

CLIMATOLOGICAL DATA.

IOWA SECTION

In cooperation with

IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXIV DES MOINES, IOWA, JANUARY, 1923 No. 1

GENERAL SUMMARY

January, 1923, was mild and free from severe storms. Only three times in the last 34 years has the mean temperature for January been higher. The daily excess in temperature averaged 8.8 degrees. Except a few days during the first week the temperature was continuously above normal. A number of stations in all portions of the State reported the highest minimum temperature of record for January, and less than half of the State reported zero weather.

The average precipitation for the State was below the normal. However, there was a slight excess in the northwestern and some west-central counties. Over the northern and a large portion of the central division the precipitation was nearly all snow, but over the southern division there was considerable rain. The snowfall was accompanied by very little wind and there was very little drifting. No kind of transportation was seriously interfered with by snow. Sleet and glaze occurred on a large number of days, but the amounts were generally light and not sufficient to damage trees, but the ground became very slippery over a large portion of the State, resulting in numerous accidents to pedestrians and automobiles.

The ground was snow covered over a small area in the north-central portion of the State the entire month and the number of days with snow cover gradually diminished to the south, where a few stations along the southern border reported less than five. A few stations in the southwestern portion of the State reported only a trace of snow.

Conditions were favorable for outdoor work the greater portion of the month and building generally continued active with little interruption on account of the weather. A good crop of ice from 8 to 16 inches in thickness was harvested under favorable conditions. A number of stations in the southern portion of the State reported that plowing was in progress at intervals throughout the month. Over the principal winter wheat sections there was no snow cover the greater portion of the month, but it apparently had suffered very little on this account. Roads continued good throughout the month, but were slippery for short intervals.

PRESSURE

F. L. D.

The mean pressure (reduced to sea level) for the State was 30.07 inches. The highest recorded was 30.71 inches, at Keokuk, on the 22d, and the lowest was 29.50 inches, at Charles City, on the 18th. The monthly range was 1.21 inches.

TEMPERATURE

The mean temperature for the State, as shown by the records of 99 stations, was 26.7°, or 8.8° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 22.6°, or 8.0° higher than the normal; Central, 26.9°, or 8.7° 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 was 20.0°, at Northwood. The highest temperature recorded was 58°, at Clarinda and Glenwood, on the 17th, and the lowest was -10°, at Rock

Rapids and Washta, on the 28th. The temperature range for the State was 68°.

HUMIDITY

The average relative humidity for the State at 7 a. m. was 82 per cent and at 7 p. m. was 72 per cent. The mean for the month was 77 per cent, which is 5 per cent below the normal. The highest monthly mean was 88 per cent at Charles City, and the lowest was 73 per cent, at Sioux City.

PRECIPITATION

The average precipitation for the State, as shown by the records of 101 stations, was 0.85 inch, or 0.20 inch less than the normal. By divisions the averages were as follows: Northern, 0.86 inch, or 0.02 inch greater than the normal; Central, 1.00 inch, or 0.11 inch less than the normal; Southern, 0.68 inch, or 0.51 inch less than the normal. The greatest amount, 2.34 inches occurred at Guthrie Center, and the least a trace, at Thurman. The greatest amount in any 24 consecutive hours, 1.50 inches, occurred at Tipton, on the 7th.

SNOWFALL

The average snowfall for the State was 6.5 inches, or 0.4 inch less than the normal. The greatest amount, 13.8 inches occurred at Marshalltown, and the least a trace at Afton, Cumberland and Thurman.

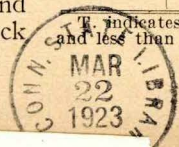
WIND

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 44 miles per hour, from the northwest, at Sioux City, on the 13th.

COMPARATIVE DATA FOR THE STATE—JANUARY

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	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	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	15	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	0.24	-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
1922	19.8	+1.9	57	-29	0.89	-0.16	2.30	0.32	5.3	4	17	6	8
1923	26.7	+8.8	58	-10	0.85	-0.20	2.34	T.	6.5	6	10	7	14

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



Daily Precipitation for January, 1923—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					T.		.14																	T.								.04	0.37			
Albia	Des Moines	.03				T.	.01	.10			T.			.01										T.		T.	.02		.01	.17		.10	.02	0.53			
Atlantic	Nishnabotna																																		**		
Bonaparte	Des Moines	T.					.03	.07		T.				.10											T.	T.									0.81		
Burlington	Mississippi					.20	.32	.10						.02													.10	.5				.03	.02	1.29			
Centerville	Chariton	.02				T.		.08						.07											T.								.01	T.	0.47		
Chariton	Chariton	.10					T.			T.															T.								T.		0.35		
Clarinda	Nodaway	.05						.07																				.15				.03		0.30			
Columbus Jet	Iowa	T.		.02		T.	.10	.10					T.												T.	.05		.07	.50	.05			.02	0.91			
Corning	Nodaway	.10																																	0.15		
Corydon	Chariton	.02				T.	.08	T.					T.												T.	.02		.10	.11			.03	T.	0.36			
Creston	Missouri	.05					T.			T.																						.23		.05	0.33		
Cumberland (near)	Nodaway	T.				T.	T.	T.																											0.22		
Earlham	Des Moines	.20				T.	T.	.20																											0.80		
Fairfield	Skunk	T.				T.	.15	.15																									.18	.02	0.82		
Glenwood	Missouri	.10					.05	.10		T.																									0.30		
Greenfield	Nodaway					T.	T.	T.																											T.	T.	0.10
Indianola	Des Moines	.10				T.	.01	.10																												0.64	
Keokuk***	Mississippi	T.				T.	.48	.08						.02																					11	.03	1.13
Keosauqua	Des Moines	T.	T.			T.	.03	.10	.10					.22																				.02	T.	1.06	
Knoxville	Des Moines	.10				T.	.10	.15																												0.86	
Lacona	Des Moines	.20						.30																												0.90	
Lamoni	Grand																																				
Lenox	Missouri	T.	.10					T.	.10	T.																										0.40	
Mt. Ayr	Grand	.03						.10	T.																											0.26	
Mt. Pleasant	Skunk			T.	.02		.05	.17						.20																						1.18	
Oakland	Nishnabotna	.05					.10	.10																												0.55	
Oskaloosa	Des Moines	.06				T.	T.	.05	.14																											0.99	
Pella	Skunk	.06	.05			T.	T.	.28		T.																										0.79	
Sigourney	Skunk	.02			.01	T.	.05	.22						T.																						1.04	
Stockport	Skunk		T.			T.	T.	.10		T.																										1.18	
Thurman	Missouri	T.	T.	T.	T.		T.	T.																												T.	
Washington	Skunk			.01			.03	.18																												0.98	
Wescott (near)	Mississippi							.30						.03																						1.18	
Winterset	Des Moines	.10						T.	.20																											0.56	
Omaha, Nebr.***	Missouri	.09		T.			.09	.04	.07																											0.87	

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.

ERRATA

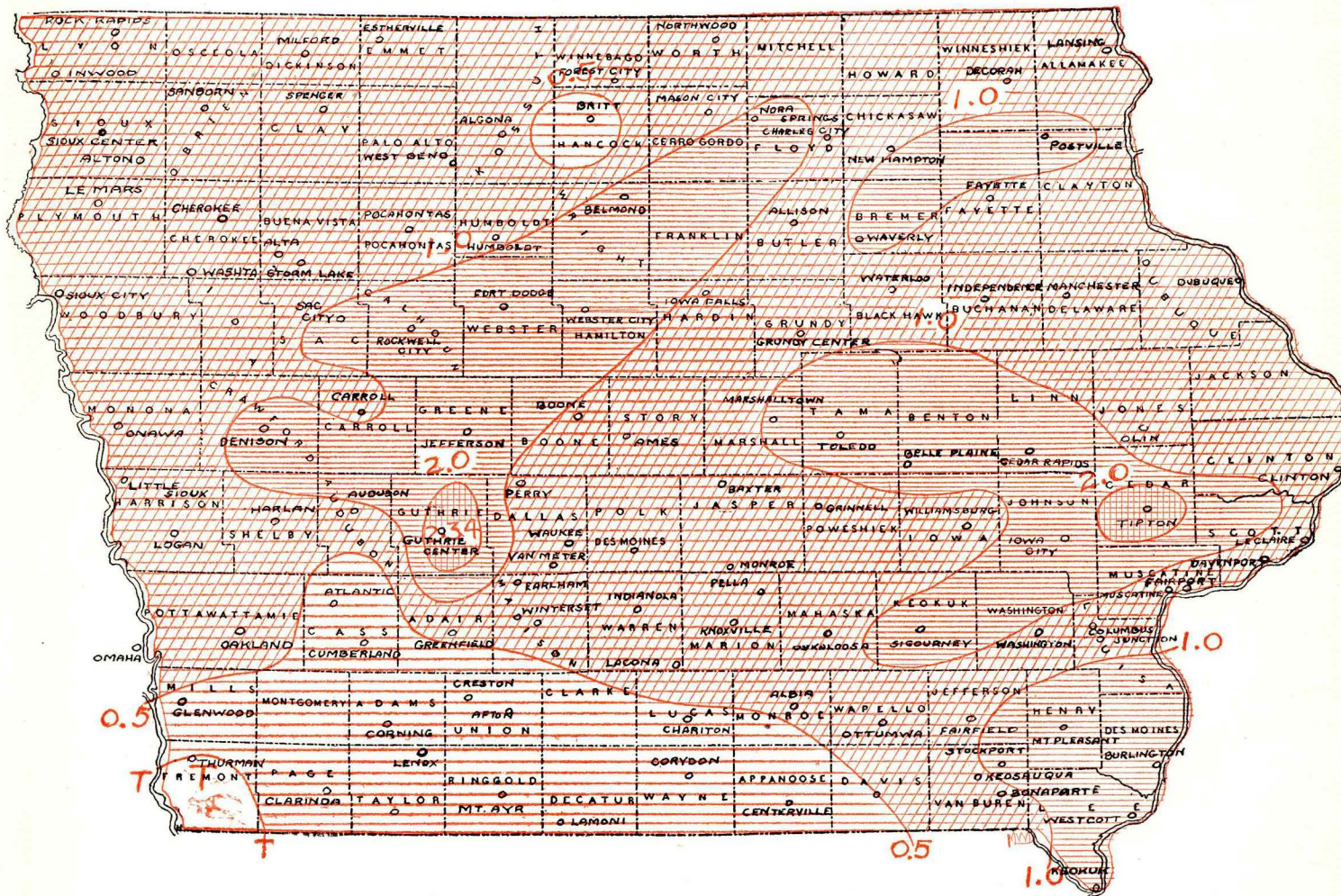
The report for December, 1922 Page 91. Sigourney, mean temperature recorded 27.1°, should be 27.2°; departure recorded +0.4°, should be +0.5°. Page 94; maximum temperature on the 20th recorded 36°, should be 38°; the mean of the maximum recorded 37.7°, should be 37.8°.

Daily Maximum and Minimum Temperature for the Month of January, 1923.

Table with columns for Stations, days 1-31, and Mean. Rows are grouped 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, JANUARY, 1923



SCALE OF SHADES—IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In cooperation with
IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXIV DES MOINES, IOWA, FEBRUARY, 1923 No. 2

GENERAL SUMMARY.

February was the coldest month of the winter. Practically all the cold weather of the month occurred during the first 18 days and in this period three rather severe cold waves occurred. After the 18th mild weather prevailed except on one or two days, and by the end of the month the deficiency in temperature that accumulated during the cold period was nearly wiped out so that the mean temperature of the State averaged less than one-half degree colder than normal. The effect of the cold waves was greatly intensified by very strong winds which attended most of the zero weather and as a result there was considerable suffering in sections of the larger cities where the coal supply of individual families gave out. During the cold wave of the 14th the strong winds persisted for an unusually long period and had been preceded by the heaviest snowfall of the month. This condition caused the snow to drift badly over most of the northern portion of the State and particularly the northeastern section. Automobile and rail traffic had to be abandoned till a passage could be cut through drifts and some drifts were packed so solid that automobiles could go over them without breaking through. At the end of the month some wagon roads were still blocked and all the snow that remained was in drifts. The number of days with zero weather averaged about 12 along the northern border and diminished gradually to an average of 3 along the southern border.

The precipitation was below normal, making this the third winter month with a deficiency. The average for the State was slightly above one-third of the usual amount for February and with the exception of February, 1917, was the least amount ever recorded in February since State wide records have been kept.

The precipitation for the three winter months is less than half the normal. Wells are beginning to fail and streams are unusually low in portions of the State, but winter wheat apparently suffered very little from lack of moisture or snow cover.

The thickness of ice increased greatly during the month but as most of the ice harvest had been completed during January there was very little harvested. Building was active but farm operations made little progress as there was too much frost in the ground to permit plowing in any section of the State, though at the end of the month the frost was fast disappearing. Roads were generally good except where blocked by snow drifts for short stretches.

F. L. D.

PRESSURE.

The mean pressure (reduced to sea level) for the State was 30.26 inches. The highest recorded was 31.04 inches, at Sioux City, on the 14th, and the lowest was 29.56 inches, at Des Moines, on the 12th. The monthly range was 1.48 inches.

TEMPERATURE.

The mean temperature for the State, as shown by the records of 98 stations, was 20.1°, or 0.4° lower than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 16.3°, or 0.8° lower than the normal; Central, 20.6°, or 0.1° lower than the normal; Southern, 23.5°, or 0.1° lower than the normal. The highest monthly mean was 26.6°, at Clarinda, and the lowest was 12.2°, at Northwood. The highest temperature reported was 61°, at Clarinda, on the 24th, and the lowest was -23°, at Postville on the 3d and Rock Rapids on the 4th. The temperature range for the State was 84°.

HUMIDITY.

The average relative humidity for the State at 7 a. m. was 78 per cent, and at 7 p. m. it was 64 per cent. The mean for the month was 71 per cent, or 9 per cent lower than the normal. The highest monthly mean was 85 per cent at Charles City, and the lowest was 65 per cent at Sioux City.

PRECIPITATION.

The average precipitation for the State, as shown by the records of 101 stations, was 0.40 inch, or 0.75 inch less than the normal. By divisions the averages were as follows: Northern, 0.40 inch, or 0.51 inch less than the normal; Central, 0.33 inch, or 0.87 inch less than the normal; Southern, 0.48 inch, or 0.87 inch less than the normal. The greatest amount, 1.71 inches, occurred at Columbus Junction, and the least, 0.00 at Cumberland and Inwood. The greatest amount in any 24 consecutive hours, 1.00 inch, occurred at Columbus Junction, on the 7th.

COMPARATIVE DATA FOR THE STATE—FEBRUARY.

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	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	-----	3	13	7	8
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	6	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	75	-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	5	6	10	12
1898	24.2	+3.7	62	-18	1.20	+0.05	3.65	0.10	7.8	5	5	10	9
1899	12.2	-5.7	75	-40	0.89	-0.26	4.32	0.12	7.1	11	11	10	7
1900	14.8	-3.3	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	13.8	-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	2.78	+1.61	5.46	0.50	7.0	6	12	6	16
1912	18.1	-2.4	57	-30	1.21	+0.06	3.25	0.04	11.2	5	10	9	10
1913	26.2	-0.3	70	-24	0.82	-0.33	2.39	0.07	7.3	4	14	7	7
1914	16.8	-3.7	50	-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	1.22	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
1922	23.7	+3.2	70	-20	1.59	+0.41	4.56	0.40	1.3	4	14	7	7
1923	20.1	-0.4	61	-23	0.40	-0.75	1.71	0.00	3.2	3	13	8	7

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



Climatological Data for February, 1923—Continued.

Main climatological data table with columns for 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, etc.), and Number of Days (Clear, Partly cloudy, Cloudy, Prevailing direction of wind).

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. *Mean temperature not included in summary.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE.

Table with columns for Stations, Barometric Pressure (Inches, Sea level), Relative Humidity (%), Wind (Average hourly velocity, Maximum), and Sunshine (Per cent of possible, from normal, Departure).

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 55 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 58, or 3 per cent greater than the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 54; Davenport, 52; Des Moines, 66; Dubuque, 52; Keokuk, 57; Sioux City, 67; Omaha, Neb., 60.

SNOWFALL.

The average snowfall for the State was 3.2 inches, or 4.2 inches less than the normal. The greatest amount, 10.6 inches, occurred at Columbus Junction, and there were two stations, Cumberland and Inwood, that reported no snowfall whatever during the month and one station in the central division and five in the southern division reported only a trace.

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

Daily Precipitation for February, 1923—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	.21																					0.24
Albia	Des Moines	T.	.02			T.					.03	.32						T.	T.					.02								0.39	
Atlantic	Nishnabotna	T.				T.					T.																		T.			T.	0.18
Bonaparte	Des Moines	T.				.05					T.	.24	.64								T.			.25								1.18	
Burlington	Mississippi					T.					.10	.05	.09	.20											.22							0.66	
Centerville	Chariton	T.	T.			T.	T.				.05	.35	T.							T.				.11								0.51	
Chariton	Chariton	T.									T.	.26																				0.26	
Clarinda	Nodaway		.01	T.	T.						.01	T.	.12																			0.14	
Columbus Jet	Iowa					.05	1.00				.04	.55	T.					.02						.05								1.71	
Corning	Nodaway		T.									.25																				0.25	
Corydon	Chariton	.01	T.	T.		T.					.05	.25	T.					T.						.24								0.55	
Creston	Missouri		T.	T.		T.					.21																					0.21	
Cumberland (near)	Nodaway																															0.60	
Earlham	Des Moines		T.								T.	.20															T.					0.20	
Fairfield	Skunk		T.			.02					.10	.60									.02					.06						0.80	
Glenwood	Missouri										T.	T.	T.																			T.	
Greenfield	Nodaway		.05								.10																						0.15
Indianola	Des Moines	T.	.05	.01		T.					.30	.10	T.								T.			T.								0.46	
Keokuk***	Mississippi	T.	T.			T.	T.				.06	.19	.03							T.				.07								0.35	
Keosauqua	Des Moines		T.			.10					.10	T.	.24	.13						T.				T.	.21							0.78	
Knoxville	Des Moines	T.	T.	.03		T.					.05	.15							T.		.30											0.53	
Lacona	Des Moines		.10	.10							.10	.50												.10								1.00	
Lamoni	Grand										.05	.15																				0.24	
Lenox	Missouri		.03	.01							.05	.15																					0.64
Mt. Ayr	Grand		T.								.05	.46												.13								T.	
Mt. Pleasant	Skunk			T.		.08					.03	.42	.08						T.				T.		.07				.01			0.60	
Oakland	Nishnabotna					T.					T.	T.																				T.	
Oskaloosa	Des Moines	.03	.06	.03			T.	T.	T.		.04	T.	.49	.07					T.	T.			.01	T.	.03							0.76	
Ottumwa	Des Moines		T.	T.		T.					.05	.53													.04								0.62
Pella	Skunk			T.		T.		T.			.05	.58	T.					T.	T.				.05		T.							0.68	
Sigourney	Skunk		T.	T.		.01	.02				.04	.76	T.						T.				T.										0.83
Stockport	Skunk					.05					.10	.40	.11											.18								T.	
Thurman	Missouri		T.	T.		T.					.05	T.	.08																				0.13
Washington	Skunk		T.			.10					.05	.38																					0.62
Wescott (near)	Mississippi		.05			T.					.15	.11													.40								0.71
Winterset	Des Moines		T.								.05	.20																					0.25
Omaha, Nebr.***	Missouri		.02			.01					.04	T.	.01																				0.08

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.

MISCELLANEOUS PHENOMENA.

Birds (migration of): Oskaloosa, robins and blue birds, 25th.
Fog: 12th, 13th.
Hail: 12th, 13th.
Halos (lunar and solar): 8th, 9th, 20th, 25th, 26th, 27th.
Parhelia: 16th, 17th.
Sleet: 1st, 2d, 12th, 13th, 19th, 24th, 27th, 28th.
Thunderstorms: 12th, 13th.

THE WINTER OF 1922-1923.

The mean temperature for the three winter months was 23.6°, which is 2.8° higher than the normal for the State, and 0.3° lower than the mean for 1921-1922. The highest temperature reported was 65°, at Thurman on December 29th, and the lowest was -25°, at Decorah, Nora Springs and Rock Rapids, on December 18th.

The average monthly precipitation for the State was 0.54 inch, and the average total precipitation was 1.62 inches, or 1.80 inches less than the normal and the least of any winter of record, except the winter of 1919-1920, when the total was 1.52 inches. The average total snowfall, unmelted, was 11.9 inches, or 8.6 inches less than the normal, and with the

exception of the previous winter, when only 9.5 inches was recorded, the least snowfall of record.

The number of days with 0.1 inch or more of precipitation was 12, or 1 less than the winter of 1921-1922. The average number of clear days was 39, partly cloudy 22 and cloudy 29, as compared with 45 clear days, 22 partly cloudy days and 23 cloudy days during the winter of 1921-1922.

RIVERS.

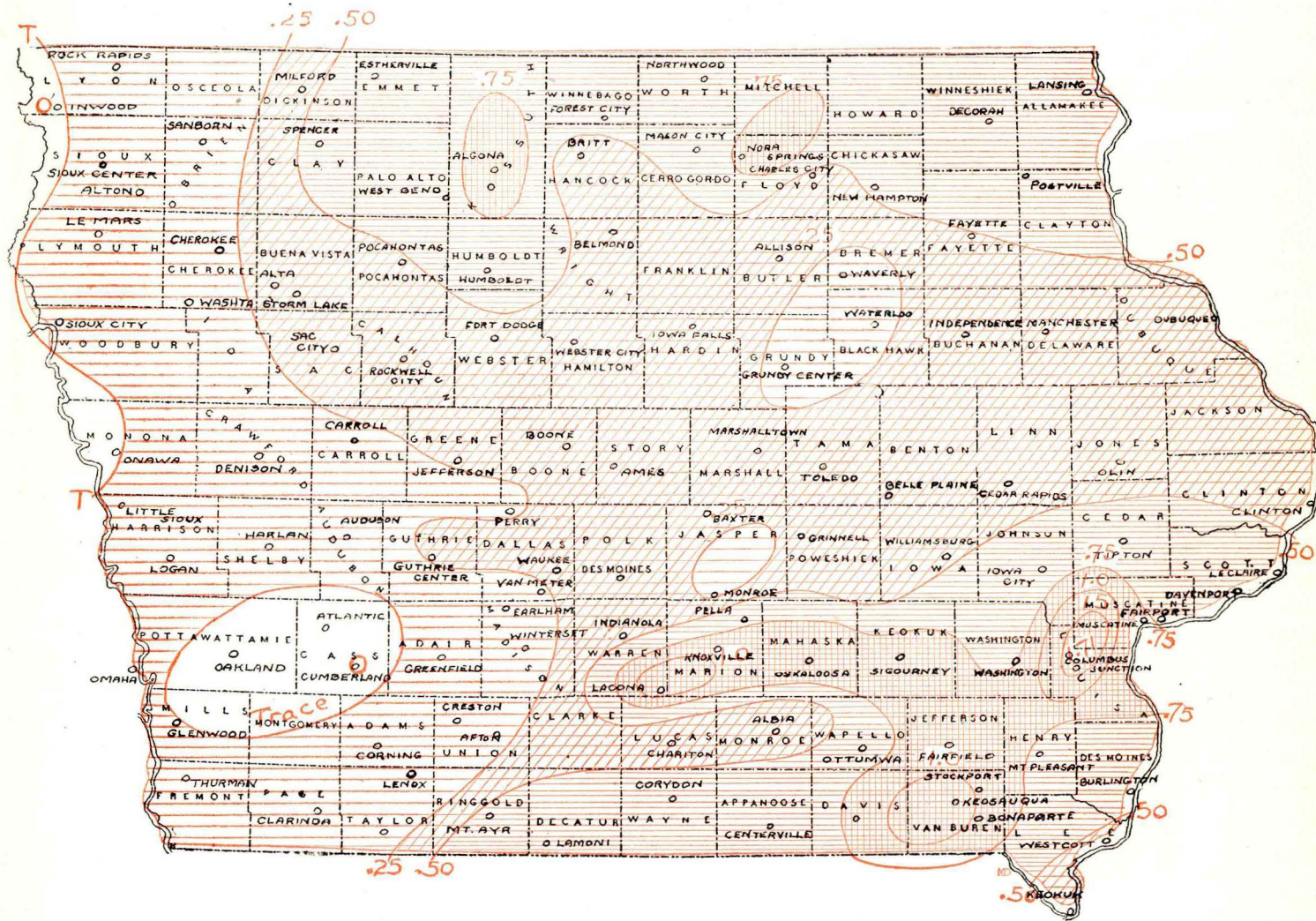
Moderate stages with a gradual falling tendency prevailed on the Missouri River. Low and nearly stationary stages prevailed on the Mississippi and all interior rivers. The Mississippi river was frozen over the entire month and at the close of the month the upper reaches were showing the effect of ice gorges.

Daily Maximum and Minimum Temperatures for the Month of February, 1923.

