	39	15	9	7	26	20	25	23	30	29	22	30	25	18	11	12	13	15	19	26	25	24	30	15	20	18	20	29	28	....	31.8
Odebolt....	Max ..	56	55	40	27	34	50	37	54	47	60	59	51	53	43	35	38	40	35	45	50	53	41	42	47	45	52	40	54	55	62		46.7
	Min...	32	40	21	11	17	31	21	30	20	31	36	21	29	28	17	11	11	11	20	19	33	27	28	35	14	24	22	22	23	29	....	23.8
Ogden... .	Max...	67	62	..	30	32	55	41	56	41	56	61	51	56	37	37	39	40	33	47	48	55	41	41	45	45	52	42	57	56	62	....	47.8
	Min.	34	45	18	6	15	29	24	25	22	30	30	26	29	24	16	10	10	11	17	14	34	24	26	31	14	21	20	18	27	27	....	22.6
Olin..	Max...	59	64	63	25	33	60	54	51	41	51	67	46	53	44	36	31	34	35	38	42	50	54	35	38	36	39	32	38	47	49	....	44.8
	Min...	31	33	23	13	13	26	32	21	27	27	45	26	29	30	23	13	9	12	13	11	12	21	29	29	22	20	20	20	32	25		22 4
Omaha, N.	Max..	66	67	40	30	40	54	42	58	49	60	63	57	58	45	37	41	39	35	48	52	57	38	44	52	49	52	46	58	58	63	....	49.9
	Min. .	45	32	26	20	24	30	25	35	27	38	39	29	38	30	20	19	23	31	27	25	38	30	31	32	25	32	33	31	38	41	....	30.5
Onawa.....	Max...	69	66	39	32	35	48	45	57	51	57	55	57	58	50	38	42	42	43	55	52	66	48	47	54	50	49	46	57	58	61	....	50 9
	Min...	35	35	23	15	21	28	21	31	23	33	37	19	26	25	16	13	15	27	19	16	34	28	29	32	15	21	25	23	27	31	....	24.8
Osage.....	Max...	58	55	53	22	30	45	35	48	39	48	57	40	47	39	33	29	33	31	40	41	50	42	37	37	32	40	33	41	44	45	....	40.8
	Min...	35	41	16	8	8	26	23	25	25	32	31	23	30	26	19	12	12	15	17	19	29	26	26	30	16	20	19	21	31	29	....	23.0
Oskaloosa .	Max...	68	62	57	28	37	60	48	57	48	57	68	49	55	43	39	35	37	38	48	49	56	45	40	44	39	51	37	50	55	58	....	48.6
	Min...	34	44	23	11	20	31	28	25	26	30	40	25	32	26	20	13	8	12	14	15	30	30	29	30	19	21	25	16	33	27	....	24 6
Ottumwa ..	Max...	64	64	60	32	40	62	44	58	48	58	70	48	55	42	39	36	36	37	47	47	54	48	42	46	40	32	40	48	54	58	....	48.3
	Min..	40	46	27	17	26	34	32	28	29	33	39	28	39	32	22	17	13	16	20	22	32	35	32	36	24	28	27	22	38	32	....	28.9
Ovid.....	Max...	70	67	62	35	38	62	47	58	51	58	67	53	64	48	42	44	44	45	53	54	59	47	37	54	47	55	48	52	66	65	....	53.1
	Min...	37	43	22	9	20	30	27	26	28	30	47	22	31	26	19	11	11	11	19	20	32	29	30	32	16	25	24	18	32	30		25.2
Pacific Jct.	Max..	65	67	52	34	42	56	42	57	48	59	60	54	58	45	37	41	41	37	46	51	56	44	43	53	46	52	45	55	56	62	....	50.1
	Min .	36	50	25	18	24	40	25	30	25	34	38	21	28	28	19	14	11	28	19	18	38	29	32	32	19	27	32	25	29	29	.	27.4
Pella....	Max..	70	62	56	35	39	60	58	57	49	59	68	52	59	44	41	40	41	49	52	52	56	49	46	49	46	51	58	59	56	62	....	52.5
	Min...	35	42	23	10	13	29	27	25	23	39	30	24	35	28	20	13	11	16	17	12	19	30	18	24	22	18	34	32	30	28		24.2
Perry.....	Max .	70	65	45	41	35	58	49	47	47	56	62	50	53	37	37	36	36	32	45	49	56	45	42	46	41	52	40	52	53	61	....	47.9
	Min...	53	42	21	8	19	31	26	25	25	49	36	21	31	26	19	19	10	13	12	17	33	27	30	32	33	22	22	20	32	37	....	26.4
Plover.....	Max...	62	67	30	23	34	52	42	54	45	54	55	49	51	..	34	35	34	35	45	51	54	40	44	49	40	44	39	50	51	59	....	45.6
	Min ..	40	42	18	9	15	22	20	30	19	30	42	19	30	25	15	12	10	10	15	18	17	20	25	34	15	22	21	23	30	29	....	22.6
Red Oak...	Max...	63	68	44	35	53	57	42	55	49	58	64	56	56	45	36	37	41	41	45	60	57	49	46	52	46	55	51	50	50	59	....	50.7
	Min...	39	42	27	22	25	36	27	32	28	37	42	27	30	30	21	17	20	28	22	20	41	32	32	32	23	28	31	28	30	30	....	29.3
Ridgeway .	Max...	61	64	56	25	31	49	39	50	45	52	62	42	52	41	38	37	43	39	42	48	52	45	37	39	40	42	39	42	50	47	....	45.0
	Min...	34	42	14	8	8	26	28	23	27	32	37	23	31	26	20	13	15	16	16	21	28	33	27	33	15	17	17	17	32	31	..	23.7
Rockwell C	Max...	65	60	..	25	34	55	42	54	47	56	59	50	52	..	35	35	38	35	43	48	53	41	45	40	40	50	45	52	51	59	....	46 8
	Min...	35	45	20	11	16	30	23	..	21	30	35	31	32	25	12	13	15	14	21	19	30	27	30	16	18	25	21	22	30	27	....	23.9
Sac City....	Max..	65	67	41	29	33	52	36	54	44	55	59	50	51	42	35	34	36	33	46	50	54	43	41	46	42	50	41	53	52	59	..	46.4
	Min...	35	40	20	12	8	30	20	27	22	30	35	20	31	27	18	12	12	15	19	18	30	38	27	33	15	26	22	22	30	29	...	24 1
St. Charles.	Max...	70	68	56	35	39	59	45	59	49	59	65	52	59	45	41	42	42	39	52	56	59	46	45	52	49	56	42	54	61	68		52.1
	Min ..	41	46	22	13	19	30	26	26	28	32	38	25	38	29	19	15	13	14	23	22	32	28	29	34	18	30	24	35	35	36	.	27.3
Scranton ..	Max..	65	66	65	..	34	52	39	55	44	55	60	50	50	48	47	35	37	35	44	47	54	35	40	46	42	45	48	50	50	58	....	48.5
	Min..	40	35	22	12	18	30	23	22	24	30	30	22	35	25	18	9	15	15	22	20	34	27	30	34	17	18	20	26	29	31	....	24.6
Sheldon....	Max...	70	60	39	37	35	42	39	42	43	54	55	52	54	31	35	40	42	31	47	50	52	38	42	43	45	50	47	52	55	56	....	45.9
	Min...	29	30	18	10	16	29	16	29	28	31	32	28	28	22	15	9	10	14	13	12	30	25	26	23	13	12	12	25	23	26	....	21.1
Sibley	Max...	69	58	32	27	33	42	38	54	42	53	54	50	53	42	36	41	38	35	48	49	52	35	41	41	45	50	43	55	56	55	.	45.6
	Min. .	27	31	17	10	14	29	14	28	18	33	34	18	28	24	14	10	11	14	13	17	32	25	26	32	12	16	23	21	26	30	....	21.6
Sigourney .	Max ..	68	62	58	28	39	64	56	55	51	55	69	49	56	45	39	36	55	42	45	50	55	50	39	43	41	51	40	47	55	57	...	51.7
	Min ..	36	40	23	12	19	29	29	24	27	29	45	24	33	28	21	12	10	11	14	15	28	32	30	32	20	22	23	11	34	26	....	24.6
SiouxC'nt'r	Max...	67	61	35	27	33	44	36	51	45	53	65	50	50	46	35	36	39	34	45	50	49	40	41	43	44	48	42	56	53	55	..	45.8
	Min..	33	31	20	10	17	27	16	30	20	33	34	20	31	26	15	10	14	21	20	20	32	28	26	30	14	26	20	25	28	32	....	23.6
Sioux City.	Max..	69	63	32	24	32	47	40	54	48	58	44	57	54	40	34	38	39	39	47	50	49	34	39	47	52	48	44	60	54	60	....	46.5
	Min..	37	32	21	16	22	28	19	38	24	38	37	25	35	30	16	15	18	28	26	18	37	29	28	34	18	23	26	29	31	35	....	27.1
Storm L...	Max ..	65	63	35	25	33	47	37	53	44	52	57	49	51	42	35	37	37	31	45	47	52	38	40	45	41	50	39	52	53	56		45.0
	Min ..	38	32	19	11	17	29	18	28	20	32	34	21	32	24	16	11	15	15	21	20	32	26	25	30	13	25	20	25	31	35	....	23.8
Thurman ..	Max...	65	67	39	36	38	35	40	56	50	59	62	54	59	46	36	39	39	37	47	49	56	48	43	54	46	50	45	55	57	62		49.0
	Min...	34	39	25	18	24	32	25	29	27	34	38	22	28	26	19	13	15	25	16	17	28	29	31	28	18	26	29	22	28	25	....	25 7
Tipton	Max ..	64	65	51	31	35	63	58	53	45	56	68	47	54	48	36	32	35	38	37	45	52	49	51	39	38	44	38	42	49	53	....	47.2
	Min ..	35	35	25	16	16	26	32	23	26	28	45	26	34	30	23	24	11	14	15	15	24	29	33	33	22	22	20	17	29	21	....	25.0
Toledo	Max ..	67	59	31	..	35	60	43	57	50	63	67	63	60	59	52	43	58	43	49	53	55	48	44	42	..	54	40	49	57	59	....	52.1
	Min...	38	31	22	5	11	16	28	24	25	28	..	25	20	16	10	7	15	12	10	14	14	31	29	32	19	22	19	15	32	28	....	20.2
Wapello...	Max ..	65	65	59	37	35	63	56	50	52	55	69	48	59	46	40	39	42	43	45	48	53	50	40	40	42	49	43	41	55	55	....	49.5
	Min..	36	49	27	18	23	28	34	25	31	30	47	28	33	21	23	16	13	17	17	17	26	38	32	34	27	25	25	18	34	34	....	27.9
Washi'gt'n	Max...	69	64	..	29	37	65	43	51	50	58	68	..	57	42	40	37	39	40	43	49	64	46	..	41	39	50	37	44	54	57	....	48.6
	Min ..	34	..	22	12	..	..	25	22	25	28	32	23	..	26	20	11	8	11	12	14	..	31	21	31	21	21	19	15	..	26	....	21.2
Waterloo..	Max..	67	59	45	32	33	58	42	54	42	51	65	46	53	38	36	35	38	38	44	50	53	44	40	40	38	45	36	44	52	53	....	45.9
	Min. .	33	39	21	8	9	25	26	23	25	29	32	24	33	25	20	13	11	12	15	15	26	30	28	30	18	21	19	12	30	29		22.7
Waverly ...	Max..	63	59	56	24	32	53	38	53	42	50	62	45	50	38	35	31	36	35	40	47	52	45	39	39	34	42	34	43	48	51	....	43.8
	Min ..	32	43	20	9	8	25	25	25	28	31	34	24	32	28	21	14	11	15	15	16	28	30	28	32	18	18	20	18	18	30	....	23.2
West Bend	Max,..	66	64	26	25	32	50	36	54	45	54	..	48	51	40	35	35	35	34	45	46	52	41	46	45	36.	45	36	50	48	58	....	44.1
	Min...	31	44	19	11	14	28	20	26	20	29	32	20	29	25	17	13	10	11	18	17	28	28	24	33	15	23	19	21	29	28		22.7
Wilton Jc..	Max ..	63	65	67	31	35	64	50	48	46	55	70	44	55	48	37	33	35	39	39	44	52	41	38	39	39	44	39	41	52	53	....	46.8
	Min ..	31	47	25	25	23	28	32	20	24	29	41	26	35	27	23	13	8	10	11	12	23	35	30	33	23	22	20	15	32	25	...	24.9
Winterset.	Max..	69	66	35	34	36	58	40	58	50	.	65	50	58	45	39	39	38	37	48	51	58	..	42	51	48	55	..	56	57	63	....	49.8
	Min...	38	46	23	12	..	31	25	27	27	33	..	23	35	34	20	15	13	15	20	21	35	27	31	33	18	28	23	21	34	31	.	25.9
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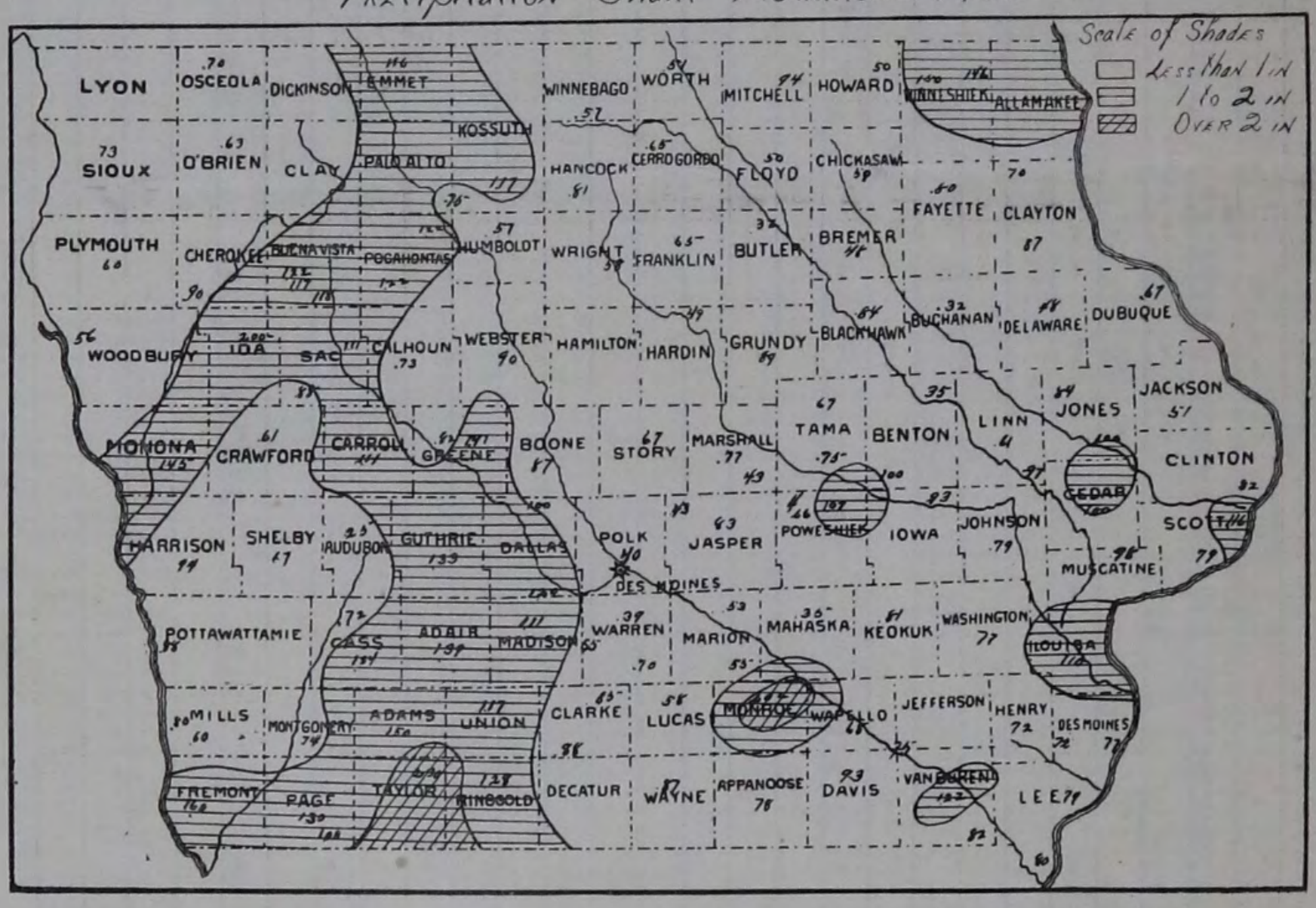
DAILY AND MONTHLY PRECIPITATION FOR NOVEMBER, 1901.

STATIONS.	DAY OF MONTH.																														TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton			.77	.20	.20					T											T										1.17
Albia		2.02		T						T														37								2.02
Algona		.80																														1 17
Alta		1.12		.01		T					02													.07								1.22
Alta (near)		1.12									.02													.03								1.17
Amana			.48								T											.11		.34								.93
Ames			.52								.01													.12					.02			.67
Atlantic			.67	.05																												.72
Audubon			.25	T						T	T																					.25
Baxter			.20																					23								.43
Belknap			.67		T																	26										.93
Belle Plaine			.75								T											T		.25								1.00
Bonaparte			.52																			.30										.82
Britt		.15	.26			T					T													.40								81
Buckingham			.52																			T		.15								.67
Burlington			.40																													.77
Bussey			.55								15											22										.55
Carroll		1.14																						T								1.14
Cedar Rapids			24								04											.07		.26		T						.61
Centerville			.62		.06																	.10										.78
Chariton			.55		.03						T											T										58
Charles City		T	.35																					.15								.50
Clarinda			1.15		.15																											1.30
Clear Lake		T	.40																					.25								.65
Clinton			28								07											.30		.17								.82
College Springs				.90	.10																											1.00
Corning			1 35	T	.15					T																						1.50
Council Bluffs		.80		.08																												.88
Cresco			.20								.10													.20								.50
Cumberland			.24	1 00	T																											1.24
Danville										.50												.22										.72
Davenport			.26								.09											.24	T	.20		T						.79
Decorah			.02							T												.50										1 46
Delaware		.80	.22								.02											02		22								.48
Denison			.10																													.61
Des Moines		.51	.40							T	T													T								.40
De Soto			1.20		T						T																					1.20
Dows		T	.40			T					T											26		.18								.58
Dubuque			.30				.02				T											T		.25								.67
Eldon			.52																			.10	T	.25		T						.75
Elkader			.70								T											.23	T									.87
Estherville		.90	.10			.02	T														T	T	T	.17								1 16
Fonda	T	1.10									T											T		.14								1.22
Forest City			.57																					.12								.57
Fort Dodge			.70								.10											T		.20								.90
Fort Madison			.43																													.79
Galva		2.00								T	T													.25								2.00
Gilman		T	.18																													.43
Glenwood		.50		.10						T											T			10								.60
Grand Meadow			.60							T	T																					.70
Greene			6.10																					.22								.32
Greenfield		.27	1.07	T	.05	T				T												T		.16								1.39
Grinnell			.50																			T		27								.66
Grinnell (near)			.80							T	T											T		.18		T						1.07
Grundy Center		T	.70								.01																					.89
Guthrie Center		1.13	.20		T																	T		.20								1.33
Hampton		.45								T	T											T										.65
Harlan		.30	.32	T	.05	T				T	.01													.22								.67
Hopeville		.81			.06						.03													.05		.02						.88
Humboldt			.12	.20																		T		T								.57
Independence			.25		T																			.25								.32
Indianola			39	T	T																	.28	T	.15								.39
Iowa City			.26								T											T		.01								.79
Iowa Falls		.04	.30			T				T																						.49
Jefferson			1.40																			.34	T									1.41
Keokuk			.38		.01						.07											.36	.02	T								.80
Keosauqua			.72		.01						.11																					1.22
Lacona			.60				.10				T		T																			.70
Le Claire			.26	T								.38										08	.34	.04	.06							1.16
Le Mars		.55	.05			T																										.60
Lenox		.45	1 75		.10																											2.30
Logan		.62	.12	.20							.15											.14		.22								.94
Maquoketa																								.12								.51
Marshalltown			.65																					.20		16						.77
Monticello		T	.48																			T	T									.84
Mount Ayr			1.06		.22						T																					1.28
Mt. Pleasant			T								.60											.12										.72
Mt. Vernon			.48								.01											.13		.33		.02						.97
New Hampton			30								.28													01								.59
Newton			.75																					08								.83
Northwood			.30							T	.07													.14								.51
Odebolt		.55	.33							T	T													T								.88
Ogden			.75																					.12								.87
Olin			.63			T					.01											01		35								1 00
Omaha, Neb		.43	.05	.01	.07																	T										.56
Onawa		1.34	.06		.05						.10													.29								1.45
Osage		T	.55								T											.03	.02									.94
Oskaloosa			30																				.68									.35
Ottumwa		T									T											T										.68
Ovid			.82		.05																											.87
Pacific Junction		.38	.32	.03	.07																											.80
Pella			.53																					T								.53
Perry			1.00							T	T																					1.00
Plover		.90									.02													30								1.22
Red Oak		.24	.38		.12																											.74
Ridgeway		.08	.59			.14					.01	.08												.60								1.50
Rockwell City		.25	.48																				T									.73
Sac City		.52	.50		T																			.09								1 11
St. Charles			50		.05						T																					.55
Scranton		.82																														.82
Sheldon		.60				.03															.20											.83
Sibley		.65				.05																		.27								.70
Sigourney			.51							T	T													.03								.81
Sioux Center		.68				.05																										.73
Sioux City		.54	.01	T	.01	T																										.56
Stockport			.35		T						T											24	T	T		T						.59

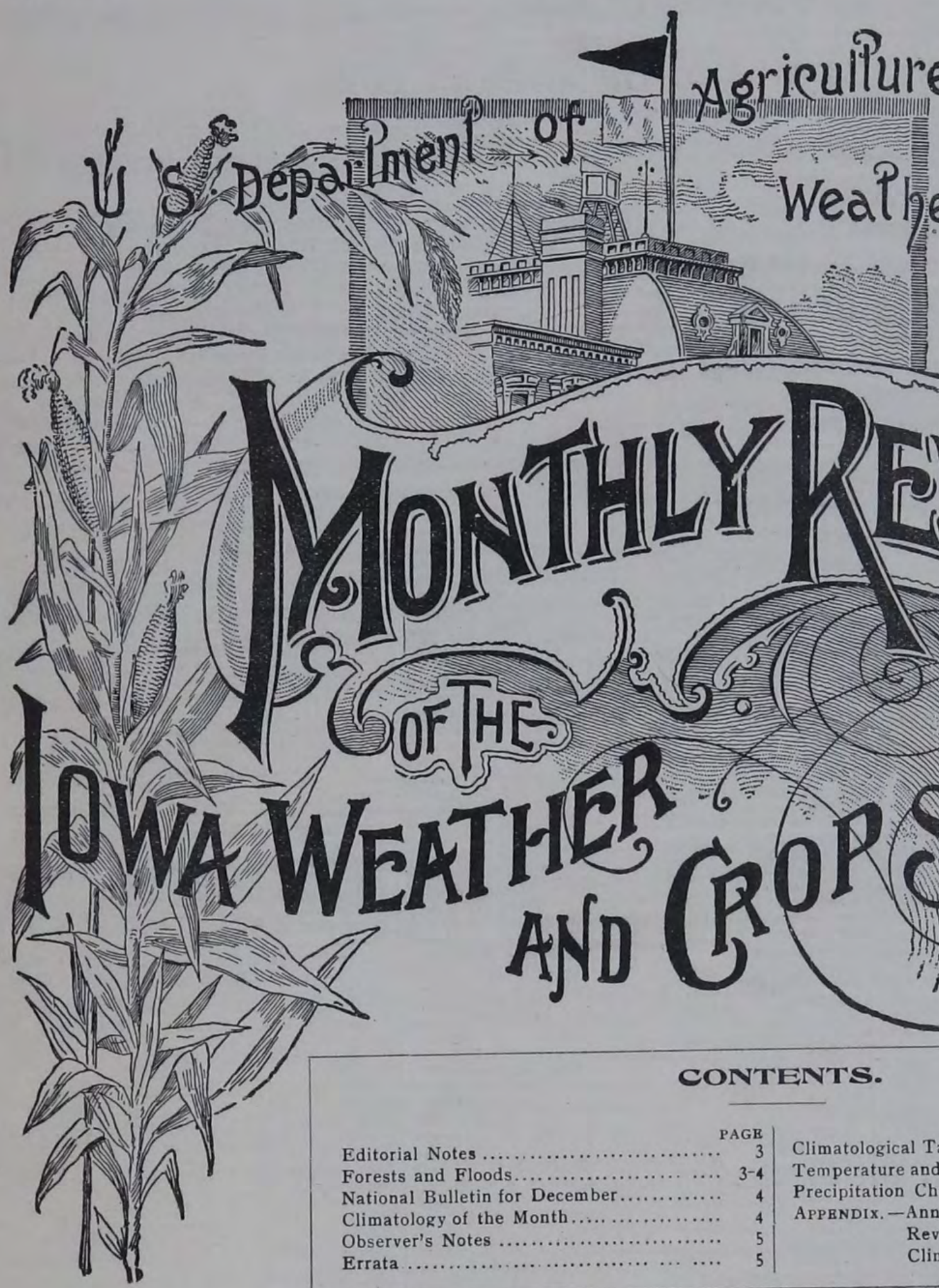
DAILY AND MONTHLY PRECIPITATION FOR NOVEMBER, 1901—CONTINUED.

STATIONS.	DAY OF MONTH.																														TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Storm Lake	..	.97	.10		T	T	...		.	T	.02	....	..	....	....	....		....	..	....	.	T	....	.09	..	...	....	..		....	..	1 18
Thurman	..	.50	1.10	T	T		....	...	....	..		..	....	....	....	..	....	T	..	..	...	....		....	....	....	T	...	....	....		1.60
Tipton	..	.....	.60			....	....	...	..	.	T	.	....	..	...	....	....	..	....	....	...	.10	T	.30	..		....		....	....	...	1.00
Toledo	....	..	.50	..		..	..	..	..	....	..	..	....		....	....	....	..	....	..	....	..		.25	..	....	....		..	..	....	.75
Vinton	....	..	.30	..	..	....	....	...	....	....	T	...	....			...	....	....	..	..	..	....	.05	T	..		...	....	....	....	....	.35
Wapello	.20	....	.51	..	....	....		..		.....	....				.	....	..	....	...			23	...	.16	....	....	.	....	....			1.10
Washington	....		.45	.		....	..		....	....	....	...	...	....	..	..		....	....	..	....	.14	..	.18	..			..		....	.	..	.77
Washta	....	.90		....	..	T		..			T	....	..		..	....	....			..	....	....	T		..	...	....	....			..	.90
Waterloo		T	.69		..	..	..	....	...	T	T	....		..	..		..	...	....		...	....		.15	..	T	....	.	.		....	.84
Waverly	...	...	.30			.	....		..	....	.01	..	....	....		....		.		....	....	.	..	.17	....	....		...		....	...	.48
West Bend	...	.50	T	....	....	T	..		..	...	.03	..				....		...	.	..		..	....	.22		..	...	..	....	....	....	.75
West Union	....	.60	...	..		.			..			.. .		..	..	..	....	....	...	.		....	....	.20	....	.....	..	...				.80
Wilton Junction	....		.45			..				....	....	....	....	....		..	...	..		..	T	.18		.28	....	....	....				....	.91
Winterset	..	1.11	....	..	T		..	...	....	...	....	.	..	....		....	....		.					...		....	....	....	....	....	....	1.11
Woodburn	....	83	....		.02		..	...		T	..	..	....	...	....	...		..	....		..	....		.	....		..	....	....	....	....	.85

Precipitation Chart November 1901.



Vol. XII. DECEMBER, 1901. No. 12



MONTHLY REVIEW

OF THE

IOWA WEATHER AND CROP SERVICE

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..AND ANNUAL SUMMARY, 1901..

CENTRAL STATION, DES MOINES, IOWA.

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DIRECTOR.

GEO. M. CHAPPEL,
LOCAL FORECAST OFFICIAL,
U. S. WEATHER BUREAU, ASS'T DIRECTOR.

ALLIED PRINTING TRADES UNION LABEL COUNCIL DES MOINES

DES MOINES:
BERNARD MURPHY, STATE PRINTER,
1901.

THE IOWA WEATHER AND CROP SERVICE

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Afton	Hon. N. W. Rowell
Albia	E. R. Reeve
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Amana	Conrad Schadt
Ames	Exp. Station
Atlantic	J. W. Love
Audubon	Roy B. Smith
Baxter	W. T. Thorp
Belknap	A. W. Rankin
Belle Plaine	S. P. Vandike
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Burlington	I. S. Shontz
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Carson	Agent C. B. & Q. Ry
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Chariton	Hon. S. H. Mallory
Charles City	Chas. O. Schmidt
Clarinda	A. S. Van Sandt
Clear Lake	John Cobb
Clinton	Luke Roberts
College Springs	A. M. Finley
Columbus Junction	Prof. H. E. Simpson
Corning	Jerome Smith
Council Bluffs	Agent C. R. I. & P. Rv
Cresco	Anthony Marshall
Cumberland	Agent C. B. & Q. Ry
Danville	Agent C. B. & Q. Ry
Davenport	*J. M. Sherier
Delaware	Wm Ball
Decorah	F. H. Baker
Denison	Prof. W. C. Van Ness
Des Moines	*Geo. M. Chappel
De Soto	R. D. Minard
Dows	A. C. Fuller
Dubuque	*E. H Bowie
Eldon	T. Madden
Elkader	Chas. Reinecke
Emerson	Agent C. B. & Q. Ry
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Fayette	R. Z. Latimer
Fort Dodge	C. R. I. & P. Agent
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Fonda	H. P. Barron
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Galva	D. W. Farnsworth
Gilman	Jas. L. Wylie
Gladbrook	Agent C. G. W. Ry
Glenwood	J. P. Jackson
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Greene	J. L. Cole
Greenfield	J. G. Culver
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Harlan	C. A. Reynolds
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Humboldt	H. S. Wells
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Larrabee	H. B. Strever
Lenox	J. L. Hurley
Le Mars	Dr. T. E. Cole
Logan	Mrs. M. B. Stern
Maquoketa	Frank Keeney
Marshalltown	Branch S. Jones
Monticello	C. E. Heisey
Mooar	Thos. T. Brady
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Northwood	Dr. J. H. Darey
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Ogden	E. Sayre
Olin	Hon. Nathan Potter
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Ovid	H. C. Miller
Osage	G. D. Pattingill
Oskaloosa	Jos. Boyd
Ottumwa	Dr. J. F. Herrick
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Pella	B. A. Viersen
Perry	J. A. Harvey
Plover	J. S. Smith
Primghar	P. R. Bailey
Red Oak	J. S. Cole
Ridgeway	Arthur Betts
Rockwell City	C. M. Randall
Ruthven	F. M. Fitzgerald
Sac City	J. A. Sodestrom
St. Charles	C. W. Minard
Scranton	E. A. Olive
Sheldon	J. B. Frisbee
Sibley	H. G. Doolittle
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Sioux City	*U. G. Purssell
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Stockport	C. L. Beswick
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Thurman	C. R. Paul
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West Union	J. M. Lisher
Woodburn	C B. McDonough

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Alta	Jonas Cushman
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Chariton	C. C. Burr
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Creston	M. V. Ashby
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Emerson	D. B. Nims
Fort Dodge	R. W. Blaine
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Harlan	H. B. Kees
Hesper	G E. Dillingham
Humeston	Hon. S. H. Moore
Independence	Geo. H. Wilson
Indianola	H. D. Guthrie
Iowa City	Edward Hummer
Ireton	J. M. Sherman
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Madrid	Geo. Swisher
Manson	J. D. Skinner
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Spirit Lake	E. E. Arey
State Center	E. P. Thompson
Stuart	W. W. Bailey
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Van Wert	J. I. Walker
Winterset	H. A. Kinsman
West Branch	Wrigley Smith
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Wiota	I. S. Coomes

U S. DEPARTMENT OF AGRICULTURE—WEATHER BUREAU.

