

# CLIMATOLOGICAL DATA.

IOWA SECTION  
In cooperation with  
IOWA WEATHER AND CROP SERVICE  
CHARLES D. REED, Meteorologist

Vol. XXXII Des Moines, Iowa, January, 1921 No. 1

## GENERAL SUMMARY.

The chief characteristic of January, 1921, was the unusually high mean temperature, which was 28.4°, the highest mean since State-wide records began in 1890. This is 10.4° higher than the normal and 0.6° higher than the previous high mean which occurred in 1914. The excess was quite uniform over the State and ranged from slightly more than 12° over portions of the northern division to less than 9° at points in a few of the southern counties. A cold wave occurred over the northern and extreme western portion of the State on the 12th and another, that covered practically the entire State, on the 17th; before and after these dates the temperature was continuously above normal and for the entire State there were less than six days with the temperature below normal.

The precipitation was less than half the normal amount for January, the amounts being less over the northern and western portions and increasing to the southern section. Only four stations in the State showed an excess of precipitation and at Keokuk this is the first time since April, 1920, that there has been an excess in precipitation.

The snowfall was below normal and only two storms of consequence occurred. The principal storm, on the 13th-14th, was accompanied by very little wind, and the snow cover remained on the ground over most of the State the rest of the month; the next storm of importance occurred on the 25th. For the State the ground was snow covered for less than 15 days; over the northwestern and north-central districts the snow remained on the ground more than 20 days; but along the Mississippi River, stretches along the Missouri River and some of the southern counties the snow cover was on the ground for less than 10 days.

The weather was favorable for the usual farm activities and stock were able to remain in the open most of the month and were generally in good condition. Very little ice had been harvested at the close of the month and the quality was not good.

F. L. D.

## PRESSURE.

The mean pressure (reduced to sea level) for the State was 30.15 inches. The highest recorded was 30.91 inches, at Keokuk, on the 17th and the lowest was 29.48 inches, at Sioux City, on the 3d. The monthly range was 1.43 inches.

## TEMPERATURE.

The mean temperature for the State, as shown by the records of 100 stations, was 28.4°, or 10.5° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 25.6, or 11.0° higher than the normal; Central, 28.9° or 10.7° higher than the normal; Southern, 30.6°, or 9.7° higher than the normal. The highest monthly mean was 33.9° at Keokuk, and the lowest monthly mean was 23.1°, at Mason City. The highest temperature reported was 67°, at Albia on the 20th, and the lowest was -9° at Inwood on the 12th, and Mason City on the 17th. The temperature range for the State was 76°.

## HUMIDITY.

The average relative humidity for the State at 7 a. m. was 83 per cent and at 7 p. m. was 74 per cent. The mean for the month was 78 per cent, which is 4 per cent below normal. The highest mean was 87 per cent, at Charles City, and the lowest, 70 per cent at Keokuk.

## PRECIPITATION.

The average precipitation for the State, as shown by the records of 104 stations, was 0.51 inch, or 0.54 inch less than the normal. By divisions the averages were as follows: Northern, 0.42 inch, or 0.42 inch less than the normal; Central, 0.40 inch, or 0.71 inch less than the normal; Southern, 0.72 inch, or 0.47 inch less than the normal. The greatest amount, 1.92 inches, occurred at Keokuk, and the least, 0.10 inch at Storm Lake. The greatest amount in any 24 consecutive hours, 0.80 inch, occurred at Keokuk, on the 21st-22d.

## SNOWFALL.

The average snowfall for the State was 4.1 inches, or 2.8 inches below the normal. The greatest amount, 9.5 inches, occurred at Lamoni, and the least, 0.4 inch at Storm Lake.

## WIND.

The prevailing direction of the wind was from the northwest. The highest velocity reported from a regular Weather Bureau Station was at the rate of 53 miles per hour, from the northwest, at Sioux City on the 16th.

## SUNSHINE AND CLOUDINESS.

The average per cent of the possible amount of sunshine was 44, or 6 per cent less than the normal. The per cent of the possible amount at the several Weather Bureau Stations was as follows: Charles City, 24; Davenport, 50; Des Moines, 53; Dubuque, 43; Keokuk, 55; Sioux City, 38; Omaha, Neb. 44.

## COMPARATIVE DATA FOR THE STATE—JANUARY

YEAR	Temperature				Precipitation				Number of Days.					
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With precipitation .01 in.	Clear	Partly cloudy	Cloudy	
1890.....	19.7	+1.8	61	-27	2.03	+0.98	3.46	0.35	.....	.....	.....	.....	.....	
1891.....	26.0	+8.1	58	-4	1.75	+0.70	3.99	0.61	.....	.....	4	13	7	11
1892.....	15.3	-2.6	76	-38	1.09	+0.04	3.13	0.10	6.9	5	16	9	6	
1893.....	9.3	-8.6	54	-34	0.74	-0.31	3.20	0.13	6.9	6	11	9	11	
1894.....	19.3	+1.4	69	-37	1.09	+0.04	2.24	0.31	6.0	5	14	9	8	
1895.....	13.6	-4.3	68	-31	0.85	-0.20	2.65	0.09	8.7	4	15	7	9	
1896.....	23.4	+5.5	68	-20	0.48	-0.57	2.10	T	2.8	3	10	10	11	
1897.....	17.2	-0.7	66	-30	2.01	+0.96	6.16	0.15	8.2	7	12	7	12	
1898.....	23.4	+5.5	52	-11	1.60	+0.55	5.32	T	12.6	5	15	6	10	
1899.....	19.8	+1.9	68	-34	0.28	-0.77	1.15	T	1.5	3	15	10	6	
1900.....	25.6	+7.7	66	-20	0.53	-0.52	2.47	T	2.3	3	16	7	8	
1901.....	23.7	+5.8	60	-21	0.74	-0.31	2.34	0.04	6.2	4	14	9	8	
1902.....	22.4	+4.5	63	-31	0.88	-0.17	2.83	0.19	9.4	4	17	8	6	
1903.....	23.0	+5.1	60	-12	0.28	-0.77	1.46	T	2.0	4	13	7	11	
1904.....	14.0	-3.9	57	-32	1.18	+0.13	3.68	0.02	6.1	6	12	8	11	
1905.....	11.2	-6.7	56	-30	0.91	-0.14	1.82	0.12	11.1	7	14	7	10	
1906.....	24.6	+6.7	69	-19	1.52	+0.47	4.71	0.28	11.3	5	14	6	11	
1907.....	18.8	+0.9	68	-22	1.52	-0.47	5.30	0.10	6.0	7	8	7	16	
1908.....	24.9	+7.0	60	-18	0.44	-0.61	1.50	0.06	4.6	2	17	8	6	
1909.....	21.2	+3.3	72	-25	1.66	+0.61	3.74	0.41	7.8	6	9	6	16	
1910.....	18.1	+0.2	56	-35	1.57	+0.52	3.15	0.55	12.6	6	13	7	11	
1911.....	20.2	+2.3	66	-35	0.97	-0.08	3.73	0.11	7.3	5	9	8	14	
1912.....	4.2	-13.7	49	-47	0.53	-0.52	1.90	T	5.5	5	14	7	10	
1913.....	20.9	+3.0	62	-25	0.77	-0.28	2.05	0.04	7.2	5	14	9	8	
1914.....	27.8	+9.9	64	-10	0.88	-0.17	2.34	0.27	5.1	5	11	8	12	
1915.....	17.5	-0.4	59	-32	1.63	+0.58	3.15	0.10	7.3	8	13	8	10	
1916.....	17.8	-0.1	63	-34	2.62	+1.57	6.07	0.85	7.2	10	12	6	13	
1917.....	17.0	-0.9	60	-28	0.83	-0.22	2.07	0.17	7.2	4	17	8	6	
1918.....	8.6	-9.3	53	-35	1.02	-0.03	2.79	0.26	11.2	7	13	8	10	
1919.....	26.8	+8.9	64	-32	2.24	-0.81	0.86	T	2.8	2	20	5	6	
1920.....	16.7	-1.2	58	-26	0.42	-0.63	1.05	T	4.6	4	12	8	11	
1921.....	28.4	+10.5	67	-9	0.51	-0.54	1.92	0.10	4.1	4	11	7	13	

T indicates an amount too small to measure, or less than .005 inch precipitation and less than .05 inch snowfall.





CLIMATOLOGICAL DATA FOR JANUARY, 1921.—Continued.

Table with columns: STATIONS, COUNTIES, Elevation—feet, Length of record, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Total snowfall), Number of Days (Precipitation 0.1 in. or more, Clear, Partly cloudy, Cloudy), Prevailing direction of wind, OBSERVERS.

The departure from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete records are used in determining means. Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example, b represents two days, etc. † Also other dates. ‡ Received too late to be included in means and summaries. T. Precipitation is less than 0.01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE.

Table with columns: Stations, Barometric Pressure (Mean, Hightest, Date, Lowest, Date), Relative Humidity (Mean, 7 A. M., Noon †, 7 P. M., Lowest, Date), WIND (Total movement, Average hourly velocity, Maximum Miles, From, Date), Sun-shine (Per ct. of possible, Departure from normal).

§Sioux City    §Dubuque    †Local mean time.    ‡And other dates.

MISCELLANEOUS PHENOMENA.

Aurora: 4th.
Fog, dense: 1st, 5th, 19th, 20th, 21st, 22d, 28th, 29th.
Halos: 10th, 17th, 19th, 20th, 23d, 27th, 28th.
Hail: 25th.
Meteor: 8th.
Rainbow: 4th.
Sleet: 19th, 24th, 25th, 27th, 29th, 30th.

DAILY PRECIPITATION FOR JANUARY, 1921.

Table with columns for Stations, Watersheds, Day of Month (1-31), and Total. It lists precipitation data for various Iowa locations such as Algona, Allison, Alta, Alton, Belmont, Britt, Charles City, Decorah, Elkader, Estherville, Fayette, Forest City, Humboldt, Inwood, Lansing, Le Mars, Mason City, Milford, New Hampton, Nora Springs, Northwood, Pocahontas, Postville, Rock Rapids, Sanborn, Sioux Center, Spencer, Storm Lake, Wacha, Waverly, West Bend, Ames, Audubon, Baxter, Belle Plaine, Boone, Carroll, Cedar Rapids, Clinton, Davenport, Delaware, Denison, Des Moines, Dubuque, Fort Dodge, Grinnell, Grundy Center, Guthrie Center, Harlan, Independence, Iowa City, Iowa Falls, Jefferson, Le Claire, Little Sioux, Logan, Maquoketa, Marshalltown, Monroe, Muscatine, Olin, Onawa, Perry, Rockwell City, Sac City, Sioux City, Tipton, Toledo, Van Meter, Waterloo, Wauke, Webster City, and Williamsburg.

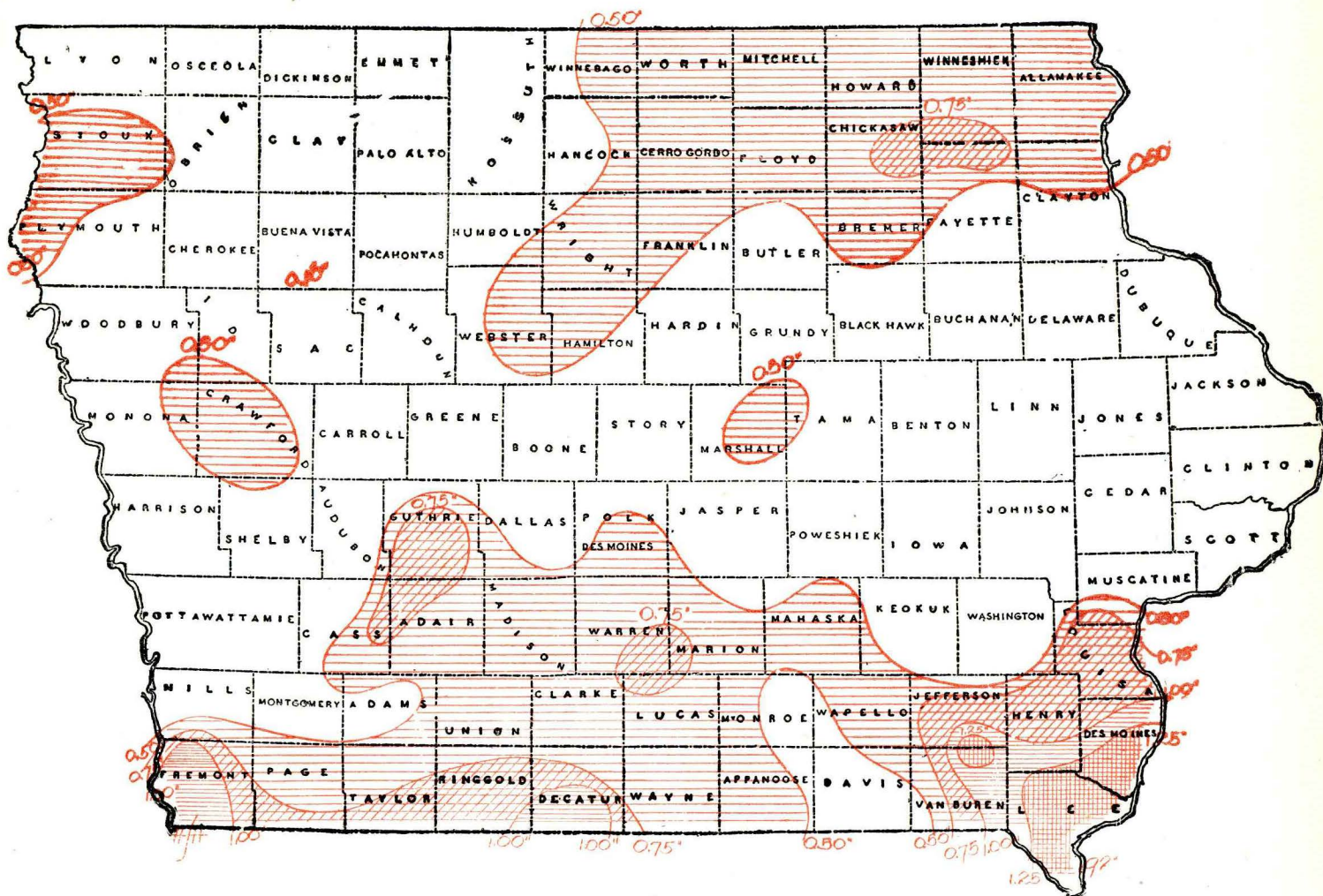


Daily Maximum and Minimum Temperatures for the Month of January, 1921.

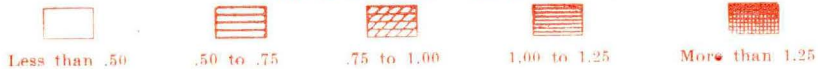
Table with columns for Stations, days 1-31, and Mean. Rows are categorized into Northern Division (Albion to Postville) and Southern Division (Albia to Omaha, Nebr.). Each station entry includes maximum and minimum temperature values for each day.

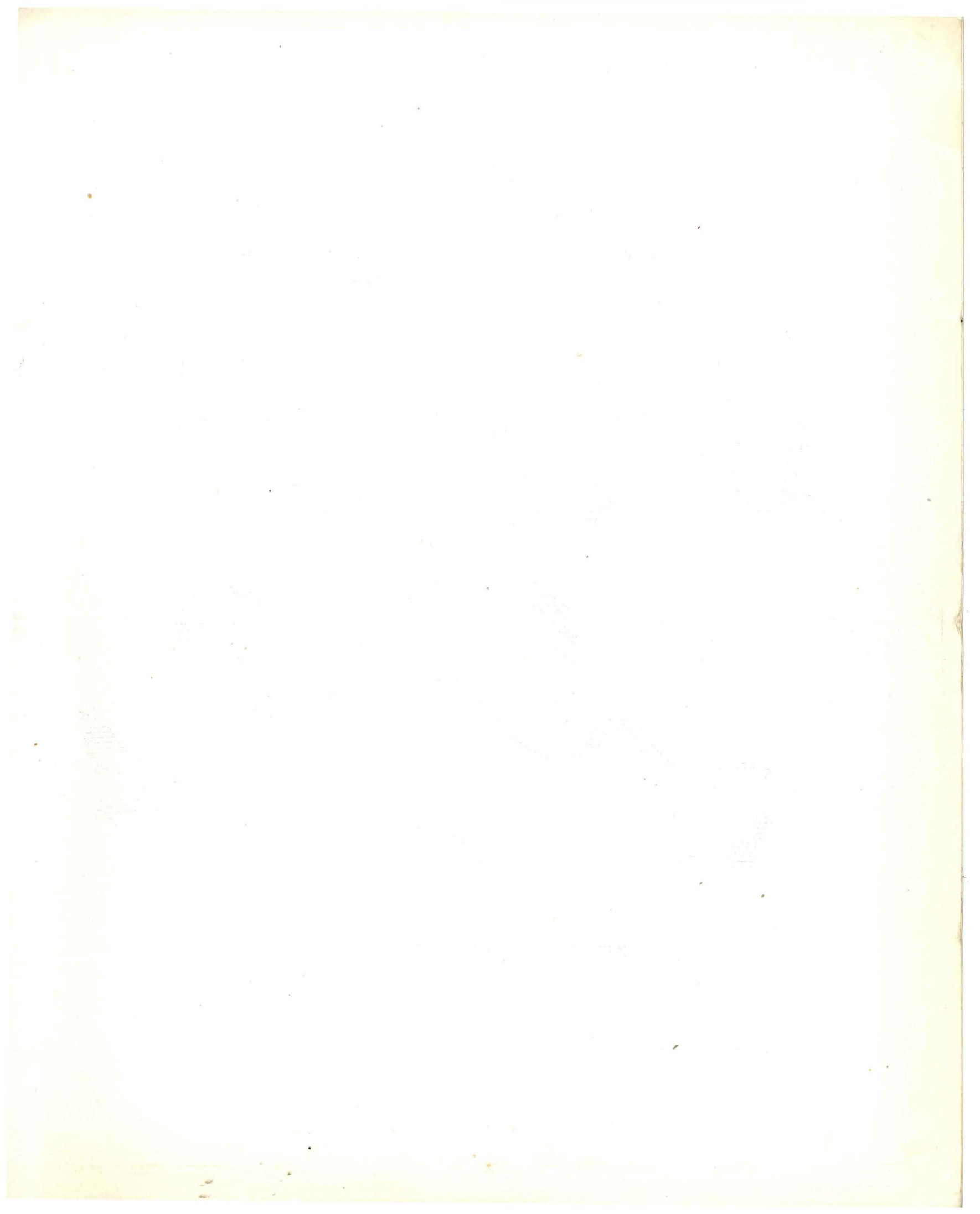
a, b, c, etc., indicate respectively 1, 2, 3, etc., days missing from record.

TOTAL PRECIPITATION, JANUARY, 1921.



SCALE OF SHADES — IN INCHES







# CLIMATOLOGICAL DATA.

## IOWA SECTION

In cooperation with  
IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

Vol. XXXII Des Moines, Iowa, February, 1921 No. 2

### GENERAL SUMMARY.

February is the 6th consecutive month that the mean temperature for the State has been above normal, and a number of new records were established. The mean temperature exceeded the former high figure by nearly two degrees, the maximum for the State has been exceeded but once since 1890, and at a large number of stations in all sections of the State the maximum broke all February records, and some records cover a period of 50 years. The minimum temperature for the State, -5°, is the highest minimum of record, and over a large portion of the State the minimum did not fall below 10°. Another unusual feature was the entire absence of cold periods, at no place was there more than two consecutive days with the temperature below normal, and for the State the average number of days with the temperature below normal was three.

The precipitation was deficient over all divisions of the State, though there were areas in each division that had amounts more than normal, principally in the northern division. Most of the precipitation occurred in the form of snow, in the period, 5th to 11th, though at a number of stations in the central and southern divisions the greatest precipitation occurred on the 22d. The ground was snow covered from a single day at several stations in the southeastern portion to 15 days at Belmond. Over most of the southern division the snow cover was on the ground less than 4 days, over most of the central division less than 9 days and over most of the northern division less than 14 days. The snow was accompanied by very little wind and no drifting occurred that interfered with any kind of traffic. A wind storm occurred from the 15th to 17th that affected the entire State. The principal damage reported occurred at Davenport. On the evening of the 16th a large hangar at the Wallace Aviation Field was completely demolished and several airplanes badly damaged, causing an estimated loss of \$10,000.

The weather was unusually favorable for farm activities and at the end of the month considerable plowing had been done and at a few points in the southern division some spring wheat had been sown. Stock was reported in good condition and considering the lack of snow covering winter grains and grasses suffered only slight injury. Country roads were in better condition than usual for the season and except for brief periods, were passable at all times. The ice harvest was light and at Keokuk this is the second time in 50 years that no ice was cut in the Mississippi River.

F. L. D.

### PRESSURE.

The mean pressure (reduced to sea level) for the State was 30.06 inches. The highest recorded was 30.79 inches, at Sioux City, on the 19th, and the lowest was 29.23 inches, at Sioux City, on the 15th. The monthly range was 1.56 inches.

### TEMPERATURE.

The mean temperature for the State, as shown by the records of 99 stations, was 31.0°, or 10.5° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 27.5° or 10.4°

higher than the normal; Central, 31.1°, or 10.4°, higher than the normal; Southern, 34.3°, or 10.7° higher than the normal. The highest monthly mean was 36.7°, at Keokuk, and the lowest monthly mean was 25.6°, at Northwood. The highest temperature reported was 76°, at Pella on the 15th, and the lowest was -5°, at Washta, on the 7th. The temperature range for the State was 81°.

### HUMIDITY.

The average relative humidity for the State at 7 a.m. was 82 per cent, and at 7 p. m. it was 68 per cent. The mean for the month was 75 per cent, or 5 per cent lower than the normal. The highest monthly mean was 84 per cent, at Charles City, and the lowest was 68 per cent, at Keokuk.

### PRECIPITATION.

The average precipitation for the State, as shown by the records of 103 stations, was 0.77 inch, or 0.38 inch less than the normal. By divisions the averages were as follows: Northern, 0.89 inch, or 0.02 inch less than the normal; Central, 0.85 inch, or 0.35 inch less than the normal; Southern, 0.58 inch, or 0.77 inch less than the normal. The greatest amount, 2.00 inches, occurred at Belmond, and the least, a trace, at Olin. The greatest amount in any 24 consecutive hours, 0.98 inch, occurred at Audubon, on the 6th.

### SNOWFALL.

The average snowfall for the State was 6.5 inches, or about 0.9 inch less than the normal. The greatest amount, 18.1 inches, occurred at Belmond, and the least, a trace, at Afton, Corning and Olin.

### WIND.

The prevailing direction of the wind was from the southwest. The highest velocity reported from a regular Weather Bureau Station was 52 miles per hour from the northwest, at Sioux City, on the 15th.

COMPARATIVE DATA FOR THE STATE—FEBRUARY.

YEAR	Temperature				Precipitation			Number of Days.					
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With precipitation .01 in.	Clear	Partly cloudy	Cloudy
1890.....	26.0	+5.5	67	-24	0.83	-0.32	2.18	0.11					
1891.....	19.4	-1.1	70	-31	1.16	+0.01	2.41	0.55					
1892.....	28.1	+7.6	68	-20	1.20	-0.05	2.18	0.12	5.0	6	6	7	16
1893.....	16.4	-4.1	60	-28	1.39	+0.24	2.91	0.06	8.1	3	10	8	10
1894.....	19.7	-0.8	60	-19	0.89	-0.26	2.41	T.	8.4	3	16	8	4
1895.....	16.4	-4.1	73	-33	0.49	-0.66	1.34	0.02	3.3	4	13	9	6
1896.....	27.4	+6.9	73	-13	0.71	-0.44	2.40	0.04	5.4	4	12	9	8
1897.....	24.7	+4.2	61	-24	0.89	-0.26	1.81	0.22	8.0	4	6	10	12
1898.....	24.2	+3.7	62	-18	1.20	+0.05	3.65	0.10	7.8	5	10	9	9
1899.....	12.2	-8.3	75	-40	0.89	-0.26	4.32	0.12	7.1	5	11	10	7
1900.....	14.8	-5.7	60	-27	1.30	+0.15	4.57	0.18	9.9	6	10	8	10
1901.....	17.5	-3.0	49	-21	1.01	-0.14	3.00	0.12	9.7	4	15	7	6
1902.....	17.6	-2.9	62	-21	0.73	-0.42	2.39	0.02	2.6	4	13	8	7
1903.....	19.8	-0.7	56	-21	1.18	+0.03	3.25	0.30	7.9	4	13	7	8
1904.....	14.8	-5.7	70	-26	0.41	-0.74	1.99	T.	4.5	4	10	9	10
1905.....	12.8	-7.7	69	-41	1.57	+0.42	2.97	0.44	15.5	7	14	6	8
1906.....	23.6	+3.1	66	-32	1.29	+0.14	2.91	0.20	6.1	5	14	7	7
1907.....	25.0	+4.5	65	-31	0.71	-0.44	1.95	0.06	4.6	4	14	6	8
1908.....	24.3	+3.8	59	-16	1.69	+0.54	3.95	0.23	8.9	6	12	6	11
1909.....	26.2	+5.7	62	-26	1.54	+0.39	4.72	0.30	7.7	5	11	6	11
1910.....	17.8	-2.7	58	-21	0.46	-0.69	2.09	T.	4.0	3	14	8	6
1911.....	27.3	+6.8	71	-13	2.76	+1.61	5.46	0.50	7.0	6	12	6	10
1912.....	18.1	-2.4	57	-30	1.21	+0.06	3.25	0.04	11.2	5	10	9	10
1913.....	20.2	-0.3	70	-24	0.82	-0.33	2.39	0.07	7.3	4	14	7	7
1914.....	16.8	-3.7	59	-29	0.87	-0.28	1.99	0.32	9.2	6	10	9	9
1915.....	29.1	+8.6	62	-8	2.93	+1.78	5.39	0.43	9.4	9	9	5	14
1916.....	19.0	-1.5	62	-32	0.55	-0.60	1.38	0.05	6.0	4	14	8	7
1917.....	15.2	-5.3	68	-37	0.36	-0.79	1.19	T.	3.5	3	14	8	6
1918.....	23.0	+2.5	70	-36	0.95	-0.20	2.10	0.09	6.0	5	14	7	7
1919.....	24.9	+4.4	65	-16	2.42	+1.27	4.12	1.32	9.9	8	11	5	12
1920.....	24.0	+3.5	59	-22	0.56	-0.59	1.75	0.04	4.1	5	9	6	14
1921.....	31.0	+10.5	76	-5	0.77	-0.38	2.00	T.	6.5	5	13	7	8

T. indicates an amount too small to measure, or less than .005 inch precipitation and less than .05 inch snowfall.







DAILY PRECIPITATION FOR FEBRUARY, 1921—Continued.

Stations	Watersheds.	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	
<b>Southern Division</b>																														
Afton	Grand					.06		T		T	.17												.10		T				0.33	
Albia	Des Moines	T				T		T		T													.22						0.22	
Atlantic	Nishnabotna	.02			.23	.51		.20		T												.01		.02		T			0.99	
Bedford	Missouri				.02	.50		.15		.03	.02											.15		.02					0.89	
Bloomfield	Mississippi																													
Bonaparte	Des Moines							T	.07		T	.03											.33						0.43	
Burlington	Mississippi								.16					.03									.30		.15				0.64	
Centerville	Chariton	T			T		T	.06		T	.07												.30						0.43	
Chariton	Chariton				T	T	T			T	.24											.17							0.41	
Clarinda	Nodaway	.01			.02	.10		.10															.07		T				0.30	
Columbus Jct.	Iowa					T	.27	.17			T												.20		.10				0.74	
Corning	Nodaway						.20			T													.12						0.32	
Corydon	Chariton	T			.01	.02	T	.08		.06	.07						.04						.20		T				0.48	
Creston	Missouri				.05	.11		T		T	.12												.12		.05				0.45	
Cumberland	Nodaway				.10	.20			.20	T							T								T		T		0.50	
Earlham	Des Moines				.08	.41	T	.04		.05	.06													T		T			0.64	
Fairfield	Skunk					T	.25	.20			.05													.25		.02			0.77	
Fairport	Mississippi																													
Glenwood	Nodaway				.02	.20		.10			.05						T								.06				0.38	
Greenfield	Nodaway				.18	.30	T	.20																	T				0.73	
Indianola	Des Moines				.05	.26		.24			.25					T							.30		T				1.10	
Keokuk ***	Mississippi	T						.10		T	.05												.34		.09				0.48	
Keosauqua	Des Moines						.05	.12		T	.08												.30		.01				0.56	
Knoxville	Des Moines	T			.10	.10		.03	.03		.10	.20											.20						0.76	
Lacona	Des Moines	.01			.25	.20				.20	.20												.24						1.10	
Lamoni	Grand					.09		.04			.10												.16		.02				0.41	
Lenox	Missouri	.04			.02	.10		T		T	.03												.13		.10				0.42	
Mt. Ayr.	Grand	T			T	.05	T	.05		.04	.05												.20		T				0.39	
Mt. Pleasant	Skunk						T	.02	.08		.02													.25		.07			0.44	
Murray	Grand	T			.01	.04		.08		T	T												.03		.04				0.20	
Oakland	Nishnabotna	.05			.20	.50		.30									T						T		T				1.05	
Oskaloosa	Des Moines				.04	.03		.05	.15		.10	.10	T										.36		T				0.83	
Ottumwa	Des Moines				T	T	.10				.05												T		.32				0.47	
Pella	Skunk				T	.13	T			T				T									.13						0.26	
Sigourney	Skunk	T			T	.03		.13			.06												.26				T		0.48	
Stockport	Skunk				T	.06	.13			T	.03	T											.23		.02				0.47	
Thurman	Missouri	T			.05	.11		.12									.05								T				0.33	
Washington	Skunk					.01	.12	.10			.15												.22		.07				0.67	
Winterset	Des Moines				.10	.50		T																T		T			0.60	
Omaha, Neb.***	Missouri	T			.02	.22	.25		.14			T					.04	T	T				.01		.01		T		0.69	

Except as otherwise indicated, observations are generally made late in the afternoon, near sunset, and precipitation recorded is for 24 hours ending at the time of observation.  
 |||Precipitation measured in the morning; amount then recorded is for the preceding 24 hours.  
 \*\*\*Regular Weather Bureau Station; precipitation is for 24-hour period, midnight to midnight.  
 \*\*Incomplete.  
 \*Precipitation included in the next following measurement.

**THE WINTER OF 1920-1921.**

The mean temperature for the three winter months was 28.6°, which is 7.8° above the normal for the State, and 10.0° higher than the mean for 1919-1920, and 0.5° higher than the mean for 1918-1919, which prior to this winter was the warmest of record. The highest temperature reported was 76°, at Pella, Marion County, on February 15th. The lowest temperature reported was -26°, at Inwood, Lyon County, on December 24th.

The average monthly precipitation for the State was 0.81 inch, and the average total precipitation was 2.44 inches, or 0.98 inch less than the winter normal. The average total snowfall, unmelted, was 18.0 inches, or 2.5 inches less than the normal and 3.5 inches more than the winter of 1919-1920.

The total number of days with .01 inch or more of precipitation was 14, or 1 more than the winter of 1919-1920. The average number of clear days was 34, partly cloudy 22, cloudy 34, as compared with 32 clear days, 21 partly cloudy days and 38 cloudy days during the winter of 1919-1920.

**RIVERS.**

The ice in the Mississippi broke up north of Dubuque on the 15th and remained open the rest of the month; at Davenport and Keokuk the river was open the entire month with only light floating and shore ice. Low stages prevailed with very slight fluctuations. On the Missouri moderate stages prevailed and the only rise of consequence occurred about the middle of the month on account of ice gorges. The ice on the interior rivers went out during the first part of the third week and the only changes of consequence were due to ice gorges.

**SUNSHINE AND CLOUDINESS.**

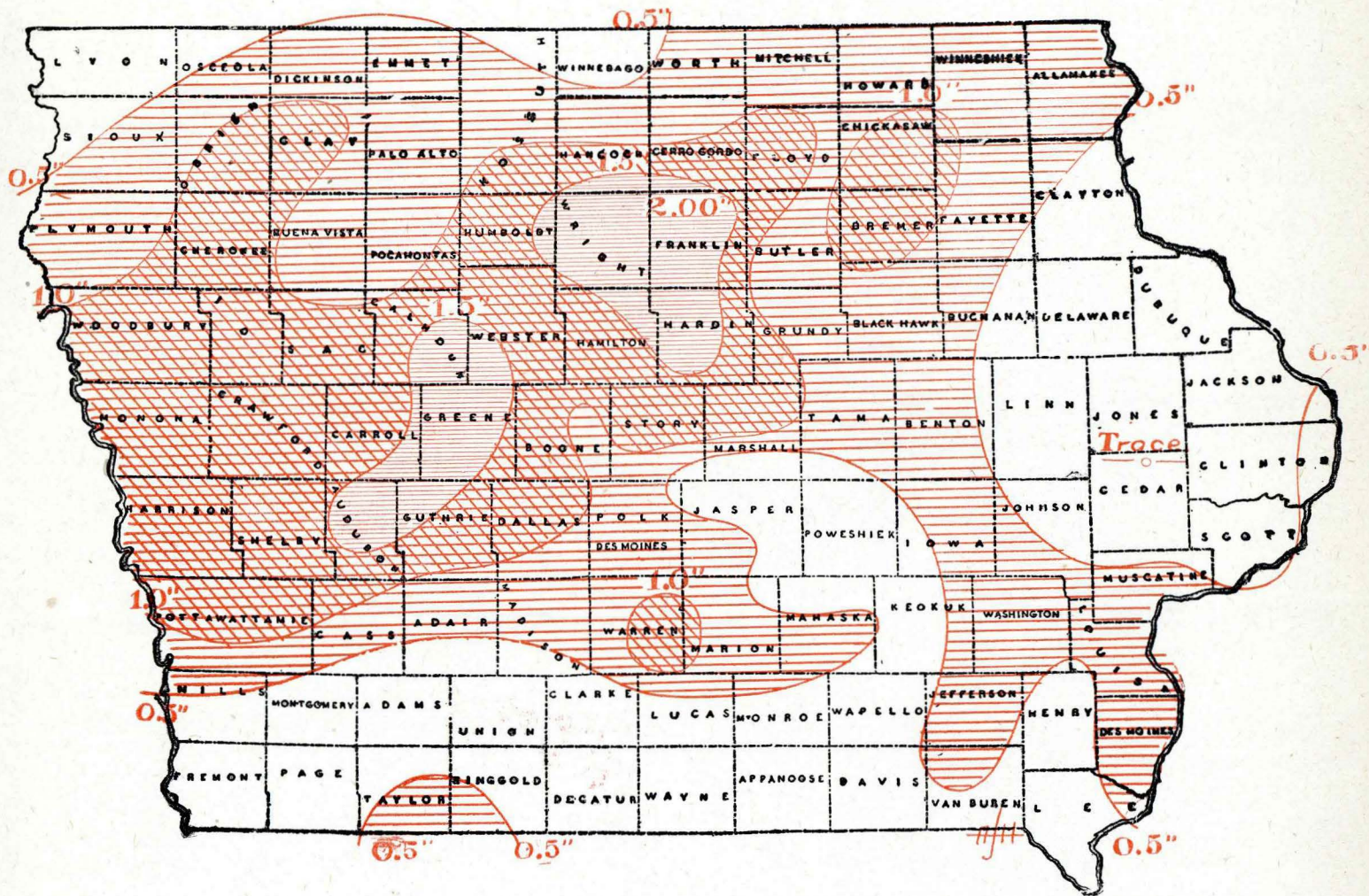
The average per cent of the possible amount of sunshine was 52, or 4 per cent less than the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows; Charles City, 39; Davenport, 44; Des Moines, 60; Dubuque, 42; Keokuk, 58; Sioux City, 53; Omaha, Nebr., 70.

Daily Maximum and Minimum Temperatures for the Month of February, 1921.

Table with columns for Stations, days 1-28, and Mean. Rows are categorized into Northern Division, Central Division, and Southern Division, listing various Iowa cities and their daily temperature ranges.

a, b, c, etc., indicate respectively 1, 2, 3, etc., days missing from record.

TOTAL PRECIPITATION,—FEBRUARY, 1921.



SCALE OF SHADES—INCHES.



# CLIMATOLOGICAL DATA.

## IOWA SECTION

In cooperation with  
IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXII DES MOINES, IOWA, MARCH, 1921 No. 3

### GENERAL SUMMARY.

The unusually mild weather that has prevailed throughout the winter continued in March. The first cold weather occurred during the latter part of the third week and a severe cold period was ushered in on the 27th that spread over the entire State. The mean temperature, 42.8°, has been exceeded but twice since State-wide records began in 1890 and considering that both January and February of this year had the highest mean temperature of record, the first three months of this year have established a record that will stand for many years. The minimum temperature, 4°, was next to the highest of record.

The precipitation averaged nearly normal, but the amounts varied greatly and over most of the State there was a pronounced deficiency. The excess was confined principally to the southeastern portion, but there were small areas in each division that had a slight excess. At Burlington the total for the month was 6.62 inches, which is the highest ever reported in Iowa in March. The precipitation was practically all rain and only once has there been less snowfall in March.

The mild weather was very favorable for all farm activities. Plowing was possible during practically the entire month and much grain had been seeded by the middle of the month and over much of the southern and central portions oats and spring wheat had a good start. Foliage was advanced to a stage nearly a month in advance of the normal, but the fruit was not injured by the severe freeze on the 28th except in some of the southern counties; however, the sudden change to colder caused much loss to young pigs and lambs.

A large number of general storms passed over the State. During one, on the 26th, a damaging tornado developed about 7:10 p. m. just north of Arthur, Ida County, traveled northeast across Sac County and disappeared somewhere in Pocahontas County several miles northeast of Fonda. The storm was accompanied by the usual freakish performances and many places in its path were not touched. At points in the path the tail of the tornado would recede from the earth for a stretch of as much as three miles, then cause destruction for a short distance and recede again. Most of the path was in a district that was sparsely settled and the damage was confined to stock and farm buildings, but the town of Fonda was directly in its path and here the greatest destruction occurred and the damage to property was estimated at \$100,000. No property in the path of the storm escaped damage, but while a number of people were injured, no lives were lost. Every class of property, ranging from light sheds to strong modern buildings, suffered damage. After the storm passed Fonda its principal damage was to occasional farm buildings that happened to be in its path.

F. L. D.

### PRESSURE.

The mean pressure (reduced to sea level) for the State was 30.01 inches. The highest recorded was 30.82 inches, the high-

est of record for the State for March, at Sioux City and Omaha, on the 28th and the lowest was 29.15 inches at Sioux City, on the 26th. The monthly range was 1.67 inches.

### TEMPERATURE.

The mean temperature for the State, as shown by the records of 99 stations, was 42.8°, or 9.5° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 39.4°, or 8.9° higher than the normal; Central, 43.3°, or 9.7° higher than the normal; Southern, 45.8°, or 9.9° higher than the normal. The highest monthly mean was 49.0°, at Burlington, and the lowest monthly mean was 36.3°, at Northwood. The highest temperature reported was 86°, at Glenwood and Thurman, on the 18th, and Center-ville on the 19th. The lowest temperature reported was 4°, at Northwood, on the 28th. The temperature range for the State was 82°.

### HUMIDITY.

The average relative humidity for the State at 7 a. m. was 78 per cent, and at 7 p. m. it was 60 per cent. The mean for the month was 69 per cent, or about 5 per cent lower than the normal. The highest monthly mean was 78 per cent, at Charles City, and the lowest was 60 per cent, at Omaha, Nebr.

### SNOW.

The average snowfall for the State was 0.2 inch, or 5.1 inches less than the normal, and with one exception, the least ever recorded in the State. The greatest amount, 3.2 inches, occurred at Inwood. Over the greater portion of the State no snow, or only traces, occurred.

COMPARATIVE DATA FOR THE STATE—MARCH.

YEAR	Temperature				Precipitation				Number of Days				
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With precipi- tation .01 in.	Clear	Partly cloudy	Cloudy
1890	28.0	-5.3	75	-24	1.57	-0.20	3.67	0.32					
1891	26.8	-6.5	66	-19	2.60	+0.83	4.58	1.33		10	6	8	17
1892	31.9	-1.4	84	-6	2.22	+0.45	4.58	0.57	3.9	6	11	8	12
1893	31.8	-1.5	84	-8	2.14	+0.37	4.40	0.64	4.0	8	9	11	11
1894	41.0	+7.7	84	-5	2.03	+0.26	4.52	0.26	2.7	6	13	10	8
1895	34.4	+1.1	94	-11	0.83	-0.94	2.60	0.22	2.9	4	16	8	7
1896	30.9	-2.4	81	-12	1.10	-0.67	3.99	0.16	5.4	5	12	9	10
1897	32.0	-1.3	72	-22	2.39	+0.62	6.16	0.29	5.5	8	9	8	14
1898	37.5	+4.2	72	-2	1.94	+0.17	6.21	0.33	3.7	6	12	9	10
1899	23.0	-10.3	75	-16	1.62	-0.15	5.90	0.37	8.0	6	7	12	12
1900	30.7	-2.6	81	-13	2.06	+0.29	5.15	0.45	6.6	5	12	9	10
1901	34.2	+0.9	76	-8	2.64	+0.87	5.25	0.70	12.6	7	10	8	13
1902	39.1	+5.8	79	-12	1.45	-0.32	4.33	0.13	1.3	7	9	11	11
1903	38.8	+5.5	82	6	1.38	-0.39	3.90	0.15	3.9	7	11	7	13
1904	34.8	+1.5	78	3	2.18	+0.41	4.57	0.50	4.4	7	8	8	15
1905	41.5	+8.2	84	1	2.04	+0.27	3.70	0.89	4.1	6	14	7	10
1906	27.1	-6.2	65	-14	2.34	+0.57	4.55	0.58	8.9	10	8	7	16
1907	40.6	+7.3	92	-7	1.35	-0.42	5.05	0.23	4.1	6	14	7	10
1908	37.9	+4.6	85	-8	1.58	-0.19	3.74	0.45	1.1	6	13	7	11
1909	32.5	-0.8	71	-15	1.53	-0.24	5.00	0.28	9.8	6	12	10	9
1910	48.9	+15.6	92	-10	0.17	-1.60	1.37	0.00	T.	1	23	6	2
1911	39.4	+6.1	83	2	0.93	-0.84	4.84	T.	1.9	5	16	9	6
1912	24.9	-8.4	70	-19	2.01	+0.24	5.25	0.60	19.1	7	15	6	10
1913	31.9	-1.4	78	-23	2.48	+0.71	5.88	0.74	5.3	9	11	10	10
1914	34.7	+1.4	78	-5	1.69	-0.08	3.84	0.28	1.8	7	12	8	11
1915	39.3	-4.0	61	-5	0.96	-0.81	2.12	0.17	8.8	5	8	9	14
1916	35.2	+1.9	80	-18	1.57	-0.20	5.80	0.23	2.9	6	11	9	11
1917	34.6	+1.3	85	-12	1.84	+0.07	4.35	0.57	6.2	6	14	8	9
1918	42.9	+9.6	85	0	0.63	-1.14	2.12	0.03	2.6	3	19	7	5
1919	37.5	+4.2	78	-11	2.33	+0.56	5.40	0.81	1.1	6	15	8	8
1920	38.0	+4.7	80	-21	3.02	+1.25	5.70	0.47	2.4	7	15	7	9
1921	42.8	+9.5	86	4	1.57	-0.20	6.62	0.17	0.2	7	14	8	9

T. indicates an amount too small to measure, or less than .005 inch precipitation and less than .05 inch snowfall.







Climatological Data for March, 1921—Continued.

Table with columns for Stations, Counties, Elevation, Length of record, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Total snowfall, Unmelted, Precipitation .01 in. or more, Clear, Partly cloudy, Cloudy), Prevailing direction of wind, and Observers.

The departure from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete records are used in determining means. Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example, b represents two days, etc. †Also other dates. ‡Received too late to be included in means and summaries. T., Precipitation is less than 0.01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE.

Table with columns for Stations, Barometric Pressure (Mean, Highest, Date, Lowest, Date, 7 a. m., Noon, 7 p. m., Lowest, Date), Wind (Total movement, Average hourly velocity, Miles, From, Date), Sunshine (Per cent of possible, Departure from normal).

§Sioux City and Omaha. †Local mean time. ‡And other dates. §Sioux City. \*Des Moines.

PRECIPITATION.

The average precipitation for the State, as shown by the records of 103 stations, was 1.57 inches, or 0.20 inch less than the normal. By divisions the averages were as follows: Northern, 1.13 inches, or 0.40 inch less than the normal; Central, 1.61 inches, or 0.26 inch less than the normal; Southern, 1.97 inches, or 0.05 inch more than the normal. The greatest amount, 6.62 inches, occurred at Burlington, and the least, 0.17 inch, at Waverly. The greatest amount in any 24 consecutive hours, 3.50 inches, occurred at Olin on the 13th-14th.

WIND.

The prevailing direction of the wind was from the northwest. The highest velocity reported from a regular Weather Bureau Station was at the rate of 53 miles per hour, from the northwest, at Sioux City, on the 26th.



Daily Precipitation for March, 1921—Continued.

Stations.	Watersheds.	Day of Month.																															Totals	
		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		
<i>Southern Division</i>																																		
Afton	Grand								.15				.50	.25										T.			.17	.05			.13	1.25		
Albia	Des Moines				.10				T.		.08		.93	.17							T.					.05	T.					1.33		
Atlantic	Nishnabotna							.01	T.				.37	.12										.11								**		
Bedford	Missouri								.01				.51									.01	.02				.40	.21			.13	1.29		
Bloomfield	Mississippi																																	
Bonaparte	Des Moines					.56	.08	.38			T.	.18	.11	.28											T.	.03	.25	T.	T.			1.87		
Burlington	Mississippi	.03	.15			.97	2.05	1.61						.77							.08	.40				.50	.06					6.62		
Centerville	Chariton			.38	T.	.07	1.22				.04			.05	.05										.04	.10	.04	T.				1.99		
Chariton	Chariton												1.16	.34												.22	.29					1.72		
Clarinda	Nodaway								T.				.39	.02										T.	T.		.24	.07			.12	0.84		
Columbus Jct.	Iowa				.75	.20	T.	.81			.12	T.	.20	.48												.27	.57				.05	3.45		
Corning	Nodaway						T.						.35	.04											T.		.39	.15				0.93		
Corydon	Chariton		T.			T.	.01	.70			.14	T.	.77	.25	T.									T.		.14	.08					2.09		
Creston	Missouri								.05				*	*	.42										T.	.05	.29	.08			.15	1.04		
Cumberland	Nodaway				.10								.48													T.	.15					0.73		
Earlham	Des Moines					T.							.33	T.													.27				.14	0.74		
Fairfield	Skunk			.45	.06	T.	.88				.06		.08	.46										T.	T.		.63	T.			.05	2.67		
Fairport	Mississippi				1.11	.03	.97				.14	.16	.45	.92							.03					.15	.02	.08			.02	4.85		
Glenwood	Missouri												.18													T.	.70					0.88		
Greenfield	Nodaway					T.							.40												T.	.09	.48				.14	1.11		
Indianola	Des Moines					T.		T.	.40				.45	.18												T.	.06	.15	T.		.14	1.38		
Keokuk***	Mississippi	.07			.77	.02	1.75	1.02			.01	T.	.34	.37							T.	.34	.09		T.	.04	.09	.22	T.			5.13		
Keosauqua	Des Moines				T.	.40	.05	1.26					.15												T.	.05	T.	.18	T.			2.29		
Knoxville	Des Moines				T.		.04	.18					.78	.74											T.	T.	T.	.10	.10		.08	2.02		
Lacona	Des Moines						.02	.50					.42	.48								.05					.07			.16		1.70		
Lamoni	Grand						T.	.42			.08		.25	.16												T.	.10	.05	.22		.05	1.33		
Lenox	Missouri							.07					.43	.13												T.	.03	.35	.10		.15	1.26		
Mt. Ayr	Grand				T.		T.	.25	.05		T.		1.50	.05	.08											T.	T.	.05	T.	.35	.10	.08	2.38	
Mt. Pleasant	Skunk			.03	.54	.03	1.29						.14	.43													.13	.28	.01	T.		.01	3.04	
Murray	Grand							.03			.01		.44	.22													.02	.06	T.	.19		.14	1.11	
Oakland	Nishnabotna						T.	T.					.17															.75					0.92	
Oskaloosa	Des Moines			.36	T.	.05	.31			.23		1.16	.33												T.	T.	.03	.03	.07		.07	T.	2.64	
Ottumwa	Des Moines			.45		.65	.25			.10			.80														.18	.05				.05	2.53	
Pella	Skunk					T.	T.	.12					.67	.55												T.	T.		.06		.06	T.	1.50	
Sigourney	Skunk		T.		.58			.38			.12		1.10	.25													.04	.01	T.		.09		2.57	
Stockport	Skunk				.02	.61	T.	1.16			.09		.15									.04	.08	.18			.10	.24	.04	.03		T.	2.74	
Thurman	Missouri				T.		T.						T.															.62					T.	0.62
Washington	Skunk			.28			.55				.08		.55	.72													.11		.13				.04	2.46
Winterset	Des Moines							T.					.38	.15																		.12	0.87	
Omaha, Neb.***	Missouri		T.	T.		T.		T.					.16															.90	T.			T.	1.08	

Except as otherwise indicated, observations are generally made late in the afternoon, near sunset, and precipitation recorded is for 24 hours ending at the time of observation.

- |||Precipitation measured in the morning; amount then recorded is for the preceding 24 hours.
- \*\*\*Regular Weather Bureau Station; precipitation is for 24-hour period, midnight to midnight.
- \*\*Incomplete.
- \*Precipitation included in the next following measurement.

SUNSHINE AND CLOUDINESS.

The average per cent of the possible amount of sunshine was 56, or about 2 per cent less than the normal. The per cent of the possible amount at the regular Weather Bureau Stations was as follows: Charles City, 47; Davenport, 51; Des Moines, 61; Dubuque, 47; Keokuk, 58; Sioux City, 58; Omaha, Nebr., 67.

MISCELLANEOUS PHENOMENA.

- Aurora:* 13th, 15th, 17th, 21st, 22d, 26th.
- Birds (migration of):* Corydon, robins on 3d, blue birds, 14th; Earlham, blackbirds and meadow larks on the 6th; Jefferson, robins on the 2d; Postville, robins and meadow larks on the 11th.
- Fog:* 7th, 8th, 11th, 13th, 14th, 15th, 16th, 24th, 25th, 26th.
- Hail:* 5th, 7th, 26th.
- Halos:* 1st, 5th, 6th, 11th, 16th, 18th, 19th, 20th, 21st, 30th.
- Parhelia:* 2d.
- Rainbow:* 26th.
- Sleet:* 7th, 8th, 13th, 14th, 30th.
- Thunderstorms:* 1st, 5th, 6th, 7th, 8th, 11th, 12th, 13th, 14th, 19th, 20th, 21st, 25th, 26th, 27th.
- Winds (high):* 2d, 4th, 10th, 16th, 18th, 19th, 20th, 26th, 27th, 29th, 31st.

RIVERS.

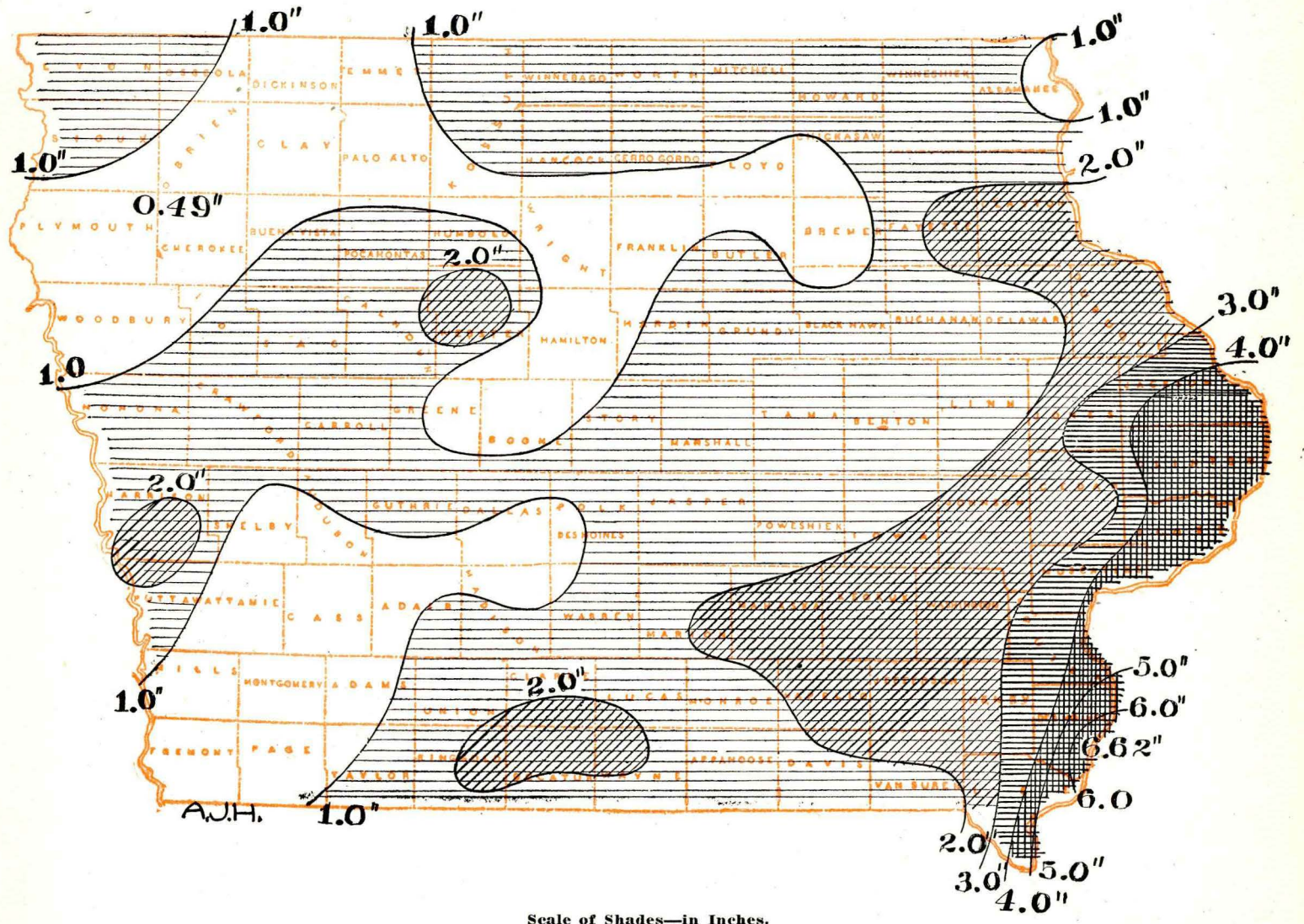
The Mississippi River was free of ice except the extreme upper portion. The stage gradually increased during the month, the highest being reached on the last day. The Missouri was open the entire month with moderate stages and very slight fluctuations. On the interior rivers the stage was low most of the month with very little range. The only rise occurred during the last week.