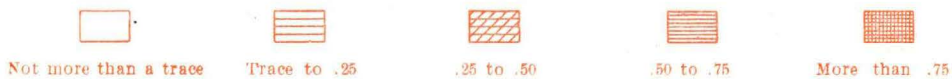
Table with columns for Stations, days 1-31, and Mean. Rows are categorized by Northern Division (Algona to Postville), Central Division (Belle Plaine to Slouso City), and Southern Division (Albia to Omaha, Nebr.).

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

TOTAL PRECIPITATION, FEBRUARY, 1923



SCALE OF SHADES—IN INCHES



CLIMATOLOGICAL DATA.

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

VOL. XXXIV DES MOINES, IOWA, MARCH, 1923 No. 3

GENERAL SUMMARY.

March was unusually stormy and the temperature was subject to great extremes and sudden changes. The month opened mild and on the first two days the highest temperature ever recorded so early in the season occurred over almost the entire State. In contrast to this the balance of the month was mostly cold and on the 19th the coldest weather ever experienced in March occurred over portions of the State and throughout the State the readings on this date were the lowest ever recorded so late in the season. The month closed cold and a number of stations reported the lowest temperature of record for the last week of March. Over most of the State the minimum temperature was lower than during December, January and February.

In addition to the unusual temperature conditions March was characterized by abnormally heavy snowfall and only once since records have been kept has any month reported a greater snowfall and that was March, 1912. The precipitation, mostly snow, occurred in five general storms beginning on the 3d and ending on the 22d. After the 22d practically no precipitation occurred. The storm that occurred on the 3d-4th was severe over the northwestern half of the State and over most of the northwestern and north-central divisions it assumed characteristics of a "blizzard" causing the snow to drift badly and some roads were blocked for nearly a week and all kinds of transportation were subject to great delay and inconvenience. The next storm occurring on the 11th-12th was especially severe over the eastern portion of the State. A heavy wet snow fell that clung to all objects and played havoc with trees, telegraph and telephone poles and wires and almost caused a suspension of rail traffic. Thousands of poles were snapped off, large limbs were broken from trees, and not a wire in large sections escaped damage. Dubuque was cut off from the rest of the world for nearly 24 hours and street car service was temporarily suspended on account of the heavy snow and large number of poles and limbs of trees that littered the streets. The damage to telephone and telegraph companies amounted to more than \$100,000 in the vicinity of Dubuque. Snow continued during most of the week from the 12th to the 18th and the amount of snow that fell over the greater portion of the State was unprecedented for so short a period. Several stations in the central part of the State reported from 25 to 30 inches within a week. On Sunday, the 18th, occurred one of the worst blizzards ever experienced. Throughout the day snow fell steadily accompanied by very strong wind and near zero temperature. The snow was heavy over more than half of the State and heavy drifts were general. Rail traffic was demoralized, all traffic was much delayed and most train service had to be suspended, as a large number of trains on main lines were snowed in. A freight train of seven box cars on the Perry interurban road stalled in a cut and before it could be backed out it was nearly covered up and had to be shoveled out. Enormous drifts were common around Des Moines and the wagon roads leading into the city were impassable, shutting off the milk supply and what milk was on hand had to be ra-

tioned where it was most needed. This storm was followed by intensely cold weather and as a result there was great suffering as the coal supplies of many families had become exhausted and it was impossible to make deliveries. This storm was severe on animal life and took a heavy toll of lambs and the loss to young pigs was around 1,000,000. Migratory birds, pheasants, quails and even rabbits were frozen to death in large numbers.

Farm work was at a standstill and the only seeding reported was a small amount of spring wheat in Monona county and some oats in Appanoose and Wayne counties on the 1st and 2d. Vegetation remained dormant and fruit buds had not begun to swell at the end of the month.

F. L. D.

PRESSURE.

The mean pressure (reduced to sea level) for the State was 30.06 inches. The highest recorded was 30.72 inches, at Dubuque on the 31st, and the lowest was 28.90 inches, at Davenport on the 12th. The monthly range for the State was 1.82 inches.

TEMPERATURE.

The mean temperature for the State, as shown by the records of 101 stations, was 29.4°, or 3.9° lower than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 25.6°, or 4.9° lower than the normal; Central, 29.7°, or 3.9° lower than the normal; Southern, 33.0°, or 2.9° lower than the normal. The highest monthly mean was 36.0°, at Keokuk, and the lowest mean was 23.1°, at Sanborn. The highest temperature reported was 78°, at Thurman on the 1st, and the lowest was -22°, at Boone on the 19th. The temperature range for the State was 100°.

COMPARATIVE DATA FOR THE STATE—MARCH.

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.....	28.0	-5.3	75	-24	1.57	-0.20	3.67	0.32	-----	10	6	8	17
1891.....	26.8	-6.5	66	-19	2.61	+0.83	4.58	1.33	-----	8	9	11	12
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	7	8	8	15
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.....	29.3	-4.0	61	-5	0.96	-0.81	2.12	1.17	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
1922.....	38.3	+5.0	74	-5	1.97	+0.20	3.73	0.76	3.4	7	12	6	13
1923.....	29.4	-3.9	78	-22	2.87	+1.10	5.08	0.71	18.5	7	13	9	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, 1923—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.						Precipitation, in Inches.				Number of Days.			Prevailing direction of wind.			
				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.	
Southern Division																				
Afton	Union	1,212	29	33.2	-2.7	76	2	-9	19	45	3.68	+1.76	1.00	26.0	7	14	8	9	ne.	S. R. Brown.
Albia	Monroe	959	25	33.4	-1.6	74	2	-11	19	46	3.51	+1.74	0.85	15.3	11	17	5	9	nw.	O. E. McBride
Atlantic	Cass	1,164	32	32.0	-2.5	75	2	-14	19	45	3.14	+1.44	1.05	17.5	8	10	11	10	sw.	Joseph N. Reynolds
Bonaparte	Van Buren		32	34.0	-2.6	72	2	-7	19	42	3.55	+1.24	1.26		9	17	7	7	s.	Bruce R. Vale.
Burlington	Des Moines	544	27	34.9	-2.2	70	2	-5	19	43	4.65	+2.00	1.12	13.0	11	20	4	7	ne.	Mrs. E. M. Donnelly
Centerville	Appanoose	1,013	18	34.8		74	2	-7	19	45	2.85	+0.55	0.96	5.3	9	14	8	9	se.	Leo J. Allen.
Chariton	Lucas	1,042	28	33.4	-2.0	75	2	-9	19	46	1.56	-0.05	0.60	7.0	7	15	4	12	nw.	C. C. Burr.
Clarinda	Page	1,009	33			77	2	-10	18	51 ^e	2.37	+0.62	0.85	15.2	5	16	2	13	nw.	A. S. Van Sandt.
Columbus Jet.	Louisa	595	22	32.6	-3.8	68	2	-11	19	43	3.39	+1.33	0.96	16.3	10	20	4	7	nw.	J. B. Johnston.
Corning	Adams	1,117	31	32.2	-1.9	76	2	-11	19	50	2.06	+0.26	0.91	10.0	6	17	2	12	sw.	Jerome Smith.
Corydon	Wayne	1,101	30	34.0	-2.8	73	2	-7	19	45	3.23	+1.33	0.80	12.5	10	10	10	11	nw.	May C. Miller.
Oreston	Union	1,312	18	32.0	-2.2	73	2	-14	18	41	3.46		0.64	23.0	8	12	10	9	sw.	Dr. H. M. Stanley.
Cumberland (near)	Cass	1,225	24								1.89	+0.15	0.82		5	8	13	10	nw.	Carl E. Pollock
Earlham	Madison	1,126	21	30.6	-3.8	76	2	-18	19	52	3.26	+1.41	0.80	24.0	8	18	3	10	sw.	Geo. Phillips.
Fairfield	Jefferson	780	39	32.7	-3.4	71	2	-9	19	44	4.35	+2.00	1.20	23.3	9	17	5	9	s.	Prof. R. M. McKenzie
Glenwood	Mills	1,100	25	34.2		76	1	-9	19	46	3.24		1.50	14.2	8	12	10	9	nw.	Dr. Geo. Mogridge.
Greenfield	Adair	1,368	31	29.5	-5.0	75	2	-13	19	45	4.33	+2.35	1.10	33.9	8	11	11	9	nw.	C. E. McCasien
Indianola	Warren	972	32	32.2	-3.4	76	2	-11	19	48	2.93	+1.37	0.85	20.7	8	7	15	9	nw.	Seth F. Shenton.
Keokuk	Lee	614	52	36.0	-2.9	71	2	-4	19	42	3.54	+1.17	1.09	6.3	10	12	7	12	nw.	U. S. Weather Bureau
Keosauqua	Van Buren	644	31	34.3	-1.5	71	2	-6	19	45	4.20	+1.88	1.80	14.5	11	10	11	10	se.	J. H. Landes.
Knoxville	Marion	920	28	32.8	-3.4	75	2	-11	19	44	4.39	+2.74	0.98	23.0	10	14	7	10	nw.	W. J. Casey.
Lacona	Warren		24								4.00	+1.74	0.70	32.0	13	7	13	11	sw.	J. B. Alter.
Lamoni	Decatur	1,123	16	33.4	-3.6	75	2	-10	19	46	2.70	+1.09	0.65	10.3	10	16	5	10	sw.	C. E. Wight.
Lenox	Taylor	1,250	28	32.9	-2.6	76	2	-10	19	49	2.60	+1.02	0.78	17.2	9	14	8	9	nw.	J. L. Hurley.
Mt. Ayr	Ringgold	1,245	30	33.6	-3.2	75	3	-10	19	42	2.86	+0.98	0.70	16.0	9	17	4	10	nw.	Alex Maxwell.
Mt. Pleasant	Henry	729	42	34.4	-2.3	71	2	-8	19	42	4.37	+2.16	1.88	10.0	11	13	10	8	nw.	John H. Jericho.
Oakland	Pottawattamie	1,105	4	32.8		76	2	-13	19	46	2.60		1.40	18.0	5	17	3	11	s.	M. E. Gray.
Oskaloosa	Mahaska	825	47	31.5	-4.2	74	2	-13	19	45	4.18	+2.38	1.02	31.6	11	9	11	11	nw.	Roy R. Robinson
Ottumwa	Wapello	649	28	34.9		73	2	-6	19	46	4.11	+2.21	1.51	9.2	9	15	8	8	nw.	C. L. Mikesch.
Pella	Marion	877	30	31.0	-4.8	74	2	-15	19	47	4.34	+2.92	1.13	25.0	10	19	3	9	nw.	J. H. Ver Steeg.
Sigourney	Keokuk	790	27	31.6	-4.3	70	2	-12	19	42	5.08	+3.21	1.55	18.7	10	13	8	10	sw.	W. E. Utterback.
Stockport	Van Buren	754	21	33.2	-3.1	71	2	-9	19	46	3.86	+1.79	0.90	14.5	11	15	3	13	nw.	M. E. Beswick.
Thurman	Fremont	975	26	33.6	-2.1	78	1	-12 ^a	19	51 ^a	2.52	+0.87	1.28	11.0	7	8	14	9	nw.	C. R. Paul.
Washington	Washington	769	41	32.3	-3.6	70	2	-12	19	43	4.28	+2.24	1.55	21.7	7	8	17	6	nw.	Wm. A. Cook.
Wescott (near)	Lee		1																	Geo. H. Smith.
Winterset	Madison	1,129	32	32.2	-3.2	76	2	-12	19	45	3.18	+1.38	0.70	19.0	6	18	8	5	nw.	H. S. Ely.
Omaha, Nebr.		1,103	52	32.7	-4.3	78	1	-8	18	47	3.95	+2.56	1.64	28.8	7	9	14	8	nw.	U. S. Weather Bureau
Means and extremes.				33.0	-2.9	78	1	-18	19	52	3.45	+1.53	1.88	17.8	8	13	8	10	nw.	
State means and extremes.				29.4	-3.9	78	1	-22	19	52	2.87	+1.10	1.90	18.5	7	13	9	9	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	Maximum		Per cent of possible	Departure from normal						
						7 a. m.	12 Noon. †		Miles	From								
Charles City	30.05	30.69	31	29.28	11	84	64	73	35	2	6,798	9.1	27	n.	3	57	0	
Davenport	30.05	30.70	31	28.90	12	77	58	65	27	28	6,799	9.1	42	ne.	11	58	0	
Des Moines	30.04	30.66	31	29.21	11	75	60	65	16	2	7,159	9.6	32	sw.	17	64	0	
Dubuque	30.06	30.72	31	29.12	12	78	64	65	32	19	6,538	8.8	28	n.	15	51	3	
Keokuk	30.07	30.71	31	29.01	12	71	53	60	23	31	7,515	10.1	37	n.	4	62	2	
Sioux City	30.07	30.68	30	29.39	11	74	60	62	21	30	10,353	13.9	43	n.	17	60	2	
Omaha, Nebr.	30.06	30.65	31	29.34	11	80	66	64	13	2	8,103	10.9	48	nw.	17	62	6	
Means and extremes.	30.06					77	61	63				10.2				59	2	
		30.72	31	29.80	12				13	2			48	nw.	17			
Normals and records.	30.04		28 th		15 th	80			67		18 th		9.6		16 th		57	
		30.82	1921	28.85	1920				*5	1918.		165	w.		1920			

†Sioux City. *Des Moines. ‡Local mean time. †And other dates.

HUMIDITY.

The average relative humidity for the State at 7 a. m. was 77 per cent, and at 7 p. m. it was 63 per cent. The mean for the month was 70 per cent, which is 4 per cent lower than the normal. The highest monthly mean was 78 per cent at Charles City and the lowest was 66 per cent at Keokuk.

SNOW.

The average snowfall for the State was 18.5 inches, or 13.2 inches more than the normal, and with the exception of 1912, when the average for the State was 19.1 inches, the greatest snowfall ever recorded in March. The greatest amount, 41.0 inches, occurred at Olin, and the least, 5.3 inches, occurred at Centerville.

SUNSHINE AND CLOUDINESS.

The average per cent of the possible amount of sunshine was 59, or 2 per cent more than the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 57; Davenport, 58; Des Moines, 64; Dubuque, 51; Keokuk, 62; Sioux City, 60; Omaha, Nebr., 62.

Daily Precipitation for March, 1923—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		
Southern Division																																		
Afton	Grand		.85									.91	.14	.15	.50			1.00					.13											3.68
Albia	Des Moines		.52	.01		T.			.18		.50	.85	.10	.20	.70	.03		.32				T.	.10											3.51
Atlantic	Nishnabotna		1.05	.02								.10	.07	.47	.93			T.	.33															3.14
Bonaparte	Des Moines		.35	T.		.05			.07		.51	1.26	.11	.04	.91	T.		T.					.25											3.55
Burlington	Mississippi		.33	.22					.42		.31	1.08	.10	.40	1.12	.30		.10					.27											4.65
Centerville	Chariton		.27	.03		T.	T.		.08		.46	.64		.04	.90			.06					.37											2.85
Chariton	Chariton		.32	.15		T.			.10		.60	T.	.10	.15				.14																1.56
Clarinda	Nodaway		.85						.47		.31	.42						.32																2.87
Columbus Jet	Iowa		.40	.05					.26		.70	.46	.10	.26	.96			.12					.08											3.29
Corning	Nodaway		.91	.25							.20		.46					.50				.08	.16											2.66
Corydon	Chariton		.36	.20		T.	T.		.14		.35	.80	.14	.10	.61	T.		.18					.35											3.23
Creston	Missouri		.52	.31							T.	.64	.20	.25	.44			.60					.50											3.46
Cumberland (near)	Nodaway		.82									.17	.25	.45			.20					T.	T.											1.89
Earlham	Des Moines		.57	.23							.46	.10	.50	.40				.40					.60	.40										3.26
Fairfield	Skunk		.45			T.			.18		1.20	.54	.13	.35	.77			.40					.33											4.85
Glenwood	Missouri		1.50	.02								.32	.05	.30	.70			.30					.05											3.24
Greenfield	Nodaway		1.05	.38								.40	T.	.20	1.10	.90		.20					.10											4.33
Indianola	Des Moines		.49	.37					T.		T.	.70	.05	.05	.85			.27					.15											2.93
Keokuk***	Mississippi		.39			T.	.11		.49		1.09	.06	.14	.03	1.05			.02				T.	.16											3.54
Keosauqua	Des Moines		.37	T.		.10			.06		1.06	.74	.20	.15	1.00	.05		.20					.27											4.20
Knoxville	Des Moines		.42	.25					.08		.28	.98	.08	.50	.70			.60					.50											4.39
Lacona	Des Moines		.44	.26					.10		.10	.70	.10	.50	.60	.10		.50	.10				.10											4.00
Lamoni	Grand		.25	.15					T.	.05	.30	.65	.20	.08	.46			.36					.20											2.70
Lenox	Missouri		.78	.03					T.		.04	.50	.05	.10	.20			.30					.60											2.60
Mt. Ayr	Grand		.37	.20					T.		.03	.70	.20	.15	.51			.35					.35			T.								2.66
Mt. Pleasant	Skunk		.24	.29		.03			.14		.42	1.46	T.	.22	1.14	.08		.07					.28											4.37
Oakland	Nishnabotna		.60	T.							.85	.10		.40	T.			.15																2.60
Oskaloosa	Des Moines		.43	.22		T.			.11		.12	.95	.09	.36	1.02	.07		.45				T.	.36											4.18
Ottumwa	Des Moines		.47	.08		T.			.34		1.51	T.	.14	.15	1.00			.24					.18											4.11
Pella	Skunk		.98	.05		T.			.10		T.	1.13	.05	.25	.70	.01		.70				T.	.37											4.34
Sigourney	Skunk		.53	.14		T.			.46		.12	1.55	.12	.35	1.21			.34					.26											5.08
Stockport	Skunk		.41	.13		.05			.09		.78	.90	.10	.17	.88	T.		.07	T.				.28											3.86
Thurman	Missouri		1.28	.05							.28	T.	.12	.54			.20						.05	T.										2.52
Washington	Skunk		.60								1.31	.12	1.55	.35			.07						.28											4.28
Wescott (near)	Mississippi		.70			.90			.40		1.55	.10		.20	1.05			.15					.30											5.35
Winterset	Des Moines		.70	.48							.70	T.		.60			.50						.20											3.18
Omaha, Nebr.***	Missouri		1.24			T.					.30	T.	1.10	.80			.34						.07											3.62

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.

PRECIPITATION.

The average precipitation for the State, as shown by the records of 103 stations, was 2.87 inches, or 1.10 inches more than the normal. By divisions the averages were as follows: Northern, 1.95 inches, or 0.42 inch more than the normal; Central, 3.21 inches, or 1.34 inches more than the normal; Southern, 3.45 inches, or 1.53 inches more than the normal. The greatest amount, 5.08 inches, occurred at Sigourney, and the least, 0.71 inch, occurred at West Bend. The greatest amount in any 24 consecutive hours, 1.90 inches, occurred at Audubon on the 15th.

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 43 miles per hour, from the north, at Sioux City on the 17th.

RIVERS

Nearly stationary stages prevailed on the Mississippi River the greater portion of the month, but there was a general rise

during the last week of the month. On the Missouri nearly stationary stages prevailed except there were sharp rises on the 10th and 11th and again on the 22d and 23d, due to the formation of ice gorges. Low lands in the vicinity of Sioux City were flooded causing some property loss. Two lives were lost on account of ice conditions on the Missouri River. Two men were marooned on an island and rescue was impossible and the rising water gradually covered the island and the men carried away. The interior rivers were nearly stationary till the latter part of the month when a general rise set in, and the flood stage was reached in the lower portion of the Des Moines River.

MISCELLANEOUS PHENOMENA.

- Aurora: 13th.
- Fog: 22d.
- Halos (lunar and solar): 2d, 5th, 7th, 8th, 17th, 20th, 21st, 23d, 29th.
- Parhelia: 8th, 18th.
- Sleet: 3d, 4th, 11th, 12th, 14th, 17th, 22d.
- Thunderstorms: 3d, 9th, 11th, 12th.

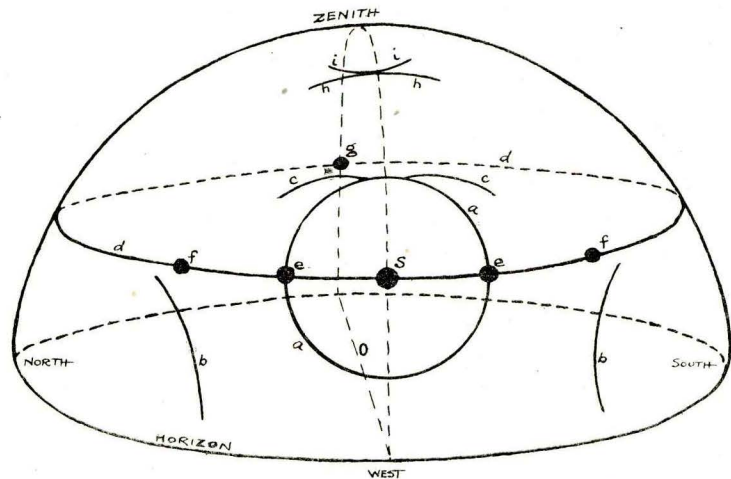
UNUSUAL SOLAR OPTICAL PHENOMENA

March 8, 1923

MILTON W. DAVIS, Observer

Weather Bureau Office, Des Moines, Iowa.

An interesting display of 22° and 46° halos, attended by tangent arcs, parhelia, the parhelic circle and anthelia were observed from the Des Moines station on the afternoon of March 8.



PERSPECTIVE VIEW OF THE SKY

- | | |
|--------------------------------------|-----------------------|
| S—Sun. | d—Parhelic Circle. |
| O—Observer. | e—Parhelia of 22°. |
| a—22° Halo. | f—Parhelia of 46°. |
| b—Infralateral tangents of 46° Halo. | g—Anthelion. |
| c—Upper tangent arcs of 22° Halo. | h—Arc of 46° Halo. |
| | i—Circumzenithal Arc. |

The 22° halo was first observed at about 2:45 p. m. at a solar altitude of approximately 35°. The sky was sparsely covered with cirro-stratus and a few tufted cirrus clouds. The clouds first formed in circumpolar bands and spread rapidly over the sky. At 3:15 p. m. the sky was almost entirely obscured by a veil of transparent cirro-stratus clouds.

The 22° halo became very distinct and infralateral tangent arcs of the 46° halo gradually appeared in the lower right and left quadrants. These arcs extended almost to the horizon and upward about 30° convexly from the sun and would have been mistaken for portions of a rainbow had not the associated phenomena been present. The prismatic colors of the rainbow were brilliantly displayed. No portion of the 46° halo was visible at the time.

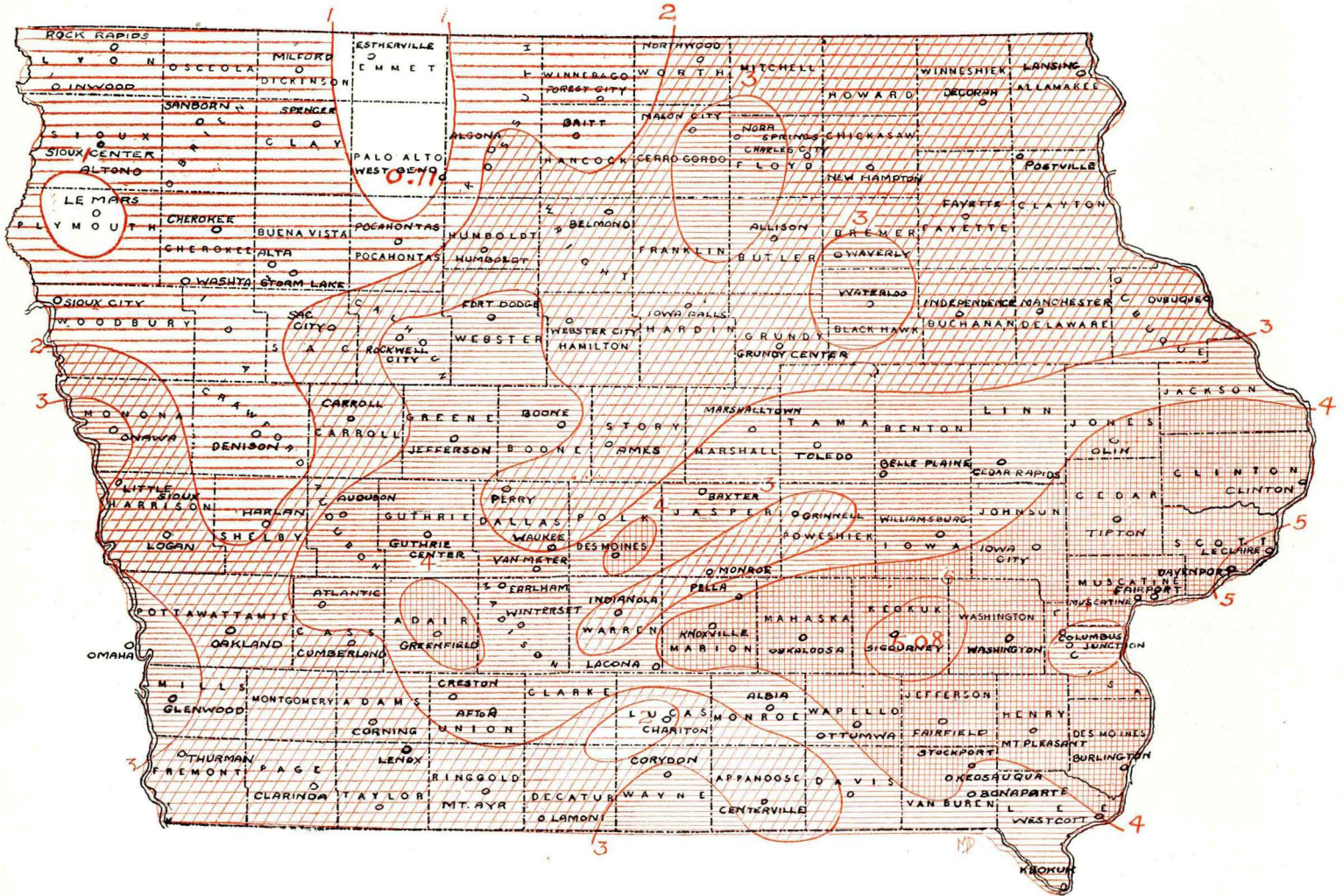
As the solar altitude gradually decreased to about 30°, tangent arcs formed at the highest point of the 22° halo which was now very brilliant in its upper portion. The arcs became very clearly defined and curved symmetrically downward away from the halo. At the point of tangency the halo displayed brilliant spectrum colors. Lower tangent arcs were not visible at any time during the afternoon.