MONTHLY REVIEW

OF THE

Iowa Weather and Crop Service.

VOLUME XII. DECEMBER, 1901. No. 12.

EDITORIAL NOTES.

The science of agriculture is simply the why and wherefore of successful farming.

By a benificent provision of nature, the presence of harmful bacteria may generally be detected by unpleasant odors or disagreeable flavors. The senses of the body are sentinels whose challenges should be heeded.

Tornadoes are the foot-ball games of the elements, and human beings should wisely avoid a mix-up in the center rush. A little distance adds enchantment to that sort of exhibition.

F. M. Slagle & Co., of Alton, Sioux county, Iowa, in a recent letter call in question the accuracy of the final crop report in relation to the yield credited that county. They assure us that the average yield was not less than thirty-five bushels per acre of corn, twenty bushels per acre of wheat, thirty-five bushels of oats, and thirty bushels of barley. So while some regard the estimates as too high, there are others with opposite views. As a whole, the totals are low enough.

On December 28th Iowa celebrated the fifty-fifth anniversary of her admission to the union. The years of her statehood comprise the most distinctively important and progressive period in the history of America, or in the era of civilization. The story of the development of this state within the span of a half century, attaining the foremost rank in agriculture, and a position of mighty influence in the national councils, comprises one of the most marvelous chapters in the annals of mankind.

Referring to the much discussed question how shall boys be kept on the farms, we have it in mind to recommend tying them up. To do this most effectually a good stout cord should be used, and the knot should be so well tied that even a cabinet fakir would fail to loosen it. The cord should be made of three very strong strands, viz.: first, parental love; second, the love of nature; third, self interest; these three, but the greatest of these is love. Where there is the full measure of parental love, and a love of nature has been incited by training and education, the boy will find it for his personal good to remain at or near the farm; and if he strays away for a time he will yearn to get back to the soil.

Arthur Betts, of Ridgeway, writes as follows concerning one of our insect pests, commonly known as the box elder bug. He says: "There is no box elder bug; it is a false nomen. The bug cares no more for the box elder tree than for a willow or oak. They are seen around our dwellings, and I am inclined to think they live on small insects. They are crusaders, and many of them carry the red cross on their backs. Every fall they make a crusade on our dwellings, and are people-loving pests."

The *Daily Wisconsin* of December 17th said: "When the cold wave had Wisconsin in its grip last Saturday, at 2 P. M., and the highest temperature that could be discovered outdoors in the shade was six below zero, the temperatures in the sun parlor at the Hotel Gifford, on Oconomowoc lake, were as follows: In the shade 68 above zero; in the sun, 120. In the warming of the sun parlor no artificial heat is employed, the sole dependence being the rays of the sun."

At the beginning of the last century Denmark was the poorest country in Europe, per head of population; at the century's close it was the richest. And it is well attested that this is the result of its land and dairy system. The Danes are exceedingly industrious, economical and thrifty.

The depth of the atmosphere is still a matter of great uncertainty. The Belgian royal meteorological observatory has been seeking to throw light on the problem, and has collected these widely varying estimates by distinguished authorities: Biot, 40 miles; Bravais, 70; Mann, 81; Callandrau, 100; Schiaparelli, 125; Marie Davie, 187; Ritter, 216. Early in the last century British physicists generally assumed the depth to be 47 miles. Meteors, which become incandescent through friction with the air, afford a means of roughly testing these estimates, and Sir Robert Ball shows Ritter's figures to be the nearest by stating that meteors have been observed at a height of more than 200 miles.—*Exchange.*

FORESTS AND FLOODS.

(THE DAILY WISCONSIN.)

Henry Gannett, in the Bulletin of the American Geographical Society, attacks the theory set forth in many works on forestry that the presence or absence of forests exerts an influence upon the rainfall; and the Monthly Weather Review, edited by Prof. Cleveland Abbe, endorses his opinion. He also denies that floods in American rivers are more frequent than formerly, as a consequence of the removal of forests from their drainage areas. This relieves the lumbermen of Wisconsin from the imputation of homicide, for if the old and exploded notion were correct, the men who chop down trees in Wisconsin might be held morally responsible for the drowning of people in Louisiana caused by high water in the Missippippi.

The situation which exists in the arid regions of the earth, Mr Gannett says, is due to their physiography. The forms of their mountains, cliffs, and canons are not such as are found in moist climates, and attest that the regions in which they exist have been arid, "for thousands if not millions of years." Popular theory regarding them has put the cart before the horse. "Want of rain prevents the growth of trees; want of trees does not prevent rain."

So much as to the arid regions. As to the floods, Mr. Gannett observes that "where forests are cut away, land is seldom left bare; it is cultivated or covered with bushes which hold water quite as effectively as forests." Records covering a long series of years show that floods in American rivers are not greater now than they were in the past. "The Ohio river," he remarks, "has been guaged continuously for many years, and these gauges show no appreciable change in regimen, whatever changes may have been made in the forest cover of its

basin." He might with equal truth have made the same statement concerning the Mississippi. At the beginning of the nineteenth century, when Wisconsin and Minnesota were given over to solitude and Indians, there were floods in Louisana as formidable as any of the worst that occurred toward the century's close, when the forests over the large areas had been felled and the spaces that they once occupied had been utilized for farming. A field of corn or wheat will hold the water as effectively as a grove of trees.

It is pleasant to note these conclusions of science. It would be sad to be forced to believe that a man could not procure the material for constructing a house in territory near the head of a watershed without endangering the habitation and jepardizing the lives of people down the stream.

NATIONAL BULLETIN FOR DECEMBER.

ISSUED BY CLIMATE AND CROP DIVISION OF THE UNITED STATES WEATHER BUREAU.

December, 1901, was abnormally cold throughout the upper lake region, central valleys, and southern states, where the temperature averaged from 3° to 8° below the normal, the most marked deficiences occurring in the central Mississippi, lower Missouri and lower Ohio valleys. In the middle Atlantic coast districts the month averaged colder than usual, but the deficiency in temperature was generally less than 3° per day, and slight deficiences in the monthly mean temperatures are also shown over the central and southeastern Rocky Mountain slopes.

The month averaged milder than usual over the greater part of New England, in the Pacific coast states, except along the immediate coasts of Oregon and Washington, throughout the northern plateau region and over portions of the middle and southern plateau region, the most marked excess occurring in Idaho and Montana.

During the period from the 14th to the 19th the minimum temperature records for the second decade of December were broken in all districts from the south Atlantic and Gulf coasts northwestward to the upper Mississippi and Missouri valleys, including the middle Rocky Mountain slope and Ohio valley, nearly all Weather Bureau stations throughout the section named reporting temperatures from 2° to 8° lower than the previous records for the second decade of December. At Tampa, New Orleans, and Galveston the minimum temperature was 5° below the lowest previous record for the second decade of December.

The precipitation during December was largely in excess of the average in the districts eastward of the Mississippi, excepting portions of the south Atlantic coast and Florida and the western portions of the upper lake region. From the central Gulf coast northeastward to southwestern Virginia the total precipitation ranged from six to twelve inches, the Middle Atlantic states and New England receiving from four to eight inches. There was also, mainly in the form of snow, more than the usual December precipitation in the upper Missouri valley and over portions of the northern Rocky Mountain region. Over the western portion of the upper lake region, in the upper Mississippi and central Missouri valleys, and over the southern portions of the country to the westward of the Mississippi, including all of the Pacific coast states, the month was drier than usual, portions of southern California, Arizona and New Mexico and western Texas receiving no appreciable amount. The shortage in precipitation in California is very marked, where the total for the month was generally less than one inch from San Francisco southward, and while the northern part of the state received from one to four inches, these amounts are much below the December average

At the close of the month the interior of New England and the northern portion of the Middle Atlantic states were covered with from three to twelve inches of snow, and depths ranging from three to twelve inches were also reported from southern portions of Michigan, Wisconsin, and Minnesota northward, with twenty-four to thirty inches at a few stations in the peninsula of upper Michigan.

CLIMATOLOGY OF THE MONTH.

BAROMETER.—Mean pressure, 30.12 inches; Highest observed, 30.74 inches, at Des Moines and Sioux City, on the 19th; lowest observed, 29.52 inches, at Keokuk, on the 24th; range for state, 1.22 inches.

TEMPERATURE.—The monthly mean temperature for the state, as shown by records of 105 stations, was 20.5°, which is 3.1° below normal. By sections the mean temperatures were as follows: Northern section, 18°; Central section, 20 8°; Southern section, 22 6°. The highest monthly mean was 27°, at Red Oak; lowest monthly mean, 14.9°, at Estherville. The highest temperature reported was 64°, at Indianola, on the 1st; lowest temperature reported, 31° below zero, at LeMars, on the 15th. The average monthly maximum was 48 2°; average monthly minimum, 20 6° below zero. Greatest daily range, 50°, at Cedar Rapids and Keokuk; average of greatest daily ranges, 37 4°.

PRECIPITATION.—Average precipitation for the state, as shown by records of 118 stations, was 0.93 of an inch, which is 0.45 of an inch below normal. The averages by sections were as follows: Northern section, 0.58 of an inch; Central section, 0.99 of an inch; Southern section, 1 23 inches. The largest amount reported was 2.75 inches at Belknap; least amount reported, 0.05 of an inch, at New Hampton The greatest daily rainfall reported was 1 95 inches, at Iowa City, on the 12th and 13th. Average number of days on which 0 01 of an inch or more was reported, 6.

WIND AND WEATHER.—Prevailing direction of the wind, northwest; highest velocity reported, 44 miles per hour, from northwest, at Sioux City, on the 6th. Average number of clear days, 10; partly cloudy, 9; cloudy, 12.

ATMOSPHERIC PRESSURE.

STATIONS.	Mean barometer reduced.	EXTREMES.			
		Highest reduced barometer.	Date.	Lowest reduced barometer.	Date
Davenport	30.09	30.63	19	29.60	23
Des Moines.	30.15	30 74	19	29.64	24
Dubuque	30.10	30.58	15	29.58	22
Omaha, Neb	30.12	30.76	19	29.52	23
Keokuk	30.10	30.64	19	29 52	24
Sioux City	30.14	30 74	19	29 65	23
.....	.....	.....	....	.....	....
Means	30.12	30.74	19	29.52	24

WIND MOVEMENT.

STATIONS.	Number of miles.	Maximum velocity	Direction.	Date.
Davenport	5,258	24	NW	13
Des Moines	5,575	25	NW	13
Dubuque	5,452	28		14
Keokuk	5,445	26	NW	13
La Crosse, Wis	4,928	25	N	29
Omaha, Neb	6,776	31	N	16
Sioux City	8,761	44	NW	6
.....	.....	..		....

OBSERVERS' NOTES.

AFTON.—*N W. Rowell.*—This closes seven and a half years service as a volunteer observer. While it has involved considerable attention and not a little labor, yet withal it has been interes ing and profitable to me.

ALTA.—*David E. Hadden.*—Intensely cold 13th to 20th. The minimum of 26 5° below zero on the 14th was 6.5° colder than any previous December day during eleven years' record at this station.

ATLANTIC.—*J. W. Love.*—The "sun-dogs" on morning of 17th were the brightest ever observed here.

BONAPARTE.—*B. R Vale.*—A mild month except 14th to 20th, which period was exceptionally cold. Rain for month 1.30. Rain for the full year 16.34 inches, as against 25.81 in 1894.

BRITT.—*Geo. P. Hardwick.*—More than usual smut in corn, and much fatality among cattle feeding in stalk fields.

CLINTON.—*Dr. Luke Roberts.*—Temperature 2.7° below normal; rainfall 0.97 inch less than normal; ground bare of snow.

COLUMBUS JUNCTION.—*Prof. H. E. Simpson.*—The cold wave commencing December 13th was remarkable for its rapid fall in temperature from 33° with heavy rain to 14° below zero, a fall of 47° in 32 hours. Ice in Iowa river 10 inches thick was reported on 21st.

ELKADER —*Chas. Reinecke.*—Mean temperature for the year 1901 was 48°; total precipitation 20.10 inches; total snowfall 40 inches; highest temperature 111° on July 24th; lowest temperature 21° below zero, January 1st and December 14th.

ESTHERVILLE.—*Leslie Littell.*—Week beginning 13th and ending 20th was the coldest week in December ever known here.

GRAND MEADOW.—*F. L. Williams* —A pleasant month but extremely cold from 12th to 20th. For 9 days mercury was below zero.

GRUNDY CENTER.—*E S. King.*—A drop of 55° from morning of 13th to morning of 14th. Good sleighing from 8th to 29th.

HUMBOLDT.—*H. S. Wells.*—From 13th to 20th very cold; balance of month agreeable. Much corn going out of the county.

OLIN.—*Nathan Potter.*—Mild weather excepting one week, 13th to 20th. A fine month for feeding stock.

PACIFIC JUNCTION.—*H. H. McCartney.*—I have watched closely for "sun-dogs" since early boyhood (50 years past) and never before saw parhelia on morning and evening of same day as on the 17th.

RIDGEWAY.—*Arthur Betts.*—Two dates, 1st and 24th, frostless; 155 hours of sunshine; very agreeable month There were dandelions in bloom till the 3rd, then winter set in.

ERROR IN OCTOBER REVIEW.

MAQUOKETA.—October.—Mean temperature recorded 59.0° on page 7; should have been 54.6°.

BELATED REPORTS.

FAYETTE.—November.—Mean temperature 32.2°; highest 62° on the 2d, and 11th; lowest zero on the 5th; greatest daily range 31° on the 5th; total precipitation 0.65 inch; greatest in 24 hours .44 inch on the 3d; total snowfall 5.0 inches; prevailing direction, northwest. Number of clear days 20; partly cloudy 4; cloudy 6; rainy 3.

LARRABEE.—November.—Mean temperature 33 4°; highest 67° on the 1st; lowest 8° on the 4th, 15th, 16th; greatest daily range 36°; total precipitation 1.25 inches; greatest in 24 hours 1.15 inches on the 2d; total snowfall 1.5 inches; number of clear days 18; partly cloudy 8; cloudy 4; rainy 3.

PRIMGHAR.—November.—Mean temperature 31.4°; highest 55° on the 1st; lowest 4° on the 3d; greatest daily range 29°; total precipitation .75 inch; greatest in 24 hours .75 inch on the 2d; prevailing direction, northwest; number of rainy days 1.

VILLISCA —November.—Mean temperature 37.7°; highest 70° on the 1st and 2d; lowest 12° on the 16th and 17th; greatest daily range 38°; total precipitation .50 inch; greatest in 24 hours .50 inch on the 2d; total snowfall 5.0 inches; number of clear days 19; partly cloudy 6; cloudy 5; rainy 1; prevailing direction, northwest.

ERRATA IN NOVEMBER REVIEW.

COLUMBUS JUNCTION.—Mean temperature recorded 36.5° on page 12, should have been 36.4°.

NORTHWOOD.—Mean temperature recorded 37.6° on page 11, should have been 32.6°. Mean minimum temperature recorded 31.8° on page 14, should have been 21.8°.

NEW HAMPTON.—Total precipitation recorded .59 inch on pages 11 and 15, should have been ,68 inch.

CLIMATOLOGICAL DATA FOR DECEMBER, 1901.

NORTHERN SECTION.

STATIONS.	COUNTIES	Elevation, feet	Length of record, years	TEMPERATURE, IN DEGREES FAHRENHEIT.							PRECIP., IN INCHES				Number rainy days	SKY			Prevailing direction of wind	DATES OF THUNDER-STORMS.
				Mean	Departure from the normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from the normal	Greatest in 24 hours	Total snowfall (unmelted)		Number clear days	Number partly cloudy days	Number cloudy days		
Algona	Kossuth	1,500	8	18.4	-2 0	45	1	-24	14	39	.78	- 51	25	7.8	5	7	18	6	NW	
Alta	Buena Vista	1,519	6	17.2	-4.4	42	6	-26	14	38	.89	-.09	.28	8 3	9	8	12	11	NW	
Alta (near)	Buena Vista										.85		.20	8.5	7					
Britt	Hancock	1,230		16 2		42	30	-27	14	39	.27		.07	3.7	6	7	17	7	NW	
Charles City	Floyd	1,012	9	15.8	4 8	40	30	-23	13	38	.32	-1.10	.10	2.5	4	9	14	8	N,S	
Clear Lake	Cerro Gordo	984		21.8		56	30	-26	14	41	.32		.20	3.2	2	18	6	7	NW	
Decorah	Winneshiek	900	7	18 0	-3.0	43	1	-24	14	39	.30	-.96	.16	3.8	3					
Dows	Wright	1,142		18 2		48	1, 30	-23	14	42	.55		.20	5.0	5	12	3	16	NW	
Elkader (a)	Clayton	600	19	19 3	-2 2	46	28	-21	14	35	.61	1 62	.46	2.0	3	13	4	14	NW	
Estherville	Emmet	1,298		14.9		46	30	-30	14	36	.57		.21	5.4	4	14	13	4	NW	
Fayette	Fayette	1,000	10	17.1	-5.4	40	1	-24	14	42	.70	-.75	.48	4 4	5	9	13	9	NW	
Fonda	Pocahontas	1,237	9								.64		.27	5 5	4	12	5	14	NW	
Forest City	Winnebago	1,220		17.4		46	30	-28	14	37	.60		.30	6.0	4	9	3	19	W	
Grand Meadow	Clayton	1,180	10	17.5	-5.0	45	1	-25	13	41	.64	- 95	.49	1.5	4	13	6	12	NW	
Greene	Butler	943		18 3		46	30	23	14, 15	39	.21		.08		4	7	8	16	NW	
Hampton	Franklin	1,240	7	19.0	-2.0	50	30	-22	14	40	.43	-.92	.12	3 1	6	5	21	5	NW	
Humboldt (a)	Humboldt	1,082	9	20.2		56	30	-24	14	38	.40	-.20	.11	3 0	4	13	9	9	NW	
Larrabee (a)	Cherokee	1,366		19.0	-3 6	43	30	-26	14	43	.76	-.38	.25	7 6	6	9	16	6	NW	
Le Mars	Plymouth	1,224		20.4		48	28	-31	15	34	.55		.30	5.5	3	13	8	10	N	
New Hampton	Chickasaw	1,166		16.0		42	1	-25	14	39	.05		.05	0.5	1	11	9	11	NW	
Northwood	Worth	1,210	9	17.6		44	30	-25	14	43	.77		.32	7.8	5	8	10	13	NW	
Osage	Mitchell	1,178		17 0	-2.1	40	1	-24	14	36	.40	- 91	.11	4 0	7	6	6	19	NW	
Plover (a)	Pocahontas	1,426		18.8		46	6	-27	14	36	27		.10	2 7	3	10	3	18	N	
Ridgeway	Winneshiek	1,215		18 9		44	30	-26	14	46	1.15		.48	5 6	17	9	12	10	NW	
Sheldon	O'Brien	1,406	7	17.5		48	30	-27	14, 15	38	.83		.30	8.3	9	11	10	10	W	
Sibley (c)	Osceola	1,506		16.1	-3.3	47	1	-29	14	36	.65	-.05	.25	6 5	5	6	19	6	NW	
Sioux Center	Sioux			18.3		46	1	-27	14	41	.70		.30	7.0	5	13	11	7	N	
Spirit Lake (a)	Dickinson	1,458		18 7		48	30	-27	14	32	.65		.20	6.5	4	20	8	3	NW	
Storm Lake (a)	Buena Vista	1,440	11	17 0		44	1	-27	14	37	62	-.30	.18	6 6	10	9	14	8	NW	
Washta	Cherokee	1,157									.80		.20	8 0	5	13	12	6	N	
Waverly (d)	Bremer	942		19 6		42	1				.58		.25	5.3	5				NW	
West Bend	Palo Alto	1,197	7	17.6	-0.3	47	1	-25	14	28	.60	-.28	.20	6.0	5	8	11	12	NW	
Average				18.0	-3.2	45.5		25 4		38.3	0.58	-.64		5.2	5	10	11	10	NW	

CENTRAL SECTION

Amana	Iowa	721	24	20 6	-1.2	44	1	-17	14	38	1 59	† .15	.78	2.0	6	8	13	10	NW	
Ames (a)	Story	936	20	20.5	-1.3	52	1	-19	14	40	.57	- .42	.17	4.2	4	8	11	12	NW	
Baxter (a)	Jasper	998		20 0		47	1	-19	14	28	.38		.23	1.5	3	12	7	12	NW	
Belle Plaine	Benton	840	10								1 45	† .12	.90	6 5	7	4	20	7	SE, NW	
Buckingham	Iowa										.93		.41	2 8	5					
Carroll	Carroll	1,265	10	21.0	-2 3	50	1, 30	-20	14	35	.50	- .47	.30	5 0	4	13	4	14		
Cedar Rapids	Linn	744	18	21.4	-3 3	48	1	-16	14	50	1.76	- .12	1.43	3.5	7	12	3	16	NW	
Clinton	Clinton	609	9	22 4	-3 9	50	1	-12	14, 20	36	.88	- 26	.68	1.0	5	7	6	18	NW	
Davenport	Scott	615	30	22.8	-4.7	49	1	-13	14	42	1 33	- .29	1.04	2.1	7	9	5	17	NW	
Delaware	Delaware	1,148	9	19.4	-2.0	41	1	-21	14	41	1.07	- 45	.80	4.5	5	9	9	13	NW	
Denison	Crawford	1,192	7	19 2	-3.1	45	6, 30	-21	14	35	.86	† 45	.25	3 6	9	18	6	7	N	
Des Moines	Polk	861	23	21 8	-4.2	47	6	-18	15	36	1.03	- .33	.30	7 9	9	7	13	11	NW	
De Soto	Dallas	866		22.8		49	1	-16	14	38	.95		.26	8 2	7	11	7	13	NE	
Dubuque	Dubuque	655	28	21.8	-3.1	45	1	-17	14	39	1.44	- .24	1.32	3.0	10	3	9	19	NW	
Fort Dodge	Webster	1,126		20.0		50	1, 30	-22	14	36	20		.10	2.0	2	13	4	14	NW	
Galva (b)	Ida	1,290	7	19 8	-2 6	48	9	-25	14	37	65	- .13	.25	6 5	4					
Gilman	Marshall	1,053									.45		.40	T	2	11	8	12	NW	
Grinnell	Poweshiek	1,011	10	20.2	-4.6	49	1	-18	14	42	1.47	† .27	.51	9.6	6	5	10	16	NW	
Grinnell (near)	Poweshiek			20.0		48	1	-19	14	37	84		.20	6.5	7	5	5	21	SE	
Grundy Center	Grundy	966	9	17.8	-5 2	47	1	-25	14	39	.83	- .45	.41	3.0	6	7	8	16	NW	
Guthrie Center	Guthrie	1,077		21.7		54	1	-19	14, 15	34	.79		.24	5.5	5	11	10	10	NW	
Harlan	Shelby	1,192		19.6		47	1	-22	14, 15	35	90		.30	9.0	5	8	6	17	NW	
Independence	Buchanan	921	38	18.3	-2.8	45	6	-22	14	43	.48	- .90	.25	4.8	5	10	8	13	NW	
Iowa City	Johnson	644	10	21.8	-5 2	45	1	-16	14	35	2 34	† 70	1.95	2.5	8	6	9	16	NW	
Iowa Falls	Hardin	1,107	7	17.4	-3.6	41	30	-22	14	42	.65	- .45	.30	6.5	4					
Jefferson	Greene	1,052									.57		.25	4 2	5				NW	
Le Claire	Scott	576									1.32		.91	0.2	8					
Logan	Harrison	928	35	21.5	-5.3	50	1	-20	14	37	1.10	- .20	.50	11 0	4	12	10	9	S, NW	
Maquoketa	Jackson	688	7	23.6	-1 7	52	1	-15	14	40	1.54	- .10	.86		3	13	7	11	SE	
Marshalltown	Marshall	947	10	20 8	-2 8	47	1	-20	14	39	.87	- .77	.40	4.5	7	7	9	15	NW	
Monticello	Jones	800	46	20.8	-1.3	44	1	-18	14	32	1.27	- .95	1 18	1.0	4	10	5	16	NW	
Mt. Vernon	Linn	847		22.2		44	22	-14	14, 20	29	1.88		1.42	3.6	8	12	6	13	NW	
Newton	Jasper	958	13	19.6	-2.3	52	1	-22	14	35	1.32	† .05	.46	9.6	6	5	18	8	SW	
Odebolt	Sac	1,356		20.5		48	1	-21	14	23	.54		23	6.3	5	12	6	13		
Ogden	Boone	1,109		21.2		50	1, 30	-22	14	33	1.30		.80	5.0	6	16	0	15	NW	
Olin (b)	Jones	760		23.2		44	1	-17	14	30	1.82		1.67	2.2	5				NW	
Onawa	Monona	1,053		21.4		49	1	-18	14	35	1.07		.28	11.2	11	17	4	10	NW	
Perry	Dallas	975		21.0		46	30	-18	14, 15	37	.95		.25	7.9	7	10	11	10		
Rockwell City (a)	Calhoun	1,219		20.7		50	1	-20	14	32	.28		.21	2.7	3	11	3	17		
Sac City (a)	Sac	900	21	18.4	-5.0	48	1	-22	14	34	.68	- .56	.30	6.8	6	9	9	13	NW	
Scranton (a)	Greene	1,172		22.8		47	30	-12	14	27	.10		10	1.0	1					
Sioux City	Woodbury	1,122	12	20.3	-5.7	47	30	-22	14	34	.63	- .22	.27	8.4	8	8	11	12	NW	
Tipton (a)	Cedar	807		23.2		48	1	-15	14	30						10	4	17	NW	
Toledo (b)	Tama	856	6	21.3	-2 0	59	1	-19	13	39						11	7	13	E	
Vinton *	Benton	800	10	19.6	-5.0	41	22	-17	14		.25	- 98	.10	2 5	3	21	0	10	NW	
Waterloo	Black Hawk	862	21	19 0	-4.3	45	1	-21	14	32	.59	- 6 4	.50	2.5	3	8	9	14	SE	
Wilton Junction	Muscatine	683		22 5		52	1	-14	14	30	2.14		1 05	3.0	7	8	5	18	NW	
Average				20.8	-3.4	47.7		-18.7		35.8	0.99	-0.28		4.9	6	10	8	13	NW	

CLIMATOLOGICAL DATA FOR DECEMBER, 1901--CONTINUED.

SOUTHERN SECTION.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.							PREC. IN INCHES.				Number rainy days.	SKY.			Prevailing direction of wind.	DATES OF THUNDER-STORMS
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall (unmelted).		Number clear days.	Number partly cloudy days.	Number cloudy days.		
Afton	Union	1,212	....	21.8	.....	52	1	-17	14	38	1.00	.....	.20	8.0	5	10	11	10	SW	
Albia	Monroe	945		21 8	.....	50	1	-18	14, 20	40	1.58	..	.53	7.6	8	7	0	24	NW	
Atlantic	Cass	1,164	9	20.7	-4 2	46	6, 30	-25	20	41	60	-.70	.25	6.0	3	9	5	17	NW	
Belknap	Davis	857	....	.....	.....	.....	.....	.....	.....	.....	2 75	.....	1.80	8.5	10	6	15	10	NW	
Bonaparte	Van Buren	.....	9	22 8	-6.0	48	1	-15	20	32	1.30	- 42	.70	1 0	5	....	..	....	.....	
Burlington	Des Moines	544	....	24.5	.....	54	1	-14	20	48	.91	.....	44	1.9	6	10	0	21	E	
Bussey	Marion	.....	...	.....	.....	.....	.....	.....	.....	.....	1.40	.....	1 30	5.0	2	....	....	....	.....	
Chariton	Lucas	1,030	....	22.1	.....	52	1	-16	14	43	1.51	.....	.75	4.5	12	9	14	8	NE, SW	
Clarinda	Page	1,069	10	23 4	-3.8	51	6	-19	20	36	.75	-.42	.30	7.0	9	8	13	10	NW	
College Springs	Page	.....	9	22.7	-5.3	52	1	-19	20	35	.85	-.65	.40	3.5	6	18	3	10	SE, SW NW	
Columbus Junct	Louisa	595	....	22.0	.....	50	1	-14	14	35	1.96	.....	1.57	3.2	8	9	8	14	NW	
Corning	Adams	1,127	8	21.4	-5.2	46	6	-19	20	37	1.18	†.19	.40	8.5	6	11	9	11	NW	
Council Bluffs	Pot'wat'mie	990	...	23.4		49	31	-15	14	33	.68	.....	.22	9.6	4	11	5	15	NW	
Cumberland	Cass	.....	....		...	.....	.....	.....	.....	.....	.80	.....	.50	8.0	4	9	1	21	NW	
Danville	Des Moines	715	....	.....	.....	.....	.....	.....	.....	.....	1.72	.....	.70	T	9	14	3	14	.....	
Eldon	Wapello	630	....	22.4	.....	48	1	-16	14, 20	36	1.78	..	.89	3.8	8	10	7	14	W	
Emerson	Mills	1,053	....	.....	.....	.....	.....	.....	.....	.....	.30	.....	.30	....	1	....	....	....	.....	
Fairfield (*d*)	Jefferson	.....	....	20 8	....	43	22	-16	20	35	.....	.....	.....	.....	...	...	...	...	.....	
Fort Madison	Lee	516	52				.....	.....	.....	.....	1.42	-.61	.79	4.0	7	7	2	22	NW	
Glenwood	Mills	979	30	23.2	-1.7	54	1	-16	14	34	.90	-.09	.29	8.5	5	3	15	13	NW	
Greenfield	Adair	....	9	20.1	-2.5	46	1	-22	14	43	.89	- 57	.21	7 7	9	10	11	10	NW	
Hopeville (*a*)	Clarke	.....	....	21.4	.....	49	1	-17	20	42	.....	.....	.....	.....	...	...	...	...	NW	
Indianola	Warren	969	....	21.0	.....	64	1	-19	14	41	2.07	.....	.75	8.8	8	5	7	19	NW	
Keokuk	Lee	619	29	25.2	-4.6	56	13	-12	20	50	1.17	-1.68	.42	3.1	9	8	6	17	NW	
Keosauqua	Van Buren	644	8	23.8	-3.4	54	1	-14	19, 20	32	1.81	†.33	1.44	2.0	9	....	....	....	.....	
Knoxville	Marion	910	....	22 6	.....	53	1	-17	14	40	1.69	.....	.90	7.5	6	8	9	14	SW	
Lacona	Warren	.....	....	...	...	.....	.....	...	...	...	1.50	.....	.75	8 0	7	....	....	....	... ...	
Lenox	Taylor	1,250	....	21 2	.....	51	1	-23	20	37	.74	.....	.31	6.4	6	14	7	10	N	
Mt Ayr	Ringgold	1,236	7	21.4	-4.1	52	1	-19	20	38	1.24	-.05	.33	11.0	9	8	8	15	NE, NW	
Mt. Pleasant (*a*)	Henry	725	....	21.1	.....	48	1	-17	20	28	23	.....	.10	1.3	4	7	12	12	... .	
Omaha, Neb.	Douglas	1,113	31	23.6	-3.1	53	6	-16	14	31	.73	-.19	.29	7.2	9	10	11	10	N	
Oskaloosa (*a*)	Mahaska	850	17	21.4	-4.8	49	1	-17	14	42	1.70	†.55	.84	6.0	10	9	5	17	NW	
Ottumwa	Wapello	630	6	24.8	-2 9	50	1	-14	14	32	.68	-1.11	.33	3.5	4	11	9	11	NW	
Ovid	Wayne	992	7	22.2	-4.3	50	1	-18	20	39	1.79	†.21	.97	5 8	9	4	3	24	NW	
Pacific Junction	Mills	960	....	22 8	.....	50	6	-21	20	41	.67	.....	.30	6.3	6	13	5	13	N	
Red Oak (*a*)	Montgom'ry	1,033	....	27.0	.....	58	6	-13	20	37	.71	.....	.35	6 3	5	4	17	10	SE, NW	
St. Charles (*a*)	Madison	1,070	....	22.5	.....	63	1	-18	14	39	1.31	.....	.58	6.6	9	13	9	9	NW	
Sigourney	Keokuk	768	....	22.1		49	1	-16	14, 20	39	1.89	.....	.94	4 0	6	10	13	8	NW	
Thurman	Fremont		...	22 2	.....	48	1	-27	20	49	.88	.. ...	.30	8.5	3	12	7	12	NW	
Villisca	Montgom'ry	1,058	7	24 0	‡. ...	54	1	-20	20	40	1.15	† 15	.40	11.0	8	8	11	12	NW	
Wapello (*a*)	Louisa	578	....	24.5	.....	53	1	-9	14, 20	32	1.35	..	.77	2 2	5	9	5	17	NW	
Washington	Washington	769	10	.....	.....	.....	.....	.....	.....	.....	1.68	†.46	1.38	....	5		...		NW	
Woodburn	Clarke	961	...	.....	.....	.....	.....	.....	.....	....	1.30	...	.75	2.5	5	12	5	14	NW	
Average		.....	.....	22.6	-3.7	51.3	.....	-17.6	.....	38.1	1.23	-0.14	.....	6.1	7	9	8	14	NW	
Av. for the state		.....	....	20.5	-3.4	48.2	.....	-20.6	.....	37.4	.93	-0.35	....	5.4	6	10	9	12	NW	

*Means determined from 7 A. M., 2 P. M. and 9 P. M. observations, and maximum and minimum are taken from eye readings. †Means determined from 7 A.M. and 7 P. M. observations. ‡Received too late to be computed with means. *a*, One day missing; *b*, two days, etc.