Daily Maximum and Minimum Temperatures for the Month of March, 1921.

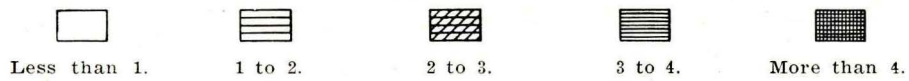
Table with columns for Stations, days 1-31, and Mean. Rows are grouped by Northern and Southern Divisions, listing various Iowa cities and their daily temperature ranges.

a, b, c, etc., indicate respectively 1, 2, 3, etc., days missing from record.

TOTAL PRECIPITATION, MARCH, 1921



Scale of Shades—in Inches.



# CLIMATOLOGICAL DATA.

IOWA SECTION  
In cooperation with  
IOWA WEATHER AND CROP SERVICE  
CHARLES D. REED, Meteorologist

VOL. XXXII DES MOINES, IOWA, APRIL, 1921 No. 4

## GENERAL SUMMARY.

April is the eighth consecutive month that the mean temperature for the State has been above the normal. The excess, while not so marked as in the three preceding months, was considerable and general. The month opened warm and pleasant, but after the first week a decided change to cooler occurred with a hard freeze over the entire State and thereafter the changes were rapid, making the month generally subject to great temperature extremes and sudden changes. Periods above and below normal were of short duration. The precipitation for the State as a whole was considerably above normal, though over nearly all of the western half and most of the north-central portion there was a decided deficiency. It was well distributed through the month, but the greatest amounts over most of the State occurred during the storm of the 15th-16th, which began as a general rain and changed to snow, resulting in the worst snowstorm of the season, in the southern and eastern portions and at many points the April snowfall records were broken. All traffic in the affected area was interrupted, many roads had drifts as great as ten feet deep, and telephone and telegraph wires were broken down. Bright sunshine and mild temperature rapidly melted the snow, but drifts remained for more than a week. Practically all the snow fell south of a line drawn from the northern portion of Mills County northeastward to the southwest corner of Allamakee County, the greatest fall occurring in a strip about 75 miles wide from Taylor to Dubuque Counties. Fruit was in full bloom over the southern and central sections and the wet snow froze to the bloom and foliage, which was then broken off by high winds; some trees were nearly stripped. Temperatures as low as 20° followed. All fruit in the central and southern divisions was seriously damaged except some small fruit and late apples, while in the northern division fruit was not sufficiently advanced to be damaged much, the storm was less severe and the temperature did not fall so low. Wind storms were frequent and resulted in damage amounting to many thousand dollars. The chief damage occurred in Woodbury, Dubuque, Johnson, Cedar, Scott, Muscatine and Louisa Counties. Most of the damage was from straight blows and squalls, but undoubtedly some storms had tornadic characteristics. At Dubuque during the storm of the 25th, in the southern and eastern portions of the city, many trees and billboards were blown down and light garages wrecked, the roof of the Illinois Central coal shed, the roof of the round house and the roofs of freight cars standing near, were blown off, and plate glass windows were broken, on lower Main street. At Seventh and White streets, two large piles of lumber were lifted over a one-story building and struck a six-story building, breaking a large number of windows and injuring a number of people. A 60-foot section of the roof of the Chicago Great Western freight house was blown away, some of the timbers being carried as much as 400 feet.

The month was generally favorable for farm operations but not for the development of vegetation, though pastures were good for the time of year. Over large areas in the drier western portion of the state, dust storms occurred, the soil piled up in drifts along the fences and in depressions and newly seeded grain was blown out of the ground. Oats were injured by the severe freezes, particularly in the south half of the state where as much as 50 per cent of the acreage was reseeded in several counties, and some was seeded the third time. It is thought more reseeding was done than in any other season in the last 31 years. The cold spells and heavy snow were unusually severe on young pigs, lambs and chicks. During the time the ground was snow covered cattle had to be taken to winter quarters.

F. L. D.

## PRESSURE.

The mean pressure (reduced to sea level) for the State was 29.94 inches. The highest recorded was 30.72 inches, at Omaha, Neb., on the 10th, and the lowest was 29.16 inches at Sioux City, on the 24th. The monthly range was 1.56 inches.

## TEMPERATURE.

The mean temperature for the State, as shown by the records of 101 stations, was 52.4°, or 3.7° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 51.1°, or 4.4° higher than the normal; central, 52.8°, or 3.9° higher than the normal; southern, 53.4°, or 2.8° higher than the normal. The highest monthly mean was 55.7°, at Clinton, and the lowest was 48.9°, at Estherville. The highest temperature reported was 88° at Little Sioux and Washta, on the 24th, and the lowest was 14°, at Little Sioux on the 16th and Waterloo on the 17th. The temperature range for the State was 74°.

COMPARATIVE DATA FOR THE STATE—APRIL.

YEAR	Temperature				Precipitation				Number of Days				
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With precipitation .01 in.	Clear	Partly cloudy	Cloudy
1890	51.8	+3.1	88	2	1.80	-1.06	4.46	0.38	-----	6	14	9	7
1891	50.6	+1.9	93	13	2.15	-0.71	5.06	0.59	-----	8	14	9	9
1892	45.4	-3.3	88	14	4.75	+1.89	8.38	2.43	5.7	9	8	9	13
1893	45.5	-3.2	96	15	4.21	+1.35	8.51	1.24	6.0	10	8	9	13
1894	51.7	+3.0	93	12	3.07	+0.21	6.91	0.55	0.2	9	11	11	8
1895	54.2	+5.5	98	8	2.62	-0.24	5.88	0.23	2.1	5	14	8	8
1896	54.5	+5.8	94	10	5.02	+2.16	9.67	2.35	4.5	11	11	10	9
1897	47.9	-0.8	89	19	5.35	+2.49	9.86	2.22	T.	11	9	10	12
1898	48.1	-0.6	91	14	2.56	-0.30	4.82	0.27	T.	8	13	9	8
1899	48.9	+0.2	89	1	2.40	-0.46	5.76	0.56	2.0	7	12	11	7
1900	52.2	+3.5	89	19	2.67	-0.19	6.62	0.43	0.9	6	12	9	9
1901	49.9	+1.2	92	15	1.79	-1.07	3.47	0.66	2.0	5	14	8	8
1902	48.2	-0.5	96	9	1.71	-1.15	4.15	0.40	T.	5	14	11	5
1903	49.8	+1.1	86	17	2.98	+0.12	6.00	0.74	0.8	9	11	9	10
1904	44.1	-4.6	86	13	3.63	+0.77	8.97	1.52	1.4	7	15	6	9
1905	47.5	-1.2	90	10	3.03	+0.17	5.49	0.63	1.2	8	12	8	10
1906	52.5	+3.8	94	22	2.42	-0.44	5.55	0.53	0.6	8	14	9	7
1907	41.5	-7.2	80	10	1.32	-1.54	3.22	0.24	2.7	6	12	8	10
1908	50.5	+1.8	91	8	2.24	-0.62	4.59	0.67	0.3	8	14	8	8
1909	43.8	-4.9	86	14	4.58	+1.72	9.43	0.83	3.1	12	9	9	12
1910	52.5	+3.8	99	15	1.48	-1.38	4.86	0.10	3.0	7	14	7	9
1911	46.7	-2.0	89	3	3.09	+0.23	6.04	1.33	3.6	9	11	8	11
1912	49.9	+1.2	84	20	2.66	-0.20	5.66	0.78	1.1	8	13	8	9
1913	50.2	+1.5	88	16	3.28	+0.42	7.43	1.12	2.7	9	15	5	10
1914	48.6	-0.1	88	11	2.52	-0.34	5.03	0.37	0.3	8	10	8	13
1915	57.2	+8.5	95	18	1.41	-1.45	4.02	0.05	T.	7	15	10	5
1916	47.1	-1.6	96	11	2.62	-0.24	5.92	1.13	1.1	10	10	9	11
1917	45.5	-3.2	88	17	4.55	+1.69	7.84	2.05	3.8	11	9	7	14
1918	44.8	-3.9	79	12	2.32	-0.54	4.20	1.01	3.5	9	13	8	10
1919	48.4	-0.3	81	20	4.78	+1.92	9.00	1.94	0.7	14	8	8	14
1920	42.4	-6.3	78	22	4.59	+1.73	7.13	1.93	2.0	12	8	9	13
1921	52.4	+3.7	88	14	3.34	+0.48	6.69	0.99	3.6	10	13	7	10

T. indicates an amount too small to measure, or less than .005 inch rainfall and less than .05 inch snowfall.



Climatological Data for April, 1921.

Table with columns: Stations, Counties, Elevation, Length of record, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Total snowfall, Precipitation .01 in. or more, Clear, Partly cloudy, Cloudy), Prevailing direction of wind, and Observers. Rows include Northern Division, Central Division, and various county stations.



Climatological Data for April, 1921—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.								Precipitation, in Inches.					Number of Days.					Observers.
				Mean.	Departure from normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from normal.	Greatest in 24 hours.	Total snowfall, unmelted.	Precipitation .01 in. or more.			Prevailing direction of wind.				
															Clear.	Partly cloudy.	Cloudy.					
<i>Southern Division</i>																						
Afton	Union	1,212	27	53.6	+ 3.0	84	24	23	9†	40	3.47	+0.12	1.39	10.0	8	13	6	11	sw.	S. R. Brown.		
Albia	Monroe	959	23	52.8	+ 3.2	83	24	19	17	40	4.60	+1.75	1.23	6.5	8	10	11	9	sw.	F. H. Holmes.		
Atlantic	Cass	1,164	30																	Joseph N. Reynolds.		
Bedford	Taylor	1,100	21	53.2	+ 2.9	84	23	18	17	43	3.59	+1.10	1.85	20.0	10	12	7	11	s.	E. E. Healy.		
Bloomfield	Davis	881	14	54.0		84	24	21	9	41	5.76	+2.63	2.90	3.0	8	16	7	7	se.	J. R. Hinkle.		
Bonaparte	Van Buren		30	53.6	+ 2.3	80	24	24	16	36	5.92	+2.71	2.11	T.	9	16	6	8	nw.	Bruce R. Vale.		
Burlington	Des Moines	544	25	55.2	+ 4.0	80	24†	27	17	32	5.35	+2.11	1.40	T.	13	14	9	7	sw.	Mrs. E. M. Donnelly.		
Centerville	Appanoose	1,013	16	54.4		84	3†	20	17	42	4.37	+1.07	1.70	3.0	11	13	4	13	sw.	Leo J. Allen.		
Chariton	Lucas	1,042	26	52.8	+ 2.8	80	2†	18	16	41	4.32	+1.20	1.20	3.0	7	13	5	12	sw.	O. C. Burr.		
Clarinda	Page	1,009	31	53.2	+ 3.6	85	2	22	17	48	2.19	-0.64	1.18	10.0	11	11	7	12	s.	A. S. Van Sandt.		
Columbus Jct.	Louisa	595	20	53.9	+ 3.2	83	5	26	17	36	5.86	+2.92	2.10	2.5	11	18	7	5	nw.	J. B. Johnston.		
Corning	Adams	1,117	29	52.0	+ 2.4	83	3†	18	17	47	2.14	-0.89	0.65	6.0	6	13	12	5	sw.	Jerome Smith.		
Corydon	Wayne	1,101	28	53.4	+ 2.2	82	24	20	17	40	4.38	+1.25	1.60	5.0	11	11	8	11	sw.	May C. Miller.		
Creston	Union	1,312	16	52.6	+ 4.3	83	23†	19	17	41	3.13		0.89	10.0	10	11	11	8	sw.	Dr. H. M. Stanley.		
Cumberland	Cass	1,225	22								1.75	-0.52	0.48	2.0	8	11	8	11	s.	G. M. Clarke.		
Earlham	Madison	1,126	19	52.7	+ 3.5	83	24	21	17	46	2.54	-0.92	0.65	8.0	9	16	4	10	sw.	Geo. Phillips.		
Fairfield	Jefferson	780	37	52.6a	+ 1.8	82a	24	21a	1	43a	4.96	+1.31	1.38	5.0	10	12	5	13	s.	Prof. R. M. McKenzie.		
Fairport	Muscatine	567		54.4a		80a	25	27a	9	33a	4.83		1.54	1.5	15	16	9	8	s.	R. L. Barney.		
Glendon	Mills	1,100	23	54.4		87	2†	24	9	42	1.96		0.40	1.0	9	15	7	8	sw.	Dr. Geo. Mogridge.		
Greenfield	Adair		29	51.9	+ 2.1	85	24	18	17	43	3.03	-0.09	0.82	7.0	11	16	7	7	sw.	J. C. Patterson.		
Indianola	Warren	969	30	54.2	+ 3.7	83	24	19	17	40	3.98	+0.77	1.23	12.0	9	11	7	12	sw.	Seth F. Shenton.		
Keokuk	Lee	614	50	54.7	+ 2.7	80	25	28	16	30	3.91	+0.57	0.91	0.9	13	5	12	13	sw.	U. S. Weather Bureau.		
Keosauqua	Van Buren	644	29	53.8	+ 3.3	81	24	23	1	41	5.09	+1.59	1.77	3.0	11	13	4	13	se.	J. H. Landes.		
Knoxville	Marion	920	26	53.5	+ 1.9	82	24	20	17	43	4.68	+1.69	1.80	15.0	8	14	3	13	sw.	W. J. Casey.		
Lacona	Warren		22								3.95	+1.25	1.10	9.0	13	7	14	9	sw.	J. B. Alter.		
Lamoni	DeCATUR	1,100	14	53.1	+ 2.1	82	23†	20	17	41	3.54	+0.19	1.15	4.5	12	14	6	10	sw.	Rupert A. Wight.		
Lenox	Taylor	1,250	26	52.7	+ 2.4	84	24	18	9	43	3.00	+0.06	1.40	14.0	8	14	6	10	s.	J. L. Hurley.		
Mt. Ayr	Ringgold	1,236	28	52.7	+ 1.5	81	24	20	17	38	3.00	-0.15	1.25	8.0	11	15	4	11	s.	Alex. Maxwell.		
Mt. Pleasant	Henry	729	40	54.6	+ 3.4	82	24	26	17	36	6.69	+3.79	2.44	3.0	11	11	5	14	nw.	John H. Jericho.		
Murray	Clarke	1,216	30	53.1	+ 2.6	83	24	21	17	42	2.75	-0.48	0.92		11	9	12	9	s.	M. T. Ashley.		
Oakland	Pottawattamie	1,105	2	54.1		86	3†	23	10	40	2.18		0.61	0.5	8	15	6	9	s.	M. E. Gray.		
Oskaloosa	Mahaska	825	45	52.8	+ 2.2	83	24	21	17	40	5.28	+2.52	2.32	12.5	15	9	8	13	nw.	Roy R. Robinson.		
Ottumwa	Wapello	849	26	51.9		80	4†	25	1†	36	6.01	+3.26	2.00	6.0	11	15	1	14	w.	Henry Eilers.		
Pella	Marion	877	28	52.9	+ 2.5	83	24	18	17	42	4.18	+1.35	1.46	12.0	11	15	4	11	s.	J. H. Ver Steeg.		
Sigourney	Keokuk	877	25	52.2	+ 1.2	82	24	22	17	39	6.04	+2.76	2.63	9.4	11	13	5	12	nw.	W. E. Utterback.		
Stockport	Van Buren	754	19	52.4	+ 1.9	80	24	22	1	40	4.65	+1.59	1.47	3.0	12	13	5	12	s.	C. L. Beswick.		
Thurman	Fremont		24	55.6	+ 4.4	87	3†	24	9	46	3.03	-0.10	0.68	4.0	10	9	16	5	sw.	C. R. Paul.		
Washington	Washington	769	39	54.0	+ 3.4	83	24	25	17	39	5.71	+3.09	1.69	5.7	11	10	11	9	sw.	Wm. A. Cook.		
Winterset	Madison	1,129	30	53.2	+ 2.5	83	24	21	17	40	3.51	-0.09	0.90	8.0	10	15	5	10	se.	H. S. Ely.		
Omaha, Nebr.		1,040	50	54.2	+ 3.7	87	3	25	9	40	2.13	-0.88	0.54	0.5	13	10	9	11	s.	U. S. Weather Bureau.		
Means and extremes				53.4	+ 2.8	87	2†	18	9†	48	4.01	+0.96	2.90	6.1	10	13	7	10	sw.			
State means and extremes				52.4	+ 3.7	88	24	14	16	59	3.34	+0.48	2.90	3.6	10	13	7	10	s.			

The departure from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete records are used in determining means.

Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example, b represents two days, etc.

†Also other dates. †Received too late to be included in means and summaries.

T., Precipitation is less than 0.01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE.

Stations.	Barometric Pressure Inches (Sea Level).				Relative Humidity (%).				Wind.					Sunshine			
	Mean.	Highest.	Date.	Lowest.	Date.	7 a. m.	Noon.	7 p. m.	Lowest.	Date.	Wind.				Total movement.	Average hourly velocity.	
											Mean.			Maximum			
											Miles.	From.	Date.				Per cent of possible.
Charles City	29.93	30.61	10	29.36	21	81.56	64	32	11	6	464	9.0	30	sw.	1	44	-21
Davenport	29.96	30.53	10	29.42	22	76.53	59	25	3	7,053	9.8	39	ne.	15	62	+3	
Des Moines	29.91	30.63	10	29.26	20	73.52	56	15	30	7,109	9.9	40	sw.	24	60	0	
Dubuque	29.96	30.33	10	29.42	22	77.59	60	23	10	5,868	8.2	32	nw.	27	56	-1	
Keokuk	29.97	30.61	10	29.47	22	72.51	56	25	29	7,194	10.0	49	w.	25	63	+6	
Sioux City	29.91	30.70	10	29.16	24	72.50	48	12	21	10,969	15.2	54	nw.	24	55	+3	
Omaha, Nebr.	29.92	30.72	10	29.27	20	75.56	57	15	2	6,875	9.5	37	n.	16	66	+9	
Means and extremes	29.94					75.54	57				10.2				58	-2	
		30.72	10	29.16	24			12	21			54	nw.		24		
Normals and records	29.98		9th		20th	76	57		7th		9.9		25th		60		
		30.78	1918	*28.80	1893				†11	1893		†74	n.	1902			

†Local mean time. †And other dates. §Dubuque. \*Davenport. †Omaha. †Sioux City.

HUMIDITY.

The average relative humidity for the State at 7 a. m. was 75 per cent, and at 7 p. m. it was 57 per cent. The mean for the month was 66 per cent, which is the normal. The highest monthly mean was 72 per cent at Charles City, and the lowest was 60 per cent, at Sioux City.

PRECIPITATION.

The average precipitation for the State, as shown by the records of 105 stations, was 3.34 inches, or 0.48 inch more than the normal. By divisions the averages were as follows: Northern, 2.50 inches, or 0.18 inch less than the normal; central, 3.52 inches, or 0.66 inch more than the normal; southern, 4.01 inches, or 0.96 inch more than the normal. The greatest amount, 6.99 inches occurred at Mt. Pleasant, and the least, 0.99 inch, occurred at Sioux City. The greatest amount in any 24 consecutive hours, 2.90 inches, occurred at Bloomfield, on the 14th.

Daily Precipitation for April, 1921.

Stations.	Drainage Basin.	Day of Month.																															Totals
		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	
<i>Northern Division</i>																																	
Algona	Des Moines					.40	.27						.03		.05					.56						.40					.15	1.86	
Allison	Cedar					.43	.25		T.				.11	.43	.61					.60	1.18					.38	.25	.49			4.73		
Alta	Raccoon			.04	.09	.42							.08	.12	.06					.05											.35	1.29	
Alton	Floyd					.18			T.				.02	.08						T.	.26					.42					.53	1.53	
Belmond	Iowa			T.	.16	.26			.03	.05	.04		.10	.49	.36	.03				.65	.35	T.				.14		.14		T.	.04	2.84	
Britt	Iowa				.04		.34	T.		.02				.01	.37	.04					.27	.13					.09					1.31	
Charles City***	Cedar				T.	.07		T.					.20	.34	.22					.76	.03					.70	.36	.30		T.		3.59	
Decorah	Mississippi					.19	.10			.05				.20	.55	.17	.16				.50					.48			.83			3.23	
Elkader	Mississippi																																
Estherville	Des Moines						1.30							.20							.30		.05		.05					.40		2.30	
Payette	Mississippi				.10	.12		T.		.03				.17	.29	.86	1.10				.29	.52							.29	.77		4.59	
Forest City	Cedar				.07	.17			.07					.17	.33						T.	.43	T.			.15			T.			1.25	
Humboldt	Des Moines			T.	.10	.12	.18							T.	.30	.28					.26	1.11				.03					.07	2.45	
Inwood	Big Sioux				.15	.45								T.							.59	.30	.01			.24				.49		2.23	
LeMars	Floyd				T.	.05		T.						T.	.10							.10				.47					.44	1.16	
Mason City	Cedar			.06	.10	.64	.09	T.		T.				.05	.26	.08					.45	.63				.27	.25			.07		2.35	
Milford (near)	Dickinson				.06	.91		T.	T.					.17	.14						.06	.02				.18				.36		1.90	
New Hampton	Wapsipicon			T.	.28			T.		.13				.10	.40	.20	.15				.12	.58				.49	.18	.84		T.		3.47	
Nora Springs	Cedar				.12	.85				.12	.05			.20	.41	.18					.90	.04				.33	.66			.02		3.88	
Northwood	Cedar				.15	.40	.10	.10						.10	.35							.28				.12	.05	.35			.04		2.04
Pocahontas	Des Moines				.13	.45		T.		.02				.03	.20	.10					.05	.48				.85		T.			.07	2.38	
Postville	Mississippi				.05	.10	.23			.05				.20	.30	.35	.30				.10	.63				.10	.18	.78		T.		3.37	
Rock Rapids	Big Sioux				.15	.26									.04						.32	.04				.42				.98		2.21	
Sanborn	Floyd				.04	.73								.21	.13										.18					.60		2.08	
Sioux Center	Floyd				.02	.43		T.		T.				.05	.03							.02	.72			.42	.02			.72		2.43	
Spencer	Little Sioux				.10	.40				.02				.10	.25							.26				.03					1.00	2.26	
Storm Lake	Raccoon			T.	.26	.45	.01			T.					.11	.11						.01	.07			.05					.29	1.36	
Washta	Little Sioux					.30			T.	T.				.20		.16										.17					.55	1.38	
Waverly	Cedar					.02	.25							.11	.35	1.06	.20									.11	.22	.58		.03		4.69	
West Bend	Des Moines				.11	.29								.05	.14	.07						.32	.07			.73				.11		1.89	
<i>Central Division</i>																																	
Ames	Skunk				.03	.74	.04			.03	T.			.12	.11	1.06	.15										.50		.15		.01	1.20	4.14
Audubon	Nishnabotna				.25	T.								.15	.37	.82	T.					.35				.08		T.					2.02
Baxter	Skunk				.01	.40	.10	T.		T.				.07	.12	1.18	.74				.05	.12				.27	.23	.25			T.		3.54
Belle Plaine	Iowa				.05	.25	T.							.17	.02	.90	1.55	.02				.42	.09	T.			.45	.36	.70		.01		4.99
Boone	Des Moines				.66	.25	.04			.03	T.			.10	.55	1.27	.02				T.	.06				.23	T.			T.	.02		2.63
Carroll	Raccoon				.12	.27								.11	.40	.81	.19					.77				.15				.10		2.92	
Cedar Rapids	Cedar				.10	T.	.52	T.						.05	.89	.60	T.					.16	.07			.57	.11	.62				3.60	
Clinton	Mississippi				T.	.02	.22	.35	T.		.02			.15	.08	1.56	.10				.15	.10	.36			.01	.73	.64	.05			4.54	
Davenport***	Mississippi				.03	.16	.10	.37	T.					.05	.17	.92	1.00	.01				.05	.39	.23			.56	.45	.26	.02	T.		4.77
Delaware	Mississippi					.30	.05	.24	T.					.29	.18	.31	.40					.96				.71	.25	.57				4.26	
Denison	Missouri			.01	.02	1.02								.04	.06	.62	.12					.57				.08				.15		2.69	
Des Moines***	Des Moines				T.	.68			.01	T.			.01	.19	.01	1.22	1.13				.06	T.			.28	.12	.01		T.	T.		3.72	
Dubuque***	Mississippi				T.	.26	.01	.65	.01					.03	.09	1.00	.48				.44	.11	.29			.51	.48	.30		.04		4.70	
Fort Dodge	Des Moines				.09	.25	.17	.01	T.					.01	.25	.64						.62	.33			.09				T.	.04	2.50	
Grinnell	Iowa					.32	.23			.02				.15	.12	1.25	.65				T.	.19				.25	.21	.41				3.80	
Grundy Center	Cedar				T.	.20	.40			.15				.12	.32	1.10	.42					.28				.42	.40	.52				4.33	
Guthrie Center	Raccoon				.04									.10	.10	1.10	.20									.02						1.56	
Harlan	Nishnabotna				.04	.21								.12	.10		.22					.32				.13		.25			.08	1.47	
Independence	Wapsipicon				.27					T.				.11		.54	.70					T.	.84			.24	T.	1.24			T.		3.94
Iowa City	Iowa					.55	.18	1.00	T.					T.	.02	.13	.08	2.42	.07			.01	.01	.02		.42	.39	.90				6.20	
Iowa Falls	Iowa				.02	.65	.17			T.				.10	.47	.95	.07					.12	.29				.24	.12	.23		T.		3.43
Jefferson	Raccoon				.05	.04			T.					T.	.12	.10	.74	T.				T.	.32			.07					T.		1.44
LeClaire	Mississippi				T.	.35	.42			T.				.08	.14	.01	1.56	.35				.20	.93				.60	.65	.09		T.		5.38
Little Sioux	Little Sioux					.12	.04	T.		T.				.22	.03	.65	.22					.09				.44		.31			.19		2.15
Logan	Missouri			.10	.02	.43								.23	.02	.76						.63				.63		.31			.10		3.23
Maquoketa	Maquoketa																																
Marshalltown	Iowa			T.	.59	.22				.01				.13	.16	1.38	1.24	.01				.16	.13	T.		.18	.17	.24		T.	T.	4.62	
Monroe	Skunk			T.	.64	.25				T.				.04	.12	T.	1.72					.04				.34	.21	T.		T.	T.	3.36	
Muscatinell	Mississippi				.02	.40	.47			T.				.02	.10	.03	1.82	.60				.02	.32				.92	.82	.05			5.59	
Olin	Wapsipicon					.20	.15			T.				T.	.75	.45	1.50					.40				.70	T.	1.10				5.25	
Onawa	Missouri																																
Perry	Raccoon				.02	.06	.01							.06	.06	1.11	.04					.15				.10					.03	1.64	
Rockwell City	Raccoon																																
Sac City	Raccoon				.11	.25			T.	T.				.12	.19	.26						.08	.45			.40					.10	1.96	
Sioux City***	Missouri				.03	.10				T.				.10	.01	.06										.15		T.		T.	.21		0.99
Tipton																																	

Daily Precipitation for April, 1921—Continued.

Stations.	Drainage Basin.	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	Totals	
<i>Southern Division</i>																																		
Afton	Grand					T.	.13	.08						.15	.05	1.05	1.39										.60	T.				.02		3.47
Albia	Des Moines					T.	.49		.05	T.				.65		.93	1.23	T.			T.						.80	.33	.12				4.60	
Atlantic	Nishnabotna																																	
Bedford	Missouri				.05	.10		.09						.20	.15	.36	1.85										.69	T.	.01			.09		3.59
Bloomfield	Mississippi					.06	.09	.80						.05	2.90	.75											.90		.21				5.76	
Bonaparte	Des Moines					.53		1.52	T.					.06		.12	2.11	T.			T.						.70	.33	.52	.03			5.92	
Burlington	Mississippi					.10	.12	.36						.45	.32	.12	1.40				.04	.06	.32				.93	.60	.53				5.35	
Centerville	Chariton					.15	.12	.21	T.					.10	.01	.67	1.70	.04									.95	.34	.08				4.37	
Chariton	Chariton					T.	.38	.55	T.							1.20	.90										1.05	.14	.10				4.32	
Clarinda	Nodaway				.03	.03		.04						.20	T.	.41	1.18										.15	.01	.02	.02	.10		2.19	
Columbus Jet.	Iowa					T.	.57		.68				T.	.13	.15	.25	2.10	.05				T.	.21				.86	.26	.60				5.86	
Corning	Nodaway				.09									.30		.45	.65				T.						.60		.05				2.14	
Corydon	Chariton					T.	.44	.01	.08	T.				.33	.10	1.60	1.00					.03		T.			.57	.17	.05		T.		4.38	
Oreston	Missouri					.11	.28							.47	.06	.71	.89						.06				.49		.04			.02	3.13	
Cumberland	Nodaway					.05	.10							.30	.07	.48	.35					T.				.35							1.75	
Earlham	Des Moines					T.	.32			T.				.13	.08	.65	.61					.05					.42		.25	.03		T.	2.54	
Fairfield	Skunk					.58		.57					.04	.20	.06	.46	1.38				T.						.69	.16	.82				4.96	
Fairport	Mississippi					.05	.27	.51	.01					.02	.18	.05	1.54						.11	.54			.16	.56	.73	.05	.02		4.83	
Glenwood	Missouri				.03	.32								.16	.11	.40	.28										T.		.08			.18	1.96	
Greenfield	Nodaway				.04	.20			T.					.18	.11	.82	.62						.04	.18			.52	T.	.26		.06		3.03	
Indianola	Des Moines					T.	.55	.17		T.	T.			.12	.03	1.10	1.23	T.			T.						.31	.10	.37				3.98	
Keokuk**	Mississippi					T.	.47		.18	T.				.09	.20	.34	.46	.01				.01	.56				.88	.37	.33	.01			3.91	
Keosauqua	Des Moines					.42	.07	.81	T.					.14	.11	.27	1.77										.68	.24	.48	.10			5.09	
Knoxville	Des Moines					T.	.95	.22		T.				.14	.15	.73	1.80	T.			T.						.45	.24	T.		T.		4.68	
Laena	Des Moines				.08	.91	.09			.98	.02	.10		.09		1.10	.80	.10									.14	.40	.04				3.95	
Lamoni	Grand				.01	.23	.16	.05						.33	T.	.61	.32					.02					.51	.08	T.		.03		.15	3.54
Lenox	Missouri					T.	.11		T.	T.				.15	.03	.63	1.40										.57		.05	.06		T.		3.00
Mt. Ayr	Grand				.02	.08	.11	.05	T.					.12	.11	.75	1.25										.42	T.	T.	.04		.05	3.00	
Mt. Pleasant	Skunk					.68	.07	.59	T.					.16	.15		2.44						.01				1.34	.55	.62	.08			6.69	
Murray	Grand				.05	.21	.12	T.	T.					.17	.01	.92	.78										.42		.04		.02		2.75	
Oakland	Nishnabotna				.07	.15								.33	T.	.61	.32					.17					.22		.31				2.18	
Oskaloosa	Des Moines				.12	.23	.05	.05	.02	T.				.22	.13	.75	2.32	.03					.03				.53	.40	.37	.03			5.28	
Ottumwa	Des Moines				.10	.20	.53	.08						.50	.05	T.	2.00	.80	T.								1.00	.70	.05				6.01	
Pella	Skunk					.76	.15		T.					T.	.21	.06	.80	1.46	T.								.10	.24	.27	.08	T.	T.	4.18	
Sigourney	Skunk					.24		.74	T.					.08	.07	.41	2.63	.07									.70	.36	.70	T.			6.04	
Stockport	Skunk					.49	.04	.73						.29	.12	.08	1.47	.02									.67	.26	.45				4.65	
Thurman	Missouri					T.	.10	.42		T.				.22	.26	.28	.68	.61									.10		T.	T.		.15	3.03	
Washington	Skunk					.38	.28	.60						.79		.11	1.58	.54									.63	.76	.04				5.71	
Winterset	Des Moines					.29	.24		T.					.10		.80	.90										.59	T.	.35	.21		.01	3.51	
Omaha, Nebr.**	Missouri				.13	.04			T.					.09	.22	.19	.45	.10									.12		.19	.02		.01	2.13	

Except as otherwise indicated, observations are generally made late in the afternoon, near sunset, and precipitation recorded is for 24 hours ending at the time of observation.

- |||Precipitation measured in the morning; amount then recorded is for the preceding 24 hours.
- \*\*Regular Weather Bureau Station; precipitation is for 24-hour period, midnight to midnight.
- \*Incomplete.
- \*Precipitation included in the next following measurement.

SNOW.

The average snowfall for the State was 3.6 inches, or 1.8 inches above the normal. The average by divisions were: Northern, 0.7 inch; central, 4.1 inches; southern, 6.1 inches. The greatest amount, 20.0 inches occurred at Bedford. Practically all the snow fell during the storm of the 15th-16th.

Sleet: 9th, 14th, 15th, 16th.  
Thunderstorms: 4th, 5th, 6th, 7th, 8th, 11th, 13th, 16th, 18th, 20th, 24th, 25th, 27th.

SUNSHINE AND CLOUDINESS.

The average per cent of the possible amount of sunshine was 58, or 2 per cent below normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows. Charles City, 44; Davenport, 62; Des Moines, 60; Dubuque, 56; Keokuk, 63; Sioux City, 55; Omaha, Neb., 66.

RIVERS

The stage of the Mississippi varied but little except at Keokuk, where a material rise occurred, beginning on the 15th and extending till the 24th. A rise set in on the Missouri during the latter part of the first week and rising stages prevailed for several days after which there was a gradual decline. On the interior rivers moderate stages prevailed with a moderate rise in the lower reaches after the heavy rain and snow of the 15th-16th.

MISCELLANEOUS PHENOMENA.

- Aurora: 1st, 6th.
- Dust Storms: 3d, 4th, 8th, 11th.
- Fog: 21st.
- Hail: 4th, 6th, 8th, 12th, 16th, 20th, 21st, 24th, 25th, 26th, 27th.
- Halos (lunar or solar): 1st, 2d, 5th, 7th, 12th, 16th, 19th, 27th.
- Parhelia: 7th.
- Rainbow: 5th.

ERRATA.

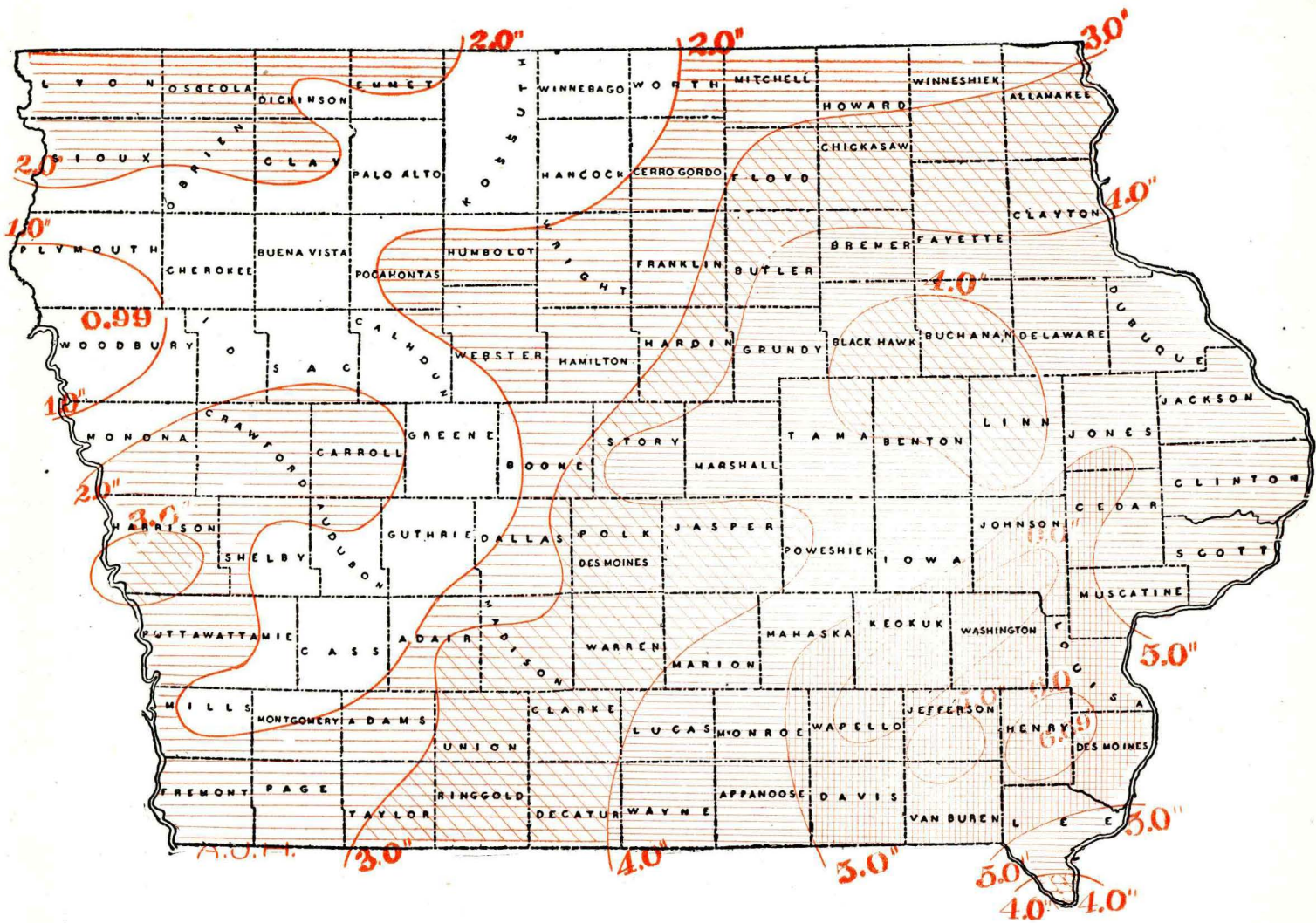
Report for March, 1921: Page 18, Charles City, mean temperature published 38.4, should be 38.5 and departure should be +10.1°. Page 22, Charles City, maximum temperature on 8th published 32°, should be 35°. Mean of maximum temperatures published 48.0°, should be 48.1°.

Daily Maximum and Minimum Temperatures for the Month of April, 1921.

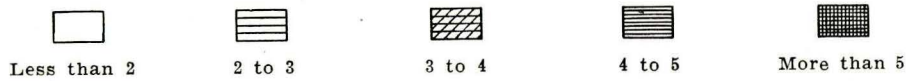
Table with columns for Stations, days 1-31, and Mean. Rows are categorized by Northern Division, Central Division, and Southern Division, listing various Iowa cities and their daily temperature ranges.

a, b, c, etc., indicate respectively 1, 2, 3, etc., days missing from record.

# TOTAL PRECIPITATION, APRIL, 1921



Scale of Shades—in Inches.



# CLIMATOLOGICAL DATA.

## IOWA SECTION

In cooperation with  
IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXII DES MOINES, IOWA, MAY, 1921 No. 5

### GENERAL SUMMARY.

Normal April weather continued till the middle of May, though the period 5th to 12th, inclusive, was slightly warmer than the normal. Freezing temperatures occurred in all divisions of the State and frosts were general over most of the State on the 2d, 3d, 4th, 14th, 15th and 16th and ice one-fourth inch thick was reported from many places on the 2d, 3d, 14th and 15th. Truck crops and gardens were injured and small fruit suffered considerably on account of the hard freezes. On the 17th a warm period set in and during the remainder of the month the temperature was continuously above normal, making the mean temperature for the State nearly three degrees above normal and the ninth consecutive month that the mean temperature for the State has been above normal. Temperatures of 90°, or higher, were reported from all portions of the State and at some stations the high record for May was equaled or exceeded.

Precipitation was very unevenly distributed. There was a decided excess over the northern division, where every station except Washta had an excess, while in the central and southern divisions all but five stations showed a deficiency. Over most of the southern division and portions of the central division very little rain fell after the 11th, and at the close of the month drouth had injuriously affected the hay crop and the hot, dry weather had caused small grain to head short and the prospect for a good crop had diminished. The excessive rains in the northern division prevented the cultivation of corn and allowed the weeds to get a good start, but over most of the State the corn fields were generally clean. Corn planting progressed favorably, 58 per cent having been planted on May 15th and 97 per cent by June 1st. The greater portion of the corn had been cultivated once at the close of the month and about one-fourth the second time. The stand is unusually good and practically the only replanting necessary is due to the excessive rains over the northern division. The percentage condition June 1st, 99.5, is the highest since 1914. Potatoes were in good condition.

A number of violent windstorms were reported. A small tornado occurred on the afternoon of the 9th along the line of Mahaska and Winneshiek Counties. Very little damage resulted, as the base of the funnel touched the earth at only a few places and no buildings were in its path. Violent winds were active on the afternoon of May 24th in some of the northwestern counties and in the vicinity of Pocahontas County tornadic characteristics were present. Considerable damage was done to farm buildings over a large area. On the afternoon of May 26th unusually severe storms occurred over many counties in the northeastern portion of the State, but the greatest damage from the wind, which was accompanied by very heavy rainfall, was in the vicinity of Clear Lake and Plymouth in Cerro Gordo County and Manly in Worth County. Five persons lost their lives, many more were injured, and the property loss was nearly a half million dollars. Violent wind

squalls occurred over a large area, but a well-defined tornado developed in the vicinity of Plymouth and Manly and the destruction in the path was nearly complete. Some property loss was also caused by small streams overflowing in the area covered by the windstorms. Strong winds with tornadic characteristics also occurred in the south-central division on May 30th. The damage was principally unroofed buildings and uprooted trees.

F. L. D.

### PRESSURE.

The mean pressure (reduced to sea level) for the State was 30.01 inches. The highest recorded was 30.43 inches, at Sioux City, on the 2d, and the lowest was 29.46 inches, at Sioux City, on the 26th. The monthly range was 0.97 inch.

### TEMPERATURE.

The mean temperature for the State, as shown by the records of 94 stations, was 63.3°, or 2.8° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 61.2°, or 2.2° higher than the normal; Central, 64.0°, or 3.3° higher than the normal; Southern, 64.6°, or 2.9° higher than the normal. The highest monthly mean was 66.7°, at Cedar Rapids, and the lowest was 59.3°, at Estherville. The highest temperature recorded was 99° at Cedar Rapids, on the 24th, and the lowest was 25°, at West Bend, on the 3d. The temperature range for the State was 74°.

### HUMIDITY.

The average relative humidity for the State at 7 a. m. was 75 per cent, and at 7 p. m. it was 57 per cent. The mean for the month was 66 per cent, or about 2 per cent below the normal. The highest monthly mean was 72 per cent, at Charles City, and the lowest was 60 per cent, at Keokuk.

### COMPARATIVE DATA FOR THE STATE—MAY.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With precipitation .01 in.	Clear	Partly cloudy	Cloudy
1890	57.7	-2.8	90	26	3.56	-1.01	6.44	1.61	-----	9	10	13	8
1891	58.3	-2.2	94	21	3.18	-1.39	7.10	1.46	-----	8	14	9	8
1892	54.0	-6.5	88	29	8.77	+4.20	12.64	4.87	T.	16	5	9	17
1893	56.6	-3.9	96	26	3.45	-1.12	5.82	1.65	0	9	13	9	4
1894	61.1	+0.6	96	22	1.87	-2.70	4.77	0.33	0	6	17	10	4
1895	61.7	+1.2	104	24	3.19	-1.38	5.79	0.84	0	9	11	12	8
1896	65.5	+5.0	100	34	6.69	+2.12	11.79	3.40	0	12	11	12	8
1897	58.5	-2.0	96	20	1.92	-2.65	3.59	0.21	0	5	16	10	5
1898	59.6	-0.9	92	26	4.67	+0.10	7.82	2.22	0	12	9	10	12
1899	60.2	-0.3	90	27	6.23	+1.66	11.47	3.09	0	13	9	12	10
1900	63.2	+2.7	98	22	3.31	-1.26	6.98	0.96	0	8	14	10	7
1901	60.7	+0.2	95	28	2.35	-2.22	4.57	0.72	0	7	16	9	6
1902	63.8	+3.3	97	25	5.39	+0.82	18.04	0.87	0	13	10	12	9
1903	61.6	+1.1	91	24	8.55	+3.98	15.45	2.88	0	16	9	12	10
1904	59.6	-0.9	93	27	3.78	-0.79	8.15	1.50	0	8	13	10	8
1905	58.3	-2.2	88	28	5.95	+1.38	10.83	2.57	0	14	12	11	8
1906	60.8	+0.3	95	24	3.54	-1.03	10.72	0.89	0	11	13	10	8
1907	53.5	-7.0	96	14	3.48	-1.09	7.68	0.71	1.0	10	11	10	10
1908	59.4	-1.1	93	13	8.34	+3.72	14.33	1.33	0	15	9	11	11
1909	57.9	-2.6	97	18	4.34	-0.23	7.85	1.86	0.1	9	12	12	7
1910	55.4	-5.1	89	18	3.41	-1.16	6.91	1.29	T.	10	15	7	9
1911	64.9	+4.4	98	23	3.76	-0.81	8.73	0.42	0.7	9	16	9	6
1912	62.7	+2.2	97	29	3.33	-1.24	6.41	0.72	0	10	14	11	6
1913	59.4	-1.1	102	30	6.24	+1.67	10.25	3.14	0	13	11	8	12
1914	62.2	+1.7	98	25	3.31	-1.26	6.90	0.30	T.	10	14	11	6
1915	56.1	-4.4	90	25	7.34	+2.77	13.21	2.82	T.	14	9	9	13
1916	59.9	-0.6	94	27	4.93	+0.36	10.44	2.14	T.	12	13	10	8
1917	55.1	-5.4	95	18	3.87	-0.70	7.33	1.69	0.6	10	15	8	8
1918	64.9	+4.4	98	25	6.87	+2.30	11.98	2.72	T.	13	13	11	7
1919	58.2	-2.3	93	30	3.11	-1.46	7.14	0.73	0	9	13	11	7
1920	59.4	-1.1	89	29	3.26	-1.31	5.73	0.62	0	8	14	9	8
1921	63.3	+2.8	99	25	4.23	-0.34	9.41	1.32	0	10	14	10	7

T. indicates an amount too small to measure, or less than .005 inch precipitation and less than .05 inch snowfall.



Climatological Data for May, 1921.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.						Precipitation, in Inches.				Number of Days.			Observers.			
				Mean.	Departure from normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from normal.	Greatest in 24 hours.	Total snowfall, unmelting.	Precipitation .01 in. or more.	Clear.		Partly cloudy.	Cloudy.	Prevailing direction of wind.
<b>Northern Division</b>																				
Algona	Kossuth	1,213	48	61.4	+ 2.1	89	22†	28	3	31	9.41	+5.29	2.79	0	12	20	4	7	se.	W. E. Laird.
Allison	Butler	1,044	9	62.1	---	92	22	30	15†	33	4.59	---	1.10	0	11	6	11	14	se.	J. A. Bell.
Alta	Buena Vista	1,513	30	61.4	+ 2.4	90	29	30	14	32	6.50	+1.48	1.40	0	16	12	12	7	nw.	David E. Hadden.
Alton	Sioux	1,305	16	61.4	+ 1.9	92	29	28	3†	37	6.95	---	2.46	0	12	9	11	11	se.	W. S. Slagle.
Belmond	Wright	1,205	11	62.0	---	91	29	29	3†	36	5.06	---	0.96	0	18	7	15	9	s.	Geo. P. Hardwick.
Britt†	Hancock	1,236	24	61.2	+ 2.8	91	22	28	3	40	6.06	+1.34	1.97	0	11	15	8	8	se.	L. M. Goodman.
Charles City	Floyd	1,015	30	61.2	+ 1.7	91	22	31	16	31	5.96	+1.02	1.64	0	11	8	15	8	se.	U. S. Weather Bureau.
Decorah	Winneshiek	875	28	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Wm. F. Baker.
Elkader	Clayton	751	42	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Carl Reincke.
Estherville	Emmet	1,298	26	59.3	+ 1.7	87	22†	29	3†	40	5.90	+0.83	1.10	0	11	12	16	3	nw.	A. O. Peterson.
Fayette	Fayette	1,003	31	61.8	+ 3.8	91	22	29	16	35	8.86	+3.80	2.29	0	14	15	8	8	se.	R. Z. Latimer.
Forest City	Winnebago	1,226	27	61.1	+ 2.6	90	22†	30	3	31	6.04	+1.55	1.62	0	13	7	18	6	nw.	Dr. M. B. Neil.
Humboldt	Humboldt	1,095	33	63.1	+ 3.7	94	29	28	3	37	4.80	+0.40	1.07	0	9	10	10	11	s.	H. C. Snitkey.
Inwood	Lyon	1,474	17	60.2	+ 1.1	89	21†	26	14	35	5.95	+2.05	1.44	0	14	15	7	9	s.	F. B. Hanson.
LeMars	Plymouth	1,224	25	61.6	+ 1.7	90	29	27	3	35	5.46	+0.96	1.34	0	15	16	7	8	se.	Mrs. M. C. Woolley.
Mason City	Cerro Gordo	1,148	24	60.8	+ 2.0	91	22†	26	16	38	7.15	+2.49	1.57	0	15	11	13	7	se.	Northern Sugar Corp.
Milford (near)	Dickinson	1,430	1	59.4	---	86	22	30	2†	28	5.70	---	1.08	0	16	10	13	8	se.	Dr. F. J. Smith.
New Hampton	Chickasaw	1,169	24	61.3	+ 2.8	91	22	31	3†	31	8.17	+3.50	2.19	0	14	11	12	8	se.	A. F. Kemman.
Nora Springs	Floyd	1,064	9	62.0	---	91	22	29	16	36	7.02	---	1.16	0	14	11	13	7	s.	Arthur Betts.
Northwood	Worth	1,222	25	61.1 <sup>a</sup>	+ 2.7	89 <sup>a</sup>	29	28 <sup>a</sup>	16	34 <sup>a</sup>	9.26	+4.17	3.00	0	13	13	10	8	nw.	Chas. Dwellie.
Pocahontas	Pocahontas	1,248	17	61.9	+ 2.6	93	29	29	3	36	5.54	+1.25	1.45	0	13	14	9	8	se.	F. E. Hronek.
Postville	Clayton	1,180	22	60.4	+ 1.7	86	22	32	2†	29	7.68	+2.38	1.43	0	14	10	12	9	se.	F. L. Williams.
Rock Rapids	Lyon	1,358	22	60.6	+ 2.1	90	22	29	3†	39	7.17	+3.73	1.16	0	16	16	8	7	nw.	J. K. Medberry.
Sanborn	O'Brien	1,553	7	60.8	---	93	29	28	14	35	5.56	---	1.18	0	14	15	7	9	se.	James W. Dow.
Sioux Center	Sioux	1,426	22	60.0	+ 1.2	88	29	27	14	35	7.08	+2.59	1.60	0	15	14	6	11	s.	J. de Ruyter.
Spencer	Clay	1,319	7	61.3	---	93	29	27	2	37	5.38	---	1.25	0	15	11	11	9	se.	E. W. Little.
Storm Lake	Buena Vista	1,440	32	61.8	+ 2.5	90	29	30	3	37	4.15	+0.11	1.14	0	11	20	4	7	se.	Geo. H. Fracker.
Washta	Cherokee	1,157	23	61.3	+ 2.3	89	21†	26	3	42	4.18	-0.97	0.81	0	14	14	8	9	s.	H. L. Felter.
Waverly	Bremer	848	25	62.2	+ 2.3	91	22	32	3	30	5.49	+0.97	2.03	0	12	13	12	6	w.	E. M. Weyrauch.
West Bend	Palo Alto	1,197	28	61.7	+ 2.5	92	29	25 <sup>a</sup>	3	41 <sup>a</sup>	6.52	+2.35	1.53	0	10	---	---	---	---	Jos. Dorweiler.
Means and extremes.	---	---	---	61.2	+ 2.2	94	29	25 <sup>a</sup>	3	42	6.35	+1.87	3.00	0	13	12	11	8	se.	---
<b>Central Division</b>																				
Ames	Story	926	45	63.7	+ 2.5	95	29	30	3	36	2.81	-1.96	1.20	0	10	19	8	4	sw.	Iowa State College.
Audubon†	Audubon	1,301	27	63.0	+ 2.8	94	29	29	2†	34	1.91	-2.50	0.68	0	6	13	15	3	s.	Geo. Kibby.
Baxter	Jasper	998	21	63.8	+ 3.2	90	23†	30	3	31	2.53	-2.77	0.87	0	7	14	10	7	s.	Rev. Paul Traeger.
Belle Plaine†	Benton	886	31	64.9	+ 4.5	94	22	31	3	35	4.28	-0.35	1.25	0	12	10	10	11	se.	O. C. Burrows.
Boone	Boone	1,134	16	64.0	+ 4.3	93	29	30	3	34	3.41	-1.71	1.07	0	12	13	10	8	s.	Carl F. Henning.
Carroll	Carroll	1,265	31	62.9	+ 3.7	92	29	31	3†	35	7.11	+2.44	2.00	0	12	16	6	9	se.	Mrs. Jos. J. Wolfe.
Cedar Rapids	Linn	733	39	66.7	+ 5.4	99	24	36	3†	34	2.48	-2.01	1.05	0	7	15	10	6	s.	R. S. Toogood.
Clinton	Clinton	593	48	65.2	+ 3.7	95	24	32	16	34	2.14	-2.48	0.98	0	9	18	6	7	s.	Dr. A. P. Bryant.
Davenport	Scott	580	50	65.6	+ 4.1	92	30	37	2	28	2.69	-1.50	1.22	0	7	11	8	12	e.	U. S. Weather Bureau.
Delaware	Delaware	1,083	30	61.8	+ 2.9	89	22†	31	16	29	5.34	+0.84	1.26	0	10	15	12	4	s.	Nettie E. Ball.
Denison	Crawford	1,180	27	63.2	+ 3.3	89	23†	31	2†	34	6.05	+1.85	2.59	0	13	14	11	6	s.	V. L. Byers.
Des Moines	Polk	861	43	65.4	+ 3.8	93	29	36	3	30	3.62	-0.94	1.19	0	8	7	13	11	sw.	U. S. Weather Bureau.
Dubuque	Dubuque	631	48	63.6	+ 3.2	91	23	35	16	30	2.26	-2.06	0.62	0	11	7	18	16	s.	U. S. Weather Bureau.
Fort Dodge†	Webster	1,114	21	62.5 <sup>a</sup>	+ 2.8	94 <sup>a</sup>	29	29 <sup>a</sup>	3	39 <sup>b</sup>	5.82	+0.49	2.36	0	11	13	7	11	s.	Fred Heman.
Grinnell	Poweshiek	1,031	27	63.2 <sup>a</sup>	+ 1.8	91 <sup>a</sup>	23†	31 <sup>a</sup>	3	31 <sup>a</sup>	3.07	-1.58	1.34	0	8	---	---	---	---	Wm. Bader.
Grundy Center	Grundy	976	30	64.0	+ 3.5	92	22†	32	2†	34	3.14	-1.77	0.82	0	10	14	13	4	nw.	M. G. Heiberger.
Guthrie Center	Guthrie	1,077	26	62.6	+ 1.2	91	29	30	3	34	2.94	-1.81	0.80	0	8	9	15	7	s.	E. L. Nesselroad.
Harlan	Shelby	1,192	22	63.3	+ 3.1	95	29	29	3	38	2.47	-2.05	0.59	0	10	22	6	3	s.	W. K. Colburn.
Independence	Buchanan	921	57	62.8	+ 3.2	90	23	31	3†	33	2.44	-1.80	0.62	0	9	18	1	12	se.	Dr. Geo. Boddy.
Iowa City	Johnson	733	61	64.6	+ 3.7	92	23†	32	16	35	4.44	-0.01	2.73	0	11	9	11	11	sw.	Prof. J. F. Reilly.
Iowa Falls	Hardin	1,107	28	62.3	+ 3.8	90	22	28	16	35	3.98	-0.62	0.98	0	11	13	11	7	sw.	J. B. Parmelee.
Jefferson	Greene	1,052	22	63.0	+ 2.0	93	29	30	3†	36	3.56	---	1.16	0	11	13	3	15	sw.	Will I. Lyon.
Le Claire	Scott	576	21	---	---	---	---	---	---	---	2.09	-1.97	0.72	0	7	---	---	---	---	Margaret T. Disney.
Little Sioux	Harrison	1,040	16	64.4	+ 2.4	94	29	28	3	39	3.25	---	1.29	0	10	13	9	9	se.	Geo. H. Gibson.
Logan	Harrison	1,035	54	64.4	+ 2.8	92	29	31	3	34	3.96	-0.24	1.29	0	8	15	11	5	sw.	Mary Jean Stern.
Maquoketa	Jackson	688	20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Marshalltown	Marshall	947	29	65.0	+ 4.5	94	29†	32	3	32	2.81	-1.70	1.01	0	12	18	12	1	sw.	O. C. Pigman.
Monroe	Jasper	922	9	66.0	---	96	29†	33	2	35	2.50	---	1.33	0	8	24	0	7	s.	J. A. Dibel.
Muscataine	Muscataine	554	61	---	---	---	---	---	---	---	2.59	-1.81	0.65	0	10	---	---	---	---	Wm. P. Molis.
Olin†	Jones	760	22	64.2 <sup>a</sup>	+ 3.7	94 <sup>a</sup>	23†	31 <sup>a</sup>	16	34 <sup>a</sup>	3.70	-1.00	1.00	0	7	---	---	---	---	Dr. F. W. Port.
Onawa	Monona	1,051	21	---	---	94 <sup>f</sup>	29	30 <sup>f</sup>	15	35 <sup>f</sup>	3.40	-1.56	1.59	0	6	---	---	---	---	Mrs. H. E. Colby.
Perry	Dallas	975	20	63.6 <sup>b</sup>	+ 2.2	93 <sup>c</sup>	29	30	3	36 <sup>c</sup>	2.86	-2.19	0.66	0	10	16	12	3	s.	F. N. Bartlett.
Rockwell City	Calhoun	1,134	25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	A. W. McIsaac.
Sac City	Sac	1,344	45	61.2 <sup>b</sup>	+ 1.2	90 <sup>b</sup>	29	30 <sup>c</sup>	3	35 <sup>c</sup>										

Climatological Data for May, 1921—Continued.