At about the same time parhelia appeared to the right and left of the sun and a faint shaft of light extended between these and passed through the sun. This shaft of light gradually extended beyond the parhelia until it formed a parhelic circle passing through the sun and parallel to the horizon. The parhelia glowed as a white light at the intersections of the 22° halo and the parhelic circle, at times rivaling the brightness of the sun. Two other parhelia were soon faintly visible at approximately 46° from the sun on the parhelic circle. Until this time the 46° halo had not become visible except for an occasional tint of color in the upper portions and the infralateral tangents faded as the sun descended.

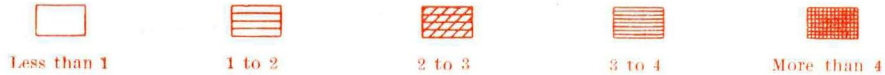
A luminous spot appeared on the parhelic circle directly opposite the sun and was recognized as anthelion. Its duration was for about ten minutes at a solar altitude between 25° and 30°. No colors were visible about the anthelion which glowed as a white light. The parhelic circle continued as a white band with none of the prismatic colors visible along its course.

As the sun descended to approximately 25°, an arc of the 46° halo formed directly above the sun with a tangent arc—circumzenithal arc—bent upward. The prismatic colors were brilliantly displayed in both arcs. The clouds now thickened quickly, gradually blotting out the phenomena until only the sun's disk was faintly visible through a dense cloud covering that appeared to be of alto-stratus clouds.

TOTAL PRECIPITATION, MARCH, 1923



SCALE OF SHADES—IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In cooperation with

IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXIV DES MOINES, IOWA, APRIL, 1923 No. 4

GENERAL SUMMARY.

The average temperature for April differed very little from the normal, but there was a decided deficiency in precipitation except over the extreme northeast corner and portions of the northwest and west-central sections.

Until the 18th the weather was mostly cold and disagreeable, with frequent rains and numerous temperature fluctuations above and below normal, but without any great extremes. Freezing temperatures were recorded almost daily over most of the northern half of the State during the first 17 days, and, during most of this period, over the rest of the State, and in connection with the frequent rains farm work was greatly hindered and there was further heavy losses to young pigs. After the 17th very favorable conditions prevailed and all farming operations were pushed so that at the end of the month practically all seeding of small grain had been finished. Preparation for planting corn was well advanced over the southern half of the State and good progress had been made in the northern half except over areas in the northwest and west-central sections where the soil was too wet to plow. The soil was in need of moisture over a large portion of the eastern and southern sections and grain that had been sown in numerous fields had not started to germinate at the close of the month, but where there was sufficient moisture many fields were well advanced in growth and showed a good stand and winter wheat was generally in good condition.

The cold weather that predominated throughout the month retarded the growth of all vegetation and the season was from one to three weeks later than normal. Grass was unusually late in starting and in connection with a shortage of hay cattle that had to be turned on pasture were becoming thin. Fruit buds had begun to swell at the end of the month, but practically no bloom had appeared except in a few southern counties and forest trees had not begun to show leaves. The last general frost occurred on the 28th, but as vegetation was backward there was practically no damage from frost during the entire month. The precipitation was evenly distributed throughout the month and was not accompanied by severe storms. Hail was reported from a large number of places on numerous dates, but without exception it was light and caused no damage. Roads were bad during the greater portion of the month, though toward the end of the month there was a decided improvement, but many dirt roads were rough. Optical phenomena were unusually numerous during the month.

F. L. D.

PRESSURE.

The mean pressure (reduced to sea level) for the State was 29.96 inches. The highest recorded was 30.51 inches, at Dubuque on the 1st, and the lowest was 29.23 inches, at Sioux City on the 21st. The monthly range was 1.28 inches.

TEMPERATURE.

The mean temperature for the State, as shown by the records of 99 stations, was 48.4°, or 0.3° lower than the normal. By divisions, three tiers of counties to the division, the means

were as follows: Northern, 46.0°, or 0.7° lower than the normal; Central, 48.6°, or 0.3° lower than the normal; Southern, 50.5°, 0.1° lower than the normal. The highest monthly mean was 52.0°, at Ottumwa, and the lowest was 43.4°, at Fayette. The highest temperature reported was 85, at Belle Plaine and Humboldt, on the 30th, and the lowest was 11°, at Inwood, on the 8th. 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. was 54 per cent. The mean for the month was 64 per cent, which is 2 per cent less than the normal. The highest monthly mean was 71 per cent, at Charles City, and the lowest was 57 per cent, at Keokuk.

PRECIPITATION.

The average precipitation for the State, as shown by the records of 102 stations, was 2.09 inches, or 0.77 inch less than the normal. By divisions the averages were as follows: Northern, 2.67 inches, or 0.01 inch less than the normal; Central, 1.93 inches, or 0.93 inch less than the normal; Southern, 1.66 inches, or 1.39 inches less than the normal. The greatest amount, 4.26 inches, occurred at Little Sioux, and the least, 0.47 inch, occurred at Keosauqua. The greatest amount in any 24 consecutive hours, 1.45 inches, occurred at Sioux City, on the 20th-21st.

SNOWFALL.

The average snowfall for the State was 0.8 inch, or 1.0 inch less than the normal. The snow was confined chiefly to the northeastern and extreme northwestern portions of the State. Over more than half of the State only a trace of snow occurred. The greatest fall reported was 7.5 inches at Decorah

COMPARATIVE DATA FOR THE STATE—APRIL.

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	51.8	+3.1	88	2	1.80	-1.06	4.46	0.98	-----	6	14	9	7
1891	50.6	+1.9	93	13	2.15	-0.71	5.06	0.59	-----	8	14	7	9
1892	45.4	-3.3	83	14	4.75	+1.89	8.38	2.43	5.7	9	8	9	13
1893	45.9	-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	11	11	8	8
1895	54.2	+5.5	98	8	2.62	-0.24	5.88	0.28	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	9	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	86	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	12
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	90	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	12	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
1922	49.9	+1.2	87	21	3.06	+0.20	6.70	1.04	1.0	9	11	9	10
1923	48.4	-0.3	85	11	2.09	-0.77	4.24	0.47	0.8	8	15	7	8

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



Climatological Data for April, 1923—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in Degrees Fahrenheit.					Precipitation, in Inches.			Number of Days.				Prevailing direction of wind.				
				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.	
Southern Division																				
Afton	Unlon	1,212	29	50.8	+ 0.2	83	30	20	8	38	3.15	-0.20	0.73	0	8	14	8	8	ne.	S. R. Brown.
Albia	Monroe	959	25	51.0	+ 1.4	84	30	21	8	41	0.72	-2.13	0.35	T.	7	16	4	10	nw.	O. E. McBride.
Atlantic	Cass	1,164	32	50.0	+ 0.4	81	29	21	8	44	2.57	-0.36	0.84	0	7	12	9	9	nw.	Joseph N. Reynolds.
Bonaparte	Van Buren	32	32	50.6	+ 0.7	83	30	23	8	40	0.61	-2.65	0.39	0	4	12	9	9	w.	Bruce R. Vate.
Burlington	Des Moines	544	27	51.8	+ 0.6	84	30	26	8	40	1.31	-1.93	0.34	T.	8	16	4	10	ne.	Mrs. E. M. Donnelly
Centerville	Appanoose	1,013	18	50.8	-----	77	19	21	8	37	0.86	-2.44	0.45	T.	4	15	5	10	nw.	Leo J. Allen.
Chariton	Lucas	1,042	25	50.2	+ 0.2	78	19†	20	8	44	1.64	-1.48	0.60	0	5	15	5	10	nw.	O. C. Burr.
Clarinda	Page	1,009	33	-----	-----	82	30	18	8	39	1.95	-0.87	0.75	0	3	21	4	5	se.	A. S. Van Sandt.
Columbus Jet.	Louisa	595	22	50.2	+ 0.5	83	30	25	8	39	1.45	-1.45	0.83	T.	6	22	5	3	w.	J. B. Johnston.
Corning	Adams	1,117	31	49.4	+ 0.2	80	29	17	8	46	2.66	-0.37	1.34	0	5	18	2	10	sw.	Jerome Smith.
Corydon	Wayne	1,101	30	51.3	+ 0.1	80	30	21	8	40	2.13	-1.00	0.97	T.	8	10	8	12	nw.	May C. Miller.
Creston	Union	1,312	18	50.0	+ 1.7	80	30	20	8	38	2.22	-----	0.81	0	4	16	5	9	se.	Mrs. H. M. Stanley.
Cumberland (near)	Cass	1,225	24	-----	-----	82	30	18	8	39	2.39	+0.12	0.70	0	7	12	6	12	nw.	Carl E. Pollock.
Earlham	Madison	1,126	21	48.8	+ 0.4	80	19	19	8	45	2.10	-1.36	0.69	T.	6	17	1	12	nw.	Geo. Phillips.
Fairfield	Jefferson	780	39	50.0	+ 0.8	83	30	23	8	42	1.30	-2.35	0.98	T.	7	16	4	10	n.	Prof. R. M. McKenzie
Glenwood	Mills	1,100	25	51.2	-----	81	19	20	8	40	2.27	-----	0.72	0	5	13	9	8	se.	Dr. Geo. Mogridge.
Greenfield	Adair	1,308	31	-----	-----	81	19	20	8	40	2.27	-----	0.72	0	5	13	9	8	se.	O. E. McCaslen.
Indianola	Warren	972	32	50.4	+ 0.1	81	30	20	8	41	1.78	-1.43	0.65	0	5	13	8	9	se.	Seth F. Shenton.
Keokuk	Lee	614	32	51.4	+ 0.9	82	30	25	8	41	1.16	-2.18	0.59	T.	7	8	6	10	n.	U. S. Weather Bureau
Keosauqua	Van Buren	644	31	50.3 ^a	+ 0.2	83 ^a	30	21 ^a	7	41 ^a	0.47	-3.03	0.26	T.	5	-----	-----	-----	ne.	J. H. Landes.
Knoxville	Marion	920	28	50.2	+ 1.4	80	30	21	8	38	1.50	-1.49	0.47	T.	6	14	5	11	nw.	W. J. Casey.
Lacona	Warren	24	24	-----	-----	80	30	21	8	38	0.97	-1.73	0.38	0	7	11	14	5	nw.	J. B. Alter.
Lamoni	Deatur	1,123	16	50.0	+ 1.0	78	19†	18	8	43	1.88	-1.47	0.83	0	5	16	5	9	s.	C. E. Wight.
Lenox	Taylor	1,250	28	50.6	+ 0.3	80	30	18	8	40	2.39	-0.55	0.75	T.	8	11	10	9	s.	J. L. Hurley.
Mt. Ayr	Ringgold	1,245	30	50.2	+ 1.0	77	19†	20	8	37	3.13	-0.62	1.14	T.	9	13	4	12	ne.	Alex Maxwell.
Mt. Pleasant	Henry	729	42	51.3	+ 0.1	84	30	24	8	40	1.11	-1.79	0.64	1.0	7	8	11	11	nw.	John H. Jericho.
Oakland	Pottawattamie	1,105	4	49.8	-----	83	30	20 ^a	8	47 ^a	1.89	-----	0.56	0	6	16	2	12	s.	M. E. Gray.
Oskaloosa	Mahaska	825	47	50.5	+ 0.1	82	30	19	8	42	1.26	-1.50	0.55	0.5	9	10	8	12	nw.	Roy R. Robinson.
Ottumwa	Wapello	649	28	52.0	-----	83	30	23	8	39	1.12	-1.63	0.62	T.	7	14	7	3	sw.	C. L. Mikesh.
Pella	Marion	790	30	49.7	+ 0.7	84 ^a	30	23	8	44 ^a	1.31	-1.92	0.55	T.	6	21	2	7	nw.	J. H. Ver Steeg.
Sigourney*	Keokuk	790	27	49.9	+ 1.1	83	30	22	8	41	1.09	-2.19	0.63	0.2	6	16	4	10	nw.	W. E. Utterback.
Stockport	Van Buren	754	21	49.2	+ 1.3	82	30	22	8†	44	0.99	-2.07	0.47	0.5	9	13	5	12	s.	M. E. Beswick.
Thurman	Fremont	975	26	51.1	+ 0.1	84	19	19	8	40	2.64	-0.49	1.08	0	5	7	19	4	sw.	C. R. Paul.
Washington	Washington	769	41	50.4	+ 0.2	84	30	24	8	39	1.06	-1.56	0.62	T.	6	9	12	9	sw.	Wm. A. Cook.
Wescott (near)	Lee	1	1	50.8	-----	78	30	28	1	34	1.36	-----	0.50	0	7	13	8	9	w.	Geo. H. Smith.
Winterset	Madison	1,125	32	49.2	+ 1.5	80	30	20	8	38	1.81	-1.79	0.51	T.	6	14	7	9	ne.	H. S. Ely.
Omaha, Nebr.	-----	1,103	52	51.2	+ 0.0	82	19	22	8	38	1.57	-1.44	0.97	T.	8	14	6	10	nw.	U. S. Weather Bureau.
Means and extremes.	-----	-----	-----	50.5	+ 0.1	84	19†	17	8	47	1.66	-1.39	1.34	T.	6	14	7	9	nw.	-----
State means and extremes.	-----	-----	-----	48.4	+ 0.3	85	30	11	8	48	2.09	-0.77	1.45	0.8	8	15	7	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				Sun- shine				
	Mean	Highest	Date	Mean	Date	Lowest	Total movement	Average hourly velocity	Maximum	Date					
Charles City	29.96	30.45	1 29.30	21	79	54	63	32	18	5,357	7.4	s.	19	67	+10
Davenport	29.96	30.47	1 29.29	1	73	48	52	25	18	6,355	8.8	sw.	2	57	-2
Des Moines	29.94	30.38	1 29.26	21	79	59	61	33	18	6,188	8.6	sw.	19	69	+9
Dubuque	29.98	30.51	1 29.30	21	73	50	53	28	18	4,926	6.8	sw.	7	55	+1
Keokuk	29.97	30.48	1 29.30	21	67	45	47	20	18	6,656	9.2	sw.	21	53	+4
Sioux City	29.94	30.34	25 29.23	21	80	53	52	23	10	9,408	13.2	sw.	21	57	-1
Omaha, Nebr.	29.94	30.31	24 29.25	20	77	55	53	25	10	6,351	8.8	sw.	14	60	+3
Means and extremes.	29.96	30.51	1 29.23	21	75	52	54	-----	-----	9.0	-----	-----	-----	60	+2
Normals and records.	29.98	-----	9th 20th	76	-----	57	-----	-----	-----	9.9	-----	-----	25th	58	-----
	30.78	-----	1918 *28.80	1898	-----	110	1902	-----	-----	174	n.	1902	-----	-----	-----

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

SUNSHINE AND CLOUDINESS.

The average per cent of the possible amount of sunshine was 60, or 2 per cent more than the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 67; Davenport, 57; Des Moines, 69; Dubuque, 55; Keokuk, 53; Sioux City, 57; Omaha, Nebr., 60.

WIND.

The prevailing direction of the wind was from the north-west. The highest velocity reported from a regular Weather Bureau station was at the rate of 42 miles per hour, from the southwest, at Des Moines, on the 19th.

MISCELLANEOUS PHENOMENA.

- Fog: 6th, 10th.
- Hail: 7th, 14th, 16th, 21st, 23d, 26th.
- Halos (lunar or solar): 1st, 4th, 12th, 17th, 23d, 24th, 25th, 26th, 27th, 29th, 30th.
- Haze: 1st, 25th.
- Parhelia: 17th.
- Sleet: 3d, 7th, 14th, 16th.
- Thunderstorms: 2d, 3d, 7th, 10th, 13th, 14th, 20th, 21st, 22d, 23d, 24th, 26th.

Daily Precipitation for April, 1923.

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			
Northern Division																																				
Algona	Des Moines		.04	.54			.08							.14						.30	.31		.80	.26											2.47	
Allison	Cedar			.55			.26		.05					.20						.06	.32		.50												1.94	
Alta	Raccoon			.02			.04	.04						.82	.10					.62	.10	.45	.20		.10										2.49	
Aiton	Floyd		T.				.05						.48	.50	.20				.41	.88	.01	.71	.12	T.	.21										3.57	
Belmond	Iowa		.42	.50			.16		.03					.11	.11				.12	.18		.65	.08												2.36	
Britt	Iowa		.02	.56			T.	.01						T.						.18	.12		.45	.10		T.									1.44	
Charles City**	Cedar		.70	.30			.21		.10	.06				.32	.03				.44	.27	T.	1.18	.53		T.							T.			3.85	
Cherokee	Little Sioux						T.		T.				T.	1.36	.02							T.	1.18	.53		.07									2.92	
Decorah	Mississippi			.95			.36	.03	.30	.05				.40						.04	.72	.04	.03												2.53	
Estherville	Des Moines					.65								.38	.10					.60		.45	.90		.05										2.17	
Fayette	Mississippi		.24	.80			.19	T.	.09					.40	.10					.03	.30		.02												1.54	
Forest City	Cedar			.55			T.	T.	.05					.08	.05					.44	.18		.56	.18		.03									2.14	
Humboldt	Des Moines		T.	.31			.13	.03	T.					.26	.02							1.20	.08	.23	.24	.01	.25								3.15	
Inwood	Big Sioux			.08			.03	.01	.05					.75	.26	.01						.35	.87	.04	1.01	.09	T.	.15							3.22	
Le Mars	Floyd		T.	T.			T.	.03					.14	.55	.02							.35	.87	.04	1.01	.09	T.	.15							2.02	
Mason City	Cedar		T.	.10	.50		.20		.12	T.				.10						.10	.40		.38	.12											1.91	
Milford (near)	Little Sioux			.05			T.							.31	.06					T.	.22	.21	.39	.39	.08	.09									2.23	
New Hampton	Wapsipinicon			.20	.74		.27		.24	.02				.30						T.	.22	.24	T.												2.15	
Nora Springs	Cedar			.63	.13		.23		.20					.23		T.				.17	.08		.48												1.96	
Northwood	Cedar			.59			T.	.02	.20	T.				.30	.20					.02	.40	T.	.15	.03	.05	.03									2.18	
Pocahontas	Des Moines		.02	.25			.02	.01						.26	.02					.38	.18		.68	.31		.05									3.17	
Postville	Mississippi		.78	.92			.15		.20	T.				.10	.20	T.				.73		.08	.01		.02	.26									3.94	
Rock Rapids	Big Sioux		T.				.05						.85	.70	.15				.25	1.00		.46	.10		.02	.26									3.80	
Sanborn	Floyd			.01			.02							1.10					.58	.73		.96	.29		.11										3.81	
Sioux Center	Floyd		T.				T.	.75					.44	.03	.20				.40	1.04	.02	.50	.21	T.	.22										3.21	
Spencer	Little Sioux			.05			.50						.08	.40	.10				.40	.35		.70	.60		.03										2.40	
Storm Lake	Raccoon						T.	.05						.75	.05				.39	.17		.70	.21		.08										3.62	
Washita	Little Sioux		T.				T.							1.07	.15				.46	.30	.02	1.18	.33	T.	.17										2.39	
Waverly	Cedar		.15	.55			.14							.42					.14	.44		.55	.21												2.15	
West Bend	Des Moines		.10	.18				.02						.18					.36	.24		.78	.23													
Central Division																																				
Ames	Skunk		.02	.38			.13				.28			.25	T.				.42	.15		.72													2.35	
Audubon	Nishnabotna			.33						.15				.98					.38	.29		.28	.28		T.										2.69	
Baxter	Skunk			.50			.05			T.	.13			.26	T.	T.			.35	T.		.38													1.67	
Belle Plaine	Iowa		.04	.28		.18				T.	.04			.15	.04	T.			.15	.04		.57			.02										1.51	
Boone	Des Moines			.40			T.				.22			.15	.05			T.		.55	T.	.65	.66												2.08	
Carroll	Raccoon			.11			T.				.14			.47	.09					.38			.86	.48											2.47	
Cedar Rapids	Cedar		T.	.50										T.		T.				T.	.55	.40	T.												1.45	
Clinton	Mississippi		.02	.02			.42	T.	.20	.05				.14						.42	.02														1.29	
Davenport	Mississippi		.02	.01			.19		.06			T.	T.	.16	.02	.05				T.	.06		.01	.01								.02			0.59	
Davenport (Pine Acres)	Mississippi																																			
Denison	Missouri						.22				.12			1.01	T.				.33	.20		.57	.10												2.55	
Des Moines**	Des Moines		.20	.24		T.	T.		T.		.12			.19	.01				.57			.42	.01										.01		1.76	
Dubuque**	Mississippi		.19	.29			.17		.10	T.				.23	.06	T.			T.	.36		.07	T.												1.45	
Fairport	Mississippi						.32		.10		.02			.10	.10	.0				.28			.10												1.04	
Fort Dodge	Des Moines		T.	.31			.14			T.				.28	.05				.58	.04		.89	.43												2.72	
Grinnell	Iowa		T.				.18	T.						.27	.02	.05			.23	.12	.02	.75													1.59	
Grundy Center	Cedar		.10	.42							.15			.30	T.	T.			.10	T.		.52													1.59	
Guthrie Center	Raccoon			.31							.24			.52	.05				.24	.18		.60	.27												2.41	
Harlan	Nishnabotna													.85					.40	.31		.90	.27												2.71	
Independence	Wapsipinicon		.03	.21		T.		.11						.13	T.				.02			.11	.04												0.65	
Iowa City	Iowa			.12	T.		.13	T.	T.	T.	.04	T.			.16	T.		.01			.09	.02	T.	.29											0.86	
Iowa Falls	Iowa		.04	.45			.15	.02			.01			.37	.10					.24	T.	.59													1.97	
Jefferson	Raccoon		.03	.50			T.		T.		.08			.45	.03	T.			.38	.11		.38	.10	T.											2.06	
Le Claire	Mississippi		.03	.01			.24	.01	.10	T.	.01			.26	T.		.65			.15	.20		T.	.01											1.04	
Little Sioux	Little Sioux						.09				.22			.60	.02	.05			.56	.55	.01	1.14	.94		.07										4.26	
Logan	Missouri													.10	.58						.47	.60		1.05	.10		.3								3.22	
Marshalltown	Iowa		T.	.53			.06	T.			.13			.32	.24	T.	T.			.19	.01	.6	.09												2.24	
Monroe	Skunk		T.	.14			T.			T.	.04			.37	T.	T.			.30	.12		.55	.04												1.58	
Muscatine	Mississippi			.06			.15		.03	T.				.14	T.						.50	.66	.42													1.36
Olin	Wapsipinicon		T.				.20	T.	.20					.15						T.		.2														0.75
Onawa	Missouri						T.							.10	.58						.47	.60		1.05	.10										3.22	
Perry	Raccoon		.04	.37			.02		.01		.11			.30	.02				.34	.18		.33	.06													1.78
Rockwell City	Raccoon		T.	.20																																

Daily Precipitation for April, 1923—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			.48										.44	.68							.73	.05	.08	.66	.03								3.15	
Albia	Des Moines		.02				T.		T.	T.				.05	.04	T.							.35	.01	.01	.24								0.72	
Atlantic	Nishnabotna		.20								.15			.87	.01								.65		.31	.38								2.57	
Bonaparte	Des Moines		.03						.02					.14								T.		.39					T.					0.61	
Burlington	Mississippi		.14				.34			.10					.12								.31	.11	.15	.04				T.				1.31	
Centerville	Chariton	T.	T.					T.		T.				.10		T.						.29	.02	T.	.45									0.86	
Chariton	Chariton	T.	.17					T.		T.				.25								.57	.05	.60										1.64	
Clarinda	Nodaway													.75									.60	.61										1.96	
Columbus Jct.	Iowa		.08	T.				.04		.01				.08								T.	.45		.83	T.								1.49	
Corning	Nodaway													1.34								.71	.04	T.	.47	.10								2.66	
Corydon	Chariton		.04	T.						T.				.27	T.							.66	.13	.01	.97	.04			T.	T.		.01		2.13	
Creston	Missouri		.31								T.			.60									.81	.50	T.									2.22	
Cumberland (near)	Nodaway		T.	.34							.05			.70	T.							.41	.17	T.	.50	.22	T.	T.						2.39	
Earlham	Des Moines		.32											.69	T.							.48	.17	.37	.07									2.10	
Fairfield	Skunk		.10					.12		.02				.16	T.	T.						.16	.06		.68									1.30	
Glenwood	Missouri		.25											.30									.48	.72		.52								2.27	
Greenfield	Nodaway																						.65	.30		.38	T.							1.78	
Indianola	Des Moines		.11				T.			T.				.34	T.								.14	T.	.59									1.16	
Keokuk**	Mississippi		.02	.05		T.		.20		.10				.03	T.	T.						T.	.14	T.	.59						.05			0.47	
Keosauqua	Des Moines		.04				T.			T.				.10								.05	.02		.26				T.					0.47	
Knoxville	Des Moines		T.	.15							.10			.28		T.							.32	.18		.47								1.59	
Lacona	Des Moines			.10			.05				.04			.28	.05								.38	.07										0.97	
Lamoni	Grand		T.				.03							.46									.46		.93	.06								1.88	
Lenox	Missouri		.25							.03				.75	T.								.57	.05	.05	.55	.14		T.					2.39	
Mt. Ayr	Grand		T.	.32				.01						.11	.62	T.	T.					.81	.05	.04	1.14	.03		T.	T.					3.13	
Mt. Pleasant	Skunk		.06	.02				T.		.12				.09	.05								T.	.13		.64									1.11
Oakland	Nishnabotna		.26											.56	T.								.38	.03	.35	.31									1.89
Oskaloosa	Des Moines		T.	.04				.03		T.		.04		.18	.03	T.							.25	.09	T.	.55	.05		T.						1.26
Ottumwa	Des Moines		.07					.04		T.				.09	.04								.10	.16		.62									1.12
Pella	Skunk		T.	.07				.03		T.	T.			.35	T.	T.							.25	.06		.55									1.31
Sigourney	Skunk		.02	T.				T.		T.		.12		.15	T.	T.							.09	.08		.63									1.09
Stockport	Skunk		.09	T.				.08		.05				.14	.06								.66	.02		.47	.02								0.99
Thurman	Missouri		T.											.15									T.	.88	.41	.12	1.08	T.		T.					2.64
Washington	Skunk		.18					.08		T.		.07											.05	.06		.62									1.66
Wescott (near)	Mississippi		.08					.27		.15				.04	T.								.50		.30						.02				1.35
Winterset	Des Moines		T.	.35										.48	T.								.51	.13		.30	.04								1.81
Omaha, Nebr.***	Missouri		.06	T.							.01			.24	T.	T.							.91	.66	.24	.04					.01				1.57

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.