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR DECEMBER, 1901.

STATIONS.		DATE.																															Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton.....	Max...	52	34	30	31	29	46	43	30	40	34	26	32	31	- 7	10	14	11	5	- 3	14	31	40	40	37	39	35	36	35	35	43	34	29.4
	Min..	33	20	20	19	21	28	28	22	16	25	10	20	- 7	-17	-13	6	- 3	-10	-14	-14	6	23	27	30	24	27	24	21	19	18	28	14 1
Albia.....	Max...	50	34	30	29	28	43	40	32	37	32	28	33	32	[illegible]	8	20	12	4	- 2	10	30	43	41	38	42	35	35	33	3:	42	36	30 3
	Min ..	32	22	18	18	20	28	28	20	13	25	15	23	- 8	-18	-15	2	...	-12	-16	-18	5	21	31	29	22	26	23	18	16	17	25	13.2
Algona	Max ..	45	29	29	21	28	39	39	27	36	33	25	26	.19	-11	5	15	.1	- 4	- 2	13	28	38	40	37	39	36	39	36	36	44	35	27.6
	Min	27	12	13	7	19	27	25	12	10	15	6	11	23	-24	-18	- 6	- 9	16	-20	-12	8	10	27	31	22	26	27	18	21	18	22	9 2
Alta	Max...	39	26	25	24	32	42	31	26	36	26	26	23	20	-10	5	8	0	- 3	- 8	14	34	38	40	36	39	37	36	32	36	40	34	25.4
	Min...	23	12	10	6	18	21	22	13	19	12	7	18	-18	-26	-21	- 6	-12	-17	-20	-14	7	25	27	28	21	20	28	17	20	20	20	9.0
Amana ...	Max .	44	34	29	28	28	37	36	34	31	31	31	33	33	- 5	3	16	10	3	0	6	22	39	36	36	34	37	34	34	34	36	35	26 1
	Min..	30	24	24	20	25	26	33	26	14	24	16	28	- 5	-17	-12	1	- 1	-11	-10	-13	3	18	23	32	29	29	22	27	21	16	24	15.1
Ames.....	Max...	52	35	..	28	29	43	43	24	41	.	27	30	30	- 6	5	15	10	1	- 2	11	17	40	41	37	39	37	35	35	33	46	42	28 6
	Min...	31	20	10	5	12	..	29	23	16	16	12	23	-10	19	-15	4	- 5	-12	-14	-14	4	19	33	33	24	29	24	24	20	18	31	12.4
Atlantic ...	Max..	40	35	30	29	34	46	39	29	43	29	24	30	26	- 5	10	12	2	0	- 2	16	36	39	41	39	40	39	40	33	38	46	39	28 9
	Min..	26	16	23	18	25	29	29	23	16	21	8	24	-10	-19	-19	1	- 6	-14	-14	-25	10	10	21	31	22	29	28	23	22	20	19	12 5
Baxter.. ..	Max..	47	33	27	28	27	40	42	35	36	35	28	31	.	- 6	- 2	17	10	- 2	- 2	2	25	40	38	37	39	35	33	35	34	43	37	27.4
	Min..	28	21	22	8	22	23	30	16	10	24	10	24	10	19	-17	3	- 7	14	-15	-15	4	..	32	29	19	26	24	22	20	15	23	12 6
Bonaparte.	Max ..	48	36	32	30	29	39	37	35	37	36	31	36	35	3	7	23	14	4	- 1	7	26	42	38	35	35	38	35	33	37	41	38	29.5
	Min...	36	26	28	22	23	23	31	27	17	29	11	27	3	-13	-10	1	- 2	-10	-13	-15	1	16	32	32	29	27	24	29	22	18	24	16 0
Britt.....	Max...	36	28	27	22	26	38	37	26	36	28	25	29	22	-13	3	16	6	- 4	- 6	12	26	38	37	36	37	34	40	32	34	42	30	25.2
	Min...	25	14	11	7	20	25	26	10	6	13	5	19	17	-27	-24	0	-10	-21	-17	-20	6	9	16	27	13	20	23	19	16	11	17	7.2
Burlington.	Max ..	54	35	31	32	29	39	40	35	39	37	33	50	51	3	8	20	15	4	- 5	4	26	44	42	39	35	38	40	36	36	42	43	31.5
	Min...	35	29	26	21	24	27	30	29	17	29	20	29	3	-12	-11	0	2	- 8	-11	-14	2	20	32	35	30	29	26	30	25	20	28	17 2
Carroll	Max...	50	32	27	27	33	45	40	29	41	31	27	26	24	14	6	14	7	4	- 3	13	37	40	42	44	39	40	39	35	38	50	39	30 1
	Min. .	30	15	17	4	22	22	27	26	20	18	18	21	11	-20	15	3	- 8	-14	-17	-13	5	15	22	30	20	28	30	20	20	18	22	11 9
Cedar Rap.	Max...	48	35	29	27	28	37	37	36	33	33	30	34	35	4	3	14	10	5	2	4	23	40	37	36	36	35	35	37	35	37	34	27.8
	Min...	31	25	25	18	24	26	32	26	16	28	19	27	15	-16	-11	0	- 1	-11	- 9	-11	3	16	21	32	28	30	24	26	33	18	24	15.1
Chariton...	Max...	52	35	29	28	27	47	40	33	38	33	27	33	36	- 3	7	20	12	2	- 1	8	29	43	44	38	44	39	37	34	34	46	38	30.0
	Min...	33	20	24	18	23	26	29	19	15	25	13	23	- 7	-16	13	4	- 2	-11	-12	-15	6	21	33	31	24	28	24	19	18	15	25	14.2
Charles Cy.	Max...	37	35	27	23	25	37	33	31	31	23	28	27	- 6	0	8	5	2	- 2	4	18	20	33	34	35	33	34	32	31	34	40	37	24.2
	Min...	29	18	15	5	18	..	21	10	21	7	18	11	-23	-20	- 4	- 8	-17	-14	-15	- 8	-5	10	15	20	22	22	21	20	20	13	23	7.4
Clarinda...	Max...	46	36	35	31	35	51	37	31	44	34	37	31	24	- 1	12	16	9	4	- 3	17	38	41	44	40	44	41	42	35	41	48	45	31 8
	Min..	34	21	25	21	26	30	29	23	12	24	15	24	- 9	-14	-11	3	- 6	10	-13	-19	9	17	27	32	23	28	27	20	24	24	25	14.9
Clear Lake	Max ..	50	42	44	36	35	42	40	35	40	32	35	32	...	0	5	20	14	10	10	9	30	52	35	42	44	50	39	31	34	56	35	32.6
	Min...	27	13	14	6	7	8	6	15	13	14	5	5	-15	26	-16	- 6	-10	-19	-18	-14	3	13	20	28	18	25	25	20	20	15	20	11.0
Clinton ..	Max..	50	37	29	31	32	38	39	35	29	37	34	38	38	2	4	15	11	5	12	4	19	37	39	38	36	35	35	37	37	37	38	29.3
	Min...	30	24	20	17	23	22	32	28	21	24	20	27	2	-12	-10	- 1	- 2	- 8	-10	-12	4	14	24	29	29	29	20	30	25	27	19	15 6
College Sp.	Max. .	52	37	30	32	37	48	39	32	42	37	27	32	29	2	13	17	6	3	- 4	16	36	39	45	38	41	38	41	36	39	47	40	21 2
	Min ..	34	20	20	20	25	29	28	21	17	27	13	23	- 5	-15	-12	2	- 4	-10	-12	-19	9	18	15	30	22	27	25	23	20	21	26	14.2
Colum. Jc.	Max...	50	37	30	30	29	36	36	35	32	33	30	34	33	- 2	6	19	10	6	4	5	25	41	38	36	36	36	35	35	40	36	39	28.7
	Min..	33	27	26	19	23	23	30	27	16	27	15	26	- 2	-14	-10	2	0	- 9	-10	-12	2	18	29	30	28	26	24	22	15	16	25	15.2
Corning ...	Max .	42	45	29	29	33	46	39	30	40	33	25	31	29	- 2	10	14	9	2	- 5	13	33	39	40	37	39	33	37	33	37	40	35	29 0
	Min...	34	20	23	20	25	30	29	22	15	23	12	21	- 8	-17	-11	1	- 6	13	-16	-19	8	17	25	31	23	28	28	17	17	22	27	13.8
Co. Bluffs..	Max...	44	35	30	31	42	51	35	33	45	30	26	28	...	- 2	15	15	10	4	0	20	43	43	43	41	44	42	41	35	47	47	49	32.2
	Min...	32	17	21	21	27	26	26	23	21	18	10	20	- 8	-15	-10	- 1	- 5	- 8	-12	-12	10	19	26	33	23	25	28	20	23	25	29	14.7
Davenport.	Max...	49	36	31	30	28	38	38	35	32	32	34	40	37	- 2	3	14	8	3	6	4	21	41	41	38	33	36	37	36	34	37	39	28 7
	Min...	35	29	20	20	24	27	32	27	21	27	20	28	- 5	-13	-10	- 1	- 1	- 8	- 9	-10	3	19	30	33	28	28	26	28	26	20	27	16,8
Decorah....	Max .	43	35	27	28	28	34	35	33	32	30	28	27	27	-12	0	11	3	1	- 3	7	22	38	35	33	34	32	36	33	33	40	33	25 3
	Min ...	31	21	17	17	23	24	32	22	12	22	11	19	-12	-24	-22	- 7	- 9	-17	-12	-18	2	12	32	25	22	20	17	20	22	11	19	10 7
Delaware..	Max...	41	34	27	26	27	34	35	32	30	29	29	33	32	- 9	1	10	5	3	- 1	4	19	35	35	35	37	36	37	37	33	32	32	25 5
	Min...	29	20	15	15	15	21	29	20	11	20	14	20	- 9	-21	-18	- 5	- 9	-14	-13	-16	-1	10	20	29	22	25	16	21	19	10	20	13.4
Denison...	Max...	41	32	28	27	34	45	39	28	42	29	26	26	23	- 7	9	9	3	- 2	- 4	16	34	37	40	37	37	38	36	35	37	45	37	27.6
	Min...	31	14	7	12	25	22	26	12	21	15	10	22	-12	-21	-20	- 8	- 9	-14	-16	-15	10	23	25	33	19	24	21	13	27	23	22	10.9
Des Moi'es	Max..	46	32	30	29	30	47	35	30	43	31	28	33	26	- 3	6	15	10	2	1	11	37	41	42	39	42	39	36	34	35	46	31	29.2
	Min. .	28	22	20	13	24	30	30	20	18	21	13	26	-10	-17	18	5	- 7	-12	-12	13	7	25	34	34	25	30	28	20	23	18	29	14.6
De Soto....	Max...	49	35	29	31	32	46	42	31	42	35	27	32	28	- 8	9	16	10	5	- 2	17	31	41	41	40	45	39	40	35	34	44	37	30.1
	Min...	29	20	24	11	27	32	30	22	18	24	9	22	- 9	-16	-14	- 3	- 2	- 8	-12	-10	11	24	32	33	26	20	30	22	22	20	27	15.4
Dows	Max .	48	30	29	25	24	38	39	32	38	33	26	27	27	-11	1	14	11	- 1	- 5	8	23	39	36	35	40	36	35	31	34	48	38	26.7
	Min ..	29	11	15	6	19	24	27	16	11	19	8	21	-15	-23	-19	- 1	- 8	-18	-16	-16	4	14	23	29	20	24	25	21	20	15	21	9.8
Dubuque...	Max...	45	35	28	28	28	36	37	36	30	32	32	35	35	- 4	1	11	7	6	5	5	19	40	37	37	35	34	35	35	34	36	37	27.3
	Min..	34	26	22	20	24	26	33	26	23	26	23	26	- 4	-17	13	0	0	- 9	- 6	-10	4	17	28	32	28	28	24	24	24	18	26	16.2
Eldon	Max ..	48	36	33	30	30	41	38	35	37	33	30	34	33	- 3	6	20	14	3	0	9	28	44	40	37	42	38	34	35	35	42	37	29.6
	Min ..	32	25	22	20	23	26	32	26	11	28	19	25	- 3	-16	11	0	- 4	-10	15	-16	4	18	32	32	29	27	23	28	23	18	23	15 2
Elkader....	Max...	37	36	31	29	28	34	36	35	38	30	33	33	18	- 7	2	13	10	6	4	5	19	45	45	37	..	35	34	46	35	45	37	28.1
	Min...	18	22	21	9	18	21	..	25	13	24	14	20	10	-21	-17	- 2	- 9	-14	-12	-17	1	10	22	32	26	25	17	28	21	12	15	10 5
Estherville	Max ..	38	26	23	25	28	40	35	25	33	25	21	22	20	-11	3	11	0	- 9	- 4	13	32	37	35	40	40	35	35	32	32	46	37	24 7
	Min. .	10	10	7	2	12	26	21	20	12	18	- 1	16	-14	-30	-27	-16	-14	-24	-19	-14	-4	14	21	20	28	18	25	18	10	..	12	5.1
Fayette,...	Max..	40	32	26	26	27	35	36	33	31	27	27	32	28	- 9	0	10	5	- 2	- 3	2	19	37	36	37	33	33	33	33	33	36	32	24.7
	Min ..	28	20	18	5	22	23	27	18	7	21	10	20	-14	-24	-22	- 4	-10	17	-14	-17	1	10	23	30	24	21	18	28	18	9	16	9.5
Forest City	Max...	44	31	25	22	24	37	37	28	33	30	29	29	23	- 2	- 1	16	9	17	- 5	7	26	40	34	44	43	35	36	32	34	46	37	27.1
	Min ..	22	9	11	8	18	..	25	17	9	16	5	18	- 2	-28	-25	- 2	-11	20	-18	-17	5	12	20	30	15	20	24	18	19	12	20	7.7
Ft. Dodge	Max...	50	35	29	27	28	44	42	32	40	35	29	28	26	- 7	0	15	10	0	0	12	30	42	40	38	40	38	40	37	33	50	40	29.1
	Min..	29	17	16	2	22	26	27	18	13	19	8	20	-10	-22	-20	- 1	8	-15	-15	-13	8	18	31	31	20	21	27	20	15	16	20	11 0
Galva.....	Max...	32	35	..	28	35	37	40	29	48	32	28	25	23	11	10	12	- 2	- 4	18	37	40	..	41	28	38	38	39	35	35	44	39	29 3
	Min..	30	13	14	4	23	19	26	15	19	16	7	21	-14	-25	-20	- 9	-16	-19	-14	- 9	20	..	24	..	..	21	28	18	16	19	19	10.2
Glenwood..	Max...	54	39	31	30	38	49	45	30	44	41	38	...	27	8	12	13	11	2	4	17	41	43	43	41	43	39	40	36	38	45	42	32 8
	Min...	35	16	21	19	26	24	27	21	20	24	12	- 4	- 7	-16	13	- 1	- 5	-10	12	-14	8	22	25	32	24	27	28	22	24	25	25	13.7
G. Meadow	Max...	45	34	25	27	28	34	34	33	30	27	29	29	-12	0	9	5	1	- 5	4	19	24	37	34	37	34	34	33	32	33	36	30	24.5
	Min. .	32	20	18	8	22	22	32	23	11	10	18	-12	-25	-20	- 4	- 8	-18	-13	-16	- 1	14	14	20	30	24	23	18	20	20	12	20	10.5
Greene.	Max..	40	35	..	23	26	35	37	32	33	32	25	28	28	-11	- 3	13	6	0	- 2	8	23	40	34	36	40	35	32	32	34	46	36	25.8
	Min...	30	23	21	10	17	24	30	20	12	20	8	20	-11	-23	-23	- 3	- 8	-18	-14	-15	3	12	17	33	20	28	23	22	21	15	22	10.8
Greenfield.	Max .	46	36	31	31	31	45	41	32	41	33	27	31	34	- 3	11	15	12	6	- 3	15	33	43	40	38	40	36	39	34	37	43	36	30.0
	Min ..	35	18	20	.	..	..	27	19	..	..	..	21	- 9	-22	-19	-10	- 5	-16	-16	-17	3	7	25	29	22	28	27	19	17	17	25	10.2
Grinnell...	Max...	49	33	28	26	27	39	37	31	33	32	26	42	32	- 8	1	14	10	4	- 2	5	22	37	37	35	35	34	32	32	34	38	36	26.8
	Min...	32	23	23	13	22	24	30	24	15	25	9	25	-10	-18	15	0	- 4	-12	-13	-14	4	19	31	30	24	29	22	22	21	17	25	13.6
Grin'l (nr.)	Max...	48	32	28	28	27	38	36	30	33	32	26	33	32	- 5	3	15	10	1	- 2	7	23	36	41	36	35	34	34	32	34	19	34	26.8
	Min ..	30	23	23	13	22	24	30	24	12	25	11	25	- 5	-19	-17	0	0	-15	-14	-16	3	16	30	30	24	30	21	21	21	14	25	13 2
Grundy C'r	Max...	47	32	26	25	26	37	37	31	32	31	27	31	30	- 9	0	15	8	1	- 2	6	21	39	34	36	33	34	32	31	33	43	35	25.9
	Min...	31	21	21	7	17	23	30	19	9	23	9	22	- 9	-25	-23	- 3	- 9	-20	-16	-20	3	15	15	31	17	26	21	23	15	11	21	9.8
Guthrie Cr	Max...	54	35	28	28	30	46	46	33	42	35	24	30	26	- 7	8	13	10	1	- 3	13	36	39	48	41	42	43	39	34	36	45	39	30 1
	Min...	32	19	22	5	25	30	30	21	21	21	5	24	- 8	-19	-19	4	- 4	-14	-13	-12	10	22	28	32	24	28	30	22	21	20	25	13.3
Hampton..	Max. .	34	35	29	27	25	38	..	30	39	32	28	28	27	- 7	4	20	5	3	- 1	9	26	40	36	37	43	37	36	32	35	50	36	27.1
	Min...	28	20	17	6	18	24	28	19	15	19	9	20	-13	-22	-19	- 2	- 8	-17	-15	-14	4	16	22	30	20	29	25	22	21	16	24	11.0
Harlan.....	Max...	47	35	29	29	36	44	38	29	36	30	24	29	23	- 7	11	10	9	5	- 4	15	33	39	42	37	38	36	41	33	37	42	36	28.5
	Min. .	32	15	21	11	22	21	27	19	17	17	5	22	-12	-22	-22	- 4	- 8	14	-17	-20	5	16	22	31	20	24	26	18	20	20	24	10.8
Hopeville..	Max...	49	33	29	29	29	46	37	35	38	30	23	32	32	- 6	13	13	9	...	- 4	10	29	37	39	38	39	35	36	33	34	41	..	28.9
	Min...	32	21	21	20	24	28	29	27	16	22	10	22	-10	-16	-16	6	6	-11	-14	-17	7	23	27	31	24	25	25	18	18	18	..	13.8
Humboldt.	Max...	47	..	30	27	27	42	40	28	37	32	27	27	25	-10	5	15	...	- 2	- 2	12	29	39	38	38	39	37	40	48	42	56	54	29.9
	Min ..	29	18	16	5	17	..	28	18	14	20	7	21	-12	-24	-20	0	- 8	-17	-16	-14	6	17	30	30	21	23	27	20	20	18	20	10.5
In'pen'nce.	Max...	40	34	27	25	26	35	37	33	31	31	29	32	32	- 5	- 1	11	5	5	- 3	2	16	37	37	36	36	32	35	34	34	34	34	25.6
	Min...	28	20	22	12	19	22	29	27	11	22	10	22	-11	-22	-18	- 5	- 6	-16	-12	-16	0	9	15	27	28	22	18	32	19	12	21	11.0
Indianola..	Max ..	64	33	30	29	28	47	40	31	40	33	27	31	31	- 5	8	16	10	1	- 2	10	31	39	41	37	43	37	37	34	33	45	38	29.6
	Min...	30	21	22	12	23	40	27	20	16	25	4	25	-10	-19	-17	5	- 3	-13	-14	-15	7	22	33	31	24	20	15	11	10	10	22	12 4
Iowa City..	Max. .	45	35	30	38	28	38	37	34	38	33	31	33	33	- 2	3	18	11	4	3	6	25	41	35	36	35	38	34	35	35	38	38	28.6
	Min ..	31	25	24	18	22	26	32	27	14	22	16	28	- 2	-16	-11	0	1	-12	-10	-13	2	15	21	31	28	29	23	30	26	16	22	14.9
Iowa Falls.	Max...	40	29	27	26	25	38	38	31	36	31	26	29	27	-10	1	13	7	- 3	- 4	8	22	38	36	36	36	35	32	31	34	41	31	25.4
	Min...	25	20	13	7	20	24	28	15	13	15	10	21	-15	-21	-22	0	- 9	-19	-15	-17	4	14	18	29	16	25	24	29	16	14	17	9.4
Keokuk ...	Max ..	52	33	34	31	29	41	39	35	37	40	33	52	56	- 4	8	24	8	3	2	10	28	42	39	39	35	39	43	42	36	40	42	31.9
	Min. .	35	29	27	23	25	28	32	28	19	31	24	31	6	-11	- 9	1	4	- 7	-11	-12	4	21	33	35	30	28	26	31	24	21	28	18 5
Keosauqua	Max ..	54	35	32	29	30	40	38	37	37	37	32	35	35	3	9	22	18	9	2	8	27	42	39	36	36	39	35	34	37	40	38	30.5
	Min...	35	25	25	23	24	27	32	28	18	29	22	27	3	-11	- 8	3	5	- 9	-14	-14	3	15	33	32	30	28	25	28	23	18	23	17 0
Knoxville .	Max...	53	33	30	32	28	44	42	30	39	32	27

DAILY MAXIMUM AND MINIMUM TEMPERATURES FOR DECEMBER, 1901—CONTINUED.