Main climatological data table with columns for Stations, Counties, Elevation, Length of record, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Total snowfall, unmelting, Precipitation .01 in. or more, Clear, Partly cloudy, Cloudy), and Observers.

The departure from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete records are used in determining means.

Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example, b represents two days, etc.

†Also other dates. ‡Received too late to be included in means and summaries.

T., Precipitation is less than 0.01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE.

Table with columns for Stations, Barometric Pressure (Inches Sea Level), Relative Humidity (%), Wind (Total movement, Average hourly velocity, Miles, From, Date), and Sunshine (Per cent of possible, Departure from normal).

\*Dubuque. §Omaha. ¶Sioux City. †Local mean time. ‡And other dates.

PRECIPITATION.

The average precipitation for the State, as shown by the records of 101 stations, was 4.23 inches, or 0.34 inch less than the normal. By divisions the averages were as follows: Northern, 6.35 inches, or 1.87 inches more than the normal; Central, 3.40 inches, or 1.19 inches less than the normal. The greatest amount, 9.41 inches, occurred at Algona, and the least, 1.32 inches, at Winterset. The greatest amount in 24 consecutive hours, 3.00 inches, occurred at Northwood, on the 26th.

WIND.

The prevailing direction of the wind was from the south. The average hourly velocity was 7.8 miles, or 0.9 mile less than the normal. The highest velocity reported from a regular Weather Bureau station was at the rate of 48 miles an hour, from the southwest, at Sioux City, on the 18th.





Daily Precipitation for May, 1921—Continued.

Stations.	Drainage Basin.	Day of Month.																															Totals
		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	
<i>Southern Division</i>																																	
Afton	Grand	.80	.10				.02	.05	.14	1.10	.10																		.14	.08	.16	2.69	
Albia	Des Moines	1.00					T.	.33	1.57	.34							T.										.05		.10	.62	4.01		
Atlantic	Nishnabotna	.14	.17				.05	.40	.28	.85	.07	.02						T.		.41						.12	2.01				4.52		
Bedford	Missouri	.30					.17	.37	.38	.72	.37																T.	.08		.01	2.40		
Bloomfield	Mississippi	.91	.90				.06	.19	.60		.51															.05	.25			.57	4.04		
Bonaparte	Des Moines		.59							.30	.05	T.														.19				.23	1.36		
Burlington	Mississippi		.55						T.	.01	.38															.04	.35	.63			1.96		
Centerville	Chariton	.57	.68					.05	.35	.54	.54														.19				T.		2.92		
Chariton	Chariton	1.50	T.					T.	.20	.82	.15															T.		T.		.35	3.02		
Clarinda	Nodaway	.23	.07				.06	.37		.96	.05	.15													.16		.02			.18	2.25		
Columbus Jet	Iowa								T.	.82	.56	T.						T.									.62	.23			2.23		
Corning	Nodaway	.38					.15	.44	.27	.74	.05															.37	T.		.45		2.85		
Corydon	Chariton	1.06	.21				T.	.47	.60	.20	T.															T.		.06	.32	.24	3.16		
Creston	Missouri		.75					.06	.46	1.44	.01	.11										.03				T.				.05	2.91		
Cumberland	Nodaway	.28					.30	.10			.10								T.							.10				1.30	2.18		
Earlham	Des Moines	.96	.02					.08	.12	.77	.05																	.11		T.	.24	3.14	
Fairfield	Skunk	2.35	.05					T.	.03	.83	.06	.02														.03				T.	3.70		
Fairport	Mississippi	.03							.43	1.34	.12															1.37		.05			3.34		
Glenwood	Missouri	.40					.50	1.20	.15	.20	.08									.30											3.10		
Greenfield	Nodaway	.87					.15	.16	.57	.82	.07							T.		.09							.22	.05		.27	3.00		
Indianola	Des Moines	1.30	.07					.13	.05	.60	.02																T.		1.55	.08	3.80		
Keokuk***	Mississippi	.69	.05					T.	T.	.35	.03	T.															.60				1.72		
Keosauqua	Des Moines	.75	.47					T.		.48	.02	.04															.16			.30	2.22		
Knoxville	Des Moines																																
Lacona	Des Moines	1.93	.09				.01	.01	.18	.75																	.01	.01		.18	3.17		
Lamoni	Grand	.32	.28				T.	.05	.57	1.10	.35	.11																.02			.33	3.13	
Lenox	Missouri	.56					.18	.38	.35	.85	.09							T.									.19			.53	3.13		
Mt. Ayr	Grand	.53	.02				.10	.22	.31	2.30	.05																T.	.02	T.		.84	4.39	
Mt. Pleasant	Skunk	.43	.32						T.	.09	.14	T.																.10	.27	.02		1.37	
Murray	Grand	.88	.13				.01	.02	.15	.82	.20																.19			.28	.07	2.75	
Oakland	Nishnabotna	.32					.15	.78		.45										.42		T.						T.	.90		3.02		
Oskaloosa	Des Moines	.85	.21					.02	.35	1.88	.22	.23						T.									.41	.24		.67	.04	5.12	
Ottumwa	Des Moines	1.30						.10	1.90	.35																		.50	.18		.10	4.43	
Pella	Skunk	.98						T.	.17	.82	.08	T.															T.	.07	.19	.54	.10	.75	3.70
Sigourney	Skunk	.76	.12					T.	.09	.75	.35	.21							T.								.04	.10			T.	2.42	
Stockport	Skunk	.80	.37							.45	.09	.03																.21	.03			.05	2.03
Thurman	Missouri	.39	T.				.55	1.60		.06	T.																T.	.21		.15		3.01	
Washington	Skunk	.30							.10	1.31	1.21		.26															.55	.37			4.09	
Winterset	Des Moines		.08					T.	.06	T.	1.03	.06																.06			T.	T.	1.32
Omaha, Nebr.***	Missouri	.30					.44	1.19	.04	.45								.65		.24							.36	T.	T.	.11		3.18	

Except as otherwise indicated, observations are generally made late in the afternoon, near sunset, and precipitation recorded is for 24 hours ending at the time of observation.

- |||Precipitation measured in the morning; amount then recorded is for the preceding 24 hours.
- \*\*\*Regular Weather Bureau Station; precipitation is for 24-hour period, midnight to midnight.
- \*\*Incomplete.
- \*Precipitation included in the next following measurement.

SUNSHINE AND CLOUDINESS.

The average per cent of the possible amount of sunshine was 65, or about 3 per cent more than the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 49; Davenport, 72; Des Moines, 70; Dubuque, 62; Keokuk, 70; Sioux City, 59; Omaha, Neb., 76.

MISCELLANEOUS PHENOMENA.

- Aurora: 3d, 13th, 14th, 15th, 16th, 17th, 25th, 29th, 31st.
- Fog: 18th.
- Frost: 2d, 3d, 4th, 14th, 15th, 16th.
- Hail: 9th, 10th, 12th, 19th, 21st, 22d, 23d, 24th, 25th, 26th, 27th, 30th, 31st.
- Halos: 10th, 11th, 16th, 17th, 18th, 19th, 22d, 25th, 26th.
- Rainbows: 9th, 24th, 25th, 30th, 31st.
- Thunderstorms: 1st, 8th, 9th, 10th, 11th, 12th, 17th, 18th, 19th, 20th, 21st, 22d, 23d, 24th, 25th, 26th, 27th, 29th, 30th, 31st.
- Tornado: 9th, 24th, 26th.

RIVERS.

Moderate stages prevailed on all rivers. The principal rise on the Missouri began during the latter part of the third week and continued till near the end of the month. Two moderate rises occurred on the Mississippi, one at the close of the first week, and the other at the beginning of the third week. On the interior rivers a general and gradual rise began the latter part of the third week and continued till the end of the month.

A REMARKABLE AURORA.

The aurora that occurred on the night of the 14th-15th was beautiful beyond description. The display was unusually brilliant between 9 p. m. and 10 p. m. of the 14th and between 2 a. m. and 3 a. m. of the 15th. The outstanding feature was the converging of a vast system of streamers at a point about 10 degrees south of the zenith that was constantly changing in color, almost continuous in motion, either pulsations or weaving back and forth as if blown by a breeze. The usual brilliant arc was absent during the early part of the display, but an arc of intensely purple color occupied the northern portion of the sky which was replaced by the usual arc of light about 10 p. m. from which violent pulsations radiated till the aurora was too indistinct to be noted. The telegraphic service was almost entirely suspended during the period of the most intense display. The display was universally observed and was declared to be the most remarkable that was ever observed. Lesser and gradually diminishing displays occurred on the two following nights.

ERRATA.

Report for April, 1921: Page 26; Dubuque, mean temperature published 52.1°, should be 52.2° and the departure should be +3.3°; page 30; Dubuque, maximum temperature on the 22d published 57°, should be 58° and the mean of the maximum should be 61.7°.

Daily Maximum and Minimum Temperatures for the Month of May, 1921.

Table with columns for Stations, days 1-31, and Mean. Rows are categorized by Northern and Southern Divisions, listing various Iowa cities and their daily temperature ranges.

a, b, c, etc., indicate respectively 1, 2, 3, etc., days missing from record.

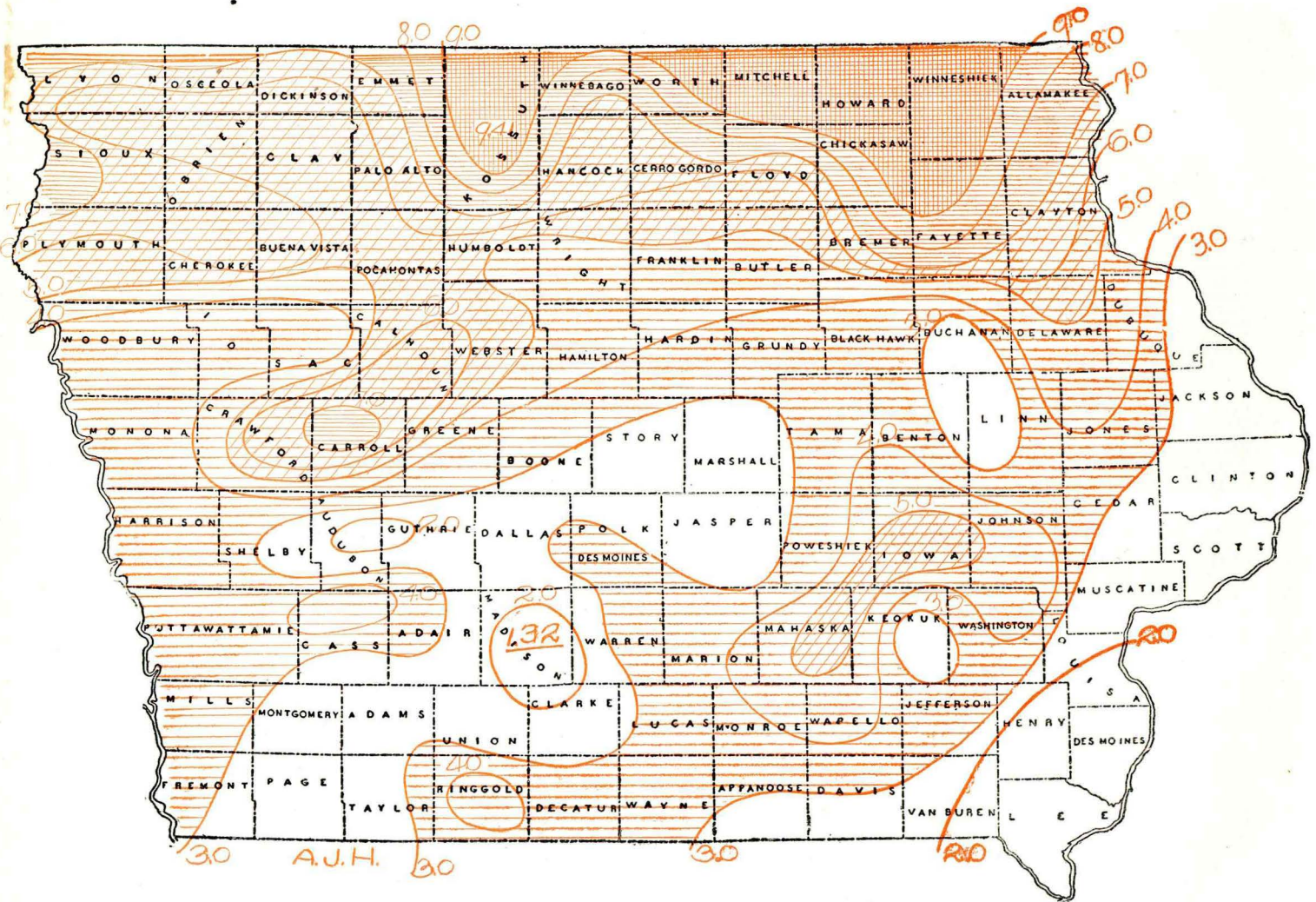
HAIL STORMS DURING APRIL, 1921

Date	County	Township	Direction From	Width of Path	Area Covered	Character	Size of Stones	Damage
6	Pocahontas	Curtis Center	S. W.	5 miles	15 sq. mi.	Light	Peas to Hazel Nuts	None
19	Louisa	Columbus City	S.	-----	-----	Light	Small	None
25	Lee	Jefferson	N. W.	6 miles	32 sq. mi.	Moderate	1/2 inch	None
25	Louisa	Columbus City	-----	-----	-----	Light	1/4 inch	None
25	Iowa	Troy	S. W.	6 miles	36 sq. mi.	Light	Peas	None
25	Iowa	Pilot	S. W.	6 miles	36 sq. mi.	Light	Small	None
25	Wapello	Pleasant	S. W.	1 mile	3 sq. mi.	Light	3/8 inch	None
25	Jones	Richland	S. W.	-----	-----	Light	Peas	None
25	Lee	Madison	N. W.	-----	-----	Light	Hazel Nuts	None
25	Jones	Wayne	W.	-----	-----	Light	Hazel Nuts	None
25	Linn	College	S. W.	3 miles	18 sq. mi.	Light	Hazel Nuts	None
26	Benton	El Dorado	N. W.	1 mile	6 sq. mi.	Light	1/4 inch	None
26	Lee	Greenbay	S. W.	-----	-----	Light	1/2 to 3/4 inch	None
27	Washington	Washington	N. W.	-----	-----	Light	Peas	None
27	Marion	Lake Prairie	S. W.	1 mile	3 sq. mi.	Light	Small	None
28	Lee	Greenbay	S. W.	-----	-----	Light	1/4 to 3/4 inch	None

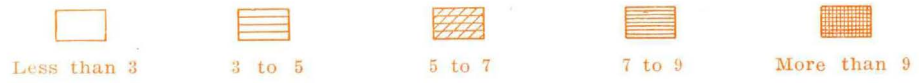
HAIL STORMS DURING MAY, 1921

9	Muscatine	Sweetland	E.	-----	-----	Moderate	3/8 inch	None
9	Monroe	Monroe	S.	2 miles	12 sq. mi.	Moderate	1/4 to 3/4 inch	None
9	Iowa	Pilot	S. W.	-----	-----	Light	Peas	None
9	Floyd	Rock Grove	W.	-----	-----	Light	Peas	None
9	Wapello	Central	N. W.	-----	-----	Heavy	Hazel Nuts	Slight
9	Wapello	Richland	N.	1 mile	1 sq. mi.	Light	1/2 inch	None
9	Poweshiek	Bear Creek	-----	-----	-----	Light	Small	None
9	Montgomery	Red Oak	S. W.	-----	-----	Light	Hazel Nuts	None
10	Bremer	Washington	S. E.	-----	-----	Light	Peas	None
10	Cedar	Springdale	S. W.	-----	-----	Heavy	1/4 inch	None
10	Muscatine	Sweetland	E.	-----	-----	Moderate	3/8 inch	None
10	Scott	Buffalo	E.	6 miles	36 sq. mi.	Light	Hazel Nuts	None
10	Benton	Iowa	S. E.	3 miles	18 sq. mi.	Light	Peas	None
10	Marion	Lake Prairie	S. E.	1 mile	2 sq. mi.	Light	Small	None
10	Pottawattamie	James	N. W.	3 miles	8 sq. mi.	Light	1 to 1 1/2 inches	Slight
12	Black Hawk	Barclay	N. W.	1 mile	4 sq. mi.	Light	1/2 inch	None
12	Tama	Perry	W.	2 miles	4 sq. mi.	Moderate	Marbles	Slight
17	Clayton	Cox Creek	N.	2 miles	12 sq. mi.	Light	Small	None
18	Clayton	Cox Creek	N. W.	3 miles	18 sq. mi.	Moderate	Hickory Nuts	Slight
23	Wright	Vernon	S. W.	1 mile	2 sq. mi.	Light	1/2 inch	None
23	Kossuth	Seneca	N. W.	2 miles	12 sq. mi.	Light	1 inch	None
23	Bremer	Douglas	S. W.	3 miles	13 sq. mi.	Heavy	Walnuts	None
23	Worth	Northwood	S. W.	3 miles	18 sq. mi.	Light	Peas to Hazel Nuts	Slight
23	Franklin	Grant	S. W.	1 mile	1 sq. mi.	Light	Beans	None
24	O'Brien	Union	W.	6 miles	36 sq. mi.	Moderate	1/2 inch	None
24	Buena Vista	Hayes	W.	6 miles	36 sq. mi.	Moderate	Hickory Nuts	None
24	Pocahontas	Swan Lake	N. W.	4 miles	18 sq. mi.	Light	1/2 inch	None
24	Buena Vista	Newell	S. W.	6 miles	36 sq. mi.	Heavy	Peas to Walnuts	Considerable
26	Harrison	Boyer	N.	-----	-----	Moderate	Large	Slight
26	Chickasaw	Wapello	S. W.	3 miles	18 sq. mi.	Light	Small	None
26	Floyd	Cedar	W.	-----	-----	Light	1/2 to 3/4 inch	Slight
26	Sac	Eden	S. W.	-----	-----	Moderate	1/2 to 3/4 inch	None
26	Plymouth	Elkhorn	-----	2 miles	4 sq. mi.	Light	Small	Slight
26	Sac	Jackson	S. W.	-----	-----	Light	1/2 inch	None
26	Mills	Glenwood	S. W.	2 miles	8 sq. mi.	Moderate	1/2 to 3/4 inch	None
26	Pocahontas	Swan Lake	S. W.	2 miles	7 sq. mi.	Light	1/4 to 1 inch	None
26	Crawford	Washington	N.	4 miles	24 sq. mi.	Light	1/2 inch	Considerable
26	Kossuth	Algona	S. W.	-----	-----	Light	1/4 inch	Slight
26	Worth	Hartland	S. E.	2 miles	12 sq. mi.	Moderate	1/2 to 3/4 inch	Slight
26	Worth	Lincoln	S.	1 mile	6 sq. mi.	Light	Small	None
26	Dickinson	Center Grove	S.	-----	-----	Light	1/4 to 1/2 inch	None
26	Appanoose	Caldwell	S. W.	-----	-----	Light	Hazel Nuts	None
26	Appanoose	Vermillion	S. W.	1 mile	4 sq. mi.	Moderate	1/4 to 1/2 inch	None
26	Winnebago	Norway	N. W.	-----	-----	Moderate	Small	None
26	Crawford	Stockholm	S. W.	3 miles	10 sq. mi.	Moderate	Marbles	None
26	Palo Alto	Silver Lake	S. W.	-----	-----	Light	Small	None
27	Hancock	Britt	S. W.	1 mile	5 sq. mi.	Light	Marbles	Slight
28	Lyon	Garfield	S. E.	2 miles	12 sq. mi.	Moderate	Robin Eggs	None
29	Ringgold	Liberty	S. W.	1 mile	3 sq. mi.	Light	1/4 inch	None
30	Winneshiek	Bloomfield	W.	6 miles	36 sq. mi.	Light	Dove Eggs	None
30	Marion	Lake Prairie	S.	-----	-----	Light	Peas	None
31	Fayette	West Union	S. W.	3 miles	18 sq. mi.	Moderate	3/8 inch	None
30	Sac	Eden	S. W.	-----	-----	Moderate	1/2 inch	Slight
30	Marion	Swan	S. W.	-----	-----	Light	1/4 inch	None
31	Fayette	Fremont	S. W.	1 mile	3 sq. mi.	Light	Small	None

# TOTAL PRECIPITATION, MAY, 1921



Scale of Shades—in Inches.



# CLIMATOLOGICAL DATA.

## IOWA SECTION

In cooperation with  
IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXII DES MOINES, IOWA, JUNE, 1921 No. 6

### GENERAL SUMMARY.

The outstanding feature of the weather during June was the uniformly high temperature that prevailed during practically the entire month. The temperature was below normal from the 3d to the 6th, but after the 6th a hot period set in and during the rest of the month the temperature was considerably above the normal continuously and the mean for the State was with the exception of 1911, the highest mean of record. At a few stations having long records, the mean was the highest ever recorded in June and the mean for this June was 1.0° less than in 1911. This month makes a total of 10 consecutive months that the mean temperature for the State has been above normal and the average daily excess for the 10-month period has been nearly 5.6°, and the excess during the current year has been 7.1° daily.

The precipitation averaged below normal. Over practically the entire northern division there was a deficiency, and with the exception of two areas centered in Boone and Dallas Counties and from Tama to Jones counties, the same is true of the central division. Over most of the southern division there was a decided excess with the greatest amounts in Lucas, Marion, Mahaska and Keokuk counties. The distribution as to time was uniform over most of the State but the distribution as to amounts was very uneven, the greatest contrast being in the south-central portion. The lack of rain in portions of the State had an injurious effect on small grain, particularly oats, which were caused to head short and many fields were not worth harvesting. However the generally ample supply of moisture and the high temperatures caused corn to make phenomenal growth and it was generally conceded that the condition of that crop was farther advanced on June 30th than it had ever been before on the same date in the history of the State.

High winds were reported from a number of places on the 1st, 15th, 27th and 28th. None had tornadic characteristics but a small funnel cloud was observed at Knoxville, the base of which did not reach the earth. Considerable damage was done to growing crops and some fields were so badly blown down that it was impossible to harvest. Very little damage was done to farm buildings.

Hail storms were not as numerous as usual but an unusually destructive storm on the 28th covered a large area in the northwest portion of the State. The greatest damage was reported from Lyon and Pocahontas Counties. In Lyon County the greatest damage occurred in Centennial, Logan, Larchwood and Sioux Townships. All crops suffered but the principal damage was to small grain. In Pocahontas county approximately 25 sections in Center, Sherman, Lincoln and Grant Townships were hailed out. The principal damage was to oats and the loss over most of the area was from 25 per cent to 40 per cent of the crop but on many of the farms the loss to small grain was total. Considerable damage was caused

by locally heavy downpours at many places in the southern and central divisions.

F. L. D.

### PRESSURE.

The mean pressure (reduced to sea level) for the State was 29.95 inches. The highest recorded was 30.45 inches, at Dubuque, on the 4th, and the lowest was 29.56 inches, at Sioux City, on the 15th. The monthly range was 0.89 inch.

### TEMPERATURE.

The mean temperature for the State as shown by the records of 94 stations, was 74.7°, or 5.6° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 73.8°, or 6.2° higher than the normal; Central, 75.1°, or 5.8° higher than the normal; Southern, 75.3°, or 5.0° higher than the normal. The highest monthly mean was 77.5°, at Keokuk, and the lowest was 71.1°, at Postville. The highest temperature reported was 100°, at Alton on the 28th and 30th and Clarinda on the 30th, and the lowest was 40°, at Fayette, on the 5th. The temperature range for the State was 60°.

### PRECIPITATION.

The average precipitation for the State, as shown by the records of 98 stations, was 3.76 inches, or 0.62 inch less than the normal. By divisions the averages were as follows: Northern, 2.68 inches, or 1.75 inches less than the normal; Central, 3.66 inches, or 0.66 inch less than the normal; Southern, 4.93 inches, or 0.54 inch more than the normal. The greatest amount, 8.85 inches, occurred at Knoxville, and the least, 0.56 inch, at Alton. The greatest amount in 24 consecutive hours, 4.71 inches, occurred at Thurman, on the 1st and 2d.

COMPARATIVE DATA FOR THE STATE—JUNE.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	Clear	Partly cloudy	Cloudy
1890	72.7	+3.6	106	44	7.76	+3.38	16.53	1.57	-----	11	12	10	8
1891	69.1	0.0	99	37	5.39	+1.01	19.88	1.68	-----	11	8	10	12
1892	69.2	+0.1	102	42	5.19	+0.81	14.16	0.67	-----	10	12	11	7
1893	71.2	+2.1	100	40	3.91	-0.47	7.56	1.36	-----	8	15	11	4
1894	73.2	+4.1	104	34	2.67	-1.71	6.20	0.57	-----	7	16	10	4
1895	69.7	+0.6	102	34	4.32	-0.66	9.26	0.98	-----	10	11	11	5
1896	69.1	0.0	100	40	3.11	-1.27	7.89	0.81	-----	9	12	13	5
1897	69.1	0.0	103	29	3.81	-0.57	9.38	1.03	-----	10	10	12	8
1898	71.4	+2.3	99	42	4.72	+0.34	12.48	1.90	-----	9	13	10	7
1899	70.7	+1.6	100	42	5.04	+0.66	11.99	1.10	-----	10	12	13	5
1900	69.7	+0.6	102	38	3.98	-0.40	12.35	0.67	-----	5	17	10	3
1901	72.3	+3.2	106	30	3.71	-0.67	7.84	1.05	-----	9	15	11	4
1902	65.2	-3.9	97	32	7.16	+2.78	16.04	1.46	-----	14	8	11	11
1903	64.6	-4.5	96	30	2.86	-1.52	6.04	0.75	-----	10	13	10	7
1904	67.1	-2.0	94	35	3.45	-0.93	8.35	0.44	-----	7	13	10	7
1905	69.9	+0.8	100	36	5.53	+1.15	14.89	1.80	-----	10	12	11	7
1906	67.9	-1.2	99	37	3.92	-0.46	8.27	1.48	-----	8	15	10	5
1907	66.5	-2.6	98	36	5.35	+0.97	9.33	2.07	-----	11	14	9	7
1908	67.1	-2.0	94	35	5.66	+1.28	11.88	1.77	-----	13	12	10	8
1909	69.1	0.0	96	40	6.41	+2.03	13.30	2.80	-----	13	12	10	8
1910	69.5	+0.4	105	33	1.99	-2.39	5.51	0.05	-----	7	18	7	5
1911	75.7	+6.6	108	36	1.82	-2.56	6.28	0.06	-----	5	20	8	2
1912	66.2	-2.9	101	34	2.74	-1.64	5.71	0.76	-----	7	15	9	6
1913	71.5	+2.4	102	33	3.31	-1.07	8.95	0.74	-----	7	19	8	3
1914	72.2	+3.1	101	40	5.57	+1.19	13.24	1.17	-----	13	12	14	4
1915	65.1	-4.0	91	31	4.16	-0.22	9.99	1.72	-----	11	12	12	6
1916	64.5	-4.6	96	38	3.71	-0.67	7.96	1.41	-----	10	13	11	6
1917	66.0	-3.1	100	32	6.65	+2.27	13.82	3.04	-----	12	13	10	7
1918	70.8	+1.7	104	38	5.29	+0.91	10.19	1.55	-----	11	16	10	4
1919	71.9	+2.8	98	41	6.13	+1.75	12.25	1.82	-----	13	12	12	6
1920	70.7	+1.6	99	40	3.56	-0.82	8.48	1.25	-----	9	16	10	4
1921	74.7	+5.6	100	40	3.76	-0.62	8.85	0.56	-----	9	16	10	4

T. indicates an amount too small to measure, or less than .005 inch rainfall and less than .05 inch snowfall.



Climatological Data for June, 1921.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.					Precipitation, in Inches.				Number of Days.			Prevailing direction of wind.	Observers.				
				Mean.	Departure from normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from normal.	Greatest in 24 hours.	Total snowfall, unmelted.	Precipitation .01 in. or more.			Clear.	Partly cloudy.	Cloudy.	
<i>Northern Division</i>																					
Algona.....	Kossuth.....	1,213	48	74.2	+ 6.1	94	28	47	5	28	2.54	-1.90	1.02	0	6	27	3	0	se.	W. E. Laird. J. A. Bell. David E. Hadden. W. S. Slagle. Geo. P. Hardwick.  L. M. Goodman. U. S. Weather Bureau. M. D. Whitney. Carl Reinecke. A. O. Peterson.  R. Z. Latimer. Dr. M. B. Neill. H. C. Snitkey. F. B. Hanson. Mrs. M. O. Woolley.  Northern Sugar Corp. Dr. F. J. Smith. A. F. Kemman. Arthur Betts. Chas. Dwelle.  F. E. Hronek. F. L. Williams. J. K. Medberry. James W. Dow. J. de Ruyter.  E. W. Little. Geo. H. Fracker. H. L. Felter. E. M. Weyrauch. Jos. Dorweiler.	
Allison.....	Butler.....	1,044	9	73.8	-----	95	18†	49	4†	33	3.00	-----	0.90	0	10	11	13	6	se.		
Alta.....	Buena Vista.....	1,513	30	74.5	+ 6.9	97	30	50	3†	28	1.20	-3.71	0.65	0	4	14	15	1	s.		
Alton.....	Sioux.....	1,305	16	75.0	+ 7.3	100	28†	47	4	36	0.56	-----	0.30	0	4	16	12	2	sw.		
Belmond.....	Wright.....	1,205	11	74.6	-----	98	28	47	5	36	1.74	-----	0.60	0	10	8	20	2	s.		
Britt.....	Hancock.....	1,236	24	74.2b	+ 6.8	95a	18†	45b	4†	32b	1.59	-2.40	0.54	0	5	-----	-----	-----	s.		
Charles City.....	Floyd.....	1,015	30	73.8	+ 5.0	95	30	45	5	30	2.93	-2.17	1.07	0	12	8	20	2	se.		
Decorah.....	Winnebago.....	875	28	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----		-----
Elkader.....	Clayton.....	751	42	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----		-----
Estherville.....	Emmet.....	1,298	26	72.8	+ 6.5	94	30	42	4	32	4.17	-0.54	1.65	0	7	22	5	3	s.		
Fayette.....	Fayette.....	1,063	31	73.2	+ 6.4	94	30	40	5	34	4.23	-0.48	1.24	0	8	21	5	4	se.		
Forest City.....	Winnebago.....	1,226	27	73.4	+ 5.9	95	18†	44	5	29	3.16	-1.06	1.37	0	8	13	15	2	se.		
Humboldt.....	Humboldt.....	1,095	33	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----		-----
Inwood.....	Lyon.....	1,474	17	73.4	+ 5.8	96	30	45	4	34	3.09	-2.06	0.73	0	7	25	4	1	s.		
LeMars.....	Plymouth.....	1,224	25	74.4	+ 6.3	98	28†	50	3†	32	1.70	-2.66	0.53	0	6	25	4	1	sw.		
Mason City.....	Cerro Gordo.....	1,148	24	73.2	+ 5.8	97	30	51	3†	36	3.19	-1.89	0.89	0	11	20	9	1	se.		
Milford (near).....	Dickinson.....	1,430	1	72.8	-----	92	17	49	5	27	3.21	-----	1.24	0	11	9	19	2	se.		
New Hampton.....	Chickasaw.....	1,169	24	73.8	+ 6.6	95	30	44	5	31	1.85	-2.09	1.01	0	8	13	15	2	se.		
Nora Springs.....	Floyd.....	1,064	9	73.6	-----	96	30	46	4†	33	3.29	-----	0.69	0	13	15	11	4	s.		
Northwood.....	Worth.....	1,222	25	72.4d	+ 5.6	94d	12†	43e	4†	31e	2.10	-2.52	0.95	0	7	13	15	2	sw.		
Pocahontas.....	Pocahontas.....	1,248	17	74.0	+ 6.9	95	30	45	5	33	5.97	-1.66	2.80	0	12	12	16	2	se.		
Postville.....	Clayton.....	1,180	22	71.1	+ 4.5	90	29	41	5	25	2.46	-1.95	1.26	0	8	15	9	6	se.		
Rock Rapids.....	Lyon.....	1,358	22	74.0	+ 6.0	98	28	44	4	36	1.66	-2.65	0.90	0	6	25	3	2	sw.		
Sanborn.....	O'Brien.....	1,553	7	74.2	-----	97	30	43	4	33	3.76	-----	1.63	0	7	22	7	1	sw.		
Sioux Center.....	Sioux.....	1,426	22	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Spencer.....	Clay.....	1,319	7	74.6	-----	98	30	46	4†	34	2.02	-----	0.60	0	9	18	10	2	se.		
Storm Lake.....	Buena Vista.....	1,440	32	74.9	+ 7.3	96	30	49	5	32	1.08	-3.30	0.64	0	6	23	5	2	s.		
Washita.....	Cherokee.....	1,157	23	73.5	+ 6.1	98	30	47	5	32	2.82	-1.26	1.40	0	8	23	5	2	s.		
Waverly.....	Bremer.....	948	25	73.9	+ 6.2	93	18†	45	5	26	2.87	-1.15	1.20	0	8	12	16	2	w.		
West Bend.....	Palo Alto.....	1,197	28	74.8	+ 6.6	96	1	44	5	36	3.46	-0.71	2.04	0	8	14	15	1	s.		
Means and extremes.....	-----	-----	-----	73.8	+ 6.2	100	28†	40	5	36	2.68	-1.75	1.80	0	8	17	11	2	se.		
<i>Central Division</i>																					
Ames!†.....	Story.....	926	45	74.6	+ 5.4	94	13	47	5	33	4.41	-0.13	1.14	0	9	22	6	2	sw.	Iowa State College. Geo. Kibby. Rev. Paul Traeger. O. C. Burrows. Carl F. Henning.  Mrs. Jos. J. Wolfe. R. S. Toogood. Dr. A. P. Bryant. U. S. Weather Bureau. Nettie E. Ball.  V. L. Byers. U. S. Weather Bureau. U. S. Weather Bureau. Fred Heman. Wm. Bader.  M. G. Heiberger. E. L. Nesselroad. W. K. Colburn. Dr. Geo. Boody. Prof. J. F. Reilly.  J. B. Parmelee. Will I. Lyon. Margaret T. Disney. Geo. H. Gibson. Mary Jean Stern.	
Audubon!†.....	Audubon.....	1,301	27	73.9	+ 5.7	96	30	46	5	34	4.70	+0.87	2.96	0	7	16	12	2	sw.		
Baxter.....	Jasper.....	998	21	74.3	+ 5.3	95	28	47	5	32	3.01	-1.16	0.87	0	15	9	16	5	se.		
Belle Plaine.....	Benton.....	886	31	75.2	+ 6.2	96	13†	45	5	32	6.12	+2.07	3.05	0	7	9	16	5	s.		
Boone.....	Boone.....	1,134	16	75.2a	+ 6.2	97a	18†	47a	5	37a	7.26	+2.58	2.47	0	7	-----	-----	-----	s.		
Carroll.....	Carroll.....	1,265	31	74.5	+ 6.7	97	30	46	5	33	3.39	-1.39	1.67	0	6	22	6	2	sw.		
Cedar Rapids.....	Linn.....	733	39	77.4	+ 6.8	99	12	45	4	33	1.25	-2.48	0.69	0	5	19	6	5	se.		
Clinton.....	Clinton.....	593	48	76.8	+ 6.4	97	20	46	5	34	3.35	-0.95	1.36	0	9	16	12	2	se.		
Davenport.....	Scott.....	580	50	76.8	+ 5.9	95	30	46	5	29	3.64	-0.47	0.90	0	12	8	11	11	e.		
Delaware.....	Delaware.....	1,083	30	73.0	+ 5.2	92	18	41	5	30	2.46	-1.49	0.87	0	10	15	15	0	s.		
Denison.....	Crawford.....	1,180	27	74.2	+ 6.1	95	30	48	5	32	2.22	-1.77	0.96	0	7	19	7	4	s.		
Des Moines.....	Polk.....	861	43	76.3	+ 5.9	96	28	50	5	28	4.66	-0.30	1.44	0	9	9	9	12	sw.		
Dubuque.....	Dubuque.....	639	48	75.0	+ 5.4	93	19	44	5	28	3.54	-1.01	2.18	0	8	6	13	11	se.		
Fort Dodge!†.....	Webster.....	1,114	21	74.2	+ 5.6	95	28†	45	5	32	3.94	-0.24	1.10	0	11	13	12	5	s.		
Grinnell.....	Poweshiek.....	1,031	27	74.1†	+ 4.1	94†	19	44e	3	34e	3.82	-0.50	1.00	0	7	-----	-----	-----	s.		
Grundy Center.....	Grundy.....	976	30	74.6	+ 5.8	95	28†	43	5	34	2.48	-2.54	1.05	0	8	13	12	5	sw.		
Guthrie Center.....	Guthrie.....	1,077	26	73.2	+ 3.4	93	28†	48	5	31	3.77	-0.44	1.14	0	6	21	4	5	se.		
Harlan.....	Shelby.....	1,192	22	74.4	+ 6.1	97	28	48	5	36	1.11	-3.18	0.60	0	5	22	8	0	s.		
Independence.....	Buchanan.....	921	57	73.8	+ 6.1	94	19†	42	5	30	3.23	-1.26	1.34	0	4	20	1	9	se.		
Iowa City.....	Johnson.....	733	61	75.2	+ 5.4	95	19	44	5	31	2.46	-1.99	0.85	0	8	10	8	12	nw.		
Iowa Falls.....	Hardin.....	1,107	28	73.0	+ 5.7	93	28	43	5	34	2.20	-3.20	0.61	0	7	17	9	4	s.		
Jefferson.....	Greene.....	1,052	22	74.2	+ 5.2	96	28	46	5	37	3.66	-----	1.20	0	8	14	8	8	sw.		
Le Claire.....	Scott.....	576	21	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Little Sioux.....	Harrison.....	1,040	16	75.6	+ 5.3	97	30	50	3	35	2.77	+0.51	1.74	0	10	21	2	7	se.		
Logan.....	Harrison.....	1,035	54	75.2	+ 5.2	95	28†	51	5	30	5.37	+0.13	2.00	0	9	19	9	2	sw.		
Maquoketa.....	Jackson.....	688	20	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Marshalltown.....	Marshall.....	947	29	76.0	+ 6.8	97	28	47	5	33	2.38	-1.88	1.06	0	10	19	9	2	sw.		
Monroe.....	Jasper.....	922	9	76.4	-----	96	13	50	5	31	4.87	-----	1.68	0	9	20	7	3	s.		
Muscataine.....	Muscataine.....	554	61	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Olin.....	Jones.....	760	22	76.0	+ 6.8	97	19	44	5	33	5.75	+2.43	1.80	0	6	13	17	0	e.		
Onawa.....	Monona.....	1,051	21	75.5	-----	99	30	47	5	35	1.38	-3.20	0.80	0	6	22	5	3	se.		
Perry.....	Dallas.....	975	20	75.8	+ 6.0	95	30	49	5	31	7.75	+3.16	3.32	0	11	21	9	0	s.		
Rockwell City.....	Calhoun.....	1,134	25	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Sac City!†.....	Sac.....	1,314	45	74.6	+ 6.6	97	18	46	5	29	1.13	-3.63	0.80	0	4	16	13	1	-----		
Sioux City.....	Woodbury.....	1,135	32	76.0	+ 6.6	96															

Climatological Data for June, 1921—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.						Precipitation, in Inches.				Number of Days.			Observers.			
				Mean.	Departure from normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from normal.	Greatest in 24 hours.	Total snowfall, unmelted.	Precipitation .01 in. or more.	Clear.		Partly cloudy.	Cloudy.	Prevailing direction of wind.
<b>Southern Division</b>																				
Afton	Union	1,212	27	76.4	+ 5.6	99	30	48	5	33	4.90	-0.04	2.51	0	9	13	13	4	sw.	S. R. Brown.
Albia	Monroe	959	23	75.6	+ 6.1	97	19	45	5	35	5.15	+1.03	1.20	0	11	12	10	8	sw.	F. H. Holmes.
Atlantic	Cass	1,164	30	74.8	+ 5.2	95	30	47	5	41	5.90	+0.78	3.69	0	7	19	6	5	sw.	Joseph N. Reynolds.
Bedford	Taylor	1,100	21	74.7	+ 5.1	97	28†	47	5	36	2.37	-1.57	1.18	0	8	16	8	6	se.	E. E. Healy.
Bloomfield	Davis	881	14	75.2	-----	95	13	47	5	31	5.16	+1.25	0.80	0	14	13	12	5	sw.	John W. Teed.
Bonaparte	Van Buren	-----	30	75.0	+ 4.6	93	13†	45	5	30	5.93	+1.69	1.02	0	11	17	12	1	sw.	Bruce R. Vale.
Burlington††	Des Moines	544	25	76.5	+ 4.6	96	13	17	5	32	6.69	+2.30	1.50	0	16	15	13	2	sw.	Mrs. E. M. Donnelly.
Centerville	Appanoose	1,013	16	75.3	-----	94	13	47	5	33	6.07	+1.89	1.81	0	10	11	6	13	se.	Leo J. Allen.
Chariton	Lucas	1,042	26	74.8	+ 6.1	93	13†	48	5	29	7.33	+3.05	2.20	0	10	10	14	6	sw.	C. O. Burr.
Clarinda	Page	1,009	31	77.1	+ 7.1	100	30	49	5	39	3.25	-1.57	2.00	0	11	18	7	5	ne.	A. S. Van Sandt.
Columbus Jct.	Louisa	595	20	76.2	- 5.2	93	12†	47	5	29	4.03	-0.13	2.07	0	11	24	6	0	s.	J. B. Johnston.
Corning	Adams	1,117	29	74.2	+ 4.8	97	30	47	5	38	3.09	-1.01	1.47	0	8	15	10	5	sw.	Jerome Smith.
Corydon	Wayne	1,101	28	75.8	+ 5.5	96	19	47	5	33	4.52	+0.23	1.20	0	10	11	14	5	se.	May O. Miller.
Creston	Union	1,312	16	74.2	+ 5.7	91	30	50	5	25	5.95	-----	3.75	0	10	9	21	0	sw.	Dr. H. M. Stanley.
Cumberland	Cass	1,225	22	-----	-----	-----	-----	-----	-----	-----	4.39	-0.05	1.75	0	7	16	13	1	s.	G. M. Clarke.
Earlham	Madison	1,126	19	74.1	+ 6.4	97	29	45	5	41	3.95	-0.29	1.67	0	9	15	11	4	sw.	Geo. Phillips.
Fairfield	Jefferson	780	37	73.4	+ 2.7	91	13†	45	5	26	7.78	+3.01	2.02	0	11	14	2	14	w.	Prof. R. M. McKenzie.
Fairport	Muscatine	567	-----	75.7	-----	96	13†	46	5	32	6.26	-----	1.66	0	11	16	11	3	s.	R. L. Barney.
Glenwood	Mills	1,100	23	76.0	-----	97	30	48	5	34	4.76	-----	1.50	0	10	16	11	3	se.	Dr. Geo. Mogridge.
Greenfield	Adair	29	75.8	+ 5.6	99	30	46	5	35	2.88	-2.05	1.74	0	8	23	5	2	se.	J. O. Patterson.	
Indianola	Warren	969	30	75.4	+ 5.1	94	18†	49	5	32	6.06	+1.60	1.57	0	10	9	15	6	se.	Seth F. Shenton.
Keokuk	Lee	614	50	77.5	+ 5.0	96	19	49	5	29	2.53	-1.82	1.33	0	9	6	12	12	sw.	U. S. Weather Bureau.
Keosauqua	Van Buren	644	29	75.4	+ 4.1	96	13†	45	5†	36	4.40	+0.37	1.00	0	14	13	10	7	se.	J. H. Landes.
Knoxville	Marion	920	25	75.5	+ 4.4	95	13†	46	5	34	8.55	+4.90	1.98	0	14	11	5	14	sw.	W. J. Casey.
Lacona	Warren	22	-----	-----	-----	-----	-----	-----	-----	-----	6.25	+1.78	1.51	0	12	7	14	9	-----	J. B. Alter.
Lamon	Decatur	1,100	14	74.7	+ 3.8	94	30	46	5	35	5.12	+0.21	1.24	0	9	10	16	4	sw.	Rupert A. Wight.
Lenox	Taylor	1,250	26	75.1	+ 5.5	97	28	47	5	35	5.07	+1.01	2.21	0	8	18	11	1	se.	J. L. Hurley.
Mt. Ayr	Ringgold	1,236	28	74.0	+ 3.4	92	28	47	5	30	4.61	-0.23	1.73	0	10	18	3	9	s.	Alex Maxwell.
Mt. Pleasant	Henry	729	40	76.4	+ 5.0	97	13	44	5	33	4.35	-0.76	2.64	0	8	9	17	4	se.	John H. Jericho.
Oakland	Pottawattamie	1,105	2	75.4	-----	99	30	51	6	37	2.61	-----	1.39	0	7	20	6	4	s.	M. E. Gray.
Oskaloosa	Mahaska	825	45	74.0	+ 3.8	91	13†	46	5†	34	7.38	+3.51	1.81	0	12	7	13	10	se.	Roy R. Robinson.
Ottumwa	Wapello	849	26	73.2	-----	94	30	46	6	27	4.16	+0.33	1.35	0	8	16	2	12	w.	Henry Eilers.
Pella	Marion	877	28	74.2	+ 3.8	92	13	47	5	26	5.13	+1.64	0.89	0	12	15	2	13	se.	J. H. Ver Steeg.
Sigourney	Keokuk	877	25	74.6	+ 3.8	94	13†	44	5	31	6.66	+2.77	3.85	0	10	11	8	11	se.	W. E. Utterback.
Stockport††	Van Buren	754	19	76.2	+ 5.6	94	13†	44	5	31	4.02	-0.53	0.78	0	14	13	11	6	s.	C. L. Beswick.
Thurman	Fremont	24	76.6	+ 5.3	98	28†	52	5	34	6.72	+1.11	4.71	0	10	3	25	2	sw.	C. R. Paul.	
Washington	Washington	769	39	74.8	+ 3.8	94	13	45	5	30	2.88	-1.00	1.21	0	13	11	12	7	sw.	Wm. A. Cook.
Winterset	Madison	1,129	30	76.0	+ 5.8	95	18†	47	5	33	2.50	-2.53	1.01	0	7	21	8	1	sw.	H. S. Ely.
Omaha, Nebr.	-----	1,040	50	77.4	+ 5.8	98	28	55	5	26	3.57	-1.48	1.41	0	10	11	11	8	se.	U. S. Weather Bureau.
Means and extremes.	-----	-----	-----	75.3	+ 5.0	100	30	44	5	41	4.93	+0.54	4.71	0	10	14	10	6	sw.	-----
State means and extremes.	-----	-----	-----	74.7	+ 5.6	100	28†	40	5	41	3.76	-0.62	4.71	0	9	16	10	4	se.	-----

The departure from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete records are used in determining means.  
Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example, b represents two days, etc.  
†Also other dates. ††Received too late to be included in means and summaries.  
T., Precipitation is less than 0.01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE.

Stations.	Barometric Pressure Inches (Sea Level).				Relative Humidity (%).			Wind.					Sunshine.					
	Mean.	Highest.	Date.	Lowest.	Mean.	Date.	Lowest.	Total movement.	Average hourly velocity.	Miles.	From.	Date.	Per cent of possible.	Departure from normal.				
Charles City	29.93	30.44	4	29.75	19	81	56	66	35	21	3,431	4.8	19	sw.	14	64	-10	
Davenport	29.96	30.40	4	29.74	27	78	56	65	34	64	4,076	5.7	26	sw.	20	71	+ 1	
Des Moines	29.91	30.39	4	29.68	28	79	57	59	31	21	3,754	5.2	30	n.	28	68	+ 1	
Dubuque	29.97	30.45	4	29.76	27	77	54	58	29	22	3,537	4.9	17	n.	3	63	- 1	
Keokuk	29.96	30.35	5	29.75	19	78	55	59	27	6	4,090	5.7	31	n.	20	65	- 8	
Sioux City	29.91	30.44	4	29.56	15	76	49	50	32	214	6,565	9.1	43	sw.	14	76	+13	
Omaha, Nebr.	29.95	30.36	4	29.61	15	80	60	58	34	21	4,243	5.9	22	n.	1	77	+10	
Means and extremes.	29.95	-----	-----	-----	-----	78	55	59	-----	-----	-----	5.9	-----	-----	-----	66	-----	0
Normals and records.	29.93	-----	10 <sup>th</sup>	-----	5 <sup>th</sup>	79	-----	-----	30 <sup>th</sup>	-----	7.6	-----	-----	-----	22 <sup>1</sup>	69	-----	-----
		*30.61	1913	29.04	1880					†14	1894		†85	w.	1917			

\*Dubuque. \$Omaha. †Sioux City. ††Local mean time. †And other dates.





Daily Precipitation for June, 1921—Continued.