RIVERS.

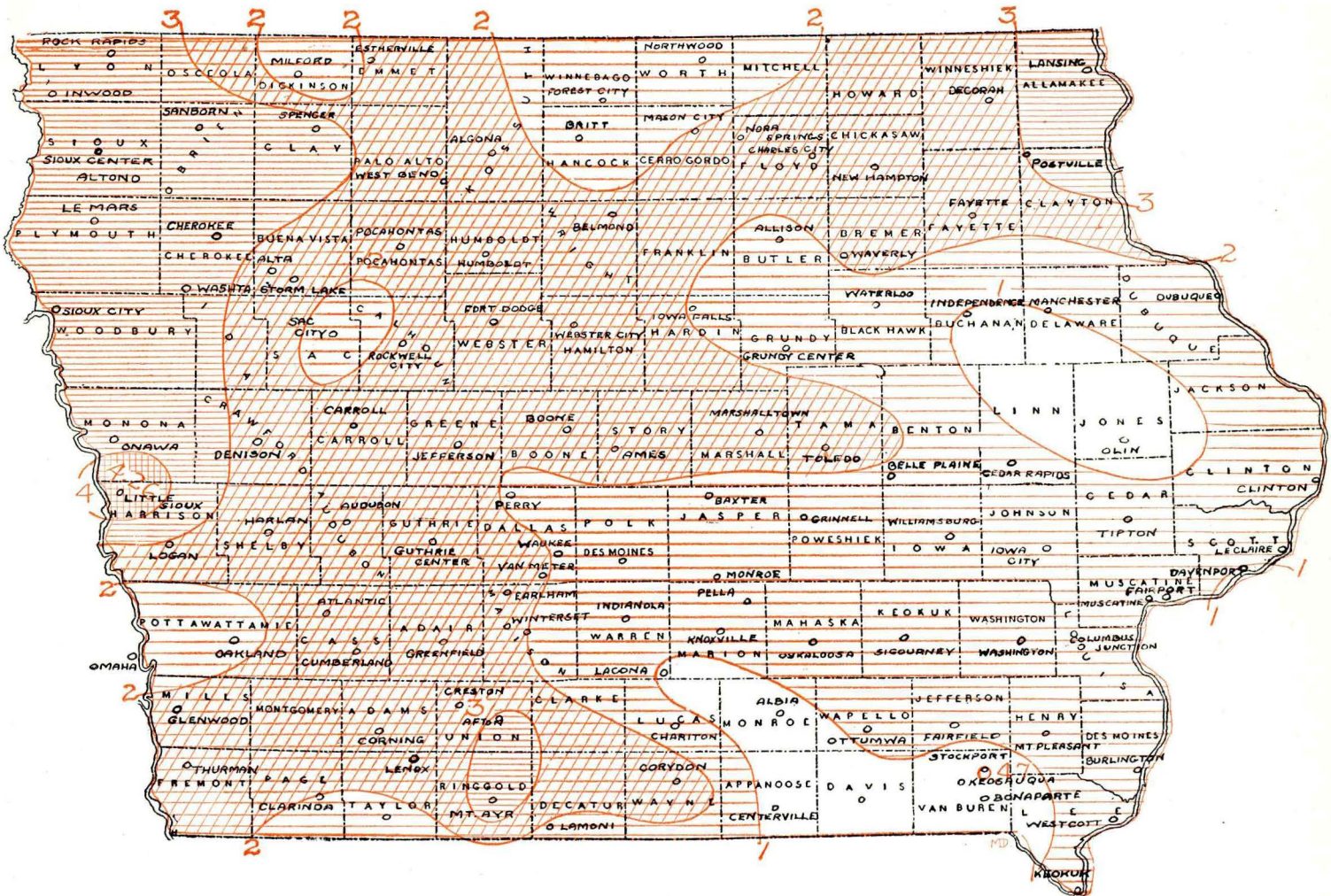
Nearly stationary stages prevailed on both the Mississippi and Missouri rivers, but a moderate rise occurred on the Mississippi during the first week and at the end of the month. A moderate rise occurred on the Missouri the latter part of the second week that continued for several days, after which there was a general falling tendency. There was a general falling tendency on all interior rivers from moderate stages at the beginning of the month. There was no overflowed land to speak of and considerable land that is usually overflowed in April along the Mississippi was plowed during the latter part of the month.

Daily Maximum and Minimum Temperature for the Month of April, 1923.

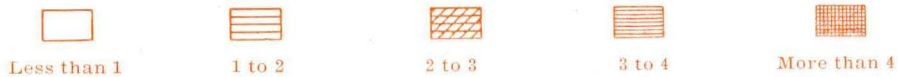
Table with columns for Stations, days 1-31, and Mean. Rows are grouped by division: Northern, Central, and Southern. Each station entry includes maximum and minimum temperature values for each day.

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

TOTAL PRECIPITATION, APRIL, 1923



SCALE OF SHADES—IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In cooperation with

IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXIV DES MOINES, IOWA, MAY, 1923 No. 5

GENERAL SUMMARY

The average temperature for May was 0.9° below the normal and the deficiency was exactly the same in each division. The month opened with a warm spell of three or four days' duration, and during the rest of the month, until the beginning of the last week the temperature was almost continuously below normal, and frost was reported in portions of the state as late as the 25th. A hard freeze occurred over practically the entire State on the morning of the 9th, but fruit buds and tender vegetation suffered only slight injury, due to a relatively strong wind movement and an unusually dry condition of the atmosphere. Reports were generally received and surprise expressed that such low temperatures and hard freezes should occur and such slight damage to vegetation result. Fruit buds that were open were apparently damaged less than those that were just beginning to open. The principal damage to fruit and vegetation was confined chiefly to the western portion of the State where the relative humidity was considerably higher than in the eastern and central portions. Heavy ice formed on exposed water surfaces on the morning of the 9th over much of the State and a heavy sheet was observed in the immediate vicinity of Des Moines at 9:00 a. m. in a vessel while only a few feet away beans and tomato plants were growing unprotected and apparently received no injury though a temperature of 28° was reliably reported. The last week was warm and plant life made rapid growth in this period.

Precipitation was decidedly below normal and the deficiency was uniform over each division, though a few small areas in each division showed an excess, due to locally heavy rains that occurred on the 11th and 29th. Damaging storms were less frequent than is common in May and only a small portion of the State was visited by wind storms, hail, or damaging rains. The only damage of consequence occurred during the general storm that passed over the State on the 11th, over a large portion of Fremont and Page counties and in limited areas in several townships it was heavy. As there were no crops growing over most of the area the damage was slight, but the heavy rain that accompanied the hail washed out a number of bridges. Fruit suffered somewhat from the hail and a number of chickens were reported killed. During the evening of the same day violent wind squalls occurred in Louisa, Des Moines, and Lee counties. Many buildings were unroofed, wires of all kinds broken and street car service was suspended. The damage was greatest around Burlington and the streets were littered with trees blown down and broken limbs.

A tornado developed in Grant township, Mahaska county, on the afternoon of the 29th and was observed by many people, but fortunately no buildings were in its path, which was

very narrow, and the only damage reported was in a field of oats. Where the tail of the funnel reached the ground all plants were lifted out of the ground.

The weather was unfavorable for the development of corn. The ground was too cold for proper germination and much that was planted rotted in the ground and that which came up made poor growth. An unusually large amount of replanting was necessary, yet at the close of the month 96 per cent of the corn planting had been completed, which is about the average.

F. L. D.

PRESSURE

The mean pressure (reduced to sea level) for the State was 29.93 inches. The highest recorded was 30.47 inches at Sioux City, on the 4th, and the lowest was 29.31 inches, at Keokuk, on the 11th. The monthly range was 1.16 inches.

TEMPERATURE

The mean temperature for the State, as shown by the records of 100 stations was 59.6°, or 0.9° lower than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 58.1°, or 0.9° lower than the normal; Central, 59.8°, or 0.9° lower than the normal; Southern, 60.8°, or 0.9° lower than the normal. The highest monthly mean was 62.4°, at Clarinda, and the lowest was 55.9°, at Washta. The highest temperature recorded was 90°, at Pocahontas, on the 26th, and the lowest was 20°, at Britt, on the 9th. The temperature range for the State was 70°.

COMPARATIVE DATA FOR THE STATE—MAY.

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	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	9
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	+3.77	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	99	25	7.34	+2.77	13.21	3.82	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
1922	63.4	+2.9	91	34	3.53	-1.04	8.36	0.47	0	12	13	10	8
1923	59.6	-0.9	90	20	2.84	-1.73	6.55	1.07	T.	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, 1923.

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

Climatological Data for May, 1923—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, etc.), and Prevailing direction of wind.

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.

HUMIDITY

The average relative humidity for the State at 7 a. m. was 70 per cent, and at 7 p. m. it was 50 per cent. The mean for the month was 60 per cent, which is 6 per cent below the normal. The highest monthly mean was 62 per cent at Des Moines and Sioux City, and the lowest was 52 per cent, at Dubuque.

PRECIPITATION

The average precipitation for the State, as shown by the records of 102 stations, was 2.84 inches, or 1.73 inches less than the normal. By divisions, the averages were as follows: Northern, 2.87 inches, or 1.61 inches less than the normal; Central, 2.91 inches, or 1.68 inches less than the normal; Southern, 2.73 inches, or 1.91 inches less than the normal. The greatest amount, 6.55 inches, occurred at Alta, and the least, 1.07 inches, occurred at Mt. Pleasant. The greatest amount in 24 consecutive hours, 3.16 inches, occurred at Des Moines, on the 11-12th.

Table with columns for Stations, Barometric Pressure (Mean, Highest, Date, Lowest), Relative Humidity (Mean, 7 a. m., 12 Noon, 7 p. m., Lowest), Wind (Total movement, Average hourly velocity, Maximum, From, Date), and Sunshine (Per cent of possible, Departure from normal).

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

Daily Precipitation for May, 1923.

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		
Northern Division																																		
Algona.....	Des Moines.....	.04					.45				.48				.98						.11								.61	.12		2.79		
Allison.....	Cedar.....	.05	.06				.11	T.			.11	.16			.27				T.	.20		T.	.05					.08			.12		1.21	
Alta.....	Raccoon.....		.17	.02			.25	.08			.05	.62			.75	.03				.86		T.	.04	T.					1.00	2.05	.63	6.55		
Atton.....	Floyd.....	T.	.21				.04				.17	.24			.33					.42		.11	T.	.02					.20	.73	1.04	3.51		
Belmond.....	Iowa.....	.03	T.				.13	.05			.62	.06			T.	.32				.10		T.								.58	.55		2.49	
Britt..... Iowa..... .06																																		
Charles City***	Cedar.....	.11	.13				.17	.01			.01		T.		.31				.01	.06		.01	.03					T.	.03	.46	T.	1.34		
Cherokee.....	Little Sioux.....	T.	T.	.01			.11	.06			.36	.09			.01	.29				.89		T.	T.	T.					.53	.88	.64	T.	3.87	
Decorah.....	Mississippi.....						.16	.02			.02				.25					.63										.09			1.15	
Estherville.....	Des Moines.....		.10	.09	.10			.30	.10			.03	.25			.15	.10						.40							.02	.35	.15	2.39	
Fayette..... Mississippi..... .40																																		
Forest City.....	Cedar.....		.20	T.			.11	.08	T.		.12				1.04	.21				.05	.03		.10					T.		.30		2.24		
Humboldt.....	Des Moines.....	T.					.08	T.			.67	.32			.17	1.16				.22		T.	T.					T.		.69	.17		3.48	
Inwood.....	Big Sioux.....		.09	.01			.08	.03			.04	.16			.01	.02	.02			.50	.02	.12	.44	.02	.01					.25	1.40	.06	3.28	
Le Mars.....	Floyd.....		.21	T.			.08	.13			.44	.10			T.	.37				.58		.04	.06	T.					.60	1.59	1.70		5.82	
Mason City..... Cedar..... .54																																		
Milford (near).....	Little Sioux.....	.04	.17	.24			.17	.05			.12				T.	.20				.30		.34							.07	.37	.18	.63	2.88	
New Hampton.....	Wapsipinicon.....						.14	.15							.16					.20								.25		.55	.19		1.64	
Nora Springs.....	Cedar.....	.29	.07				.10	.02			.07				.33					.36		.06						.11	.05	1.53			2.99	
Northwood.....	Cedar.....	.40	.15	.03			.15	.05							.75					.13								T.		1.05	.08		2.79	
Oelwein..... Wapsipinicon..... .41																																		
Pocahontas.....	Des Moines.....		.10	.16			.26				.60	.36			.05	.70				.54		T.							.51	.96	.05		4.29	
Postville.....	Mississippi.....						.31	.05			T.				.46					.43		T.	T.							.36			1.61	
Rock Rapids.....	Big Sioux.....	.03	.12	.03			.07	.08			.24				.04					.52		.53	.04					.11		.10	.15	.01	2.07	
Sanborn.....	Floyd.....	.01	.17				.27				.37	.03			.39					.41		.32	.03						.12	.39	.98	.31	3.80	
Sioux Center..... Floyd..... T. .27 T.																																		
Spencer.....	Little Sioux.....	.05	.03	.20			.20	.02			.20	.05			.15					.25		.10							.38	.65	.33	.05	2.66	
Storm Lake.....	Raccoon.....	T.	.02	.30			.34	.07			.93				.75					.35	.03		T.						.32	1.65		.16	4.92	
Washta.....	Little Sioux.....	.04	.02	.12			.21	.10		T.	.50	.14			.05	.46				.72		T.	T.	.05					.02	.33	.28		3.04	
Waverly.....	Cedar.....						.34	.02			.15	.18			.24					.17		.06							.04				1.20	
West Bend..... Des Moines..... .07																																		
Central Division																																		
Ames.....	Skunk.....		.05				.31	T.			.61	.46			.76					.30								T.		T.		2.49		
Audubon.....	Nishnabotna.....						.10	.04			.80	.25			.05	.65				.14	T.		.16					.04	T.	.18			2.41	
Baxter.....	Skunk.....	T.					.19	T.		T.	1.20				.50					.05	.19							.10	T.	.10			2.14	
Belle Plaine.....	Iowa.....						.10	T.			.74	.37			.98	T.				.02	.26		.03					.21	T.	.18			2.71	
Boone.....	Des Moines.....		T.				.23	T.			.05	1.00			.80	.03				.03									.30	.24	.87		3.55	
Carroll..... Raccoon..... .02																																		
Cedar Rapids.....	Cedar.....						.40					2.45			.80	.14				.33				.08						.07	.11		4.40	
Clinton.....	Mississippi.....		.02	.05			.63	.87			.44				.44					.08		.08						T.	.13				2.22	
Davenport***	Mississippi.....		.04	.01				1.53	.14		.09	.19	.06						T.	.62		.08		T.				.54	.06	.01	.31		3.60	
Davenport (Pine Acres)	Mississippi.....																																	
Denison..... Missouri..... .06																																		
Des Moines***	Des Moines.....	.09					.09	.04		.12	2.98	.21			.06	.51	.01			.02		T.						.13	.20	.30	.02		4.78	
Dubuque***	Mississippi.....						.06	.01		T.	.39		T.		.09	.41				T.	.24		T.	T.					.02	.66			1.86	
Fairport.....	Mississippi.....						T.	.08			1.05	.52			.18	.03				.34		T.	T.					T.	.08				2.20	
Fort Dodge.....	Des Moines.....		.21					.07	.71			.51	.20		.51	.20				.08									.25	.81			2.84	
Grinnell..... Iowa..... .22																																		
Grundy Center.....	Cedar.....	T.	T.				.28				.28	.36			.63					.02	T.		.05						.45	.02			2.65	
Guthrie Center.....	Raccoon.....						.04	.04			1.23	.61			.76					.10			.15						.25	.25			3.43	
Harlan.....	Nishnabotna.....		T.	.06			.20				.65	.37			.09	.63				.40			.07	.01					.40	.20	.70		3.78	
Independence.....	Wapsipinicon.....						.14	.04			.44	.37			.78					.14			.11					.71	T.	.12	.12		2.97	
Iowa City..... Iowa..... T. .06																																		
Iowa Falls.....	Iowa.....		.01	.04			.12	.05	T.		.04	.88			.10	.07				T.	.17	.05	T.					T.	.03	.15			1.71	
Jefferson.....	Raccoon.....			T.			.19	.04			1.38	.39			T.	.48				T.		T.							.05	.41	T.		2.94	
Le Claire.....	Mississippi.....						.02	.01			.28	1.60			.26	.08				.05		.52							.27		.12		3.21	
Little Sioux.....	Little Sioux.....	.01		.39			.04				.60	.50			.14	.62				.02	.38		.52			.15				.03			2.88	
Logan..... Missouri..... .10																																		
Marshalltown.....	Iowa.....		T.	T.			.09	.06	T.		.10	1.10			.60	.02				.01		T.							.05	.18			4.23	
Monroe.....	Skunk.....		T.				.12	T.			2.71	.38			T.	.22				T.	T.	T.							T.	T.	.61	T.	4.04	
Muscataine.....	Mississippi.....						.06	.02			.23	1.53			.23	.05				.36											.10			2.58
Olin.....	Wapsipinicon.....						.08	.02		.01	.66	.61			.25					.01	.10													1.74
Onawa..... Missouri..... .17																																		
Perry.....	Raccoon.....			T.			.17				.45	.31			.25	.47				.52			T.	.23					T.	.55	.05		3.00	
Rockwell City.....	Raccoon.....						.20	T.			2.13	.22			.74					.23	.01							T.	.03	.32	.07		3.71	
Sac City.....	Raccoon.....		.03	.05			.06	.03			.61	.43			.10	.87				.23	.01								.65	.42			3.41	
Sioux City***	Raccoon.....						.33	.03			.80				.06	.57							T.						.60	.48			2.95	
	Missouri.....	.17	.23	.10			.05			.01	.56				.19	.17				T.	.72	T.	.05	.04	.04	T.			T.	.65	.61		3.81	
Tipton..... Cedar..... T. .07																																		
Toledo.....	Iowa.....		.23	T.			.23	T.			.57	.35			.53					.03	.15								.03	.05			1.94	
Van Meter.....	Raccoon.....						.26	1.95			.73				.70								.05						.57				3.53	
Waterloo.....	Cedar.....		.11	.16	.01						.73				.42	.28					.02	.02		.07					.40	.01			2.23	
Waukeo.....	Raccoon.....		.18	.01			.10	.05	.01		2.20	.61			T.	.74				T.			T.	T.				.03	.08	.44	.03		4.42	
Webster City..... Des Moines..... .20																																		
Williamsburg.....	Iowa.....						T.	T.			.55	.33			.33					.26	.03							.34		.10	.07		1.63	

Daily Precipitation for May, 1923—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	
Southern Division																																	
Afton	Grand		.09	.03	.23				.07	.09		.63	.25		T.	.65								.33					.20	.02			2.59
Albia	Des Moines								.08	T.	.15	1.05			.30	.05		.02	T.						.04	.10			.05	.27			1.97
Atlantic	Nishnabotna			T.	.11				.08	T.	.03	.64			.72	T.		.02	.11										.02	.33	.22		2.42
Bonaparte	Des Moines								.10	.04		.25	.90		T.	.18	.27		T.	.07	.03							.27	T.			1.93	
Burlington	Mississippi									T.	.14	1.57				.16		.03	T.	.53								T.	.46		2.45	5.62	
Centerville	Chariton							T.	T.		T.	.44	.88		T.	.17	.04		.05				T.		T.			.01	.19	.02	.10	1.90	
Chariton	Chariton							T.	T.			.25	.81		T.	.20			T.	T.								T.	.20	.40		1.86	
Clarinda	Nodaway				.23				T.	T.		T.	1.29			.43	T.		.01	.15			T.	.13	.01	.08			.22	T.		2.57	
Columbus Jct.	Iowa									T.		2.05	.63		T.	.28	.10		.05	T.	.55						1.05		.08		4.79		
Corning	Nodaway		T.								T.	1.30	.30			.36			T.				T.					.51	T.		2.47		
Corydon	Chariton							T.	.02			.31	.90		T.	.10	.02		.02	.02			T.	.02				T.	.06	.07	T.	1.54	
Creston	Missouri			T.	.34				T.	.05		T.	1.08			.50	T.		T.	T.					.08				.18	.38		2.61	
Cumberland (near)	Nodaway		T.	.05					.23	T.		T.	.13	.29		.02	.62			.14			T.	.13					.27	.23		2.11	
Farham	Des Moines			.60						T.		.64	.24			.53			T.						.09				T.	.31		2.41	
Fairfield	Skunk								.06	.05			.75	.47		.01	.09			.03								T.	.03	.23	.02	1.98	
Glenwood	Missouri		.05	.28					.10	T.		.53	.25		.08	.83								.33		.30	T.			.20		2.95	
Greenfield	Nodaway											.80	.26			.48	.10		.01	.01								.15	T.	1.16	.30	3.69	
Indianola	Des Moines		.11	.08	T.			.14	.09			.80	.26			.48	.10		.01	.01								.12	.04	.53		2.37	
Keokuk**	Mississippi								.03		T.	1.22			.08	.01	.18		.06	.10												2.01	
Keosauqua	Des Moines							.01	T.			.65	.61			.03	.12		.10	.08	.02							.36	.03			2.01	
Knoxville	Des Moines								T.	T.		1.68	.46			.38			T.	T.								.15	T.	.59		3.26	
Lacona	Des Moines							.01	.02			.97	.27		.11	.68		.01	.01	.02	.02						.01	.01	.15	.95		3.22	
Lamon	Grand								.05			.05	.43			.11	.01		.02	.01				.01	.45					.05		1.19	
Lenox	Missouri		.05	.16							1.07	.33			.38				.10						.27			.22				2.58	
Mt. Ayr	Grand		T.	.11					.02	.06		T.	.79	.12		T.	.14	T.			.03			T.	.13	T.			T.	.01		1.41	
Mt. Pleasant	Skunk								.33	T.		T.	T.		T.	.11			.16	T.	T.							.31	.04	.12		1.07	
Oakland	Nishnabotna			T.					.30	T.		.62			.73			.89						.26	.02				.09	.29		3.20	
Oskaloosa	Des Moines								.09	.06		2.19	.44		T.	.35	.05		.04	.03							.01	T.	.43		3.69		
Ottumwa	Des Moines								.03	.09		.46	.93			.29	.08		.01									.52	.02	.62		3.05	
Pella	Skunk								T.	.11		2.70				.17	T.			T.							T.	1.50				4.48	
Sigourney	Skunk							.02	.04			2.40	.44		T.	.58	.06		T.	T.								.28		.04		3.86	
Stockport	Skunk							.02	.05			.67	.42		.02	.09	.18		.02	.02	.02						.17	.16	T.	T.		1.79	
Thurman	Missouri		T.	.12	.16							.68	.38		.08	.92		T.					T.	.12					T.	T.		2.95	
Washington	Skunk							.02	.04			1.67	1.52		.20			.06	.23								.35		.11		4.24		
Wescott (near)	Mississippi											2.02				.12	.12		.08	.02								.53		.12		3.01	
Winterset	Des Moines			T.								.75	.40			.65			.03									.05	T.	.30		2.20	
Omaha, Nebr.**	Missouri		T.	.03	T.			.05	.19	.04		.47	.02		.59	.11		T.	.70			T.	.02	.16	T.		.11	T.	.01		2.50		

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 average velocity was 8.6 miles per hour, or 0.1 mile less than the normal. The highest velocity reported from the regular Weather Bureau stations was at the rate of 44 miles per hour, from the north at Sioux City on the 8th, and from the northwest, at Keokuk, on the 11th.