STATIONS.		DATE.																													Mean.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Lenox	Max	51	36	28	30	30	46	42	31	39	34	26	35	31	- 3	9	13	9	1	- 4	14	31	37	41	37	39	36	38	33	36	42	39	29.3
	Min	34	19	23	19	24	29	28	22	17	25	11	20	- 8	-19	-13	3	- 5	-13	-18	-23	6	17	23	31	22	27	25	20	16	19	26	13.1
Logan	Max	50	36	31	30	40	45	40	32	42	34	25	29	24	- 3	12	14	10	6	- 1	20	37	43	34	39	39	40	38	35	39	44	37	30.4
	Min	30	11	19	13	17	20	27	20	20	21	1	18	-10	-20	-19	- 5	- 6	-14	-12	17	8	20	25	20	30	26	24	25	26	25	24	12.6
Maquoketa	Max	52	45	34	32	33	40	41	42	36	38	36	42	43	12	11	15	15	12	12	11	24	43	47	39	43	36	40	43	46	40	41	33.7
	Min	27	23	16	11	24	..	31	26	21	20	18	25	3	-15	-12		- 2	-10	- 9	-13	3	10	20	30	27	27	19	31	24	15	16	13 5
Marsh'lt'n	Max	47	34	29	26	24	39	38	32	34	34	29	32	33	- 5	3	15	13	3	- 1	8	24	44	42	37	38	35	35	35	35	42	35	28.0
	Min	32	22	24	7	20	25	30	24	13	26	12	24	- 6	-20	-14	..	- 5	-14	-14	-13	5	19	29	30	21	30	23	24	22	17	24	13.5
Monticello	Max	44	43	28	29	30	35	34	33	34	32	33	33	35	3	5	11	9	5	2	5	30	34	40	38	33	34	33	36	34	35	36	27.8
	Min	25	25	23	18	18	19	26	25	24	23	30	29	3	-18	-14	- 9	- 5	- 8	-10	-13	18	16	23	25	28	27	20	14	12	18	17	13.7
Mt. Ayr	Max	52	35	29	29	29	49	41	29	40	33	27	32	30	- 4	11	15	9	6	- 3	12	34	39	41	38	40	37	37	34	37	44	40	29 7
	Min	31	19	21	20	23	28	27	21	16	25	12	21	- 8	-16	-14	5	- 6	-13	-15	19	5	18	26	31	21	26	24	17	14	17	26	13.0
Mt.Ple's'nt	Max	48	35	35	30	30	39	40	35	34	34	35	36	..	8	7	10	12	5	3	6	24	40	38	36	35	38	35	35	42	40	38	29.4
	Min	31	23	29	20	..	23	..	25	14	20	12	21	4	-15	- 8	- 5	- 3	-11	-14	-17	- 2	12	28	28	25	24	20	28	20	21	22	12.8
Mt.Vernon	Max	..	35	34	30	28	35	34	..	31	31	32	35	..	..	1	13	..	..	..	6	24	44	37	35	34	34	33	32	32	37	26	26.5
	Min	32	26	24	24	24	24	31	27	17	27	20	24	- 8	-14	-10	- 1	- 2	- 9	- 8	-14	4	15	24	30	29	30	27	26	24	16	21	15.6
NewH'pton	Max	42	23	28	23	25	33	36	32	39	30	26	27	27	-11	- 1	9	9	2	- 5	1	18	37	34	35	32	31	32	32	33	40	36	24.3
	Min	31	18	17	10	17	16	29	20	9	9	7	19	-12	-25	-21	- 6	-10	-18	-16	-17	- 3	- 3	17	30	23	23	19	20	18	12	22	7.6
Newton	Max	52	34	31	27	27	40	39	31	34	29	27	32	32	- 3	- 3	16	12	4	- 3	7	20	38	38	36	37	36	40	38	39	38	24	27.2
	Min	30	21	22	9	21	21	29	25	12	25	8	..	- 3	-22	-20	- 1	- 7	-16	-17	- 8	2	18	32	30	18	28	23	18	20	17	24	11.9
Northwood	Max	40	31	30	25	26	35	38	36	39	33	27	30	28	-12	4	16	14	0	- 4	11	22	39	41	38	35	34	36	33	34	44	35	27.0
	Min	27	16	11	5	18	23	26	14	11	12	4	18	-15	-25	-22	- 5	- 8	-18	-16	-15	4	11	18	30	18	22	21	20	13	15	20	8.3
Odebolt	Max	48	33	28	28	34	42	40	28	37	32	28	26	23	- 8	6	10	9	1	- 4	14	35	44	40	37	38	37	40	35	06	43	35	28.2
	Min	32	11	17	3	24	21	27	16	20	19	10	22	-10	-21	-18	- 4	- 6	-15	-16	-12	11	24	25	36	22	21	29	19	19	20	21	12 8
Ogden	Max	50	35	28	26	27	44	42	30	43	35	27	30	23	- 9	6	16	10	3	- 6	10	28	43	43	37	42	39	36	33	33	50	48	31.2
	Min	29	17	17	7	24	26	27	18	13	14	10	20	-10	-22	-18	..	- 7	-16	-18	-17	5	16	30	32	21	26	25	22	17	15	22	11.1
Olin	Max	44	55	30	29	30	37	36	35	31	31	30	33	33	3	14	15	..	5	..	5	20	38	36	35	35	36	34	35	35	34	35	28.9
	Min	29	27	24	11	21	26	31	29	15	23	17	26	3	-17	..	- 3	..	-10	-10	.	..	12	31	28	28	28	29	31	23	14	20	17.4
Omaha, N.	Max	48	32	31	30	40	53	36	32	47	30	25	27	20	- 3	14	14	3	4	- 3	22	44	42	43	41	43	42	40	33	38	49	39	30 8
	Min	29	19	21	21	28	28	28	23	23	19	11	20	-11	-16	-11	- 2	- 6	- 6	-11	- 8	14	30	33	33	28	28	30	21	31	31	27	16.3
Onawa	Max	49	37	30	28	41	47	42	32	43	33	28	26	24	- 2	10	15	10	8	2	17	38	42	42	37	36	42	38	35	40	48	40	30 9
	Min	31	13	17	8	25	22	26	20	19	21	9	22	-11	-18	-17	- 5	- 8	- 9	-14	-16	9	18	26	29	18	22	26	19	19	20	22	11.7
Osage	Max	40	32	25	23	25	34	35	32	30	30	22	26	25	-11	1	10	6	1	- 6	6	19	32	34	34	32	33	34	31	34	39	38	24.1
	Min	30	18	16	16	18	23	28	20	11	19	6	17	-11	-24	-20	- 4	- 9	-17	-16	-15	1	9	20	31	17	26	21	21	21	15	21	10.5
Oskaloosa	Max	49	..	30	32	29	42	39	31	35	..	27	35	34	- 4	8	20	12	2	- 5	11	26	41	41	35	41	35	34	34	34	41	35	28.4
	Min	31	23	21	20	23	27	29	24	13	25	10	25	- 8	-17	-12	..	- 4	-12	-15	-15	6	20	31	30	25	28	24	22	20	17	21	14.4
Ottumwa	Max	50	37	34	32	32	42	46	34	36	37	30	38	34	2	10	27	16	7	2	14	30	44	41	39	41	40	36	36	36	42	37	31.5
	Min	34	27	26	23	25	28	33	29	18	30	21	30	2	-14	- 8	- 4	..	- 6	-10	-10	8	27	36	34	31	31	26	27	23	20	27	18.2
Ovid	Max	50	35	32	30	29	48	41	33	41	33	29	33	33	- 4	11	21	12	6	4	9	31	43	43	38	47	39	37	35	35	47	45	31.2
	Min	32	21	19	20	22	25	27	19	15	25	14	21	- 6	-16	-13	4	- 3	-11	-14	-18	4	21	31	30	23	23	24	17	15	14	23	13.2
Pacific Jct.	Max	45	38	30	31	39	50	40	34	44	..	29	29	25	0	15	16	11	8	- 5	20	40	44	45	40	44	39	41	35	39	45	38	31.6
	Min	31	18	23	22	28	23	29	20	20	24	14	24	- 8	-15	-12	.	- 5	-10	-14	-21	7	14	21	31	21	28	27	23	23	26	23	14.1
Perry	Max	45	31	28	29	29	45	41	32	42	35	22	32	48	- 9	8	14	10	3	- 2	13	32	42	41	37	41	37	38	33	34	46	38	28 9
	Min	29	20	19	8	24	29	29	19	17	22	10	24	- 9	-18	-18	6	- 5	-15	-14	-15	8	13	32	33	25	29	29	19	18	13	23	13.0
Plover	Max	42	30	28	29	30	46	..	32	36	..	..	26	22	-10	6	22	..	- 4	- 4	10	28	39	38	37	40	39	40	..	35	43	34	27.5
	Min	28	15	10	5	16	26	24	15	20	25	16	17	10	-27	-22	-14	..	-20	-18	-16	- 6	- 3	30	31	18	20	18	20	28	13	22	10.0
Red Oak	Max	48	41	33	49	49	58	42	33	47	36	31	36	31	7	18	40	17	12	7	22	34	38	55	47	39	46	.	42	39	45	35	36.1
	Min	37	21	25	23	28	31	30	25	24	24	16	26	- 1	- 8	- 2	5	0	- 2	- 6	13	15	21	26	33	28	30	..	24	24	25	25	17.8
Ridgeway	Max	40	36	30	25	26	36	37	36	32	34	32	30	28	- 4	2	14	7	9	2	8	19	39	40	36	35	35	32	33	34	44	39	27.5
	Min	33	20	18	8	18	23	32	20	10	22	10	18	-18	-26	-23	- 6	- 6	-18	-14	-16	0	14	24	33	24	25	20	21	19	12	21	10.3
Rockwell C	Max	50	39	35	30	35	42	40	33	40	35	31	29		-10	6	15	..	0	- 4	11	22	39	41	38	39	36	41	36	33	45	37	30.4
	Min	30	16	12	5	21	..	23	18	19	17	9	21	- 2	-20	-16	- 1	- 6	-14	-17	-12	3	22	31	30	22	25	25	20	21	20	21	11.0
Sac City	Max	48	33	28	27	33	42	39	25	37	32	25	26	22	-10	4	10	4	0	- 2	12	34	38	41	38	39	..	36	34	34	43	35	26.9
	Min	30	15	15	5	22	18	10	..	18	14	7	20	-12	-22	-18	- 6	- 7	-15	-16	-13	5	32	27	31	21	22	32	19	18	20	22	9 8
St. Charles	Max	63	35	..	30	29	48	40	32	45	35	25	32	30	- 2	11	19	10	1	4	13	37	40	44	37	45	40	39	38	35	49	37	31.5
	Min	31	21	22	14	23	28	30	21	17	24	7	22	- 9	-18	-11	5	- 4	-11	-13	13	7	26	32	..	25	28	27	26	20	18	25	13 5
Scranton	Max	40	32	28	30	30	44	40	30	40	..	30	38	9	4	10	20	15	20	16	14	32	40	43	38	40	38	40	35	35	47	41	30.6
	Min	30	18	20	8	24	26	28	20	20	22	24	23	0	-12	-10	0	- 4	0	- 4	-11	6	..	30	32	22	27	27	22	21	20	21	15.0
Sheldon	Max	40	28	25	26	31	42	38	28	35	28	27	24	22	4	4	10	6	3	- 1	15	35	38	38	39	39	37	36	34	37	48	36	27.5
	Min	25	9	12	4	4	19	22	15	16	10	0	15	-16	-27	-27	-13	-11	-20	-20	-15	5	22	24	31	17	17	26	16	27	25	19	7.5
Sibley	Max	47	28	26	22	30	..	41	26	..	26	22	23	18	11	2	9	2	..	- 2	13	35	35	34	37	39	37	35	33	37	46	31	25 8
	Min	28	12	11	2	22	..	16	12	..	10	1	14	-18	-29	-27	-27	-18	..	-21	-17	6	22	26	26	11	15	25	16	25	21	18	6 4
Sigourney	Max	49	45	34	32	29	40	40	34	46	35	30	35	33	- 5	9	23	14	14	1	-16	9	25	42	39	36	36	38	32	34	35	40	30.1
	Min	32	25	21	19	22	25	30	26	13	25	13	24	- 6	-16	-14	1	- 4	-12	-13	-16	4	20	32	30	27	28	22	22	20	20	22	14.1
SiouxC'nt'r	Max	46	29	32	27	35	43	36	29	34	28	22	25	23	- 9	6	12	2	2	- 2	15	34	38	41	38	37	35	37	35	39	43	37	27 3
	Min	25	11	12	4	24	20	23	13	17	14	12	16	-18	-27	-24	-11	-10	-15	-18	-12	7	26	22	32	19	18	27	17	29	24	20	9.3
Sioux City	Max	38	29	21	26	41	45	29	29	36	23	23	23	18	- 9	14	12	3	1	- 2	17	37	40	43	38	40	40	38	39	37	47	34	27.4
	Min	34	15	15	11	28	25	25	21	25	19	9	18	-16	-22	-20	- 9	-10	11	-16	12	11	31	32	31	24	24	29	16	30	28	25	13.2
Spirit Lake	Max	36	31	..	26	31	42	36	28	32	24	30	24	16	-10	5	10	0	0	- 1	12	35	36	35	39	38	36	35	34	32	48	36	25 9
	Min	20	13	12	6	20	22	22	16	17	11	2	.	16	-27	-22	- 8	-10	-20	-18	-14	7	21	25	30	17	17	24	18	24	17	20	11 5
Storm L	Max	44	27	26	25	32	40	36	35	36	28	23		21	-11	3	8	5	- 4	- 6	10	33	36	38	37	37	36	36	35	33	39	33	25.7
	Min	22	13	13	7	22	..	24	16	19	11	5	18	-16	-27	-21	- 7	-12	-18	-20	-16	7	21	26	31	19	20	26	17	12	18	20	8 3
Thurman	Max	48	38	29	31	39	49	43	32	45	36	27	28	24	- 1	13	15	10	4	- 2	22	38	42	43	42	42	40	41	37	38	47	39	31.6
	Min	35	22	21	20	25	20	29	22	16	25	11	24	- 8	15	-12	1	- 4	-11	-20	-27	11	5	24	32	21	28	31	24	24	22	24	12.8
Tipton	Max	48	36	30	31	31	38	38	34	32	34	..	35	35	..	6	17	15	5	3	7	22	41	38	36	38	36	35	36	34	42	38	30.0
	Min	34	27	25	24	17	25	32	29	25	15	16	26	5	-15	-11	.	- 3	-10	-11	8	2	16	25	31	28	30	29	30	24	17	23	16.4
Toledo	Max	59	37	38	36	29	38	34	36	30	30	32	..	10	13	12	22	20	..	9	42	38	36	37	37	38	38	34	35	33	46	31 3
	Min	28	29	30	27	7	..	24	25	12	13	12	12	-19	-15	-10	- 8	- 5	-14	-14	6	4	6	25	24	25	..	23	26	19	15	22	11.3
Villisca	Max	54	48	40	38	38	40	44	42	40	30	33	32	23	10	15	15	12	18	0	20	35	42	48	42	44	40	45	39	40	46	40	34 2
	Min	33	30	28	23	28	30	28	..	30	32	13	23	- 6	-17	-12	- 5	- 5	-12	-14	-10	5	10	..	28	18	28	22	24	..	24	24	13.9
Wapello	Max	53	38	32	34	31	38	38	35	41	33	31	35	39	17	15	17	18	11	10	13	22	..	42	36	34	36	36	36	34	42	44	31.4
	Min	36	28	27	22	24	22	32	29	19	27	32	28	38	25	- 7	2	12	7	1	2	5	22	41	35	36	34	36	33	33	34	43	36	26.6
Waterloo	Max	45	35	29	25	26	36	34	33	34	32	19	12	23	- 7	-21	-18	0	- 6	-15	-13	-15	4	9	12	31	24	28	21	22	34	41	34	27.0
	Min	30	22	17	10	21	21	30	17	11	19	12	23	- 7	-21	-18	0	- 6	-15	-13	0	4	21	40	35	37	..	35	34	33	34	41	34	27.0
Waverly	Max	42	30	29	25	27	36	37	33	33	27	..	30	30		..	..	- 2	- 6	-16	-13	-17	2	8	15	..	25	25	22	21	21	14	25	12 3
	Min	30	20	18	9	19	25	30	13	23	11	..	25	26	-12	..	..	14	2	- 3	- 3	11	28	38	37	37	39	36	..	..	32	43	..	24.8
West Bend	Max	47	30	26	27	27	39	30	25	29	..	25	10	20	-12	-25	5	- 2	- 6	-17	-16	-14	8	15	26	32	18	22	25	20	20	15	23	10.5
	Min	25	14	16	5	22	27	28	17	19	17	38	30	35	35	8	-20	19	14	5	8	7	22	38	37	37	35	38	35	35	35	36	38	29 4
Wilton Jc	Max	52	36	29	31	31	41	41	35	32	38	30	35	35	8	5	19	14	5	8	7	22	38	37	37	35	38	35	35	35	36	38	29 4
	Min	34	27	25	16	21	26	31	30	15	22	13	28	5	-14	-10	1	- 4	- 9	-10	-13	1	16	24	31	30	30	23	31	25	16	22	15 6

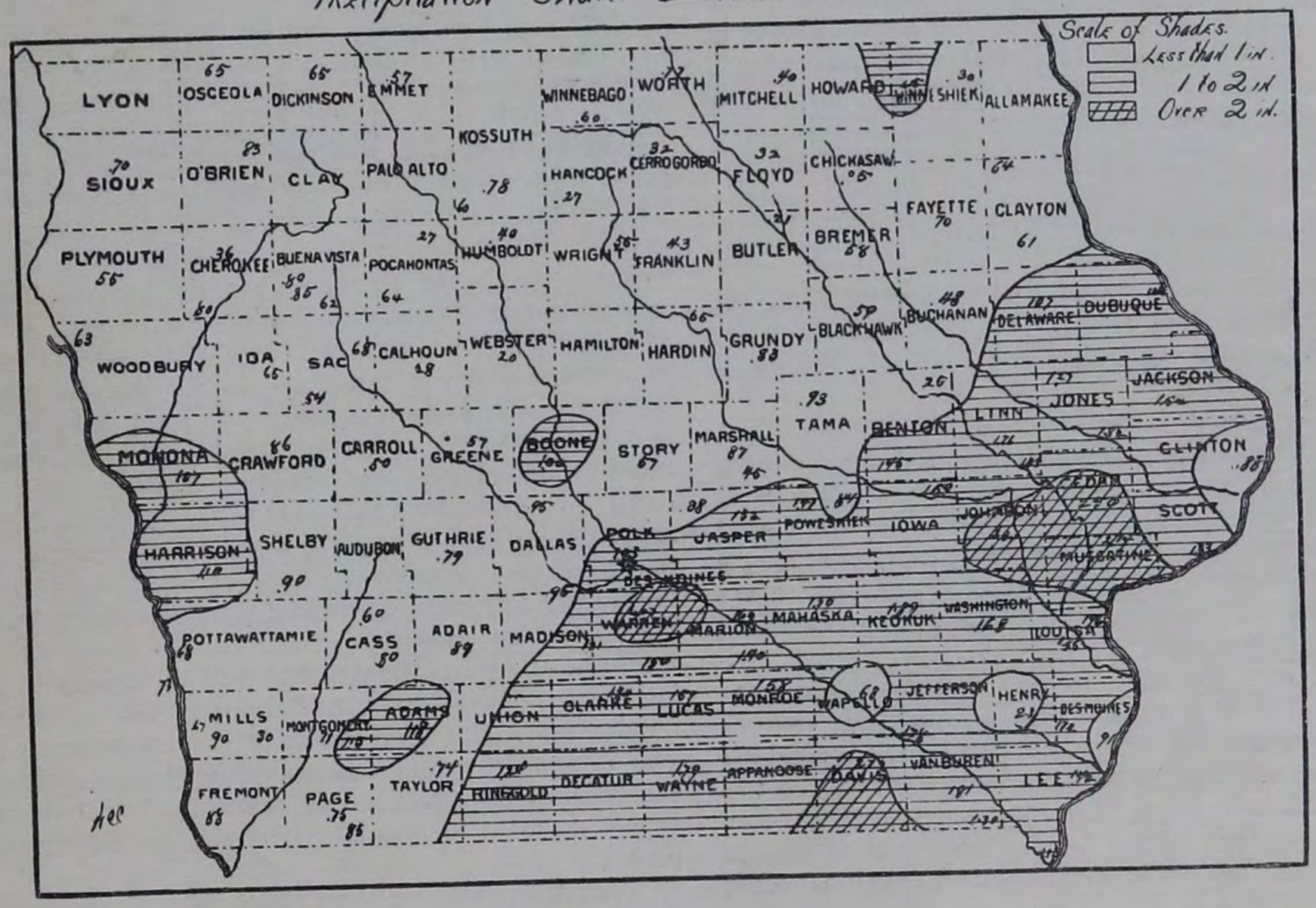
DAILY AND MONTHLY PRECIPITATION FOR DECEMBER, 1901.

STATIONS.	DAY OF MONTH.																														TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Afton		....	....	....	20	..	....	T	....	.20	....	.20		....	..	T	....	.20	....	..	---		....	....	..	T	....	.20	...	....	....	1.00
Albia	....	....	....	..	.16	....	T	.08	..	.12	....	.29	.53	....		.10	T	.07	....			...	....	....	..	T	....	.23	....	....	....	1.58
Algona	T	....	..	..	.15	....	.18	..	..	....	.25	....	....	....	.10	....	..		....	....	....	.	....	..	..		10	....		....	....	.78
Alta	....	..	..	..	.28	....		.06	....	....	..	.12		....	.10	.02		.06	..	....	....	....	.04	....	....	....	....	.21	....	....	....	.89
Alta (near)	....	....		....	.15	....	....	.10	..	....	....	.20	....		....	.10	....	.10	..	.....			.05		..	..	.15	....	....	...	..	.85
Amana			T	....	.03	..	...	.04	...	.05	....	.78	.66	....		.03	T	....	..	....	....	...	....		...	T			T	....		1.59
Ames	....	T			.17		....	T	....	....	....	....	.10	....	T	.20	....	T		..	..	..	....	. ..	....	....	....	.10	....		....	.57
Atlantic			....	..	.25	....	..		....	.10	....	....		....		T		.25	....	..	....	....	....	..	....	T	....		..	...	...	.60
Baxter	....	....	....		.10	....	....	....	....	.05	....	.23	....	....	....				....	....		....	....	.....	....	....	..	....	....	....	....	.38
Belknap	....		....	....	.10	....	....	.05	..	.10		.20	1.80	....	....	.10	.05	.05	....	....	..	....	....	....	....	.10	....	.20		....		2.75
Belle Plaine	....	....	....	.10	.15		....	.10	....	.05		.90	....	....	....	.10	T	....	..	..	..	....	....	..	....	.05		....	....	..		1.45
Bonaparte	....	....		....	.10	....	.03	....	....	....	....	.35	.70	....	....		..	....	....	....	....	..	...	....	.12	....		....		....		1.30
Britt	T	....	....	....	.07	....	....	.05	..	....	..	.07	.01	....	....	03	....	....	....	..	....	....	....	....	....	....	....	.04	T	...		.27
Buckingham	....	..		..	.41	.	....	.03	....	....	....	.38	....		....	.10	....	....	....	....		.	....	T	T	T	T	01	....			.93
Burlington			T	....	T	....	T	.07	....	.05	..	.22	.44	....	....	.07	....	..	....	....		...	....	T	.06		....	....	T	....	....	91
Bussey	T	....	....	....	....	....	.10	....	....	....	....	1 30	....	....	....	....	....	....	....	....		....	....	.	....	....	....	..	....	....	....	1.40
Carroll	....	....		....	.30	....	T	....	T		....	.05	....	..	T	T	T	.15	....	....	....	....	....	....	....	....	....	T	....	....	....	.50
Cedar Rapids		....	T	T	.10	.10	T	.05		T	....	1.43		..	T	.05	....	---	....	..	....	....	....	T	....	.02	....	T	.01		..	1.76
Chariton	....		....	....	.07	....	.02	.07	....	.09	....	.75	.15		T	.02	.02	.07	....	....	..	....	.04		....	.05		.16	....		...	1.51
Charles City	....	....	T	T	.10	....	.07	.05	..	....	.10			....	T	T	....	....	....	....		....		....	....	....	....				.32
Clarinda		...	....	....	.25	....	.03	....		....	.02	.08	....	....	.01	.03	....	.30	....	..	....	....		....	T	....		.03	....	..	....	.75
Clear Lake	...	....	....	....	.20	....	....	....	....		..	.12	....	....	....	....	..		....	..	....	....	....	....	....	....	....	T	T	....	....	.32
Clinton	....	.	....		....	....	....	.12	..	....	....	.68	T	....	....	.03			....	..	....	....	....	.01	.04	T	....	..	....	....	....	.88
College Springs	....	..	....	....	....	.15	....	....	.05		....	.15	..	...	....		.05	.40	....	....	....	....	T	....	....	T		.05		....	....	.85
Columbus Jct	T	....	T	T	.02		...	.05		.25	....	.82	.75	....	....	02	.01	....	....	....	....	....	....	T	T	.04	....		T	....	....	1.96
Corning	....	....	....	T	.15	....	T	.10		T	T	.28	T	..	T	.05	....	.40		....		....	..	.	....	T	....	.20				1.18
Council Bluffs	....	...	....	.19	.07		...	..	T		..	T	T	....	T	.20	....	.22	....	....			....	..	....	....	....	T	....	....	...	.68
Cumberland		.	....	....	10		....	....	....	.10	....	.10	....	....	T	T	....	.50	....	..	....		....	....	.	T	..		....	.	....	.80
Danville	....	.02	....	.70	....	.10	....		05	T	T	.50	.10	....	T	.10	10	....	....	.05	....						....	..				1.72
Davenport		T	T	T	T	T	T	.10	....	.11	....	.40	.67	....		.02	T	T	T		....	..	....	....	02	T	....	....	.01	....	....	1.33
Decorah	....		....	....		....	....		.07	....	....	16	....	....	T	T	T	.	..	.05	....	..	....		....	....		....	.07	....	....	.30
Delaware	....	....	T	....	.05		....	.06	..	....	....	.80	.12	....	....	....	.	....	....	....		.	....		....	.04	....			....	..	1.07
Denison	.	....		T	.10			.02	...	.02	....	.05	....	02	05	....	....	..	.10			....	.25	.25	....	....	....	T	..	..		.86
Des Moines	T	T	T	....	.16	T	T	.05	....	.17	....	.30	.02	....	T	.06	T	.04		....	....	....	.09	..	....	T	....	.14		....	....	1.03
De Soto	....	....	....		12	....	....	.07	..	.26	..	.20	....	....		.05	T	.05	....	....	....	..	....	....	..	....	....	.20	....	....	....	.95
Dows	....	....	....		.20	.05	....	....	....	..	....	.10		....	....	.10	.10	....			..	..	....	....	....	....	....	..	....	....	....	55
Dubuque	....	....	01	....	01	T	....	.03		....	....	.66	.66	....	....	.03	01	....	T	...	..	....		.01	....	.01		T	01		....	1.44
Eldon	T	T	....	..	.10		T	02	....	.13	....	.55	89		...	05	T	T	....	..	....	....	.03	....	..	T	...	.01	....	....	...	1.78
Elkader	....		T	....	T		....	.77	....	..	....	.46	....	..	....	.04	....	....	....	....	....	....		....		....	...	T	T	....	....	.61
Emerson	....	....	....		....	T	T	T	....	....	....	....	.30	....	....	....	....	T	T	T	T	....	....	....	....	....		T	..	....	..	.30
Estherville	....		T	....	.18	T	....	.11	....		..	.21	T	...	T	T	....	T	....	....	.	..	T	....	.....	....	....	.07			....	.57
Fayette	...	....	T	T	.04	....	....	.05	....	....	....	.48		....	.07		....	....	....	....			....	....		T	...		.06	....	....	.70
Fonda	....	....	..	.27	....	....	..	T	...	T		.15	....		....	.07		15	....	..	....			T	..	..	....	....	....	....	....	.64
Forest City	...	.	...	T	.10	T	....	.10	..	....		.30		....	..	T	....	T	....	....	.....	....	..	T	..	....	....	.10	T	....	....	.60
Fort Dodge	...	....	..	....	.10	..	....	....		....	....	.10	....		....	T	T	.	....		....	..	T	T	....	....	....	....	....	....	....	.20
Fort Madison	.....	T	....	T	T	....	.10	....	. ..	T	....	.79	.10	....		.20	..	.10	....	.....	....	.....	.08	.05	...	T	....	T	T		..	1.42
Galva	....	....	....	....	.25	....	....		....	....	..	.18	....	....	..	12	....	..	....	....	....	....	....	....	....	....	...	.10	....	....	....	.65
Gilman		....	T	....	.05	...	T	....	....	..		.40	..	T	....	T	....		....	..	....	....	....	T	....	....	...	T		....	....	.45
Glenwood	....	...	..	...	.18	....	....	....		..	.29	04		....	....	....	....	T	.24	....	....	....	....	T	..	.15	....	....	....	....	....	.90
Grand Meadow	...		....	..	.....	.05	....	.05		...	49	....	....	....	....	....	....		....	....	....	....	..	....	.	....	....	....	.05	....	....	.64
Greene	....	....	..	....	....	05	....	.03	....	.	....	.08	..	....		.05	T		....	.		....	....	..	..		....	....	..	....	.21
Greenfield	....	....	....	....	.21	....	....	02	....	.06	....	.21		....	T	T	01	.19	....	..		....	.02		.	.06	....	.11		....	....	.89
Grinnell	....		....	....	.38	....	.....	.07	..	.22	....	.51	T		....	24	....	....		....	....	....	.05	....	T		....	....	....	....	....	1.47
Grinnell (near)	..	....	....	....	.11	..	T	.05	...	.15	....	.20	.20	....	...	.08	..	....		....	....	....	.05	....	T	....	..	....	....	....	....	.84
Grundy Center	....		....	....	.10	.04	....	.09	..	....	....	.41	.13	....	T	T	.06	....	...		....	....	T	T	....	T	....		..	..	..	.83
Guthrie Center	....	....	....	.20	..	....	T	....	....	.20	....	T	.	....	T	T	....	.10	....	..	....	....	.24	....	.. .		.05	....	....	..	....	.79
Hampton	....	T	....	....	12	....	.06	....	....	....	.10	T		....	.07	.04	....	....	....	....	....	....	04	.....	....	....	T	....	....	....	....	.43
Harlan	T	....	....	T	.35		T	T	....	.20	....	....	.02	....	T	.03	T	.30	....	....	....	....	T	....	....	T	....	T		....	..	.90
Humboldt	....	....	....	.11	.08	....	....	....	....	....	....	.11	....	..		.10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.40
Independence	T		T	....	.10	....	....	.03		..	....	.25	....	....	.....	.05	....	....	....	....	....	....	..	....	..	T	....	T	.05	....	....	.48
Indianola	T	....	....	....	.20	....	T	.30	..	.38		.31	T		....		T	.05	....	..	....	....	11	....	....	.75	....	.15	....	....	....	2.25
Iowa City	....				.05	....	....	.10	....	.06	....	.85	1.10	....	....	.05	.03	....	....	....	....	....	....	..	....	.10	..	T	T	..	....	2.34
Iowa Falls	T	..	T	..	30		...	05			....	.20		....		.10	T	....	....	....	....	....	....	..	..	....	....	T	..	....	....	.65
Jefferson	....	....			.25	....	....	....	....	....	....	.05			.10	...	....	.02	....		..	.15		....	....	....	....	....	....	....	....	.57
Keokuk	....	T	....	T	.07	....	T	08	....		....	.22	.40	....	....	.02	T	.04	..	....	....	....	24	T	.04	T		.06	T	....		1.17
Keosauqua			T	T	.07	....	T	.09	....	T		47	.97	....	....	.06	.02	.05	..	..	..	....	.06	T		....	....	.02	T	....	..	1.81
Knoxville	....	....			.11	....	....	.10	....	.33		.90	T		....	T	T	.10	....		...	....		....		T	....	.15	. ..	....		1.69
Lacona	T	T	T	T	.10	....	....	.10	....	.20	....	.75		..	...	T	.10		....	..			.10	....		.15	..		....	.		1.50
Larabee	....	..	....	.25	....	....	..	.08	....	....	.12	....	....		.15	T	....	.01	....		...	T	..	....		....	....	.15	....	....	....		.76
Le Claire	....	....	....	..	T	T	....	.18	.01	....	.10	01	.91	.08	...	T	.01	....	....		....	....	..	.02	..	T	...	....			....	1 32
Le Mars	....	..		.20	..	...	....	....	....	....	....	.30	....	T	.05	T		T			....	....	..	....	....	.	T	....	....	..	..	.55
Lenox	....	....	....	....	.08	....	....	.05	....	.05	..	.10	....	....	....	..	....	.31	....	....	....	....	....	....	....	....	....	.15	....	....	....	.74
Logan	.50	....	..	.10	....		.40			10	....	....	....	....	....	..	....	.	....	....	....	....	....	....	....	....	....		....	....	....	1.10
Maquoketa	....	....	....	..		T	....	.10	....	....	..	58	86		....	T	....		....	.....		....	T	....	T	..		....	....	....	1.54
Marshalltown	....	....		....	.15		....	.04	.	..	....	.40	.12	....	....	.11	.03		...	....	....	....	.02	....	..	....	....	..	.			.87
Monticello	...	....	T	T	.02	....	....	.05	....		.02	....	1.18	....	T	T	T	...	....		....	....	....	T	....	T	T		....	....	....	1.27
Mount Ayr	....	....	....	..	.25	.(3	....	.08		.08	....	.20	....	....	....	.02	.05	.20		....	....	....		..	..	....	....	.33	....		....	1.24
Mt. Pleasant	....	..	T	T	.09	....	....	.10	....	.01	....	.03	....	..	..	....	....	....	....	....	....	....	....	T	....	....		T	....	....		.23
Mt. Vernon	...	..	T	T	.04	T	T	.10	....	.02	....	1.42	....	....		.07	T	T	..	....	....			.11	....	.07	..	....	.05		....	1.88
New Hampton	....	..	T	....	T	....	....	....	....	....	....	....	T	....		.05	.....	....	..			....	..	....	....		T		....	....		.05
Newton	..	....	....	....	.20	....	..	.15	....	.30	....	.46	....	..	....	.15		....	..	..	.....	..	.06		...	..	....	....	....	....	....	1 32
Northwood	....	....	T	....	.15	....	....	.10	..	..	....	.32	..	..	....	....	T	....	....	....	..	..	....	....	..	..	...	.15	.05	....	..	.77
Odebolt	....	.....	....	...	.23	....	....	.03	....		....	.05	....	....	....	....	....	.10	....	..	....		....	..		....	...	.13	....	....	....	.54
Ogden	....	....		...	20	....	....	....	....	....	....	.10					..	.10	....	....	..	....	.80		..		.05	.05	....	....	....	1.30
Olin	..	....	T	....	.06	....	...	.02	...	T		1.67	T	....	.03			....	.	..	....	T	....	.		....	....	.04	....	....		1.82
Omaha, Neb	....	....	..	.01	.20	..	T	T	....	.08	T	.02	T	....	T	.05	.04	.29	....		....	...	T	....	....	.02		.02	...	..	....	.73
Onawa	....	....	....	.03	.28	....	....	.02	....	.05	....	.05	.02	....	.05	.05		.25	...	...	....		.02		..	....	T	.25	....	..	...	1.07
Osage	....		.02	..	.10		...	.11				.10	....	....		05	.01		....	....	....		....	T	....	....		....	.01	..	....	.40
Oskaloosa	....	....	....	..	.08	....	.08		....	.25	....	.84	.23	....	..	.10	.02	.02		..	....	....	.05	....	....	....	.03	....		....	....	1.70
Ottumwa	..	..	....	....	.10	....	T	....	....	.20	....	.33	.05	...	....	T		T	..	..	..	....	....	..	..	..	..	T	....	..	...	.68
Ovid	....	....		...	.09	....	....	.10	.....	.11	....	.42	.55	....	..	T	T	.09	....		....		.06	..		.02		.35	..	....	....	1.79
Pacific Junction	...	..	..	T	.25	....	T	....	....	....	....	.02	....	..		.04	....	.30	....		.	....	....	....		.04	....	02	....	....	....	.67
Perry	....	....	....	..	.18	....	....	.16		.25	. .	.16	....	....	T	T	..	.07	....	....	....	....	.06	T	....	T	....	.07		.	....	.95
Plover	....	....	....	....	.07	....	....	.10	....	....	..	.10	..	....	....	T	....	T	.....	....	..		..	....	....			..	....	..	....	.27
Red Oak	....	..	....	....	.24	....	....	.02	....	T	...	.05	....	...	T	.05	....	.35	...	...	....	....	T			T	....	....	....		...	.71
Ridgeway	05	T	.03	T	.05	.10	01	.09	.01	T	T	.48	.05	...	.07	.02	.02	.01	T	T	..	..	....	.02	T	T	T	.02	.11	.01	....	1.15
Rockwell City	...	. .	..	....	.21	....	....	T	....	....	....	.02	....		....	.05	....	T	....	....	....	....	T	..	....	..	....	T	....	..	....	.28
Sac City	....	....	..	....	.30	....	....	....	.	....	....	.10	....	....	.07	.03	08	..	....	....	..		....	..	....	..	....	.10	....	....	....	.68
St. Charles	....	..	....		.10	....	....	.08	..	.15	....	.58	...			.06	....	.10	T	....	....	....	.07	....	....	.05	....	.12	....	....		1.31
Scranton	....	....	....	..	.10	....	....	T	....	T	....	..	T	....	T	..	I		....	....			T			....	....	....	..	....	.10
Sheldon	....	....	....	....	.30	....	....	.15	...	....	....	.20	.05	..	.01	.05	01	.03	....	....		..	03	T	.	....	T	....	....	....	....	.83
Sibley	...	.	T	T	.25	.	....	.10	....	....	....	.20	T	....	T	02	..	T	....	....	..	....	.08	..	...	...	T	...		....	....	.65
Sigourney	....	....	....	T	.08	....	....	.13	....	.17	....	.49	.94	...	....	....	....	T	..	....	..	....		....	....	.08	..	....	....			1.89
Sioux Center	T	....	....	.20	....	...	....	....	....	....	....	.30	....	....	.05	.05		.10	....	....	..	T	....	.	....	....	..	...	....	..	....	.70
Sioux City	....	...	T	.05	.22	..	....	.02	....	....	...	.16	.01	....	.02	.04	T	.11	....		....	....	....	....	...	..	T	T	....	....	....	.63
Spirit Lake	....	...	....	....	.20	....	...	.15	....	..	....	.20	....	....	T	T	....	....	.	....	....	....	....	....	.	....	....	.10	....	.	....	.65

DAILY AND MONTHLY PRECIPITATION FOR DECEMBER, 1901—CONTINUED.