Stations.	Drainage Basin.	Day of Month.																															Totals
		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	
<b>Southern Division</b>																																	
Afton	Grand	.30	.25							.14	.93			.17	.43									.05			.03				.34		4.90
Albia	Des Moines	.62	.73					T.	T.	.89				1.20		T.	.27				.30			.05	.12	.25	.19		.53		5.15		
Atlantic	Nishnabotna	3.69								.03		.20		.76							.09				.23	.90						5.90	
Bedford	Missouri	T.	1.18				.05			.02	T.			.45	.18		.01						.34	.07								2.37	
Bloomfield	Mississippi	.51	.39						.05	.18				.52	.03		.17	.63			.47			.35	.02	.58	.26	.40				5.16	
Bonaparte	Des Moines	1.01	.54				.04	T.		.05	.41			.42	.09			1.02			.67			.84	T.	.84	T.					5.93	
Burlington	Mississippi	.08	.60							.12	.10	.70		.20	.12		1.50	1.13	.40				.10	.57	.04	.60	.40	.03				6.69	
Centerville	Chariton	.68	.40						.01	.15	1.81			.78			T.						.74	.65	.40		.45					6.07	
Chariton	Chariton	.50	2.20					T.	.52	T.				.25						1.05			.95	.41	T.	.54	.10		.81			7.33	
Clarinda	Nodaway	2.00	.08				.05	.04	.07	.02				.59		.09							.02	.14	.15							3.25	
Columbus Jct.	Iowa	.18	.50						.16					.05				2.07		.10			.04		.05	.40	.44	.04				4.03	
Corning	Nodaway	.30	1.17				T.		.04	T.				.65	.38				.37			.13	.05	T.								3.09	
Corydon	Chariton	.36	.78				T.	T.	T.	1.20				.05	.01				T.	.32			.06	.06	.01		.77					4.52	
Creston	Missouri		3.75	.07					.01	.17		.31			.02								.02	.06		.53			.11			5.95	
Cumberland	Nodaway	.40	1.60				.07		T.					.40	1.75								T.	.12	.05							4.39	
Earlham	Des Moines	.50	1.17				T.				.20			.18	.66								.07	.08	.20		1.49					3.95	
Fairfield	Skunk	1.50	.63	T.			.03				.24			1.47	.07		1.09	2.02					.35	.08	T.	.35						7.78	
Fairport	Mississippi	.15	.82											.25		.12		1.66			.14		.02			1.44	.71	.42		.53		6.26	
Glenwood	Missouri	.45	1.50				.30	.30	1.11					.05	.40		.40						.05		.20							4.76	
Greenfield	Nodaway	.40	1.34				T.	.12	.30					.40	.22								.09		T.	.01		T.				2.88	
Indianola	Des Moines	.86	.71				T.	.03	T.	.03			1.25										T.	.09	.16	1.11	.73	T.	1.09			6.06	
Keokuk**	Mississippi	.01					T.	.01	.06	.01				.91	T.			.14		T.			T.	1.33	.04	.02	T.					2.53	
Keosauqua	Des Moines	.43	.77				.10	.14	.01	.07				.45	.20			.57		.01			T.	1.00	.37	.18	.10					4.40	
Knoxville	Des Moines	1.68	.65				.08	T.	.29	.95				1.30				.17		.34			.14	.08	1.98	.60	.35		.24			8.85	
Lacona	Des Moines	1.15	.28					.01	1.51					.75			.05			.90			.02	.23	.10	.25		1.00				6.25	
Lamoni	Grand		1.24	.11				.02	.60	1.20	.10				.95	T.	T.								.61					.29			5.12
Lenox	Missouri	.29	1.92						.72	.11				.76	.53								.13	T.	T.					.61			5.07
Mt. Ayr	Grand	T.	1.73				.11	T.	.11	.10				.29	.25		T.						.45	.81	1.06	T.		.20	T.			4.61	
Mt. Pleasant	Skunk	.44	.19					T.	.02	T.				.09	.25			2.64					.29		.56	.12						4.35	
Murray	Grand																																
Oakland	Nishnabotna	.07	1.32				.05			.32	T.			.10	.50											.25						2.61	
Oskaloosa	Des Moines	1.81	.15							.74				1.74	.01			.68			.18		T.	.15	.82	.71	.07		.32			7.38	
Ottumwa	Des Moines	.36								.40	T.			.73	.70		.20	.32		.70			.10		1.35							4.16	
Pella	Skunk	.55	.45							.47				.65	.03		T.	.55		.30			.08	.63	.45	.08		.89				5.13	
Sigourney	Skunk	.51	.05				.07	T.	T.	.44				.43		T.	T.	3.85					.55	.12	.62			.02				6.66	
Stockport	Skunk	.37	.44				.67	.01	T.	.40				.64	.11			.78		.12			.53	.03	.26	.23						4.02	
Thurman	Missouri	1.83	2.88				.12	T.	.26				.02	.03	.70		.46						T.	.04		.38						6.72	
Washington	Skunk	.45	.31				.05				.04			.01			.05	1.21		.19			.15	.07	.25	.06	.04					2.88	
Winterset	Des Moines	1.01					T.	T.						.18	.03					T.			.06	.03	.51			.68				2.50	
Omaha, Nebr.**	Missouri	.88	.21				.18	.15	1.37	.01				.59	.12	.01							T.	T.	T.	.05						3.57	

Except as otherwise indicated, observations are generally made late in the afternoon, near sunset, and precipitation recorded is for 24 hours ending at the time of observation.

- ||| Precipitation measured in the morning; amount then recorded is for the preceding 24 hours.
- \*\* Regular Weather Bureau Station; precipitation is for 24-hour period, midnight to midnight.
- \* Incomplete.
- \* Precipitation included in the next following measurement.

**HUMIDITY.**

The average relative humidity for the State at 7 a. m. was 78 per cent, and at 7 p. m. was 59 per cent. The mean for the month was 68 per cent, or 2 per cent below the normal. The highest monthly mean was 74 per cent, at Charles City, and the lowest was 63 per cent at Sioux City.

**WIND.**

The prevailing direction of the wind was from the southeast. The highest velocity reported from a regular Weather Bureau station was 43 miles an hour, from the southwest, at Sioux City, on the 14th.

**SUNSHINE AND CLOUDINESS.**

The average per cent of the possible amount of sunshine was 69 or just about the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 64; Davenport, 71; Des Moines, 68; Dubuque, 63; Keokuk, 65; Sioux City, 76; Omaha, Nebr., 77.

**MISCELLANEOUS PHENOMENA.**

- Aurora: 2d, 5th.
- Fog: 8th, 9th, 27th.
- Hail: 1st, 18th, 19th, 27th, 28th, 29th, 30th.
- Halos: (lunar or solar) 2d, 15th, 18th, 20th, 21st, 23d, 24th, 29th.
- Rainbows: 10th, 19th, 20th, 26th, 28th, 30th.
- Strong Winds: 1st, 15th, 28th, 29th.
- Thunderstorms: All days during the month except on the 4th, 5th, 11th, 12th, 21st, 22d.

**RIVERS.**

Gradually decreasing stages prevailed on the Mississippi River, the lowest stage being generally on the last of the month. On the Missouri River there was a gradually increasing tendency till the end of the month except in the upper reaches where the crest stage was reached on the 28th. In the lower reaches the flood stage was nearly reached. On the interior rivers low stages prevailed most of the time, the stage being affected by the locally heavy rains less than is usual in June.

**ERRATA.**

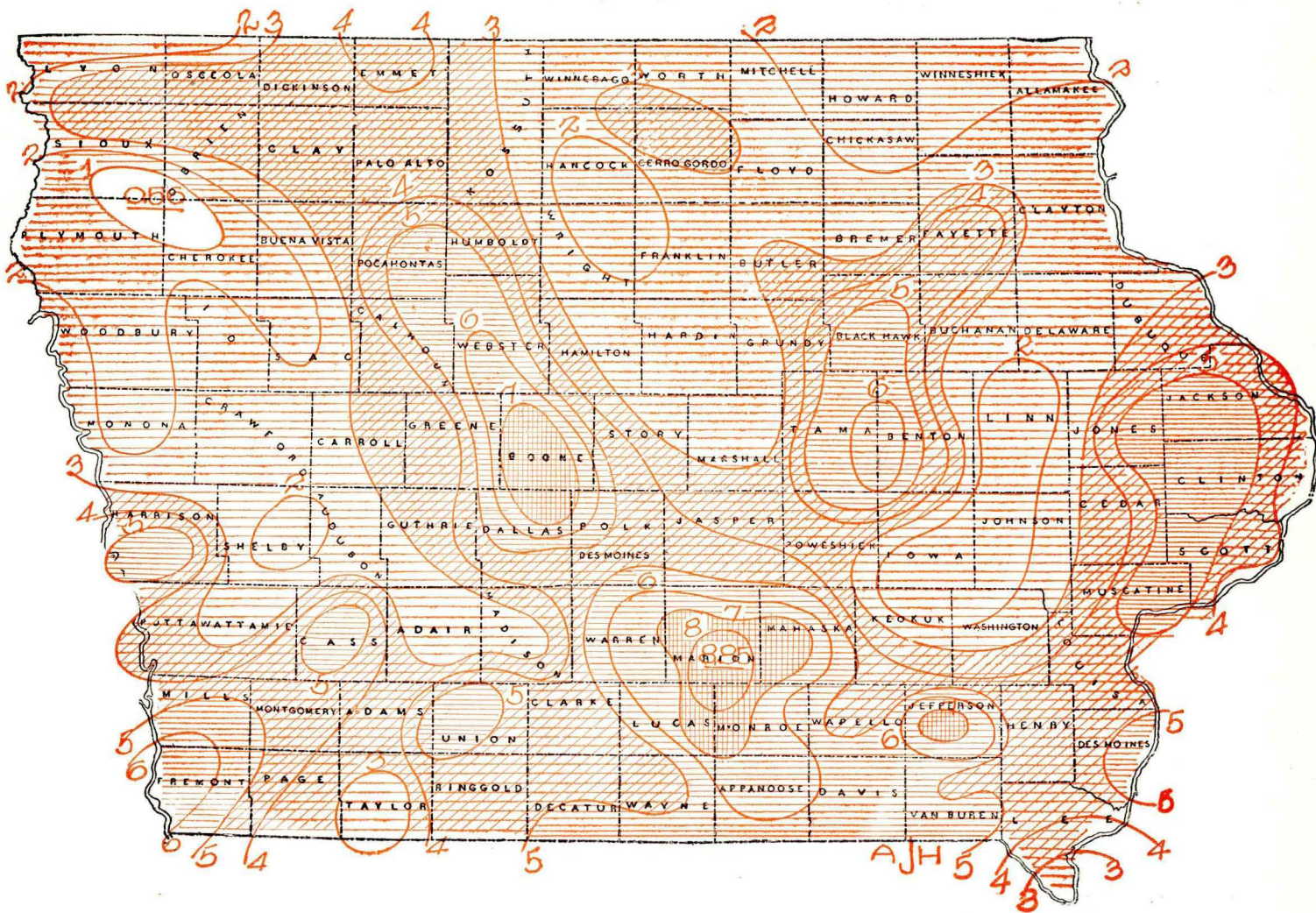
Report for May, 1921: Page 34; Fort Dodge, total precipitation published 5.82, should be 5.76; departure published +0.49, should be +0.43; number of days with .01 or more precipitation, published 11, should be 10; Iowa City, greatest precipitation in 24 hours published, 2.73, should be 2.33. Page 35; total precipitation at Albia published 4.01, should be 3.39; departure published—0.96, should be—1.58; number of days with .01 or more precipitation, published 7, should be 6. Page 36; Fort Dodge, the daily precipitation entries should be 1st, .61, 2d, .37, 9th, .13, 10th, .19, 11th, .01, 13th, T, 17th, .33, 18th, .41, 19th, .65, 25th, .31, 26th, T, 27th, 2.36, 30th, T, 31st, .39; the total should be 5.76. Page 37; Albia, all precipitation entries should be advanced one day and the amount entered on the 31st, 0.62, should be stricken out; the total for the month should be 3.39.

Daily Maximum and Minimum Temperatures for the Month of June, 1921.

Table with columns for Stations, days 1-31, and Mean. Rows are categorized by Northern Division, Central Division, and Southern Division, listing various Iowa cities and their daily temperature ranges.

a, b, c, etc., indicate respectively 1, 2, 3, etc., days missing from record.

# TOTAL PRECIPITATION, JUNE, 1921



SCALE OF SHADES—IN INCHES



# CLIMATOLOGICAL DATA.

## IOWA SECTION

In cooperation with  
IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXII DES MOINES, IOWA, JULY, 1921 No. 7

### GENERAL SUMMARY.

The chief characteristics of the weather during July, 1921, were the uniformly high temperatures that prevailed practically the entire month and the severe drouth that prevailed over much of the north-central and eastern portions of the State.

The mean temperature, 77.9°, has been exceeded but twice since the records for the State as a whole began in 1890. The number of consecutive months with the temperature above normal is now 11, which far exceeds any similar period in the history of the State. The nearest approach to the present record was in 1894, when the temperature was above normal from March to October, inclusive, with an average excess of 5.4°. From October, 1918, till March, 1919, inclusive, there was an excess of 5.8° daily.

The rainfall for the State was only 64 per cent of the normal and the deficiency covered the entire State except most of the southwestern and west-central divisions, where there was a decided excess. The continuous high temperatures and the lack of precipitation had a disastrous effect on all vegetation in many counties in the northern and eastern portion of the State and especially in the north-central district. The corn crop which gave unusual promise in June was injured beyond recovery by the continued hot, dry weather and in many fields outside of the drouth-stricken area it was observed that the luxurious stalk growth was at the expense of the ears and at the close of the month the outlook for a crop of corn was about the 10-year average. In the drouth-stricken area the potato crop was a failure, gardens were ruined, pastures and meadows burned brown, and what promised a good crop of berries was nearly a total failure. In areas where there was sufficient precipitation the general crop outlook was good.

F. L. D.

### PRESSURE.

The mean pressure (reduced to sea level) for the State was 29.98 inches. The highest pressure recorded was 30.25 inches at Charles City on the 20th, and the lowest was 29.44 inches at Sioux City on the 2d. The monthly range was 0.81 inch.

### TEMPERATURE.

The mean temperature for the State, as shown by the records of 100 stations, was 77.9°, or 3.8° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 77.0°, or 4.3° higher than the normal; Central, 78.1°, or 3.8° higher than the normal; Southern, 78.6°, or 3.4° higher than the normal. The highest monthly mean was 81.8°, at Keokuk, and the lowest was 75.0°, at Milford and Postville. The highest temperature recorded was 104°, at Clinton, on the 11th, 12th and 13th, and the lowest recorded was 41°, at New Hampton, on the 31st. The temperature range for the State was 63°.

### HUMIDITY.

The average relative humidity for the State at 7 a. m. was 77 per cent, and at 7 p. m. it was 54 per cent. The mean for the

State was 66 per cent, or 2 per cent lower than the normal. The highest monthly mean was 70 per cent at Omaha, Nebr., and the lowest was 60 per cent at Keokuk.

### PRECIPITATION.

The average precipitation for the State, as shown by the records of 106 stations, was 2.53 inches, or 1.43 inches less than the normal. By divisions the averages were as follows: Northern, 2.12 inches, or 1.76 inches less than the normal; Central, 2.60 inches, or 1.38 inches less than the normal; Southern, 2.88 inches, or 1.14 inches less than the normal. The greatest amount, 7.45 inches, occurred at Thurman, and the least, 0.42 inch, at Mason City. The greatest amount in 24 consecutive hours was 3.32 inches, at Thurman, on the 1st and 2d.

### WIND.

The prevailing direction of the wind was from the southwest. The highest velocity reported from a regular Weather Bureau Station was 50 miles per hour, from the northwest, at Sioux City, on the 13th.

### SUNSHINE AND CLOUDINESS.

The average per cent of the possible amount of sunshine was 78, or 4 per cent above the normal. The per cent of the possible amount at the regular Weather Bureau Stations was as follows: Charles City, 76; Davenport, 85; Des Moines, 83; Dubuque, 77; Keokuk, 76; Sioux City, 67; Omaha, Nebr., 79.

### RIVERS.

Moderate stages prevailed on the Missouri River and low stages on the Mississippi and all interior rivers. No rises of importance occurred; and during practically the entire month gradually falling stages prevailed.

COMPARATIVE DATA FOR THE STATE—JULY.

YEAR	Temperature				Precipitation				Number of Days				
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	Clear	Partly cloudy	Cloudy
1890.....	75.6	+1.5	110	45	1.98	-1.98	5.00	0.37	-----	3	18	8	5
1891.....	68.5	-5.6	99	41	4.22	+0.26	8.20	1.67	-----	6	13	13	5
1892.....	73.0	-1.1	104	38	5.29	+1.33	12.86	1.71	-----	9	16	10	5
1893.....	75.0	+0.9	102	47	3.33	-0.63	8.84	1.49	-----	7	19	10	2
1894.....	76.4	+2.3	109	39	0.63	-3.33	3.50	T.	-----	3	22	8	1
1895.....	72.1	-2.0	104	35	3.40	-0.56	10.10	0.45	-----	7	15	12	4
1896.....	73.6	-0.5	104	42	6.90	+2.94	12.67	1.61	-----	9	14	11	6
1897.....	75.6	+1.5	106	42	3.26	-0.70	7.60	1.01	-----	6	18	10	3
1898.....	73.4	-0.7	102	42	2.98	-0.98	12.88	0.55	-----	7	19	9	3
1899.....	73.1	-1.0	101	38	3.07	-0.89	8.66	0.42	-----	7	16	10	5
1900.....	73.4	-0.7	102	37	6.15	+2.19	18.45	1.80	-----	9	16	10	5
1901.....	82.4	+8.3	113	46	2.34	-1.62	5.97	0.27	-----	5	21	9	1
1902.....	73.1	-1.0	99	41	8.67	+4.71	13.57	4.82	-----	13	14	10	7
1903.....	72.9	-1.2	100	40	4.83	+0.87	12.72	0.94	-----	9	17	9	5
1904.....	70.6	-3.5	100	38	4.41	+0.45	11.97	1.28	-----	10	16	9	6
1905.....	70.6	-3.5	102	40	2.91	-1.05	7.08	0.69	-----	9	14	10	7
1906.....	70.9	-3.2	102	42	3.04	+3.92	7.05	0.26	-----	8	18	10	3
1907.....	73.7	-0.4	102	41	7.27	+3.31	13.66	3.97	-----	13	16	11	4
1908.....	73.0	-1.1	100	42	3.66	-0.30	9.21	0.70	-----	8	16	10	5
1909.....	72.3	-1.8	102	46	4.77	+0.81	12.20	1.20	-----	10	15	8	8
1910.....	74.5	+0.4	108	43	1.86	-2.10	5.69	0.12	-----	7	19	8	4
1911.....	75.5	+1.4	111	38	2.27	-1.69	6.62	0.08	-----	7	18	10	3
1912.....	74.6	+0.5	103	38	3.71	-0.25	7.56	1.17	-----	10	17	10	4
1913.....	76.1	+2.0	108	45	1.82	-2.14	6.23	T.	-----	5	21	8	2
1914.....	76.6	+2.5	109	43	2.27	-1.69	6.50	0.44	-----	5	20	8	3
1915.....	69.5	-4.6	92	40	8.32	+4.36	15.83	3.68	-----	14	10	12	9
1916.....	79.7	+5.6	105	48	1.78	-2.18	6.87	0.10	-----	5	23	7	1
1917.....	74.3	+0.2	106	38	2.27	-1.69	6.66	0.23	-----	7	21	8	2
1918.....	73.1	-1.0	105	40	3.17	-0.79	8.05	0.26	-----	8	19	8	4
1919.....	77.4	+3.3	104	41	2.86	-1.10	7.82	0.39	-----	6	22	8	1
1920.....	72.3	-1.8	102	45	4.22	+0.26	7.49	1.11	-----	9	19	9	3
1921.....	77.9	+3.8	104	41	2.53	-1.43	7.45	0.42	-----	7	19	9	3

T. indicates an amount too small to measure, or less than .005 inch rainfall and less than .05 inch snowfall.



Climatological Data for July, 1921.

Table with columns: Stations, Counties, Elevation, Length of record, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Total snowfall, Precipitation of in. or more, Clear, Partly cloudy, Cloudy), Number of Days (Prevaling direction of wind), Observers.

Climatological Data for July, 1921—Continued.

Table with columns: Stations, Counties, Elevation, Length of record, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Total snowfall, etc.), Number of Days (Clear, Partly cloudy, Cloudy), Prevailing direction of wind, Observers.

The departure from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete records are used in determining means. Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example, b represents two days, etc. †Also other dates. ‡Received too late to be included in means and summaries. T., Precipitation is less than 0.01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE.

Table with columns: Stations, Barometric Pressure (Mean, Highest, Date, Lowest, Date), Relative Humidity (Mean, 7 a. m., Noon, 7 p. m., Lowest, Date), Wind (Total movement, Average hourly velocity, Maximum, Miles, From, Date), Sunshine (Per cent of possible, Departure from normal).

MISCELLANEOUS PHENOMENA.

Aurora: 15th. Fog: 5th, 23d, 29th, 30th. Halos: 4th, 5th, 13th, 17th, 18th, 25th. Hail: 7th, 9th. Rainbows: 4th, 6th, 12th, 16th. Thunderstorms: 1st, 2d, 3d, 4th, 5th, 6th, 7th, 8th, 10th, 12th, 13th, 14th, 16th, 17th, 18th, 22d, 23d, 24th, 25th, 26th, 27th, 28th, 29th. Tornado: 27th.

ERRATA.

Report for June 1921: Page 43; Charles City, mean barometer reduced to sea level, published 29.93 inches, should be 29.95 inches.

\*Davenport. †Charles City. ‡Des Moines. †Omaha. †Local mean time. †And other dates.





Daily Precipitation for July, 1921—Continued.

Stations.	Drainage Basin.	Day of Month.																															Totals		
		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			
<i>Southern Division</i>																																			
Afton	Grand	.52		.60										.75			.40					.11	.09					.50						2.97	
Albia	Des Moines				.42									.10				.15					T.	.15				T.	.51					1.33	
Atlantic	Nishnabotna	.55	.74	.07		.10								1.03				1.15					.52					.11	.30					4.57	
Bedford	Missouri	.41		.73										.73				.50					.06	.01				.56						3.03	
Bloomfield	Mississippi	.06		.06										.18				.58						.04				.11	1.19	.07				2.29	
Bonaparte	Des Moines			1.26										T.				T.					.08			.64	.33	.80	.20					2.71	
Burlington	Mississippi				.06				.25						T.				.07		.07							.03	.49					0.90	
Centerville	Chariton			.84										.07				.24						.03					.50						1.68
Chariton	Chariton	T.		T.										.35				1.64					T.	T.				.11	.80					2.90	
Clarinda	Nodaway	1.00	.81	1.22				.02			.09				.39			.40						.16							.30				4.39
Columbus Jet	Iowa			T.			T.							.05				.75								T.		.57	.66					2.03	
Corning	Nodaway	.93	T.	.82										1.30			.70						.15	.14				.65						4.69	
Corydon	Chariton	T.		.18										.19				.48					T.	.05				.01	.33	.01				1.25	
Creston	Missouri	.59	.55		.05	.03								.33	.16			.45							.22	.10		.02		.42				2.92	
Cumberland	Nodaway		.72														.75						.10	.70					.15					2.42	
Earlham	Des Moines	.17		.45	T.		.75				T.			1.48				.45					.03	.20					.24	T.				3.77	
Fairfield	Skunk			.22	T.									T.				.37						.05				.20	.52					1.36	
Fairport	Mississippi						.0	.05										.18										.50	.20	.16				1.18	
Glenwood	Missouri	2.75		.60	.48									.40				2.00						.03				.20	.18	.02				6.66	
Greenfield	Nodaway	.42		.32		T.					.20			1.56				.52					.10	.30				.06	.32					3.80	
Indianola	Des Moines						.14							.50				.16					T.	.35				T.	.58					1.73	
Keokuk	Mississippi	T.		.04										T.				.08					.03	.01				.01	.38					0.55	
Keosauqua	Des Moines	T.		.05										T.				.92						T.				.50	.78	.10				2.35	
Knoxville	Des Moines																																		
Lacona	Des Moines	.10												.25				.99					.01	.50				.01	.54					1.50	
Lamoni	Grand			.65	.04		T.				.77			.43	.02		.13			.70						.10				.35				3.19	
Lenox	Missouri	1.05	T.	.50										.53				.50					.26	.12				.66						3.62	
Mt. Ayr	Grand	.03	T.	.52			T.							T.	.65			.84						.03	.13			.01	.41					2.65	
Mt. Pleasant	Skunk			.38					.05					T.				.45										.30	.80	.11					2.09
Oakland	Nishnabotna	.10		2.08	.09									.95				.89					.75	.40											5.17
Oskaloosa	Des Moines	.14	T.	2.58										.22				.09					T.	.16		T.		.10	.65					3.94	
Ottumwa	Des Moines	.35		.20										.38				.17											.57						1.77
Pella	Skunk	T.		.08										.35				.63						.38		T.		.16	.65					2.25	
Sigourney	Skunk			.65										.34				.37						.03			.05	.32	.59						2.35
Stockport	Skunk			.87					.02					T.				.09						.05				.28	1.13	.02					2.46
Thurman	Missouri	.10	3.22	T.	2.45	T.	T.							.36				.18										T.	.14	T.					7.45
Washington	Skunk			.25														.57										.20	.51						1.50
Winterset	Des Moines	.37	.28		.37								.17	.67				.27											.68						2.94
Omaha, Nebr.	Missouri	.05	.61	1.40	.14	.05							T.	.36	.57		.06	.40						T.	.17			.06	.14	.01		.03		4.99	

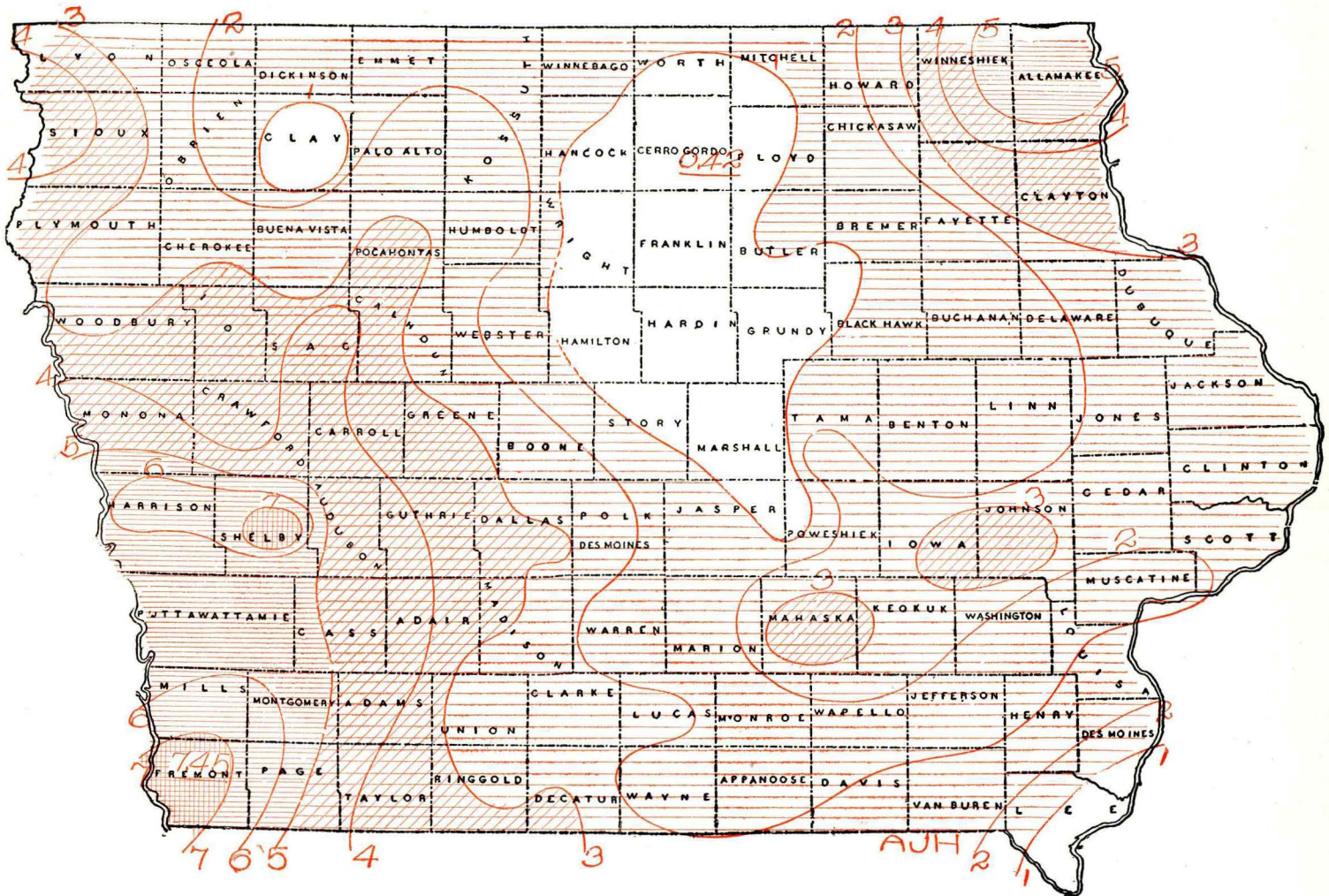
Except as otherwise indicated, observations are generally made late in the afternoon, near sunset, and precipitation recorded is for 24 hours ending at the time of observation.

- |||Precipitation measured in the morning; amount then recorded is for the preceding 24 hours.
- \*\*\*Regular Weather Bureau Station; precipitation is for 24-hour period, midnight to midnight.
- \*\*Incomplete.
- \*Precipitation included in the next following measurement.

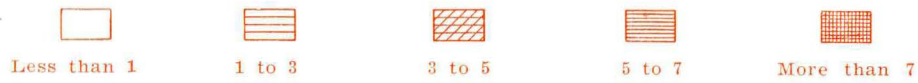
Daily Maximum and Minimum Temperatures for the Month of July, 1921.

Table with columns for Stations, days 1-31, and Mean. Rows are categorized by Northern Division (Albion, Alta, Alton, Belmont, Charles City, Decorah, Forest City, Inwood, Mason City, Milford, New Hampton, Northwood, Pocahontas, Postville), Central Division (Belle Plaine, Boone, Carroll, Davenport, Des Moines, Dubuque, Fort Dodge, Grinnell, Guthrie Center, Independence, Iowa City, Iowa Falls, Little Sioux, Marshalltown, Olin, Sioux City), and Southern Division (Albia, Atlantic, Bloomfield, Burlington, Columbus Jct., Corning, Corydon, Fairfield, Keokuk, Lamon, Pella, Sigourney, Thurman, Winterset, Omaha, Nebr.).

# TOTAL PRECIPITATION, JULY, 1921



SCALE OF SHADES—IN INCHES



# CLIMATOLOGICAL DATA.

## IOWA SECTION

In cooperation with  
IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXII DES MOINES, IOWA, AUGUST, 1921 No. 8

### GENERAL SUMMARY.

August was the twelfth consecutive month with the mean temperature for the State above normal, though the excess was the least since this remarkable condition began last September. The month opened cool and gave promise that the stretch of months with the temperature above normal was at an end, but at the beginning of the fourth week a hot period set in that continued through the rest of the month, and slightly more than offset the previous deficiency over most of the State. Cool weather prevailed over most of the first three weeks, but at a number of stations in the central and southern divisions the warmest day of the season occurred on the 19th. The excess was not general over the entire State, there being a considerable area in the northeastern corner, the western half of the southeastern section and a stretch reaching from the center of the State to the Missouri River, that had a deficiency.

The precipitation was above normal and was characterized by a number of heavy general rains, the principal one occurring on the first of the month. During this storm nearly every station reported as much as an inch of rain, a large number from two to three inches, and a few stations reported more than four inches. This storm completely broke the serious drouth that prevailed over much of the north-central and northeastern portions of the State and greatly benefited all crops, especially the corn crop. The heavy rain was not a benefit over other sections as the soft condition of the soil caused a great deal of corn to be flattened out by the wind and considerable grain that had not been threshed was damaged by the excessive moisture.

Considerable damage was caused to crops and farm properties by storms of a local character, the principal one occurring on the 5th, in Appanoose and portions of adjoining counties, between seven and eight p. m. This storm had all the destructive elements combined. At points there was terrific thunder and lightning, at others a deluge of rain and at others severe hail and destructive winds. The rainfall over most of the storm area was of little consequence, but the damage from hail and wind was very great. The path of greatest destruction was about 4 miles wide and 20 miles long and reached from the northwest to southeast across Appanoose county and the loss to the crops varied from 10 per cent to total destruction. In Johns Township the damage was estimated at \$50,000, and practically every window that faced the north was broken. At Jerome and Plano the storm had tornadic characteristics and many buildings were unroofed and trees twisted out of the ground.

F. L. D.

### PRESSURE.

The mean pressure (reduced to sea level) for the State was 30.00 inches. The highest recorded was 30.40 inches at Dubuque, on the 21st, and the lowest was 29.65 inches at Keokuk on the 5th, Sioux City on the 16th and Des Moines on the 17th. The monthly range was 0.75 inch.

### TEMPERATURE.

The mean temperature for the State, as shown by the records of 98 stations, was 72.1°, or 0.3° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 70.6°, of 0.2° higher than the normal; Central, 72.0°, or 0.3° higher than the normal; Southern, 73.7°, or 0.5° higher than the normal. The highest monthly mean was 76.4° at Clarinda, and the lowest was 67.6° at Postville. The highest temperature recorded was 102° at Clarinda, on the 19th and Spencer on the 29th, and the lowest was 37° at New Hampton, on the 8th. The temperature range for the state was 65°.

### PRECIPITATION.

The average precipitation for the State, as shown by the records of 100 stations, was 5.04 inches, or 1.36 inches more than the normal. By divisions the averages were as follows: Northern, 4.64 inches, or 1.16 inches more than the normal; Central, 5.71 inches, or 2.03 inches more than the normal; Southern, 4.76 inches, or 0.98 inch less than the normal. The greatest amount, 9.04 inches, occurred at Postville, and the least 2.20 inches occurred at Cumberland. The greatest amount in 24 hours, 4.40 inches, occurred at Le Claire, on the 2d.

### HUMIDITY.

The average relative humidity for the State at 7 a. m. was 83 per cent, and at 7 p. m. it was 64 per cent. The mean for the month was 74 per cent, or 2 per cent higher than the normal. The highest monthly mean was 76 per cent at Davenport, and the lowest was 71 per cent at Keokuk.

COMPARATIVE DATA FOR THE STATE—AUGUST.

YEAR	Temperature				Precipitation				Number of Days				
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	Clear	Partly cloudy	Cloudy
1890	68.4	-3.4	102	36	3.41	-0.27	6.44	1.02	-----	8	15	10	6
1891	69.1	-2.7	106	34	4.24	+0.56	13.02	1.23	-----	8	13	12	6
1892	71.4	-0.4	102	40	2.24	-1.44	4.69	0.65	-----	5	18	9	4
1893	69.4	-2.4	101	30	2.32	-1.26	6.22	0.40	-----	5	19	9	3
1894	74.6	+2.8	108	38	1.58	-2.10	4.53	T.	-----	4	21	8	2
1895	71.9	+0.1	103	37	4.43	+0.75	10.63	0.67	-----	7	17	9	5
1896	71.7	-0.1	104	34	3.52	-0.16	12.25	0.86	-----	8	15	11	5
1897	68.9	-2.9	104	35	1.86	-1.82	4.98	0.47	-----	6	15	11	5
1898	71.2	-0.6	103	40	3.44	-0.24	10.55	0.58	-----	6	17	9	5
1899	74.4	+2.6	100	41	3.68	0.00	10.45	1.12	-----	7	17	10	4
1900	77.4	+5.6	103	44	4.65	+0.97	10.43	1.26	-----	6	18	10	3
1901	73.8	+2.0	105	40	1.29	-2.39	4.46	T.	-----	5	20	9	2
1902	69.1	-2.7	98	37	6.58	+2.90	15.47	1.57	-----	11	11	11	9
1903	69.1	-2.7	101	41	6.64	+2.96	17.74	2.55	-----	11	12	10	9
1904	69.1	-2.7	97	35	3.43	-0.25	6.75	0.66	-----	7	17	8	6
1905	74.3	+2.5	104	44	4.05	+0.37	8.47	1.04	-----	9	16	9	6
1906	74.1	+2.3	101	33	3.95	+0.27	10.51	0.92	-----	9	17	9	5
1907	71.1	-0.7	99	37	4.33	+0.65	9.67	1.05	-----	9	17	9	5
1908	70.0	-1.8	101	38	4.77	+1.09	10.55	1.35	-----	9	17	9	5
1909	76.1	+4.3	103	33	1.81	-1.87	8.21	T.	-----	5	21	8	2
1910	71.9	+0.1	104	36	3.88	+0.20	11.22	0.37	-----	8	15	10	6
1911	71.7	-0.1	107	34	3.32	-0.36	9.47	0.44	-----	9	16	10	5
1912	71.0	-0.8	101	40	3.78	+0.10	7.90	0.89	-----	10	15	10	6
1913	76.6	+4.8	108	40	2.68	-1.00	7.13	0.08	-----	6	17	10	4
1914	73.7	+1.9	103	40	2.19	-1.49	4.90	0.42	-----	7	17	10	4
1915	65.9	-5.9	91	30	2.81	-0.87	9.14	0.27	-----	8	16	8	7
1916	74.0	+2.2	106	35	2.58	-1.10	6.23	0.49	-----	7	18	9	4
1917	69.4	-2.4	102	31	2.29	-1.39	6.31	0.70	-----	7	19	8	4
1918	76.0	+4.2	113	38	3.61	-0.07	8.38	0.54	-----	8	16	10	5
1919	71.5	-0.3	103	38	2.59	-1.09	5.72	0.97	-----	7	19	9	3
1920	69.3	-2.5	98	39	3.35	-0.33	8.52	0.44	-----	7	18	8	5
1921	72.1	+0.3	102	37	5.04	+1.36	9.04	2.20	-----	8	16	11	4

T indicates an amount too small to measure, or less than .005 inch precipitation, and less than .05 inch snowfall.



Climatological Data for August, 1921.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.						Precipitation, in Inches.				Number of Days.				Observers.		
				Mean.	Departure from normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from normal.	Greatest in 24 hours.	Total snowfall, unmelted.	Precipitation .01 in. or more.	Clear.	Partly cloudy.		Cloudy.	Prevailing direction of wind.
<b>Northern Division</b>																				
Algona.....	Kossuth.....	1,213	48	70.6	- 0.2	97	19	48	7	31	4.94	+1.27	2.05	0	6	25	1	5	se.	W. E. Laird.
Alison.....	Butler.....	1,044	9	71.2	-----	95	19	47	21	34	4.30	-----	1.45	0	7	12	15	4	sw.	J. A. Bell.
Alta.....	Buena Vista.....	1,513	30	70.9	+ 0.3	92	29	45	7	30	5.98	+2.09	3.00	0	9	16	12	3	sw.	David E. Hadden.
Alton.....	Sioux.....	1,305	16	71.9	+ 0.5	93	12†	46	7	39	2.50	-----	1.02	0	9	15	11	3	sw.	W. S. Slagle.
Belmond.....	Wright.....	1,205	11	71.4	-----	93	19†	48	8	39	5.17	-----	1.13	0	9	11	17	3	sw.	Geo. P. Hardwick.
Britt.....	Hancock.....	1,236	24	71.5	+ 1.3	95	30	53	6	36	4.19	+0.39	1.67	0	5	18	8	5	se.	L. M. Goodman.
Charles City.....	Floyd.....	1,015	30	69.8	- 0.9	92	29	49	21	32	6.74	+3.32	2.93	0	6	10	17	4	se.	U. S. Weather Bureau.
Decorah.....	Winneshiek.....	875	28	70.0	+ 1.2	91	30	45	8†	39	4.24	+0.88	0.96	0	9	18	5	8	sw.	M. D. Whitney.
Estherville.....	Emmet.....	1,298	26	68.7	- 0.4	90	29	46	21	32	5.05	+0.95	1.75	0	7	12	17	2	sw.	A. O. Peterson.
Fayette††.....	Fayette.....	1,003	31	70.1	+ 0.5	92	19†	45	8	40	8.24	+4.82	3.93	0	9	22	4	5	sw.	R. Z. Latimer.
Furness City.....	Winnebago.....	1,226	27	70.4	+ 0.3	95	29	47	7†	37	4.47	+1.03	1.26	0	9	14	11	6	ne.	Dr. M. B. Nell.
Humboldt.....	Humboldt.....	1,095	33	71.8	+ 1.0	97	29	45	8†	39	4.35	+0.99	1.48	0	7	13	13	5	s.	H. C. Snitkey.
Inwood.....	Lyon.....	1,474	17	71.5	+ 0.5	93	29	45	7	36	2.82	-0.06	1.60	0	7	21	6	4	s.	F. B. Hanson.
LeMars.....	Plymouth.....	1,224	25	71.7	+ 0.9	92	29	46	14	37	5.14	+2.35	3.46	0	8	19	8	4	sw.	Mrs. M. C. Woolley.
Mason City.....	Cerro Gordo.....	1,148	24	70.0	0.0	96	29	45	8	42	5.86	+1.92	1.79	0	7	17	11	3	se.	Northern Sugar Corp.
Milford (near).....	Dickinson.....	1,430	1	69.0	-----	87	29	49	7	28	5.10	-----	1.50	0	8	10	16	5	ne.	Dr. F. J. Smith.
New Hampton.....	Chickasaw.....	1,169	24	68.4	- 0.9	93	19†	37	8	48	7.15	+3.48	2.73	0	7	11	17	3	se.	A. F. Kemman.
Nora Springs.....	Floyd.....	1,064	9	71.4	-----	97	29	45	21	36	4.68	-----	1.44	0	8	19	9	3	s.	Arthur Betts.
Northwood.....	Worth.....	1,222	25	70.0†	+ 0.4	94†	29	47†	21	30†	3.17	-0.87	1.30	0	7	13	13	5	se.	Chas. Dwell.
Pocahontas.....	Pocahontas.....	1,248	17	71.4	+ 0.6	95	29	48	7	36	3.90	-0.01	1.57	0	8	15	13	3	s.	F. E. Hronek.
Postville.....	Clayton.....	1,180	22	67.6	- 1.6	86	19†	49	21	28	9.04	+5.48	2.50	0	9	11	15	5	sw.	F. L. Williams.
Rock Rapids.....	Lyon.....	1,358	22	70.6	- 0.8	93	29	46	7	37	4.06	+1.79	2.10	0	7	23	6	2	sw.	J. K. Medberry.
Sanborn.....	O'Brien.....	1,553	7	70.6	-----	97	29	45	7	35	3.13	-----	1.16	0	8	21	5	5	se.	James W. Dow.
Sioux Center.....	Sioux.....	1,426	22	70.6	+ 0.2	94	29	47	7	32	3.00	-0.18	1.24	0	5	21	4	6	s.	J. de Ruyter.
Spencer.....	Clay.....	1,319	7	71.5	-----	102	29	45	7	39	3.50	-----	1.15	0	9	11	15	5	se.	E. W. Little.
Storm Lake.....	Buena Vista.....	1,440	32	72.2	+ 1.1	94	29	49	7	29	4.30	+0.97	2.56	0	7	23	6	2	s.	Geo. H. Fracker.
Washita.....	Cherokee.....	1,157	23	71.4	+ 0.2	92	29	45	21	38	4.99	+1.86	2.08	0	8	16	10	5	s.	H. L. Felter.
Waverly.....	Bremser.....	948	25	70.0	- 0.6	93†	19	49	8†	36†	4.90	+1.52	1.84	0	8	11	16	4	w.	E. M. Weyrauch.
West Bend.....	Palo Alto.....	1,197	28	71.6	+ 1.4	97	29	45	7	41	3.22	-0.67	0.97	0	7	17	9	5	se.	Jos. Dorweiler.
<b>Means and extremes.</b>				70.6	+ 0.2	102	29	37	8	48	4.64	+1.16	3.46	0	8	16	11	4	se.	
<b>Central Division</b>																				
Ames.....	Story.....	926	45	71.2	- 1.1	93	19†	49	21	33	7.19	+3.33	2.42	0	8	23	6	2	ne.	Iowa State College.
Audubon.....	Audubon.....	1,301	27	72.6†	+ 1.3	98	29	49†	21	33†	2.79	-0.86	1.78	0	6	21	8	2	s.	Geo. Kibby.
Baxter.....	Jasper.....	998	21	72.2	+ 0.4	98	19	52	8†	31	4.49	+0.87	1.70	0	9	9	16	6	se.	Rev. Paul Traeger.
Belle Plaine.....	Benton.....	886	31	72.1	+ 0.8	98	19	49	8	36	5.88	+2.38	2.24	0	9	12	13	6	se.	O. C. Burrows.
Boone.....	Boone.....	1,134	16																	Carl F. Henning.
Carroll.....	Carroll.....	1,265	31	71.9	+ 1.3	97	29	50	7†	34	6.64	+2.73	2.54	0	7	23	4	4	se.	Mrs. Jos. J. Wolfe.
Cedar Rapids.....	Linn.....	733	39	73.4	+ 0.6	97	19	53	21	34	4.31	+0.80	1.29	0	7	18	3	10	se.	R. S. Toogood.
Clinton.....	Clinton.....	593	48	72.9	+ 1.0	94	19	49	15	33	4.42	+0.71	1.72	0	10	18	6	7	s.	Dr. A. P. Bryant.
Davenport.....	Scott.....	580	50	73.4	+ 0.4	93	29	55	21	24	6.62	+2.98	4.17	0	10	12	10	9	e.	U. S. Weather Bureau.
Delaware.....	Delaware.....	1,083	30	70.2	+ 0.2	94	19	47	15	32	4.91	+1.15	1.66	0	11	15	12	4	s.	Nettie E. Ball.
Denison.....	Crawford.....	1,180	27	72.0	+ 0.3	95	29	50	7	33	7.55	+3.44	2.90	0	6	17	7	7	s.	V. L. Byers.
Des Moines.....	Polk.....	861	43	73.2	+ 1.2	99	19	56	8	29	6.63	+3.02	2.58	0	9	17	8	6	sw.	U. S. Weather Bureau.
Dubuque.....	Dubuque.....	639	48	71.6	- 0.4	94	19	52	21	28	4.29	+1.25	1.49	0	11	7	17	7	s.	U. S. Weather Bureau.
Fort Dodge.....	Webster.....	1,114	21	71.2	- 0.4	95	29	47	21	37	7.93	+3.58	2.46	0	9	13	12	6	se.	Fred Heman.
Grinnell.....	Poweshiek.....	1,031	27	71.4 <sup>b</sup>	- 1.3	95 <sup>b</sup>	19	50 <sup>b</sup>	21	35 <sup>b</sup>	6.50	+2.44	2.80	0	7	-----	-----	-----	se.	Wm. Bader.
Grundy Center.....	Grundy.....	976	30	71.1	- 0.7	95	19	48	21	37	7.66	+4.03	2.27	0	11	14	11	6	nw.	M. G. Helberger.
Guthrie Center.....	Guthrie.....	1,077	26	71.8	- 0.7	95	19	48	21	34	5.37	+1.16	2.50	0	9	17	10	4	s.	E. L. Nesselroad.
Harlan.....	Shelby.....	1,192	22	70.8 <sup>h</sup>	- 0.7	95 <sup>h</sup>	19	50 <sup>h</sup>	8†	36 <sup>h</sup>	2.67	-1.31	2.12	0	5	-----	-----	-----	sw.	W. K. Colburn.
Independence.....	Buchanan.....	921	57	71.2	+ 0.4	94	19	47	8†	37	5.11	+1.80	1.41	0	9	22	6	3	sw.	Dr. Geo. Boody.
Iowa City††.....	Johnson.....	733	61	71.9	- 0.3	95	19	50	8†	33	8.61	+4.37	4.34	0	13	12	12	7	se.	Prof. J. F. Reilly.
Iowa Falls.....	Hardin.....	1,107	28	70.0	+ 0.5	95	19	46	8	36	4.82	+1.11	1.46	0	10	17	8	6	s.	J. B. Parmelee.
Jefferson.....	Greene.....	1,052	22	70.8	- 1.2	94	19	47	21	34	6.84	-----	3.05	0	7	16	7	8	sw.	Will I. Lyon.
Le Claire.....	Scott.....	576	21								7.94	+4.20	4.40	0	9	19	2	10	ne.	Margaret T. Disney.
Little Sioux.....	Harrison.....	1,040	16	73.0 <sup>a</sup>	- 0.6	95 <sup>a</sup>	29	46 <sup>a</sup>	7	37 <sup>a</sup>	4.03	-----	1.40	0	8	-----	-----	-----	se.	Geo. H. Gibson.
Logan.....	Harrison.....	1,035	54	74.0	+ 0.8	96	29†	52	7	33	3.65	-0.12	2.35	0	7	20	9	2	sw.	Mary Jean Stern.
Marshalltown.....	Marshall.....	947	29	72.8	+ 1.0	98	19	52	21	33	6.47	+3.30	2.00	0	10	19	7	5	sw.	O. C. Pigman.
Monroe.....	Jasper.....	922	9	74.5	-----	98	19	54	7	32	7.30	-----	2.25	0	8	22	4	5	sw.	J. A. Dibel.
Muscatine.....	Muscatine.....	554	61								7.01	+2.82	3.45	0	7	14	5	12	e.	Wm. P. Molls.
Olin.....	Jones.....	760	22	71.3	- 0.2	95	19	48	8	36	5.65	+0.95	2.25	0	6	20	8	3	sw.	Dr. F. W. Port.
Onawa.....	Monona.....	1,051	21	72.5	-----	97	29	48	7	39	3.76	-1.60	1.80	0	4	17	8	6	s.	Mrs. H. E. Colby.
Perrv.....	Dallas.....	975	20	72.0	- 0.4	92	19†	49	21	37	3.61	-1.03	1.24	0	9	19	11	1	se.	F. N. Bartlett.
Rockwell City††.....	Calhoun.....	1,134	25	71.0	- 0.8	96	29	49	7	32	5.67	+1.71	2.20	0	7	20	3	8	s.	A. W. McIsaac.
Sac City††.....	Sac.....	1,344	45	70.2	- 0.9	92	29	46	21	31	3.54	-0.03	1.39							

Climatological Data for August, 1921—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.						Precipitation, in Inches.				Number of Days.			Observers.			
				Mean.	Departure from normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from normal.	Greatest in 24 hours.	Total snowfall, unmelted.	Precipitation .01 in. or more.	Clear.		Partly cloudy.	Cloudy.	
<i>Southern Division</i>																				
Afton	Union	1,212	27	74.1	+ 1.1	100	19	53	21	34	3.21	-0.31	0.98	0	11	17	10	4	sw.	S. R. Brown.
Albia	Monroe	959	23	73.6	+ 0.5	98	19	50	8	35	6.73	+3.51	2.53	0	9	15	6	10	sw.	F. H. Holmes.
Atlantic	Cass	1,164	30	74.0	+ 1.4	99	29	50	21	35	3.51	-0.08	2.24	0	8	21	5	5	sw.	Joseph N. Reynolds.
Bedford	Taylor	1,100	21	74.6	+ 1.2	98	19	47	8	39	4.59	+0.74	1.45	0	11	19	8	4	se.	E. E. Healy.
Bloomfield	Davis	881	14																	John W. Teed.
Bonaparte	Van Buren		30																	Bruce R. Vale.
Burlington	Des Moines	544	25	75.0	+ 1.0	96	19	53	15	30	4.08	-0.25	1.47	0	7	23	5	3	ne.	Mrs. E. M. Donnelly.
Centerville	Appanoose	1,013	16	74.2	+ 1.1	95	19	51	7	30	4.43	+1.57	1.93	0	7	16	5	10	se.	Leo J. Allen.
Chariton	Lucas	1,042	26	73.3	+ 0.7	96	19	48	2	30	5.07	+1.15	1.10	0	7	18	9	4	sw.	C. C. Burr.
Clarinda	Page	1,009	31	76.4	+ 2.9	102	19	50	8	39	3.01	-0.61	1.10	0	11	23	4	4	s.	A. S. Van Sandt.
Columbus Jct.	Louisa	595	20	73.2	+ 0.5	94	19	55	8	27	6.46	+1.23	1.83	0	8	26	2	3	se.	J. B. Johnston.
Corning	Adams	1,117	29	73.4	+ 1.2	99	19	50	8	37	3.88	-0.06	1.44	0	5	18	9	4	sw.	Jerome Smith.
Corydon	Wayne	1,101	28	74.8	+ 0.9	98	19	53	7	34	5.01	+1.45	1.65	0	12	14	12	5	s.	May C. Miller.
Creston	Union	1,312	16	73.1	+ 1.3	93	19	55	7	27	4.33		2.20	0	11	16	13	2	sw.	Dr. H. M. Stanley.
Cumberland	Cass	1,225	22								2.20	-1.77	0.80	0	4	22	4	5	s.	G. M. Clarke.
Earlham	Madison	1,126	19	71.4	+ 0.2	99	19	47	8	34	4.10	-0.30	1.74	0	9	21	2	8	sw.	Geo. Phillips.
Fairfield	Jefferson	780	37	73.3	+ 0.2	97	19	49	8	35	6.08	+2.44	2.62	0	6	18	3	10	sw.	Prof. R. M. McKenzie.
Fairport	Muscatine	567		73.7 <sup>a</sup>		94 <sup>a</sup>	20	52 <sup>a</sup>	21	31 <sup>a</sup>	5.39		1.98	0	6				sw.	R. L. Barney.
Greenwood	Mills	1,106	23	75.4		98	19	52	3	34	4.11		1.10	0	12	15	11	5	se.	Dr. Geo. Mogridge.
Greenfield	Adair		29	73.4	+ 1.1	99	19	50	8	35	3.87	+0.07	0.96	0	8	26	3	2	se.	J. C. Patterson.
Indianola	Warren	909	30	73.1	+ 0.2	99	19	52	8	33	5.71	+1.43	2.07	0	9	17	9	5	se.	Seth F. Shenton.
Keokuk	Lee	614	50	75.1	+ 0.5	96	19	56	15	28	5.34	+2.10	3.20	0	9	8	15	8	s.	U. S. Weather Bureau.
Keosauqua	Van Buren	644	29	73.8	+ 0.5	97	19	50	8	34	4.10	-0.56	2.59	0	8	16	9	6	se.	J. H. Landess.
Knoxville	Marion	920	26	72.8	- 0.8	98	19	50	8	35	5.34	+1.27	1.95	0	9	20	1	10	ne.	W. J. Casey.
Lacona	Warren		22								5.07		1.48	0	11	9	14	8		J. B. Alter.
Lamon	Decatur	1,100	14	73.6	- 0.1	96	19	49	8	38	4.57	+1.77	2.05	0	8	20	9	2	sw.	Rupert A. Wight.
Lenox	Taylor	1,250	26	74.9	+ 2.1	98	9	52	21	39	4.51	+0.79	1.45	0	9	22	6	3	s.	J. L. Hurley.
Mt. Ayr	Ringgold	1,236	28	73.6	- 0.5	95	19	52	8	29	3.85	-0.35	1.65	0	10	22	4	5	s.	Alex Maxwell.
Mt. Pleasant	Henry	729	40	73.6	+ 0.2	95	19	51	15	31	5.47	+2.04	3.00	0	9	12	15	4	se.	John H. Jericho.
Oakland	Pottawattamie	1,105	2	74.0		98	19	47	7	40	2.98		1.45	0	6	19	9	3	s.	M. E. Gray.
Oskaloosa	Mahaska	825	45	72.0	- 0.8	95	19	52	8	30	5.37	+2.18	2.81	0	9	13	10	8	se.	Roy R. Robinson.
Ottumwa	Wapello	849	26	72.0		90	19	50	8	27	7.39	+3.79	3.50	0	7	18	2	11	e.	Henry Eilers.
Pella	Marion	877	28	72.0	- 1.1	97	19	49	8	33	6.82	+3.37	2.26	0	8	19	1	11	se.	J. H. Ver Steeg.
Sigourney	Keokuk	877	25	72.0	- 1.2	95	19	52	8	31	5.13	+1.66	1.75	0	9				se.	W. E. Utterback.
Stockport	Van Buren	754	19	72.4	- 0.8	95	19	51	4	34	5.41	+1.62	2.47	0	12	18	8	5	s.	C. L. Beswick.
Thurman	Fremont		24	75.8	+ 2.4	97	19	50	8	36	6.92	+2.47	2.10	0	10	4	24	3	ne.	C. R. Paul.
Washington	Washington	769	39	72.6	+ 0.1	95	19	53	8	29	5.09	+1.31	1.70	0	10	11	12	8	sw.	Wm. A. Cook.
Winterset	Madison	1,129	30	73.7	+ 0.2	99	19	52	7	30	4.93	+1.11	1.76	0	13	22	7	2	sw.	H. S. Ely.
Omaha, Nebr.		1,040	50	75.6	+ 1.2	97	19	57	7	28	2.07	-1.55	0.92	0	11	13	13	5	se.	U. S. Weather Bureau.
Means and extremes.				73.7	+ 0.5	102	19	47	8	40	4.76	+0.98	3.50	0	9	17	8	6	sw.	
State means and extremes.				72.1	+ 0.3	102	19	37	8	48	5.04	+1.36	4.40	0	8	17	9	5	se.	