SUNSHINE AND CLOUDINESS

The average per cent of the possible amount of sunshine was 61, which is just the normal for the State. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 64; Davenport, 56; Des Moines, 63; Dubuque 63; Keokuk, 61; Sioux City, 57; Omaha, Nebr., 65.

SNOWFALL

Light snow flurries occurred over most of the State on the 8th, but only two stations reported more than a trace.

MISCELLANEOUS PHENOMENA

Fog: 19th.
Frost: 5th, 8th, 9th, 10th, 12th, 13th, 17th, 25th.
Hail: 1st, 8th, 11th, 19th, 29th.
Halos (lunar and solar): 1st, 2d, 3d, 4th, 5th, 6th, 7th, 9th, 10th, 12th, 13th, 14th, 16th, 17th, 19th, 20th, 21st, 23d, 24th, 31st.
Rainbow: 19th.
Sleet: 8th.
Thunderstorms: 1st, 2d, 3d, 6th, 7th, 8th, 10th, 11th, 12th, 15th, 19th, 20th, 21st, 27th, 28th, 29th, 30th, 31st.
Tornado: 29th.

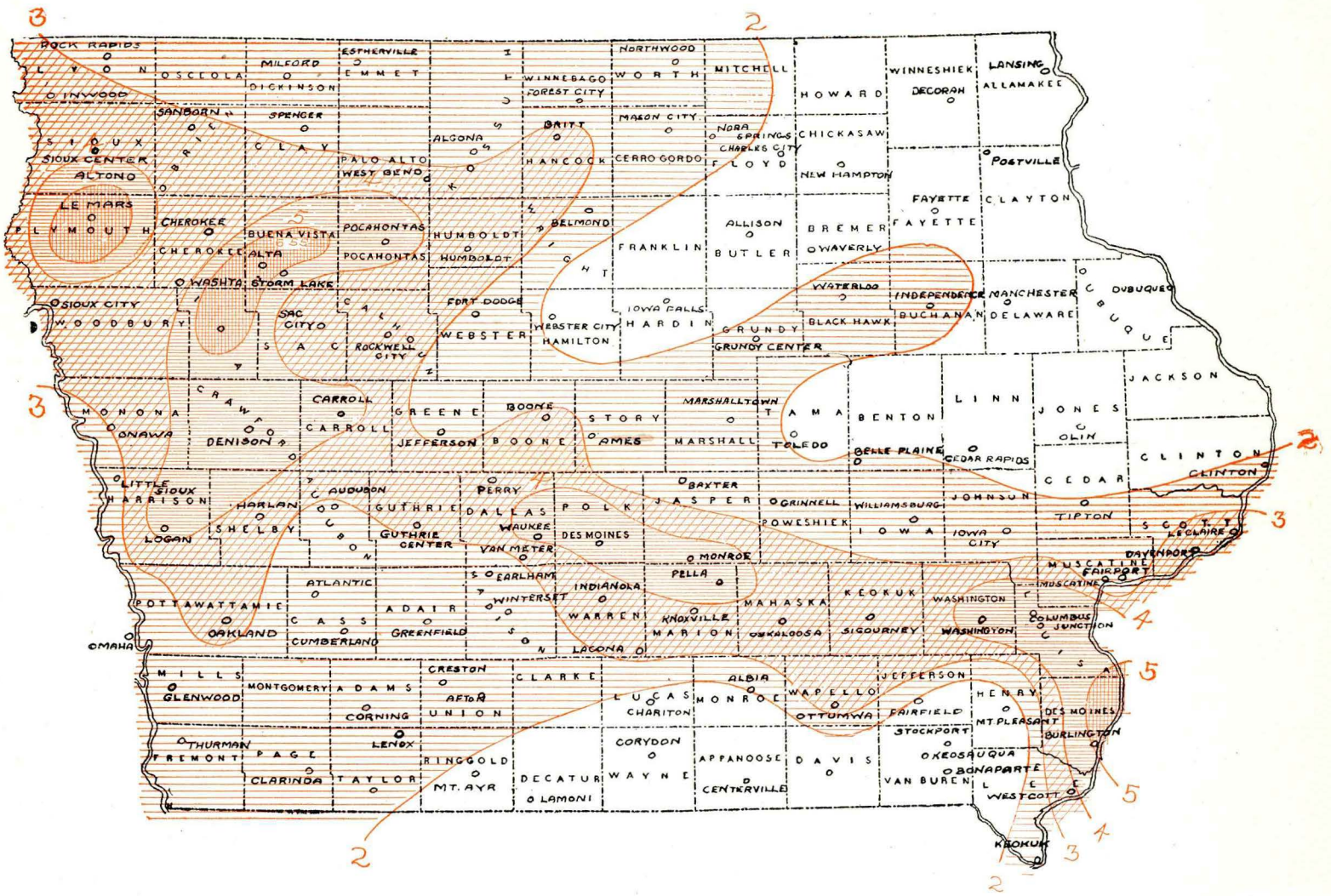
RIVERS

Moderate stages prevailed on the Mississippi River during the first week after which there was a gradual fall and the stage was lower than the average for May. Nearly stationary stages prevailed on the Missouri River. On the interior rivers mostly low stages prevailed though there were a few moderate rises, but the crest stages were much below flood stages.

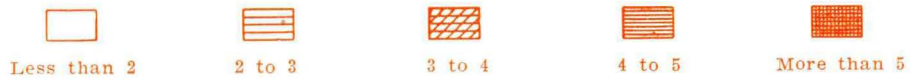
Daily Maximum and Minimum Temperature for the Month of May, 1923.

Stations.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean
Northern Division																																
Algona.....(Maximum.....)	81	72	67	67	71	77	71	58	59	70	63	69	67	69	61	71	66	75	74	64	70	73	73	77	81	81	82	76	79	83	71.1	
.....(Minimum.....)	57	54	52	43	37	45	48	30	27	41	46	34	40	45	48	38	35	50	54	50	51	49	48	48	41	46	58	60	58	61	57	46.8
Alta.....(Maximum.....)	79	65	59	67	73	77	65	46	62	69	57	58	67	69	52	56	70	74	71	72	64	72	70	75	81	84	85	80	76	78	81	69.5
.....(Minimum.....)	54	57	50	42	40	48	41	29	27	43	42	32	40	45	44	35	38	46	54	48	53	52	49	52	47	50	56	59	60	60	63	47.0
Alton.....(Maximum.....)	76	71	65	66	71	72	70	58	63	66	62	60	63	66	54	60	70	72	68	71	68	69	65	72	78	84	84	83	75	76	83	69.7
.....(Minimum.....)	58	56	50	40	35	48	46	30	25	40	46	30	37	44	43	36	34	48	56	48	53	51	50	52	50	44	52	59	58	63	46.5	
Belmond.....(Maximum.....)	78	77	73	69	71	76	65	50	62	72	61	61	67	68	56	60	72	73	77	79	74	72	76	71	82	82	81	84	83	81	81	72.1
.....(Minimum.....)	53	55	54	46	36	42	48	31	25	40	47	37	39	44	47	40	32	43	56	50	50	50	48	48	41	50	56	50	58	61	56	46.2
Charles City.....(Maximum.....)	82	80	76	67	69	74	60	43	57	69	62	58	67	69	56	57	69	61	76	72	65	71	74	73	78	81	80	84	85	76	82	70.1
.....(Minimum.....)	54	56	53	46	38	45	37	32	29	41	47	39	42	45	47	40	34	45	54	50	47	51	47	46	38	44	62	62	64	55	46.5	
Decorah.....(Maximum.....)	80	80	78	69	70	73	59	59	59	71	65	57	68	69	60	55	69	60	76	72	69	70	72	73	80	82	80	82	86	79	82	71.1
.....(Minimum.....)	51	51	52	52	34	41	51	32	30	33	41	41	36	45	47	42	30	41	53	52	42	52	44	60	33	39	59	58	49	60	51	45.2
Forest City.....(Maximum.....)	70	69	62	69	74	72	58	55	65	65	61	54	60	68	51	56	66	66	71	67	67	67	72	68	73	76	71	79	78	73	83	67.5
.....(Minimum.....)	53	52	52	45	42	43	47	29	26	40	45	35	37	43	46	38	35	40	53	48	47	48	45	47	43	48	55	58	54	60	55	45.5
Inwood.....(Maximum.....)	72	78	68	76	77	80	64	51	65	69	59	62	64	66	55	61	75	75	63	71	65	68	67	75	77	83	86	80	74	80	70.4	
.....(Minimum.....)	57	52	48	34	39	47	45	29	21	41	42	29	37	42	45	33	34	49	58	45	51	51	45	52	41	44	53	57	61	57	63	45.2
Mason City.....(Maximum.....)	78	77	71	66	76	70	71	44	56	68	62	56	68	68	53	65	71	63	76	70	62	70	73	72	77	80	74	84	80	74	83	69.7
.....(Minimum.....)	52	53	55	46	45	33	38	29	25	40	43	38	40	43	47	40	30	40	52	50	45	49	44	46	34	39	54	62	51	55	54	44.3
Milford (near).....(Maximum.....)	76	64	61	61	68	75	67	54	58	62	63	57	67	67	55	58	72	69	71	67	69	68	71	74	72	80	80	80	80	78	77	68.1
.....(Minimum.....)	58	54	49	40	37	45	46	29	28	41	44	32	36	42	42	34	42	42	55	50	52	51	49	51	45	52	54	60	57	60	46.4	
New Hampton.....(Maximum.....)	84	83	77	67	72	75	68	55	55	71	64	58	68	73	62	56	71	64	77	72	68	71	75	74	78	84	80	74	83	75	81	71.5
.....(Minimum.....)	50	52	47	37	40	49	30	27	35	45	39	38	42	46	40	34	40	50	46	48	48	44	46	42	50	58	60	59	60	51	45.0	
Northwood.....(Maximum.....)	81	77	72	64	70	72	61	51	57	69	61	57	69	71	59	58	73	73	77	77	77	78	77	80	79	83	80	77	80	77	80	70.3 ^b
.....(Minimum.....)	51	50	53	48	38	48	29	26	37	48	48	36	38	40	45	39	37	43	50	47	49	48	53	42	46	55	59	52	59	53	45.9 ^b	
Pocahontas.....(Maximum.....)	81	70	64	64	72	78	70	58	60	71	57	59	67	69	54	57	72	71	74	73	66	74	75	72	79	80	85	88	77	81	83	71.2
.....(Minimum.....)	57	51	53	43	33	42	48	29	29	39	46	34	36	42	47	37	34	43	55	50	52	43	49	52	39	54	54	58	55	62	60	46.0
Postville.....(Maximum.....)	81	80	76	66	67	73	60	51	55	67	64	58	65	68	59	56	66	58	71	69	67	66	70	71	74	78	78	80	83	75	78	68.7
.....(Minimum.....)	49	54	50	49	37	40	48	31	27	36	42	43	37	46	46	41	35	42	51	51	46	50	43	44	42	47	60	57	54	58	50	45.4
Central Division																																
Belle Plaine.....(Maximum.....)	85	84	78	71	73	77	69	49	63	74	66	62	68	69	59	61	71	72	82	74	72	73	72	71	79	82	74	81	84	81	82	72.8
.....(Minimum.....)	56	57	55	51	37	42	44	34	30	36	51	42	34	49	50	44	36	50	58	55	47	57	48	51	41	49	62	61	59	63	54	48.5
Boone.....(Maximum.....)	83	82	75	68	71	76	70	52	61	74	63	61	66	65	57	58	71	66	80	77	72	73	73	70	80	83	80	82	80	81	84	72.1
.....(Minimum.....)	52	51	56	50	32	36	52	33	26	36	50	41	33	47	49	41	32	47	54	51	45	53	49	53	38	43	51	53	58	62	60	46.3
Carroll.....(Maximum.....)	80	74	70	68	71	76	70	68	66	72	64	58	65	65	55	58	69	71	76	74	73	71	63	72	73	83	82	82	81	84	86	71.8
.....(Minimum.....)	51	52	55	45	38	49	52	31	28	45	49	34	40	49	46	37	40	48	54	49	50	53	49	51	43	46	54	59	59	60	61	47.6
Davenport.....(Maximum.....)	84	81	79	69	68	75	69	49	57	72	58	63	65	66	56	61	68	64	81	73	71	69	72	71	80	78	73	81	84	81	84	71.0
.....(Minimum.....)	53	58	54	51	44	45	49	35	33	49	49	44	40	52	52	45	43	52	57	57	50	51	49	49	50	57	61	63	59	62	56	50.5
Des Moines.....(Maximum.....)	81	80	76	68	70	73	66	48	53	74	58	59	66	64	54	57	69	66	80	75	71	68	69	68	79	82	74	81	79	81	85	70.3
.....(Minimum.....)	58	59	53	51	46	47	48	35	32	44	50	45	41	52	49	43	41	50	56	53	55	54	51	54	50	54	60	62	63	65	63	51.1
Dubuque.....(Maximum.....)	82	78	78	68	68	74	63	47	55	68	64	61	64	66	54	59	67	64	80	70	69	68	72	71	79	81	78	83	85	82	83	70.4
.....(Minimum.....)	56	60	55	52	44	43	45	32	34	39	48	44	40	51	50	48	41	48	56	54	49	53	48	50	45	50	62	63	59	61	54	49.5
Fort Dodge.....(Maximum.....)	84	80	72	70	73	77	70	60	59	72	65	58	68	69	59	58	72	68	77	75	69	73	75	73	78	83	85	83	80	80	84	72.5
.....(Minimum.....)	57	47	55	46	34	43	50	30	27	40	47	36	38	47	47	38	34	45	54	49	52	52	47	51	38	45	53	57	57	61	58	46.3
Grinnell.....(Maximum.....)	84	82	80	74	72	75	71	61	58	72	68	58	67	67	60	58	70	65	81	77	72	72	73	71	81	83	80	84	83	84	86	73.2
.....(Minimum.....)	53	56	56																													

TOTAL PRECIPITATION, MAY, 1923



SCALE OF SHADES—IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In cooperation with
IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXIV DES MOINES, IOWA, JUNE, 1923 No. 6

GENERAL SUMMARY.

Both the temperature and precipitation averaged slightly above the normal for June. The month opened with a moderately warm period and there were four well defined alternately warm and cool periods during the month, with the warm periods predominating. The most pronounced warm period extended from the 15th to the 26th, inclusive, and maximum temperatures were 90 degrees, or above, over portions of the State for a larger number of consecutive days than were ever before experienced in June. This warm period came to an abrupt end and unusually low temperatures were general on the 29th, a number of stations reporting the lowest temperature of record so late in the month. The high temperatures were very trying on man and beast, due to a relatively high humidity. Heat prostrations were more numerous than usual and a large number of horses succumbed to the heat.

The rainfall was well distributed throughout the month and unusually heavy downpours were lacking except in small scattered areas, and there were no areas with unusually heavy totals. There were large areas in the northeastern and southern portions of the State where the rainfall was not sufficient for agricultural needs, which greatly reduced the hay crop and injuriously affected oats and spring wheat, causing them to prematurely ripen. Hail occurred on an unusually large number of days over a large portion of the state. However, the storms, as a rule, were lighter than usual and the damage, considering the number of storms, was light. The greatest damage was confined to a series of storms that were active on the 27th and the greatest damage was done in Iowa, Boone, Fremont, Taylor, Adams, Ringgold and Clarke counties. Local wind squalls were also very numerous during the period from the 23d to 27th. The principal damage was to crops and much corn was blown down and small grain badly lodged. There was considerable property damage in Sioux county, as silos were blown down in all parts of the county, trees uprooted and many small buildings wrecked. Over the northeastern portion of the State there was also considerable damage to electric and telephone wires. In Linn county 500 telephone poles were reported broken off and many wires were put out of commission. Six deaths were caused by lightning and one death was caused by a live wire broken during a wind storm.

Corn, which got off to a poor start in May, was further hindered in the early part of June, as the frequent rains prevented cultivation and many fields were overrun with weeds and in some fields it was impossible to distinguish the rows of corn. Replanting continued till after the middle of the month and some corn was just coming through the ground as others had been cultivated the second and third time. During the hot period from the 15th to the 26th corn made unusually rapid growth and the condition of the crop in general was well up to average and most fields were free of weeds by the end of the month.

F. L. D.

PRESSURE.

The mean pressure (reduced to sea level) for the State was 29.93 inches. The highest recorded was 30.33 inches, at Charles City and Dubuque on the 8th, and the lowest was 29.48 inches, at Dubuque on the 25th. The monthly range was 0.85 inch.

HUMIDITY.

The average relative humidity for the State at 7 a. m. was 81 per cent, and at 7 p. m. was 63 per cent. The mean for the month was 72 per cent, or 2 per cent above the normal. The highest monthly mean was 76 per cent, at Des Moines, and the lowest was 68 per cent, at Dubuque.

TEMPERATURE.

The mean temperature for the State, as shown by the records of 98 stations, was 70.9°, or 1.9° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 69.9°, or 2.3° higher than the normal; Central, 71.2°, or 1.9° higher than the normal; Southern, 71.6°, or 1.3° higher than the normal. The highest monthly mean was 74.0°, at Keokuk, and the lowest was 68.3°, at Milford. The highest temperature reported was 100°, at Clarinda on the 25th, and the lowest was 40°, at Inwood on the 9th and at Washta on the 29th. The temperature range for the State was 60°.

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 42 miles per hour from the southeast, at Sioux City on the 18th.

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	-0.06	9.26	0.98	-----	10	11	11	8
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	1.93	-----	10	10	12	8
1898	71.4	+2.3	99	42	4.72	+0.34	12.48	1.00	-----	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	0.78	-----	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
1922	72.2	+3.1	104	38	1.82	-2.56	7.19	0.28	-----	6	19	8	3
1923	70.9	+1.8	100	40	4.93	+0.55	7.69	2.43	-----	12	14	10	6

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



Climatological Data for June, 1923.

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
Northern Division																				
Algona	Kossuth	1,213	50	70.6	+ 2.5	93	24	45	29	27	5.13	+0.69	1.30	0	14	20	4	6	se.	W. E. Laird.
Allison	Butler	1,044	11	70.9	-----	94	25	41	8	33	5.16	-----	1.90	0	10	9	16	5	sw.	J. A. Bell.
Alta	Buena Vista	1,513	32	68.8	+ 1.2	91	24	46	29	25	6.85	+1.94	1.74	0	14	13	12	5	sw.	D. E. Hadden.
Alton	Sioux	1,305	18	69.6	+ 1.9	94	24	41	29	31	4.38	-----	1.78	0	12	10	12	4	sw.	W. S. Stagle.
Belmond	Wright	1,205	13	70.7	-----	95	24	43	29	30	4.34	-----	1.55	0	11	2	25	3	sw.	Geo. P. Hardwick.
Britt	Hancock	1,236	26	70.0	+ 2.6	93	24	41	8	42	4.48	+0.49	1.17	0	11	11	15	4	s.	L. M. Goodman.
Charles City	Floyd	1,015	32	70.5	+ 1.7	94	24	45	29	26	3.65	-1.45	0.98	0	11	14	11	5	sw.	U. S. Weather Bureau.
Cherokee	Cherokee	1,196	1	68.6	-----	90	23†	42	29	30	5.02	-----	1.34	0	15	14	9	4	sw.	J. E. Wirth.
Decorah	Winneshek	875	30	71.2	+ 2.7	95	23	43	8	32	2.70	-1.54	0.62	0	9	16	10	4	sw.	M. D. Whitney.
Estherville	Emmet	1,298	28	68.7	+ 2.4	92	24	45	29	30	5.40	+0.69	1.80	0	10	14	15	1	s.	A. O. Peterson.
Fayette	Fayette	1,003	33	70.2	+ 3.4	95	24†	42	12	36	2.71	-2.00	0.59	0	10	20	6	4	s.	R. Z. Latimer.
Forest City	Winneshago	1,226	29	69.9	+ 2.4	94	24	45	29	29	3.31	-.91	1.22	0	9	10	14	6	sw.	Dr. M. B. Neil.
Humboldt	Humboldt	1,095	35	70.6	+ 2.5	96	24	44	29	30	5.02	+1.19	1.87	0	14	14	10	6	sw.	H. C. Snitkey.
Inwood	Lyon	1,474	19	69.4	+ 1.8	94	24	40	9	33	3.26	-1.89	0.85	0	11	18	4	8	sw.	F. B. Hanson.
Le Mars	Plymouth	1,224	27	69.7	+ 1.6	94	24	42	29	30	5.89	+1.53	1.56	0	13	18	6	6	sw.	Mrs. M. C. Woolley.
Mason City	Cerro Gordo	1,148	26	70.1	+ 2.7	96	24	42	8†	33	3.81	-1.27	1.18	0	8	11	13	6	sw.	Northern Sugar Corp.
Milford (Near)	Dickinson	1,430	3	68.3	-----	89	24	47	29	23	4.64	-----	1.51	0	13	8	14	8	sw.	Dr. F. J. Smith.
New Hampton	Chickasaw	1,169	26	70.7	+ 3.5	96	24	46	29	32	5.20	+1.26	1.88	0	12	13	14	3	s.	A. F. Kemman.
Nora Springs	Floyd	1,064	11	71.3	-----	95	24	42	29	32	4.59	-----	1.01	0	13	13	13	4	s.	Arthur Betts.
Northwood	Worth	1,222	27	70.4 ^b	+ 3.6	93 ^b	24	41 ^c	28	30 ^c	4.73	+0.11	1.40	0	9	9	17	4	sw.	Chas. Dwelle.
Oelwein	Fayette	1,036	0	70.6	-----	93	23†	45	29	27	7.69	-----	1.76	0	12	23	3	4	s.	John T. Ridler.
Pocahontas	Pocahontas	1,248	19	69.6	+ 2.5	95	24	44	29	29	6.65	+2.34	1.67	0	13	15	10	5	sw.	F. E. Hronek.
Postville	Clayton	1,180	24	68.6	+ 2.0	89	24†	46	8†	26	2.43	-1.98	0.58	0	8	12	15	3	sw.	F. L. Williams.
Rock Rapids	Lyon	1,358	24	69.8	+ 1.8	95	24	41	29	36	3.88	-0.43	1.26	0	12	18	8	4	sw.	J. K. Medberry.
Sanborn	O'Brien	1,553	9	69.1	-----	95	24	42	29	31	4.93	-----	1.31	0	11	12	12	6	s.	J. W. Dow.
Sioux Center	Sioux	1,426	24	68.7	+ 1.5	92	24	43	29	30	4.54	+0.58	1.15	0	13	16	4	10	s.	J. de Ruyter.
Spencer	Clay	1,319	9	70.2	-----	95	24	43	29	32	4.66	+1.19	1.17	0	11	14	11	5	sw.	Geo. W. Little.
Storm Lake	Buena Vista	1,440	34	69.2	+ 1.6	91	24	45	29	29	7.30	+2.92	1.99	0	11	17	9	4	s.	E. H. Fracker.
Washa	Cherokee	1,157	25	68.4	+ 1.0	90	23†	40	29	26	7.67	+3.59	1.92	0	15	15	7	8	s.	H. L. Felter.
Waverly	Bremer	948	27	71.4	+ 3.7	97	24	44	29	29	4.31	+0.29	1.63	0	12	24	4	2	sw.	D. H. Murphy.
West Bend	Palo Alto	1,197	30	70.6	+ 2.4	93	23	49 ^a	7†	32 ^a	6.23	+2.06	1.88	0	12	11	15	4	s.	Jos. Dorweiler.
Means and extremes				69.9	+ 2.3	97	24	40	9†	42	4.88	+0.45	1.99	0	12	14	11	5	s.	
Central Division																				
Ames	Story	926	46	71.0	+ 1.8	96	24	47	29	35	5.29	+0.75	1.61	0	7	14	10	6	s.	Iowa State College.
Audubon	Audubon	1,297	29	69.4	+ 1.2	94	24	43	29	29	5.32	+1.49	1.82	0	11	15	8	7	s.	Geo. Kibby.
Baxter	Jasper	998	23	70.8	+ 1.8	94	25	46	29	29	7.45	+3.28	2.47	0	12	12	13	5	s.	Henry Geise.
Belle Plaine	Benton	886	33	71.8	+ 2.8	97	23†	43	29	33	4.20	+0.15	1.21	0	13	12	13	5	s.	O. C. Burrows.
Boone	Boone	1,134	18	70.0	+ 1.0	95	25	43	29	33	5.85	+1.17	2.37	0	10	14	9	7	s.	C. F. Henning.
Carroll	Carroll	1,265	33	69.8	+ 2.0	92	24†	42	29	31	6.79	+2.01	2.15	0	13	19	4	7	sw.	Mrs. Jos. J. Wolfe.
Cedar Rapids	Linn	737	41	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	H. F. Paar.
Clinton	Clinton	593	50	73.0	+ 2.6	98	24	46	29	31	4.52	+0.22	1.40	0	10	22	5	3	s.	Dr. A. P. Bryant.
Davenport	Scott	580	52	73.7	+ 3.2	98	24	50	29	27	6.03	+1.92	1.70	0	12	11	11	8	s.	U. S. Weather Bureau.
Davenport (Pine Acres)	Scott	690	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	Alfred C. Hansen.
Denison	Crawford	1,171	29	69.6	+ 1.5	90	24	42	29	28	5.13	+1.14	1.35	0	13	16	10	4	sw.	V. L. Byers.
Des Moines	Polk	861	45	72.0	+ 1.6	96	25	50	29	25	4.95	-0.01	1.22	0	11	7	12	11	s.	U. S. Weather Bureau.
Dubuque	Dubuque	698	50	72.7	+ 3.3	97	24	48	29	33	3.66	-0.89	0.91	0	14	11	9	10	s.	U. S. Weather Bureau.
Fairport	Muscatine	567	2	72.5	-----	96	24	47	29	25	4.70	-----	1.22	0	10	14	10	6	s.	Bureau of Fisheries.
Fort Dodge	Webster	1,114	23	70.2	+ 1.6	96	24	43	29	30	4.18	0.0	1.25	0	11	21	5	4	sw.	Samuel Sampson.
Grinnell	Poweshiek	1,031	29	72.2	+ 2.2	97	24†	47	29	30	5.87	+1.55	1.52	0	13	11	13	6	sw.	Paul P. Meyers.
Grundy Center	Grundy	976	32	71.2	+ 2.4	95	24†	45	8	30	4.81	-0.21	1.46	0	12	18	6	6	sw.	M. G. Heiberger.
Guthrie Center	Guthrie	1,075	28	69.7	- 0.1	93	24†	44	29	30	5.89	+1.68	1.45	0	11	19	5	6	s.	E. L. Nesselroad.
Harlan	Shelby	1,192	24	70.2	+ 1.9	95	24	43	29	30	6.28	+1.99	2.20	0	13	21	7	2	s.	W. K. Colburn.
Independence	Buchanan	921	59	71.8	+ 4.1	93	24†	44	29	32	5.70	+1.21	1.43	0	13	18	4	8	sw.	Dr. Geo. Boody.
Iowa City	Johnson	733	63	71.6	+ 1.8	95	24	45	29	30	6.21	+1.76	0.94	0	11	12	9	9	s.	Prof. J. F. Reilly.
Iowa Falls	Hardin	1,107	30	70.2	+ 2.9	94	25	43	8	30	3.44	-1.96	1.88	0	10	16	6	8	s.	J. B. Parmelee.
Jefferson†	Greene	1,052	24	69.9	+ 0.9	92	24	42	29	29	5.37	-----	2.13	0	9	12	10	8	sw.	W. I. Lyon.
Little Sioux	Harrison	1,049	18	70.7	+ 0.4	95	24	41	29	31	4.63	-----	1.81	0	10	11	11	8	sw.	G. H. Gibson.
Logan	Harrison	1,035	56	70.0	0	93	24	43	29	26	7.53	+2.29	2.72	0	9	14	10	6	sw.	Mary Jean Stern.
Marshalltown	Marshall	947	31	72.4	+ 3.2	97	24	47	29	28	6.56	+2.30	1.64	0	12	19	5	6	sw.	C. C. Pigman.
Monroe	Jasper	922	11	71.8	-----	96	25	48	29	30	4.96	-----	1.70	0	7	20	3	7	s.	J. A. Dibel.
Olin	Jones	760	24	71.8	+ 2.6	98	24	44	29	33	4.73	+1.41	2.43	0	6	19	5	6	sw.	Mrs. L. Stingley.
Onawa	Monona	1,051	23	70.0	-----	94	23	43	29	28	4.82	+0.24	1.73	0	8	17	1	12	s.	Mrs. H. E. Colby.
Perry	Dallas	975	22	71.4	+ 1.6	96	25	44	29	29	4.36	-0.23	1.26	0	9	18	8	4	s.	F. N. Bartlett.
Rockwell City	Calhoun	1,134	27	-----	-----	-----	-----	44	29	-----	4.12	-----	0	-----	-----	-----	-----	-----	-----	A. W. McIsaac.
Sac City††	Sac	1,344	47	69.2 ^a	+ 1.2	91 ^c	24	47 ^c	29	2										