STATIONS.	DAY OF MONTH.																															TOTAL.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Storm Lake			T	T	.18	....	T	.04		....		.13	.01		.01	.05	T	.08		..		....	.05	.02		..		.05				.62
Thurman	..	..	..	T	.30	....	T	T	....	T	....	T	T	T	T	.30	.28			....		T	T	....	....	.05	..	T	....	....	....	.88
Villisca	....	..	..	.15		....	..	.	....	.15	.10	.15	05		T	T		40	.....	....	..	T		....	....	.05	..	.10	....	....	....	1.15
Vinton				T	05	....	....	....	....	....	....	.10		...	....	....	....	....	..	....		....			..		....	..	.10	....	....	....	.25
Wapello	...	..	..	....	T	...		.09	....	.17	....	.27	77	....	..	T		....		...	....	....			.05	.05	..	....		..	..	1 35
Washington	....	..	..	....	.05	....	T	....	....	.20		....	1.38			....	....		....	....	....	....			....			.20		....	....	1.68
Washta	....	..		.20			.10				..	.20			..			10	..	....	....	T	T			T	T		....	....	80
Waterloo	...	..	T	T	.05			T	....			.50	....	....	.04	T					....	....	....	.....		....	....	....	.02	....	..	59
Waverly	....	....	T	....	.17	..	04	....		....	25	....	....	....	....	.10		.....			....	....	....	....		....	....	....	....	....	..	.58
West Bend			....	..	.20		....	.10			....	.10	..	..	.10	T	T		....		....	..		....	....	....		.10	....	....	..	.60
Wilton Junction	....	....	..	....	T		..	.04	....	.25	..	.60	1.05			.05	....	....	....	....	....	..			..	.10	T		.05	....	....	2 14
Woodburn		..	...	.	.12	.06	..	....	....	.03		.75	...	....	..		..	.12	....		..			..	..	..	....	.22	...		..	1.30

Precipitation Chart December 1901.



APPENDIX.

CLIMATOLOGY OF THE YEAR 1901.

BAROMETER.—The mean pressure for the year was 30.03 inches. The highest observed pressure was 30.74 inches on December 19th at Des Moines and Sioux City; lowest pressure, 29.18 on April 5th at Keokuk. Range for the state 1.56 inches.

TEMPERATURE.—The mean temperature for the state was 49°, which is 1.8° above normal. The highest temperature reported was 113° on July 22d at Sigourney, or 3° above any previous official record for Iowa. The lowest temperature reported was 31° below zero, on December 15th, at LeMars. Range for the year 144°.

PRECIPITATION.—The average amount of rain and melted snow for the year was 24.62 inches, which is 5.68 inches below the normal, and 10.98 inches below the average amount recorded in 1900. The greatest amount recorded at any station for the year was 37.69 inches at Fonda; least amount recorded, 16 35 inches at Bonaparte. The greatest monthly rainfall was 13.62 inches at Fonda in September; least amount, a trace at Danville and Emerson in August. The greatest amount in any consecutive 24 hours was 5.49 inches at Plover, September 27th. The average number of days on which .01 inch or more of rain fell was 74.

WIND AND WEATHER.—The prevailing direction of wind was northwest. Highest velocity reported, 58 miles an hour in Sioux City, from northwest, on March 3d, average daily wind movement 207 miles. There were 178 clear days, 103 partly cloudy, and 84 cloudy days.

CLIMATE AND CROP REVIEW, 1901.

The winter months were generally quite favorable for the care of stock and farm operations usual to that season. There were no very severe storms, sudden changes or marked extremes of temperature.

The crop season opened about two weeks later than usual, the work of seeding and preparing the ground for planting being retarded by frequent storms of snow, sleet and rain in March, with continued wet and cloudy weather the first half of April. But the abnormally wet weather of the early spring compensated for the delay, by the storage of moisture in the soil and subsoil that afforded some mitigation during the period of intense heat in midsummer.

The last half of April was warmer, and conditions were favorable for seeding and preparations for planting. At the close of the month grass and winter grain had made a vigorous start, and the season was about as early as usual in respect to the appearance of foliage and blossoms in orchards, gardens and forests. The average rainful for the state was below the April normal, though the soil was more than usually saturated with moisture.

May was slightly warmer than usual, though the prevalence of cool nights, and unusual fluctuations in temperature, caused the impression that the month was unseasonably cool. Light frosts and ice were reported in numerous localities in the second week. The conditions were generally favorable for farming operations. The work of preparing the ground and planting the large area devoted to the corn crop proceeded with but slight hindrance from wet weather. At the close of the month the corn, though somewhat below normal size, was in fairly promising condition and the fields were in good tilth. The condition of fruit was quite variable, apples being much below the average.

The first decade in June was somewhat cooler than usual, with cool nights; but the balance of the month was much warmer, and the temperature was unseasonably high during the closing decade, raising the daily mean for the month to 2.3 degrees above the normal. The heat was intensified by high winds, causing rapid evaporation of the deficient moisture near the surface The average rainfall was about half an inch below normal, with the greatest deficiency in the eastern half of the state. At the close of the month corn was generally in a fairly promising condition, though somewhat smaller than usual at that period. Spring wheat, oats and barley made rapid progress toward maturity in the closing decade, under influence of the excessive heat. Hay making was in progress in the closing week of the month, and the quality of the product was excellent. On the whole June was a favorable month, though the condition of all crops at its close was somewhat below the average of recent years.

July, 1901, broke all records of monthly means and daily maximum temperatures. The figures recording sustained high temperatures for the longest period ever experienced in this section will stand for comparison in future years, and it may be hoped the new record will remain unbroken during the coming century. The monthly mean for the state, 82,4°, was 8 7° above the normal, and the daily average temperature for the month was 6° higher than in July during the great drouth of 1894. The surprising feature in the crop situation at the close of the month was that so large a percentage of corn and other unmatured crops survived the fiery ordeal of the solar rays, intensified by the hot winds and low humidity As compared with conditions in the drouth of 1894, the destructive effects were not so great, because of the fact that the supply of soil moisture was greater at the outset and there was a much larger amount of rainfall in the state at large. The intense heat and hot winds destroyed the higher tassels on the early planted corn, but the greater portion of the crop was planted later than usual, and when the force of the hot wave was broken, about the 27th, there remained sufficient vitality in stalk and tassel to bring forth the promise of a fair yield of sound corn. And there was remaining a crop of fodder of very high quality, much of it being cut up and utilized. The dry weather was favorable for harvesting hay, oats, wheat and barley, which were secured in very excellent condition. The small grain was unusually bright in color, and the straw free from damage by rust or the effects of wet weather in the harvest season The pastures suffered great injury from effects of the drouth and overfeeding. The late potato crop was exceedingly light. Garden truck, blackberries and raspberries were nearly all destroyed, and apples suffered continual deterioration during the heated period.

August was warmer than usual, with a large excess of sunshine, and less than half the normal amount of rainfall. The average daily excess of temperature was 2.7°, and on the average there were twenty cloudless days and nine partly cloudy. The rainfall was an average of 1.29, and quite unequally distributed, the northern section receiving an average of 2 10 inches, the central section 1.14, the southern section only .64 hundredths of an inch, and considerable areas therein only traces of rain. The bulk of the rainfall came in the first decade, leaving the balance extremely dry, especially in the central and southern belts. There was sufficient moisture in the western half of the northern section and portions of the

central section to revive pastures and help the potato crop to some extent, but in two-thirds of the state it was very dry, and feeding stock from the corn fields or other forage was quite general In the counties touching the Mississippi river, and the larger part of the southern tier, the drouth remained unbroken throughout August, though the temperature was lower than in July. But despite all adverse conditions, in three-fourths of the state the corn crop showed remarkable vitality in maintaining its color and in the development and filling out of ears, giving promise of a much larger yield of grain, and a better quality of fodder, than was deemed possible at the beginning of the month. Early corn was rapidly brought to maturity, and binders were at work in the fields about the close of August. The high temperature was beneficial to late corn, but detrimental to pastures, meadows, potatoes, and all late maturing vegetables. The second crop of clover developed much better than was expected, and the yield of clover seed was of extra quality though materially less than in recent years.

September was slightly cooler than usual, the daily mean temperature for the state being about one degree below normal. The general conditions as to sunshine and warmth were quite favorable for the needs of all crops, and for the germination of fall sown grain. The average rainfall for the state was 4.77 inches, or 1.76 above normal. The distribution by sections was unequal, the northern section receiving 7.07 inches; central section 4.24 inches; southern section 2.98 inches In the northern districts the excessive rainfall hindered threshing, plowing and corn harvesting to some extent, but generally very fair progress was made in all farm operations Cutting corn, with harvesters and by hand, was in progress from the beginning of the month till the necessary amount was secured for fodder, and put in shock in excellent condition. The corn crop was quite generally matured by the middle of the month. The first frost was reported on the morning of the 17th, and was followed by frosts at various localities on the 18th and 20th. Some late corn was at that time green, and in portions of the western districts slight damage resulted from killing the blades. The percentage of damage from September frosts, however, was exceedingly small, and the month, as a whole, was favorable, both in respect to temperature and moisture. There was no killing frost during the month,—that is, frost sufficiently severe to be "destructive to vegetation and the staple crops." The pastures were greatly improved during the month. Good progress was made in plowing The late potato crop was much benefited by rains, and the output of that useful crop was better than anticipated The fall sown grain made a ready start and a fair stand. The winter apple crop, while generally very light, was better than had been anticipated in the commercial orchards of the southwest district.

October was somewhat warmer than usual, the average temperature being about four degrees above the normal for the state. The rainfall was slightly below normal, but with copious rains in September the amount of moisture was ample for growth of grass and germination of fall grain, except in some of the southern, southeastern and eastern counties. The skies were clear and weather conditions were well nigh perfect the larger part of the month. During the dry and warm period in the last half of the month good progress was made in cribbing corn, plowing, harvesting potatoes and other fall work. The pastures were green and afforded considerable feed for stock. Except in the limited dry area fall wheat and rye germinated readily and made a vigorous start, and the acreage seeded was somewhat increased as compared with the preceding year. As a whole the output of the season was much greater than was believed possible during the prevalence of the drouth in July and August. This applies especially to corn and the late potato crop. Though all records of temperature were broken, and the period of hot winds was longer than in any previous year, yet the supply of moisture stored in the soil was sufficient to give much better crops than were secured in the relatively cooler season of 1894.

ERRATA IN 1900 ANNUAL.

DANVILLE.—Total precipitation for November recorded 3.30 inches on page 22, should have been 3.35 inches. Annual precipitation recorded 32.42 inches on pages 15 and 22, should have been 32.47 inches.

FAYETTE.—Total precipitation for May recorded 1.95 inches on page 22, should have been 2.06 inches. Annual precipitation recorded 32.62 inches on pages 15 and 22, should have been 32.73 inches.

GRAND MEADOW.—Total precipitation for March recorded 1.79 inches on page 22, should have been 1.69 inches.

MT. VERNON.—Annual precipitation recorded 34.21 inches on pages 15 and 22, should have been 34.45 inches.

MT. AYR.—Mean temperature for April recorded 54.2° on page 20 should have been 54.4°.

NORTHWOOD.—Annual precipitation recorded 35.49 inches on pages 16 and 22, should have been 34.49 inches.

OLIN.—Mean temperature for December recorded 28.0° on page 20, should have been 27.6°.

VILLISCA.—Annual mean temperature recorded 52 4° on pages 16 and 21, should have been 52.1°.

OSAGE.—Annual mean temperature recorded 45.6° on pages 16 and 20, should have been 45.5°.

PLOVER.—Mean temperature for February recorded 13.0° on page 20, should have been 13.8°.

CLIMATOLOGICAL DATA FOR THE YEAR 1901

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.						PRECIP., IN INCHES.				Month.	SKY.					Prevailing direction of wind.
				Annual Mean.	Highest.	Date	Lowest.	Date.	Length of record, years.	Total for the year.	Greatest monthly.	Month.	Least monthly.		Total snowfall.	Number rainy days.	Number clear days.	Number partly cloudy days.	Number cloudy days.	
Afton	Union	1,212	....	49.9	107	July 22	-17	Dec. 14	.....	29.62	5.05	June	.44	August	49 5	69	143	140	82	SW
Albia	Monroe	945	...	50.1	110	July 22	-18	Dec. †14	.....	23.49	2 75	July	60	January	54.1	63	179	83	103	.....
Algona	Kossuth	1,213	10	47.6	106	July 21	-24	Dec. 14	10	33.16	9.40	Sept	.55	January	43.3	65	143	166	56	NW
Alta	Buena Vista	1,513	11	47 1	105	July †21	-26	Dec. 14	11	25.68	6.53	Sept	.42	January	35.8	87	184	125	66	NW
Alta (near)	Buena Vista	.....	....	.....	.....	.....		.....	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....
Amana	Iowa	721	....	49.1	104	July †21	-17	Dec. 14	..	22.59	4 36	June	.93	Nov	30.9	83	178	113	74	NW
Ames	Story	926	22	49.2	109	July 2,	-19	Dec. 14	27	22.32	3.69	May	.57	Jan. Dec.	28 4	72	224	68	73	NW
Atlantic	Cass	1,164	11	49.4	110	July 24	-25	Dec. 20	11	27.93	6.70	June	.60	Dec	54.5	59	93	164	108	NW
Baxter	Jasper	998	...	48.9	105	July 22	-19	Dec. 14	.....	23.35	4.53	June	.38	Dec	....	62	158	124	83	NW
Belknap	Davis	877	.....	.....	107	July 22	.....	.....	.....	20.25	2 75	Dec	.33	August		71	.....	.....	.....	NW
Belle Plaine	Benton	828	....	.....	104	July 21	.....	.....	.....	26 53	5.02	March	.66	January	44.1	80	85	220	60	SE
Bonaparte	Van Buren	.....	....	51.7	112	July 22	-15	Dec. 20	11	16.35	2.50	March	.31	August	16.0	51				.....
Britt	Hancock	1,236	....	45.8	104	July 24	-27	Dec. 14	.....	28.08	8.37	Sept	.27	Dec	23.8	88	141	177	47	NW
Buckingham	Tama	.....	....	.....	.....	.....		.....	.....	20.72	3.00	May	.67	Nov	39.1	70	.....			.....
Burlington	Des Moines	544	....	52.5	107	July 24	-14	Dec 20	.....	23.24	4.95	June	.36	August	22 6	79	189	63	113	
Bussey	Marion	.....	...	.....	.....	.....	.....	.....	.....	19.09	3.10	June	.55	Nov	35.5	..	.....	.....	...	.....
Carroll	Carroll	1,265	12	49.0	109	July 22	-20	Dec. 14	12	29.55	8.34	Sept	.50	Jan Dec	45 5	69	225	41	99	.....
Cedar Rapids	Linn	733	20	49.9	107	July †21	-16	Dec. 14	20	22.06	3.86	June	.42	August	43 7	82	210	50	105	NW
Chariton	Lucas	1,042	....	50,4	109	July †22	-16	Dec. 14	.....	24.19	5.18	June	.61	August	45.0	86	151	134	80	NW
Charles City	Floyd	1,012	11	46.4	108	July 21	-23	Dec. 13	11	25.02	5 21	Sept	.32	Dec	26.0	66	142	155	68	SE
Clarinda	Page	1,069	12	51.6	110	July 24	-19	Dec. 20	12	34.05	5.94	June	.65	August		90	176	119	70	S
Clear Lake	Cerro Gordo	984	....	48.3	106	July 21	-26	Dec. 14	.....	23.47	6.00	Sept	.32	Dec	34 7	58	224	99	42	NW
Clinton	Clinton	609	11	48.7	106	July 2	-12	Dec. †14	11	22.07	4.26	July	.48	August	31.7	70	157	93	115	W
College Springs	Page	...	11	51.1	107	July 24	-19	Dec. 20	11	28.13	5.57	July	.69	January		77	231	77	57	SE
Columbus Junc.	Louisa	595		51.1	109	July 24	-14	Dec. 14	...	20.05	3.00	March	.80	Nov	25.4	91	191	88	86	SE
Corning	Adams	1.127	....	49.6	106	July 24	-19	Dec. 20	.....	29.26	5.34	June	.50	January	44.8	64	171	108	86	SW
Council Bluffs	Pottawat'mie	990	....	52.2	108	July 22	-15	Dec. 14		24 93	5.35	Sept	.27	January	....	72	200	49	116	S
Cresco	Howard	1,312	30	.....	106	July 24		.....	31	.....	.....	.....	.....	.....			.....	.....	.....	.....
Cumberland	Cass	.....	.....	.....	.....	.....	.....	.....	.....	22.61	5.14	June	.40	January	....	54	204	60	101	S
Danville	Des Moines	.....	.....	.....	.....	...	.....	.....	.....	19.39	2.47	Sept	T.	August	...	51	....	.....		.....
Davenport	Scott	529	30	51.0	106	July 24	-13	Dec. 14	30	17.33	3.02	June	45	October	30.7	90	185	85	95	W
Delaware	Delaware	1,083	11	46.6	108	July 24	-21	Dec. 14	11	18.68	3.77	Sept	.48	Nov	27.1	72	153	140	72	NW
Deccrah	Winneshiek	875	9	46.2	107	July †21	-24	Dec. 14	9	.....	.....	....	.....	.....	....	.	....	....	.....	.....
Denison	Crawford	1,180	9	48.3	106	July †22	-21	Dec. 14	9	23.40	7.45	Sept	.22	July	28 6	75	...	..		N
Des Moines	Polk	861	24	49 6	109	July 22	-18	Dec. 15	23	19.77	3.02	March	.40	Nov	55.6	76	133	147	85	.....
De Sota	Dallas	886	...	.....	.....	.....	-16	Dec. 14	.....	21.80	3.42	June	.60	January	49.7	64	.....	..	..	NE, SW, NW
Dows	Wright	1,142		46.8	106	July †21	-23	Dec. 14	...	27.03	6.52	Sept	.55	Dec	40 0	73	231	50	84	NW
Dubuque	Dubuque	698	29	48.7	106	July 21	-17	Dec. 14	29	20.39	3.72	Sept	.25	August	30.0	96	148	121	96	NW
Eldon	Wapello	.....	....	51.3	112	July 22	-16	Dec. †14	.....	18 61	3.15	June	.60	August	24.1	70	238	40	87	NW
Elkader	Clayton	600	21	48.3	111	July 24	-21	Dec. 14	23	20.98	4 04	Sept	.61	Dec	40.0	58	166	132	67	NW
Emerson	Mills	1,053	....	.....	.....	.....	.....	.....	.....	24.72	4.50	March	T.	August		....	....	....	....	.....
Estherville	Emmet	1,298	....	45.0	107	July 25	-30	Dec. 14	.....	24 03	6.14	Sept	.29	January	....	94	201	104	60	S, NW
Fayette	Fayette	1,003	12	46.4	110	July 24	-24	Dec. 14	12	25.14	4.80	Sept	.62	July	41.7	86	.	.		NW
Fort Dodge	Webster	1,126	....	47.9	107	July †22	-22	Dec. 14	.....	30.91	7.13	Sept	.20	Dec	31.5	54	....		....	NW
Fort Madison	Lee	522	....	.....	.....	.....		.....	54	24.36	4.91	June	.05	August	18 0	62	122	115	128	SW
Fonda	Pocahontas	1,232	....			.....		.....	.....	37.69	13.62	Sept	.49	February	45 9	69	202	107	56	NW
Forest City	Winnebago	1,220	....	46.6	106	July 21	-28	Dec. 14	....	28.79	9.48	Sept	.51	Nov	35 5	66	196	56	113	W
Galva	Ida	1,290	9	48.5	106	July 22	-25	Dec. 14	.....	23 21	7.12	Sept	.22	January	25 7	48	.....			.....
Gilman	Marshall	1,053			.....	.....	.....	.....	.....	24.20	4.88	June	.43	Nov	....	64	199	85	81	S
Glenwood	Mills	957	32	51 9	106	July 24	-16	Dec. 14	18	22.43	4.66	June	.32	January	38.4	63	69	234	62	NW
Grand Meadow	Clayton	1,180	....	.....	108	July 21	-25	Dec. 13	.....	23.67	5.96	Sept	.35	February	34.0	63	.....	.....	.....	NW
Greene	Butler	943	....	47.8	111	July 24	-23	Dec. †14	.....	22.68	4.79	Sept	.21	Dec	.....	77	152	98	115	W
Greenfield	Adair	.....	11	50.2	106	July 24	-22	Dec. 14	11	27.61	5.71	June	.41	January	40.3	....	.	....	....	.....
Grinnell	Poweshiek	1,023	...	.....	.....	.....	-18	Dec. 14	.....	.....	.....	.....	.....	.....				....	....	.....
Grinnell (near)	Poweshiek	.....	.....	49.2	103	July †20	-19	Dec. 24	....	24.49	4.72	June	.84	Dec	45 8	81	157	92	116	SE
Grundy Center	Grundy	976	....	47.6	105	July 24	-25	Dec. 14	.....	25.14	5.12	June	.75	January	28 8	87	207	72	86	NW
Guthrie Center	Guthrie	1,077	....	.....	106	July 22	-19	Dec. †14	..	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....
Hampton	Franklin	1,000	12		109	July †21	-22	Dec. 14	12	27 06	6.38	Sept	.43	Dec	16.4	83	132	179	54	NW
Harlan	Shelby	1,192	....	49.2	111	July 22	-22	Dec. †14	.....	29 95	8.02	Sept	.38	January	56.2	83	114	151	100	NW
Humboldt	Humboldt	1.095	....	48.2	108	July 21	-24	Dec. 14	9	26.80	8.24	Sept	.09	January	31.5	78	230	55	80	NW
Independence	Buchanan	1,111	40	.....	106	July 24	-22	Dec. 14	35	19.61	3.18	Sept	.32	Nov	34.6	68	...	....	....	NW
Indianola	Warren	969	10	.....	109	July 22	-19	Dec. 14	10	.....	.....	.....	.....	.....	46.8	....	...	...	....	NW
Iowa City	Johnson	685	12	49.8	108	July 24	-16	Dec. 14	12	23.31	3.62	March	.66	August	37 0	72	177	99	89	S
Iowa Falls	Hardin	1,107	....	46.5	104	July 24	-22	Dec. 14	9	26.58	5.24	June	.49	Nov	47.2	81	....	....	....	NW
Keokuk	Lee	613	31	52.7	108	July 22	-12	Dec. 20	30	22.54	6.34	June	.15	August	....	79	186	97	82	SW, NW
Keosauqua	Van Buren	664	10	.....	110	July 22	-14	Dec. †19	10		.....	.....	.....	.....	..	....	....	....	....	
Knoxville	Marion	910	9	.....	109	July 22	-17	Dec. 14	9	.....	.....	....			....	....	....	....		
Lacona	Warren	....	....	.....	....			.....	.....	26.45	5.45	June	.70	Aug.Nov.		68	.	....		
Larrabee	Cherokee	1,366	11	47.2	108	July 22	-26	Dec. 14	12	27.42	10.77	Sept	.22	January	20.7	70	.	....	..	NW
Lenox	Taylor	1,250	...	49.9	104	July 24	-23	Dec. 20	.....	25.99	4.96	June	.23	January	20.7	71	231	67	67	S
Le Mars	Plymouth	1,224	....	48 2	105	July 21	-31	Dec. 15	.....	24.32	6.97	Sept	,08	January	18.8	58	.	..	....	S
Logan	Harrison	928	37	49 8	110	July 24	-20	Dec. 14	36	30.56	7 97	June	.70	January	60.0	78	....			S
Maquoketa	Jackson	688	....	49.0	108	July 24	-15	Dec. 14		21.34	3.27	Sept	.51	Nov		80	230	49	86	SE
Marshalltown	Marshall	947	10	49.6	108	July 24	-20	Dec. 14	10	23 92	3.71	March	.77	Nov	....	94	178	87	100	NW
Monticello	Jones	925	48	.....	108	July 24	-18	Dec. 14	47	20 66	3.56	June	.63	February	39.5	53	.....	....		SW
Mooar	Lee	654	....	.....	110	July 22		.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mount Vernon	Linn	847	....	50.0	107	July 22	-14	Dec. †14	.....	21.16	4.25	June	.61	July	46.4	88	201	66	98	S
Mt. Ayr	Ringgold	1,236	9	50 6	109	July 24	-19	Dec. 20	9	27.40	4 59	June	.75	August	57 5	89	135	148	82	NW
Mt. Pleasant	Henry	729	..	49.7	109	July 24	-17	Dec. 20	....	16 74	2.91	July	.23	Dec	...	58	188	126	51	.....
New Hampton	Chickasaw	1,166	....	45.9	103	July 25	-25	Dec. 14	.....	21.10	4 98	Sept	.05	Dec	37.0	62	188	86	91	NW
Newton	Jasper	592	15	49.4	107	July †21	-22	Dec. 14	15	25 15	3.58	June	.83	Nov	61.1	65	159	142	64	NW
Northwood	Worth	1,222	...	46.5	105	July 24	-25	Dec. 14		26.83	9.37	Sept	.51	Nov	44.3	77	155	120	90	NW
Odeboldt	Sac	1.356	....	49.3	109	July 22	-21	Dec. 14	.....	22.31	7.93	Sept	.18	January	40 0	58	260	35	70	.....
Ogden	Boone	1,211	....	48.5	108	July 22	-22	Dec, 14	.....	25.95	6.87	Sept	.55	January	30.6	81	219	42	104	SE
Olin	Jones	760	....	47.7	103	July †21	-17	Dec 14	.....	23 90	5.09	June	.64	August	....		.	....	....	.....
Omaha, Neb	Douglas	1,113	31	52.2	105	July 24	-16	Dec. 14	30	25.08	6.83	Sept	.31	January	34.9	90	144	128	93	SE
Onawa	Monona	1,053	....	50.2	103	July †21	-18	Dec. 14	19	30.07	3 29	Sept	.29	January	...	97	255	52	58	NW
Ovid	Wayne	932	....	51 1	112	July 22	-18	Dec. 20	9	26.35	3.08	July	87	Nov	44 7	91	175	41	149	NW
Osage	Mitchell	1,184	11	45.1	101	July †21	-24	Dec. 14	11	24.46	5.70	Sept	.40	Dec	43 3	90	97	118	150	NW
Oskaloosa	Mahaska	843	19	50 2	107	July †21	-17	Dec. 14	25	20 29	3.60	June	.35	Nov	32.0	86	208	42	115	
Ottumwa	Wapello	630	8		108	July 22	-14	Dec. 14	8	19.97	4.15	Sept	.40	January	31.4	47	.	....	.	SE
Pacific Junction	Mills	961	....	51.1	107	July 24	-21	Dec. 20	.....	21 64	3.75	June	.33	January	37.0	86	142	165	58	SE
Pella	Marion	877	....	....	110	July 22			.....	.....	.....	.....	.....	.....	....	..	.	....	....	.....
Perry	Dallas	975	....	.....	110	July 24	-18	Dec. †14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.	....	.....
Plover	Pocahontas	1,426	.	47 3	109	July 24	-27	Dec. 14	.....	32.06	13.55	Sept	.27	Dec	40 5	67	.. .	....	...	.....
Primghar	O'Brien	1,800	....	.....	110	July 22		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Red Oak	Montgomery	1,033	..	51 4	101	July 24	-13	Dec. 20	.....	28.36	4.33	June	.40	January	49.8	72	144	152	69	SE
Ridgeway	Winneshiek	1,215	....	48 0	105	July 21	-26	Dec. 14	.....	35.61	7.06	Sept	1.15	Dec	50 8	122	180	120	65	NE, NW
Rockwell City	Calhoun	1,219	....	48.5	106	July 21	-20	Dec. 14	.....	26.12	7.06	Sept	.28	Dec	....	....	.....	.....		.....
Sac City	Sac	900	23	48 4	108	July †21	-22	Dec. 14	27	24.35	10.15	Sept	.10	January	31.3	64	221	66	78	NW

CLIMATOLOGICAL DATA FOR YEAR 1901.—CONTINUED.