The departure from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete records are used in determining means.

Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example, b represents two days, etc.

†Also other dates. ††Received too late to be included in means and summaries.

T., Precipitation is less than 0.01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE.

SUNSHINE.

Stations.	Barometric Pressure (Sea Level).					Relative Humidity (%).			Wind.				Sunshine.				
	Mean.	Highest.	Date.	Lowest.	Date.	Mean.	7 a. m. to noon.	Lowest.	Date.	Total movement.	Average hourly velocity.	Maximum.		Per cent of possible.	Departure from normal.		
												Miles.	From.			Date.	
Charles City	30.00	30.35	21	29.67	17	86	59	65	33	8	3,866	5.2	18	sw.	7	63	-12
Davenport	30.02	30.35	21	29.70	17	84	64	69	47	14	4,925	6.6	30	e.	1	73	+3
Des Moines	29.97	30.34	21	29.65	17	82	58	63	40	14	4,831	6.5	24	n.	22	77	+5
Dubuque	30.04	30.40	21	29.70	17	84	60	68	34	8	3,901	5.2	29	nw.	30	57	+8
Keokuk	30.02	30.33	21	29.65	5	80	59	62	35	9	4,430	6.0	35	s.	5	68	-5
Sioux City	29.99	30.36	14	29.65	16	85	58	58	33	14	7,391	10.0	40	nw.	16	60	+11
Omaha, Nebr.	29.98	30.30	14	29.68	16	82	58	63	37	8	5,123	6.9	28	ne.	19	76	+8
Means and extremes.	30.00					83	59	64				6.6				68	-3
Normals and records.	29.97		29 <sup>th</sup>			10 <sup>th</sup>	82		61		45 <sup>th</sup>		6.3			71	
			30.43	1909	29.40	1874			419	1918			7.0		sw.	1916	

The average per cent of the possible amount of sunshine was 68, or 3 per cent less than the normal. The per cent of the possible amount at the regular Weather Bureau Stations was as follows: Charles City, 63; Davenport, 73; Des Moines, 77; Dubuque, 57; Keokuk, 68; Sioux City, 60; Omaha, Neb., 76.

MISCELLANEOUS PHENOMENA.

*Aurora:* 2d, 26th.  
*Fog:* 2d, 3d, 11th, 13th, 16th, 18th, 20th, 24th, 25th, 28th, 29th.  
*Hail:* 5th, 6th, 17th, 19th, 20th, 30th.  
*Halos:* (lunar or solar) 14th, 15th, 21st.  
*Rainbows:* 1st, 15th.  
*Thunderstorms:* All days except 7th, 8th, 9th, 12th, 14th, 18th, 21st.  
*Tornado:* 5th.

§Sioux City. §Omaha. †Des Moines. †Local mean time. †And other dates.



Daily Precipitation for August, 1921—Continued.

Stations.	Drainage Basin.	Day of Month.																															Totals	
		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		
<b>Southern Division</b>																																		
Afton	Grand	.57	.25		.16					.05	.11		.09			.98			.08	.80			.06	.06										3.21
Albia	Des Moines		2.53	T.			.35	T.		.27	.56			1.43		.05	.57		.90			.07								T.			6.73	
Atlantic	Nishnabotna	2.24			.21						.10				.01	.17	.37			.31			.10										3.51	
Bedford	Missouri	.41	.53		.23			.01		.09	1.07					1.45				.45			.05	.26		.04							4.59	
Bloomfield	Mississippi																																	
Bonaparte	Des Moines																																	
Burlington	Mississippi	T.	1.47	.53							.55			.70		T.	.45		.34			T.	.04										4.08	
Centerville	Chariton	1.35	.58				.38			.22		.83				.32			.65														4.33	
Chariton	Chariton	.60	1.10				.55			.46		.75				.76			.85			T.											5.07	
Clarinda	Nodaway		.45			.27		.02		.05	.16					1.07	.03		.42				.18	.09		.27							3.01	
Columbus Jet	Iowa	.85	1.75						.21	.02		1.83				.13					1.32		.35										6.46	
Corning	Nodaway	1.44			.23				T.							1.29			.88			.04	T.	T.									3.88	
Corydon	Chariton	1.28	.37			.17			.38	.04		1.08				.63	.02		1.00			.02	.01	T.									5.01	
Creston	Missouri		.44			.20				.06	.13			.01		.38	1.82		1.11			T.	.12	.05	T.						.01	.43		
Cumberland	Nodaway	.70			.35											T.								.35									2.20	
Earlham	Des Moines	1.69	.05		.05	.02			.03	.66		T.				.40			.95			T.	.25	T.									4.10	
Fairfield	Skunk	.80	1.82						1.50			1.44							.30	T.		.22											6.08	
Fairport	Mississippi	.91	1.98							.01						.07			1.62			.50											5.39	
Glenwood	Missouri	.93	.05		.38				1.10	.10						.56	.30		.90		.02		.05			.46						.16	4.11	
Greenfield	Nodaway	.96			.31					.24	.58					T.			.96			T.	.48										.08	3.87
Indianola	Des Moines	2.02	.05		T.	.06			.11	.67		.05				.65			T.	2.07		.03	T.										5.71	
Keokuk	Mississippi	1.86	1.34		T.				.28	.12		.98			T.	.60	.01		.10			T.	.05	T.						T.			5.34	
Keosauqua	Des Moines	.57	2.02						.14	.17		.04				.65	.02				.49	T.	T.	T.									4.10	
Knoxville	Des Moines	1.95	.17			.25	T.		.90	.33			T.			.30			.12	1.12		.20	T.										5.34	
Lacona	Des Moines	1.48	.08			1.10				.24	.20					.60	.08		.81	.34			.07	.07										5.07
Lamon	Grand		.78			.18			.04	.10						2.05	1.03		.29					.10										4.57
Lenox	Missouri	1.32	.23		.21				T.	.08						1.45			.62	.50	.05			.05										4.51
Mt. Ayr	Grand	1.07	.33		.18			.01		.10	.02					1.65	.03		.38	T.		T.			.08									3.85
Mt. Pleasant	Skunk	.30	2.70			.20			.13	.02		1.21				.45			.38	T.		.08												5.47
Oakland	Nishnabotna	.48	T.						.06							.63	.25	1.45						T.								.11		2.98
Oskaloosa	Des Moines	2.81	.15		T.				.83	.08		.09	T.			.26			T.	.60		.35	T.									.20	5.37	
Ottumwa	Des Moines	1.50	2.00						1.70			.30				.42			.95			.52												7.39
Pella	Skunk	1.83	.43		T.		.18			.88	.30					.30			2.15			.75	T.											6.82
Sigourney	Skunk	1.75	.38		T.	.39			.07	.07		1.07				.26			.84			.30												5.13
Stockport	Skunk	.40	2.07		T.	.02			.04		1.26	.10				.07			.54			.31	.04	.02										5.41
Thurman	Missouri	.65	.44		.28				.05	2.10		.08				T.	.66			1.70	T.			.04	T.		.92					T.	6.92	
Washington	Skunk	1.29	1.70			.64			.23	.03		.39	.05			.10			1.00			.26											5.09	
Winterset	Des Moines	1.25	.02		.03	.35			.06	.59		.05				T.	.64			.06	1.76		.01	.10	.01								4.93	
Omaha, Nebr.	Missouri	.02	T.		.48	T.	T.		.92					T.		.11	.15			.05		.03	T.		.01		.19				.08	.03	2.07	

Except as otherwise indicated, observations are generally made late in the afternoon, near sunset, and precipitation recorded is for 24 hours ending at the time of observation.  
 |||Precipitation measured in the morning; amount then recorded is for the preceding 24 hours.  
 \*\*\*Regular Weather Bureau Station; precipitation is for 24-hour period, midnight to midnight.  
 \*\*Incomplete.  
 \*Precipitation included in the next following measurement.

**WIND.**

The prevailing direction of the wind was from the south-east. The highest velocity reported from a regular Weather Bureau Station was at the rate of 40 miles per hour at Sioux City, from the northwest, on the 16th.

**RIVERS.**

Low stages prevailed on the principal rivers with a general falling tendency and the heavy rains affected the stages but little. On the interior rivers a moderate rise occurred after the heavy rain of the first but thereafter low stages prevailed with slight fluctuations.

**CROP STATISTICS.**

For more than 30 years statistics of Iowa crops have been published in Climatological Data or its predecessors under other names. Hereafter crop statistics will not appear in this publication but will appear in a new publication called the Iowa Monthly Crop Report prepared under a co-operative arrangement with the U. S. Bureau of Markets and Crop Estimates. Those who have been receiving Climatological Data solely for the crop statistics should make application for the new bulletin and request that their names be dropped from the list for Climatological Data.

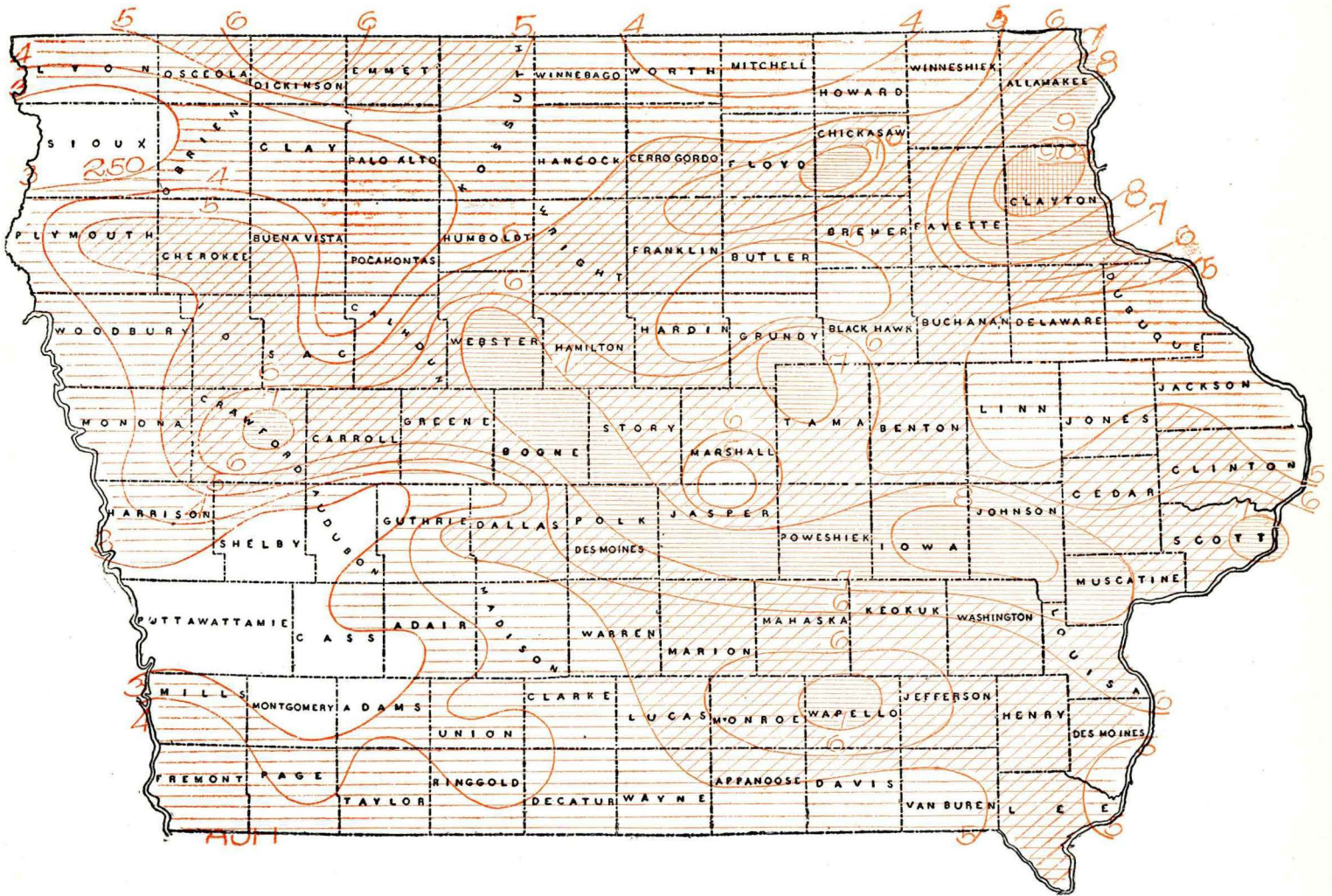


Daily Maximum and Minimum Temperatures for the Month of August, 1921.

Table with columns for Stations, days 1-31, and Mean. Rows are categorized by Northern Division, Central Division, and Southern Division, listing various Iowa cities and their daily temperature ranges.

a, b, c, etc., indicate respectively 1, 2, 3, etc., days missing from record.

# TOTAL PRECIPITATION, AUGUST, 1921



## SCALE OF SHADES—IN INCHES



# CLIMATOLOGICAL DATA.

## IOWA SECTION

In cooperation with  
 IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXII DES MOINES, IOWA, SEPTEMBER, 1921 No. 9

### GENERAL SUMMARY.

September was warm and wet. Since 1890, when State-wide records began, there have been but three Septembers warmer and only one wetter than the present month. There were no cold periods and at no time during the month were there more than two consecutive days with the temperature normal, or below, and for the entire State the number of days that the temperature was not above normal was less than ten. Every station in the State showed an excess in temperature, being greatest in the central and southern divisions, where there was also the greatest excess in precipitation. Frost was reported from several stations, principally on the 30th, but the damage from this source was of little consequence as the staple crops were generally out of danger.

The precipitation was unusually heavy over the entire State except along the Missouri River, where a few sections received less than the normal amount. Thunderstorms were unusually prevalent and severe and only two other Septembers have had as many rainy days. One death from lightning occurred near Burlington. The rainfall was well distributed throughout the month with no period of fair weather of more than a few days, and the greatest amount occurred in the period from the 10th to 20th, inclusive. On the 15th and 16th the amounts were especially heavy over most of the central and eastern portions of the State and as a result of the rains that had fallen previously the soil was thoroughly saturated, causing practically the entire amount to find its way to the small streams, which were soon out of banks, the larger interior rivers reaching flood stages in the lower reaches, and many thousands of acres in the central and eastern portions of the State were under water. The damage was particularly heavy in Tama County, in the vicinity of Traer. In this county and areas adjoining, several hundred cattle and sheep were drowned, many bridges and culverts washed out, farm machinery washed away, and railroad washouts were numerous. Between Traer and Eagle Grove train service was suspended nearly 3 days. The rainfall was also very heavy in a number of counties in the southwestern portion of the State on the 10th, which was accompanied by severe lightning, heavy hail in localities and strong winds. Many farm animals were killed by lightning, much damage resulted to farm buildings, trees, and crops, from wind and hail; and small streams out of banks did considerable damage.

A small tornado developed on the evening of the 4th, at the western edge of Burlington. The path was about 300 feet wide and it moved eastward about 2½ miles across the Mississippi River into Illinois. It unroofed numerous buildings and uprooted a large number of trees in its path.

The excessive rainfall and strong winds had a disastrous effect on the corn crop. As a result of the saturated condition of the soil and the strong winds that accompanied the rain, much of the crop is down and in a bad condition to harvest. Many fields are seriously affected with mold, some fields as

much as 50 per cent, and considerable down corn is sprouting. The crop is also seriously injured by the ear worm and many silos will not be filled on account of the unfavorable conditions that have prevailed throughout the month. Pastures were greatly benefited by the rains and were generally in good condition. Early seeded winter grain is mostly up and making excellent growth. A tabulated statement relative to hail storms appears elsewhere in this report.

F. L. D.

### TEMPERATURE.

The mean temperature for the State, as shown by the records of 94 stations, was 67.3°, or 3.9° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 64.8°, or 3.0° higher than the normal; Central, 67.6°, or 4.1° higher than the normal; Southern, 69.4°, or 4.4° higher than the normal. The highest monthly mean was 71.2°, at Clarinda and Keokuk, and the lowest 62.7°, at Estherville. The highest temperature reported was 99°, at Mt. Pleasant, on the 4th, and the lowest was 31°, at Sanborn, on the 30th. The monthly range for the State was 68°.

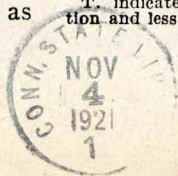
### RIVERS.

Low stages prevailed on the Mississippi River until the end of the second week, after which moderate stages prevailed. On the Missouri River moderate stages prevailed with but little fluctuation. High stages prevailed on the interior rivers after the heavy rains from the 10th to 20th, but during the last week gradually falling stages prevailed. On the smaller streams in the interior of the State severe overflows occurred which caused great loss of property. Salt Creek in Tama County was the highest ever known.

### COMPARATIVE DATA FOR THE STATE—SEPTEMBER.

YEAR	Temperature				Precipitation				Number of Days				
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. of in. or more	Clear	Partly cloudy	Cloudy
1890	59.3	-4.1	96	23	2.97	-0.39	4.85	1.36	-----	7	13	10	7
1891	67.3	+3.9	104	28	1.33	-2.03	3.60	0.13	-----	4	20	7	3
1892	64.7	+1.3	99	29	1.53	-1.83	4.15	0.16	-----	4	16	8	6
1893	64.7	+1.3	102	18	2.34	-1.02	5.49	0.74	-----	4	20	6	4
1894	65.1	+1.7	100	26	3.57	+0.21	7.43	0.67	-----	8	15	10	5
1895	66.8	+3.4	103	22	3.03	-0.33	7.43	0.85	-----	5	18	8	4
1896	58.5	-4.9	95	22	4.09	+0.73	9.96	1.82	-----	10	11	9	10
1897	70.9	+7.5	106	26	2.04	-1.32	5.88	0.00	-----	4	23	5	2
1898	65.3	+1.9	99	29	2.69	-0.67	8.45	0.41	-----	7	16	9	5
1899	62.5	-0.9	104	15	0.93	-2.43	4.32	T.	-----	4	16	9	5
1900	64.4	+1.0	99	26	4.98	+1.62	8.82	2.48	-----	9	15	8	7
1901	63.3	-0.1	102	26	4.77	+1.41	13.62	1.71	-----	9	13	9	8
1902	59.1	-4.3	88	23	4.35	+0.99	10.41	1.65	-----	9	15	6	9
1903	60.8	-2.6	94	28	3.81	+0.45	8.79	1.42	-----	10	14	6	10
1904	64.0	+0.6	94	30	2.78	-0.58	8.33	0.09	-----	7	13	8	9
1905	65.8	+2.4	96	36	3.81	+0.45	13.18	0.50	-----	8	14	8	8
1906	67.2	+3.8	100	27	4.16	+0.80	11.10	0.64	-----	8	16	8	6
1907	62.8	-0.6	98	25	2.75	-1.61	6.06	1.38	-----	8	15	9	6
1908	67.9	+4.5	98	20	1.20	-2.16	3.46	0.25	-----	3	21	6	3
1909	62.4	-1.0	94	30	3.58	+0.22	7.34	1.39	-----	9	14	8	8
1910	63.2	-0.2	99	30	3.59	+0.23	7.43	1.18	-----	9	14	7	9
1911	65.8	+2.4	103	32	5.12	+1.76	13.73	1.19	-----	10	11	9	10
1912	62.1	-1.3	104	24	3.98	+0.62	10.12	0.28	-----	11	12	8	10
1913	64.5	+1.1	107	19	3.31	-0.05	7.44	0.45	-----	9	15	8	7
1914	64.5	+1.1	99	30	7.88	+4.52	16.24	2.48	-----	10	16	7	7
1915	63.7	+0.3	91	30	6.03	+2.67	12.45	2.88	-----	11	11	8	11
1916	62.5	-0.9	98	21	3.89	+0.53	9.71	1.45	-----	7	17	8	5
1917	62.6	-0.8	97	28	2.90	-0.46	8.68	0.39	-----	7	15	7	8
1918	58.6	-4.8	93	20	1.87	-1.49	4.62	0.48	-----	6	16	8	6
1919	67.5	+4.1	99	33	5.34	+1.98	11.82	1.49	-----	8	16	6	8
1920	66.5	+3.1	98	24	3.30	-0.06	7.21	0.69	-----	8	17	8	5
1921	67.3	+3.9	99	31	6.72	+3.36	11.95	1.72	-----	11	14	8	8

T. Indicates an amount too small to measure, or less than .005 inch precipitation and less than .05 inch snowfall.



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Climatological Data for September, 1921.

Table with columns: Stations, Counties, Elevation, Length of record, Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range, Total, Departure from normal, Greatest in 24 hours, Total snowfall, Precipitation .01 in. or more, Clear, Partly cloudy, Cloudy, Prevailing direction of wind, Observers.

Climatological Data for September, 1921—Continued.

Table with columns: Stations, Counties, Elevation, Length of record, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Total snowfall, Precipitation .01 in. or more, Clear, Partly cloudy, Cloudy), Number of Days, Prevailing direction of wind, Observers.

The departure from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete records are used in determining means. Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example, b represents two days, etc. †Also other dates. ‡Received too late to be included in means and summaries. T., Precipitation is less than 0.01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE.

Table with columns: Stations, Barometric Pressure (Inches (Sea Level)), Relative Humidity (%), Wind (Total movement, Average hourly velocity, Miles, From, Date), Sunshine (Per cent of possible, Departure from normal).

HUMIDITY.

The average relative humidity for the State at 7:00 a. m. was 83 per cent, and at 7:00 p. m. it was 68 per cent. The mean for the month was 76 per cent, or 2 per cent above the normal. The highest monthly mean was 80 per cent, at Charles City, and the lowest was 69 per cent, at Sioux City.

PRECIPITATION.

The average precipitation for the State, as shown by the records of 99 stations was 6.72 inches, or 3.36 inches more than the normal. By divisions, the averages were as follows: Northern, 5.06 inches, or 2.01 inches more than the normal; Central, 7.47 inches, or 4.01 inches more than the normal; Southern, 7.64 inches, or 4.08 inches more than the normal. The greatest amount, 11.95 inches, occurred at Olin, and the least, 1.72 inches, occurred at Le Mars. The greatest amount, in 24 consecutive hours, 5.26 inches, occurred at Belle Plaine on the 16th.

\*Dubuque. §Omaha. ¶Davenport. †Local mean time. ‡And other dates.

Daily Precipitation for September, 1921.

Table with columns: Stations, Drainage Basin, Day of Month (1-31), and Totals. Rows include various Iowa locations like Algona, Allison, Alton, Belmont, Britt, Charles City, Decorah, Estherville, Fayette, Forest City, Humboldt, Inwood, LeMars, Mason City, Milford, New Hampton, Nora Springs, Northwood, Pocahontas, Postville, Rock Rapids, Sanborn, Sioux Center, Spencer, Storm Lake, Washta, Waverly, West Bend, Ames, Audubon, Baxter, Belle Plaine, Boone, Carroll, Cedar Rapids, Clinton, Davenport, Denison, Des Moines, Dubuque, Fort Dodge, Grinnell, Grundy Center, Guthrie Center, Harlan, Independence, Iowa City, Iowa Falls, Jefferson, LeClaire, Little Sioux, Logan, Manchester, Marshalltown, Monroe, Muscatine, Olin, Onawa, Perry, Rockwell City, Sac City, Sioux City, Tipton, Toledo, Van Meter, Waterloo, Wauke, Webster City, and Williamsburg.

Daily Precipitation for September, 1921—Continued.

Table with columns: Stations, Drainage Basin, Day of Month (1-31), and Totals. Rows list various Iowa locations and their drainage basins with daily precipitation values.

Except as otherwise indicated, observations are generally made late in the afternoon, near sunset, and precipitation recorded is for 24 hours ending at the time of observation.

- |||Precipitation measured in the morning; amount then recorded is for the preceding 24 hours.
\*\*\*Regular Weather Bureau Station; precipitation is for 24-hour period, midnight to midnight.
\*\*Incomplete.
\*Precipitation included in the next following measurement.

The reference \* after the reference ||| indicates that the time of measurement was changed from 7 a. m. to 7 p. m. on the 16th.

PRESSURE.

The mean pressure (reduced to sea level) for the State was 29.94 inches. The highest recorded was 30.31 inches, at Charles City, on the 12th, and the lowest was 29.39 inches, at Sioux City, on the 28th. The monthly range was 0.94 inch.

MISCELLANEOUS PHENOMENA.

- Aurora: 1st, 24th, 27th, 28th, 29th, 30th.
Fog: 3d, 4th, 6th, 7th, 14th, 19th, 24th.
Frost, light: 18th, 26th, 28th, 30th; killing: 30th.
Hail: 4th, 9th, 10th, 13th, 15th, 16th, 20th, 24th.
Halos: 20th, 22d, 27th.
Rainbows: 2d 13th, 16th, 23d.
Thunderstorms: All dates except 6th, 18th, 22d, 26th, 27th, 28th, 30th.
Tornado: 4th.

WIND.

The prevailing direction of the wind was from the south. The highest velocity reported from a regular Weather Bureau Station was at the rate of 43 miles per hour from the northwest at Sioux City, on the 4th.

SUNSHINE.

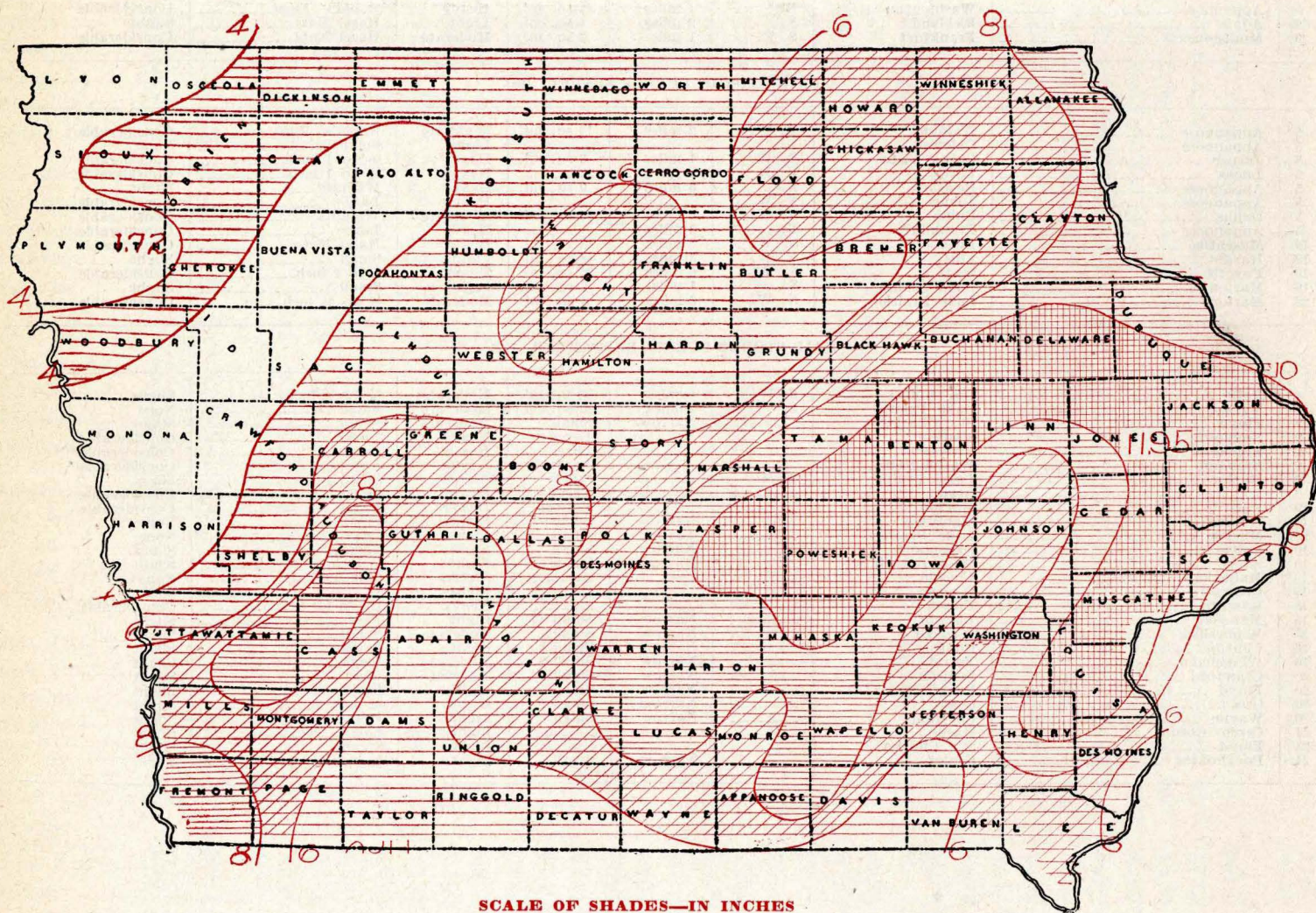
The average per cent of the possible amount of sunshine was 62, which is 1 per cent below the normal. The per cent of the

possible amount at the regular Weather Bureau Stations was as follows: Charles City, 53; Davenport, 69; Des Moines, 63; Dubuque, 60; Keokuk, 58; Sioux City, 60; Omaha, Nebr., 71.

ERRATA.

Report for August, 1921: Page 58, Waverly, mean temperature recorded 70.0, should be 70.2, departure recorded 0.6° should be 0.4°; Des Moines, prevailing direction of wind recorded sw. should be se; page 59, Charles City, sunshine recorded 63 per cent, should be 60 per cent; Omaha, noon humidity recorded 58 per cent, should be 59 per cent; page 62, Dubuque, minimum temperature on 16th recorded 61°, should be 60° and the mean of the minimum temperatures recorded 62.8°, should be 62.7°.

TOTAL PRECIPITATION, SEPTEMBER, 1921



SCALE OF SHADES—IN INCHES





# CLIMATOLOGICAL DATA.

## IOWA SECTION

In cooperation with  
IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXII DES MOINES, IOWA, OCTOBER, 1921 No. 10

### GENERAL SUMMARY.

October was, as a whole, a very pleasant month with the temperature considerably above normal and the precipitation somewhat below. The coldest weather during the month occurred during the first twelve days and thereafter the temperature remained continuously above normal except a few days when nearly normal temperature conditions prevailed. This month makes a total of fourteen consecutive months that the mean temperature for the State has been above normal. The first killing frost occurred at a few stations in the northwestern portion on the 3d; on the 4th a number of stations also reported killing frosts; but on the 8th general freezing weather prevailed except over areas in the vicinity of the Mississippi River. Freezing temperatures also occurred generally on the 12th, but the areas that escaped the earlier freezes also escaped this one and at Dubuque this is the first time in 21 years that a killing frost has not occurred in October. After the 12th practically no frost or freezing temperatures occurred in the State. The damage from frost was slight as the corn crop was beyond injury and truck crops were generally protected. The warm weather during the last two decades, in connection with well-distributed rainfall, resulted in a good crop of potatoes in small areas over the eastern portion of the State. Some potato vines were still green at the close of the month. The warm weather had an unusual effect on plant growth in general. At many points fruit buds swelled to a considerable extent and in some cases trees were in bloom, spring flowers bloomed and reports of ripe strawberries were not uncommon.

The weather was favorable for all out door work and the high temperature and strong winds that prevailed on a large number of days caused corn to dry rapidly so that 50 per cent of that crop was gathered and cribbed under favorable conditions by the close of the month.

The precipitation was deficient over the northern and central divisions, but there was a slight excess over the southern division. Over much of the western portion of the State practically no rain fell during the first three weeks and winter wheat had begun to need rain badly, but the general rains that occurred during the last week greatly benefited that crop. Pastures were unusually good for the season. F. L. D.

### PRESSURE.

The mean pressure (reduced to sea level) for the State was 29.96 inches. The highest recorded was 30.45 inches, at Keokuk, on the 13th, and the lowest was 29.46 inches, at Sioux City, on the 26th. The monthly mean was 0.99 inch.

### TEMPERATURE.

The mean temperature for the State, as shown by the records of 94 stations, was 54.6°, or 3.8° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 52.7°, or 3.7° higher than the normal; Central, 54.8°, or 3.9° higher than the normal; Southern, 56.4°,

or 3.8° higher than the normal. The highest monthly mean was 58.2°, at Thurman, and the lowest was 50.4°, at Postville. The highest temperature reported was 90°, at Clarinda, on the 16th, and the lowest was 21°, at Bedford and Washta, on the 12th. The temperature range for the State was 69°.

### HUMIDITY.

The average relative humidity for the State at 7 a. m. was 75 per cent, and at 7 p. m. it was 59 per cent. The mean for the month was 67 per cent, or 5 per cent less than the normal. The highest monthly mean was 78 per cent, at Charles City, and the lowest was 58 per cent, at Sioux City. The lowest observed was 24 per cent, at Sioux City, on the 8th.

### PRECIPITATION.

The average precipitation for the State, as shown by the records of 99 stations, was 1.96 inches, or 0.50 inch less than the normal. By divisions the averages were as follows: Northern, 1.37 inches, or 0.97 inch less than the normal; Central, 1.90 inches, or 0.59 inch less than the normal; Southern, 2.62 inches, or 0.08 inch more than the normal. The greatest amount, 3.61 inches, occurred at Mt. Ayr, and the least, 0.21 inch, at Rock Rapids. The greatest amount in 24 consecutive hours, 2.32 inches, occurred at Greenfield, on the 29th.

### WIND.

The prevailing direction of the wind was from the northwest. The highest velocity reported from a regular Weather Bureau Station was at the rate of 52 miles per hour, from the northwest, at Sioux City on the 10th.

COMPARATIVE DATA FOR THE STATE—OCTOBER.

YEAR	Temperature				Precipitation				Number of Days				
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	Clear	Partly cloudy	Cloudy
1890.....	49.2	-1.6	86	16	3.48	+1.02	6.82	1.59	-----	7	11	11	9
1891.....	50.0	-0.8	92	19	2.77	+0.31	6.53	0.85	-----	6	18	7	6
1892.....	54.5	+3.7	96	14	1.55	-0.91	2.58	0.00	0.0	4	21	6	4
1893.....	52.4	+1.6	94	10	1.28	-1.18	4.56	0.02	0.0	4	16	9	6
1894.....	51.7	+0.9	90	20	2.67	+0.21	5.25	0.03	0.2	8	14	8	9
1895.....	46.0	-4.8	88	4	0.47	-1.99	1.88	0.00	T.	2	19	8	4
1896.....	47.9	-2.9	88	12	3.13	+0.67	5.05	1.51	T.	5	18	6	7
1897.....	56.8	+6.0	97	12	1.14	-1.32	3.30	0.03	0.0	4	17	8	6
1898.....	47.5	-3.3	88	17	3.56	+1.10	5.75	1.27	3.6	8	7	9	15
1899.....	56.7	+5.9	95	17	1.73	-0.73	4.64	0.15	0.0	5	17	8	6
1900.....	59.3	+8.5	90	21	3.91	+1.45	8.00	1.20	0.0	7	16	7	8
1901.....	54.2	+3.4	88	20	1.98	-0.48	4.23	0.45	T.	6	17	7	7
1902.....	53.5	+2.7	83	20	2.54	+0.08	6.66	0.28	T.	5	16	8	7
1903.....	52.2	+1.4	90	16	1.95	-0.51	4.50	0.32	0.0	5	19	6	6
1904.....	53.1	+2.3	96	16	1.67	-0.79	4.43	0.14	T.	6	15	8	8
1905.....	49.2	-1.6	95	16	3.40	+0.94	5.36	1.20	1.6	8	16	6	9
1906.....	50.5	-0.3	87	7	1.96	-0.50	4.25	0.50	0.1	6	14	7	10
1907.....	50.4	-0.4	85	10	1.50	-0.96	3.71	0.30	0.0	5	20	5	6
1908.....	51.1	+0.3	89	17	3.38	+0.92	3.83	0.58	2.6	8	16	6	9
1909.....	49.7	-1.1	97	10	2.22	-0.24	4.70	0.48	T.	6	16	6	9
1910.....	55.2	+4.4	93	10	0.77	-1.69	1.73	T.	0.1	4	21	4	6
1911.....	48.7	-2.1	87	14	3.34	+0.88	7.03	0.73	0.6	10	12	8	11
1912.....	52.2	+1.4	92	16	2.98	+0.52	5.77	1.08	T.	6	21	3	7
1913.....	49.2	-1.6	89	-2	3.03	+0.57	7.29	0.35	1.2	9	15	8	8
1914.....	55.9	+5.1	88	14	3.23	+0.77	6.64	0.74	T.	9	16	6	9
1915.....	54.4	+3.6	86	19	1.31	-1.15	3.25	T.	T.	5	19	6	6
1916.....	50.9	+0.1	92	6	2.00	-0.46	4.33	0.20	2.0	8	16	7	8
1917.....	42.9	-7.9	85	0	1.41	-1.05	4.00	1.15	2.2	6	10	11	10
1918.....	55.1	+4.3	93	21	3.64	+1.18	7.56	1.36	0.8	7	13	7	11
1919.....	50.7	-0.1	89	8	3.02	+0.56	8.65	0.45	T.	10	11	8	12
1920.....	57.7	+6.9	90	11	2.13	-0.33	4.64	0.48	T.	6	19	6	8
1921.....	54.6	+3.8	90	21	1.96	-0.50	3.61	0.21	T.	6	17	8	6

T. indicates an amount too small to measure, or less than .005 inch precipitation and less than .05 inch snowfall.



Climatological Data for October, 1921.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.					Precipitation, in Inches.				Number of Days.			Prevailing direction of wind.	Observers.			
				Mean.	Departure from normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from normal.	Greatest in 24 hours.	Total snowfall, unmelted.	Precipitation .01 in. or more.			Clear.	Partly cloudy.	Cloudy.
<b>Northern Division</b>																				
Algona	Kossuth	1,213	48	54.0	+ 5.2	80	16	29	8	40	1.34	-0.90	0.80	T.	2	18	3	10	se.	W. E. Laird.
Allison	Butler	1,044	9	53.0		84	16	25	8	40	0.85	-0.49	0.49	T.	5	13	10	8	nw.	J. A. Bell.
Alta	Buena Vista	1,513	30	53.2	+ 4.4	80	9†	30	8†	45	1.46	-1.49	0.52	0	6	12	14	5	nw.	David E. Hadden.
Alton	Sioux	1,305	16	52.2	+ 3.2	79	9	26	8	43	0.62	-0.33	0.33	0	5	17	8	6	nw.	W. S. Slagle.
Belmond	Wright	1,205	11	53.2		85	16	23	8†	43	0.85	-0.43	0.43	T.	3	10	15	6	nw.	Geo. P. Hardwick.
Britt	Hancock	1,236	24																	L. M. Goodman.
Charles City	Floyd	1,015	30	51.2	+ 3.0	77	16	30	8	30	2.27	+0.24	0.77	0	8	9	12	10	nw.	U. S. Weather Bureau.
Decorah	Winneshiek	875	28	51.2	+ 2.1	75	16†	23	4†	33	2.00	-0.77	0.69	0	6	15	5	11	nw.	M. D. Whitney.
Estherville	Emmet	1,298	26	51.8	+ 4.5	78	9	30	4†	40	1.05	-1.37	0.40	0	5	18	9	4	nw.	A. O. Peterson.
Fayette	Fayette	1,003	31	51.8	+ 3.1	77	16	28	4†	34	2.13	-0.33	1.34	0	6	16	8	7	nw.	R. Z. Latimer.
Forest City	Winnebago	1,226	27	52.2	+ 3.9	83	16	27	8	41	1.47	-0.94	0.51	T.	6	16	7	8	nw.	Dr. M. B. Neill.
Humboldt	Humboldt	1,095	33																	H. O. Snitkey.
Inwood	Lyon	1,474	17	53.4	+ 4.5	82	16	24	8	54	0.56	-1.66	0.38	0	4	19	8	4	nw.	F. B. Hanson.
LeMars	Plymouth	1,224	25	53.6	+ 4.3	81	9	28	4†	49	1.44	-0.78	0.64	0	7	19	6	6	sw.	Mrs. M. C. Woolley.
Mason City	Cerro Gordo	1,148	24	51.9	+ 3.1	83	16	25	12	42	2.33	+0.19	0.84	0	8	21	3	7	nw.	Northern Sugar Corp.
Milford (near)	Dickinson	1,430	1	51.8 <sup>f</sup>		76 <sup>f</sup>	16	23 <sup>e</sup>	8	44 <sup>r</sup>	0.51	-0.22	0.22	0	7					Dr. F. J. Smith.
New Hampton	Chickasaw	1,169	24	51.7	+ 3.6	80	16	27	8	34	2.49	+0.22	1.08	0	8	12	12	7	sw.	A. F. Kemman.
Nora Springs	Floyd	1,064	9	53.6		83	16	28	4†	40	2.21	-0.71	0.71	T.	8	16	9	6	s.	Arthur Betts.
Northwood	Worth	1,222	25	50.8 <sup>e</sup>	- 3.1	78 <sup>e</sup>	16	28	8	44 <sup>e</sup>	1.91	-0.69	0.57	0.5	8	14	12	5	sw.	Chas. Dwelle.
Pocahontas	Pocahontas	1,248	17	54.0	+ 4.6	85	16	27	8†	50	1.33	-1.14	0.65	0	6	16	8	7	sw.	F. E. Hronek.
Postville	Clayton	1,180	22	50.4	+ 1.3	74	16	23	8	27	2.17	-0.41	0.80	T.	8	12	8	11	sw.	F. L. Williams.
Rock Rapids	Lyon	1,358	22	52.4	+ 5.5	80	16	22	12	47	0.21	-2.11	0.13	0	3	22	4	5	sw.	H. L. Felter.
Sanborn	O'Brien	1,553	7	52.4		84	15	25	8	50	0.56	-0.45	0.45	0	3	18	4	9	sw.	James W. Dow.
Sioux Center	Sioux	1,426	22	54.0	+ 5.3	80	15†	27	12	48	0.95	-1.11	0.37	0	5	19	5	7	s.	J. de Ruyter.
Spencer	Clay	1,319	7	53.4		84	16	24	12	50	1.08	-0.30	0.30	0	6	15	11	5	nw.	E. W. Little.
Storm Lake	Buena Vista	1,440	32	54.4	+ 4.2	81	16	30	8	45	0.92	-0.96	0.59	0	5	22	6	3	s.	Geo. H. Fracker.
Washta	Cherokee	1,157	23	53.6	+ 4.0	82	9	21	12	54	1.66	-0.38	0.77	0	5	22	4	5	s.	H. L. Felter.
Waverly	Bremer	948	25	53.6	+ 3.5	80	16	29	10	32	1.50	-0.86	0.80	0	7	15	10	6	w.	E. M. Weyrauch.
West Bend	Palo Alto	1,197	28	54.8	+ 6.7	85	17	26	8†	52	1.30	-0.63	0.56	0	5	18	5	8	sw.	Jos. Dorweller.
Means and extremes.				52.7	+ 3.7	85	16†	21	12	54	1.37	-0.97	1.34	T.	6	16	8	7	nw.	
<b>Central Division</b>																				
Ames	Story	926	45	54.3 <sup>b</sup>	+ 3.0	83 <sup>1</sup>	16	26	12	39 <sup>1</sup>	1.45	-1.29	0.86	0	5	18	6	7	sw.	Iowa State College.
Audubon	Audubon	1,301	27	54.8	+ 4.5	85	9†	23	8†	47	2.26	-0.02	1.10	0	6	20	2	9	sw.	Geo. Kibby.
Baxter	Jasper	996	21	55.3	+ 3.8	80	9	30	8†	39	0.84	-1.95	0.58	0	4	15	10	6	s.	Henry Geise
Belle Plaine	Benton	886	31	54.5	+ 3.5	84	16	26	12	42	2.38	-0.18	0.81	0	10	14	10	7	nw.	O. C. Burrows.
Boone	Boone	1,134	16	54.2	+ 3.6	87	16	23	12	47	1.55	-1.16	1.01	0	7	15	11	5	nw.	Carl F. Henning.
Carroll	Carroll	1,265	31	55.6	+ 6.3	85	16	28	8	45	2.46	-0.10	1.50	0	4	20	5	6	nw.	Mrs. Jos. J. Wolfe.
Cedar Rapids	Linn	733	39	55.5	+ 4.6	82	16	31	8	33	1.95	-0.48	0.73	0	6	17	3	11	s.	R. S. Toogood.
Clinton	Clinton	593	48	55.6	+ 4.6	81	16	30	8	34	2.25	-0.14	1.24	0	7	13	9	9	s.	Dr. A. P. Bryant.
Davenport	Scott	580	50	55.6	+ 3.0	79	16	32	8	25	2.38	-0.01	1.04	T.	10	12	9	10	sw.	U. S. Weather Bureau
Denison	Crawford	1,180	27	55.3	+ 4.5	84	9	28	4†	48	2.37	+0.25	1.30	0	4	16	8	7	sw.	V. L. Byers.
Des Moines	Polk	861	43	56.5	+ 4.0	85	16	32	12	39	1.51	-1.17	1.03	0	8	13	13	5	sw.	U. S. Weather Bureau
Dubuque	Dubuque	639	48	52.9	+ 0.9	77	16	33	8	27	3.43	+0.75	1.24	T.	8	9	11	11	nw.	U. S. Weather Bureau
Fort Dodge	Webster	1,114	21	54.2	+ 4.3	83	16	27	8	43	0.92	-2.07	0.46	T.	4	16	6	9	n.	Fred Heman.
Grinnell	Poweshiek	1,031	27	54.2 <sup>c</sup>	+ 1.8	80 <sup>c</sup>	16	28 <sup>c</sup>	8	42 <sup>c</sup>	1.28	-1.40	0.68	0	4					Wm. Bader.
Grundy Center	Grundy	976	30	53.8	+ 3.0	86	16	29	8	36	1.26	-1.34	0.40	0	6	12	12	7	nw.	M. G. Helberger.
Guthrie Center	Guthrie	1,077	26	56.7	+ 5.4	88	16	30	8	43	2.06	-0.47	0.95	0	5	23	3	5	sw.	E. L. Nesselroad.
Harlan	Shelby	1,192	22	54.6	+ 4.2	83	9†	25	12	45	3.01	+0.47	1.62	0	6	23	5	3	s.	W. K. Colburn.
Independence	Buchanan	921	57	54.6	+ 4.7	80	16	28	8	36	2.30	-0.18	1.34	T.	8	19	5	7	nw.	Dr. Geo. Boody.
Iowa City	Johnson	733	61	54.2	+ 3.2	81	16	27	8	37	2.47	-0.25	1.33	0	10	14	13	4	sw.	Prof. J. F. Reilly.
Iowa Falls	Hardin	1,107	28	52.8	+ 4.4	82	16	25	12	37	1.00	-1.36	0.39	T.	5	17	7	7	nw.	J. B. Parmelee.
Jefferson	Greene	1,052	22	53.9	+ 2.9	82	16	26	12	42	1.76	-1.03	1.03	0	4	17	4	10	sw.	Will I. Lyon.
Le Claire	Scott	576	21								2.36	+0.29	1.02	0	8					Margaret T. Disney.
Little Sioux	Harrison	1,040	16	56.3 <sup>b</sup>	+ 3.5	88 <sup>b</sup>	9	25 <sup>b</sup>	12	58 <sup>b</sup>	2.04	-0.85	0.85	0	7					Geo. H. Gibson.
Logan	Harrison	1,035	54	57.0	+ 5.2	87	16	25	12	53	1.98	-0.37	0.90	0	6	19	8	4	sw.	Mary Jean Stern.
Manchester	Delaware			51.5		81	16	33	13†	37	3.48	-1.20	1.20	0	4	16	6	9	sw.	Thomas H. Tracey
Marshalltown	Marshall	947	29	55.1	+ 4.5	82	16	31	8†	34	1.18	-1.54	0.57	0	5	23	4	4	nw.	C. C. Pigman.
Monroe	Jasper	922	9	57.7		83	16	30	12	39	1.84	-1.09	1.09	0	7	23	1	7	s.	J. A. Dibel.
Muscatine	Muscatine	554	61								1.93	-0.77	0.94	0	7					Wm. P. Molls.
Olin	Jones	760	22	51.4	+ 0.6	75	16	29	8	32	2.82	+0.44	1.00	0	7	14	13	4	sw.	Dr. F. W. Port.
Onawa	Monona	1,051	21																	Mrs. H. E. Colby.
Perry	Dallas	975	20	55.0	+ 3.7	82	16	29	8†	41	1.40	-1.34	0.71	0	8	21	4	6	s.	F. N. Bartlett.
Rockwell City	Calhoun	1,134	25	54.2 <sup>a</sup>	+ 3.5	85 <sup>a</sup>	16	29 <sup>a</sup>	12	44 <sup>a</sup>	1.60	-0.94	0.70	0	4					A. W. McIsaac.
Sac City	Sac	1,344	45	54.0 <sup>b</sup>	+ 3.7	83 <sup>c</sup>	16	29 <sup>b</sup>	8	46 <sup>c</sup>	1.33	-0.82	0.42	0	6					F. P. Kessler.
Sioux City	Woodbury	1,135	32	55.2	+ 4.1	82	9	31	4	45	1.70	-0.09	1.17	0	6	13	11	7	nw.	U. S. Weather Bureau
Tipton	Cedar	807	22	54.6		80	16†	30	8†	38	1.81	-0.34	0.88	0	7	8	13	10	se.	C. N. Wallick.
Toledo	Tama																			

Climatological Data for October, 1921—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.					Greatest daily range.	Precipitation, in Inches.				Number of Days.			Prevailing direction of wind.	Observers.		
				Mean.	Departure from normal.	Highest.	Date.	Lowest.		Date.	Total.	Departure from normal.	Greatest in 24 hours.	Total snowfall, unmelting.	Precipitation .01 in. or more.	Clear.			Partly cloudy.	Cloudy.
<b>Southern Division</b>																				
Afton	Union	1,212	27	57.0	+ 5.5	87	16	29	8	43	2.44	-0.23	0.85	0	7	23	3	5	sw.	S. R. Brown.
Albia	Monroe	959	23	56.3	+ 4.4	85	16	28	8	42	2.81	+0.27	1.04	0	8	16	6	9	sw.	O. E. McBride
Atlantic	Cass	1,164	30	56.0	+ 5.0	87	16	25	12	45	2.75	+0.19	1.17	C	6	22	3	6	sw.	Joseph N. Reynolds.
Bedford	Taylor	1,100	21	56.2	+ 3.8	86	16	21	12	49	3.03	+0.34	1.46	0	5	17	9	5	sw.	E. E. Healy.
Bloomfield	Davis	881	14																	John W. Teed.
Bonaparte	Van Buren	30	30	55.6	+ 2.2	80	16†	28	8	36	2.37	+0.46	0.70	0	8	21	5	5	sw.	Bruce R. Vale.
Burlington	Des Moines	544	25	57.0	+ 3.3	82	6†	30	8	40	2.54	+0.28	1.05	0	6	21	5	5	sw.	Mrs. E. M. Donnelly.
Centerville	Appanoose	1,013	16	56.6		82	16	31	8†	36	3.01	-0.49	1.12	0	6	20	5	6	sw.	Leo J. Allen.
Chariton	Lucas	1,042	26	56.8	+ 4.0	85	16	27	8	43	2.21	-0.30	1.55	0	3	10	16	5	sw.	C. C. Burr.
Clarinda	Page	1,009	31	58.0	+ 6.1	90	16	26	12	49	3.11	+0.53	2.01	0	5	20	5	6	sw.	G. S. Van Sandt.
Columbus Jet	Louisa	595	20	56.2	+ 3.3	79	16†	31	8	34	2.52	+0.01	1.02	T.	8	25	2	4	nw.	J. B. Johnston.
Corning	Adams	1,117	29	56.6	+ 5.2	87	16	24	12	50	2.86	+0.19	1.34	0	4	21	4	6	sw.	Jerome Smith.
Corydon	Wayne	1,101	28	56.6	+ 2.7	85	16	28	8	42	2.61	-0.21	1.29	0	8	15	11	5	sw.	May C. Miller.
Creston	Union	1,312	16	55.8	+ 4.5	82	16	32	8†	37	3.60		1.63	0	7	15	12	4	sw.	Dr. H. M. Stanley.
Cumberland	Cass	1,225	22								2.75	-0.17	1.30	0	4	14	7	10	sw.	G. M. Clarke.
Earlham	Madison	1,126	19	55.5	+ 3.7	85	16	24	12	44	2.26	-0.39	0.98	0	4	19	3	9	sw.	Geo. Phillips.
Fairfield	Jefferson	780	37	55.3	+ 2.6	82	16	28	8†	36	2.62	-0.21	1.23	0	7	19	1	11	nw.	Prof. R. M. McKenzie.
Fairport	Muscatine	567		56.8		79	16†	31	8†	37	2.48		1.10	0	6	9	13	9	sw.	R. L. Barney.
Glenwood	Mills	1,100	23	58.0		87	9†	28	12	50	1.69		0.94	0	3	21	3	7	se.	Dr. Geo. Mogridge.
Greenfield	Adair	1,368	29	55.3	+ 3.7	85	16	30	8	46	2.50	+0.02	2.36	0	4	26	2	3	nw.	J. C. Patterson.
Indianola	Warren	969	30	56.7	+ 3.8	85	16	28	12	42	2.12	-0.36	0.95	0	8	17	10	4	sw.	Seth F. Shenton.
Keokuk	Lee	614	50	56.6	+ 2.1	84	24	31	8	30	2.56	+0.07	0.83	0	10	12	11	8	sw.	U. S. Weather Bureau.
Keosauqua	Van Buren	644	29	55.6	+ 3.4	82	16†	25	12	38	2.89	+0.90	1.23	0	5	12	14	5	sw.	J. H. Landes.
Knoxville	Marion	920	26	56.3	+ 2.8	85	16†	29	8	41	2.04	-0.35	0.78	0	6	13	8	10	sw.	W. J. Casey.
Laona	Warren		22								1.80	-1.14	1.40	0	8	11	14	6	sw.	J. B. Alter.
Lamoni	Decatur	1,100	14	57.0	+ 4.1	85	16†	27	8†	45	2.70	-0.35	0.83	0	5	21	8	2	sw.	Rupert A. Wight.
Lenox	Taylor	1,250	26	56.4	+ 4.2	88	16	28	12	43	3.05	+0.19	1.23	0	6	19	8	4	sw.	J. L. Hurley.
Mt. Ayr	Ringgold	1,236	28	56.8	+ 3.2	86	16	27	12	44	3.61	+0.82	1.29	0	8	17	9	5	nw.	Alex Maxwell.
Mt. Pleasant	Henry	729	40	55.6	+ 2.9	82	17	29	8	32	2.43	-0.03	0.97	T.	5	13	12	6	sw.	John H. Jericho.
Oakland	Pottawattamie	1,105	2	56.2		86	6†	25	12	54	3.15		1.60	C	4	23	0	8	sw.	M. E. Gray.
Oskaloosa	Mahaska	825	45	55.1	+ 2.6	83	16	28	8†	43	2.93	+0.75	1.20	0	8	9	16	6	nw.	Roy R. Robinson.
Ottumwa	Wapello	849	26								2.97	+0.46	2.05	0	6	19	2	10	e.	Henry Eilers.
Pella	Marion	877	28	55.8	+ 2.7	83	16	26	12	40	1.63	-1.11	1.21	0	5	24	1	6	nw.	J. H. Ver Steeg.
Sigourney	Keokuk	877	25	54.6	+ 2.0	81	16	27	8	35	3.19	+0.83	1.20	0	6	21	2	8	sw.	W. E. Utterback.
Stockport	Van Buren	754	19	54.4	+ 1.6	81	16	27	8	36	3.29	+1.20	1.31	0	7	18	8	5	sw.	C. L. Beswick.
Thurman	Fremont		24	58.2	+ 5.6	87	9	25	12	50	2.44	-0.44	1.56	0	3	12	15	4	nw.	C. R. Paul.
Washington	Washington	769	39	55.4	+ 2.9	83	16	28	8	34	2.57	+0.40	1.46	0	5	12	15	4	sw.	Wm. A. Cook.
Winterset	Madison	1,129	30	57.2	+ 4.9	86	16	30	8	42	3.01	+0.53	1.37	0	5	22	6	3	sw.	H. S. Ely.
Omaha, Nebr.	Madison	1,040	50	58.6	+ 4.4	87	9	36	11	39	1.52	-0.83	0.79	0	6	18	7	6	nw.	U. S. Weather Bureau.
Means and extremes.				56.4	+ 3.8	90	16	21	12	50	2.62	+0.08	2.36	T.	6	17	8	6	sw.	
State means and extremes.				54.6	+ 3.8	90	16	21	12	58	1.96	-0.50	2.36	T.	6	17	8	6	nw.	