Climatological Data for June, 1923—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	29	71.1	+ 0.3	97	25	46	29	28	4.48	-0.46	0.90	0	14	15	9	6	sw.	S. R. Brown.
Albia.....	Monroe.....	959	25	72.3	+ 2.8	98	24	45	29	29	5.78	+1.66	1.45	0	12	14	3	13	sw.	O. E. McBride.
Atlantic.....	Cass.....	1,164	32	70.3	+ 0.7	94	25	44	29	28	4.40	-0.72	0.93	0	14	12	11	7	s.	J. N. Reynolds.
Bonaparte.....	Van Buren.....	.....	32	72.2	+ 1.8	96	24	47	29	27	3.81	-0.43	1.30	0	10	19	8	3	s.	B. R. Vale.
Burlington.....	Des Moines.....	544	27	73.5	+ 1.6	98	24	50	29	26	3.75	-0.64	0.90	0	12	17	8	5	sw.	Mrs. E. M. Donnelly.
Centerville.....	Appanoose.....	1,013	18	71.2	-----	95	25	47	29	29	4.01	-0.17	0.98	0	12	12	11	7	sw.	Leo. J. Allen.
Chariton.....	Lucas.....	1,042	28	71.0	+ 2.3	97	25	47	29	32	3.19	-1.09	0.75	0	10	12	8	10	s.	O. C. Burr.
Clarinda.....	Page.....	1,009	33	71.8	+ 1.8	100	25	49	29	27	4.45	-0.37	0.97	0	13	10	14	6	se.	A. S. Van Sandt.
Columbus Jet.....	Louisa.....	595	22	72.8	+ 1.8	94	24	48	29	27	6.33	+2.17	1.65	0	13	24	3	3	s.	J. B. Johnston.
Corning.....	Adams.....	1,117	31	69.4	0	96	25	45 ^a	29	30 ^a	6.63	+2.53	1.26	0	13	14	7	9	sw.	Jerome Smith.
Corydon.....	Wayne.....	1,101	30	71.9	+ 1.6	97	25	46	29	29	4.41	+0.12	1.53	0	12	13	7	10	se.	May C. Miller.
Creston.....	Union.....	1,312	18	70.4	+ 1.9	93	25	47	29	24	4.97	-1.09	1.13	0	12	12	12	6	s.	Mrs. H. M. Stanley.
Cumberland (Near).....	Cass.....	1,225	24	-----	-----	-----	-----	-----	-----	-----	4.09	-0.35	0.80	0	13	10	12	8	s.	Carl E. Pollock.
Earlham.....	Madison.....	1,126	21	69.8	+ 2.1	94	24	43	29	28	4.58	+0.34	0.76	0	14	17	6	7	sw.	Geo. Phillips.
Fairfield.....	Jefferson.....	780	39	72.2	+ 1.5	99	24	46	29	31	5.06	+0.29	1.92	0	9	8	12	10	s.	Prof. R. M. McKenzie.
Glenwood.....	Mills.....	1,100	25	71.4	-----	93	24	43	29	28	6.92	-----	1.48	0	12	13	12	5	se.	Dr. Geo. Mogridge.
Greenfield.....	Adair.....	1,368	31	-----	-----	-----	-----	-----	-----	-----	3.54	-0.93	1.00	0	13	9	15	6	-----	C. E. McCaslen.
Indianola.....	Warren.....	972	32	71.0	+ 0.7	95	25	48	29	27	4.18	-0.28	0.95	0	11	13	13	4	sw.	Seth F. Shenton.
Keokuk.....	Lee.....	614	52	74.0	+ 1.5	96	23	51	29	24	3.17	-1.18	1.45	0	12	8	16	6	s.	U. S. Weather Bureau
Keosauqua ^{††}	Van Buren.....	644	31	72.2	+ 0.9	97	25	45	29	29	5.33	+1.30	1.50	0	11	12	9	9	se.	J. H. Landes.
Knoxville.....	Marion.....	920	28	71.8	+ 0.7	97	25	47	8	28	5.07	+1.12	1.48	0	10	15	4	11	se.	W. J. Casey.
Lacona.....	Warren.....	24	-----	-----	-----	-----	-----	-----	-----	-----	3.54	-0.93	1.00	0	13	9	15	6	-----	J. B. Alter.
Lamoni.....	Decatur.....	1,123	16	70.6	- 0.3	98	25	45	29	31	3.78	-1.13	1.55	0	12	12	13	5	se.	C. E. Wight.
Lenox.....	Taylor.....	1,250	28	71.0	+ 1.4	97	25	48	29	28	6.33	+2.27	1.62	0	13	14	11	5	s.	J. L. Hurley.
Mt. Ayr.....	Ringgold.....	1,245	30	70.4	- 0.2	95	25	47	29	25	4.70	-0.14	0.98	0	15	13	9	8	s.	Alex Maxwell.
Mt. Pleasant.....	Henry.....	729	42	73.2	+ 1.8	97	23	48	28	29	4.45	-0.66	1.94	0	11	6	18	6	nw.	J. H. Jericho.
Oakland.....	Pottawattamie.....	1,105	4	71.8	-----	96	24	43	29	29	6.77	-----	1.32	0	13	14	4	12	s.	M. E. Gray.
Oskaloosa.....	Mahaska.....	825	47	71.0	+ 0.8	96	24	48	29	27	4.40	+0.53	1.76	0	11	9	9	12	sw.	Roy R. Robinson.
Ottumwa.....	Wapello.....	649	28	73.6	-----	96	23	49	29	31	4.38	+0.55	1.60	0	10	19	5	6	sw.	C. L. Mikesh.
Pella.....	Marion.....	877	30	70.2	- 0.2	95	25	46	29	28	5.26	+1.77	1.76	0	9	18	2	10	s.	J. H. Ver Steeg.
Sigourney.....	Keokuk.....	790	27	71.6	+ 0.8	95	24	47	29	26	6.10	+2.21	1.53	0	10	16	3	11	s.	W. E. Utterback.
Stockport.....	Van Buren.....	754	21	71.5	+ 0.9	96	24	48	8	29	4.16	-0.39	1.65	0	10	16	8	6	s.	C. L. Beswick.
Thurman.....	Fremont.....	975	26	72.8	+ 1.5	95	24	44	29	27	4.40	-1.21	1.30	0	10	0	28	2	sw.	C. R. Paul.
Washington.....	Washington.....	769	41	71.8	+ 0.8	94	24	47	29	26	7.13	+3.25	2.19	0	12	9	15	6	sw.	Wm. A. Cook.
Wescott (Near).....	Lee.....	769	1	71.8	-----	93	24	50	8	24	3.41	-----	1.55	0	10	10	10	10	s.	Geo. H. Smith.
Winterset.....	Madison.....	1,129	32	71.4	+ 1.2	97	25	45	29	29	4.04	-0.99	0.97	0	11	17	9	4	sw.	H. S. Ely.
Omaha, Nebr.....	-----	1,103	52	72.4	+ 0.8	97	24	51	29	25	6.00	+0.95	2.17	0	12	5	15	10	se.	U. S. Weather Bureau.
Means and extremes.....	-----	-----	-----	71.6	+ 1.3	100	25	43	29	32	4.80	+0.41	2.19	0	12	13	10	7	s.	-----
State means and extremes.....	-----	-----	-----	70.9	+ 1.8	100	25	40	9	42	4.93	+0.55	2.72	0	12	14	10	16	s.	-----

The departure from normal temperature and precipitation are computed only for such stations as have ten or more years of record, but tall 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		Lowest	Date	Total movement	Average hourly velocity		Maximum		Per cent of possible	Departure from normal	
						7 a. m.	7 p. m.				Miles	From	Date				
						12 Noon	7 p. m.				Direction	Date					
Charles City.....	29.93	30.33	8	29.55	25	80	60	67	43	29	4,197	5.8	27	w.	19	72	+ 5
Davenport.....	29.95	30.31	8	29.57	27	78	55	59	37	29	4,750	6.6	30	sw.	6	66	- 5
Des Moines.....	29.91	30.28	8	29.53	27	85	62	66	37	26	4,808	6.7	32	nw.	5	52	- 9
Dubuque.....	29.95	30.33	8	29.48	25	78	52	58	35	29	3,827	5.3	34	nw.	25	62	+ 4
Keokuk.....	29.94	30.28	8	29.52	27	77	55	62	33	9	4,529	6.3	29	sw.	4	70	- 4
Sioux City.....	29.90	30.25	8	29.57	27	84	62	63	38	25	8,325	11.6	42	se.	18	54	- 10
Omaha, Neb.....	29.90	30.24	8	29.57	27	84	67	66	38	25	5,115	7.1	39	w.	27	66	- 2
Means and extremes.....	29.93	-----	-----	-----	-----	81	59	63	-----	-----	-----	7.1	-----	-----	-----	65	- 3
Normals and records.....	29.93	30.33	8	29.48	25	-----	33	9	-----	-----	-----	42	se.	18	-----	-----	
	-----	*30.61	1913	\$29.04	1880	79	-----	60	-----	-----	7.6	-----	22	w.	29	68	-----
	-----	-----	-----	-----	-----	114	1894	-----	-----	-----	-----	85	w.	-----	-----	-----	-----

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

Daily Precipitation for June, 1923—Continued.

Table with columns for Stations, Drainage, Day of Month (1-31), and Totals. Rows list various Iowa locations like Afton, Albia, Atlantic, etc., and their corresponding precipitation data.

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.

PRECIPITATION.

The average precipitation for the State, as shown by the records of 101 stations, was 4.93 inches, or 0.55 inch more than the normal. By divisions, the averages were as follows: Northern, 4.88 inches, or 0.45 inch more than the normal; Central, 5.12 inches, or 0.80 inch more than the normal; Southern, 4.80 inches, or 0.41 inch more than the normal. The greatest amount, 7.69 inches, occurred at Oelwein, and the least, 2.43 inches, occurred at Postville. The greatest amount in 24 consecutive hours, 2.72 inches, occurred at Logan on the 18th.

SUNSHINE AND CLOUDINESS.

The average per cent of the possible amount of sunshine was 65, or 3 per cent below the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 72; Davenport, 66; Des Moines, 58; Dubuque, 68; Keokuk, 70; Sioux City, 54; Omaha, Neb., 66.

RIVERS.

Low stages prevailed on the Mississippi river with very little fluctuation. Moderate stages prevailed on the Missouri river with considerable fluctuation. Crest stages were much below the flood stages on all rivers.

MISCELLANEOUS PHENOMENA.

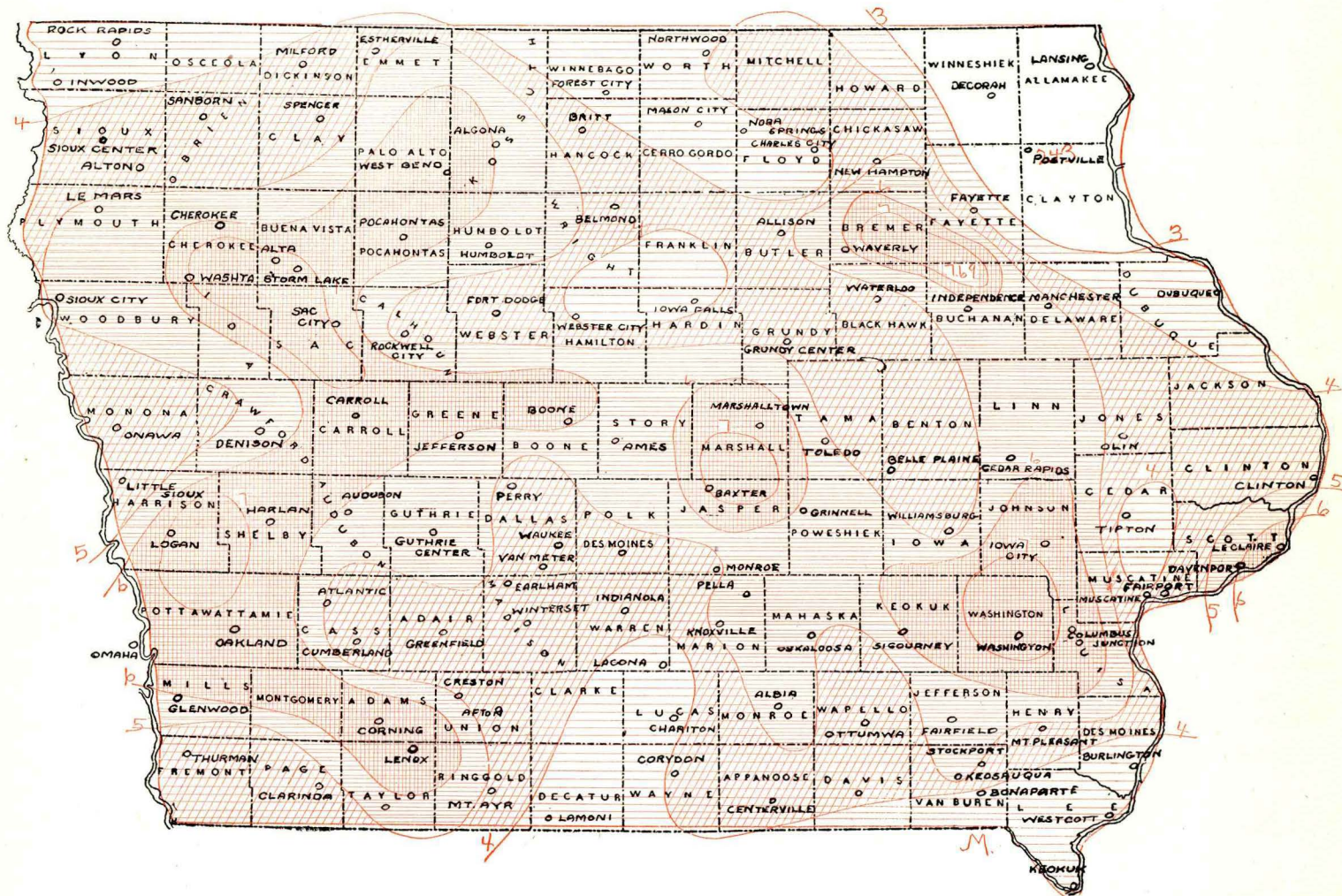
- Aurora: 16th, 18th, 19th, 20th, 21st, 22d, 23d, 24th, 25th, 28th.
Fog: 8th, 12th, 14th, 15th, 16th, 18th, 30th.
Hail: 1st, 2d, 6th, 8th, 12th, 16th, 18th, 19th, 23d, 24th, 26th, 27th, 28th.
Halos (lunar and solar): 1st, 6th, 14th, 19th.
Rainbows: 4th, 12th, 20th.
Thunderstorms: All days during the month except on the 13th, 16th, 29th.

Daily Maximum and Minimum Temperature for the Month of June, 1923.

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

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

TOTAL PRECIPITATION JUNE, 1923



SCALE OF SHADES—IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In cooperation with
IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXIV DES MOINES, IOWA, JULY, 1923 No. 7

GENERAL SUMMARY

July was warm and dry. Since 1890, when state-wide records commenced, there has been but one July that was drier and only five times has the mean temperature been higher.

The month opened cool and the first four days were below normal, but from the 5th to the 25th the temperature was almost continuously above normal. The excess in temperature was general throughout the state except at two stations in the extreme southern portion, being greatest in the northern and least in the southern division. Most of the stations with temperatures of 100°, or higher, were in the northern division.

The precipitation was deficient over the entire state except at two stations in the northern and three in the southern division. The first two weeks were favorable for the development of all crops and beneficial showers occurred at frequent intervals, but there was considerable damage due to hail and strong wind at some sections of the state almost daily during the first ten days. The greatest damage from hail occurred in the northeastern and east central divisions, and the damage was especially severe in Mitchell and portions of Howard, Floyd, Chickasaw, Bremer, and Winneshiek counties on the 7th. In many corn fields only the naked stalks were standing and some oat fields were beaten down so completely that it was impossible to tell that there had been crops growing on them. The principal damage from wind occurred in the western portion of the state on the 10th, and the greatest damage reported occurred in Lyon county, where the damage to crops was estimated at near \$200,000. Crops also suffered somewhat in Cherokee, Buena Vista, Woodbury, and Harrison counties from wind.

After the 15th very little rain fell till the 27th, and over much of the state the amounts were too light to be of agricultural benefit. At the end of the month the state was suffering from a severe drouth, and the high temperatures that prevailed during most of the dry period checked the growth of corn. There were many reports of corn curling from all parts of the state and some upland corn in the drier sections had fired so badly that under favorable future conditions not more than half a crop could be expected. The hot, dry weather caused late oats and spring wheat to ripen prematurely and pastures over a large portion of the state were burned brown and stock feeding was general over most of the state. Berries dried on the vines, truck crops were cut short, and the prospects for honey were the worst in years. The hay crop suffered greatly and in Winneshiek county it was reported the lightest in fifty years.

F. L. D.

PRESSURE

The mean pressure (reduced to sea level) for the state was 29.98 inches. The highest pressure recorded was 30.26 inches, at Dubuque, on the 18th, and the lowest was 29.70 inches, at Sioux City, on the 31st. The monthly range was 0.56 inch.

TEMPERATURE

The mean temperature for the state, as shown by the records at 102 stations, was 76.5°, or 2.4° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 75.9°, or 3.2° higher than the normal; Central, 76.7°, or 2.3° higher than the normal; Southern, 77.0°, or 1.8° higher than the normal. The highest monthly mean was 78.8°, at Keokuk, and the lowest was 72.9°, at Postville. The highest temperature recorded was 102°, at Nora Springs, on the 22d, and the lowest was 47°, at Little Sioux, on the 28th. The temperature range for the state was 55°.

HUMIDITY

The average relative humidity for the state at 7 a. m. was 77 per cent, and at 7 p. m. was 53 per cent. The mean for the month was 65 per cent, or 3 per cent less than the normal. The highest monthly mean was 68 per cent, at Charles City, and the lowest was 61 per cent, at Keokuk.

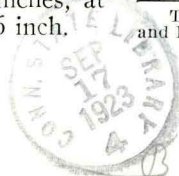
PRECIPITATION

The average precipitation for the state, as shown by the records of 104 stations, was 1.75 inches, or 2.21 inches less than the normal. By divisions the means were as follows: Northern, 2.06 inches, or 1.82 inches less than the normal; Central, 1.62 inches, or 2.36 inches less than the normal; Southern, 1.58 inches, or 2.44 inches less than the normal. The greatest amount, 5.54 inches, occurred at Mount Ayr, and the least, 0.29 inch, at Washington and Winterest. The greatest amount in twenty-four consecutive hours, 2.63 inches, occurred at Waverly on the 14th and 15th.

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	90	41	4.22	+0.26	8.20	1.67		5	13	13	5
1892.....	73.0	-1.1	104	38	5.29	+1.33	12.86	1.71		2	16	10	10
1893.....	75.0	+0.9	102	47	3.33	-0.63	8.84	1.49		7	19	10	10
1894.....	76.4	+2.3	109	39	0.63	-3.33	3.50	7.1		3	22	8	8
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	1.61		6	18	10	10
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	10
1900.....	73.4	-0.7	102	37	6.15	+2.19	18.45	1.80		9	16	10	10
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	-0.92	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	4.86	-2.10	5.69	0.12		7	19	8	1
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	7.1		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	-2.26	6.87	0.10		5	23	7	1
1917.....	74.3	+0.2	106	38	2.27	-1.69	6.06	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
1922.....	71.5	-2.6	98	40	6.31	+2.35	11.72	3.13		11	14	12	5
1923.....	76.5	+2.4	102	47	1.75	-2.21	5.54	0.29		5	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, 1923.