STATIONS.	COUNTIES.	Elevation, feet.	Length of record, years.	TEMPERATURE, IN DEGREES FAHRENHEIT.						PERCIPITATION, IN INCHES.				SKY.					
				Mean.	Highest.	Date.	Lowest.	Date.	Length of record, years.	Total for the year.	Greatest monthly.	Month.	Least monthly.	Month.	Total snowfall	Number rainy days	Number clear days.	Number partly cloudy days.	Number of cloudy days.	Prevailing direction of wind.
St Charles	Madison	1,070	....	.....	108	July 22	-18	Dec. 14	....	....	.....	.....	.....	.....	.....	....	....	....	....	.....
Scranton	Greene	1,172	.	49.4	105	July 24	-12	Dec. 14	.....	20.65	4.66	Sept ...	.10	Dec	....	41	....	....	....	NW
Sheldon	O'Brien	1,406		46.7	104	July 22	-27	Dec. †14	.....	25.27	6.04	Sept ...	.20	January .	20.0	89	....	....	....	S
Sibley	Osceola	1,509	9	46.6	106	July 22	-29	Dec. 14	9	26.62	6.37	Sept	.15	January .	14.6	89	....	....		S
Sigourney	Keokuk	768	..	51.4	113	July 22	-16	Dec. †14	.....	21.71	3.41	March...	.48	August .	36.7	73	192	139	34	NW
Sioux Center	Sioux	.....	....	.....	.....	....	-27	Dec. 14	.....	.....	.....	.....	.....	.....	.....	....	....	....	....	.....
Sioux City	Woodbury	1,122	13	49.4	106	July 21	-22	Dec. 14	13	26.59	7.99	Sept	.22	January .	....	100	169	107	89	NW
Spirit Lake	Dickinson	1,458	....		108	July 25	-27	Dec. 14		.....	.....	.....	.....	.....	....	....	....	....	....	.....
Storm Lake	Buena Vista	1,440	.	47.4	104	July 22	-27	Dec. 14	13	22.99	6.92	Sept	.39	January .	29.9	94	186	104	75	S
Thurman	Fremont	.....	....	50.6	102	July †21	-27	Dec 20		31.76	5.25	Sept	.54	January .	...	71	180	96	89	NW
Toledo	Tama	856	....	49.5	109	July †21	-19	Dec. 13	8	.....	.....	.....	.....	.....	..	....	212	70	83	E, SE
Vinton	Benton	800	12	48.6	103	July †22	-17	Dec. 14	12	22.12	4.04	July	.25	Dec	....	54	.....	.....	.....	NW
Villisca	Montgomery	1,058	9	.....	104	July 22	-20	Dec. 20	9	.....		.....	.....	.....	....	....	.....		.....	NW
Wapello	Louisa	578	....	51.7	111	July 10	- 9	Dec. †14	...	17.03	2.58	May ...	.18	August ..	....	56	.....	.....	...	SE
Washington	Washington	738	11	.....	106	July †21	.....	.....	12	16.56	2.06	May	.24	August ..	....	60	.....	.....	....	NW
Washta	Cherokee	1,157	....	.....	.....	.....	...	.....	.....	25.13	6.58	Sept	.45	January .	34.0	63	.		....	S
Waterloo	Black Hawk	862	23	48.2	107	July 24	-21	Dec. 14	23	23.53	3.57	Sept	.59	Dec.	35.5	77	186	92	87	NW
Waverly	Bremer	942	....	48.0	106	July 21	.....	.....	.....	23.75	4.78	Sept	.48	Nov.	34.2	94	.....		....	NW
Whitten	Hardin	1,036		.....	106	July 24	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	.....	.....	.....
Wilton Junction	Muscatine	683	....	49.3	108	July 24	-14	Dec 14	..	22.34	3.60	July	.67	August ..	33.5	62	203	63	99	NW
Winterset	Madison	1,129	11	.....	109	July 22	.....	.....	11	.....	.....	.....	.....	.....	.....	...	.....	.....	.....	.....
West Bend	Palo Alto	1,197	....	46.7	109	July 24	-25	Dec. 14	9	28.39	9.77	Sept	.43	February	36.6	72	.....	.....		NW
West Union	Fayette	1,115	...		.....	.....	....	.....	.....		.....	.....	.....	.....		..	.....	.	..	.....
Woodburn	Clarke	961	....	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	....	....	.....	.....	.....	.....
Averages	.....	.....		49.0	.....	.....		.....	.....	24.62	.....	....	.....	.....	37.2	74	178	103	84	NW

† and other dates.

MONTHLY MAXIMUM AND MINIMUM TEMPERATURES FOR 1901, WITH DATES.

STATIONS.		Jan.		Feb.		March.		April.		May.		June		July.		Aug.		Sept.		Oct.		Nov.		Dec.	
		Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date.
Afton	Max	51	*20	43	17	68	18	85	*27	87	* 2	98	*24	107	22	97	25	95	7	79	22	66	2	52	1
	Min	- 5	1	- 9	10	5	5	24	18	36	13	40	7	55	8	50	31	29	18	26	4	14	* 4	-17	14
Albia	Max	53	*15	43	*17	68	20	87	29	88	18	100	*28	110	22	94	*13	98	7	81	22	65	1	50	1
	Min	- 4	1	- 7	10	7	5	25	* 3	36	26	42	7	55	7	51	31	31	18	28	*4	8	22	-18	*14
Algona	Max	46	15	40	13	57	23	85	30	88	2	96	26	106	21	92	*20	90	5	78	*22	64	1	45	1
	Min	-10	2	- 5	* 5	- 3	5	24	18	32	*12	36	7	52	7	48	31	33	*18	32	*17	11	* 4	-24	14
Alta	Max	46	*14	42	*15	63	1	86	29	89	2	97	30	105	*21	98	1	92	5	79	22	67	* 1	42	6
	Min	- 7	2	- 8	9	- 2	5	22	18	32	12	34	7	54	7	51	31	32	20	29	* 4	10	* 4	-26	14
Amana	Max	51	20	39	17	65	18	87	29	89	2	99	30	104	*21	93	7	93	* 6	80	* 7	67	11	44	1
	Min	- 9	1	-18	10	4	5	27	18	36	*13	42	7	52	8	50	31	35	*18	24	4	8	17	-17	14
Ames	Max	51	15	40	13	67	18	87	*29	89	2	99	*28	109	24	97	21	93	* 5	81	22	68	1	52	1
	Min	- 8	1	-14	10	1	* 5	26	18	37	*11	39	7	55	* 7	48	28	35	18	27	5	11	5	-19	14
Atlantic	Max	53	23	46	17	76	17	86	29	89	2	99	28	110	24	101	25	94	5	83	22	69	2	46	* 6
	Min	-13	1	-13	10	8	11	22	18	29	13	37	7	51	7	47	23	26	18	22	4	11	*16	-25	20
Baxter	Max	52	*20	44	13	72	18	86	29	87	18	95	*28	105	*22	94	*19	95	7	83	22	77	1	47	1
	Min	- 5	11	-10	23	5	5	24	18	35	12	38	7	54	7	49	31	34	18	28	4	8	4	-19	14
Belknap	Max	55	*15	39	14	68	18	86	29	89	2	98	*28	107	22	96	28	95	7	83	22	70	* 1	..	..
	Min	- 3	1	- 8	10	8	5	27	18	38	13	46	7	58	* 7	55	31	34	18	30	4	15	4	..	..
Belle Plaine	Max	48	*15	40	17	65	18	87	29	89	2	97	*26	104	*21	92	19	94	7	81	29	67	11	..	..
	Min	- 9	1	-13	10	3	5	25	18	36	13	..	..	55	8	51	31	35	18	28	4	6	4	..	..
Bonaparte	Max	56	20	42	17	70	18	88	29	90	2	102	30	112	22	98	2	97	* 6	83	*22	70	11	48	1
	Min	- 3	1	-12	10	10	5	28	*18	35	13	44	7	54	8	53	31	35	18	28	5	9	17	-15	20
Britt	Max	46	15	40	28	61	23	85	29	88	2	95	14	104	24	92	21	92	6	79	*22	61	* 1	42	30
	Min	-10	2	- 7	10	- 4	5	22	18	31	12	33	7	48	7	46	* 8	29	20	25	* 4	6	4	-27	14
Burlington	Max	56	20	47	17	70	18	89	29	91	2	98	30	107	24	94	* 2	97	7	85	23	71	1	54	1
	Min	0	1	- 5	5	10	* 5	29	18	37	26	48	18	60	7	54	31	37	18	32	* 4	13	17	14	20
Corroll	Max	50	20	44	15	67	1	85	*29	88	* 2	97	30	109	22	97	1	93	5	82	*22	68	2	50	* 1
	Min	- 5	2	- 6	9	1	5	22	18	32	12	35	7	54	7	50	31	29	18	27	4	11	* 4	-20	14
Cedar Rapids	Max	52	20	39	17	67	18	90	29	91	2	103	30	107	*21	94	28	93	6	82	*22	69	11	48	1
	Min	-10	1	-18	10	1	5	28	* 1	39	*12	42	* 7	55	* 7	48	31	35	18	28	4	12	17	-16	14
Chariton	Max	57	23	44	17	66	18	84	*29	87	18	96	28	109	*22	96	25	96	7	85	22	67	1	52	1
	Min	- 4	1	- 8	10	7	5	22	15	34	13	43	7	56	7	51	31	32	18	26	4	11	4	-16	14
Charles City	Max	43	20	37	13	58	18	86	29	90	2	99	26	108	21	93	*20	91	5	79	23	63	1	40	30
	Min	- 9	30	-14	7	- 3	5	23	2	33	12	34	9	55	31	48	8	33	18	27	3	6	5	-23	13
Clarinda	Max	56	20	48	17	75	17	89	26	91	2	102	28	110	24	100	* 1	96	* 5	86	22	71	* 1	51	6
	Min	- 7	1	-10	10	10	5	25	3	35	13	44	7	57	7	52	31	29	18	27	4	14	17	-19	20
Clear Lake	Max	45	*15	39	17	59	23	88	29	95	* 2	98	27	106	21	100	19	95	6	86	23	74	1	56	30
	Min	- 9	2	- 8	10	- 5	5	21	18	31	12	35	7	52	7	49	31	34	18	30	17	9	4	-26	14
Clinton	Max	53	20	39	17	68	18	90	29	91	2	102	25	106	21	93	*14	93	6	83	23	67	11	50	1
	Min	- 7	1	-12	6	5	5	22	* 1	32	26	39	8	49	8	48	31	33	19	26	17	10	*16	-12	*14
College Springs	Max	54	20	47	27	70	17	87	26	88	* 2	100	28	107	24	97	28	95	7	80	*18	67	2	52	1
	Min	- 6	1	- 6	10	8	21	25	18	34	26	44	7	59	* 6	55	* 4	24	18	29	*14	13	16	-11	20
Columbus Junction	Max	56	*15	40	17	69	18	90	29	90	2	104	30	109	24	97	14	97	6	83	23	69	11	50	1
	Min	- 2	* 1	- 6	* 5	5	5	27	* 1	35	13	45	* 8	58	7	51	31	36	18	30	4	12	*17	-14	14
Corning	Max	52	23	42	17	65	18	83	*26	86	2	98	28	106	24	95	1	92	7	79	29	63	* 1	46	6
	Min	- 4	12	-11	10	7	5	25	3	34	13	43	7	55	7	49	23	24	18	24	4	13	16	-19	20
Council Bluffs	Max	56	19	47	*13	75	17	91	26	90	* 2	103	28	108	22	102	1	95	5	83	*18	68	2	49	31
	Min	- 2	1	- 2	* 9	8	5	26	18	35	*28	44	7	62	* 6	55	5	30	18	31	*14	18	* 4	-15	14
Cresco	Max	40	15	36	17	51	23	85	29	90	2	99	25	106	24	93	20	93	6	79	31	67	1	..	..
	Min	-12	30	-11	10	- 6	5	23	18	32	12	34	8	48	7	44	8	32	18	26	4	6	5	..	..
Davenport	Max	54	20	39	17	67	18	87	29	88	2	97	30	106	24	92	14	93	6	82	23	68	11	49	1
	Min	- 3	30	- 7	6	4	5	29	1	40	26	44	9	57	8	52	31	36	18	31	17	15	16	-13	14
Decorah	Max	45	15	39	*17	57	18	88	29	92	2	101	27	107	*21	96	13	92	6	80	*22	62	2	43	1
	Min	-10	30	-16	10	- 4	5	20	19	32	26	32	8	48	7	44	8	34	*18	28	4	2	5	-24	14
Delaware	Max	47	20	37	17	64	18	86	30	88	2	97	*27	108	24	95	7	93	6	78	*23	65	11	41	1
	Min	-16	1	-13	10	- 1	5	20	1	33	13	35	8	49	7	46	31	32	18	25	4	7	5	-21	14
Denison	Max	51	20	43	*15	69	1	86	29	87	2	97	30	106	*22	101	1	94	5	80	23	66	* 1	45	* 6
	Min	- 6	2	- 9	12	- 8	4	19	4	32	*25	36	7	51	7	48	23	29	20	26	4	11	17	-21	14
Des Moines	Max	57	23	44	17	66	18	84	29	88	18	98	28	109	22	95	21	93	6	83	22	67	1	47	6
	Min	- 3	1	- 8	10	4	5	28	3	36	13	42	7	59	8	56	31	36	18	30	4	13	4	-18	15
De Soto	Max	54	15	42	17	66	18	88	27	86	* 2	100	*27	109	22	96	28	93	6	78	29	65	2	49	1
	Min	- 4	2	- 6	10	7	5	25	3	38	26	43	7	59	7	55	* 4	35	18	29	4	13	17	-16	14
Dows	Max	49	20	40	13	63	18	86	29	87	2	97	*27	106	*21	94	*20	91	* 5	81	22	64	1	48	* 1
	Min	- 8	2	-11	10	- 4	5	20	18	32	12	35	7	50	7	48	31	31	*18	20	3	6	4	-23	14
Dubuque	Max	52	20	38	17	65	18	86	29	88	2	98	30	106	21	92	13	91	6	80	23	68	11	45	1
	Min	-11	1	-10	6	- 2	5	26	1	38	26	39	8	54	7	52	31	38	18	31	14	12	4	-17	14
Eldon	Max	58	15	43	17	69	18	91	29	92	18	102	30	112	22	96	* 4	99	7	85	22	70	1	48	1
	Min	- 6	1	-20	10	6	5	26	* 3	33	13	40	7	55	8	50	31	33	18	26	5	6	17	-16	*14
Elkader	Max	51	20	41	*13	65	18	90	28	92	* 2	102	*26	111	24	98	21	97	6	88	23	69	1	46	28
	Min	-21	1	-18	10	0	5	22	1	36	*12	34	8	48	8	48	31	33	18	25	4	2	5	-21	14
Estherville	Max	46	19	48	13	60	1	87	30	88	2	95	*25	107	25	94	*20	87	5	80	23	66	1	46	30
	Min	-17	2	-15	10	- 6	5	17	18	29	12	35	7	50	31	41	31	31	20	26	*17	6	17	-30	14
Fayette	Max	46	20	37	28	61	18	87	29	88	2	98	*27	110	24	94	13	94	6	80	22	62	* 2	40	1
	Min	-17	1	-17	10	- 4	5	21	1	33	*12	32	8	48	7	44	5	31	19	22	4	0	5	-24	14
Fort Dodge	Max	48	21	41	17	62	* 1	85	*26	90	18	96	30	107	*22	97	21	94	5	82	22	68	1	50	* 1
	Min	- 8	12	- 8	12	0	5	20	18	34	*11	36	7	50	7	47	31	30	18	26	* 4	8	17	-22	14
Forest City	Max	45	20	40	13	67	23	85	29	87	2	93	30	106	21	93	*19	90	5	81	21	66	1	46	30
	Min	- 8	2	- 8	10	- 6	5	22	18	30	12	34	7	49	7	40	10	29	20	28	17	5	5	-28	14
Galva	Max	49	*14	45	27	65	1	87	*26	91	2	99	30	106	22	100	1	92	5	80	21	68	2	48	9
	Min	- 4	* 1	- 6	* 9	- 2	* 5	20	18	32	12	40	6	54	7	47	23	29	20	26	* 4	10	17	-25	14
Glenwood	Max	55	20	46	*27	71	17	87	26	87	2	100	*28	106	24	103	1	94	5	82	18	67	2	54	1
	Min	- 5	* 1	- 7	10	7	5	29	* 3	39	26	43	7	60	7	52	4	27	18	28	4	15	*16	-16	14
Grand Meadow	Max	..	..	30	17	56	*17	86	29	86	* 1	96	27	108	21	94	13	93	6	78	*23	62	2	45	1
	Min	- 8	30	- 5	22	- 3	5	23	1	33	12	37	* 7	49	7	48	31	36	20	29	17	5	5	-25	13
Greene	Max	46	20	41	13	62	18	88	29	91	2	101	*26	111	24	98	20	92	5	81	*22	66	1	46	30
	Min	- 8	30	- 9	10	- 2	5	23	18	33	*12	35	8	50	7	48	8	32	18	27	4	7	5	-23	*14
Greenfield	Max	53	23	44	17	68	18	87	27	88	18	97	14	106	24	97	25	96	6	86	22	66	1	46	1
	Min	- 3	* 1	- 6	5	5	5	25	18	34	13	38	7	58	* 7	53	*23	29	18	29	4	11	4	-22	14
Grinnnell (near)	Max	48	20	38	17	65	18	89	29	89	2	99	30	103	*20	92	29	92	* 6	81	*22	66	* 1	48	1
	Min	- 7	1	-11	10	2	5	23	18	36	13	40	7	56	7	54	31	34	18	30	* 4	6	4	-19	14
Grundy Center	Max	47	20	40	17	66	18	87	*29	90	2	94	*26	105	24	93	*18	91	*-6	82	22	67	1	47	1
	Min	- 9	1	-10	10	0	5	22	18	34	13	37	7	50	7	49	31	31	18	25	4	3	4	-25	14
Guthrie Center	Max	51	23	..	..	65	23	..	..	..	..	96	*26	106	22	95	21	91	* 5	82	24	68	* 1	54	1
	Min	- 6	12	..	..	6	5	..	..	..	..	36	7	50	29	50	31	30	*18	26	17	10	4	-19	*14
Hampton	Max	..	..	42	13	66	18	88	29	92	2	99	27	09	*21	99	19	95	* 4	86	22	61	11	50	30
	Min	- 6	30	- 8	10	- 3	5	24	18	33	12	37	7	52	7	50	31	34	*18	29	17	8	4	-22	14
Harlan	Max	50	20	44	17	68	17	87	*26	91	18	100	27	111	22	98	1	92	5	86	19	63	* 1	47	1
	Min	- 9	1	-10	10	4	5	23	18	30	13	37	7	53	6	50	23	28	18	25	4	12	16	-22	*14
Hopeville	Max	53	23	42	17	66	*17	84	*26	85	2	96	28	105	22	97	25	94	7	80	22	65	* 1	49	1
	Min	- 2	1	- 7	10	7	5	27	* 3	38	13	44	7	59	8	54	31	32	18	32	* 4	13	4	-17	20
Humboldt	Max	48	15	40	17	60	* 1	86	29	88	* 2	97	*27	108	21	95	21	92	5	80	22	65	1	56	30
	Min	- 9	2	- 8	10	- 2	5	24	18	33	12	37	7	51	7	47	31	34	18	29	20	8	17	-24	14

MONTHLY MAXIMUM AND MINIMUM TEMPERATURES FOR 1901, WITH DATES.

STATIONS.		Jan		Feb.		March.		April.		May.		June		July.		Aug.		Sept.		Oct.		Nov.		Dec.	
		Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date	Deg.	Date.	Deg.	Date,	Deg.	Date.	Deg	Date.	Deg.	Date.	Deg.	Date.
Independence	Max	..	..	37	17	64	18	86	29	87	2	100	30	106	24	94	*19	93	6	80	*22	65	11	45	6
	Min	-14	1	-13	10	- 2	5	24	1	34	25	36	8	48	7	47	31	32	18	25	4	5	4	-22	14
Indianola	Max	..	..	41	17	66	18	85	29	86	2	96	*28	109	22	96	25	97	5	82	22	68	1	64	1
	Min	- 3	1	- 6	10	4	5	25	18	37	13	42	7	61	8	53	31	33	18	27	4	12	* 4	-19	14
Iowa City	Max	55	19	41	17	68	18	89	29	88	* 2	102	30	108	24	97	*13	101	7	83	29	72	1	45	1
	Min	-10	1	-21	10	8	* 5	26	1	36	*13	43	* 8	53	8	49	31	36	18	27	4	9	17	-16	14
Iowa Falls	Max	46	15	37	17	63	18	85	29	87	2	96	*26	104	24	92	*20	92	6	80	22	63	1	41	30
	Min	- 7	* 2	-17	10	- 2	5	23	18	33	*12	36	* 7	51	7	47	31	32	18	22	17	6	4	-22	14
Keokuk	Max	60	15	45	17	70	18	88	29	87	* 2	100	30	108	22	96	2	95	7	85	1	70	11	56	13
	Min	3	1	- 3	15	10	6	30	18	40	*13	50	7	57	8	56	31	35	18	35	17	14	17	-12	20
Keosauqua	Max	..	..	46	17	69	18	90	29	90	* 2	101	30	110	22	95	* 2	95	7	82	29	70	11	54	1
	Min			- 7	6	11	6	28	* 1	37	13	47	8	57	8	55	31	38	18	30	* 5	10	17	-14	*19
Knoxville	Max	56	23	44	17	67	18	88	29	..	..	97	*28	109	22	94	28	95	7	82	*22	68	1	53	1
	Min	- 4	12	-10	10	2	5	27	18	..		43	7	57	8	53	31	36	18	29	4	12	17	-17	14
Larrabee	Max	48	20	45	28	65	1	88	*29	90	* 1	98	30	108	22	98	1	92	5	80	22	67	1	43	30
	Min	- 8	2	-10	9	- 2	5	20	18	28	12	30	7	53	7	50	* 4	29	20	28	* 4	8	* 4	-26	14
Lenox	Max	51	20	42	17	67	17	84	29	85	2	94	28	104	24	94	*20	91	* 5	78	22	67	2	51	1
	Min	- 6	1	- 8	10	6	5	27	3	36	13	43	7	59	6	54	31	29	18	30	4	13	4	-23	20
Le Mars	Max	48	14	48	28	68	* 1	88	26	87	* 1	97	30	105	21	98	1	89	* 5	78	22	67	1	48	28
	Min	- 2	2	- 7	9	1	5	17	1	32	25	35	7	52	6	48	23	29	18	24	4	10	16	-31	15
Logan	Max	56	20	46	26	70	* 1	88	30	92	2	98	30	110	24	98	*21	93	5	77	*23	74	11	50	1
	Min	-11	3	- 9	*10	8	5	24	* 2	31	12	36	7	51	6	50	31	26	18	22	4	13	16	-20	14
Maquoketa	Max	52	20	39	17	66	18	87	29	91	2	98	*25	108	24	96	14	97	6	84	23	72	11	52	1
	Min	- 8	31	-18	6	1	5	21	* 1	30	26	39	9	46	8	46	31	32	*19	23	4	8	7	-15	14
Marshalltown	Max	52	20	42	17	67	18	89	29	91	2	99	*26	103	24	96	*19	95	7	83	22	67	* 1	47	1
	Min	-11	1	-12	10	2	5	25	3	36	13	39	7	54	* 7	50	31	33	18	25	4	9	4	-20	14
Monticello	Max	52	21	40	28	65	18	88	28	90	2	100	30	108	24	96	14	95	6	82	22	65	2	44	1
	Min	-11	2	-14	10	- 2	6	15	1	35	25	37	8	.	. .	45	31	34	18	23	4	9	17	-18	14
Mt. Vernon	Max	52	20	40	17	66	18	87	29	91	2	98	*26	107	22	98	20	96	7	84	22	69	1	44	22
	Min	-10	1	-10	* 6	0	5	22	1	35	13	42	8	57	* 7	52	31	36	18	29	* 4	10	4	-14	*14
Mt. Ayr	Max	54	20	43	17	69	17	84	*26	87	18	96	*28	109	24	99	25	96	7	81	* 1	68	2	52	1
	Min	- 8	1	- 7	10	7	5	27	* 3	36	13	42	7	56	8	53	31	30	18	29	* 4	13	4	-19	20
Mt. Pleasant	Max	55	*19	42	17	69	18	86	29	88	23	100	30	109	24	92	* 2	96	6	80	* 7	71	11	48	1
	Min	0	2	-12	10	8	6	26	1	34	13	42	9	50	8	47	31	32	18	25	* 4	6	17	-17	20
New Hampton	Max	42	*20	35	17	58	18	85	29	87	2	96	*26	103	25	93	21	91	6	79	22	61	1	42	1
	Min	-10	30	-10	10	- 4	5	24	18	32	12	36	* 7	48	7	48	31	32	18	26	4	5	5	-25	14
Newton	Max	51	20	41	17	66	18	89	29	90	2	98	30	107	*21	93	20	94	7	80	22	65	* 1	52	1
	Min	- 8	1	-15	10	3	5	24	18	37	13	41	7	57	* 7	52	31	35	18	30	17	8	4	-22	14
Northwood	Max	47	20	41	13	60	17	85	29	88	2	93	*26	105	24	93	20	90	5	80	23	63	2	44	30
	Min	- 7	* 2	-10	10	- 5	5	22	18	31	12	35	7	49	7	46	8	31	20	28	16	7	5	-25	14
Odebolt	Max	49	20	43	28	69	23	87	29	93	18	100	30	109	22	102	1	94	5	80	22	62	30	48	1
	Min	- 4	1	- 7	9	3	5	21	18	32	12	35	7	55	7	48	23	30	*18	27	4	11	* 4	-21	8
Ogden	Max	48	15	42	17	64	18	86	29	88	2	97	30	108	*22	96	21	92	* 5	83	22	67	1	50	* 1
	Min	- 8	1	-15	10	0	5	23	18	32	12	35	7	56	* 7	50	10	31	17	26	17	6	4	-22	14
Olin	Max	50	21	40	17	64	17	86	29	86	2	98	*27	103	*21	92	14	90	* 6	80	29	67	11	44	1
	Min	-18	3	-18	6	2	5	25	1	33	26	32	8	51	8	47	31	35	18	25	4	9	17	-17	14
Omaha	Max	54	19	46	17	75	17	88	26	87	2	100	28	105	24	99	1	92	5	83	18	67	2	53	6
	Min	0	1	0	9	6	5	30	17	42	12	45	7	64	5	58	4	32	18	36	14	19	16	-16	14
Onawa	Max	51	14	47	14	73	1	87	*29	90	2	96	30	103	*21	100	1	92	5	84	22	69	1	49	1
	Min	- 3	* 1	- 5	9	5	5	24	18	35	*11	39	7	56	6	55	23	28	18	29	* 4	13	16	-18	14
Ovid	Max	56	23	45	17	69	18	85	29	89	18	97	30	112	22	98	21	97	6	86	*22	70	1	50	1
	Min	- 4	1	-11	10	7	5	23	18	33	13	42	7	58	8	52	31	30	18	27	17	9	4	-18	20
Osage	Max	42	15	36	17	51	23	83	*29	85	2	95	26	101	*21	89	*18	86	* 5	78	23	58	1	40	1
	Min	- 8	2	- 9	10	- 5	5	24	18	32	12	34	8	48	7	47	31	32	20	29	* 4	8	* 4	-24	14
Oskaloosa	Max	54	20	42	17	69	18	89	29	88	2	99	30	107	*21	96	28	98	7	82	*23	68	* 1	49	1
	Min	- 7	12	-17	10	5	5	25	18	35	13	43	7	56	7	53	4	34	18	28	* 4	8	17	-17	14
Ottumwa	Max	57	20	46	17	70	18	88	29	88	2	101	30	108	22	94	13	91	* 5	81	23	70	11	50	1
	Min	2	1	-10	10	12	* 4	30	* 2	40	*14	..	...	60	8	58	4	35	18	31	4	13	17	-14	14
Pacific Junction	Max	54	*15	48	*17	71	17	87	26	89	2	100	28	107	24	105	1	95	5	80	18	67	2	50	6
	Min	- 6	1	- 8	10	7	21	23	18	33	26	44	* 6	57	7	51	* 4	27	18	28	4	11	17	-21	20
Pella	Max	55	20	46	17	78	18	88	29	89	18	98	30	110	22	98	14	97	7	86	22	70	1	..	..
	Min	- 3	1	-12	9	5	20	26	18	36	13	42	7	60	* 6	50	31	34	18	27	4	10	4	..	...
Perry	Max	52	15	42	17	66	18	85	30	88	18	100	30	110	24	96	*21	98	7	...	...	70	1	46	30
	Min	0	*13	- 8	*10	4	5	24	18	34	13	39	7	55	6	50	31	33	17	. .	...	8	4	-18	*14
Plover	Max	47	*15	40	*13	60	* 1	89	30	91	2	98	*25	109	24	98	21	95	6	80	22	67	2	46	6
	Min	-10	2	-10	10	0	5	21	18	31	12	32	7	50	7	45	31	31	20	27	* 4	9	4	-27	14
Primghar	Max	48	14	43	15	60	1	89	30	91	2	94	26	110	22	100	1	95	5	...	...	...	...	..	.
	Min	- 5	* 8	-12	9	9	11	...	..	33	25	...	..	55	7	50	31	35	*15	..	..	..	..	.	...
Red Oak	Max	53	*15	45	17	71	17	88	*26	90	2	96	28	101	24	93	1	90	4	76	29	68	2	58	6
	Min	- 5	* 1	- 9	*10	5	5	21	6	39	13	47	7	62	7	59	23	34	18	33	17	17	16	-13	20
Ridgeway	Max	49	20	39	15	56	*17	90	29	92	2	101	26	105	*21	92	*20	90	* 5	82	*22	64	2	44	30
	Min	-11	30	- 6	22	- 2	5	25	*18	34	12	38	7	52	7	50	31	33	18	30	* 4	8	* 4	-26	14
Rockwell City	Max	47	20	42	17	66	23	84	29	88	* 2	97	26	106	21	95	20	91	5	80	22	65	1	50	1
	Min	- 5	2	-10	10	1	5	25	18	35	12	36	7	53	7	50	31	33	20	30	* 4	11	4	-20	14
Sac City	Max	51	20	40	*17	63	1	85	*29	88	2	98	30	108	*21	98	1	94	5	81	22	67	2	48	1
	Min	- 6	2	- 8	10	1	5	23	18	34	12	36	7	54	7	50	31	32	*17	28	4	8	5	-22	14
Sioux City	Max	54	14	44	28	70	1	88	26	87	1	99	30	106	21	102	1	91	5	82	22	69	1	47	30
	Min	1	1	- 8	9	4	5	22	17	36	12	39	7	58	7	53	23	30	18	31	4	15	16	-22	14
St. Charles	Max	59	23	47	14	68	*17	86	29	87	2	97	*28	108	22	95	*21	95	7	85	22	70	1	63	1
	Min	- 3	1	..	...	7	5	24	18	37	13	47	7	59	* 7	54	31	34	18	30	4	13	* 4	-18	14
Scranton	Max	48	20	40	17	62	* 1	84	29	88	2	97	*28	105	24	95	1	91	5	80	23	66	2	47	30
	Min	- 3	1	- 4	* 9	3	5	25	18	36	*12	37	7	57	7	51	31	33	*18	29	4	9	16	-12	14
Sheldon	Max	45	*14	44	28	65	1	87	30	89	* 2	96	30	104	*22	94	* 1	91	5	83	*22	70	1	48	30
	Min	- 9	2	-10	* 9	- 4	5	20	18	31	12	33	7	48	8	46	23	31	18	25	17	9	16	-27	*14
Sibley	Max	47	20	46	13	65	1	88	30	91	2	96	30	106	22	98	1	94	5	81	22	69	1	47	1
	Min	-11	2	- 7	* 9	- 4	5	21	18	30	12	32	7	52	7	47	23	31	17	25	4	10	* 4	-29	14
Sigourney	Max	57	20	42	13	70	18	92	29	94	18	04	25	113	22	100	*19	102	7	82	* 7	69	11	49	1
	Min	- 6	1	-12	10	5	5	26	* 1	35	13	42	7	51	8	49	31	35	18	27	4	10	17	-16	*14
Sioux Center	Max	46	23	45	28	65	1	88	26	89	2	97	30	...	...	96	1	90	6	78	22	67	1	46	1
	Min	- 6	2	-10	9	- 3	5	23	18	31	25	33	7	...	.	52	30	31	18	27	4	10	* 4	-27	14
Spirit Lake	Max	43	14	48	13	61	1	...	...	91	* 2	94	*25	108	25	98	20	92	* 3	..	...	...	...	48	30
	Min	-10	2	- 5	* 4	- 8	5	...	...	29	12	33	7	52	7	50	31	32	17	...	...	...	...	-22	15
Storm Lake	Max	46	20	42	28	62	1	82	30	85	18	95	30	104	22	95	1	90	* 5	77	22	65	1	44	1
	Min	- 7	2	- 9	10	- 2	5	23	18	32	*12	36	7	54	7	49	31	33	*17	29	17	11	* 4	-27	14
Stuart	Max	53	22	45	*15	67	*17	88	*27	87	18	98	28	108	*22	96	21	...	...	...	...	...	...	..	...
	Min	0	29	- 5	9	2	* 4	23	17	35	13	38	7	62	* 6	57	* 4	.	..	...	.	..	...	..	...
Thurman	Max	54	15	47	*17	70	17	87	26	87	2	100	28	102	*21	95	23	90	5	80	18	67	2	48	1
	Min	- 8	1	-13	10	1	11	24	3	34	13	45	7	58	7	52	* 5	28	18	28	4	13	16	-27	20
Toledo	Max	54	20	42	*13	70	18	90	29	92	2	98	30	109	*21	98	18	98	7	84	* 2	67	* 1	59	1
	Min	-10	2	-15	10	2	6	24	18	30	12	38	8	53	7	48	31	32	19	23	5	5	4	-19	13
Vinton	Max	49	20	39	*13	66	23	87	29	90	2	97	30	103	*22	93	*18	92	7	83	22	...	...	41	22
	Min	- 6	* 2	- 5	5	6	5	29	7	38	12	44	7	57	7	52	31	35	18	26	4	8	4	-17	14

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STATIONS.		Jan.		Feb.		March.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.	
		Deg	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date	Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date	Deg.	Date.	Deg.	Date.	Deg.	Date.	Deg.	Date.
Villisca	Max	54	23	46	17	70	* 3	88	27	89	* 2	98	28	104	22	103	29	93	3	...	...	70	* 1	54	1
	Min	- 7	1	-10	* 9	7	21	24	18	32	*13	42	7	53	4	51	*23	23	18	...	...	12	*16	-20	20
Wapello	Max	54	20	45	16	66	18	91	29	90	17	96	30	111	10	96	7	95	7	80	29	65	* 1	53	1
	Min	- 2	1	- 7	6	11	* 5	29	18	37	27	46	8	56	8	55	* 4	39	18	32	* 4	13	17	- 9	*14
Washington	Max	56	20	41	17	69	18	90	29	79	2	100	30	106	*21	95	14	97	7	84	23	69	1	..	...
	Min	- 6	1	-13	10	4	5	25	* 1	34	13	40	7	53	8	40	31	33	18	27	* 4	8	17	..	...
Waterloo	Max	49	20	40	17	65	18	88	29	91	2	98	*27	107	24	95	*19	94	6	84	22	67	1	45	1
	Min.	-10	1	-13	10	0	5	24	18	36	*12	38	8	51	7	49	31	33	18	26	4	8	4	-21	14
Waverly	Max	48	15	39	17	63	18	88	29	91	2	97	26	106	21	93	*19	93	6	81	*22	63	1	42	1
	Min	- 7	30	-15	10	- 1	5	25	18	35	12	39	8	53	7	51	* 8	34	18	28	4	8	5	..	...
Wilton Junction	Max	54	20	41	17	67	18	87	*29	89	3	101	26	108	24	95	14	95	7	80	23	67	3	52	1
	Min	-10	1	-15	10	5	5	25	1	33	13	41	8	50	8	47	31	32	*17	24	4	8	17	-14	14
Winterset	Max	54	23	43	17	64	18	81	29	90	2	98	30	109	22	99	25	100	7	83	22	69	1	..	..
	Min	- 1	* 1	- 7	22	0	13	25	* 3	35	13	41	7	58	7	53	31	32	18	27	4	12	4	..	...
West Bend	Max	43	20	40	13	57	23	84	*29	89	*18	96	30	109	21	96	21	93	5	81	22	66	1	47	1
	Min	-10	2	- 8	10	3	5	28	18	33	12	35	7	50	7	47	31	31	18	28	17	10	17	-25	14

* And other dates.