The departure from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete records are used in determining means.

Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example, b represents two days. etc.

†Also other dates. ‡Received too late to be included in means and summaries.

T., Precipitation is less than 0.01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE.

Stations.	Barometric Pressure Inches (Sea Level).				Relative Humidity (%).			Wind.				Sunshine			
	Mean.	Highest.	Date.	Lowest.	Date.	Mean.		Total movement.	Average hourly velocity.	Maximum		Per cent of possible.	Departure from normal.		
						7 a. m.	Noon. †			7 p. m.	Miles.			From.	Date.
Charles City	29.96	30.31	12	29.58	9 85	58 71	32	13	5,244	7.0	27	ne.	29	43	-22
Davenport	29.96	30.41	13	29.52	9 79	50 63	32	14	5,866	7.9	29	ne.	6	70	+12
Des Moines	29.93	30.33	12	29.50	9 74	46 52	27	12	5,893	7.9	30	nw.	19	69	+ 6
Dubuque	29.97	30.36	13	29.64	9 79	55 66	32	9	5,002	6.7	24	nw.	19	54	+ 1
Keokuk	29.97	30.45	13	29.56	9 76	50 60	26	19	5,607	7.5	34	nw.	19	68	+ 5
Sioux City	29.96	30.43	11	29.46	26 67	48 50	24	8	9,284	12.5	52	nw.	10	67	+ 5
Omaha, Nebr.	29.94	30.40	11	29.45	25 68	42 48	22	7	6,533	8.8	36	ne.	6	73	+12
Means and extremes.	29.96					75 50	39			8.3				63	+ 1
		30.45	13	29.45	25	--	22				52	nw.		10	--
Normals and records	30.02		31st		20th	81	62			8.1				16th	62
		*30.09	1913	‡28.96	1876		‡17	1895		*60	sw.	1880		--	--

\*Davenport. ‡Omaha. †Sioux City. ‡Local mean time. †And other dates.



Daily Precipitation for October, 1921—Continued.

Stations.	Drainage Basin.	Day of Month.																															Totals	
		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		
<b>Southern Division</b>																																		
Afton	Grand		.14															.03								.10	.55		.75	.85	.02		2.44	
Albia	Des Moines		.03					.18								T.		.50	.02								.23		1.04	.80		.01	2.81	
Atlantic	Nishnabotna																	.02								.78	.54		.12	1.17	.12		2.75	
Bedford	Missouri							.11										.27								.81			.38	1.46	T.		3.03	
Bloomfield	Mississippi																																	
Bonaparte	Des Moines		.03			.16												.50	.13								.25		.70	.45		.15	2.37	
Burlington	Mississippi						.20									T.		.32	.53								.18		T.	1.05		.26	2.54	
Centerville	Chariton		.02			.24											1.12										.16		.84	.63			3.01	
Chariton	Chariton																	.52												1.55	.14		2.21	
Clarinda	Nodaway																	.06								.51	.53			1.99	.02		3.11	
Columbus Jet.	Iowa		.05				.20									.05		.74									.34		.23	.79		.12	2.52	
Corning	Nodaway																	T.								.90	.44		.42	1.10			2.86	
Corydon	Chariton		.04			.18										T.		.59									T.	.30	1.29	1.15	.05	.01	2.61	
Creston	Missouri		.04					T.										.05								.21	.81	.86		1.58	.05		3.60	
Cumberland	Nodaway																.15										1.30	T.	.90	.40			2.75	
Earlham	Des Moines		T.															.19								T.	.70	T.		.39	.98		2.26	
Fairfield	Skunk				.11													.66									.25		1.28	.28	.02	.02	2.62	
Fairport	Mississippi					.25											1.10	.12									.12			.80		.09	2.48	
Greenwood	Missouri																									.60				.94	.15		1.69	
Greenfield	Nodaway		.02			T.											.12													2.32	.04		2.50	
Indianola	Des Moines		.12				.13									.20		.06				T.					.12		.95	.51	.03		2.12	
Keokuk***	Mississippi				.42	.36											.83									.04	.20		.53	.05	.11	.01	2.56	
Keosauqua	Des Moines		T.														T.	.58										.40	1.23	.34		.34	2.89	
Knoxville	Des Moines		.06			.22											.13										.13		.78	.72			2.04	
Lacona	Des Moines		.02			.04										.06		.04									.12		.87	.53	.12		1.80	
Lamoni	Grand					.05												.83								T.	.58		.74	.50			2.70	
Lenox	Missouri																	.02									.70	.53		.61	1.14	.05		3.05
Mt. Ayr	Grand					T.	.09											.36									.08	.47	1.29	1.27	.02	.03	3.61	
Mt. Pleasant	Skunk					T.												.97										.23		.36	.60		.27	2.43
Oakland	Nishnabotna																										.74	.86		1.00	.55			3.15
Oskaloosa	Des Moines		.04			.13									T.	.05		.56									.22		1.20	.70		.03	2.93	
Ottumwa	Des Moines		.06			.16												.20								.30			5.05	.20			2.97	
Pella	Skunk		.10			.11										.11											.10			1.21			1.63	
Sigourney	Skunk		T.			.31										.06		.61									.21		1.20	.80		T.	3.19	
Stockport	Skunk					.21											.79	.52									.27		1.02	.21		.27	3.29	
Thurman	Missouri						T.											T.								.52	T.		T.	1.56	.36		2.44	
Washington	Skunk					.16												.68									.16			1.46		.11	2.57	
Winterset	Des Moines																	.25										.56		.78	1.37	.05		3.01
Omaha, Nebr.***	Missouri					T.												.01								.66	.04	T.	.22	.58	.01	T.	1.52	

Except as otherwise indicated, observations are generally made late in the afternoon, near sunset, and precipitation recorded is for 24 hours ending at the time of observation.  
 |||Precipitation measured in the morning; amount then recorded is for the preceding 24 hours.  
 \*\*\*Regular Weather Bureau Station; precipitation is for 24-hour period, midnight to midnight.  
 \*\*Incomplete.  
 \*Precipitation included in the next following measurement.

SUNSHINE AND CLOUDINESS.

The average per cent of the possible amount of sunshine was 63, or 1 per cent greater than the normal. The per cent of the possible amount at the regular Weather Bureau Stations was as follows: Charles City, 43; Davenport, 70; Des Moines, 69; Dubuque, 54; Keokuk, 68; Sioux City, 67; Omaha, Nebr., 73.

SNOW.

Light snow flurries occurred at a number of stations in each division. Only one station, Northwood, reported more than a trace of snow.

RIVERS.

Low stages prevailed on all rivers with a general falling tendency. A slight rise occurred on most rivers during the third week and a general, though slight, rise occurred on all rivers during the last few days of the month.

MISCELLANEOUS PHENOMENA.

- Aurora: 7th, 8th, 9th, 11th.
- Fog: 10th, 27th, 28th, 31st.
- Frost (killing): 3d, 4th, 8th, 9th, 10th, 12th.
- Hail: 6th, 7th, 17th, 28th.
- Halos (Lunar or Solar): 1st, 5th, 9th, 14th, 15th, 17th, 18th.
- Rainbow: 17th.
- Sleet: 7th.
- Thunderstorms: 1st, 6th, 7th, 14th, 15th, 17th, 21st, 24th, 25th, 26th, 28th, 29th.

ERRATA.

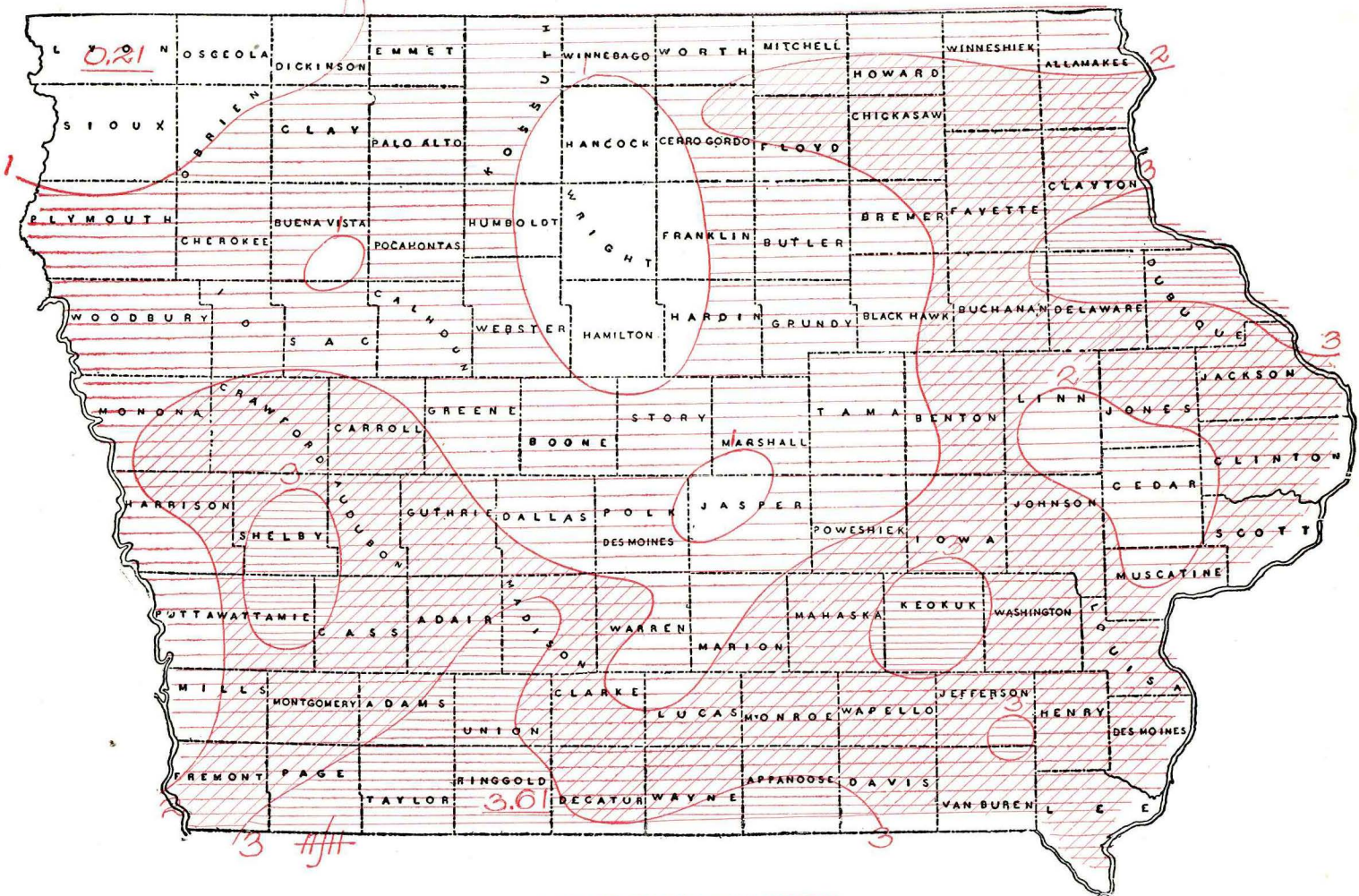
Report for September, 1921. Page 66, Des Moines, greatest precipitation in 24 hours published 1.82 inches, should be 2.09 inches; Page 67, Earlham, mean temperature published 67.2°, should be 68.2°; departure published +3.9° should be +4.9°.

Daily Maximum and Minimum Temperatures for the Month of October, 1921.


Table with columns for Stations (Northern, Central, Southern Divisions) and days 1-31, plus a Mean column. Each station entry includes Maximum and Minimum temperature values.

a, b, c, etc., indicate respectively 1, 2, 3, etc., days missing from record.

TOTAL PRECIPITATION, OCTOBER, 1921



SCALE OF SHADES—IN INCHES

 Less than 1.

 1 to 2.

 2 to 3.

 More than 3.

# CLIMATOLOGICAL DATA.

## IOWA SECTION

In cooperation with  
IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXII DES MOINES, IOWA, NOVEMBER, 1921 No. 11

### GENERAL SUMMARY.

The main feature of the weather during November was a change to subnormal temperature after 14 consecutive months above normal, though over much of the southern portion of the State the temperature continued above normal. The first week was warm and spring-like, but on the 8th a cold period set in that continued generally till the beginning of the last week. The portion of the State that escaped killing frost in October was covered by a general freeze on the 8th.

The month was mostly favorable for all outdoor work and at the end of the month about 90 per cent of the corn crop had been gathered. However, over much of the extreme northern portion of the State, where the ground was snow covered from 15 to 20 days, great difficulty was experienced in gathering corn on account of so much being down. There was much cloudiness and an unusual number of dark, gloomy days when the sun did not shine at all. Fog occurred on a large number of days, especially along the large streams, and the humidity was high. From the 25th to 28th, moisture was continually present on all exposed objects. During this period the temperature fluctuations were very slight and at some stations the daily range was not more than two degrees. Notwithstanding the low temperatures that occurred during the month, a number of places reported that hardy vegetables and flowers in sheltered places, were still vigorous at the end of the month, and dandelions were in bloom generally over the southern and much of the central division of the State. The last day of the month was generally warm and pleasant and it is reported that bees were able to make a good flight.

Precipitation was decidedly below normal, being slightly more than one-third of the average for the State. Only one station, Sioux Center, reported an amount greater than the normal. Over the northern division nearly all the precipitation was in the form of snow and in the central and southern divisions more than half was snow. The lack of precipitation apparently had no bad effect on the growth of winter grain as it was generally reported in good condition. Pastures were unusually good considering the deficient precipitation and the time of year.

F. L. D.

### PRESSURE.

The mean pressure (reduced to sea level) for the State was 30.09 inches. The highest was 30.55 inches at Dubuque, on the 22d, and at Sioux City on the 28th, and the lowest was 29.55 inches at Sioux City, on the 30th. The monthly range was 1.00 inch.

### TEMPERATURE.

The mean temperature for the State, as shown by the records of 97 stations, was 33.6°, or 1.4° lower than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 30.0°, or 2.8° lower than the normal; Central, 34.0°, or 1.1° lower than the normal; Southern, 36.8°, or 0.3° lower than the normal. The highest monthly mean was 40.3°, at Keokuk, and the lowest was 27.8°, at Milford. The

highest temperature recorded was 70° at Clarinda and Mount Ayr on the 4th, Greenfield on the 7th and 9th and Lamoni on the 5th and 7th, and the lowest was 5° below zero, at Sanborn, on the 20th. The temperature range for the State was 75°.

### PRECIPITATION.

The average precipitation for the State, as shown by the records of 100 stations, was 0.58 inch, or 0.93 inch less than the normal. By divisions, the averages were as follows: Northern, 0.79 inch, or 0.62 inch less than the normal; Central, 0.63 inch, or 0.90 inch less than the normal; Southern, 0.33 inch, or 1.25 inches less than the normal. The greatest amount, 1.61 inches, occurred at Clinton, and the least a trace at Bedford, Clarinda, Corning, Glenwood, Lenox, Mt. Ayr and Thurman. The greatest amount in 24 consecutive hours, 1.15 inches, occurred at Grinnell on the 8th.

### SNOWFALL.

The average snowfall for the State was 3.4 inches, or 0.9 inch more than the normal. The first general fall occurred on the 8th, but it soon melted. Another storm that was general over most of the State occurred on the 10th and 11th. This snow remained on the ground till the middle of the month. The ground was also snow covered for short periods during the third and fourth week over the greater portion of the State. The greatest snowfall reported was 13.0 inches at New Hampton. Several stations in the southern division reported no snowfall.

### WIND.

The prevailing direction of the wind was from the northwest. The highest velocity reported from a regular Weather Bureau Station was at the rate of 32 miles per hour, from the south, at Sioux City, on the 15th.

COMPARATIVE DATA FOR THE STATE—NOVEMBER.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Lowest	Highest	Total	Departure	Greatest	Least	Snowfall	With precipi- tation .01 in. or more	Clear	Partly cloudy	Cloudy
1890.....	38.6	+3.6	78	-2	1.46	-0.05	3.55	0.71	-----	3	15	8	7
1891.....	30.5	-4.5	84	-24	1.70	+0.19	3.64	0.66	-----	7	10	8	12
1892.....	33.3	-1.7	70	-3	1.10	-0.41	3.16	0.05	1.8	4	11	8	11
1893.....	34.0	-1.0	86	-13	1.17	-0.34	2.56	0.05	4.6	4	16	8	6
1894.....	32.7	-2.3	72	-5	0.92	-0.59	2.42	T.	0.4	4	9	11	10
1895.....	34.3	-0.7	86	-12	1.51	0.00	3.01	0.45	4.9	6	9	8	13
1896.....	29.6	-5.4	82	-15	1.83	+0.32	4.51	0.16	2.9	6	9	8	13
1897.....	34.3	-0.7	81	-19	0.66	-0.85	2.24	T.	1.2	5	12	8	10
1898.....	32.2	-2.8	78	-17	1.50	-0.01	3.61	0.33	8.7	6	14	8	8
1899.....	43.9	+8.9	86	8	1.20	-0.31	2.97	0.13	0.5	5	12	8	10
1900.....	33.5	-1.5	79	-6	1.06	-0.45	3.35	T.	3.7	6	12	7	11
1901.....	35.8	+0.8	77	2	0.86	-0.65	2.30	0.20	2.6	3	18	6	6
1902.....	41.2	+6.2	79	4	2.13	+0.62	4.19	0.16	1.8	7	9	7	14
1903.....	34.2	-0.8	76	-5	0.52	-0.99	1.74	T.	1.1	3	13	8	9
1904.....	41.0	+6.0	80	4	0.15	-1.36	0.50	0.00	0.5	1	20	6	4
1905.....	38.4	+3.4	70	-12	2.84	+1.33	5.30	0.90	0.6	5	16	7	7
1906.....	35.4	+0.4	76	-5	2.03	+0.52	3.86	0.35	4.4	8	9	7	14
1907.....	36.7	+1.7	68	-4	1.03	-0.48	2.27	0.05	0.9	4	17	6	7
1908.....	39.3	+4.3	80	5	1.56	+0.05	3.31	0.21	1.4	5	14	7	9
1909.....	42.4	+7.4	84	-3	5.39	+3.88	11.48	2.07	6.8	10	10	7	13
1910.....	33.4	-1.6	76	5	0.34	-1.17	1.03	T.	0.7	3	13	9	8
1911.....	29.9	-5.1	79	-8	1.42	-0.09	4.99	0.11	1.6	6	11	8	11
1912.....	40.1	+5.1	77	6	0.98	-0.53	2.38	0.00	T.	2	18	8	4
1913.....	44.1	+9.1	78	10	1.18	-0.33	3.49	0.20	0.4	6	11	7	12
1914.....	41.0	+6.0	80	-4	0.22	-1.29	0.95	0.00	T.	2	19	6	5
1915.....	40.2	+5.2	83	-5	1.94	+0.43	4.86	0.30	1.2	6	11	10	9
1916.....	37.3	+3.3	80	-8	1.61	+0.10	3.65	0.05	3.6	5	16	6	8
1917.....	40.7	+5.7	77	3	0.28	-1.23	1.02	T.	1.4	3	14	6	10
1918.....	39.9	+4.9	76	0	2.11	+0.60	5.10	0.70	4.4	7	13	5	12
1919.....	33.6	-1.4	68	-12	3.40	+1.89	6.22	1.97	6.3	8	11	7	12
1920.....	35.4	+0.4	71	5	2.18	+0.67	4.45	0.73	1.2	8	10	5	15
1921.....	33.6	-1.4	70	-5	0.58	-0.93	1.61	T.	3.4	5	10	5	15

T. indicates an amount too small to measure, or less than .005 inch rainfall, and less than .05 inch snowfall.





Climatological Data for November, 1921.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.						Precipitation, in Inches.					Number of Days.			Prevailing direction of wind.	Observers.	
				Mean.	Departure from normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from normal.	Greatest in 24 hours.	Total snowfall, unmelting.	Precipitation .01 in. or more.	Clear.	Partly cloudy.			Cloudy.
<b>Northern Division</b>																				
Algona	Kossuth	1,213	48	29.4	- 3.3	58	3	3	12	32	0.77	-0.53	0.55	7.7	5	11	3	16	ne.	W. E. Laird.
Allison	Butler	1,044	9	30.7	-----	58	4	1	12	27	1.05	-----	0.28	6.0	8	8	3	19	nw.	J. A. Bell.
Alta	Buena Vista	1,513	30	30.0	- 2.4	60	4	3	22	31	0.46	-0.92	0.15	4.3	7	9	4	17	s.	David E. Hadden.
Alton	Sioux	1,305	16	30.1	- 2.5	58	3	1	22	34	0.55	-----	0.20	5.0	7	7	6	17	nw.	W. S. Slagle.
Belmond	Wright	1,205	11	30.3	-----	59	4	0	12	29	1.16	-----	0.35	8.8	9	6	11	13	n.	Geo. P. Hardwick.
<b>Britt</b>																				
Charles City	Hancock	1,236	24	-----	-----	57 <sup>f</sup>	4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	L. M. Goodman.
Decorah	Floyd	1,015	30	30.0	- 3.0	56	4	3	12	23	0.96	-0.43	0.41	11.2	9	5	5	20	nw.	U. S. Weather Bureau.
Estherville	Winneshiek	875	28	30.4	- 3.3	54	4	1	12	27	1.43	-0.40	0.95	3.0	2	14	1	15	nw.	M. D. Whitney.
Fayette	Emmett	1,298	26	30.6	- 0.9	58	1	1	20	33	0.65	-0.74	0.20	6.5	6	10	16	4	nw.	A. O. Peterson.
	Fayette	1,003	31	31.4	- 1.3	58	4	1	12	29	1.30	-0.28	0.90	11.0	4	11	1	18	nw.	R. Z. Latimer.
<b>Forest City</b>																				
Humboldt	Winnebago	1,226	27	29.0	- 2.7	56	1	1	12	32	0.98	-0.45	0.30	8.8	8	8	4	18	se.	Dr. M. B. Nell.
Inwood	Humboldt	1,095	33	30.8	- 3.5	61	4	0	12	34	1.04	-0.55	0.50	3.5	4	9	3	18	n.	H. C. Smitkey.
LeMars	Lyon	1,474	17	28.2	- 3.6	61	4	3	20	37	0.30	-0.54	0.40	3.0	7	15	5	10	s.	F. B. Hanson.
Mason City	Plymouth	1,224	25	30.5	- 2.6	61	4	2	20	30	0.27	-0.83	0.17	2.6	4	14	6	10	sw.	Mrs. M. C. Woolley.
	Cerro Gordo	1,148	24	30.2 <sup>b</sup>	- 2.7	57	4	3	12	30 <sup>d</sup>	0.76	-0.92	0.24	6.3	9	11	3	16	nw.	Northern Sugar Corp.
<b>Milford (near)</b>																				
New Hampton	Dickinson	1,430	1	27.8	-----	57	4	1	12	31	0.53	-----	0.15	3.9	8	10	9	11	nw.	Dr. F. J. Smith.
Nora Springs	Chickasaw	1,169	24	30.8	- 2.2	56	4	2	12	24	1.30	-0.33	0.39	13.0	5	9	6	15	n.	A. F. Kemman.
Northwood	Floyd	1,064	9	31.8	-----	59	1	1	12	29	0.86	-----	0.20	4.0	9	7	10	13	s.	Arthur Betts.
Pocahontas	Worth	1,222	25	28.4 <sup>d</sup>	- 3.6	58 <sup>d</sup>	1	1	12	29 <sup>d</sup>	0.85	-0.91	0.25	6.8	7	7	9	14	sw.	Chas. Dwelle.
	Pocahontas	1,248	17	30.6	- 2.2	60	3	0	12	32	0.65	-1.01	0.27	6.8	8	10	7	13	n.	F. E. Hronek.
<b>Postville</b>																				
Rock Rapids	Clayton	1,180	22	30.0	- 3.3	58	4	0	12	28	0.95	-0.70	0.43	5.2	6	7	8	15	ne.	F. L. Williams.
Sanborn	Lyon	1,358	22	28.6	- 2.9	58	3	1	20	34	0.49	-0.57	0.15	4.0	6	13	6	11	s.	J. K. Medberry.
Sioux Center	O'Brien	1,553	7	27.6	-----	61	4	5	20	37	0.35	-----	0.15	3.5	4	12	1	17	se.	James W. Dow.
Spencer	Sioux	1,426	22	29.0	- 2.9	60	4	0	20	30	0.95	+0.15	0.30	9.5	7	10	2	18	s.	J. de Ruyter.
	Clay	1,319	7	29.5	-----	66	3	0	12	41	0.73	-----	0.20	7.3	6	10	7	13	nw.	E. W. Little.
<b>Storm Lake</b>																				
Washta	Buena Vista	1,440	32	31.7	- 1.9	60	4	3	22	31	0.41	-0.72	0.25	3.6	6	8	8	14	nw.	Geo. H. Fracker.
Waverly	Cherokee	1,157	23	31.2	- 2.2	63	4	4	22	38	0.50	-0.63	0.29	5.0	5	10	6	14	s.	H. L. Felter.
West Bend	Bremer	948	25	32.0	- 2.1	57	1	3	12	24	1.18	-0.41	0.48	9.5	6	6	9	15	n.	E. M. Weyrauch.
	Palo Alto	1,197	28	28.8	- 3.7	60	3	2	12	36	0.75	-0.69	0.30	7.5	7	10	6	14	nw.	Jos. Dorweiler.
<b>Means and extremes</b>																				
				30.0	- 2.8	66	3	-5	20	41	0.79	-0.62	0.95	6.4	6	10	6	14	nw.	
<b>Central Division</b>																				
Ames	Story	926	45	32.9	- 2.5	61	4	7	12	32	0.30	-1.03	0.18	1.5	3	10	4	16	sw.	Iowa State College.
Audubon	Audubon	1,301	27	33.1	- 1.8	63	4	6	22	35	0.04	-1.32	0.03	0.1	2	11	7	12	ne.	Geo. Kibby.
Baxter	Jasper	998	21	34.6	- 1.2	64	4	7	12	29	0.50	-0.90	0.25	2.0	3	13	3	14	nw.	Henry Geise.
Belle Plaine	Benton	886	31	34.8	- 0.6	65	4	4	12	29	1.31	-0.42	0.63	7.3	7	5	11	14	nw.	O. O. Burrows.
Boone	Boone	1,134	16	33.6	- 1.0	66	3	8	12	41	0.46	-0.91	0.25	1.0	3	-----	-----	-----	nw.	Carl F. Henning.
<b>Carroll</b>																				
Cedar Rapids	Carroll	1,265	31	33.4	0.0	63	2	7	22	35	0.35	-0.90	0.12	2.0	4	14	5	11	nw.	Mrs. Jos. J. Wolfe.
Clinton	Linn	733	39	35.0	0.0	61	4	8	12	24	0.60	-0.81	0.40	2.0	2	9	3	18	n.	R. S. Toogood.
Davenport	Clinton	593	48	37.6	+ 1.6	68	4	9	12	30	1.61	-0.33	0.75	3.5	6	13	1	16	n.	Dr. A. P. Bryant.
Denison	Scott	580	50	36.8	- 0.7	64	4	13	12	24	0.77	-0.99	0.27	5.4	8	4	5	21	e.	U. S. Weather Bureau.
	Crawford	1,180	27	32.8	- 1.9	64	4	6	22	33	0.40	-0.78	0.14	2.9	5	9	8	13	s.	V. L. Byers.
<b>Des Moines</b>																				
Dubuque	Polk	861	43	35.8	- 1.0	64	4	14	22	28	0.35	-1.13	0.15	0.4	6	8	6	16	n.	U. S. Weather Bureau.
Fort Dodge	Dubuque	639	48	34.2	- 1.8	59	4	14	12	24	0.91	-0.90	0.68	7.0	7	5	4	21	nw.	U. S. Weather Bureau.
Grinnell	Webster	1,114	21	31.4	- 2.2	63	4	1	12	32	0.65	-0.83	0.15	6.1	7	11	4	15	n.	Fred Heman.
Grundy Center	Poweshiek	1,031	27	33.8 <sup>b</sup>	- 2.7	63 <sup>b</sup>	4	5 <sup>b</sup>	22	29 <sup>b</sup>	1.29	-0.52	1.15	-----	2	-----	-----	-----	n.	Wm. Bader.
	Grundy	976	30	33.4	- 2.0	60	4	3	12	30	0.60	-0.80	0.40	7.0	3	6	6	18	nw.	M. G. Helberger.
<b>Guthrie Center</b>																				
Harlan	Guthrie	1,077	26	35.5	- 0.2	67	4	9	22	38	0.17	-1.26	0.09	1.0	2	12	7	11	n.	E. L. Nesselroad.
Independence	Shelby	1,192	22	34.4 <sup>e</sup>	0.0	65 <sup>e</sup>	4	8 <sup>e</sup>	22	37 <sup>e</sup>	0.11	-1.03	0.11	T.	1	-----	-----	-----	s.	W. K. Colburn.
Iowa City	Buchanan	921	57	32.7	- 1.8	64	1	2	12	30	0.76	-0.62	0.44	2.0	6	11	1	18	nw.	Dr. Geo. Boody.
Iowa Falls	Johnson	733	61	35.4	+ 0.5	62	4	7	12	28	0.74	-1.52	0.31	2.5	5	7	6	17	nw.	Prof. J. F. Reilly.
	Hardin	1,107	28	31.2	- 1.4	61	4	-2	12	30	0.72	-0.82	0.31	5.5	5	8	3	19	nw.	J. B. Parmelee.
<b>Jefferson</b>																				
Le Claire	Greene	1,052	22	33.0	- 2.0	66	4	7	12	34	0.28	-----	0.17	1.3	3	11	3	16	ne.	Will I. Lyon.
Little Sioux	Scott	576	21	-----	-----	-----	-----	-----	-----	-----	1.46	-0.49	0.35	5.0	14	-----	-----	-----	ne.	Margaret T. Disney.
Logan	Harrison	1,040	16	33.9	- 1.9	66	4	7	22	35	0.46	-----	0.15	4.1	6	7	6	11	ne.	Geo. H. Gibson.
Manchester	Harrison	1,035	54	35.8	+ 0.1	67	4	9	22	36	0.32	-0.95	0.12	T.	5	11	8	11	sw.	Mary Jean Stern.
	Delaware	-----	-----	33.4	-----	59	4	1	22	27	0.58	-----	0.48	3.0	2	8	4	18	se.	Thomas H. Tracey
<b>Marshalltown</b>																				
Monroe	Marshall	947	29	34.4	- 0.2	64	4	8	12	27	0.56	-0.91	0.31	3.0	6	13	4	13	nw.	O. C. Pigman.
Muscataine	Jasper	554	61	36.4	-----	66	4	12	12	29	0.41	-----	0.21	2.2	2	11	2	17	ne.	J. A. Dibel.
Olin	Muscataine	760	22	34.5	- 0.6	60	4	6	12	29	0.82	-1.54	0.25	1.5	10	-----	-----	-----	sw.	Wm. P. Molls.
Onawa	Jones	1,051	21	-----	-----	-----	-----	-----	-----	-----	1.15	-0.31	0.75	4.5	3	12	3	15	sw.	Dr. F. W. Port.
	Monona	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	sw.	Mrs. H. E. Colby.
<b>Perry</b>																				
Rockwell City	Dallas	975	20	33.2 <sup>b</sup>	- 2.3	63 <sup>b</sup>	4	10 <sup>b</sup>	12	31 <sup>b</sup>	0.30	-1.32	0.17	0.2	4	-----	-----	-----	nw.	F. N. Bartlett.
Sac City	Calhoun	1,134	25	-----	-----	-----	-----	-----	-----	-----	0.50	-0.76	0.15	5.0	5	-----	-----	-----	n.	A. W. McIsaac.
Sioux City	Sac	1,344	45	30.3 <sup>a</sup>	- 3.6	60 <sup>a</sup>	4	4 <sup>a</sup>	22	33 <sup>a</sup>	0.50	-0.76	0.15	5.0	5	-----				

Climatological Data for November, 1921—Continued.

Table with columns: Stations, Counties, Elevation, Length of record, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Total snowfall, Precipitation .01 in. or more, Clear, Partly cloudy, Cloudy), Prevailing direction of wind, Observers.

The departure from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete records are used in determining means. Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example, b represents two days. etc. †Also other dates. ††Received too late to be included in means and summaries. T., Precipitation is less than 0.01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE.

Table with columns: Stations, Barometric Pressure (Mean, Highest, Date, Lowest, Date), Relative Humidity (Mean, 7 a. m., Noon, 7 p. m., Lowest, Date), Wind (Total movement, Average hourly velocity, Miles, From, Date), Sunshine (Per cent of possible, Departure from normal).

\*Sioux City. §Davenport. †Omaha. ††Keokuk. †Local mean time. †And other dates.

Daily Precipitation for November, 1921.

Stations.	Drainage Basin.	Day of Month.																															Totals		
		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			
<b>Northern Division</b>																																			
Algona	Des Moines						.05		.10									.05	.02											.55			0.77		
Allison	Cedar						.28		.10	.20		.10					.07	T.	.10			.10								.10			1.05		
Alta	Raccoon						.03		.12								.03	.04													T.	.15		0.46	
Alton	Floyd								.03	.03			.04	.05				T.	.10	.05	.05									.20			0.55		
Belmond	Iowa	T.	T.				.15		.11		.12						.08	.10			.02		T.	T.	T.	T.	T.	T.	.35	T.			1.16		
Britt	Iowa				.06				.12	T.										T.	T.												**		
Charles City**	Cedar						.41		.20	.04	T.	.13					.08	.01	T.	.07			T.							.02			0.96		
Decorah	Mississippi						.95		.17	T.	.09						.48				.05	.05											1.43		
Estherville	Des Moines						.20		.15				.05				.10				.05							.10					0.65		
Fayette	Mississippi						.90		.22	T.	.13										.10												1.30		
Forest City	Cedar		T.				.10		.12	.08	T.	.12					.06	T.	T.	.10	.10								.30				0.98		
Humboldt	Des Moines						.21		T.	.10							T.	T.	T.	.23									.50				1.04		
Inwood	Des Moines						.03		.04	.03							.01			.05	.05								.09					0.60	
LeMars	Floyd						T.		.04	T.							T.	.05	.01	T.								.17					0.27		
Mason City	Cedar		T.				T.	.24	.20	.02	T.	.01					.02	.03		.06	.04							.14					0.6		
Milford (near)	Dickinson						.02	.05		.10	T.	.10					T.	.05	.02	.04									.15				0.51		
New Hampton	Wapsipinicon						.15	.39	.15	.15		.15					.30			.16					T.			T.	.09				1.30		
Nora Springs	Cedar						.02	.20	.17	T.	.09						.18	.03	.07	.01									T.	.09			0.56		
Northwood	Cedar						T.	.25	.05	.05	.10								.10	.10									.20				0.85		
Pocahontas	Des Moines						.02	.15	.11			.02	T.				.03	.02	T.	.03									.27				0.63		
Postville	Mississippi						.30		.02	.05	.05	.10					.43	T.	T.						T.				T.				0.95		
Rock Rapids	Big Sioux						.15	.04			.08						T.		.10					.02					.10				0.49		
Sanborn	Floyd						.10	.05									.05		T.										.15				0.53		
Sioux Center	Floyd						T.	.05	.10			.30	.05				T.		.10	.05									.30				0.95		
Spencer	Little Sioux						.15	.10									.10	.10	.08										.20				0.43		
Storm Lake	Raccoon						.02			.08								.03	.02		.02								.25				0.41		
Washita	Little Sioux						T.			.05	.10						T.	.05	.10	T.									.20				0.50		
Waverly	Cedar						.48	.18	.20	.20							.05			.07													1.18		
West Bend	Des Moines						.02	.15	.16		.04							.04		.04									.30				0.75		
<b>Central Division</b>																																			
Ames	Skunk						.18			.11										T.								.01					0.30		
Audubon	Nishnabotna						.03													T.									.01					0.04	
Baxter	Skunk						.20			.25																			.05					0.30	
Belle Plaine	Iowa						.63	.07	.28	T.	T.						T.	.25		T.		T.	.04					.02					1.31		
Boone	Des Moines						.25		T.	.17		T.						T.	.25		.04								T.					0.46	
Carroll	Raccoon						.12								.04					.11									.08					0.35	
Cedar Rapids	Cedar						.40	T.	.20								T.	T.											T.					0.60	
Clinton	Mississippi						.75		.40		.02						.10		.32										T.					1.61	
Davenport**	Mississippi						.21	.02	.25	.04	.03						T.	T.	.12	.09	.05			T.	T.	T.			.01					0.77	
Denison	Missouri						.10			.06								.02	.09	.14									.08					0.46	
Des Moines***	Des Moines						.15	.08	.04		T.	T.		T.			.03	T.											.04	.01				0.35	
Dubuque**	Mississippi						.68	.09	.02	.01	T.	T.		T.			T.	.08	.02				T.					T.						0.91	
Fort Dodge	Des Moines						.15	.11	.09								.04	.02	T.	.20									.15					0.65	
Grinnell	Iowa						1.15	T.	.05	.09		T.											T.						T.					1.20	
Grundy Center	Cedar						.40	.10	.10		T.																		T.	T.				0.60	
Guthrie Center	Raccoon						.09			.08																									0.17
Harlan	Nishnabotna						.11													T.									T.					0.11	
Independence	Wapsipinicon						.44	T.	.11	.05							.08	T.		.07				.01					T.					0.76	
Iowa City	Iowa		T.				.28	.02	.29		T.						T.	T.	.08		.07								.07					0.74	
Iowa Falls	Iowa						.31	.07	.25		T.						.06	T.		.03	T.			T.					T.					0.72	
Jefferson	Raccoon						.17		T.	T.							T.	T.	T.	.06									.05					0.28	
LeClaire	Mississippi	.03					.34	.10	.35	.05	.02	.04					.05	.02	.35					.03	T.			.04	.02		.02			1.46	
Little Sioux	Little Sioux						.08		.05								.03	.07		.15									.08					0.46	
Logan	Missouri						.03		.12										.06										.01					0.32	
Manchester	Delaware						.48	.10																T.					T.					0.53	
Marshalltown	Iowa						.20	.06	.25		T.	T.		T.			.02	T.		T.			.02					.01					0.56		
Monroe	Skunk						.20		.21		T.	T.		T.			T.	T.										T.	T.					0.41	
Muscataine	Mississippi	T.					.11	.12	.25	.02	.02	.02					.03	T.	.20					T.				.03						0.82	
Olin	Wapsipinicon						.75		T.	.30	T.								.10																1.15
Onawa	Missouri																																		
Perry	Raccoon						.17		T.	.10		.1					.02			T.									.01					0.30	
Rockwell City	Raccoon																																		
Sac City	Raccoon						.05		.10		T.						T.	.10	.10										.15						0.50
Sioux City**	Missouri						.03	.07	T.		T.	T.					.04	.08	.10	.02	T.							.04							0.58
Tipton	Cedar						.28	.03	.35	T.							T.	.20	T.										.08						0.94
Toledo	Iowa						.28	T.	.35								.04	T.											.05						0.72
Van Meter	Raccoon						T.	.08	.09								T.	T.											T.						0.17
Waterloo	Cedar						.62	.05	.23	.25							.02			T.						T.			.03						1.20
Waukee	Raccoon						.16	T.	.14	T.	T.		T.				.02	T.	T.	T.									.04	T.					0.36
Webster City	Des Moines						.17	.06	.20		T.																								

Daily Precipitation for November, 1921—Continued.

Stations.	Drainage Basin.	Day of Month.																															Totals				
		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					
<i>Southern Division</i>																																					
Afton	Grand							.04			.06							T.																	0.10		
Albia	Des Moines							.08			.09		T.				T.	.01		T.															0.19		
Atlantic	Nishnabotna							.18		T.	.03							T.																	0.21		
Bedford	Missouri																	T.		T.															T.		
Bloomfield	Mississippi																																				
Bonaparte	Des Moines							.09			T.	T.							.07	.04					T.			T.	.10				.04		0.34		
Burlington	Mississippi							.04		T.	.23								.28	.15															0.67		
Centerville	Chariton							.05			.09		T.						.02	T.					.02		.02	T.	.02						0.22		
Chariton	Chariton								.28	T.	T.																								0.28		
Charinda	Nodaway							T.										T.		T.															T.		
Columbus Jct.	Iowa							.13		.13	.38	T.	T.					T.	T.	.03	.12				T.								T.		0.87		
Corning	Nodaway							T.											T.																T.		
Corydon	Chariton							.08			.08	T.	T.		T.				.01	T.	T.			T.				T.	T.						0.17		
Creston	Missouri							.12			.02				.63			.03																	0.21		
Cumberland	Nodaway																																				
Earlham	Des Moines							.13		T.	.07		T.	T.																					0.20		
Fairfield	Skunk							T.			.10																								0.46		
Fairport	Mississippi							.26		.05	.37	.03							.05	.20				.01											1.31		
Glenwood	Missouri							T.							T.																				T.		
Greenfield	Nodaway							.14																												0.14	
Indianola	Des Moines							.14			.03							T.	.01																0.18		
Keokuk***	Mississippi							.06		.01	.11							T.	.69	.02				.01	.02		T.	T.				.15		1.12			
Keosauqua	Des Moines							.14			.18		T.					T.	T.	.25														.05	0.66		
Knoxville	Des Moines							.19			.18			T.				.05	T.															.10	0.52		
Lacona	Des Moines	.10								.21				.01				.02	.02															.02	0.38		
Lamoni	Grand							T.			.18																								0.18		
Lenox	Missouri							T.			T.																								T.		
Mt. Ayr	Grand							T.	T.		T.	T.																							T.		
Mt. Pleasant	Skunk							.09			.03																									T.	
Oakland	Nishnabotna							.12			T.									.04	.18													.08	0.46		
Oskaloosa	Des Moines							.14			.09	T.		T.				.04	.03	T.	.01			T	T.	.03									0.34		
Ottumwa	Des Moines						.10				.03									.03															.05	0.36	
Pella	Skunk							.23			.22										T.	T.													T.	0.45	
Sigourney	Skunk							.10	T.	.05	.15		T.																							T.	0.34
Stockport	Skunk							.08	T.		.18										.04	.24													.06	0.69	
Thurman	Missouri							T.																												T.	
Washington	Skunk							.19		.10	.20																										T.
Winterset	Des Moines							.10			.19										.20														.12	0.81	
Omaha, Nebr.***	Missouri							.07		.01	T.									.01																0.29	

Except as otherwise indicated, observations are generally made late in the afternoon, near sunset, and precipitation recorded is for 24 hours ending at the time of observation.

|||Precipitation measured in the morning; amount then recorded is for the preceding 24 hours.  
 \*\*\*Regular Weather Bureau Station; precipitation is for 24-hour period, midnight to midnight.  
 \*\*Incomplete.  
 \*Precipitation included in the next following measurement.

HUMIDITY.

The average relative humidity for the State at 7 a. m. was 87 per cent and at 7 p. m. 75 per cent. The mean for the month was 81 per cent, or 5 per cent above the normal. The highest mean was 88 per cent, at Charles City, and the least was 76 per cent, at Des Moines.

SUNSHINE.

The average per cent of the possible amount of sunshine was 39, or 15 per cent less than the normal. The per cent of the possible amount at the regular Weather Bureau Stations was as follows: Charles City, 26; Davenport, 33; Des Moines, 45; Dubuque, 34; Keokuk, 35; Sioux City, 35; Omaha, Nebr., 39.

MISCELLANEOUS PHENOMENA.

Aurora: 1st.  
 Fog: 7th, 15th, 16th, 17th, 18th, 23d, 24th, 25th, 26th, 27th, 28th, 29th, 30th.  
 Hail: 12th, 18th.  
 Halos: 7th, 10th, 12th, 13th, 14th, 20th, 21st.  
 Sleet: 7th, 8th, 13th, 17th, 18th, 23d, 27th.  
 Thunderstorms: 7th, 8th, 10th.

RIVERS.

Low stages with but slight fluctuations and a general falling tendency prevailed on all rivers. The Mississippi River froze along the extreme northern border on the morning of the 25th, and the Missouri at Sioux City on the 24th.

ERRATA.

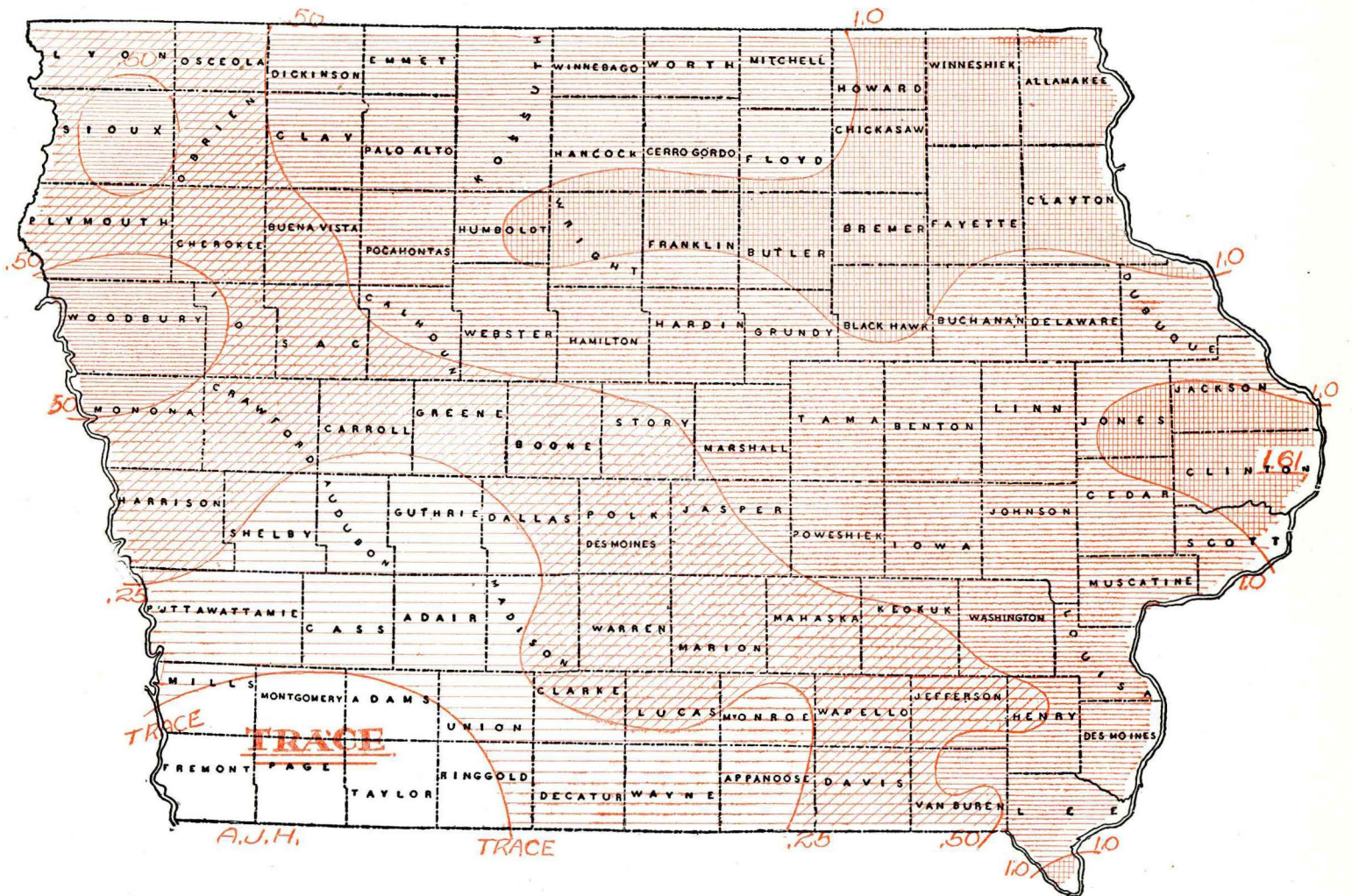
Report for October, 1921. Page 78; Charles City, minimum temperature on the 22d, published 44°, should be 42°; mean of the minimum published 41.4°, should be 41.3°; Keokuk, minimum temperature on the 3d published 45°, should be 44. Page 77; Keokuk, precipitation on the 2d omitted, should be T.

Daily Maximum and Minimum Temperature for the Month of November, 1921.

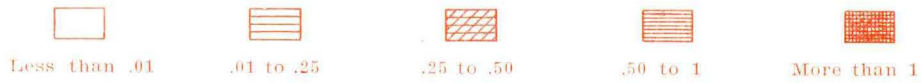
Table with columns for Stations, days 1-31, and Mean. Rows are categorized by Northern Division (Albion, Alta, Alton, Belmont, Charles City, Decorah, Forest City, Inwood, Mason City, Milford, New Hampton, Northwood, Pocahontas, Postville), Central Division (Belle Plaine, Boone, Carroll, Davenport, Des Moines, Dubuque, Fort Dodge, Grinnell, Guthrie Center, Independence, Iowa City, Iowa Falls, Little Sioux, Marshalltown, Olin, Sioux City), and Southern Division (Albia, Atlantic, Bloomfield, Burlington, Columbus Jet, Corning, Corydon, Fairfield, Keokuk, Lamoni, Pella, Sigourney, Thurman, Winterset, Omaha, Nebr.).

a, b, c, etc., indicate respectively 1, 2, 3, etc., days missing from record.

TOTAL PRECIPITATION, NOVEMBER, 1921



SCALE OF SHADES—IN INCHES



# CLIMATOLOGICAL DATA.

## IOWA SECTION

In cooperation with  
IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXII DES MOINES, IOWA, DECEMBER, 1921 No. 12

### GENERAL SUMMARY.

The principal feature of the weather during December was the return to temperature conditions above normal, making 11 months during the year that the mean temperature for the State was above normal, and the mean for the year was by far the highest ever experienced in the State since records have been kept. The month for the most part was very pleasant and the first 16 days were, with the exception of one or two days, continuously above normal and the mean for this period averaged nearly 10 degrees above normal. As a result of this favorable condition outside work was possible during nearly the entire month and by the end of December practically the entire corn crop had been gathered. Very little frost was in the ground and plowing was reported from all parts of the State till the general rain and snow storm on the 16th and 17th. During this mild period grass made perceptible growth and dandelions bloomed profusely till the beginning of the third week and flowers were reported in bloom almost to the northern border. The last half of the month was almost continuously below normal till the 28th, when another mild period set in that continued through the month.