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
Northern Division																				
Algona	Kossuth	1,213	50	77.0	+ 3.7	99	23	53	23†	38	0.46	-2.56	0.20	0	3	28	3	0	sw.	W. E. Laird.
Allison	Butler	1,044	11	76.4	-----	101	22	49	28	39	1.82	-0.75	0	5	17	14	0	sw.	J. A. Bell.	
Alta	Buena Vista	1,513	32	75.2	+ 2.4	93	9†	54	1	26	1.44	-3.11	0.62	0	5	16	15	0	sw.	D. E. Hadden.
Alton	Sioux	1,305	18	76.4	+ 3.4	96	9†	50	28	38	2.07	-----	0.85	0	6	20	10	1	sw.	W. S. Slagle.
Belmond	Wright	1,205	13	77.8	-----	100	23	51	28	40	1.44	-----	0.69	0	7	8	22	1	s.	Geo. P. Hardwick.
Britt	Hancock	1,236	36	77.2	+ 4.5	98	20†	51	19	42	1.13	-2.86	0.92	0	2	24	7	0	se.	L. M. Goodman.
Charles City	Floyd	1,015	32	76.3	+ 2.8	96	23	52	28	33	3.30	-0.28	0.96	0	10	15	14	2	se.	U. S. Weather Bureau.
Cherokee	Cherokee	1,196	1	74.8	-----	94	23	48	28	37	1.36	-----	0.96	0	7	19	12	0	s.	J. E. Wirth.
Decorah	Winneshek	875	30	75.4	+ 2.0	99	22	48	1	40	3.56	-0.39	1.92	0	7	24	6	1	sw.	M. D. Whitney.
Estherville	Emmet	1,298	28	75.6	+ 4.9	98	22	50	28	40	0.93	-3.60	0.35	0	5	21	10	0	s.	A. O. Peterson.
Fayette	Fayette	1,003	33	75.2	+ 3.1	98	23	51	28	40	3.30	-0.66	1.36	0	8	27	3	1	sw.	R. Z. Latimer.
Forest City	Winnebago	1,226	29	76.4	+ 3.8	100	23	49	28	39	0.84	-2.80	0.30	0	7	12	13	7	se.	Dr. M. B. Neil.
Humboldt	Humboldt	1,005	35	77.6	+ 4.4	99	22†	50	28	41	1.13	-2.53	0.36	0	5	21	9	1	s.	H. C. Snitkey.
Inwood	Lyon	1,474	19	76.0	+ 3.1	96	23	52	1†	36	2.58	-0.57	1.13	0	6	22	7	2	s.	F. B. Hanson.
Le Mars	Plymouth	1,224	27	76.0	+ 3.3	97	23	52	28	34	2.09	-1.92	0.96	0	9	27	4	0	sw.	Mrs. M. C. Woolley.
Mason City	Cerro Gordo	1,148	26	75.9	+ 3.0	98	22†	48	28	38	2.33	-1.29	1.18	0	4	23	5	3	se.	Northern Sugar Corp.
Milford (Near)	Dickinson	1,430	3	74.2 ^b	-----	91 ^b	22†	51 ^b	28	33 ^b	1.50	-----	0.72	0	5	21	9	1	sw.	Dr. F. J. Smith.
New Hampton	Chickasaw	1,169	26	75.1	+ 2.9	97	7	51	28	34	2.84	-0.91	0.70	0	9	21	9	1	w.	A. F. Kemman.
Nora Springs	Floyd	1,064	11	77.4	-----	102	22	49	28	40	2.12	-----	0.83	0	11	16	14	1	s.	Arthur Betts.
Northwood	Worth	1,222	27	75.7 ^a	+ 3.8	99 ^a	22	53 ^a	1	33 ^a	2.54	-1.45	0.70	0	6	9	20	2	sw.	Chas. Dwele.
Oelwein	Fayette	1,036	0	75.7	-----	96	22†	55	29	34	1.75	-----	1.40	0	3	24	2	5	s.	John T. Ridler.
Pocahontas	Pocahontas	1,248	19	75.6	+ 3.1	96	23	52	1	31	1.22	-2.88	0.48	0	10	22	8	1	sw.	F. E. Hronek.
Postville	Clayton	1,180	24	72.9	+ 1.2	93	22	51	1	32	2.70	-1.82	1.10	0	8	19	10	2	sw.	F. L. Williams.
Rock Rapids	Lyon	1,358	24	75.6	+ 1.8	95	9†	50	28	38	4.19	+1.11	1.85	0	10	19	10	2	sw.	J. K. Medberry.
Sanborn	O'Brien	1,553	9	75.6	-----	96	22	50	1†	39	1.90	-----	0.87	0	6	22	8	1	s.	J. W. Dow.
Sioux Center	Sioux	1,426	24	75.2	+ 2.9	98	23	51	1	32	3.65	-1.34	1.09	0	8	24	6	1	s.	J. de Ruyter.
Spencer	Clay	1,319	9	76.8 ^c	-----	99 ^c	21†	50 ^c	28	36 ^c	0.57	-2.51	0.30	0	6	22	8	1	sw.	E. W. Little.
Storm Lake	Buena Vista	1,440	34	76.4	+ 3.5	94	23	55	1	25	1.93	-1.96	1.39	0	9	25	5	1	s.	Geo. H. Fracker.
Washita	Cherokee	1,157	25	73.8	+ 1.1	93	10†	50	1	30	1.57	-2.63	0.41	0	9	23	6	2	s.	H. L. Felter.
Waverly	Bremer	948	27	75.4 ^b	+ 2.4	98 ^b	22	50 ^b	1	32 ^b	4.52	+0.58	2.63	0	6	-----	-----	-----	se.	D. H. Murphy.
West Bend	Palo Alto	1,197	30	76.8	+ 3.8	97	21†	50	1†	40	1.78	-1.78	1.08	0	6	20	11	0	sw.	Jos. Dorweiler.
Means and extremes				75.9	+ 3.2	102	22	48	1†	42	2.06	-1.82	2.63	0	7	20	9	2	s.	
Central Division																				
Ames	Story	926	46	77.2	+ 3.2	98	10	54	1†	35	0.69	-3.65	0.44	0	2	19	8	4	s.	Iowa State College.
Audubon	Audubon	1,297	29	75.8	+ 2.5	96	10†	52	28	36	1.50	-2.23	1.17	0	6	19	12	0	sw.	Geo. Kibby.
Baxter	Jasper	908	23	76.8 ^a	+ 3.2	98 ^a	22	52 ^a	1†	35 ^a	0.75	-3.31	0.56	0	4	-----	-----	-----	sw.	Henry Geise.
Belle Plaine	Benton	886	33	75.2	+ 0.9	98	10	49	28	38	2.00	-1.94	1.15	0	5	17	12	2	s.	O. C. Burrows.
Boone	Boone	1,134	18	75.2	+ 0.9	98	10	49	28	38	2.00	-1.94	1.15	0	5	17	12	2	s.	C. F. Henning.
Carroll	Carroll	1,265	33	76.0	+ 3.2	96	23	52	28	34	2.20	-1.31	1.15	0	6	29	2	0	sw.	Mrs. Jos. J. Wolfe.
Cedar Rapids	Linn	737	41	77.1	+ 1.5	96	7†	58	18†	32	1.35	-2.34	0.50	0	5	23	2	6	-----	H. F. Paar.
Clinton	Clinton	593	50	77.4	+ 2.3	99	22	54	1	36	2.39	-1.67	0.63	0	6	23	7	1	s.	Dr. A. P. Bryant.
Davenport	Scott	580	52	78.4	+ 3.1	99	22	58	1	29	1.76	-1.79	0.64	0	5	11	16	4	e.	U. S. Weather Bureau.
Davenport (Pine Acres)	Scott	690	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	Alfred C. Hansen.
Denison	Crawford	1,171	29	75.4	+ 1.9	96	23	51	2	35	1.04	-2.69	0.52	0	6	21	9	1	sw.	V. L. Byers.
Des Moines	Polk	861	45	78.2	+ 2.8	98	23	57	1	30	0.78	-3.08	0.56	0	5	11	14	6	sw.	U. S. Weather Bureau.
Dubuque	Dubuque	698	50	76.8	+ 2.7	96	22	55	1	32	1.67	-2.63	0.84	0	7	7	18	6	s.	U. S. Weather Bureau.
Fairport	Muscatine	567	2	77.0	-----	97	21	55	1	35	1.27	-----	0.76	0	5	21	2	8	e.	Bureau of Fisheries.
Fort Dodge	Webster	1,114	23	77.1	+ 3.5	99	23	49	28	42	0.66	-3.02	0.40	0	5	20	10	1	sw.	Samuel Sampson.
Grinnell	Poweshiek	1,031	29	77.6	+ 3.1	97	7†	55	1†	32	1.58	-2.53	0.80	0	4	15	16	0	se.	Paul P. Meyers.
Grundy Center	Grundy	976	32	77.2	+ 2.9	98	21	52	28	34	1.12	-2.82	0.78	0	4	24	7	0	sw.	M. G. Heiberger.
Guthrie Center	Guthrie	1,077	28	75.8	+ 1.0	97	10	51	1	35	0.68	-3.60	0.32	0	6	19	9	3	sw.	E. L. Nesselroad.
Harlan	Shelby	1,192	24	75.4	+ 1.9	96	10†	51	28	35	2.70	-1.41	0.92	0	6	28	3	0	s.	W. K. Colburn.
Independence	Buchanan	921	59	75.4	+ 2.7	95	23†	53	1†	33	2.68	-1.74	1.26	0	5	26	5	0	sw.	Dr. Geo. Boody.
Iowa City	Johnson	733	63	76.8	+ 2.1	98	10	55	19	38	2.37	-1.91	0.95	0	5	12	15	4	se.	Prof. J. F. Reilly.
Iowa Falls	Hardin	1,107	30	75.6	+ 3.7	96	22	50	28	35	1.13	-3.06	0.57	0	9	24	6	1	s.	J. B. Parmelee.
Jefferson	Greene	1,052	24	75.1	+ 1.1	95	10	51	28	32	2.93	-----	1.42	0	5	22	7	2	sw.	W. I. Lyon.
Little Sioux	Harrison	1,040	18	77.4	+ 2.2	99	23	47	28	42	1.86	-----	0.63	0	7	16	12	3	se.	G. H. Gibson.
Logan	Harrison	1,035	56	76.1	+ 1.4	96	23	51	28	34	1.57	-3.07	1.04	0	5	20	10	1	sw.	Mary Jean Stern.
Marshalltown	Marshall	947	31	78.0	+ 4.0	98	7†	54	28	33	1.99	-2.18	1.17	0	5	25	6	0	sw.	C. C. Pigman.
Monroe	Jasper	922	11	77.4	-----	97	22†	55	1†	30	0.60	-----	0.32	0	3	25	3	3	s.	J. A. Dibel.
Olin	Jones	760	24	75.2	+ 1.5	98	8†	50	1	36	2.50	-1.02	1.50	0	3	26	4	1	se.	Mrs. L. Stingley.
Onawa	Monona	1,051	23	76.4	-----	98	23	52	28	33	3.34	-0.94	1.21	0	6	25	4	2	s.	Mrs. H. E. Colby.
Perry	Dallas	975	22	77.1	+ 2.1	100	10	53	28	37	1.12	-2.93	0.43	0	4	20	11	0	s.	F. N. Bartlett.
Rockwell City	Calhoun	1,134	27	76.2	+ 1.5	96	7†	51	28	36	1.68	-2.22	0.90	0	5	24	5	2	s.	A. W. McIsaac.
Sac City	Sac	1,344	47	75.8 ^a	+ 2.9	94 ^a	23	53 ^a	2†	32 ^a	1.55	-2.26	0.80	0	8	-----	-----	-----	s.	F. P. Kessler.

Climatological Data for July, 1923—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
Southern Division																				
Afton	Union	1,212	29	76.9	+ 1.4	99	10	55	28	38	1.38	-2.67	0.60	0	4	22	4	5	sw.	S. R. Brown.
Albia	Monroe	959	25	77.2	+ 2.5	98	10	56	28	37	0.89	-3.17	0.32	0	5	25	1	5	sw.	O. E. McBride.
Atlantic	Cass	1,164	32	76.3	+ 1.6	96	10†	52	28	36	1.83	-1.90	0.61	0	8	18	10	3	se.	J. N. Reynolds.
Bonaparte	Van Buren		32	77.2	+ 2.1	99	10	53 ^a	29	42 ^a	1.42	-2.22	0.70	0	5	23	6	2	e.	B. R. Vale.
Burlington	Des Moines	544	27	78.6	+ 2.6	98	22	58	1	31	2.05	-1.49	1.17	0	7	20	7	4	ne.	Mrs. E. M. Donnelly.
Centerville	Appanoose	1,013	18	76.8	---	96	9	56	1	34	3.14	+0.24	2.21	0	6	17	7	7	sw.	Leo. J. Allen.
Chariton	Lucas	1,042	28	75.8	+ 2.0	98	10	55	1	33	1.70	-2.76	0.65	0	3	19	7	5	sw.	O. E. Burr.
Clarinda	Page	1,009	33	77.4	+ 2.2	100	10	56	2†	34	2.05	-2.43	1.09	0	6	16	11	4	s.	A. S. Van Sandt.
Columbus Jct.	Louisa	595	22	77.2	+ 2.2	96	23	57	1	28	0.35	-3.56	0.35	0	1	28	3	0	s.	J. B. Johnston.
Corning	Adams	1,117	31	76.2	+ 1.8	98	10†	50	1†	37	1.06	-2.95	0.56	0	2	20	9	2	sw.	Jerome Smith.
Corydon	Wayne	1,101	30	77.4	+ 1.9	99	10	56	1	34	3.98	+0.21	1.31	0	7	20	7	4	s.	May C. Miller.
Creston	Union	1,312	18	75.8	+ 2.0	93	23	54	1	24	2.41	---	0.68	0	6	18	13	0	s.	Mrs. H. M. Stanley.
Cumberland (Near)	Cass	1,225	24	77.4	+ 2.1	97	10†	51	27	36	1.50	-2.69	0.86	0	5	17	9	5	se.	Carl E. Pollock.
Earlham	Madison	1,126	21	75.4	+ 2.1	97	10†	51	27	36	0.45	-3.58	0.34	0	2	19	8	4	sw.	Geo. Phillips.
Fairfield	Jefferson	780	39	78.1	+ 2.1	101	10	55	19	40	1.07	-2.79	0.84	0	5	16	7	8	n.	Prof. R. M. McKenzie.
Glenwood	Mills	1,160	25	77.6	---	97	23	52	28	36	1.08	---	0.33	0	7	19	7	5	se.	Dr. Geo. Mogridge.
Greenfield	Adair	1,368	31	77.6	+ 2.0	97	10†	55	1	34	0.82	-2.92	0.42	0	4	22	7	2	sw.	C. E. McCaslen.
Indianola	Warren	972	32	77.1	+ 2.0	97	10†	55	1	34	1.61	-2.42	0.67	0	4	13	8	10	ne.	Seth F. Shenton.
Keokuk	Lee	614	52	78.8	+ 1.9	97	22	61	1	31	1.61	-2.42	0.67	0	4	13	8	2	ne.	U. S. Weather Bureau
Keosauqua	Van Buren	644	31	76.9	+ 1.2	99	22	52	19	42	2.69	-1.31	1.16	0	5	14	10	7	se.	J. H. Landes.
Knoxville	Marion	920	28	76.8	+ 1.1	97	10	54	1	35	2.35	-1.66	1.56	0	3	19	6	6	sw.	W. J. Casey.
Lacona	Warren		24	76.8	+ 1.1	97	10	54	1	35	0.33	-3.27	0.20	0	3	12	14	5	---	J. B. Alter.
Lamoni	Decatur	1,123	16	76.0	- 0.1	98	10	55	1†	35	2.28	-1.68	1.33	0	5	21	7	3	sw.	C. E. Wight.
Lenox	Taylor	1,250	28	77.3	+ 2.4	99	10†	53	29	34	0.84	-3.52	0.52	0	3	24	7	0	s.	J. L. Hurley.
Mt. Ayr	Ringgold	1,245	30	75.6	- 0.4	95	10	56	2	27	5.54	+0.87	2.37	0	6	18	7	6	s.	Alex Maxwell.
Mt. Pleasant	Henry	729	42	78.1	+ 2.3	98	21†	59	26	35	0.51	-2.91	0.29	0	4	9	21	1	se.	J. H. Jericho.
Oakland	Pottawattamie	1,105	4	76.4 ^b	---	100 ^b	10	51 ^b	28	37 ^b	1.82	---	1.18	0	5	23	1	7	s.	M. E. Gray.
Oskaloosa	Mahaska	825	47	76.1	+ 1.5	97	23	51	1	33	1.62	-1.99	0.99	0	4	17	5	9	sw.	Roy R. Robinson.
Ottumwa	Wapello	649	28	78.0	---	100	22	56	19	39	0.91	-2.52	0.63	0	4	21	8	2	se.	C. L. Mikesh.
Pella	Marion	877	30	75.3	+ 0.1	98	23	49	1	36	1.49	-1.74	1.16	0	4	22	4	5	s.	J. H. Ver Steeg.
Sigourney	Keokuk	790	27	76.2	+ 0.6	99	10	48	1	36	2.68	-1.25	1.62	0	4	21	8	2	ne.	W. E. Utterback.
Stockport	Van Buren	754	21	76.4	+ 1.4	99	22	53	20†	44	0.92	-3.48	0.36	0	6	19	6	6	e.	C. L. Beswick.
Thurman	Fremont	975	26	77.2	+ 0.8	98	23†	49	28	36	1.09	-3.95	0.50	0	5	1	30	0	se.	C. R. Paul.
Washington	Washington	769	41	77.2	+ 2.5	96	22	59	28	31	0.29	-3.10	0.29	0	1	11	15	5	sw.	Wm. A. Cook.
Wescott (Near)	Lee		1	75.6	---	94	10	56	29	34	1.41	---	0.87	0	3	17	11	3	sw.	Geo. H. Smith.
Winterset	Madison	1,129	32	77.8	+ 2.0	98	10†	54	28	34	0.29	-4.38	0.14	0	3	24	7	0	sw.	H. S. Ely.
Omaha, Nebr.		1,103	52	79.5	+ 2.8	99	10	60	1	25	0.86	-3.47	0.38	0	6	13	13	5	se.	U. S. Weather Bureau.
Means and extremes				77.0	+ 1.8	101	10	48	1	44	1.58	-2.44	2.37	0	4	18	9	4	sw.	
State means and extremes				76.5	+ 2.4	102	22	47	28	44	1.75	-2.21	2.63	0	5	19	9	3	s.	

The departures 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.	12 Noon†	7 p. m.	Lowest	Date	Total movement	Average hourly velocity	Maximum		Per cent of possible	Departure from normal	
													Miles	From			Date
Charles City	29.98	30.24	18	29.75	23	78	50	57	33	19	3,419	4.6	23	ne.	23	78	+ 3
Davenport	29.99	30.23	18	29.76	27	77	50	53	27	20	3,946	5.3	25	s.	23	76	+ 5
Des Moines	29.96	30.18	18	29.75	31	78	48	52	27	19	3,776	5.1	32	sw.	5	75	+ 2
Dubuque	30.01	30.26	18	29.72	23	79	50	53	26	17	3,187	4.3	19	n.	10	65	+ 5
Keokuk	30.00	30.21	19	29.80	27	72	47	50	20	20	3,676	4.9	23	w.	11	77	+ 2
Sioux City	29.96	30.17	19	29.70	31	78	52	53	34	23	6,744	9.1	36	s.	31	77	+ 7
Omaha, Neb.	29.97	30.18	2	29.75	31	79	56	55	32	23	4,082	5.5	25	n.	27	83	+ 10
Means and extremes	29.98					77	50	53				5.5				75	+ 1
		30.26	18	29.70	31				20	20			36	s.	31		
Normals and records	29.95		7 th		4 th	79		57		25 th		67			13 th	74	
		*30.47	1892	†29.37	1905				†13	1894			†64	ne.	1905		

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

Daily Precipitation for July, 1923—Continued.

Stations	Drainage	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		
Southern Division																																		
Afton	Grand			.58								.13	.60		T.																		.07	1.38
Albia||	Des Moines	.25	.03		.12					T.	T.	.32																				.17	0.89	
Atlantic|||	Nishnabotna	.61		.21							.47	.16	.17				.17														.01	1.83		
Bonaparte	Des Moines			.07		.27						.15											.23			T.					.70	1.42		
Burlington|||	Mississippi			.03	.01	.20					.10	1.17											.05							.49	2.05			
Centerville	Chariton	.01		.40	.16	.05						2.21																		.31	3.14			
Chariton	Chariton			.45								.65																		.60	1.70			
Clarinda|||	Nodaway	.46										.23	1.09														.02			.15	2.05			
Columbus Jet	Iowa			T.								T.															T.			.35	0.35			
Corning	Nodaway	.56		T.						T.	T.						T.													.50	1.06			
Corydon	Chariton	.02		.85	.02	.01					.99	.78															T.	1.31		T.		3.98		
Creston|||	Missouri	.14			.54						.58	.42	.68																.05	2.41				
Cumberland (near)	Nodaway			.86							.03	.45															T.	.03	T.		1.50			
Earlham	Des Moines			.11							.34						T.															0.45		
Fairfield	Skunk					.03					.26	.33				.20													.08	.08	1.07			
Glenwood	Missouri			.04		.03						.84														T.	.08	.08		.10	1.08			
Greenfield	Nodaway											.42	.04																		.17	0.82		
Indianola	Des Moines			.19								.29																		.51	1.61			
Keokuk***	Mississippi	T.		.67		T.						.48											.14							T.	1.16	2.69		
Keosauqua	Des Moines			.89	.01	.15																	T.										2.69	
Knoxville	Des Moines	T.		.54	T.					T.	1.56	T.																T.	.25	2.35				
Lacona	Des Moines			.20							.01																			.12	0.33			
Lamon|||	Grand	.45			.19							1.31	.02																.31	2.28				
Lenox	Missouri			.11						T.																				.52	0.84			
Mt. Ayr	Grand	T.		1.90	.94	T.					2.25	.12				T.										T.	T.	.31	.02	5.54				
Mt. Pleasant	Skunk					.10						.09																		.29	0.51			
Oakland	Nishnabotna			1.18							.07					.11														.28	1.82			
Oskaloosa	Des Moines	T.		.08		T.					.18	.81																	.55	1.62				
Ottumwa	Des Moines	.01		.03							T.	.24																		.63	0.91			
Pella	Skunk	T.			.07	T.					1.16	.06															T.	.20	1.49					
Sigourney	Skunk	.20	T.								1.62	.33																	.53	2.68				
Stockport	Skunk			.11	.02	.01						.30											.1						.36	0.92				
Thurman	Missouri	T.		T.	.50	.27				T.	T.	T.				.02										T.	.14	T.	.29	.16	T.	1.09		
Washington	Skunk																													.87	0.29			
Wescott (near)	Mississippi		T.	.26	.28																											1.41		
Winterset	Des Moines			.14		T.						.08																		.07	0.29			
Omaha, Nebr.***	Missouri	.01		.30							T.						.07	T.									T.	.65	T.	.38	.0	T.	0.86	

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. The highest velocity reported from a regular Weather Bureau station was at the rate of 36 miles per hour, from the south, at Sioux City, on the 31st.

RIVERS

Moderate stages with a general falling tendency prevailed on the Missouri river. Unusually low stages prevailed on the Mississippi river, with a slight rise during the last of the first and the beginning of the second week and a general falling tendency thereafter. Low stages were general on all interior rivers and no rises of consequence occurred. The low stage record for July on the Des Moines river was equaled at Des Moines.

SUNSHINE AND CLOUDINESS

The average per cent of the possible amount of sunshine was 75, 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, 78; Davenport, 70; Des Moines, 75; Dubuque, 65; Keokuk, 77; Sioux City, 77; Omaha, Neb., 83.