MONTHLY AND ANNUAL MEAN TEMPERATURES FOR 1901, WITH DEPARTURES.

STATIONS.	Jan.		Feb.		March		April.		May.		June.		July.		August.		Sept.		Oct.		Nov.		Dec.		Annual.	
	Tem.	Dept	Tem.	Dept.	Tem.	Dept.	Tem.	Dept	Tem.	Dept.	Tem	Dept.	Tem.	Dept.	Tem.	Dept.	Tem	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept,	Tem.	Dept,
Afton	26.0	.....	19.7	.....	35.0	.....	49.6	.....	61.0	.....	73.4	.....	82 6	.....	73 6	.....	62 9	.....	55.0	.....	38 4	.....	21.8	.....	49.9	.....
Albia	26 0	.....	20.9	.....	35.0	.....	49 3	.....	60 4	.....	73 2	.....	83 8	.....	73.6	.....	6:.6	.....	55 2	.....	37.0	.....	21.8	.....	50.1	.....
Algona	20.3	* 6.1	16 7	-2.4	32.0	* 1.3	49 5	* 1.5	60.0	* 1.6	71,4	* 1 4	82 2	* 8.6	72.6	* 3.3	60.6	-3 0	53.6	* 5.5	33.3	* 3.9	18.4	-2.0	47.6	* 2.2
Alta	21.1	* 6.1	17.4	-0.8	31.8	* 2.2	48.5	* 1.1	59 7	* 2 1	69.4	* 0 3	81.2	* 8.8	72 9	* 2.9	60 4	-4 2	52.0	* 2.9	34 (	* 5.0	17.2	-4 4	47.1	* 1.8
Amana	24 3	* 9 9	15 1	-5 7	36 4	* 5.3	50.3	* 1.9	60.8	* 1.2	73 2	* 3.6	82.0	* 8 3	72 8	* 2.5	63 8	* 1.9	54.4	* 5.9	35 1	* 3 1	20 6	-1.2	49.1	* 3 0
Ames	23.6	* 7 8	18.0	-4.4	34.3	* 1.9	49 0	-0. 1	61.4	* 2 4	74.4	* 4.4	83.3	* 3.8	72.8	* o 8	61.6	.2 0	53 9	* 4.0	37.9	* 6 1	20 5	-1.3	49.2	* 2.3
Atlantic	24 3	* 5.9	19 4	-3 5	36.0	* 1.6	49.2	* 0.2	60 4	* 2 9	72 4	* 2.6	82.3	* 9.5	74.7	* 4. (	63.4	-2.3	53.4	* 4.2	36 7	* 4.2	20.7	-4 2	49 4	* 2 0
Baxter	23.3	.....	15.2	.....	36.8	.	49 4		60 6	.	71.8	.	82.2	....	73.4	.....	63.4	.....	55.0	-	35.8	.	20.0	.....	48.9	.....
Bedford	28. 1	.....	20.4	.....	34 8	.	50.1	.....	...	.....	.....	.....	.....	.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belknap	28.6	.....	19.0	.....	38.8	.	51.7	.....	63 0	.	74 6	.. .	85 0	....	75.8	.....	67 0	.....	57.8	.....	43.6	.....	.....	.....	.....	.....
Belle Plaine	23 8	* 5.3	6 0	-6.5	34 3	* 1.5	49.2	-0.4	60.6	* 2 4	72.5	* 2 6	81 6	* 8 8	72 8	* 2.9	65,2	* 1.1	53.8	* 4.7	33 7	* 1 4	.....	.....	.....	.....
Bonaparte	28.8	* 7.2	19 2	-6.2	37 4	-1.0	50.6	-1 4	62.4	* 0,1	74.8	* 1 7	84 8	* 8.9	77 2	* 3 1	67.2	-1.6	57 0	* 2.8	38 2	* 2 0	22 8	-6.0	51.7	* 0.8
Britt	19.2	.....	15.4	.....	31 0	.	48.1	.	58.3	....	70 2	.	79 4	.....	70 2	...	60.0	... .	50.2	.....	32 0	.....	16.2	.....	45.8	.....
Burlington	29.6	.....	21 0	.. .	39.0	... .	52 8	....	63.3	.	75 4	....	83.6	.	76 4	....	67 6	... .	58.0	....	39 2	....	24 5	.	52.5	....
Carroll	24 0	* 5.5	20.0	-0.7	35.0	* 3.8	49 7	* 0.9	59.0	* 0.5	71.1	* 1 1	83.0	* 9 9	74 0	* 3 8	60 7	-3 2	54.0	* 4 6	37 0	* 5 9	21.0	-2 3	49 0	* 2 4
Cedar Rapids	25.8	* 9 1	15.2	-6.5	34.6	* 1 8	51.2	* 7.4	61.8	* 2.8	74.2	* 3.6	83,0	* 8.4	74 2	* 2 7	65.4	* 2 0	55.	* 5.5	36.2	* 1 6	21.4	-3 3	49.9	* 2.9
Chariton	27.0	.....	19.8	.....	36.4	.....	49 4	.....	60.4	.	73.2		83.7	.....	74.3		65 2	.....	56.0	.....	37.8	.	22 1	....	50.4	.....
Charles City	19.4	* 5.5	13 2	-4.4	31 4	* 0.9	48 6	* 1.7	60 4	* 3 1	70.2	* 1 6	81 0	* 7.5	72.4	* 2 2	61 6	-2.0	51.0	* 1.9	32.4	* 3.1	15 8	-4.8	46.4	* 1.3
Clarinda	27 0	* 5.8	22.0	-2.9	37.4	* 2 5	51.4	* 0.6	61.5	* 0 7	74.0	* 2. 1	83.6	* 7.8	76 1	* 2 3	66.1	-1.5	57 1	* 4 1	39.2	* 3.4	23.4	-3 8	51 6	* 1.7
Clear Lake	19.6	.....	14 6	.	30.6	....	50.1	.	62.8	.....	72 0		80.9	.....	74.7	.....	61.4	....	54.0	.....	37.4	.....	20.8	....	48.3	.....
Clinton	24.4	* 5 7	14 8	-7 9	34.7	-2.0	49.4	-1 5	61.0	* 0.1	73.3	* 1 8	80 6	* 6.5	73.4	* 0.7	63 2	-2 2	53.6	* 2.4	33.9	* 0.3	22 4	-3.9	48 7	0 0
College Springs	27 1	* 4 6	21.3	-5.1	36.5	-0.8	50.4	-0.3	61.0	* 0.4	74.8	* 4 c	83.2	* 8.8	75.6	* 2 1	65 4	-3.4	56.5	* 0.7	39.2	* 2 1	22.7	-5.3	51.1	* 0 6
Columbus Junction	27.6	.	17 4	.	37.0	.....	52 4	.....	63 0	....	75.6	.....	84.8	.....	75.0		66.7	.	55 0	.	36 5	....	22 0	.	51 1	.....
Corning	26 4	* 5 8	19 7	-5.5	35 2	-1.5	48 8	-2.3	60 8	* 0.5	72.6	* 2 2	80 7	* 7.2	74 0	* 2.0	63.9	-2 5	54 2	* 1.5	37.0	* 1.2	21 4	-5 2	49.6	* 0.3
Council Bluffs	27.6	....	22.8	.....	37.2	. .	52.6	.....	62.1	.....	74.9	.....	85.8	....	77.1	.....	65.8	.....	56 5	.....	40.9	.....	23.4	....	52.2	....
Cresco	16.4	* 6.1	11 2	-4 7	29 0	* 3 2	48 0	* 3 6	58 6	* 2 1	69.1	* 2 8	86 6	* 7.7	71 2	* 2 6	59 2	-0 6	51.0	* 4.7	31 2	* 1.8	.....	.....	.....	.....
Davenport	26 6	* 5.6	15.7	-8.9	35.	* 1.2	50.5	* 0.3	61.3	* 0.3	74.2	* 3.3	83.0	* 7 6	74.2	* 1 0	65.4	* 0.2	55.6	* 2 4	36.8	-0 5	22 8	-4.7	51.0	* 0 8
Decorah	19 4	* 6 9	11 8	-5 7	30.6	* 1 4	48.2	-1.0	59.8	0.0	71.2	* 2 8	80.4	*10. 1	71 6	* 2 1	60.6	-2.6	51 2	* 2.7	31.4	* 1.1	18.0	-3.0	46.2	* 1.0
Delaware	20.5	* 6 2	11.8	-6.3	30 3	-0 6	48 0	* 1.3	58.4	* 0.5	72.3	* 3 6	81.0	* 9.4	72.5	* 3.7	61.7	-0 1	51 8	* 5.3	32 5	* 3 0	19 4	-2 0	46 6	* 2.0
Denison	22 8	* 2.8	18 0	-4.5	33 1	* 1.0	48.8	-0 5	58.7	-1.3	72.2	* 3 5	82.4	* 9.6	74 5	* 3.8	62 1	-3.2	52 8	* 4.4	35.0	* 3 3	19 2	-3 1	48 3	* 1.3
Des Moines	26.3	* 7 0	20 0	-3 c	35. 8	* 1 0	50 4	-0.6	61 '6	* 0 6	73 5	* 2.5	84 0	* 8.0	75.0	* 2.0	64 8	-0.2	56 1	* 3.1	37.6	* 0 6	21 8	-4.2	49.6	* 1 5
Desoto	26.2	.....	20.6	.	36.4	.....	50.6	....	62 6	.	75.5	.	.....	.....	75.1	.....	64 8	...	55.4	.....	37 3	....	22 8	....	.....	. ...
Dows	20 6	....	15 2		32 5	...	48 0	.	59 1	...	70 4	.....	80.5	.....	70 8	.....	61 1	.	52.4		33 0	.	18.2		46 8	.....
Dubuque	23.7	* 6.0	14 5	-8.1	32 8	0 0	50.1	* 1.5	60.2	* 0 3	72.5	* 3 1	82 2	* 8.0	73.5	* 1 5	63.0	0 0	54.4	* 3.5	35.3	* 0 3	21.8	-3.6	48 7	* 1.1
Eldon	27 6	... .	18.2	...	37 7	.....	50 8	.	62.2	.....	75 2	.....	85.1	.....	75.9	.....	66 4	...	56.2		37.6	.....	22 4	.....	51.3	.
Elkader	20.2	* 7.2	13.8	-5.3	33.4	* 2.5	50.6	* 2 6	61 6	* 1.0	73.0	* 3 5	81 8	* 8.1	74.4	* 4 2	62 8	* 0.6	4 0	* 5.8	34 8	* 3.5	19 3	-2 2	48.3	* 2 6
Estherville	17 8	.....	15 6	....	30.3	.....	45.6	..	57.4	.....	69 4	.....	80.4	.	70.4	.....	58.3	.....	49 2	.....	31 2	.....	14 9	.....	45.0	.....
Fayette	20.5	* 4 8	12.3	-7.8	31.3	* 0 4	47.6	* 0 4	59.0	* 2 2	70.6	* 2.2	82.4	*10.5	72 0	* 3.3	60 6	-3 0	51 2	* 2 9	32 2	* 1.2	17.1	-5 4	46 4	* 1.0
Ft. Dodge	22 0	.....	18 0	.	32 4	.....	48.1	.	60.2	.....	70.7	.....	81.3	.....	71 6	.....	62.8	..	53 0	.....	34 2	.....	20 0	.....	47 9	....
Forest City	19 4	... .	14.4	.....	30 4	....	48.4	....	59.7	.....	69.3	.....	82.6		71.4	.....	60 8	.....	52 6	.	33.4	.....	17.4	.....	46 6	.....
Galva	23.4	* 7 4	18.6	-1 4	32 5	-1.3	49.7	* 0 4	59.3	-0.9	72.2	* 3.0	82 3	* 8 8	73.8	* 3.8	62.8	-2.7	52.6	* 3.8	34.6	* 4.7	19.8	-2.6	48.5	* 1.9
Glenwood	28 8	*11.1	22 0	-1.7	37.4	* 4.1	52.2	* 3.4	62 2	* 2.3	74.6	* 4.1	84.8	*10 7	76.5	* 4.4	65.0	* 2 6	56.6	* 7.6	39.5	* 5.6	23.2	-1.7	51 9	* 4.2
Grand Meadow	....	.....	12.4	-7 3	31.8	* 0.7	49.0	* 1.8	59.1	* 1.6	69.8	* 2.9	80.8	*10.7	72.5	* 4 6	59.2	-3.8	51.8	* 3 8	32 6	* 2.1	17.5	-5.0		.....
Greene	20 9	.....	15.6	... .	32.2	.....	49.5	.....	60.6	.....	72 0	.	82.6	....	73.6	...,	62.4	.....	52.6	.....	33 6	.	18.3	....	47.8	.....
Greenfield	25 8	* 5.6	28.8	-2.2	36.2	* 2.2	50.1	-0.7	61 2	* 1.6	72.8	* 2.0	82.4	* 8 4	75.2	* 3 0	64.4	-1.7	56 3	* 4 5	37.5	* 3.7	20 1	2 5	50.2	* 2 0
Grinnell	24.3	* 6.0	17.4	-5 8	34.3	* 1.2	49.4	-1.3	59 0	-0.4	.....	.....	.....	.....	.....	.....	64.4	* 1.0	56.6	* 9.4	35.1	* 0.6	20 2	-4 6	.....	....
Grinnell (near)	23 4	.....	16.7	....	34.0	.....	49 8	.	61.2	.....	72.9	.....	83.0	....	74.1	.....	64.6	.....	55 8	.....	34 9	..	20.0	..	49.2	....
Grundy Center	22.1	* 7.2	15.6	-4.4	32 7	* 0.6	49 0	* 0.2	59.9	* 1.8	70.7	* 0 9	80.2	* 8 4	72.4	* 2 6	62 4	-1.4	54.0	* 4.2	14 0	* 3 4	17.8	-5 2	47.6	* 1.6
Guthrie Center	29 6	.		.....	35.4	.....		.....	.....	.....	75.9	.....	81.8	.....	73.8	.	62 8	.	54 3	.....	36.8	.	21.7	.....	.....	.....
Hampton		.....	17.0	-1 0	33.4	* 4.4	50.2	* 3 4	61.7	* 4.7	72.2	* 4 3	82.4	*10. 7	74 6	* 5.9	63 6	* 1.2	54.2	* 6 1	35.0	* 5.3	19 0	-2.0	.....	.....
Harlan	23.5	.	19.2	....	34.8	.....	49.8	.....	60.8	.....	73.2	.....	82.4		73.9	.....	64 2	.....	53.7	.....	35.7	.....	19.6	.....	49.2	.....
Hopeville	26.2	.	20.0	.....	35 6	.	49.8	.	60 2	.....	72.1	.....	83.0	.....	75 3	.	64 8	.....	56 2	...	37 6	...	21 4	.....	50 2	.....
Humboldt	22.3	.....	17.8	.....	33.8	.....	49.1	.....	60.1	.....	72.0	.	83.0	....	72 0	...	61.8	.....	52.6	.....	33 9	...	20 2	.....	48 2	.....
Independence	....	.....	12 8	-7 5	32.0	* 1.6	48.6	* 1.4	59.0	-0.4	70.7	* 3.7	81.2	*10 0	72.6	* 4 5	62 1	* 2 1	52 5	* 5.4	33 2	* 1 2	18.3	-2 8	....	....
Indianola	....	.....	19.5	.....	36 5	.....	50.4	.....	61.6	.	73.2		84.6	.....	75 8	.....	64 9	.....	55.8	.....	37.3	.....	2 0	....		
Iowa City	24.7	* 3.7	14.6	-10 3	35.3	* 0 1	51.0	* 0.2	62.3	* 2.7	73.8	* 2.6	83 2	* 9.3	74.8	* 4.1	6, 7	* 0.5	55.6	* 5.0	35.4	-0.4	21 8	-5.2	49.8	* 1.0
Iowa Falls	20.8	* 8 6	14 5	-2.7	31 2	-0.5	48.2	* 1.2	59.8	* 0.8	70.6	* 1.9	80.0	* 7.7	70.8	* 1 8	61 0	-1.5	51.8	* 3.8	32.3	* 2 6	17.4	-3 6	46.5	* 1.6
Keokuk	30.6	* 7.0	19.8	-8 0	38.6	* 1.0	51 6	-0.4	63 0	0 0	76.2	* 4.2	85 0	* 8.0	77 2	* 2 2	67.4	0 0	58 2	* 3 1	39.2	* 0 2	25.2	-4 6	52 7	* 1.5
Keosauqua	....	.	21.8	-4.8	38.8	-0 2	52.6	-0.4	63.2	* 1. 1	76 3	* 3.0	85.8	* 9 4	76 6	* 2 5	67.3	-0.7	57.0	* 2.4	39.2	* 2 .	23 8	-3.4	....	.....
Knoxville	25.2	* 1.8	18.2	-6.0	36.8	-0.2	51.0	-1.8	....	.	74.0	* 2.0	84.7	* 9 2	74 9	* 1 9	65 8	.....	57 0		38 3	.....	22 6	...	.....	.....
Larrabee	21.4	* 4.9	17.4	-3.1	32.4	* 1.8	48.9	* 0.4	57.8	* 0 2	68.8	-0.8	82.0	* 9.8	72.9	* 2.7	60 6	-3.9	51 3	* 2. 1	33 4	* 3 4	19 0	-3.6	47.2	* 1.2
Lenox	25.8	.....	19.7	.....	36.0	.....	49.5	.....	60.0	.....	71.5	.....	82.0	.	75 1	.	64.5	....	55.5	....	37 7	.....	21.2	.....	49.9	.....
Le Mars	22.8		18 2	.....	34.4	.	49 8	....	59.5	.....	70.4	.....	81.4	.....	72 9	.....	60.6	.	52 4	.....	35.1	.	20 4	.....	48 2	.....
Logan	23.1	* 2 8	20.6	-3.5	37.4	* 3.4	51.0	-0.9	61.6	* 0.8	71.9	* 0.2	83.4	* 8 6	76 2	* 4 1	62 3	-4 0	52.2	* 0.1	36.4	* 1.5	21.5	-5.3	49 8	* 0.5
Maquoketa	25.6	* 7.8	(4 2	-1.1	35 4	-0.3	50 1	* 1.8	59.8	-0.9	71.8	* 0 7	80 6	* 4 9	72.2	* 0 6	63.6	-1.1	54 6	* 1.4	37.0	* 1.2	23 6	-1.7	49.0	* 0 2
Marshalltown	24.4	* 6.4	18.2	-3 5	35.0	* 3. 1	50.4	* 1. 3	61.5	* 2.9	73.0	* 3 9	82.6	*10. 2	74.2	* 3.6	64 2	-0.7	55.	* 4.8	35 6	* 3.0	20 8	-2 8	49 6	* 2.7
Monticello,	22 6	* 7.3	15 2	-6.2	32.6	* 0.7	49.6	* 1.3	61.2	* 2 0	70 6	* 1.8	....	...	70 4	* 0 4	62.3	* 0 6	52 6	* 4.1	33.8	* 0 6	20.8	-1 3	....	.....
Mt. Vernon	21.8	.....	16.0	.....	33.5	.....	50.3	.....	61.2	.....	74.4	...	84 8	...	76 7	.....	65.8	.....	56 8	....	36 0	.....	22 2	.....	50.0	. ...
Mt. Ayr	26.7	* 4 5	20.2	-6 3	35 8	-0.6	49.8	-2.4	60. 4	-1 8	72.8	* 1.8	82.9	* 7.7	75 8	* 2 8	65.5	-2 7	56.8	* 3.8	38 8	* 3 4	21 4	-4 1	50.6	* 0.5
Mt. Pleasant	28.0	.....	19.0	.....	37.0	.....	50.2	.....	61.3	....	73.4	.	82.0	.....	72 2	....	63.5	.	53.8	.	35.4	...	21 1	....	49 7	.....
New Hampton	20.0	.	12.6	.....	30.2	.....	48.6	.....	58.5	.....	69.0	.....	79 6	.....	72 0		60 9	...	51 7	.....	31.5	.....	16 0	.....	45 9	.....
Newton	24 8	* 8 5	17.6	-4. 1	34.2	-0. 2	49 7	* 1. 1	62 2	* 1 7	72.8	* 2. 2	83 1	* 8. 3	73.8	* 2 0	64 2	* 1 3	55.5	* 5. 3	35.5	* 2. 8	19 6	-2 3	49 4	* 2 2
Northwood	17.5	.....	15.4	.	32.5	....	50.2	.	59 6	.....	68 8	.....	79.8	....	71 9		60.4	...	52.0	.....	37.6	....	17 6	....	46.5	.....
Odebolt	23.4	.....	19.4	.....	34.7	.....	49 9	.....	60.8	.....	72 8	.....	84 2	.....	75 7	....	62 3	....	53.2	.....	35 2	.....	20.5	....	49 3	.....
Ogden	22.5	.	17.0	.	33.6	.....	49.4	.....	60 2	....	70.7	.....	82 2	....	73 2	....	63 0	.....	53.5	.	35 2	.	21.2	.....	48.5	.....
Olin	20.4		13 2		32 7	.	49.2	.....	59.8	.	72 8	.	81 2	. .	70.9	.	62.4	.....	52 8	.	33.8	....	23 2	.....	47.7	....
Omaha	27.8	* 7.0	22 9	-2.0	36 9	* 1.0	51.9	-0. 1	62.5	* 0. 5	74.7	* 2.7	85.1	* 9 1	77.0	* 5.0	65.4	-0 6	57.8	* 3 8	40 2	* 3 6	23.6	-3 1	52.2	* 2.4
Onawa	25.3	.....	21.9	....	36 2	.....	51.2	.	61 8	.....	72.0	....	82.4	.	75 0	.....	63 6	.....	54.2	.....	37.8	.....	21.4	.....	50 2	....
Ovid	26.4	* 3.7	19.4	-5.4	35.2	-2 2	49.6	-3.0	61 2	-0 1	73.4	* 2 1	85.2	* 9.9	76.3	* 2.6	66 8	-1.0	58.3	* 5 6	39.2	* 3.5	22 2	-4 3	51.1	* 1.0
Osage	18.6	* 6 2	12.6	-3.4	29.1	* 0 6	46.8	* 2.0	58.0	* 1 9	68.7	* 2.2	77.8	* 7.9	70 4	* 4 3	59.4	* 0 1	51.4	* 7.7	31.9	* 5.5	17 0	-2.1	45.1	* 2.7
Oskaloosa	25.8	* 8 2	18.0	-4.4	36 1	-1.8	50.4	* 0.2	61.2	* 1 3	73 4	* 3 5	84.0	* 9.3	74.5	* 3.4	65.0	* 0 5	55.8	* 5.2	36 6	* 0.9	21 4	-4 8	50.2	* 2.1
Ottumwa	29.4	* 6 8	21.0	-4 2	38 0	-0 9	51.0	-2 5	63.0	0.0	.....	.....	86 0	*10.4	75 8	* 2 0	67 0	-0.9	57 0	* 4.0	38.6	* 2.2	24 8	-2.9	.....	.....
Pacific Junction	26.6	.....	22.6	.....	36 4	.....	51.8	.	61.0	.	73.4	.....	83.3	.	75.6	.....	65.2	.....	55.6	.....	38.8		22.8	.....	51 1	.....
Pella	25.0	.....	16 6	.....	36.2	... .	51.2	.	62.0	....	74 4	.....	84.8	.....	74 6	.	63.5	.....	57 2	.....	38.4	.....		.	.....	.....
Perry	26.9	.....	19 5	....	35 4	....	50.2	.....	61.0	.....	72.9	.....	84 1	.....	74 2	....	63.6	.	....	.....	37.2	.	21 0	.	.....	.....
Plover	21.2	.....	17.4	.	31.3	.	49.0	....	60.0	.....	70 2	.....	81 8	.....	71.1	....	61.4	.	51.6	....	34 1	....	18 8	.....	47.3	.....
Primghar	20.4	.....	15 4	.....	32 8	.....	.....	.....	62.4	.....	76.2	.....	83 6	....	76.2	....	62 6	.....	....	.....	31.4	.....	.....	.....	.....	.....
Red Oak	25.8	.....	19 9	.	36.1	....	51.0	.....	61.4	.....	73.9	.	83 0	.....	76.2	.	65 6	.....	56.4	.....	40 0	....	27 0	.	51.4	.....
Ridgeway	22 1	.....	15 8	.	32.1	.	50.5		61.0	.....	72 1	.....	80 9	.....	73 7	. .	61.4	.....	53 4	....	34.4	.....	18.9	.....	48.0	.....
Rockwell City	24 0	.	18.8	.....	34 6	.	49.2	....	60.4	. .	68.4	.....	81.4	....	73.0	.....	62 4	.....	53.8	.	35 4	....	20.7	.....	48.5	.....
Sac City	23.0	* 9.1	18.8	-0 9	33.4	* 2.2	49.2	-0.5	59.8	* 0.8	71.1	-0.6	82 8	* 6.7	73 9	* 1.4	62.0	-1 9	53 2	* 2.0	35.2	* 2 1	18.4	-5.0	48 4	* 1.3
Sioux City	24.2	* 5 0	20.0	* 1.0	35 0	* 4.0	50.4	-0.6	60.8	* 0.2	71.5	* 1.5	82.6	* 7.6	74.4	* 2.4	62 3	-2 7	54 6	* 2 7	36 8	* 2.8	20.3	-5.7	49.4	* 1.1
St. Charles	27.1	.....		.....	36.7	.....	50.4	.	61 4	.	73.6	. .	83.9	.....	75 2	....	65.1	.	57.8	. .	39.7	....	22.5	.....	.....	....
Scranton	24 1	.....	19 4	.....	34.3	.....	48.9	.....	61 0	....	72 7	.....	82.2	.....	73.6	....	62 6	.....	54.4	. .	36 6	.....	22 8	. .	49.4	.....
Sheldon	20.0	.....	15.3	.....	31.8	.....	49.2	.....	59.6	.....	68.7	.....	79.6	. .	72.4	.....	60.8	.....	51.8	. .	33.5	.....	17.5	.....	46.7	.....
Sibley	19 6	* 6.9	16 8	-1.2	32.8	* 2.4	48.5	* 0.3	59 6	* 1 8	68 4	* 1.1	79.5	* 9 2	72 6	* 5.0	60 3	-1.9	51.8	* 3.6	33.6	* 5.8	16.1	-3.3	46.6	* 2.4
Sigourney	26.8	. .	19.0	.....	37.0	.....	52.3	....	62 7	.....	76 0	.....	85.4	.....	75.8	....	66.0	. .	55.8	....	38 2	.....	22.1	....	51.4	.....
Sioux Center	21 2	.....	18.3	.....	34.4	....	48.7	.....	60.0	.	69.8	. .	.....	.....	72 3	.....	61.0	.....	52 9	. .	34.7	.....	18.3	.....	.....	.....
Storm Lake	21.8	.....	17.4	....	32.2	.	48.3	....	59.0	.....	70.0	.....	81.5	.....	73 4	.....	61.4	.....	52 3	.....	34.4	.....	17 0	....	47.4	.....
Thurman	28.0	.	22.0	.....	36 2	....	50 8	....	61.0	.....	74.0	....	82 7	.....	74.2	....	64 0	.....	55.0	.....	37.4	.....	22.2	.....	50.6	.....
Toledo	21.2	* 2 8	17.0	-5.0	35.9	* 0.9	51 0	* 0.1	62.0	* 0.4	73.2	* 2.7	83.3	* 9 5	74.0	* 2.6	63.6	-1.0	54.8	* 5.7	36.2	* 3.2	21.3	-2.0	49.5	* 1.7

MONTHLY AND ANNUAL MEAN TEMPERATURE FOR 901, WITH DEPARTURES.