The precipitation was below normal except over the east-central and southeastern sections and most was in the form of rain. The ground was bare till the 16th over the entire State, but winter grain and grasses were apparently uninjured as there were no hard freezes during the time that the ground was bare, and during the latter part of the month when the low temperatures prevailed the ground was generally protected by an ample snow cover. Sleet occurred at many places on the 22d and 23d, but very little damage or inconvenience resulted. Snowfall was decidedly below normal and the average was less than half the usual amount for December. There was some drifting over the northern half of the State, but not sufficient to delay railroad traffic or interfere with ordinary wagon and automobile travel. The thickness of ice increased gradually till the close of the month and a good ice harvest is in prospect. Live stock is wintering well and the health is generally good, hog cholera having subsided somewhat. F. L. D.

### PRESSURE.

The mean pressure (reduced to sea level) for the State was 30.11 inches. The highest recorded was 30.71 inches, at Sioux City, on the 21st, and the lowest was 29.32 inches, at Davenport, on the 1st. The monthly range was 1.39 inches.

### TEMPERATURE.

The mean temperature for the State, as shown by the records of 99 stations, was 28.2°, or 4.3° higher than the normal. By divisions, tiers of three counties to the division, the means were as follows: Northern, 24.7°, or 3.5° higher than the normal; Central, 28.8°, or 4.7° higher than the normal; Southern, 31.2°, or 4.8° higher than the normal. The highest monthly mean was 33.0° at Burlington and Keokuk, and the lowest was 21.4° at Inwood. The highest temperature recorded was

69° at Logan and Thurman on the 13th and Washta on the 14th, and the lowest was 22° below zero at Washta on the 25th. The temperature range for the State was 91°.

### HUMIDITY.

The average relative humidity for the State at 7 a. m. was 81 per cent, and at 7 p. m. it was 72 per cent. The mean for the month was 76 per cent, which is 5 per cent below the normal. The highest monthly mean was 86 per cent at Charles City and the lowest was 72 per cent at Des Moines.

### PRECIPITATION.

The average precipitation for the State, as shown by the records of 100 stations, was 1.02 inches, or 0.20 inch less than the normal. By divisions the averages were as follows: Northern, 0.61 inch, or 0.46 inch less than the normal; Central, 1.42 inches, or 0.17 inch more than the normal; Southern, 1.04 inches, or 0.31 inch less than the normal. The greatest amount, 3.72 inches, occurred at Davenport, and the least, a trace, at Harlan. The greatest amount in 24 consecutive hours was 2.40 inches at Tipton, on the 16th.

### SNOWFALL.

The average snowfall for the State was 2.9 inches, or 3.3 inches less than the normal. The greatest amount, 9.1 inches, occurred at Inwood, and the least was a trace at Afton, Atlantic, Chariton, Denison, Harlan and Webster City.

### WIND.

The prevailing direction of the wind was from the northwest. The highest velocity reported from a regular Weather Bureau station was at the rate of 53 miles per hour, from the northwest, at Sioux City, on the 30th.

COMPARATIVE DATA FOR THE STATE—DECEMBER.

YEAR	Temperature				Precipitation				Number of Days				
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre-.01 in. or more	Clear	Partly cloudy	Cloudy
1890.....	29.1	+5.2	72	-13	0.45	-0.77	1.40	0.00	-----	3	17	7	8
1891.....	32.3	+8.4	72	-14	2.41	+1.19	4.50	1.21	-----	6	14	9	14
1892.....	18.9	-5.0	68	-29	1.65	+0.43	3.04	0.20	10.9	8	9	8	14
1893.....	22.0	-1.9	70	-21	1.31	+0.09	2.80	0.46	7.6	7	10	9	12
1894.....	30.1	+6.2	73	-17	0.95	-0.27	1.75	0.25	1.3	3	15	6	10
1895.....	25.4	+1.5	63	-16	1.63	+0.41	5.74	0.00	4.1	5	11	9	11
1896.....	30.8	+6.9	70	-10	0.65	-0.57	1.79	T.	1.6	4	10	8	13
1897.....	18.0	-5.9	60	-25	1.65	+0.43	3.22	0.61	15.9	6	11	7	13
1898.....	18.1	-5.8	60	-25	0.48	-0.74	1.70	T.	3.9	3	15	8	8
1899.....	22.6	-1.3	75	-19	1.61	+0.39	4.28	0.10	4.3	5	12	9	10
1900.....	26.9	+3.0	63	-10	0.45	-0.77	2.70	T.	2.4	4	13	6	12
1901.....	20.5	-3.4	64	-31	0.93	-0.29	2.75	0.05	5.4	6	10	9	12
1902.....	20.1	-3.8	59	-20	2.23	+1.01	5.51	0.67	12.9	8	9	6	16
1903.....	19.6	-4.3	58	-27	0.41	-0.81	1.96	T.	3.7	4	11	9	11
1904.....	23.4	-0.5	67	-19	1.44	+0.22	3.68	0.06	12.3	5	12	7	12
1905.....	27.0	+3.1	62	-11	1.52	-0.70	2.81	0.37	1.4	6	11	7	13
1906.....	25.7	+1.8	65	-9	1.43	+0.21	2.81	0.05	4.7	5	10	7	14
1907.....	28.8	+4.9	62	-9	1.00	-0.22	2.28	0.05	3.8	3	15	8	8
1908.....	27.2	+3.3	67	-17	0.57	-0.65	6.10	0.89	13.7	11	10	5	16
1909.....	15.1	-8.0	60	-26	2.18	+0.96	1.39	0.01	3.0	3	15	7	9
1910.....	23.4	-0.5	57	-14	0.37	-0.85	4.43	0.62	12.6	7	13	6	12
1911.....	27.9	+4.0	60	-24	2.57	+1.35	4.75	0.10	1.1	3	18	7	6
1912.....	29.2	+5.3	64	-13	0.74	-0.48	1.73	0.00	1.3	4	15	5	11
1913.....	32.0	+8.1	65	-13	1.02	-0.20	4.78	0.00	1.3	4	15	5	11
1914.....	15.7	-8.2	63	-31	1.30	+0.08	2.24	0.57	11.1	9	10	6	15
1915.....	25.0	+1.1	56	-10	0.69	-0.53	1.70	T.	4.6	5	11	8	12
1916.....	18.7	-5.2	67	-25	1.04	+0.18	2.40	0.35	6.7	6	15	8	8
1917.....	14.5	-9.4	62	-40	0.56	-0.86	1.70	0.14	6.7	6	10	9	12
1918.....	32.7	+8.8	68	-7	1.30	+0.08	3.30	0.37	5.1	8	9	8	14
1919.....	15.0	-8.9	52	-36	5.44	-0.68	1.55	0.08	5.8	4	11	7	13
1920.....	26.4	+2.5	65	-26	1.16	-0.06	2.64	0.26	7.4	5	10	8	13
1921.....	28.2	+4.3	69	-22	1.02	-0.20	3.72	T.	2.9	4	14	9	8

T. indicates an amount too small to measure, or less than .005 inch precipitation and less than .05 inch snowfall.



Climatological Data for December, 1921.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.						Precipitation, in Inches.				Number of Days.			Prevailing direction of wind.	Observers.		
				Mean.	Departure from normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from normal.	Greatest in 24 hours.	Total snowfall, unmelting.	Precipitation .01 in. or more.	Clear.			Partly cloudy.	Cloudy.
<b>Northern Division</b>																				
Algona	Kossuth	1,213	48	25.0	+ 3.7	52	12	-11	25	31	0.24	-0.73	0.12	4.8	3	23	2	6	nw.	W. E. Laird.
Allison	Butler	1,044	9	25.6	-----	53	14	-15	25	32	0.60	-----	0.50	3.0	2	10	12	9	nw.	J. A. Bell.
Alta	Buena Vista	1,513	30	24.6	+ 3.6	61	13	-12	24	31	0.58	-0.37	0.28	4.5	3	15	9	7	nw.	David E. Hadden.
Alton	Sioux	1,305	16	24.6	+ 3.3	62	13	-16	25	33	0.40	-----	0.20	4.0	3	17	7	7	nw.	W. S. Slagle.
Belmond	Wright	1,205	11	25.2	-----	55	13	-17	25	35	1.41	-----	1.02	5.2	5	7	16	8	nw.	Geo. P. Hardwick.
Britt	Hancock	1,236	24	25.0	+ 4.3	57	13	-16	25	29	0.18	-0.65	0.10	0.8	4	16	13	2	w.	L. M. Goodman.
Charles City	Floyd	1,015	30	24.0	+ 5.0	51	13	-12	25	29	0.85	-0.43	0.77	4.7	4	6	14	11	nw.	J. S. Weather Bureau
Cherokee	Cherokee	1,196	-----	25.0	-----	62	13	-13	25	34	0.19	-----	0.09	2.3	3	11	16	4	sw.	J. E. Wirth
Decorah	Winneshiek	875	28	24.8 <sup>e</sup>	+ 2.6	54 <sup>a</sup>	12	-17 <sup>a</sup>	25	33 <sup>e</sup>	0.84	-0.50	0.72	2.5	3	10	13	8	sw.	M. D. Whitney.
Estherville	Emmet	1,298	26	25.6	+ 5.7	65	14	-14	22	34	0.55	-0.26	0.35	4.0	2	9	18	4	nw.	A. O. Peterson.
Fayette	Fayette	1,003	31	24.7	+ 3.8	55	1	-16	25	34	1.21	-0.32	0.64	2.0	3	13	8	10	nw.	R. Z. Latimer.
Forest City	Winnebago	1,226	27	24.8	+ 5.2	57	13	-17	25	35	0.72	-0.25	0.32	7.0	3	10	10	8	nw.	Dr. M. B. Neill.
Humboldt	Humboldt	1,065	33	26.0	+ 2.8	59	13	-20	25	42	0.29	-0.57	0.22	3.0	2	12	10	9	nw.	H. C. Smithey.
Inwood	Lyon	1,474	17	21.4 <sup>b</sup>	+ 1.4	58 <sup>b</sup>	12	-18 <sup>b</sup>	24	45 <sup>b</sup>	0.91	+0.23	0.35	9.1	5	16	6	9	nw.	F. B. Hanson.
LeMars	Plymouth	1,224	25	25.7	+ 3.2	68	12	-13	24	38	0.20	-0.73	0.09	5.0	3	18	7	6	nw.	Mrs. M. C. Woolley.
Mason City	Cerro Gordo	1,148	24	23.9	+ 2.4	53	13	-18	25	35	0.53	-0.87	0.36	2.5	3	17	5	9	nw.	Northern Sugar Corp.
Milford (near)	Dickinson	1,430	1	23.0	+ 2.8	57	13	-13	24	30	0.20	-----	0.12	2.1	2	11	15	5	nw.	Dr. F. J. Smith.
New Hampton	Chickasaw	1,169	24	24.2	+ 3.3	50	1	12	25	30	0.25	-0.88	0.20	2.5	2	12	12	7	w.	A. F. Kemman.
Nora Springs	Floyd	1,064	9	26.2	-----	55	12	-21	25	41	1.37	-----	1.09	3.2	4	10	12	9	s.	Arthur Betts.
Northwood	Worth	1,222	25	22.2 <sup>d</sup>	+ 2.2	52 <sup>d</sup>	13	-15 <sup>d</sup>	25	31 <sup>d</sup>	0.75	-0.49	0.50	6.0	4	14	11	6	nw.	Chas. Dwelle.
Pocahontas	Pocahontas	1,248	17	25.4	+ 3.5	61	13	-17	25	39	0.84	-0.02	0.40	7.9	4	18	6	7	sw.	F. E. Hronek.
Postville	Clayton	1,180	22	24.2	+ 2.8	55	1	-12	25	34	0.66	-0.80	0.20	3.0	5	4	21	6	sw.	F. L. Williams.
Rock Rapids	Lyon	1,358	22	23.5	+ 3.9	60	13	-13	24	38	0.41	-0.17	0.23	4.1	3	19	9	3	nw.	J. K. Medberry.
Sanborn	O'Brien	1,553	7	22.8	-----	60	12	-17	24	35	0.35	-----	0.20	3.5	2	17	7	7	nw.	James W. Dow.
Sioux Center	Sioux	1,426	22	24.2	+ 3.1	63	13	-15	24	34	0.75	-0.14	0.30	7.5	3	13	5	13	w.	J. de Ruyter.
Spencer	Clay	1,319	7	25.0 <sup>a</sup>	-----	60 <sup>b</sup>	13	-15	25	38 <sup>b</sup>	0.45	-----	0.30	4.5	3	18	6	7	nw.	E. W. Little.
Storm Lake	Buena Vista	1,440	32	26.5	+ 4.1	61	13	-12	24 <sup>f</sup>	34	0.38	-0.44	0.15	3.3	5	21	3	7	nw.	Geo. H. Fracker.
Washta	Cherokee	1,157	23	27.4	+ 4.9	69	14	-22	25	46	0.50	-0.30	0.50	5.0	1	19	11	1	n.	H. L. Felzer.
Waverly	Bremer	948	25	26.5	+ 3.7	53	1	-10	25	37	0.66	-0.60	0.50	2.0	3	9	11	11	n.	E. M. Weyrauch.
West Bend	Palo Alto	1,197	28	24.4	+ 2.6	59	13	-18	25	36	0.91	-0.32	0.65	3.5	4	15	8	8	nw.	Jos. Dorweiler.
Means and extremes				24.7	+ 3.5	69	14	-22	25	46	0.61	-0.46	1.09	4.1	3	14	10	7	nw.	
<b>Central Division</b>																				
Ames	Story	926	45	28.1	+ 3.7	60	13	-11	25	33	0.81	-0.41	0.46	3.0	3	18	8	5	nw.	Iowa State College.
Audubon	Audubon	1,301	27	27.6 <sup>a</sup>	+ 3.7	62 <sup>a</sup>	13	-10 <sup>a</sup>	24	36 <sup>a</sup>	0.57	-0.42	0.50	0.7	3	-----	-----	-----	w.	Geo. Kibby.
Baxter	Jasper	948	21	29.6	+ 5.3	60	13	-11	25	32	0.61	-0.39	0.40	2.1	3	15	9	7	w.	Henry Geise.
Bella Plaine	Benton	886	31	27.8	+ 3.9	56	11	-17	25	37	3.02	+1.59	1.50	5.7	6	4	17	10	sw.	O. C. Burrows.
Boone	Boone	1,134	16	28.2 <sup>b</sup>	+ 5.1	62 <sup>b</sup>	13	-4 <sup>b</sup>	24	33 <sup>b</sup>	1.00	+0.03	0.90	0.8	2	-----	-----	-----	sw.	Carl F. Henning.
Carroll	Carroll	1,265	31	29.2	+ 6.0	63	13	-12	25	36	0.69	-0.33	0.55	1.6	3	24	0	7	nw.	Mrs. Jos. J. Wolfe.
Cedar Rapids	Linn	733	39	29.2	+ 5.2	55	1	-11	25	29	2.15	+0.75	1.00	1.7	5	11	4	16	n.	R. S. Toogood.
Clinton	Clinton	593	48	30.2	+ 4.5	54	11	-5	21	28	3.36	+1.51	1.17	2.4	7	14	11	6	n.	Dr. A. P. Bryant.
Davenport	Scott	580	50	30.4	+ 3.3	54	1	5	21	23	3.72	+2.03	1.72	2.8	7	6	11	14	nw.	U. S. Weather Bureau
Denison	Crawford	1,180	27	28.9	+ 4.4	63	13	-11	25	36	0.21	-0.72	0.21	T.	1	15	9	7	nw.	V. L. Byers.
Des Moines	Polk	861	43	30.0	+ 4.3	64	13	-5	25	30	0.80	-0.51	0.66	1.6	6	12	8	11	n.	U. S. Weather Bureau
Dubuque	Dubuque	639	48	27.2	+ 3.7	54	1	-7	25	27	2.43	+0.71	1.24	3.8	6	5	10	16	nw.	U. S. Weather Bureau
Fairport	Muscatine	567	-----	32.1	-----	56	11 <sup>f</sup>	0	27	39	3.25	-----	0.98	-----	4	13	5	13	sw.	R. L. Barney
Fort Dodge	Webster	1,114	21	-----	-----	53	13 <sup>f</sup>	-15	25	29	1.16	+0.54	0.74	3.8	5	13	9	9	n.	Fred Heman.
Grinnell	Poweshiek	1,031	27	28.6 <sup>g</sup>	+ 3.1	58 <sup>g</sup>	13	-10 <sup>g</sup>	25	35 <sup>g</sup>	1.47	+0.34	0.88	2.0	3	-----	-----	-----	nw.	Wm. Bader.
Grundy Center	Grundy	976	30	27.8	+ 4.1	55	13	-12	25	32	0.85	-0.33	0.70	8.0	3	10	16	5	nw.	M. G. Heiberger.
Guthrie Center	Guthrie	1,077	26	30.9	+ 5.7	65	13	-10	25	35	0.39	-0.79	0.29	1.0	2	18	5	8	nw.	E. L. Nesselroad.
Harlan	Shelby	1,192	22	29.3	+ 5.5	65	13	-9	25	37	T.	-1.06	T.	T.	0	26	1	4	s.	W. K. Colburn.
Independence	Buchanan	921	57	27.7	+ 4.9	54	1	-15	25	29	1.33	-0.05	0.41	3.0	5	20	3	8	nw.	Dr. Geo. Boody.
Iowa City	Johnson	733	61	29.1	+ 5.0	55	1	-19	25	36	3.19	+1.58	1.34	4.5	6	8	14	9	nw.	Prof. J. F. Reilly.
Iowa Falls	Hardin	1,107	28	26.1	+ 4.8	56	13	-19	25	36	0.89	-0.48	0.74	3.5	5	15	4	12	nw.	J. B. Parmelee.
Jefferson	Greene	1,052	22	27.9	+ 3.7	62	13	-14	25	38	0.71	-----	0.61	1.0	2	17	7	7	w.	Will I. Lyon.
Le Claire	Scott	576	21	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	nw.	Margaret T. Disney.
Little Sioux	Harrison	1,040	16	29.7	+ 4.3	68	13	-10	24 <sup>f</sup>	41	0.10	-----	0.10	1.0	1	14	9	8	nw.	Geo. H. Gibson.
Logan	Harrison	1,035	54	30.3	+ 5.1	69	13	-10	25	41	0.35	-0.83	0.30	3.0	3	16	8	7	sw.	Mary Jean Stern.
Manchester	Delaware	944	-----	26.2	-----	56	1	-3	21 <sup>f</sup>	33	2.56	-----	1.20	4.0	3	7	6	18	nw.	Thomas H. Tracey
Marshalltown	Marshall	947	29	28.8	+ 5.7	57	13	-12	25	29	1.23	-0.12	0.60	5.1	5	19	5	7	nw.	O. C. Pigman.
Monroe	Jasper	922	9	31.3	-----	58	12	-7	25	32	1.39	-----	0.59	4.6	4	17	4	10	sw.	J. A. Dibel.
Muscatine	Muscatine	554	61	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	nw.	Wm. P. Molis.
Olin	Jones	760	22	27.0	+ 2.0	55	1	-17	25	37	3.30	+1.81	1.40	1.5	5	11	11	9	nw.	Dr. F. W. Port.
Onawa	Monona	1,051	21	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	Mrs. H. E. Colby.
Perrv	Dallas	975	20	29.6 <sup>a</sup>	+ 4.8	62 <sup>a</sup>	13	-10 <sup>a</sup>	25	34 <sup>a</sup>	0.54	-0.65	0.49	0.7	3	-----	-----	-----	w.	F. N. Bartlett.
Rockwell City†	Calhoun	1,134	25																	



Climatological Data for December, 1921—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.						Precipitation, in Inches.				Number of Days.				Observers.			
				Mean.	Departure from normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from normal.	Greatest in 24 hours.	Total snowfall, unmelted.	Precipitation .01 in. or more.	Clear.	Partly cloudy.		Cloudy.	Prevailing direction of wind.	
<i>Southern Division</i>																					
Afton.....	Union.....	1,212	27	30.6	+ 4.4	60	13	- 5	25	30	0.13	-1.21	0.10	T.	2	20	5	6	sw.	S. R. Brown.	
Albia.....	Monroe.....	959	23	31.2	+ 5.9	59	13	- 7	25	34	1.45	+0.30	0.50	1.4	5	9	8	14	sw.	O. E. McBride	
Atlantic.....	Cass.....	1,164	30	31.6 <sup>6</sup>	+ 6.8	65 <sup>8</sup>	13	- 6 <sup>5</sup>	25	42 <sup>3</sup>	0.30	-0.90	0.30	T.	1	---	---	---	---	nw.	Joseph N. Reynolds.
Bedford.....	Taylor.....	1,100	21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	E. E. Healy.
Bloomfield.....	Davis.....	881	14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	John W. Teed.
Bonaparte.....	Van Buren.....	---	30	32.0	+ 4.1	57	10 <sup>†</sup>	-10	25	37	1.71	+0.36	1.22	0.5	5	15	6	10	sw.	Bruce R. Vale.	
Burlington.....	Des Moines.....	544	25	33.0	+ 5.1	59	11	- 2	25	30	2.38	+0.60	1.32	1.5	5	18	4	9	sw.	Mrs. E. M. Donnelly.	
Centerville.....	Appanoose.....	1,013	16	32.5	---	59	13	- 8	25	32	1.00	-0.29	0.41	3.2	6	17	3	11	w.	Leo J. Allen.	
Chariton <sup>††</sup> .....	Lucas.....	1,042	26	34.2	+ 7.8	62	13	- 6	25	37	0.96	-0.36	0.76	T.	2	17	9	5	nw.	C. C. Burr.	
Clarinda.....	Page.....	1,009	31	32.0	+ 7.3	64	13	- 4	25	35	0.38	-0.79	0.26	2.0	5	16	8	7	nw.	A. S. Van Sandt.	
Columbus Jct.....	Louisa.....	595	20	31.4	+ 3.7	56	1	- 9	15	31	2.47	+1.16	1.08	2.1	6	21	2	8	nw.	J. B. Johnston.	
Corning.....	Adams.....	1,117	29	30.6	+ 5.9	66	2	- 7	25	43	0.27	-1.07	0.25	0.5	2	23	1	7	sw.	Jerome Smith.	
Corydon.....	Wayne.....	1,101	28	31.9	+ 4.5	63	13	- 5	25	31	0.95	-0.47	0.78	2.0	4	10	14	7	sw.	May C. Miller.	
Creston.....	Union.....	1,312	16	30.4	+ 5.7	60	13	- 4	24 <sup>†</sup>	34	0.37	---	0.20	2.0	4	14	12	5	nw.	Dr. H. M. Stanley.	
Cumberland.....	Cass.....	1,225	22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	G. M. Clarke.
Earlham.....	Madison.....	1,126	19	29.0	+ 3.6	64	13	-14	25	39	0.25	-1.16	0.23	1.0	2	21	4	6	nw.	Geo. Phillips.	
Fairfield.....	Jefferson.....	780	37	30.2	+ 3.0	56	1	-15	25	36	1.97	+0.28	0.90	3.5	4	16	4	11	nw.	Prof. R. M. McKenzie.	
Glenwood.....	Mills.....	1,100	23	32.3	---	68	13	- 5	24	35	0.02	---	0.02	0.2	1	14	11	6	nw.	Dr. Geo. Mogridge.	
Greenfield.....	Adair.....	1,368	29	28.6	+ 3.6	62	13	- 8	25	40	0.10	-1.08	0.10	1.0	1	19	5	7	sw.	C. E. McCaslen.	
Indianola.....	Warren.....	972	30	30.4	+ 4.1	63	13	- 9	25	32	0.38	-1.07	0.16	2.0	4	14	10	7	nw.	Seth F. Shenton.	
Keokuk.....	Lee.....	614	50	33.0	+ 3.6	57	11	- 2	25	23	2.25	+0.38	1.24	3.5	7	7	14	10	w.	U. S. Weather Bureau.	
Keosauqua.....	Van Buren.....	644	29	31.5	+ 4.8	57	11	-11	25	34	1.95	+0.52	1.13	3.0	5	15	6	10	sw.	J. H. Landes.	
Knoxville.....	Marion.....	920	26	30.5	+ 4.0	60	13	-10	25	36	0.91	-0.46	0.53	0.5	4	15	7	9	sw.	W. J. Casey.	
Lacونا.....	Warren.....	---	22	---	---	---	---	---	---	---	1.70	0.00	0.78	6.0	5	11	13	7	---	J. B. Alter.	
Lamoni.....	Decatur.....	1,100	14	30.6	+ 3.9	64	13	- 5	25	35	0.22	-1.00	0.10	1.0	3	17	4	10	nw.	Rupert A. Wight.	
Lenox.....	Taylor.....	1,250	26	31.2	+ 5.5	63	13	- 4	25	31	0.42	-0.71	0.20	1.4	5	17	7	7	nw.	J. L. Hurley.	
Mt. Ayr.....	Ringgold.....	1,236	28	31.4	+ 4.4	65	13	- 5	25	35	0.21	-1.18	0.06	0.9	4	17	6	8	nw.	Alex Maxwell.	
Mt. Pleasant.....	Henry.....	729	40	31.8	+ 4.0	58	11	- 7	25	31	2.07	+0.71	1.19	1.2	5	12	11	8	nw.	John H. Jericho.	
Oakland.....	Pottawattamie.....	1,105	2	30.2	---	66	13	- 5	24 <sup>†</sup>	37	0.51	---	0.31	2.0	3	25	1	5	n.	M. E. Gray.	
Oskaloosa.....	Mahaska.....	825	45	30.6	+ 4.5	58	13	-12	25	35	1.69	+0.54	0.80	4.3	6	8	13	10	nw.	Roy R. Robinson.	
Ottumwa.....	Wapello.....	849	26	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Henry Eilers.
Pella.....	Marion.....	877	28	31.2	+ 4.6	58	13 <sup>†</sup>	-17 <sup>8</sup>	25	39 <sup>a</sup>	1.34	+0.26	0.92	5.0	3	16	4	11	s.	J. H. Ver Steeg.	
Sigourney.....	Keokuk.....	790	25	28.7	+ 2.0	53	1 <sup>†</sup>	-14	25	30	1.84	+0.61	0.56	2.7	5	13	7	11	nw.	W. E. Utterback.	
Stockport <sup>††</sup> .....	Van Buren.....	754	19	30.8	+ 3.2	56	1 <sup>†</sup>	-14	25	34	2.09	+0.81	1.16	2.5	5	12	10	9	nw.	C. L. Beswick.	
Thurman.....	Fremont.....	24	31.8	+ 6.1	69	13	- 4	25	40	0.20	-1.15	0.08	2.0	3	7	18	6	sw.	C. R. Paul.		
Washington.....	Washington.....	769	39	30.2	+ 3.1	56	1	-13	25	32	3.14	+1.78	1.20	3.5	5	6	16	9	w.	Wm. A. Cook.	
Winterset.....	Madison.....	1,129	30	31.0	+ 4.9	64	13	- 5	25	32	0.55	-0.75	0.45	1.0	2	22	4	5	sw.	H. S. Ely.	
Omaha, Nebr.....	---	1,040	50	31.7	+ 4.6	70	13	- 5	24	36	0.14	-0.77	0.10	0.8	2	13	12	6	nw.	U. S. Weather Bureau.	
Means and extremes.....	---	---	---	31.2	+ 4.8	70	13	-17	25	43	1.04	-0.31	1.32	1.9	4	15	8	8	nw.	---	
State means and extremes.....	---	---	---	28.2	+ 4.3	70	13	-22	25	46	1.02	-0.20	2.40	2.9	4	14	9	8	nw.	---	

The departure from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete records are used in determining means.  
 Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example, b represents two days, etc.  
 †Also other dates. ††Received too late to be included in means and summaries.  
 T., Precipitation is less than 0.01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE.

Stations.	Barometric Pressure Inches (Sea Level).					Relative Humidity (%).				Wind.					Sunshine.	
	Mean.	Highest.	Date.	Lowest.	Date.	Mean.				Total movement.	Average hourly velocity.	Maximum			Per cent of possible.	Departure from normal.
						7 a. m.	Noon.	7 p. m.	Lowest.			Date.	Miles.	From.		
Charles City	30.10	30.70	21	29.48	1 87	74	84	40	19	5,886	7.9	38	nw.	30	8	-13
Davenport.	30.08	30.63	21	29.32	1 82	68	76	34	29	6,179	8.2	31	w.	31	4	1
Des Moines.	30.09	30.65	21	29.38	1 79	64	65	32	9	6,218	8.9	28	nw.	30	5	+6
Dubuque.	30.08	30.67	21	29.37	1 84	71	76	51	3	5,721	7.7	32	nw.	31	3	-7
Keokuk.	30.11	30.63	25	29.34	1 80	68	72	42	21	6,622	8.9	31	nw.	31	5	+6
Sioux City.	30.15	30.71	21	29.49	1 78	66	68	26	13	9,050	12.2	53	nw.	30	5	+1
Omaha, Nebr.	30.14	30.64	21	29.49	1 77	57	60	28	9	7,328	9.8	38	nw.	11	6	+16
Means and extremes.....	30.11	---	---	---	---	---	---	---	---	---	9.0	---	---	---	---	49 + 1
Normals and records	30.12	---	29 <sup>th</sup>	---	---	---	---	---	---	---	8.1	---	---	---	---	48
		*31.09	1917	29.00	1921	---	---	---	---	---	---	*58	nw.	1907	---	---

\*Sioux City. §Dubuque. †Davenport. ††Local mean time.



Daily Precipitation for December, 1921—Continued.

Stations.	Drainage Basin.	Day of Month.																															Totals		
		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			
<i>Southern Division</i>																																			
Afton	Grand	.03															.10	T.																	0.13
Albia	Des Moines	.50	.30														.18	.45					T.	T.	.02										1.45
Atlantic	Nishnabotna																.30			T.				T.	T.									0.30	
Bedford	Missouri																																		
Bloomfield	Mississippi																																		
Bonaparte	Des Moines	.53	.69														.30	.17						T.	T.	.02								1.71	
Burlington	Mississippi	1.32	.50													.30	.25						T.	T.	.01	T.								2.38	
Centerville	Chariton	.41	.20													.23	.05						T.	T.	.01	.10								1.00	
Chariton	Chariton	.76														.20	T.																	0.96	
Clarinda	Nodaway	.09														.11	.15							.01	T.	.02								0.38	
Columbus Jct.	Iowa	.80	.30													1.08	.20							T.	.04	.05								2.47	
Corning	Nodaway	T.														.25	.02																	0.27	
Corydon	Chariton	.78														.05	.10							T.	T.	.02								0.95	
Creston	Missouri	.05														.10	.09					T.			T.	.03								0.37	
Cumberland	Nodaway																																		
Earlham	Des Moines	T.														.23	.02								T.	T.								0.25	
Fairfield	Skunk	.90														.67	.20							T.	T.	.20								1.97	
Glenwood	Missouri															T.	.02							T.										0.02	
Greenfield	Nodaway															T.	.10							T.	T.									0.10	
Indianola	Des Moines	.16														.02	.10							T.		.10								0.38	
Keokuk***	Mississippi	1.23	.01													.67	.23							.05	.01	.05								2.25	
Keosauqua	Des Moines	1.01	.12													.50	.12							T.	T.	.20								1.95	
Knoxville	Des Moines	.53										T.				.28	T.							.05	.05									0.91	
Lacona	Des Moines	.78														.32	.20							.20	.20									1.70	
Lamoni	Grand															.07	.10							.05	T.									0.22	
Lenox	Missouri	.20														.08	.05							T.	.02	.07								0.42	
Mt. Ayr	Grand	.06														.05	.05								T.	.05								0.21	
Mt. Pleasant	Skunk	.67	.52													.44	.36								T.	T.	.08								2.07
Oakland	Nishnabotna															.31	.10								.10									0.51	
Oskaloosa	Des Moines	.80	.04								T.					.50	.27							.02	T.	.06								1.69	
Ottumwa	Des Moines	1.00														.78	.15									.13								2.06	
Pella	Skunk															.32	.92							T.	T.	.10								1.34	
Sigourney	Skunk	.49	.56									T.				.32	.39								T.	T.	.08							1.84	
Stockport	Skunk	.76	.40													.39	.34							T.	T.	.20								2.09	
Thurman	Missouri															.08	.06							T.	T.	.06								0.20	
Washington	Skunk	.10	1.20													.77	.96									.11								3.14	
Winterset	Des Moines															.45	.10																	0.55	
Omaha, Nebr.***	Missouri															.10								T.	T.	.04				T.				0.14	

Except as otherwise indicated, observations are generally made late in the afternoon, near sunset, and precipitation recorded is for 24 hours ending at the time of observation.

|||Precipitation measured in the morning; amount then recorded is for the preceding 24 hours.  
 \*\*\*Regular Weather Bureau Station; precipitation is for 24-hour period, midnight to midnight.  
 \*\*Incomplete.  
 \*Precipitation included in the next following measurement.

SUNSHINE AND CLOUDINESS.

The average per cent of the possible amount of sunshine was 49, or 1 per cent greater than the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 38; Davenport, 42; Des Moines, 58; Dubuque, 36; Keokuk, 52; Sioux City, 50; Omaha, Nebr. 67.

RIVERS.

Moderate stages prevailed on the Missouri River and low stages on the Mississippi and all interior rivers. Most streams were open till after the middle of the month. Most interior streams were frozen by the 20th and the Missouri and Mississippi were frozen over from the 21st to 25th, with ice from eight to ten inches thick.

MISCELLANEOUS PHENOMENA.

Aurora: 26th.  
 Fog: 1st, 6th, 12th, 15th, 16th, 25th, 27th.  
 Halos (Lunar and Solar): 3d, 6th, 7th, 9th, 10th, 11th, 12th, 13th, 14th, 21st, 24th.  
 Parhelia: 3d, 29th, 31st.  
 Sleet: 11th, 16th, 19th, 22d, 23d.  
 Thunderstorms: 16th.

ERRATA.

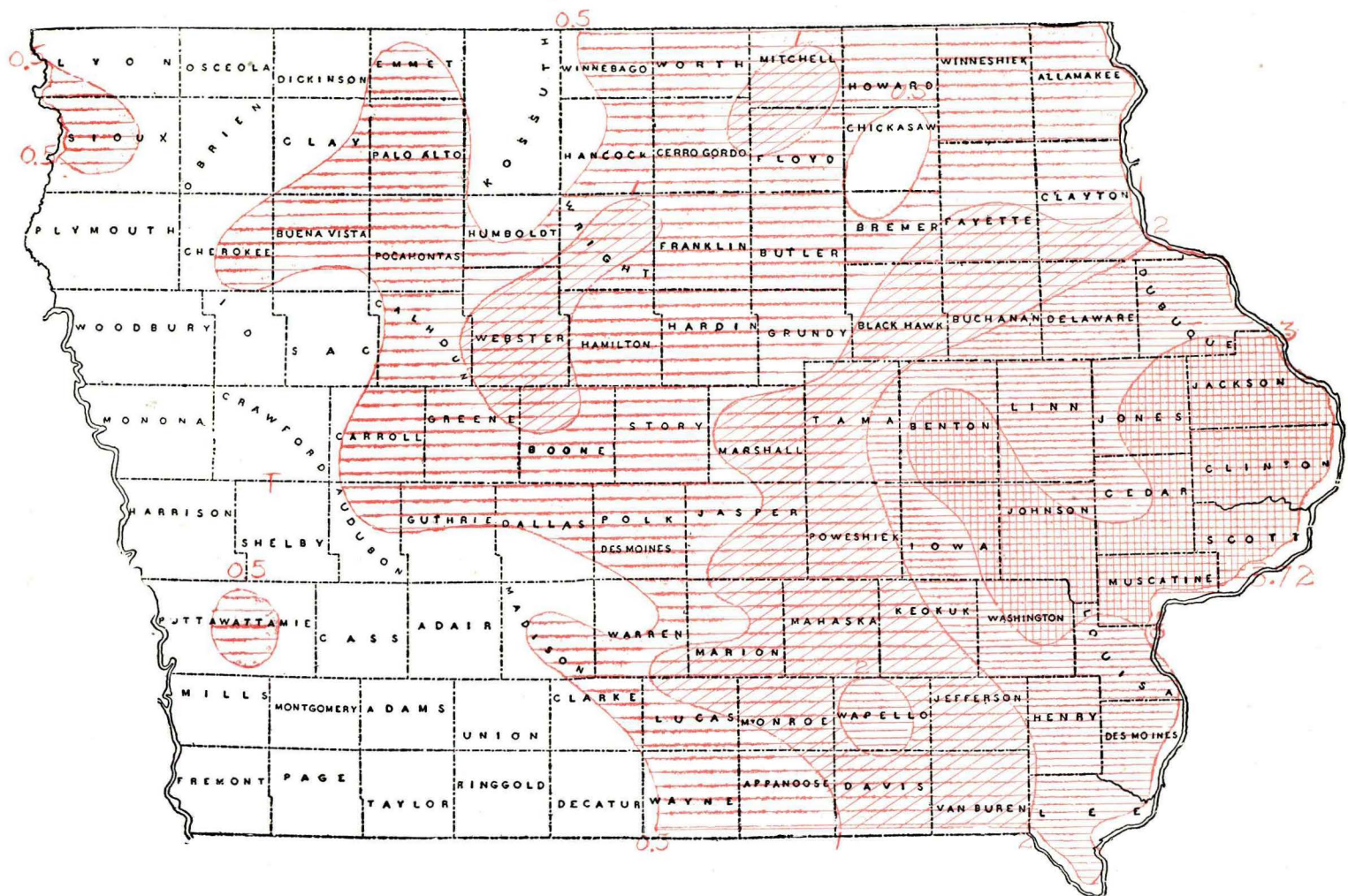
Report for November, 1921. Page 82; Charles City, mean temperature published 30.0°, should be 30.1° and the departure published -3.0°, should be -2.9°; Storm Lake, total precipitation published 0.41 inch, should be 0.26 inch and the departure published -0.72 inch, should be -0.87 inch. Page 83; Washington temperature department published +1.1, should be -1.1. Page 84; Storm Lake, precipitation on the 27th published .25 inch, should be .10 inch and the total for the month published 0.41 inch, should be 0.26 inch. Page 86; Charles City, minimum temperature on the 8th, published 21°, should be 26° and the mean of the minimum published 23.3°, should be 23.5°.

Daily Maximum and Minimum Temperature for the Month of December, 1921.

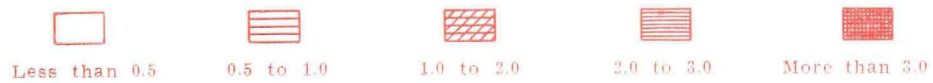
Table with columns for Stations, days 1-31, and Mean. Rows are categorized by Northern Division (Albion, Alta, Alton, Belmont, Charles City, Decorah, Forest City, Inwood, Mason City, Milford, New Hampton, Northwood, Pocahontas, Postville), Central Division (Belle Plaine, Boone, Carroll, Davenport, Des Moines, Dubuque, Fort Dodge, Grinnell, Guthrie Center, Independence, Iowa City, Iowa Falls, Little Sioux, Marshalltown, Olin, Sioux City), and Southern Division (Albia, Atlantic, Bloomfield, Burlington, Columbus, Corning, Corydon, Fairfield, Keokuk, Lamoni, Pella, Sigourney, Thurman, Winterset, Omaha, Nebr.).

a, b, c, etc., indicate respectively 1, 2, 3, etc., days missing from record.

### TOTAL PRECIPITATION, DECEMBER, 1921



SCALE OF SHADES—IN INCHES



# CLIMATOLOGICAL DATA.

## IOWA SECTION

In cooperation with  
IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXII—DES MOINES, IOWA, ANNUAL, 1921 No. 13

### GENERAL SUMMARY

The mean temperature,  $52.2^{\circ}$ , is  $4.8^{\circ}$  above normal and  $2.5^{\circ}$  warmer than any previous year since State-wide records began in 1890. Every month but November was above normal. January and February were the warmest of record. The highest temperature recorded was  $104^{\circ}$ , at Clinton, on July 11, 12 and 13. The lowest was  $-22^{\circ}$ , at Washta, on December 25. The annual variation in temperature within the State was  $126^{\circ}$ . The total precipitation averaged 32.03 inches, or 0.06 inch above normal. Spring advanced too rapidly. Oats were seriously damaged by freezes March 28 and April 15th-16th. Tree fruits advanced so far that these freezes caused nearly a total loss, particularly in the south half of the State. Oats and potatoes were injured by the excessive heat. Winter wheat did well. Corn, though injured by drouth in July, gave a very good yield. Prices were discouraging.

### SYNOPSIS BY MONTHS

January, with a mean temperature of  $28.4^{\circ}$ , is the warmest of record. Cold waves covered the northern and extreme western portions of the State on the 12th and most of the State on the 17th. Zero temperatures were confined to this period and scarcely reached the southern district. Snowstorms occurred on the 13th, 14th and 25th and during the latter half of the month the ground was snow covered over most of the State. Live stock remained in the open much of the month. Very little ice of poor quality was harvested.

February mean temperature,  $31.0^{\circ}$ , is the warmest of record. The lowest temperature was  $-5^{\circ}$  at Washta on the 7th. Never since records began has a February passed without a lower temperature being recorded some place in the State. Only three days were below normal. Most of the precipitation was in the form of snow, 5th-11th, though considerable fell on the 22nd in the southern division. Damaging winds occurred, 15th-17th. At Davenport on the 16th the damage was \$10,000. Considerable plowing was done toward the end of the month and there were a few reports of spring wheat seeding in the southern division. Though snow covering was deficient, winter grains and grasses suffered little. Ice harvest was light. For the second time in 50 years none was cut in the Mississippi River at Keokuk.

Mild weather continued generally in March, though abnormally cold weather spread over the State on the 27th-28th. Precipitation, mostly rain, averaged nearly normal but varied from excessively heavy in the extreme east to considerably below normal over most of the State. Plowing and seeding made unusual progress and over much of the central and southern portions, oats and wheat made a good start. Foliage advanced a month ahead of normal. Fruit was probably not injured by the severe freeze of the 28th except in the south, but the sudden change to colder caused much loss of young pigs and lambs. A tornado on the 26th moved from near

Arthur to Fonda, causing \$100,000 damage and injuring some persons.

Though April averaged warm, there was a hard freeze after the first week and several rapid and decided fluctuations in temperature thereafter. A heavy snowstorm occurred in the south and east portions of the State on the 15th-16th. All traffic in this area was delayed and many telephone and telegraph wires broken. Tree fruit was in full bloom over the southern and central sections, and was nearly a total loss. The wet snow froze to bloom and foliage, which was then broken off by high wind. Temperatures as low as  $20^{\circ}$  followed. However, a good many peaches survived in Scott County. In the northern division fruit was not so far advanced, the storm was less severe and the temperature did not fall so low, so the damage was not great. Many damaging windstorms occurred. Dust storms were unusually prevalent in the drier west-central and northwest counties. Newly seeded grains were blown out of the ground. Oats suffered unusual damage from the severe freezes and in some southern counties 50 per cent of the acreage was reseeded and some seeded the third time. Lambs, pigs and chicks suffered from the snow and cold, and live stock had to be returned to winter quarters.

Freezing temperatures or frosts were general May 2, 3, 4, 14, 15 and 16. Truck crops and small fruits were injured. A warm period began the 17th, so that the month averaged nearly three degrees above normal. Temperatures of  $90^{\circ}$  or higher were reported from all portions of the State during the last 10 days and at some stations the highest record for May was equalled or exceeded. Drouth over most of the central and southern divisions after the 11th cut the hay crop, and the hot, dry weather caused small grain to head short. Corn planting progressed favorably, germination was good, and the greater portion had been cultivated once by the close of the month and about one-fourth the second time. A tornado occurred on the 9th and severe local winds on the 24th, 26th and 30th. Five persons were killed, many injured and property loss was nearly half a million dollars.

June was continuously warm after the 6th. Some stations had the highest June mean temperature of record. Precipitation was deficient over the northern and most of the central divisions. The abnormal heat and drouth greatly reduced the yield and quality of oats and spring wheat and to some extent winter wheat. Winter wheat harvest had begun as far north as Woodbury County by the close of the month. Corn made phenomenal growth. Potatoes developed large tops but failed to form tubers later. Many horses died from over heating. High winds occurred on the 1st, 15th and 28th. Hail storms were not as numerous as usual, though large areas were damaged in Lyon and Pocahontas Counties on the 28th.

Abnormal heat continued through July with pronounced drouth except in the west central, extreme northwest and extreme northeast portions. In several north central and central counties, precipitation was less than 20 per cent of normal, at a very critical time in the growth of corn, which deteriorated greatly from the magnificent prospects of the close of June. Haying, harvest and threshing made good progress with ideal weather excepting that it was too hot for horses and men and there was too much rain in the west central portion. The potato crop was seriously damaged by the heat in all portions



of the State as well as the drouth where drouth prevailed. Gardens in the dry area were ruined, pastures burned brown and a promising berry crop became a failure.

August was cool until the fourth week, when it turned hot. The drouth was relieved by general and heavy rains on the 1st-2nd, and other generous and timely rains. Corn was greatly benefitted and made greater recovery than at first seemed possible. However, in some sections the heavy rains made the soil so soft that the corn fell over or was blown over by the winds. Potatoes had been generally injured beyond recovery. With abundant soil moisture, plowing and preparation for winter wheat seeding made good progress and some seeding was done. Conditions were unusually good for seeding alfalfa. Shocked grain was damaged by the rains. Severe local storms occurred in Appanoose and portions of adjoining counties on the 5th.

September was generally warm and wet. Frost was reported from several stations on the 30th, but there was no appreciable damage. Thunderstorms were unusually prevalent. The soil became saturated and the heavy rains of the 15th-16th caused the interior streams to overflow in the central and eastern portions of the State. In Tama County and adjoining areas several hundred cattle and sheep were drowned, bridges and culverts washed out and trains delayed. Severe local wind, hail and rain storms were more numerous than usual. Corn went down badly in the south and east portions of the State. Ears that were on or near the moist ground sprouted, molded and rotted. Silo filling and fodder cutting was greatly impeded by the tangled condition of the corn. Corn ear worms became unusually numerous as a result of the mild winter and warm spring and caused great damage during September. Pastures became excellent. Winter wheat seeding made good progress and the earliest was up and making good growth at the close of the month.

The first killing frost occurred at a few stations in the northwest portion of the State on October 3 and at a large number on the 4th. On the 8th freezing temperatures were general except along the Mississippi River, where killing frost did not occur during the month for the first time in 21 years. Frost damage was mostly confined to late gardens. Corn was practically all mature. The warm weather after the 12th caused potatoes to take on new growth in small areas in the extreme eastern portion; a few fruit trees bloomed; and ripe strawberries were not uncommon. Fifty per cent of the corn was husked during October under favorable weather conditions, there being little rain till toward the close of the month. Winter wheat suffered from drouth somewhat in the western counties till the rains came.

After 14 consecutive months with temperatures above normal, November turned cold on the 8th and averaged below normal. The freeze of the 8th was the first killing frost in some Mississippi River counties. The weather favored outdoor work. Ninety per cent of the corn had been gathered by the close of the month, though considerable difficulty was experienced with down corn in the extreme north, where the ground was snow covered 15 to 20 days of the month. Precipitation was deficient, being mostly snow in the northern portion. New Hampton reported 13 inches. There was much cloudiness.

Warm weather returned in December, and pleasant weather prevailed. Corn husking was finished; there was very little frost in the ground; live stock grazed in the corn stalk fields and pastures, and many corn stalk fields were plowed, which is unusual. Dandelions and other flowers bloomed till about the middle of the month. Precipitation was deficient.

The low temperatures toward the close of the month were generally preceded by ample snow cover in the winter wheat sections. However, some damage may have resulted from deficient moisture.

SUPPLEMENTAL PRECIPITATION TABLE.

Stations	January	February	March	April	May	June	July	August	September	October	November	December	Annual
<i>Northern Division</i>													
Britt	0.18	0.56	1.07	1.31	6.06	1.59	0.43	4.19	---	---	0.18	0.18	---
Decorah	0.55	0.66	1.16	3.23	---	3.28	5.08	4.24	6.70	2.00	1.43	0.84	---
Estherville	---	0.90	0.75	2.30	5.90	4.17	2.11	5.05	5.25	1.05	0.65	0.55	---
Humboldt	0.27	1.37	1.81	2.45	4.80	---	2.81	4.35	4.29	---	1.04	0.29	---
Lansing	---	---	0.97	3.42	7.44	1.33	3.33	4.80	8.85	2.30	1.19	---	---
Sioux Center	0.53	0.95	1.02	2.43	7.08	---	3.02	3.00	4.49	0.95	0.95	0.75	---
<i>Central Division</i>													
Baxter	0.35	0.41	1.21	3.54	2.53	3.01	1.22	4.49	---	0.84	0.50	0.61	---
Boone	0.23	0.98	0.98	2.63	3.41	7.26	---	---	---	1.55	0.46	1.00	---
Delaware	0.37	0.72	1.83	4.26	5.34	2.46	1.45	4.91	---	---	---	---	---
Fairport	---	---	4.85	4.83	3.34	6.26	1.18	5.39	10.64	2.48	1.31	3.25	---
Le Claire	---	---	4.98	5.38	2.09	4.19	2.17	7.94	8.35	2.36	1.46	---	---
Manchester	---	---	---	---	---	---	---	---	10.24	3.48	0.58	2.56	---
Muscatine	---	0.63	3.99	5.59	2.59	5.99	1.83	7.01	11.67	1.93	0.82	---	---
Onawa	---	---	---	---	3.40	1.38	4.79	3.76	2.92	---	---	---	---
Rockwell City	0.48	1.52	---	---	---	---	2.66	5.67	4.68	1.60	0.37	0.24	---
Van Meter	---	---	0.88	2.29	2.70	5.76	2.77	4.61	9.58	1.64	0.17	0.41	---
<i>Southern Division</i>													
Atlantic	0.38	0.99	---	---	4.52	5.90	4.57	3.51	9.24	2.75	0.21	0.30	---
Bloomfield	0.20	---	---	5.76	4.04	5.16	2.29	---	---	---	---	---	---
Cumberland	0.75	0.50	0.73	1.75	2.18	4.39	2.42	2.20	6.85	2.75	---	---	---
Murray	0.61	0.20	1.11	2.75	2.75	---	---	---	---	---	---	---	---
Ottumwa	0.55	---	2.53	6.01	4.43	4.16	1.77	7.39	8.25	2.97	0.36	2.06	---

COMPARATIVE DATA FOR THE STATE—Annual.

Year	Temperature				Precipitation in inches				
	Mean annual	Highest	Date	Lowest	Date	Annual	Greatest annual	Least annual	Av. snowfall
1890	48.0	110	July 13	-27	January 22	31.30	45.74	16.00	---
1891	47.3	106	August 9	-31	February 4	32.90	49.05	23.48	---
1892	46.6	104	July 11	-38	January 19	36.58	48.77	24.78	34.2
1893	45.7	102	July* 13	-36	January 14	27.59	33.27	19.19	37.2
1894	49.7	109	July 26	-37	January 25	21.94	29.81	15.65	19.2
1895	47.2	104	May 28	-33	February 1	26.77	35.25	18.57	26.0
1896	48.6	104	July 3	-29	January 4	37.23	51.60	28.68	22.6
1897	47.8	106	July* 23	-30	January 25	26.98	36.18	20.21	38.8
1898	47.7	103	August 20	-25	December 31	31.34	55.47	19.51	40.3
1899	47.3	104	September 6	-40	February 11	28.68	42.06	21.79	23.4
1900	49.3	103	August 3	-27	February 15	35.05	47.33	25.05	25.8
1901	49.0	113	July 22	-31	December 15	24.41	37.69	16.35	38.5
1902	47.7	98	July 30	-31	January 27	43.82	58.80	20.14	28.0
1903	47.2	101	August 24	-27	December 13	35.39	59.53	26.41	19.4
1904	46.3	100	July 17	-32	January 27	28.51	38.93	19.34	29.2
1905	47.2	104	August 11	-41	February* 2	36.56	52.26	24.66	38.3
1906	48.4	102	July 21	-32	February 10	31.60	44.34	20.63	32.8
1907	47.4	102	July 5	-31	February 5	31.61	43.90	19.93	24.0
1908	49.5	101	August 3	-18	January 29	35.26	49.98	24.11	22.7
1909	47.4	103	August* 15	-26	February* 15	40.01	53.48	27.20	49.0
1910	48.6	108	July 16	-35	January 7	19.87	27.99	12.11	23.4
1911	49.5	111	July* 3	-35	January 3	31.37	46.77	19.74	35.3
1912	46.4	104	September 8	-47	January 12	28.89	33.13	15.25	39.5
1913	49.7	108	July* 16	-25	January 8	29.95	45.18	20.31	25.4
1914	49.1	109	July 12	-31	December 26	31.93	44.11	23.30	27.5
1915	47.8	99	May 14	-32	January 28	39.53	51.15	27.29	31.3
1916	47.2	106	August 4	-34	January 13	28.90	46.34	22.48	29.5
1917	44.8	106	July 3	-40	December 29	27.81	36.00	20.78	32.4
1918	49.2	113	August 4	-36	February 4	32.78	47.53	25.03	33.4
1919	48.6	104	July* 30	-36	December 10	36.76	48.16	26.88	26.6
1920	48.2	102	July 23	-26	January* 4	31.75	44.00	20.95	21.7
1921	52.2	104	July* 11	-22	December 25	32.03	46.47	20.44	30.7

\*And other dates.

CLIMATOLOGICAL DATA FOR THE YEAR, 1921.