STATIONS.	Jan.		Feb.		March		April		May		June.		July.		August.		Sept.		Oct.		Nov.		Dec.		Annual.	
	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept.	Tem.	Dept	Tem.	Dept.	Tem.	Dept.
Vinton	24.4	* 7.2	15.8	-6.1	33.4	* 1.0	51.6	* 2 7	61.5	* 2.7	72 3	* 2.4	81.2	* 8 0	72.8	* 3 2	62 5	-0 7	53.4	* 4.2	34.2	* 1 4	19.6	-5 0	48.6	* 1.8
Villisca	25.7	* 4.9	20.6	-3.9	37.2	* 1 0	50.9	* 1.1	61.0	-0.4	74 0	* 3.0	10.6	* 6 6	73.2	* 2 2	65.2	0 0	.....	.....	37.7	* 3.5	24 0	0.0	....	....
Wapello	28.5	.....	19 1	.....	36 9	.....	52 0	.....	63.3	.....	75 8	...	85.6	.	75 9	.....	64 9	.....	55 6	.	38.7	....	24.5	.	51.7	.....
Washington	24.4	* 2.9	17.5	-8.1	36.2	* 1.0	50 4	* 1 9	60.7	-0.3	73 2	-0.5	82 0	* 6 4	73 3	* 0 2	64.2	-2 5	54 6	* 2 3	34.9	-0.7	...	.....	...	...
Waterloo	22.0	* 5.3	15.9	-6.0	33.1	* 0 2	49 6	-0 7	60.8	-2.7	71.8	-1 0	81 8	* 4.0	73 0	-1.4	62.8	-3 2	53.7	* 7.1	34.3	-2.3	19.0	-4.3	48 2	-0.8
Waverly	21.8	...	15.1	.....	32.8	....	50.0	.....	60.6	.	71.0	.	81 6	.....	73.2	.....	62.8	.....	53 8	....	33.5	.	19.6	.....	48.0	.....
Wilton Junction	25 1	....	15.4		35.6	....	50.0	.....	60.9	....	73.9	.	82.2	.	73 4	.....	63 6	....	53.7	....	35.8	.....	22.5	.....	49 3	.....
Winterset	26.2	* 6.4	19.3	-4.3	34.8	* 0 6	50 4	* 1 0	62.8	* 2.4	73.8	* 3 4	83 8	*10.4	75 4	* 4.0	66 2	* 0 3	57.0	* 5 4	37.8	* 4.1	...	.....	.....	.....
West Bend	19.8	* 4 2	16.2	-3 5	30.4	* 0.5	47.7	* 1.5	59,1	* 0 7	70.0	* 1.8	81.4	* 9 2	71 8	* 2 6	60.8	-0 7	51.7	* 6.1	33.4	* 5.7	17.6	-0.3	46.7	* 2.9

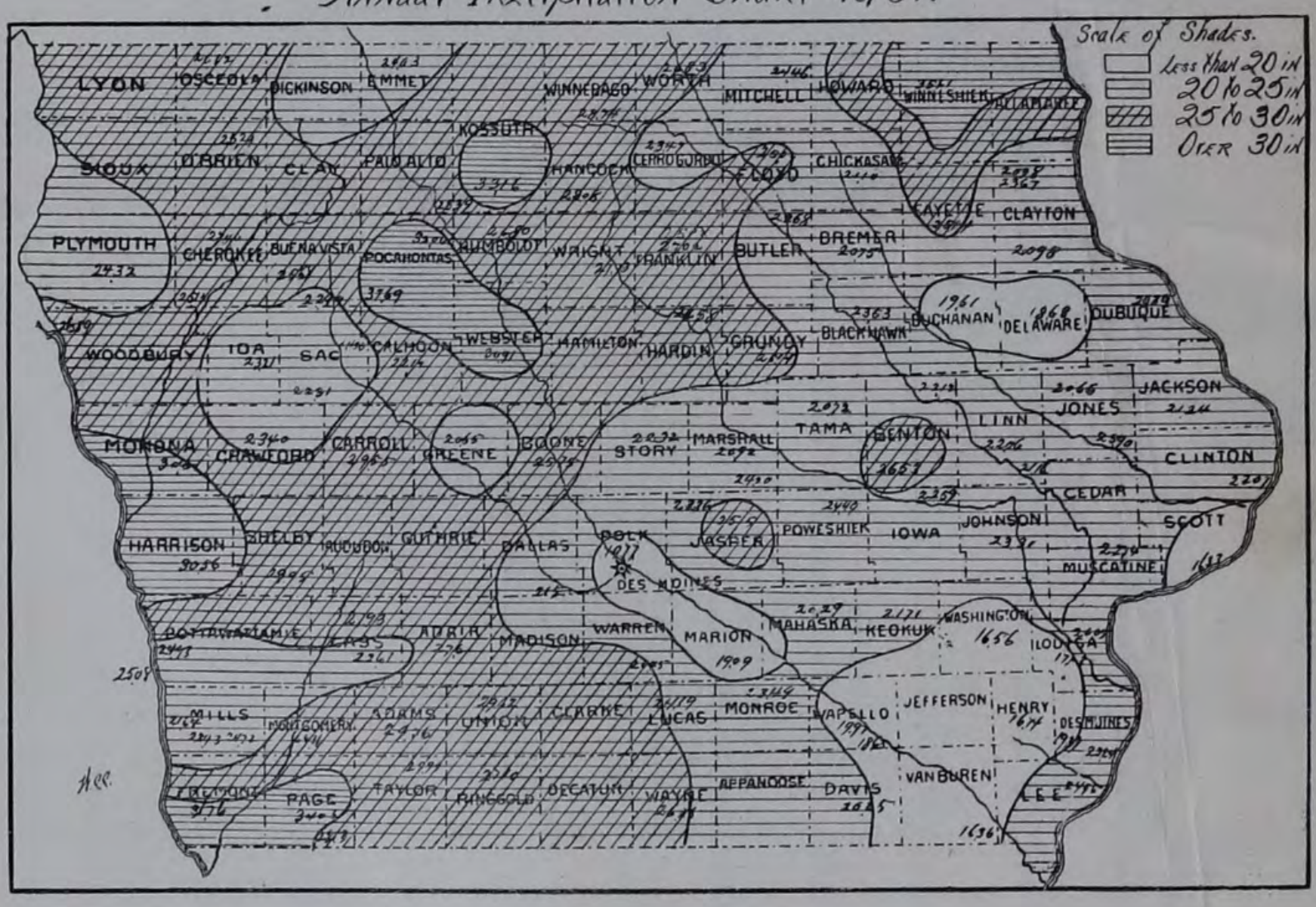
MONTHLY AND ANNUAL PRECIPITATION FOR 1901, WITH DEPARTURES FROM NORMAL.

STATIONS.	Jan.		Feb.		March		April		May		June		July		August		Sept.		Oct.		Nov.		Dec.		Annual	
	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.
Afton	.76		1.10		3.19		3.21		2 90		5 05		4.42		.44		3.56		2.82		1.17		1.00		29 62	
Albia	60		2.35		2.74		2 65		1.46		2.47		2 75		1.25		2 36		1 26		2 02		1.58		23 49	
Algona	55	- 06	.80	- .07	2.21	* .58	2.02	-1 92	2.93	- 67	3 82	* .24	4 80	*2.57	3.61	* .77	9.40	*7.58	1.07	- .69	.17	* .13	78	- .51	33 16	* 7.95
Alta	.42	- .31	.49	- .27	2.31	* .45	1 61	-2 43	1.86	-2.36	3.20	-2 16	1.55	-2 05	3 70	- .06	6.53	*4.52	1.87	- .44	1.22	* .22	89	- .09	25.68	- 4.98
Alta (near)	.25		....		1.42		1.58		1.80		3 51		2.25		2 55		7.31		1 84		1.17		85		.....	
Amana	1 50	- 04	1 69	* .42	3.48	*1 50	1 69	- .25	1 83	-2.37	4 36	- 11	1 35	-2.76	98	2.48	1.71	1.66	1.48	-1 19	.93	- .81	1.50	*.15	22 59	- 54
Ames	57	- 47	50	- .02	1 64	* .25	1 82	-1 03	3 69	- .15	2 36	-2 08	2.26	-2.19	1.21	2.19	3 65	- .06	2.98	* .64	.67	- .55	57	- .42	22 32	- 8.07
Atlantic	.78	* .01	1 70	* .79	3 02	*1.17	2.85	- .68	2 48	- .84	6.70	* .85	1 41	-2.13	1.13	-1.53	3.71	* .9	2 80	* .61	.72	- .02	60	- 7	27 93	- 2 56
Baxter	.82		1 18		4.11		1.74		2.07		4.53		2 15		.87		2.79		2 28		43		.38		23.35	
Belknap	1.23		2.00		2 73		1.73		.72		2 43		2.07		.33		2 40		93		.93		2.75		20 25	
Belle Plaine	.66	-1 07	1 90	* .78	5.02	*2 96	1.90	-1.60	4.57	* .53	3 04	- 52	1 68	-1.51	1.27	1.76	2.50	- 27	1 54	- .08	1 00	- 66	1.45	*.12	26.53	- 3.99
Bonaparte	1 05	- 96	1 17	* .15	2 50	- 38	1.34	-2 46	1.30	-2 75	2 26	2.02	9	-2 80	.31	-3.58	2.46	1.94	.9	- .66	.82	-1.10	1.30	-.42	16 35	- 8.92
Britt	.44		51		1.35		1.84		2 63		3 45		4 98		1 94		8.37		1.49		.81		.27		28 08	
Buckingham	1.25		1.20		2 59		1 89		3.00		2 99		1.59		1.06		2 23		1.32		.67		9		20 72	
Burlington	1.84		1.66		3.30		1.86		2.10		4.95		2. 5		36		2 26		1.08		.77		91		23.24	
Bussey	75		1 25		2 05		2.12		1.43		3.10		2.56		.95		1 60		1.33		.55		1.40		9 09	
Carroll	.50	- .73	.75	- .28	2 78	* .30	2 83	-1.04	2.20	-2 13	4.41	* .2	74	- 2 48	2 24	- .57	8.34	*6.15	3.12	* .47	1.14	* 06	.50	- .47	29 55	- 49
Cedar Rapids	1 05	- .55	1.84	* .17	2.74	* .48	1.17	-1.99	1.86	-2 62	3.86	* 04	2 74	-1 01	.42	-2.56	2.64	- .31	1.37	-1.20	.61	- 89	1.76	-.12	22 06	-10.41
Chariton	.95		1.13		2.95		2.02		1.28		5.18		4 25		6		2.03		1 70		.58		1.51		24.19	
Charles City	1.10	- .19	.79	- .55	2.65	*1 07	2.36	-1.02	2.30	-1 47	2.69	-2 20	2.65	- .11	2.08	- .17	5.21	*2.95	2.37	* .33	.50	- 84	.32	-1 10	25.02	- 3 32
Clarinda	.82	- .29	1.42	* .36	3.64	*1.93	3.33	* .09	2.10	-2 49	5 95	* 89	5.18	* .85	.65	-2.70	4 89	*2.76	4.03	*2 15	1 30	* .36	.75	- 42	34 05	* 3 49
Clear Lake	.50		.70		2.10		1.40		2.10		2.15		3.70		1.45		6.00		2 40		.65		32		23.47	
Clinton	1.35	- .83	1.40	- .30	3.86	*1 31	.80	-2 39	1.72	-2 42	3 17	-1 6	4.26	* .92	48	-1.51	2.52	- 47	.81	- .77	82	-1.17	.88	-.26	22.07	-10.29
College Springs	.69	* .11	.98	* .06	2.42	* .62	3.47	- .59	3.00	-1 55	4.88	* .50	5.57	* .23	74	1.95	3.18	* .81	1.35	-1.27	1.00	* .22	85	-.65	28 13	- 3.46
Columbus Junction	.92		1.23		3 00		1.69		1 95		1.05		1.82		1.75		2.54		1.34		80		1.96		20.05	
Corning	.50	- .32	1.40	* .57	2 80	*1.08	2 87	- .69	4.15	- .50	5 34	- .98	1.91	-2 12	.70	-2 43	3.34	*1.07	3.57	*1 84	1.50	* .62	1.18	* 19	29 26	* .29
Council Bluffs	.27		1.06		3.74		.82		2.51		4.75		2.11		88		5 35		1 88		.88		.68		24.93	
Cresco	.48	- .75	.77	- .16	2.78	*1.45	.99	-1 60	2.02	-1 55	1.52	-3.61	4.08	* .18	1.36	-1 53	6.40	*2.76	2.25	- 13	.50	- .95				
Cumberland	.40		1.50		1.55		2.22		2.33		5.14		1.39		71		2 87		2 46		1 24		.80		22 61	
Danville	.90		1.00		2 65		2.21		2 18		1.61		2 37		T		2.47		1.56		.72		1 72		19.39	
Davenport	1 10	- .60	1.59	- .02	2.57	* .31	88	-1 88	1.37	-2 96	3.02	-1.01	1.48	-2.07	.46	-3.03	2 29	- 77	.45	-1 96	79	-1.10	1.33	-.02	17.33	-15.38
Delaware	.74	- .48	.55	- .23	2.16	* .35	1.18	-1.88	1.70	-2.12	2 72	-1.56	1.52	-1 78	.62	2.26	3.77	* .41	2.17	- .11	.48	-1.28	1.07	-.45	18.68	-11.71
Des Moines	1 01	- .23	1 11	- .04	3.02	*1.43	2.26	- 75	1.40	-3.20	2 41	-2.58	1.72	-1 67	67	-2 63	2.63	- .39	2.14	- .68	.40	-1.14	1 03	- 33	19 77	-12.21
Decorah	.90	- .36	.83	* .06	2 82	*1.34	1.22	-2.10	3.88	* .68	2 99	-1.36	3 30	* .91	.02	- .36	7 28	*4 37			1.46	- .07	.30			
De Soto	.60		1 45		1.82		1.84		3.03		3.42		1.58		72		2 64		2.55		1.20		.95	-.96	21.80	
Denison	.35	- .27	.72	- .14	1.69	- .05	3 14	-2 03	1.34	-2.90	4.11	*1.16	.22	-3.52	.65	-2.35	7.45	*5.16	2 26	* .61	.61	- .39	.86	*.45	23 40	- 4.27
Dubuque	1.07	- .53	1.07	- .39	2 88	* .35	1.01	-2.00	3.10	-1 06	1.23	-3 46	2 31	-1 92	.25	-2.74	3 72	- .37	1.61	- 96	67	-1 21	1 44	-.24	20.39	-15.14
Dows	.89		1.00		3.31		2.09		2 42		2.28		2.17		2.22		6.52		3 co		.58		.55		27 03	
Eldon	.98		.6*		2.82		1 49		.99		3.15		1.24		.60		2 72		1.41		.75		1.78		8.61	
Elkader	.9	- .59	.85	- .25	2 62	* .84	.88	-2 08	2.34	-1 37	1 56	-2.33	2.95	-1 16	.82	2.03	4 04	* .13	2.53	- .21	87	- .85	.6	-1 62	20 98	-11.52
Emerson	.33		2.00		4.50		2 21		3.13		4.42		1.87		T		3.66		2 30		0		.30		24.72	
Estherville	29		1 00		1.15		1.49		2 38		3.22		1.41		4 28		6.14		.94		1 16		.57		24 03	
Fayette	1 10	- .34	.66	- .45	3.25	*1.15	1.46	-2.16	2.85	-1 13	3.69	-2 41	.62	-2 53	3.04	* .29	4.80	*1.97	2.32	- .43	65	-1.10	.70	-.75	25 14	- 7.89
Ft. Dodge	85		.40		1.50		2 88		3.75		2 95		4 82		1.33		7.13		4 20		90		.20		30.91	
Ft. Madison	1.30	- 70	1.04	- 90	3.75	* .98	2.51	- .71	3 11	-1 28	4 91	* .63	2.10	- .71	.05	-3.60	2 20	1.65	1 09	-1.66	.79	-1.40	1.42	-.61	24 36	-12.61
Fonda	.60		.49		3.56		2.81		2.85		4.16		4.38		1 02		13 62		2.34		1.22		.64		37 69	
Forest City	.90		.70		1.95		1.67		2 08		3 43		4.00		2.15		9 48		1 21		.57		60		28 74	
Galva	.22	- .22	.90	* .57	3 40	*2 13	1.40	-2 20	1.12	-2.43	2 35	-1 33	69	-2 73	1 45	-1 45	7.12	*5.16	1.91	* .77	2.00	* .83	.65	-.13	23 21	- .97
Gilman	.82		1 64		2.17		1.73		2 98		4 88		3.51		.86		2.64		2.09		.43		45		24 30	
Glenwood	.32	- .56	.70	- .10	1 75	* .38	1.83	- .70	2.31	-2 88	4.66	- 19	2 31	-1 43	.98	-2.39	3 43	*1 20	2 64	* .23	60	- .31	90	* 09	22 43	- 6 28
Grand Meadow	.94	- .49	.35	- .70	2.55	* .50	1.17	-2.41	2.85	-1.36	3.01	-2 23	1.56	-2 28	.99	-1.37	5.96	*3 07	2.95	* .41	.70	- 92	.64	*.09	23 67	- 8.53
Greene	.96		.51		2.24		1.66		1 58		2.22		2.84		2 17		4.79		3.18		32		21		22 68	
Greenfield	.41	- .68	1.05	- .12	2.32	- .08	2.86	- .74	3 28	-1.15	5 71	- 50	2.26	2 18	1 17	-1.42	3 53	* .50	2 74	* .53	1.39	* .39	.89	- 57	27 61	- 4 62
Grinnell (near)	1.01		1 24		3 20		1.79		3 55		4 72		1 46		1.27		2 53		1 81		1.07		.84		24 49	
Grundy Center	.75	0	1 10	* .40	3 17	*1.84	1.45	-2.55	2 84	-1.57	5.12	*1.10	2.13	-1.60	1 86	-1.13	2.97	* .11	2 03	- 67	89	- .11	.8	- 45	25.14	- 4 83
Hampton	1 01	- .22	98	- .19	3.38	*1.37	2.10	-2.03	2 06	-1 70	2 46	-2.51	2 89	- 44	1 84	-1.19	6.38	*3.51	2 88	* .21	.65	-1.14	.49	-.92	27 06	- 5.25
Harlan	.38		1.15		3.26		1.97		1.78		7.29		.76		.81		8 02		2 25		.67		.71		29 95	
Hopeville	.60		.84		2.76		2.33		3 22		4.85		1 79		.55		2 61		2 30		.88					
Humboldt	.09	- .40	.50	- .14	1.80	* .28	1.75	-2 28	3 64	- .04	3.69	* 08	2 47	- .67	1.74	-1 09	8 24	*6.14	1 91	* .15	.57	- .33	.40	-.20	26 80	- 1.50
Independence	.93	- .37	.90	- .14	1.62	- .12	1.55	- 89	2 00	-2 01	2 81	-1 99	2 07	-2.22	1 37	1 77	3.18	-1.11	2 38	* 0	.32	-1.09	.48	-.90	19 61	-12 60
Indianola	.89		1 57		2 47		2.36		1.58				1.43		.57		4 5		2 51		.39		2 25			
Iowa City	1.07	- .96	1.97	* .72	3 62	*1.23	2.36	- .82	1 54	-2 61	3 33	- .35	1.29	-2 84	.66	-1.69	2 56	- .14	1 78	- .21	.79	- .93	2.34	- 70	23 31	- 7 90
Iowa Falls	.82	- .09	1 30	* 47	2.13	* .87	1.80	-2 42	2.10	-1.58	5.24	*1.62	3.47	* .65	1.83	-1.09	4.26	*1 37	2.39	* .13	49	- .86	.65	- 45	26.58	- 1.38
Jefferson			1.41		3.45		2 18		1.44		4.37		1.07		1.01		6.12		2.74		1.41		.57			
Keokuk	1.41	- 45	.75	- .91	2.59	* .26	2 29	- .92	1.95	-2.42	6.34	*2 03	2.02	-2.31	.15	-2 78	2.14	-1.65	.93	-1 75	.80	-1 15	1 17	-.68	22 54	-12.25
Keosauqua			1 21	- 01	3.12	* .63	1.95	-2 57	1.43	-3.30	2.31	-1.63	2.79	-1.03	41	-2.94	2.94	-2 19	.97	- .50	1.22	- .07	1 81	*.33		
Knoxville	.55	- .84	90	.09	3 34	*2.07	.69	-3 41			4.92	*1.47	2 66	-1.19	.50	-3.40	2 43	- .92	1.17	-1.23	27	- 95	1.6-	*.33		
Lacona	1.15		1.60		3 85		2.35		2.05		5 45		3.35		.70		1.90		1.85		.70		1 50		26 45	
Larrabee	.22	- .42	.46	- 14	1.98	* .10	.85	-2.98	2 57	-1 30	3.78	-2 28	1.13	-2 81	1.90	-1 29	10.77	*8.80	1.75	- 40	1 25	- .30	76	-.38	27 42	2 90
Lenox	.23		.47		2.50		2.35		2.50		4 96		1.81		90		4 46		2 77		2.30		.74		25.99	
Le Mars	.08		.63		1 06		1.70		4.54		3.26		2 10		1 09		6.97		1.74		60		.55		24.32	
Logan	.70	- .49	.90	- .28	3.00	*1.13	1.44	-1.54	2.54	-1.85	7 97	*2.46	71	-4 15	77	-3.11	7 66	*4 60	2 83	* .46	.94	- .12	1.10	- 20	30 56	- 3 09
Maquoketa	1 15	- .56	1.25	- .53	3.03	* .59	1 04	-2.18	1 91	-2.04	3.11	-3 23	2.15	-1 04	76	-2 44	3.27	* .49	1.62	-1.34	.51	-1 05	1 54	- 10	21.34	-13.01
Marshalltown	1.05	- 21	1 17	* .45	3 71	*2.17	1 82	-1.81	2 89	-1 56	2.80	-1 11	2.79	-1.55	1 16	-1.46	2 62	* .49	2 27	- .29	.77	- .29	87	- .77	23.92	- 5 52
Monticello	1.36	- .25	.63	-1.08	3 38	* .99	1.24	-1 44	1.56	-2.31	3.56	- 90	.59	-3.55	.97	-2.69	3.29	- .56	1.97	- .78	84	-1 41	1.2	- .95	20 66	14.86
Mooar	1.32		1.02		2 56		1.42		2.18		5 00		1.96		.13		2 18		1 52							
Mt. Vernon	1.08		1.23		3.32		1.43		1.37		4.25		.61		.80		2.74		1 48		97		1.88		21 16	
Mt Ayr	.76	- .56	1.52	* .38	3.04	* .91	2.22	-1 54	2.90	-2.87	4 59	- .01	3.62	-1 21	75	-2 26	3 12	* .35	2.36	* .45	1 28	* .02	1 24	- 05	27 40	- 6.39
Mt. Pleasant	.80		.48		2.33		1 98		1.37		2.01		2.91		.48		2.64		79		.72		23		16 74	
New Hampton	1.05		.80		1.65		1.13		1.74		2.70		1 82		1.68		4.98		2 82		.68		.05		21.10	
Newton	1.00	* .08	1 80	* .83	3 47	*2.12	1.94	-1.56	2.24	-2.26	3.58	- .48	2.89	- .30	1.30	-2 25	2.98	- 32	1.80	- .76	.83	-1.04	1.32	*.05	25.15	- 5 89
Northwood	75		.70		2.25		1.57		4 09		2.46		1.18		1.83		9.37		1.35		.88		54		22.31	
Odebolt	.18		.53		2 93		.91		1.53		3.72		.30		1.29		7.93		.57		.87		1 30		25.95	
Ogden	.55		.60		1 61		1.57		2.72		2.76		2.41		1 38		6 87		3.31				1.82		23 90	
Olin	2.34		1.34		3.41		1.20		1.69		5.09				.64		2.85		1 44		1 00					
Omaha	.31	- .32	.66	- .08	2 07	* .60	.89	-2.24	2.13	-2 23	5.31	* .01	2 98	-1.57	65	-2.69	6 83	*3.86	1 96	- .63	.56	- .45	.73	-.19	25 08	- 6.62
Onawa	.29		87		2 86		1.27		2 95		5.67		.92		2 24		8.29		2.19		1.45		1.07		30.07	
Ovid	1.86	- .15	1 58	* .23	2.75	* .56	2 00	-1 64	1.54	-1 88	5.01	*1.18	3.08	- .45	.91	-2 95	2.23	-1 51	2 73	* .39	.87	- 49	1.79	* 21	26 35	- 6.50
Osage	1.22	* .30	.95	- 22	2.50	*1.05	1.87	-1 03	2 18	-1.91	1.58	-2 64	2 53	- .93	1.80	- .94	5.70	*2 32	2 79	* 22	.94	- .54	.40	- .91	24 46	- 5.17
Oskaloosa	.83	- .13	1.38	* .31	2 84	* .86	1.47	-1 27	2 08	-1.63	3.60	- .40	1.64	-2.08	.81	-1.92	2 29	- 62	1 30	- .9	.35	-1.31	1.70	* 55	20 29	- 8 62
Ottumwa	.40	-2 10	1.69	* .56	3.40	*1.00	1.29	-2 59	.95	-3 92	2.04	-1.36	1.98	-2.27	1.36	-1 99	4 15	* 79	1.35	-1.18	.68	- .95	68	-1.11	19.97	-14.82
Pacific Junction	.33		.44		2.70		.93		2.47		3.75		2.68		1.26		2 62		2.99		.80		.67		21.64	
Perry	T		1.20		1.60		1.45		.90		2.63		1.10		1 49		4 45				1 00		.95			
Plover	.50		.35		2 75		1 22		1.36		3.67		2.27		2 93		13 55		2 co		1 22		27		32 06	
Red Oak	.40		.80		5.25		2.88		3.29		4 33		2.80		1.07		3.79		2.30		74		.71		28.36	
Ridgeway	1.97		1 67		4.28		1.19		3.22		2 71		5 97		1.51		7 06		3.38		1.50		1.15		35 61	
Rockwell City	.80		.70		2.85		1.75		2.53		5.47		1.45		.55		7.06		1 95		.73		.28		26 12	
Sac City	.10	-1 01	.51	- .55	2.31	* .70	2.01	-1 36	2.17	-2 01	2.05	-3.04	.35	-3 38	1 21	-2 11	10.15	*7 06	1 70	- 58	1.11	- .05	.68	- .56	24 35	- 6.89
St. Charles	.75				3 72		2.78		2.45		4.36		2 42		.33		2.85		2 78		55		1 31			
Scranton	.38		.30		1.17		1.62		2.27		4.03		1.12		1.84		4.66		2.34		.82		.10		20.65	
Sioux City	.22	- .34	.54	- .02	1.58	* 36	1.50	-1.47	3.65	- .06	4.70	* 74	1.24	-2.03	1 75	-4.01	7.99	*5.78	2.23	* 53	.56	- .26	63	-.22	26.59	* 1.82

MONTHLY AND ANNUAL PRECIPITATION FOR 190', WITH DEPARTURES FROM NORMAL.

STATIONS.	Jan		Feb.		Ma·ch		April		May		June		July		August		Sept.		Oct.		Nov.		Dec.		Annual	
	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.	Prec.	Dept.
Sheldon	.20	.....	.63	.....	1.39	.....	1 56	.	4.09	.....	4 93	.	1.82	.....	1.73	.....	6.04	....	1.22	.	.83		.83		25.27	.....
Sibley	.15	- .65	.64	* .26	1.35	* 18	1 78	-1.70	3.72	* .36	4.79	* .84	2.85	- .16	2.58	* 55	6 37	*3.98	1 04	- 86	.70	- .33	.65	- .05	26 62	* 2.42
Sigourney	1.32	.....	1 91	.....	3.41	....	1.58	....	2.24	.....	2 39	.....	1.37	....	.48		2 02	....	2 29	....	.81	.....	1.89	....	21.71	...
Sioux Center	.27	.	.75	.....	1.41	.....	2.07		4 31	.	5.40	.....	.....	.....	4 46	....	6.03		1.26	.....	.73	.....	.70	....	....	.....
Spirit Lake	.60	.	.25	....	.50	...	....	.....	2.66	....	4.28	.....	89	.	2.46		8.02	.....	....	....			.65	...	.....	.....
Storm Lake	.39	- .42	.53	* .15	1.82	* .45	1 41	-1.08	1.55	-1.92	2.87	-1.65	1.67	-2 12	2.15	- .51	6.92	*4 26	1.88	* .4	1.18	* .39	62	- .30	22 99	- 2.62
Thurman	.54	.....	1.35	.	2 81	....	2 62	...	4.06	.....	4 81	....	2 11	.	1.50		5.25	.....	4 23		1 60	.	.88		31.76	
Toledo	1.00	00	1 30	* .66	3.97	*2.64	2 12	-1.30	2.87	- .27	4 04	*1.56	2.56	- .52	1 58	- .98	3 15	* .04	2.01	- .02	.7	- .55		....	.	.....
Vinton	.95	- 42	1.50	* .54	2.65	* .96	1 74	-1.41	2.42	-1 30	3 20	- .34	4.04	*1.45	.76	-1.45	2.95	* .23	1.31	-1.18	35	- .84	.2	- .98	22.12	- 4.74
Villisca	.82	* .10	1 15	* .30	4 35	*2.21	2.91	-1.03	2.10	-1 78	5.70	* .81	4.04	- .51	69	-3.73	5.19	*2.80	....	...	.50	- .62	1.15	1.15	....	..
Wapello	1.11	.....	.83	....	2 40	....	1.52	.....	2.58	.....	1 46	.	1.50	.....	.18	.	2 44		.56	...	1 10	....	1 35	.	17.03	
Washington	1.04	- .78	1 8	* .80	1.67	* 58	1.66	-1.05	2 06	-1.47	1.61	-1.51	97	-2 87	24	-2.32	1 74	- .88	1.32	- 33	.77	- .69	1.68	-1 46	16.56	-11.22
Washta	.45	....	.90	.....	2 18	.	1.28		2 86		2.82	.	2.55	....	2 04	.....	6.58		1.72	....	.93	.	.80		25.13	.....
Waterloo	1 07	- .13	1 06	- 05	2.95	*1.57	1.56	- .92	1.79	-1.81	3.48	- .12	3.04	- .94	1.40	-2.19	3.57	- .67	2 18	- .10	.84	- 59	.59	- 64	23 53	- 6.59
Waverly	.84	....	.97	....	3.51	...	1.47	.....	2.38	....	1.87	.....	1.66	.	1.80	.	4.78	....	3.41	.....	.48	.....	.58	....	23.75	.....
Wilton Junction	.78	....	2.06	...	3 21	....	1.56	.....	1 63	.....	2.04	.	3 60		.67	.....	2.56		1 18	.....	91	.	2.14	....	22 34	.....
Winterset	.80	- .31	1.20	* .31	4 13	*2 30	3.13	-1.30	2.13	-2.43	4.83	- .34	4.27	-1.04	.86	-2.21	2 84	- 29	2.95	*1.01	1.11	- .07		....		.....
West Bend	.50	- .26	.43	- 49	2.49	* .79	1.61	-1 81	2 17	- .67	3.07	- .79	3.66	* .70	2.20	- .39	9 77	*7 61	1 14	- 24	75	- .81	.60	- .28	28.39	- 3.39
Woodburn	.65	.	1 03	.....		...	1 85	.....	2.67	.....	4.44	...	3.85	.	53	....	2.59	.	1 51	.	.85	....	1 30		...	.....

Annual Precipitation Chart 1901.



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