STATIONS	COUNTIES	Elevation, feet	Length of record, years	Temperature, in Degrees Fahrenheit					Precipitation, in Inches					Total snowfall (un-melted)	Number of Days				Prevailing direction of wind	
				Mean	Highest	Date	Lowest	Date	Length of record, years	Total	Greatest monthly	Month	Least monthly		Month	Precipitation 0.01 in. or more	Clear	Partly cloudy		Cloudy
<i>Northern Division</i>																				
Algona	Kossuth	1,213	48	50.0	97	Aug. 19	-11	Dec. 25	48	32.61	9.41	May	0.24	Dec.	30.5	60	243	36	86	se.
Allison	Butler	1,044	9	50.4	101	July 10	-15	Dec. 25	9	29.04	6.21	Sept.	0.35	Jan.	22.5	89	129	121	115	nw.
Alta	Buena Vista	1,513	30	50.1	97	June 30	-12	Dec. 24	30	26.37	6.50	May	0.27	Jan.	18.8	82	157	128	80	nw.
Alton	Sioux	1,305	16	50.3	100	June 28†	-16	Dec. 25	16	24.24	6.95	May	0.40	Dec.	19.9	78	152	116	97	nw.
Belmond	Wright	1,205	11	50.3	100	July 9†	-17	Dec. 25	11	29.82	7.15	Sept.	0.61	Jan.	37.6	109	100	169	96	sw.
<i>Central Division</i>																				
Britt	Hancock	1,236	24	49.8	98	July 16	-16	Dec. 25	24	30.73	7.15	Sept.	0.43	Jan.	35.4	92	193	77	95	nw.
Charles City	Floyd	1,015	30	49.3	96	July 10	-12	Dec. 25	30	34.66	7.07	Sept.	0.58	Jan.	35.3	101	93	153	119	nw.
Decorah	Winneshiek	875	28	49.2	96	July 10	-17	Dec. 25	28	30	5.90	May	0.55	Jan.	17.3	71	166	160	39	nw.
Estherville	Emmet	1,298	26	48.7	95	July 11†	-14	Dec. 25	26	24.10	5.56	May	0.52	Jan.	22.0	71	166	160	39	nw.
Fayette	Fayette	1,003	31	49.8	98	July 10†	-16	Dec. 25	31	45.52	9.76	Sept.	0.43	Jan.	35.4	92	193	77	95	nw.
Forest City	Winnebago	1,226	27	49.7	99	July 10	-17	Dec. 25	27	27.38	6.04	May	0.48	Feb.	27.5	84	204	87	74	nw.
Humboldt	Humboldt	1,095	33	49.2	98	July 10	-20	Dec. 25	33	4.80	4.80	May	0.27	Jan.	23.0	84	204	87	74	s.
Lyon	Lyon	1,474	17	49.2	96	June 30†	-18	Dec. 24	17	24.97	5.95	May	0.20	Feb.	19.8	84	204	87	74	s.
Le Mars	Plymouth	1,224	25	50.8	98	June 28†	-13	Dec. 24	25	21.18	5.46	May	0.15	Jan.	14.6	69	204	87	74	sw.
Mason City	Cerro Gordo	1,148	24	49.8	99	July 10†	-18	Dec. 25	24	30.73	7.15	May	0.42	July	19.8	98	194	96	75	se.
Milford (near)	Dickinson	1,430	1	48.2	92	June 17†	-3	Dec. 24	1	25.17	5.70	May	0.20	Dec.	15.8	95	142	129	94	nw.
New Hampton	Chickasaw	1,169	24	49.5	99	July 11	-12	Dec. 25	24	36.75	8.17	May	0.25	Dec.	35.5	94	142	129	94	s.
Nora Springs	Floyd	1,064	9	50.9	100	July 10	-21	Dec. 25	9	34.88	7.39	Sept.	0.58	Jan.	16.1	111	156	117	92	s.
Northwood	Worth	1,222	25	48.4	97	July 11	-15	Dec. 25	25	24.43	9.26	May	0.52	Jan.	31.5	89	147	134	84	sw.
Pocahontas	Pocahontas	1,248	17	50.4	96	July 10	-17	Dec. 25	17	30.96	5.97	June	0.20	Jan.	27.9	95	178	95	92	sw.
Postville	Clayton	1,180	30	48.6	93	July 12	-12	Dec. 25	30	38.73	9.04	Aug.	0.57	Feb.	23.2	111	124	136	105	sw.
Rock Rapids	Lyon	1,358	22	49.2	98	June 28	-13	Dec. 24	22	22.38	7.17	May	0.26	Feb.	16.7	78	241	67	57	nw.
Sanborn	O'Brien	1,553	7	49.4	98	July 10	-17	Dec. 24	7	24.10	5.56	May	0.20	Jan.	13.5	72	198	72	95	sw.
Sioux Center	Sioux	1,426	22	49.4	98	July 10	-15	Dec. 24	22	22.86	5.38	May	0.52	Jan.	32.2	82	154	129	82	nw.
Spencer	Clay	1,319	7	50.1	102	July 10†	-15	Dec. 25	7	22.86	5.38	May	0.30	Jan.	27.8	82	154	129	82	nw.
Storm Lake	Buena Vista	1,440	32	51.2	96	June 30†	-12	Dec. 24†	32	20.44	4.30	Aug.	0.16	Jan.	15.8	79	230	63	72	s.
Washita	Cherokee	1,157	23	50.8	98	June 30	-22	Dec. 25	23	26.38	4.99	Aug.	0.15	Jan.	21.5	73	209	79	77	sw.
Waverly	Bremer	948	25	50.9	99	July 10	-10	Dec. 25	25	28.93	5.49	May	0.17	March	32.0	87	137	132	96	w.
West Bend	Palo Alto	1,197	28	50.4	97	July 10†	-18	Dec. 25	28	25.70	6.52	May	0.36	Jan.	22.2	74	137	132	96	s.
<i>Central Division</i>																				
Ames	Story	926	41	52.3	96	July 10	-11	Dec. 25	41	32.21	7.19	Aug.	0.30	Nov.	17.7	85	196	84	85	sw.
Audubon	Audubon	1,301	27	51.7	98	Aug. 29	-10a	Dec. 24	27	30.64	8.37	Sept.	0.04	Nov.	15.8	71	196	84	85	sw.
Baxter	Jasper	998	21	52.8	98	July 10	-11	Dec. 25	21	43.83	11.14	Sept.	0.35	Jan.	16.6	107	125	136	104	s.
Belle Plaine	Benton	886	31	52.8	98	July 10†	-4b	Dec. 24	31	43.83	11.14	Sept.	0.44	Jan.	33.3	107	125	136	104	s.
Boone	Boone	1,134	16	52.8	98	July 10†	-4b	Dec. 24	16	43.83	11.14	Sept.	0.23	Jan.	13.8	107	125	136	104	s.
Carroll	Carroll	1,265	31	52.0	97	June 30†	-12	Dec. 25	31	37.63	7.46	Sept.	0.35	Nov.	20.6	71	246	43	76	nw.
Cedar Rapids	Linn	733	39	54.0	103	July 11	-11	Dec. 25	39	27.18	7.04	Sept.	0.28	Feb.	14.7	71	169	52	144	sw.
Clinton	Clinton	593	48	54.5	104	July 11	0	Jan. 17	54	40.05	10.18	Sept.	0.46	Jan.	15.2	100	191	82	92	sw.
Davenport	Scott	580	50	54.3	101	July 12	2	Jan. 17	50	39.73	7.92	Sept.	0.31	Feb.	14.9	113	115	99	151	sw.
Delaware	Delaware	1,083	30	54.3	97	July 12†	-15	Dec. 25	30	39.73	7.92	Sept.	0.32	Feb.	14.9	113	115	99	151	s.
Denison	Crawford	1,180	27	52.4	97	July 10	-11	Dec. 25	27	32.57	7.55	Aug.	0.21	Dec.	14.4	74	139	104	131	sw.
Des Moines	Polk	861	42	53.9	99	Aug. 19	-5	Dec. 25	42	33.52	7.16	Sept.	0.35	Nov.	22.0	98	139	104	131	sw.
Dubuque	Dubuque	639	48	51.8	98	July 11	-7	Dec. 25	48	34.91	8.35	Sept.	0.18	Jan.	25.8	105	92	123	150	nw.
Fairport	Muscatine	567	100	54.3	101	July 12	-15	Dec. 25	100	10.64	7.93	Sept.	0.51	Jan.	24.7	97	155	100	110	sw.
Fort Dodge	Webster	1,126	21	50.9	97	July 10†	-15	Dec. 25	21	36.35	7.93	Aug.	0.51	Jan.	24.7	97	155	100	110	s.
Grinnell	Poweshiek	1,031	27	52.4	99	July 10†	-10c	Dec. 25	27	35.35	11.46	Sept.	0.34	Jan.	68	88	100	110	118	s.
Grundy Center	Grundy	976	30	52.1	99	July 10	-12	Dec. 25	30	27.94	7.66	Aug.	0.40	Jan.	33.6	88	100	110	118	nw.
Guthrie Center	Guthrie	1,077	26	53.1	96	July 10	-10	Dec. 25	26	28.02	5.37	Aug.	0.17	Nov.	19.1	72	209	68	97	s.
Harlan	Shelby	1,182	22	52.3	97	June 28†	-9	Dec. 25	22	24.61	7.13	July	T.	Dec.	16.6	61	210	37	118	sw.
Independence	Buchanan	921	57	51.7	97	July 12	-15	Dec. 25	54	30.25	8.07	Sept.	0.20	Jan.	17.2	80	210	37	118	sw.
Iowa City	Johnson	733	61	63.1	99	July 13	-19	Dec. 25	58	42.83	8.61	Aug.	0.35	Jan.	20.0	110	123	119	123	nw.
Iowa Falls	Hardin	1,107	28	50.4	95	July 10†	-19	Dec. 25	28	26.20	5.48	Sept.	0.37	Jan.	32.4	99	181	70	114	s.
Jefferson	Greene	1,052	22	51.6	97	July 9	-14	Dec. 25	22	31.27	7.35	Sept.	0.28	Nov.	21.3	71	171	71	123	sw.
Le Claire	Scott	576	21	51.6	97	July 9	-14	Dec. 25	21	31.27	7.35	Sept.	0.28	Nov.	21.3	71	171	71	123	sw.
Little Sioux	Harrison	1,040	16	53.5	97	June 30	-10	Dec. 24†	16	26.82	6.16	July	0.10	Dec.	18.6	78	194	92	69	sw.
Logan	Harrison	928	54	54.1	96	Aug. 29†	-10	Dec. 25	54	31.11	5.61	July	0.32	Nov.	16.0	77	194	92	69	sw.
Marshalltown	Marshall	947	29	53.0	100	July 6†	-12	Dec. 25	29	30.11	7.37	Sept.	0.56	Nov.	24.6	108	219	77	69	sw.
Monroe	Jasper	922	9	54.8	100	July 10†	-7	Dec. 25	9	36.36	11.17	Sept.	0.19	Jan.	29.0	72	221	39	105	s.
Muscatine	Muscatine	554	61	54.8	100	July 10†	-7	Dec. 25	61	36.36	11.17	Sept.	0.19	Jan.	29.0	72	221	39	105	s.
Olin	Jones	760	22	52.0	101	July 11†	-17	Dec. 25	22	46.47	11.95	Sept.	T.	Feb.	15.5	68	111	137	117	sw.
Onawa	Monona	1,051	21	52.0	101	July 11†	-17	Dec. 25	21	46.47	11.95	Sept.	T.	Feb.	15.5	68	111	137	117	sw.
Perry	Dallas	975	20	52.5	98	July 9	-10a	Dec. 25	20	29.63	7.75	June	0.30	Nov.	14.1</					



CLIMATOLOGICAL DATA FOR THE YEAR, 1921—Continued.

Table with columns: STATIONS, COUNTIES, Elevation, Length of record, Temperature (Mean, Highest, Date, Lowest, Date), Precipitation (Length of record, Total, Greatest monthly, Month, Least monthly, Month), Total snowfall, Number of Days (Precipitation 0.01 in. or more, Clear, Partly cloudy, Cloudy), Prevailing direction of wind.

Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example, b represents two days, etc. †Also on other dates.

MONTHLY STATE DATA FOR 1921.

Table with columns: MONTH, Barometric Pressure (Mean, Highest, Date, Lowest, Date), Temperature (Mean, Departure from normal, Highest, Lowest), Relative Humidity (7 a. m., 12 noon, 7 p. m., Departure from normal, Lowest), Precipitation (Average, Departure from normal, Greatest, Least, Snowfall, With 0.1 inch or more precipitation), Number of Days (Clear, Partly cloudy, Cloudy, Per cent of the possible amount), Sunshine (Departure from normal, Average hourly velocity), Wind (Departure from normal, Prevailing direction).

\*Also on 28th. †Also 16th and 17th. ‡25th. §Local mean time. \*Normal central time. †7 a. m. and 7 p. m. observations only.

MEAN MONTHLY AND ANNUAL TEMPERATURES, WITH DEPARTURES FROM THE NORMAL, FOR 1921.

STATIONS	January		February		March		April		May		June		July		August		September		October		November		December		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	
<i>Northern Division</i>																											
Algona	25.4	+11.1	27.0	+ 9.4	39.1	+ 8.5	51.8	+ 4.8	61.4	+ 2.1	74.2	+ 6.1	77.0	+ 3.7	70.6	- 0.2	64.6	+ 2.4	54.0	+ 5.2	29.4	- 3.3	25.0	+ 3.7	50.0	+ 4.5	
Allison	25.6	27.4	27.4	40.2	38.4	40.2	51.2	62.1	62.1	73.8	73.8	77.8	77.8	78.8	70.9	+ 0.3	64.2	+ 2.3	53.0	+ 4.4	30.0	- 2.4	24.6	+ 3.6	50.1	+ 5.0	
Alta	26.4	+12.3	28.4	+12.3	40.0	+ 9.9	50.7	+ 4.4	61.4	+ 2.4	74.5	+ 6.9	76.6	+ 3.8	70.9	+ 0.3	64.2	+ 2.3	53.0	+ 4.4	30.0	- 2.4	24.6	+ 3.6	50.1	+ 5.0	
Alton	26.8	+11.6	28.6	+10.9	39.9	+ 8.6	51.0	+ 4.2	61.4	+ 1.9	75.0	+ 7.3	77.2	+ 4.2	71.9	+ 0.5	64.6	+ 2.2	52.2	+ 3.2	30.1	- 2.5	24.6	+ 3.6	50.3	+ 4.6	
Belmond	25.8	26.4	26.4	39.0	39.0	51.0	51.0	62.0	62.0	74.6	74.6	78.8	78.8	71.4	71.4	66.0	66.0	53.2	30.3	30.3	30.3	35.2	49.7	50.3	50.3	49.7	
Charles City	24.0	+12.6	26.2	+11.1	38.4	+10.0	50.8	+ 4.5	61.2	+ 1.7	73.8	+ 5.0	77.4	+ 3.9	69.8	- 0.9	64.2	+ 2.9	51.2	+ 3.0	30.1	- 2.9	24.0	+ 5.0	49.3	+ 4.7	
Decorah	25.2	+11.3	26.5	+ 8.9	38.8	+ 8.6	51.9	+ 5.0	59.3	+ 1.7	72.8	+ 6.5	76.0	+ 4.2	70.0	- 1.2	63.8	+ 1.6	51.2	+ 2.1	30.4	- 3.3	24.2	+ 2.6	48.7	+ 5.0	
Fsherville	23.8	+11.1	27.7	+12.7	36.6	+ 8.0	48.9	+ 3.8	59.3	+ 1.7	72.8	+ 6.5	76.0	+ 4.2	70.0	- 1.2	63.8	+ 1.6	51.2	+ 2.1	30.4	- 3.3	24.2	+ 2.6	48.7	+ 5.0	
Fayette	26.0	+12.5	26.5	+ 9.1	39.2	+ 8.6	51.2	+ 4.8	61.8	+ 3.8	73.2	+ 6.4	77.5	+ 5.4	70.1	+ 0.5	64.8	+ 3.5	51.2	+ 3.1	31.4	- 1.3	24.7	+ 3.8	49.8	+ 5.0	
Forest City	25.2	+12.4	26.6	+11.5	39.2	+10.3	51.8	+ 5.9	61.1	+ 2.6	73.4	+ 5.9	77.2	+ 4.6	70.4	+ 0.3	65.1	+ 3.8	52.2	+ 3.9	29.0	- 2.7	24.8	+ 5.2	49.7	+ 5.3	
Humboldt	26.4	+10.4	28.0	+ 8.8	40.8	+ 8.5	52.5	+ 4.3	63.1	+ 3.7	73.2	+ 5.8	75.4	+ 4.6	71.8	+ 1.0	66.9	+ 4.6	53.4	+ 4.5	28.2	- 3.6	21.4 <sup>b</sup>	+ 1.4	49.2	+ 4.1	
Inwood	24.6	+10.8	28.4	+12.2	39.6 <sup>b</sup>	+ 9.0	50.4	+ 3.8	60.2	+ 1.1	73.4	+ 5.8	75.4	+ 2.9	71.5	+ 0.5	64.4	+ 1.9	53.4	+ 4.3	30.5	- 2.6	25.7	+ 3.2	50.8	+ 4.7	
Le Mars	27.2	+11.0	29.9	+11.6	41.4	+ 9.3	51.5	+ 4.1	61.6	+ 1.7	74.4	+ 5.3	76.5	+ 3.2	71.7	+ 0.9	65.4	+ 3.0	53.6	+ 4.3	30.5	- 2.6	25.9	+ 3.2	50.8	+ 4.7	
Mason City	23.1	+ 8.6	26.0	38.7 <sup>b</sup>	38.7 <sup>b</sup>	51.1	51.1	61.1	61.1	73.2	73.2	77.4	77.4	70.0	70.0	63.2	63.2	51.9	30.2 <sup>b</sup>	30.2 <sup>b</sup>	30.2 <sup>b</sup>	35.7	49.7	50.4	50.4	49.7	
Milford (near)	25.8	26.0	26.0	37.7	37.7	49.4	49.4	59.4	59.4	72.8	72.8	77.8	77.8	71.5	71.5	65.1	65.1	53.4	29.5	29.5	29.5	35.0 <sup>a</sup>	50.1	50.1	50.1	49.2	
New Hampton	24.8	+11.5	26.3	+ 9.7	39.4	+ 9.8	51.0	+ 4.6	61.3	+ 2.8	73.8	+ 6.6	77.6	+ 5.4	68.4	- 0.9	65.0	+ 4.1	51.7	+ 3.6	30.8	- 2.2	24.2	+ 3.3	49.5	+ 4.8	
Nora Springs	27.0	27.5	27.5	40.0	40.0	52.4	52.4	62.0	62.0	73.6	73.6	78.4	78.4	71.4	71.4	66.4	66.4	53.6	31.8	31.8	31.8	36.2	50.9	50.9	50.9	49.4	
Northwood	23.6	+11.0	25.6	+ 9.3	36.3 <sup>a</sup>	+ 6.9	49.8	+ 3.7	61.1 <sup>a</sup>	+ 2.7	72.4 <sup>a</sup>	+ 5.6	76.9 <sup>a</sup>	+ 5.0	70.0 <sup>a</sup>	+ 0.4	63.6 <sup>a</sup>	+ 2.6	50.8 <sup>a</sup>	+ 3.1	28.4 <sup>a</sup>	- 3.6	22.2 <sup>a</sup>	+ 2.2	48.4	+ 4.1	
Pocahontas	26.7	+11.2	28.4	+10.8	40.0	+ 9.0	50.4	+ 3.4	61.9	+ 2.6	74.0	+ 6.9	76.6	+ 4.1	71.4	+ 0.6	65.9	+ 3.5	54.0	+ 4.6	30.6	- 2.2	25.4	+ 3.5	50.4	+ 4.8	
Pocahontas	25.2	+10.8	26.2	+ 8.5	38.2	+ 7.6	51.0	+ 4.4	60.4	+ 1.7	71.1	+ 6.5	75.0	+ 3.3	67.6	- 1.6	63.5	+ 2.4	50.4	+ 1.3	30.0	- 3.3	24.2	+ 2.8	48.6	+ 3.6	
Rock Rapids	24.5	+11.9	27.8	+12.2	39.2	+ 9.4	50.4	+ 5.3	60.6	+ 2.1	74.0	+ 6.0	75.9	+ 2.1	70.6	- 0.8	62.8	+ 0.8	52.4	+ 5.5	28.6	- 2.9	23.5	+ 3.9	49.2	+ 4.6	
Sanborn	25.4	28.2	28.2	39.6	39.6	50.8	50.8	60.8	60.8	74.2	74.2	76.7	76.7	70.6	70.6	64.0	64.0	52.4	27.6	27.6	27.6	32.8	49.4	49.4	49.4	48.2	
Sioux Center	25.4	+10.8	28.3	+11.3	39.7	+ 8.9	50.4	+ 3.9	60.0	+ 1.2	74.6	+ 7.3	77.7	+ 4.2	72.2	+ 1.1	66.0	+ 3.8	54.4	+ 4.2	31.7	- 1.9	26.5	+ 4.1	51.2	+ 5.4	
Spencer	24.8	27.4	27.4	39.3	39.3	51.5	51.5	61.3	61.3	74.6	74.6	77.8	77.8	71.5	71.5	65.1	65.1	53.4	29.5	29.5	29.5	35.0 <sup>a</sup>	50.1	50.1	50.1	49.2	
Storm Lake	27.4	+12.1	29.0	+11.9	41.2	+10.4	51.4	+ 4.6	61.8	+ 2.5	74.9	+ 7.3	77.7	+ 4.2	72.2	+ 1.1	66.0	+ 3.8	54.4	+ 4.2	31.7	- 1.9	26.5	+ 4.1	51.2	+ 5.4	
Washta	27.1	+10.7	30.0	+11.3	41.6	+ 9.9	50.8	+ 3.6	61.3	+ 2.3	73.5	+ 6.1	76.0	+ 3.7	71.4	+ 0.2	65.2	+ 1.9	53.6	+ 4.0	31.2	- 2.2	27.4	+ 4.9	50.8	+ 4.7	
Waverly	27.2	+12.2	27.6	+ 9.0	40.6	+ 9.1	52.5 <sup>b</sup>	+ 4.7	62.2 <sup>b</sup>	+ 2.3	73.9	+ 6.2	78.0	+ 5.0	70.0	+ 0.6	66.6	+ 4.4	53.6	+ 3.5	32.0	- 2.1	26.5	+ 3.7	50.9	+ 4.8	
West Bend	25.0	+10.3	28.4 <sup>a</sup>	+10.9	39.4	+ 8.6	52.0	+ 4.8	61.7	+ 2.5	74.8	+ 6.6	77.0	+ 4.0	71.6	+ 1.4	67.1	+ 5.5	54.3	+ 6.2	28.8	- 3.7	24.4	+ 2.6	50.4	+ 5.0	
<i>Central Division</i>																											
Ames	30.0	+11.9	32.1	+11.4	43.7	+ 9.7	53.1	+ 3.5	63.7	+ 2.5	74.6	+ 5.4	77.4 <sup>a</sup>	+ 3.4	71.2	- 1.1	66.8	+ 3.4	54.3 <sup>b</sup>	+ 3.0	32.9	- 2.5	28.1	+ 3.7	52.3	+ 4.5	
Audubon	27.6	+ 9.7	30.2	+ 9.5	42.2	+ 8.6	51.2	+ 2.5	63.0	+ 2.8	73.9	+ 5.7	76.6	+ 3.3	72.6 <sup>a</sup>	+ 1.3	67.3	+ 4.8	54.8	+ 4.5	33.1	- 1.8	27.6 <sup>a</sup>	+ 3.7	51.7	+ 4.6	
Baxter	28.9	+10.9	30.6	+ 9.5	42.6	+ 8.7	52.0	+ 2.7	63.8	+ 3.2	74.3	+ 5.3	78.8	+ 4.2	72.2	+ 0.4	68.0	---	55.3	+ 3.8	34.6	- 1.2	29.6	+ 5.3	52.0	+ 5.9	
Belle Plaine	29.4	+11.9	32.4	+11.6	43.4	+10.1	53.0	+ 4.1	64.9	+ 4.5	75.2	+ 6.2	78.4	+ 5.0	72.1	+ 0.8	68.0	+ 4.8	54.5	+ 3.5	34.8	- 0.6	27.8	+ 3.9	52.8	+ 5.5	
Carroll	28.6	+11.6	30.0	+11.0	42.8	+10.8	50.8	+ 3.6	62.9	+ 3.7	74.5	+ 6.7	77.4	+ 4.6	71.9	+ 1.3	68.0	+ 4.8	55.6	+ 6.3	33.4	- 0.0	29.2	+ 6.0	52.0	+ 5.9	
Cedar Rapids	29.7	+12.5	32.4	+12.6	44.6	+11.9	54.2	+ 5.4	66.7	+ 5.4	77.4	+ 6.8	81.2	+ 5.6	73.4	+ 0.6	69.1	+ 5.1	55.5	+ 4.6	35.0	- 0.0	29.2	+ 5.2	54.0	+ 6.5	
Clinton	27.0	+ 9.9	33.4	+10.5	46.0	+11.2	55.7	+ 6.0	65.2	+ 3.7	76.8	+ 6.4	80.4	+ 5.3	72.9	+ 1.0	69.6	+ 6.1	55.6	+ 4.6	37.6	+ 1.6	30.2	+ 4.5	54.5	+ 5.5	
Davenport	31.2	+10.4	32.8	+ 9.0	44.8	+ 9.4	53.8	+ 3.6	65.6	+ 4.1	76.8	+ 5.9	80.9	+ 5.5	73.4	+ 0.4	69.3	+ 4.6	55.6	+ 3.0	36.8	- 0.7	30.4	+ 3.3	54.3	+ 4.9	
Denison	29.2	+11.4	32.2	+12.1	44.6 <sup>a</sup>	+10.8	52.6	+ 4.0	63.2	+ 3.3	74.2	+ 6.1	77.1	+ 3.6	72.0	+ 0.3	67.7	+ 4.2	55.3	+ 4.5	32.8	- 1.9	28.9	+ 4.4	52.4	+ 5.2	
Des Moines	30.4	+10.0	33.3	+ 9.2	44.2	+ 8.5	52.8	+ 2.2	65.4	+ 3.8	76.3	+ 5.9	79.6	+ 4.1	73.2	+ 0.2	69.4	+ 4.4	56.5	+ 4.0	35.8	- 1.0	30.0	+ 4.3	53.9	+ 4.6	
Dubuque	28.5	+10.2	29.8	+ 8.0	41.2	+ 8.0	52.1	+ 3.2	63.6	+ 2.8	75.0	+ 5.4	79.0	+ 4.3	71.6	+ 0.4	66.9	+ 3.3	52.9	+ 0.9	34.2	- 1.8	27.2	+ 2.7	51.8	+ 3.9	
Fort Dodge	27.2	+12.2	29.6	+12.0	41.0	+ 9.9	52.8	+ 5.6	62.5 <sup>a</sup>	+ 2.8	74.2	+ 5.6	77.4	+ 3.8	71.2	+ 0.4	65.4	+ 2.8	54.2	+ 4.3	31.4	- 2.2	23.8	+ 1.9	50.9	+ 4.9	
Grinnell	29.4 <sup>a</sup>	+10.5	29.4	+ 7.3	43.4 <sup>a</sup>	+10.8	51.4 <sup>a</sup>	+ 1.6	63.2 <sup>a</sup>	+ 1.8	74.1 <sup>a</sup>	+ 5.1	77.5 <sup>a</sup>	+ 3.0	71.4 <sup>a</sup>	- 1.3	66.6 <sup>a</sup>	+ 2.0	54.2 <sup>a</sup>	+ 1.8	33.8 <sup>a</sup>	- 2.7	28.6 <sup>a</sup>	+ 3.1	52.1	+ 4.9	
Grundy Center	28.4	+11.5	30.2	+10.6	43.4 <sup>a</sup>	+10.8	52.6	+ 3.8	64.0	+ 3.5	74.6	+ 5.8	78.6	+ 4.3	71.1	+ 0.7	67.0	+ 3.4	53.2 <sup>a</sup>	+ 3.0	33.4	- 2.0	27.8	+ 4.1	52.1	+ 4.9	
Guthrie Center	30.1	+10.5	33.4	+11.8	43.9	+ 9.5	53.1	+ 3.5	62.6	+ 1.2	73.2	+ 5.4	77.5	+ 2.7	71.8	+ 0.7	68.3	+ 4.6	56.7	+ 5.4	35.5	- 0.2	30.9	+ 5.7	53.1	+ 4.8	
Harlan	28.6	+ 9.9	32.0	+11.4	44.0	+10.2	52.3	+ 3.4	63.3	+ 3.1	74.4	+ 6.1	77.6	+ 4.1	70.8 <sup>b</sup>	+ 0.7	66.4 <sup>a</sup>	+ 3.2	54.6	+ 4.2	34.4 <sup>a</sup>	- 0.0	29.3	+ 5.5	52.3	+ 5.0	
Independence	28.0	+12.4	2																								

MONTHLY AND ANNUAL PRECIPITATION, WITH DEPARTURES FROM THE NORMAL, FOR 1921.

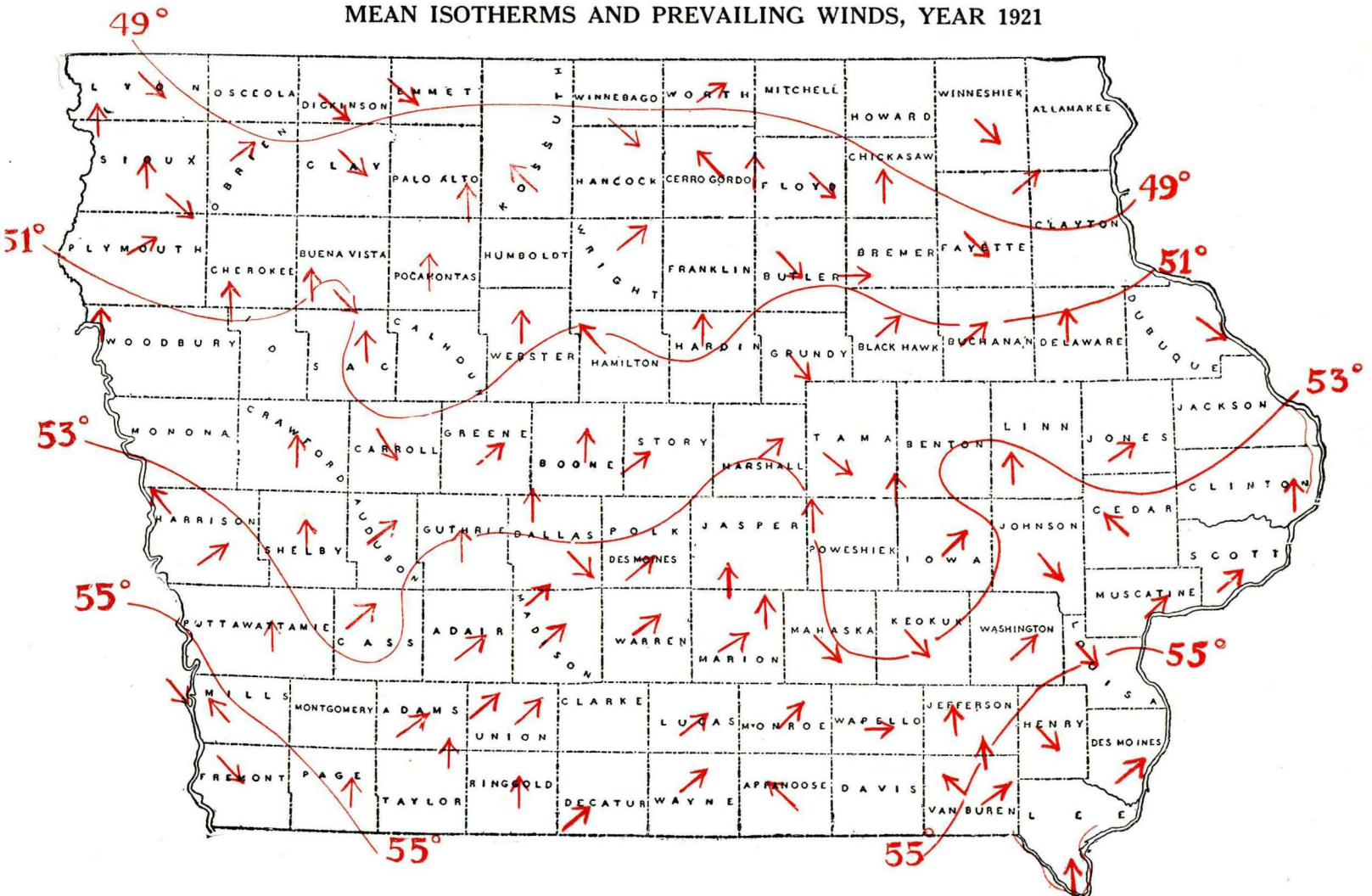
STATIONS	January		February		March		April		May		June		July		August		September		October		November		December		Annual		
	Precipitation	Departure	Precipitation	Departure	Precipitation	Departure	Precipitation	Departure	Precipitation	Departure	Precipitation	Departure	Precipitation	Departure	Precipitation	Departure	Precipitation	Departure	Precipitation	Departure	Precipitation	Departure	Precipitation	Departure	Precipitation	Departure	Precipitation
<b>Northern Division</b>																											
Algonia	0.45	-0.35	1.12	+0.03	1.73	+0.24	1.86	-0.65	9.41	+5.28	2.54	-1.90	2.23	-0.79	4.94	+1.27	5.98	+2.74	1.34	-0.90	0.77	-0.53	0.24	-0.73	32.61	+3.71	
Allison	0.25	0.90	0.90	0.00	1.05	0.00	4.73	4.59	4.50	3.00	1.41	1.41	4.30	4.30	6.21	6.21	1.85	1.85	1.05	1.05	0.60	0.60	29.04	29.04	6.50	6.50	
Alta	0.27	-0.39	0.78	-0.14	1.14	-0.38	1.29	-1.75	6.50	+1.48	1.20	-3.71	2.99	-1.86	5.98	+2.09	3.72	+0.64	1.46	-1.49	0.45	-0.92	0.50	-0.37	26.37	-6.50	
Alton	0.55	0.85	0.85	0.69	0.89	0.89	2.84	5.03	6.95	1.74	0.56	3.24	3.24	3.24	5.50	5.50	5.80	5.80	0.62	0.55	0.55	0.40	24.24	24.24	29.82	29.82	
Belmond	0.61	2.00	2.00	0.89	0.89	2.84	5.03	6.95	1.74	0.56	3.24	3.24	5.50	5.50	5.80	5.80	0.62	0.55	0.55	0.40	24.24	24.24	29.82	29.82			
Charles City	0.58	-0.39	0.95	-0.02	0.93	-0.99	3.59	+0.76	5.96	+1.02	2.93	-2.17	1.83	-1.75	6.74	+3.32	7.07	+4.27	2.27	+0.24	0.96	-0.43	0.85	-0.43	34.66	+3.43	
Fayette	0.43	-0.81	0.89	-0.87	2.25	+0.21	4.59	+1.50	8.86	+3.80	4.23	-0.48	1.63	-2.39	8.24	+4.82	9.76	+6.37	2.13	-0.33	1.30	-0.28	1.21	-0.32	45.52	+11.28	
Forest City	0.67	-0.11	0.48	-0.36	1.17	-0.27	1.25	-1.10	6.04	+1.55	3.16	-1.06	1.28	-2.39	4.47	+1.03	5.69	+2.24	1.47	-0.94	0.98	-0.45	0.72	-0.25	27.38	-2.08	
Inwood	0.26	-0.28	0.20	-0.58	1.33	+0.32	2.23	-0.36	5.95	+2.05	3.09	-2.06	4.36	+1.21	2.82	-0.06	2.06	+0.15	0.56	-1.66	0.30	-0.54	0.91	+0.23	24.97	-1.55	
Le Mars	0.15	-0.40	0.57	-0.20	0.49	-0.72	1.16	-1.71	5.49	+0.96	1.70	-2.66	2.88	-1.13	5.14	+2.35	1.73	-1.53	1.44	-0.78	0.27	-0.80	0.20	-0.73	21.18	-7.35	
Mason City	0.60	-0.45	0.75	-0.06	1.14	-0.26	2.35	-0.14	7.15	+2.49	3.19	-1.89	0.42	-3.20	5.86	+1.92	5.63	+3.20	2.33	+0.19	0.76	-0.92	0.53	-0.87	30.73	+0.01	
Milford (near)	0.23	0.23	0.89	0.89	1.62	1.62	3.88	3.88	7.02	7.02	3.29	3.29	0.68	0.68	4.78	4.78	7.39	7.39	2.21	2.21	0.86	0.86	1.37	1.37	34.88	34.88	
New Hampton	0.87	-0.03	1.39	+0.38	1.03	-0.50	3.47	+1.05	8.17	+3.50	1.85	-2.09	1.25	-2.50	7.62	+3.48	7.62	+4.50	2.49	+0.22	1.30	-0.33	0.25	-0.88	36.75	+6.50	
Nora Springs	0.58	1.30	1.30	1.62	3.88	3.88	7.02	7.02	3.29	3.29	0.68	0.68	4.78	4.78	7.39	7.39	2.21	2.21	0.86	0.86	1.37	1.37	34.88	34.88			
Northwood	0.52	-0.52	0.85	-0.47	1.34	-0.42	2.04	-0.43	9.26	+4.17	2.10	-2.52	0.97	-3.02	3.17	-0.87	5.67	+2.41	1.91	-0.69	0.85	-0.91	0.75	-0.49	29.43	-3.76	
Pocahontas	0.20	-0.45	0.97	+0.12	1.56	+0.28	2.38	+0.63	5.54	+1.25	5.97	+1.66	3.29	-0.81	3.90	-0.01	4.33	+0.54	1.33	-1.14	0.65	-1.01	0.84	-0.62	30.93	+0.44	
Postville	0.74	-0.42	0.57	-0.57	1.78	-0.13	3.37	+0.39	7.68	+2.38	2.46	-1.95	3.18	-1.94	0.94	+5.48	6.13	+2.44	2.44	-0.41	0.95	-0.70	0.66	-0.80	38.73	+4.37	
Rock Rapids	0.37	-0.14	0.26	-0.14	1.26	+0.20	2.21	-0.44	7.17	+3.73	1.66	-2.65	2.10	-0.98	4.06	+1.79	2.18	-0.24	2.11	-2.11	0.49	-0.57	0.41	-0.17	22.38	-1.72	
Sanborn	0.20	1.00	1.00	0.93	2.08	2.08	5.56	5.56	3.76	3.76	1.28	1.28	3.13	3.13	4.90	4.90	0.56	0.56	0.35	0.35	0.45	0.45	14.10	14.10			
Spencer	0.30	1.30	1.30	0.93	2.08	2.08	5.56	5.56	3.76	3.76	1.28	1.28	3.13	3.13	4.90	4.90	0.56	0.56	0.35	0.35	0.45	0.45	14.10	14.10			
Storm Lake	0.10	-0.58	0.61	-0.14	1.03	-0.29	1.36	-1.48	4.15	+0.11	1.08	-3.39	2.65	-1.24	4.39	+0.97	3.60	+0.54	0.92	-0.96	0.26	-0.87	0.38	-0.44	20.44	-7.08	
Washta	0.15	-0.37	1.10	+0.28	0.98	+0.05	1.38	-1.03	4.18	+0.97	2.82	-1.26	3.88	-0.32	4.99	+1.86	4.24	+0.72	1.66	-0.38	0.58	-0.65	0.50	-0.30	26.38	-2.35	
Waverly	0.55	-0.45	1.18	+0.06	0.17	-1.65	4.09	+1.23	5.49	+0.97	2.87	-1.15	0.85	-3.09	4.99	+1.52	5.49	+2.50	1.50	-0.86	1.18	-0.41	0.69	-0.60	28.93	-1.93	
West Bend	0.36	-0.57	0.90	+0.01	0.52	-1.15	1.89	-0.95	6.52	+2.52	3.46	-0.71	2.48	-1.08	3.22	-0.67	3.89	+0.32	1.30	-0.63	0.75	-0.69	0.91	-0.32	25.70	-3.92	
<b>Central Division</b>																											
Ames	0.32	-0.61	1.03	+0.12	1.40	-0.12	4.14	+1.28	2.81	-1.96	4.41	-0.13	1.54	-2.80	7.19	+3.38	6.81	+3.14	1.45	-1.29	0.39	-1.03	0.81	-0.41	32.21	-0.43	
Audubon	0.45	-0.31	1.64	+0.68	1.45	-0.17	2.02	-1.07	1.91	-2.50	4.70	+0.87	4.44	+0.71	2.79	-0.86	8.37	+4.97	2.26	-0.02	0.04	-1.32	0.57	-0.42	30.64	+0.56	
Belle Plaine	0.44	-1.21	0.67	-0.95	1.88	-0.45	4.99	+1.72	4.28	-0.35	6.12	+2.07	1.72	-2.26	5.88	+2.38	11.14	+8.10	2.88	-0.18	1.31	-0.42	3.62	+1.59	43.83	+9.94	
Carroll	0.40	-0.41	1.08	+0.01	1.33	-0.53	2.92	+0.03	7.11	+2.44	3.39	-1.39	3.80	+0.19	6.61	+2.73	7.46	+4.38	2.46	-0.10	0.35	-0.90	0.69	-0.49	37.63	+6.12	
Cedar Rapids	0.44	-0.88	0.28	-1.14	1.33	-0.63	3.60	+0.70	2.48	-2.01	1.25	-2.48	1.75	-1.94	4.31	+0.80	7.04	+4.01	1.95	-0.48	0.60	-0.81	2.15	+0.75	27.18	-4.1	
Clinton	0.46	-1.37	0.52	-1.55	4.56	+1.69	4.54	+1.38	2.14	-2.48	3.35	-0.95	2.66	-1.40	4.42	+0.71	10.18	+6.85	2.25	-0.14	1.61	-0.33	3.36	+1.51	40.05	+3.92	
Davenport	0.47	-1.10	0.31	-1.25	4.23	+2.02	4.77	+1.89	2.69	-1.50	3.64	-0.47	2.21	-1.34	6.62	+2.98	7.92	+4.78	2.28	-0.01	0.77	-0.99	3.72	+2.03	39.73	+7.04	
Denison	0.57	-0.04	1.36	+0.44	1.31	-0.29	2.69	-0.26	6.05	+1.85	2.22	-1.77	3.22	-0.44	7.55	+3.44	4.62	+1.69	2.37	+0.25	0.40	-0.78	0.20	-0.72	32.57	+3.37	
Des Moines	0.59	-0.62	0.92	-0.16	1.07	-0.58	3.72	+0.74	3.62	-0.94	4.66	-0.30	2.49	-1.37	6.33	+3.02	7.16	+4.09	1.51	-1.17	0.35	-1.13	0.80	-0.51	33.52	-1.07	
Dubuque	0.71	-1.31	0.29	-1.09	2.05	-0.16	4.70	+1.78	2.26	-2.06	3.54	-1.01	2.48	-1.82	4.29	+1.25	8.35	+4.76	3.43	+0.75	0.91	-0.99	2.43	+0.71	34.91	+0.90	
Fort Dodge	0.51	-0.24	1.21	+0.59	2.10	+0.37	2.50	-0.13	5.82	+0.49	3.94	-0.24	1.87	-1.81	7.99	+3.58	7.74	+3.43	0.92	-2.07	0.65	-0.83	1.16	+0.54	35.35	+4.68	
Grinnell	0.34	-0.93	0.38	-0.73	1.45	-0.28	3.80	+0.39	3.07	-1.58	3.82	-0.50	0.58	-3.53	6.50	+2.44	11.46	+7.87	1.28	-1.70	1.20	-0.52	1.47	+0.34	35.35	+1.57	
Grundy Center	0.40	-0.52	0.55	-0.34	1.43	-0.38	4.33	+1.26	3.14	-1.77	2.48	-2.54	0.80	-3.14	7.66	+4.03	4.44	+1.01	1.26	-1.34	0.60	-0.80	0.85	-0.79	25.02	-4.46	
Guthrie Center	0.80	0.00	1.02	0.09	1.10	-0.49	1.56	-1.35	2.94	-1.51	3.77	-0.44	3.77	-0.51	5.37	+1.16	5.07	+1.54	2.06	-0.47	1.17	-1.26	0.39	-0.79	28.02	-4.46	
Harlan	0.38	-0.29	1.28	+0.24	0.90	-0.51	1.47	-1.65	2.47	-2.05	1.11	-1.18	1.73	+3.02	6.67	-1.31	4.08	-0.10	3.01	+0.47	0.11	-1.08	0.78	-1.16	24.61	-6.50	
Independence	0.20	-1.02	0.50	-0.56	1.22	-0.53	3.94	+1.54	2.44	-1.80	3.23	-1.26	1.15	-3.27	5.11	+1.80	8.07	+4.21	2.30	-0.18	0.76	-0.62	1.33	-0.05	30.25	-1.74	
Iowa City	0.25	-1.30	0.49	-1.04	2.46	+0.08	6.20	+3.02	4.44	-0.01	2.46	-1.99	3.59	-0.67	8.61	+4.37	7.83	+4.15	2.47	-0.25	0.74	-1.52	3.19	+1.58	42.83	+6.40	
Iowa Falls	0.37	-0.84	1.56	-0.08	1.01	-0.85	3.43	+0.30	3.88	-0.62	2.20	-3.20	0.74	-3.45	4.84	+1.11	5.48	+1.94	1.00	-1.36	0.72	-0.82	0.89	-0.48	26.23	-8.35	
Jefferson	0.49	1.50	1.50	0.63	1.43	1.43	3.59	3.59	2.77	2.77	6.16	6.16	4.03	4.03	3.07	3.07	2.04	2.04	0.46	0.46	0.10	0.10	26.82	26.82			
Little Sioux	0.35	-0.71	1.17	-0.05	2.02	+0.28	3.23	+0.49	3.96	-0.24	5.37	+0.13	5.61	+0.97	3.65	-0.12	3.10	-0.24	1.98	-0.37	0.32	-0.95	0.35	-0.83	31.11	-1.64	
Logan	0.63	-0.51	1.17	+0.63	1.02	-0.86	4.62	+1.92	2.81	-1.70	2.38	-1.88	0.67	-3.50	4.47	+3.30	7.37	+3.63	1.18	-1.54	0.56	-0.91	1.				

DATES OF KILLING FROSTS, 1921.

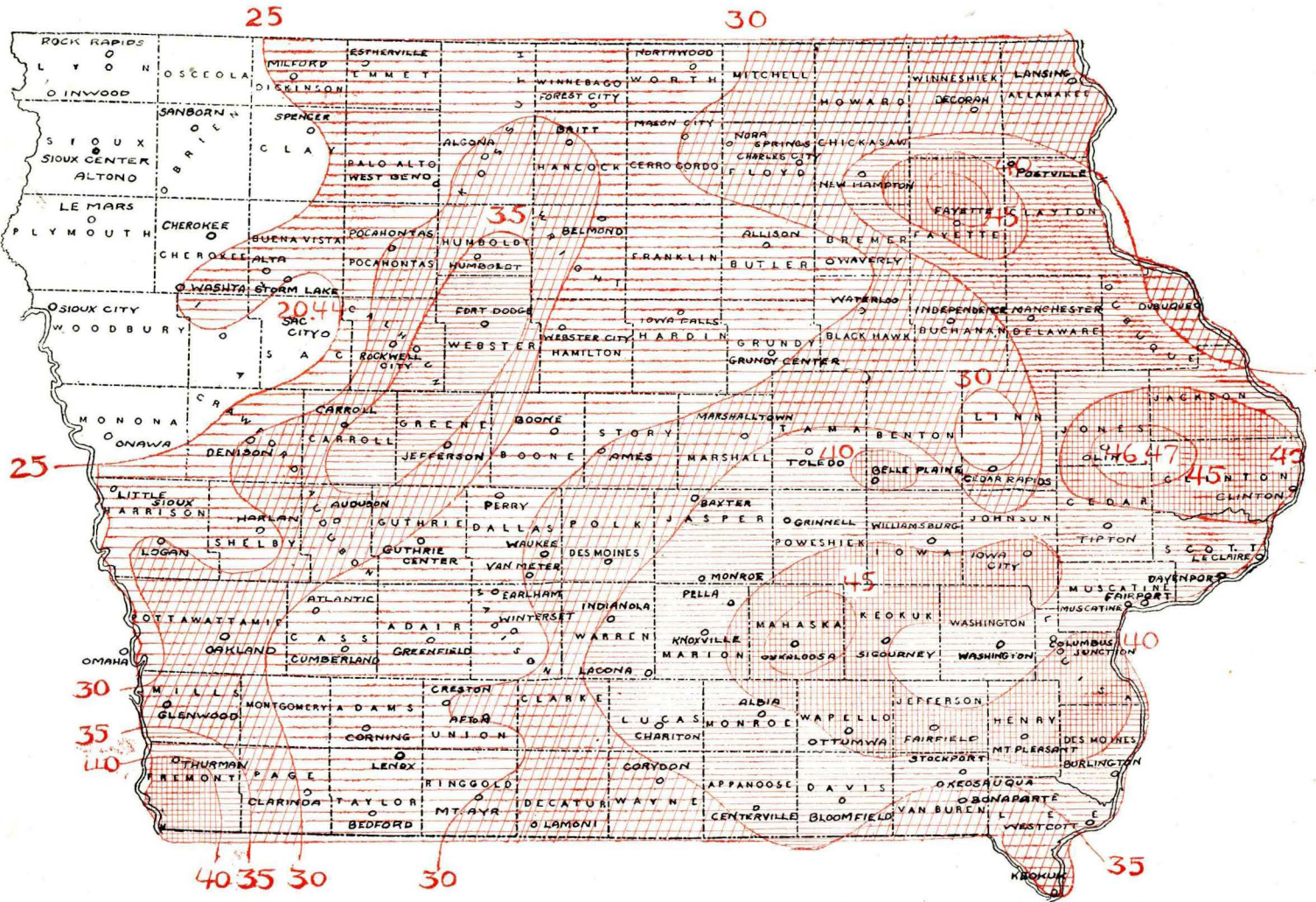
STATIONS	Killing Frosts		STATIONS	Killing Frosts		STATIONS	Killing Frosts	
	Last in Spring	First in Autumn		Last in Spring	First in Autumn		Last in Spring	First in Autumn
<i>Northern Division</i>			<i>Central Division</i>			<i>Southern Division</i>		
Algona	May 16†	Oct. 3†	Ames	May 16†	Oct. 4†	Afton	May 3†	Oct. 4
Allison	May 16	Oct. 4†	Audubon	May 14†	Oct. 4	Albia	May 3†	Oct. 8
Alta	May 14	Oct. 8	Baxter	May 3†	Oct. 4	Atlantic	May 4†	Oct. 3†
Alton	May 14†	Oct. 4	Belle Plaine	May 3†	Oct. 4†	Bedford	May 15†	Oct. 4†
Belmond	May 16†	Oct. 4	Boone	May 15†	Oct. 3	Bloomfield	April 17†	Oct. 8
Britt	May 15†	Oct. 2†	Carroll	May 4†	Oct. 4	Bonaparte	April 18†	Oct. 8†
Charles City	April 10	Oct. 12	Cedar Rapids	April 18†	Oct. 4	Burlington	April 18†	Oct. 8
Decorah		Oct. 3	Clinton	May 16†	Oct. 4†	Centerville	April 18†	Oct. 8
Estherville	May 16†	Oct. 3†	Davenport	April 18	Oct. 8	Chariton	May 3	Oct. 4†
Fayette	May 16	Oct. 4	Delaware	May 16†	Oct. 8	Clarinda	May 4†	Oct. 8†
Forest City	May 16†	Oct. 4	Denison	May 14†	Oct. 4	Columbus Junction	April 18†	Oct. 4
Humboldt	May 16†		Des Moines	April 17	Oct. 8	Corning	May 4†	Oct. 4†
Inwood	May 14	Oct. 4	Dubuque	April 18	Nov. 2	Corydon	May 3†	Oct. 4†
Le Mars	May 14	Oct. 4	Fairport	April 18†	Oct. 8	Creston	May 3†	Oct. 8†
Mason City	May 16	Oct. 4	Fort Dodge	May 16	Oct. 8	Earlham	May 16†	Oct. 3†
Milford (near)	May 15	Oct. 4	Grinnell	May 3†	Oct. 4†	Fairfield	April 17	Oct. 8
New Hampton	May 16†	Oct. 4†	Grundy Center	May 16†	Oct. 3	Glenwood	May 4†	Oct. 4†
Nora Springs	May 16	Oct. 4	Guthrie Center	May 3†	Oct. 4	Greenfield	May 3†	Oct. 8†
Northwood	May 16	Oct. 4†	Harlan	May 4	Oct. 4†	Indianola	May 16	Oct. 4
Pocahontas	May 16†	Oct. 3	Independence	May 16†	Oct. 8†	Keokuk	April 17†	Oct. 8
Postville	May 3	Oct. 4†	Iowa City	May 16†	Oct. 4	Keosauqua	May 16	Oct. 8
Rock Rapids	May 16	Oct. 4	Iowa Falls	May 16†	Oct. 4†	Knoxville	May 3†	Oct. 4†
Sanborn	May 16†	Sept. 30†	Jefferson	May 16	Oct. 4	Lamoni	May 3	Oct. 4
Sioux Center	May 14†	Oct. 8†	Little Sioux	May 14†	Sept. 30	Lenox	April 18†	Sept. 30
Spencer	May 16	Oct. 3	Logan	May 4	Oct. 4†	Mount Ayr	May 3†	Oct. 8
Storm Lake	May 14†	Oct. 4†	Marshalltown	May 3†	Oct. 8	Mount Pleasant	April 17	Oct. 8
Washita	May 16†	Oct. 4	Monroe	April 17†	Oct. 8	Murray	May 3	
Waverly	May 3†	Oct. 4	Olin	May 16†	Oct. 4†	Oakland	May 4	Oct. 4†
West Bend	May 15†	Oct. 3	Onawa	May 15†		Oskaloosa	April 18	Oct. 4
			Perry	May 16†	Oct. 4†	Ottumwa	April 17	Oct. 4†
			Rockwell City		Oct. 4†	Pella	April 18	Oct. 8
			Sac City	May 15†	Oct. 4	Sigourney	April 29	Oct. 8
			Sioux City	May 3	Oct. 4	Stockport	April 29†	Oct. 4†
			Tipton	April 18†	Oct. 8	Thurman	May 4†	Oct. 4†
			Toledo	May 16†	Oct. 4†	Washington	May 16	Oct. 4
			Waterloo	May 16†	Oct. 4†	Winterset	May 3	Oct. 8
			Waukee	May 3	Oct. 4	Omaha, Neb.	April 17	Nov. 8
			Webster City	May 16†	Oct. 4†			
			Williamsburg	May 3†	Oct. 8†			

†Date of last temperature of 32 or lower in the spring, or first temperature of 32 or lower in the autumn (as the case may be) when frost was not reported.

MEAN ISOTHERMS AND PREVAILING WINDS, YEAR 1921



# TOTAL PRECIPITATION, YEAR 1921



SCALE OF SHADES—IN INCHES