MISCELLANEOUS PHENOMENA

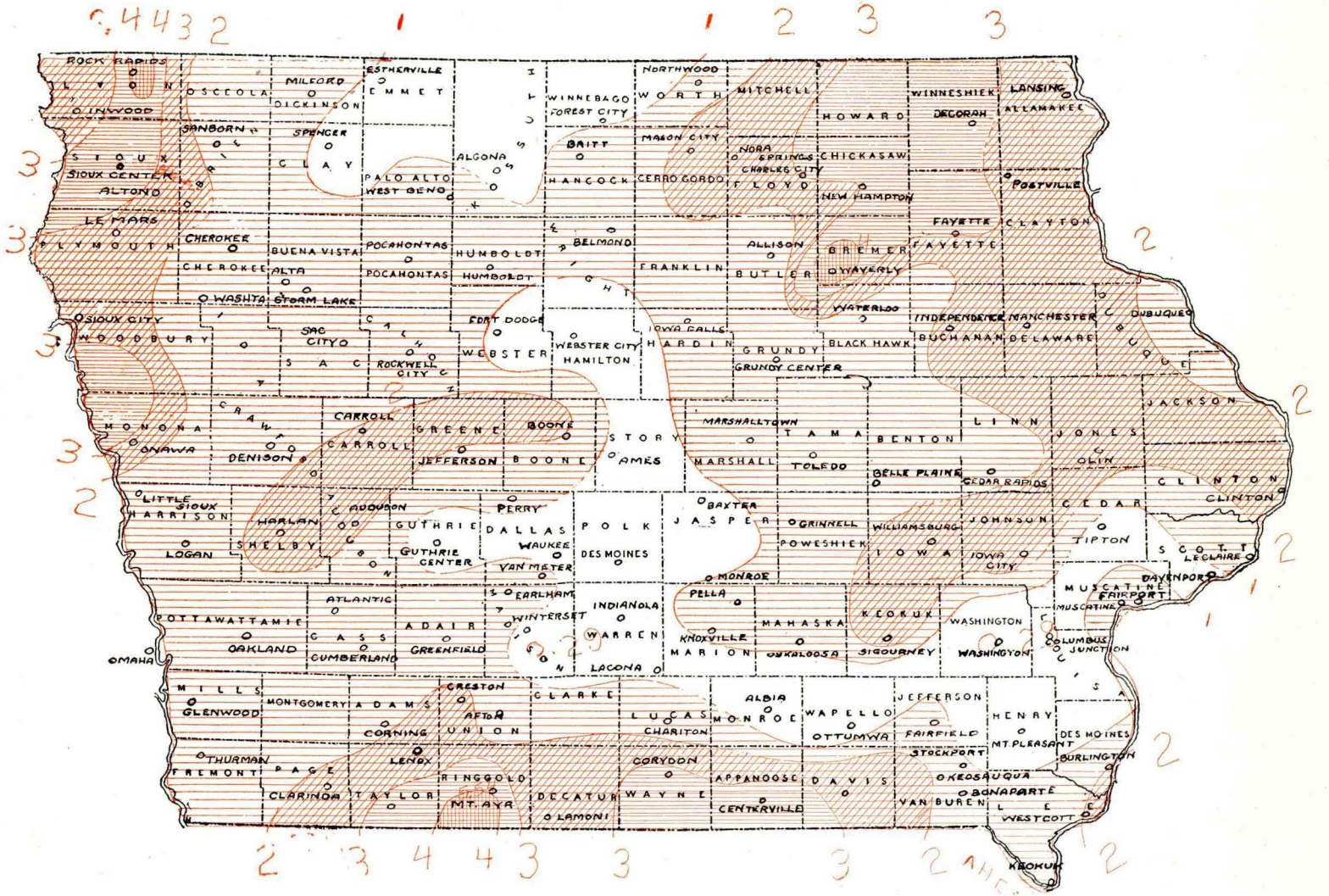
Aurora: 16th, 17th.
 Fog: 1st, 2d, 4th, 12th, 13th, 16th.
 Hail: 1st, 2d, 3d, 6th, 7th, 8th, 9th, 10th, 14th.
 Halos (lunar and solar): 6th, 19th, 20th, 26th, 29th, 31st.
 Rainbows: 3d, 5th, 7th, 10th, 23d, 27th, 29th.
 Thunderstorms: 1st, 2d, 3d, 4th, 6th, 7th, 10th, 11th, 12th, 14th, 15th, 22d, 23d, 26th, 27th, 28th, 29th, 30th, 31st.

Daily Maximum and Minimum Temperature for the Month of July, 1923.

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 the record.

TOTAL PRECIPITATION, JULY, 1923.



SCALE OF SHADES—IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

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

VOL. XXXIV DES MOINES, IOWA, AUGUST, 1923 No. 8

GENERAL SUMMARY.

The mean temperature for the State averaged 1.2° below the normal, though there were areas in the southeastern and southwestern sections that had a slight excess. There were no warm periods, such as can be expected in August, and very few warm days. The temperature was characterized by an unusually large number of fluctuations slightly above and below normal, the longest period above normal being four days during the second week, and the longest period below normal being five days, from the 21st to the 25th. During this period most of the month's deficiency occurred and the lowest temperature for the month occurred at most stations on the 22d, when light frost was reported on lowlands over nearly all sections of the State, being most general in the southern division.

The precipitation varied greatly and with two exceptions was the heaviest ever recorded in August, and the number of days with .01 inch or more of precipitation was the greatest of record for August. The excess was general throughout the State except in the southeast, east-central and north-central sections. The drouth that prevailed in July was relieved over almost the entire State by general rains during the first week, but in portions of the north-central division the drouth was not broken in time and the corn crop was nearly a failure in much of Winnebago County, the first time that condition has happened in 50 years. Sunshine was deficient and in connection with the frequent showers grain in the shock was thoroughly saturated and much sprouted and rotted in the fields. At the end of the month there was still much thrashing to be done in the western and central sections. The weather was too cool and wet for corn and that crop made little progress toward maturity, very little being safe from early frosts, and at the end of the month a large portion of the crop was still in the roasting ear stage.

Crops suffered considerably from heavy rains, hail and strong winds. Corn was blown down badly over much of the southern and central divisions on the 4th, and over limited areas on the 7th, 11th, 25th and 26th. Severe hail occurred over scattered areas in the western portion of the State on the 4th, and in the east-central section on the 11th, but the most damaging hail occurred in the north-central and central sections on the 25th and 26th. The hail was particularly heavy in Hancock, Wright, Hardin, Story, Mahaska and Poweshiek Counties. Whole sections were completely hailed out in a number of counties and the damage from hail amounted to more than \$1,000,000.00. Tornadoes were reported on the 4th, 11th and 25th. The damage was considerable in Hancock County, being chiefly to animals and farm buildings, there being no dwellings in the path of any storm. Lightning killed a number of farm animals and two men who were seeking shelter under a tree in a public park in Cedar Rapids were killed.

F. L. D.

PRESSURE.

The mean pressure (reduced to sea level) for the State was 29.98 inches. The highest recorded was 30.33 inches, at Sioux City, on the 22d, and the lowest was 29.61 inches, at Sioux City, on the 21st. The monthly range was 0.72 inch.

TEMPERATURE.

The mean temperature for the State, as shown by the records of 102 stations, was 70.6°, or 1.2° lower than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 68.6°, or 1.8° lower than the normal; Central, 70.6°, or 1.1° lower than the normal; Southern, 72.5°, or 0.7° lower than the normal. The highest monthly mean was 74.9°, at Keokuk, and the lowest was 66.4° at Postville. The highest temperature recorded was 102°, at Fairfield, on the 11th, and the lowest was 38°, at Cherokee, Corning and Inwood, on the 22d. The temperature range for the State was 64°.

PRECIPITATION.

The average precipitation for the State, as shown by the records of 105 stations, was 5.42 inches, or 1.74 inches more than the normal. By divisions, the averages were as follows: Northern, 5.28 inches, or 1.80 inches more than the normal; Central, 6.08 inches, or 2.31 inches more than the normal; Southern, 4.90 inches, or 1.12 inches more than the normal. The greatest amount, 13.14 inches, occurred at Grundy Center, and the least, 1.46 inches, occurred at Clinton. The greatest amount in 24 consecutive hours, 5.22 inches, occurred at Grundy Center on the 27th.

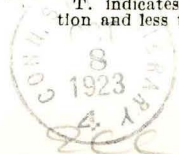
HUMIDITY.

The average relative humidity for the State at 7 a. m. was 83 per cent, and at 7 p. m. was 63 per cent. The mean for the month was 73 per cent, or 1 per cent more than the normal. The highest monthly mean was 78 per cent, at Des Moines, and the lowest was 70 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. of 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	4.06	+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
1922	73.8	+2.0	102	42	3.06	-0.62	9.80	0.33	-----	8	19	8	4
1923	70.6	-1.2	102	38	5.42	+1.74	13.14	1.46	-----	12	15	9	7

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



Climatological Data for August, 1923.

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	50	69.3	- 1.5	94	6	40	22	41	7.04	+3.37	1.95	0	10	24	2	5	se.	W. E. Laird.
Allison.....	Butler.....	1,044	11	69.2	-----	93	11	40	22	35	7.60	-----	1.95	0	11	11	10	10	se.	J. A. Bell.
Alta.....	Buena Vista.....	1,513	32	68.1	- 2.5	88	6	44	21	32	4.28	+0.39	1.07	0	15	11	12	8	se.	H. E. Hadden.
Alton.....	Sioux.....	1,305	18	68.4	- 3.0	90	18	40	22	36	4.47	-----	1.26	0	11	12	13	6	se.	W. S. Slagle.
Belmond.....	Wright.....	1,265	13	70.6	-----	97	6	46	22	39	4.99	-----	1.00	0	16	6	19	6	se.	Geo. P. Hardwick.
Britt.....	Hancock.....	1,236	36	70.1	- 0.1	93	6†	40	22	36	3.83	+0.03	1.16	0	9	15	15	1	s.	L. M. Goodman.
Charles City.....	Floyd.....	1,015	32	68.1	- 2.6	91	11	43	22	31	5.10	+1.68	1.21	0	14	11	14	6	se.	U. S. Weather Bureau.
Cherokee.....	Cherokee.....	1,196	1	68.0	-----	90	11	38	22	34	5.43	-----	1.08	0	15	13	12	6	n.	H. E. Wirth.
Decorah.....	Winneshiek.....	875	30	68.3	- 1.9	98	11	40	22	38	3.59	+0.23	1.44	0	11	20	4	7	nw.	M. D. Whitney.
Estherville.....	Emmet.....	1,298	28	67.4	- 2.7	90	3†	43	22	38	4.75	+0.65	1.50	0	13	16	12	3	nw.	A. O. Peterson.
Fayette.....	Fayette.....	1,003	33	67.3	- 2.3	94	20	40	22	36	5.71	+2.29	1.24	0	15	18	9	4	sw.	R. Z. Latimer.
Forest City.....	Winnebago.....	1,223	29	69.0	- 1.1	94	6†	40	22	39	2.81	-0.63	1.05	0	11	13	10	8	se.	Dr. M. B. Neil.
Humboldt.....	Humboldt.....	1,095	35	69.6	- 1.2	95	6	41	22	37	5.12	+1.76	1.64	0	13	13	12	6	ne.	H. C. Snitkey.
Inwood.....	Lyon.....	1,474	19	68.8	- 2.2	92	11	38	22	39	4.39	+1.51	1.05	0	13	-----	-----	-----	s.	J. B. Hanson.
Le Mars.....	Plymouth.....	1,224	27	68.8	- 2.0	89	3†	39	22	32	5.62	+2.83	1.15	0	11	18	8	-----	ne.	Mrs. M. C. Woolley.
Mason City.....	Cerro Gordo.....	1,148	26	68.6	- 1.4	95	11	40	22	39	3.86	-0.08	1.15	0	11	16	12	3	ne.	Northern Sugar Corp.
Millford (Near).....	Dickinson.....	1,439	3	67.0	-----	86	18	43	22	28	5.36	-----	1.84	0	13	7	18	6	e.	Dr. F. J. Smith.
New Hampton.....	Chickasaw.....	1,169	26	68.4	- 0.9	93	11	42	22	34	6.87	+3.20	1.44	0	13	13	11	7	nw.	A. F. Kemman.
Nora Springs.....	Floyd.....	1,064	11	69.7	-----	96	6	40	22	40	5.75	-----	2.25	0	14	14	13	4	s.	Arthur Betts.
Northwood.....	Worth.....	1,222	27	67.6†	- 2.0	92†	6	42†	22	31†	5.80	+1.76	1.30	0	11	13	12	6	ne.	Chas. Dwelle.
Oelwein.....	Fayette.....	1,039	6	69.2	-----	92	11	42	22	31	7.45	-----	1.66	0	10	17	3	11	sw.	John T. Ridler.
Pocahontas.....	Pocahontas.....	1,248	19	69.0	- 1.8	93	11	41	22	37	5.30	+1.39	.96	0	13	16	6	9	se.	F. E. Hronek.
Postville.....	Clayton.....	1,180	24	66.4	- 2.8	87	11†	43	22	31	5.87	+2.31	1.44	0	11	13	9	9	sw.	F. L. Williams.
Rock Rapids.....	Lyon.....	1,358	24	68.4	- 3.0	89	12†	39	22	39	5.38	+3.11	1.13	0	13	19	6	6	ne.	J. K. Medberry.
Sanborn.....	O'Brien.....	1,553	9	68.0	-----	92	11†	40	22	36	4.70	-----	1.57	0	12	13	12	6	ne.	J. W. Dow.
Sioux Center.....	Sioux.....	1,426	24	68.6†	- 1.8	91†	18	40†	22	33†	4.29	+1.02	1.09	0	10	16	6	9	ne.	J. de Ruyter.
Spencer.....	Clay.....	1,319	9	69.8	-----	94	11	39	22	36	5.20	+1.83	1.90	0	12	-----	-----	-----	ne.	E. W. Little.
Storm Lake.....	Buena Vista.....	1,440	34	69.4	- 1.7	90	6†	42	22	30	4.48	+1.15	1.28	0	15	19	6	6	se.	Geo. H. Fracker.
Washta.....	Cherokee.....	1,157	35	67.0	- 4.2	85	6†	39	22	33	6.99	+3.86	1.50	0	13	14	11	6	s.	H. L. Felter.
Waverly.....	Bremer.....	948	27	69.3†	- 1.3	93†	6†	42†	22	36†	6.70	+3.32	1.14	0	12	-----	-----	-----	se.	D. H. Murphy.
West Bend.....	Palo Alto.....	1,197	30	69.8	- 0.4	95	11†	39	22	37	5.55	+1.06	1.43	0	13	16	10	5	se.	Jos. Dorweller.
Means and extremes.....	-----	-----	-----	68.6	- 1.8	98	11	38	22	41	5.28	+1.80	2.25	0	12	15	10	6	se.	-----
<i>Central Division</i>																				
Ames.....	Story.....	926	46	69.9	- 2.4	94	11	43	22	34	8.42	+4.61	3.05	0	13	17	4	10	se.	Iowa State College.
Audubon.....	Audubon.....	1,297	29	69.3	- 2.0	93	11	41	22	37	7.28	+3.63	2.38	0	12	17	6	8	ne.	Geo. Kibby.
Baxter.....	Jasper.....	988	23	71.0	- 0.8	96	11	42	22	34	5.95	+2.33	1.68	0	13	12	13	6	s.	Henry Geise.
Belle Plaine.....	Benton.....	886	33	70.9	- 0.4	98	11	41	22	37	4.08	+0.58	1.76	0	16	13	7	11	se.	O. C. Burrows.
Boone.....	Boone.....	1,134	18	69.2	- 2.6	95	11	39	22	40	6.16	+2.38	2.10	0	19	11	10	10	s.	C. F. Henning.
Carroll.....	Carroll.....	1,265	33	69.8	- 0.8	95	11	42	22	32	6.14	+2.23	1.20	0	15	21	3	7	nw.	Mrs. Jos. J. Wolfe.
Cedar Rapids.....	Linn.....	737	41	71.6	- 1.2	96	11	45	23	36	4.32	+0.81	.81	0	10	15	5	11	nw.	E. W. Paar.
Clinton.....	Clinton.....	593	50	72.6	+ 0.7	97	11	45	22†	34	1.46	-2.25	.57	0	7	15	10	6	s.	Dr. A. P. Bryant.
Davenport.....	Scott.....	580	52	72.9	- 0.2	97	11	47	22	29	1.61	-2.03	.55	0	10	10	9	12	e.	U. S. Weather Bureau.
Davenport (No. 2).....	Scott.....	690	-----	72.4	-----	99	11	42	22	35	2.17	-----	.70	0	8	-----	-----	-----	-----	Rex Shriver.
Denison.....	Crawford.....	1,171	29	70.2	- 1.5	93	11	41	22	30	7.52	+3.41	1.46	0	15	14	7	10	se.	V. L. Byers.
Des Moines.....	Polk.....	861	45	71.4	- 1.7	95	11	48	22	31	5.34	+1.73	1.84	0	14	12	5	14	n.	U. S. Weather Bureau.
Dubuque.....	Dubuque.....	698	50	69.6	- 2.1	94	11	45	25	28	4.77	+1.73	.99	0	12	9	10	12	nw.	U. S. Weather Bureau
Fairport.....	Muscatine.....	567	2	73.4	-----	98	11	47	22	32	2.20	-----	1.10	0	6	17	5	9	sw.	Bureau of Fisheries.
Fort Dodge.....	Webster.....	1,114	23	69.4	- 2.2	93	6	41	22	37	6.95	+2.60	1.85	0	17	14	8	9	nw.	Samuel Sampson.
Grinnell.....	Poweshiek.....	1,031	29	71.8	- 0.9	97	11	45	22	31	5.13	+1.07	2.00	0	12	13	12	6	se.	Paul P. Meyers.
Grundy Center.....	Grundy.....	976	32	69.8	- 2.0	94	11	42	22	34	13.14	+9.51	5.22	0	15	17	6	8	nw.	M. G. Heiberger.
Guthrie Center.....	Guthrie.....	1,077	28	70.6	- 1.9	94	11	42	22	32	6.16	+1.95	1.40	0	12	18	5	8	nw.	E. L. Nesselroad.
Harlan.....	Shelby.....	1,192	24	69.9†	- 1.6	93†	11	42†	22	35†	6.72	+2.74	1.73	0	13	-----	-----	-----	e.	W. K. Colburn.
Independence.....	Buchanan.....	921	59	69.7	- 1.1	92	11	44	22	31	9.48	+6.17	2.80	0	12	15	5	11	ne.	Dr. Geo. Boody.
Iowa City.....	Johnson.....	733	63	71.4	- 0.8	98	11	41	22	37	4.01	-0.23	1.61	0	11	10	11	10	ne.	Prof. J. F. Reilly.
Iowa Falls.....	Hardin.....	1,107	30	68.6	- 0.9	90	6†	42	22	33	9.53	+5.82	2.04	0	17	14	9	8	s.	J. B. Parmelee.
Jefferson.....	Greene.....	1,052	24	68.5	- 3.5	90	11	41	22	30	7.38	-----	1.63	0	15	14	5	12	sw.	W. I. Lyon.
Little Sioux.....	Harrison.....	1,040	18	71.8	- 1.8	94	11	40	22	35	6.28	-----	1.84	0	14	17	8	6	s.	G. H. Gibson.
Logan.....	Harrison.....	1,035	56	70.5	- 2.7	92	11	42	22	31	7.28	+3.51	1.48	0	14	17	7	7	sw.	Mary Jean Stern.
Marshalltown.....	Marshall.....	947	31	71.4	- 0.4	97	11	43	22	32	4.86	+1.60	.97	0	18	14	10	7	ne.	C. C. Pigman.
Monroe.....	Jasper.....	922	11	72.3	-----	95	11	45	22	31	5.36	-----	1.43	0	9	-----	-----	-----	s.	J. A. Dibel.
Olin.....	Jones.....	769	24	70.4	- 1.1	98	12	39	22	38	3.28	-1.42	1.45	0	5	18	7	6	se.	Mrs. L. Stingley.
Onawa.....	Monona.....	1,051	23	69.6	-----	87	6†	42	22	28	7.12	+2.76	1.53	0	11	17	5	9	s.	Mrs. H. E. Colby.
Perry.....	Dallas.....	975	22	70.4†	- 2.0	93†	6	42†	22	33†	5.71	+1.07	1.00	0	14	14	7	7	nw.	F. N. Bartlett.
Rockwell City.....	Calhoun.....	1,134	27	70.5†	- 1.3	93	7	48†	22	33†	7.78	+3.82	1.50	0	13	14	10	7	ne.	A. W. McIsaac.
Sac City.....	Sac.....	1,244	47																	

Climatological Data for August, 1923—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
Southern Division																				
Afton	Union	1,212	29	72.3	- 0	90	11	42	22	36	6.50	+2.9	1.56	0	16	14	10	7	sw.	S. R. Brown.
Albia	Monroe	959	25	72.3	- 0	97	11	42	22	35	3.34	+0.12	1.45	0	13	16	2	13	ne.	O. E. McBride.
Atlantic	Cass	1,164	32	72.2	- 0	93	11	42	22	33	5.11	+1.52	1.30	0	14				sw.	J. N. Reynolds.
Bonaparte	Van Buren	32	32	73.4	+ 0.1	97	11	44	22	35	2.90	-1.05	1.04	0	9	20	5	6	e.	B. R. Vale.
Burlington	Des Moines	544	27	74.2	+ 0.	99	11	50	22	28	2.17	-2.16	.45	0	11	18	6	7	ne.	Mrs. E. M. Donnelly.
Centerville	Appanoose	1,013	18	72.9	-----	94	11	45	22†	33	3.16	+0.30	.68	0	10	13	12	6	se.	Leo. J. Allen.
Chariton	Lucas	1,042	28	71.2	+ 1.4	96	11	43	22	35	5.17	+1.25	1.75	0	8	13	14	4	sw.	C. C. Burr.
Clarinda	Page	1,009	33	73.7	+ 0.2	98	11	44	22	37	5.11	+1.49	1.46	0	17	11	11	9	ne.	A. S. Van Sandt.
Columbus Jct.	Louisa	595	22	72.8	+ 0.1	97	11	45	22	34	2.47	-2.76	.90	0	9	19	9	3	w.	J. B. Johnston.
Corning	Adams	1,117	31	71.5 ^a	- 0.7	93 ^a	11	38 ^a	22	36 ^a	6.83	+2.89	1.59	0	13				se.	Jerome Smith.
Corydon	Wayne	1,101	30	73.4	- 0.5	96	7†	41	22	35	3.86	+0.30	1.20	0	15	13	13	5	ne.	May C. Miller.
Creston	Union	1,312	18	70.6	- 1.2	90	11	45	22	31	5.50	-----	1.52	0	8	12	16	3	s.	Mrs. H. M. Stanley.
Cumberland (Near)	Cass	1,225	24								6.47	+2.50	1.90	0	10	16	6	9	ne.	Carl E. Pollock.
Earlham	Madison	1,123	21	70.4	- 0.8	93	11	40	22	33	8.77	+4.37	3.24	0	10	15	5	11	ne.	Geo. Phillips.
Fairfield	Jefferson	780	39	73.0	- 0.1	102 ^a	11	41	23†	39 ^a	4.04	+0.40	1.38	0	9				nw.	Prof. R. M. McKenzie.
Glenwood	Mills	1,100	25	72.8	-----	95	11	44	22	33	5.54	-----	2.21	0	10	17	10	4	se.	Dr. Geo. Mogridge.
Greenfield	Adair	1,368	31																	C. E. McCaslen.
Indianola	Warren	972	32	71.4	- 1.5	95	11	45	22†	32	5.77	+1.49	1.57	0	12	16	9	6	se.	Seth F. Shenton.
Keokuk	Lee	614	52	74.9	+ 0.1	98	7	51	23	25	3.63	+0.39	1.02	0	15	11	8	12	ne.	U. S. Weather Bureau
Keosauqua	Van Buren	644	31	73.6	+ 0.3	98	11	40	23	40	3.38	-0.16	1.15	0	12	13	10	8	e.	J. H. Landes.
Knoxville	Marion	920	28	72.0	- 1.6	96	11	43	22	35	6.48	+2.41	1.97	0	12	11	10	10	ne.	W. J. Casey.
Lacona	Warren	24									4.95	+1.03	2.05	0	19	7	15	9	-----	J. B. Alter.
Lamoni	Decatur	1,123	16	71.6 ^b	- 2.1	95 ^b	7	42 ^b	22	36 ^b	5.85	+3.05	1.60	0	13	15	8	6	n.	C. E. Wight.
Lenox	Taylor	1,250	28	73.0	+ 0.2	95	11	43	22	36	6.56	+2.84	1.45	0	16	15	12	4	nw.	J. L. Hurley.
Mt. Ayr	Ringgold	1,245	30	71.6	- 0.5	93	11	44	22	30	9.14	+5.64	3.52	0	14	15	7	9	ne.	Alex Maxwell.
Mt. Pleasant	Henry	729	42	73.6	+ 0.2	99	11	46	22	31	3.60	+0.17	1.36	0	11	12	12	7	nw.	J. H. Jericho.
Oakland	Pottawattamie	1,105	4	71.6 ^b	-----	95 ^b	11	39 ^c	22	36 ^c	5.71	-----	2.35	0	8	21	1	9	n.	M. E. Gray.
Oskaloosa	Mahaska	825	47	71.3	- 1.5	96	11	45	22†	34	3.83	+0.64	1.31	0	12	11	11	9	ne.	Roy R. Robinson.
Ottumwa	Wapello	649	28	74.4	-----	99	11	44	22†	39	4.36	+0.76	1.59	0	12	20	3	8	nw.	C. L. Mikesh.
Pella	Marion	877	30	70.9	- 2.2	95	11	41	22	38	4.99	+1.54	1.80	0	10	18	2	11	s.	J. H. Ver Steeg.
Sigourney	Keokuk	790	27	71.8	- 1.4	96	11	42	23	39	3.20	-0.27	1.04	0	9	16	6	9	ne.	W. E. Utterback.
Stockport	Van Buren	754	21	72.6	- 0.6	98	11	41	23	43	2.82	-0.97	.78	0	12	19	5	7	ne.	C. L. Beswick.
Thurman	Fremont	975	26	74.1	+ 0.7	96	11†	44	22	33	9.05	+4.00	3.10	0	10	3	26	2	ne.	C. R. Paul.
Washington	Washington	769	41	71.6	- 0.9	93	7	44	22	32	2.63	-1.15	1.11	0	5				w.	Wm. A. Cook.
Wescott (Near)	Lee	1	1	71.6	-----	92	6	43	22	32	2.87	-----	.82	0	7	14	12	5	se.	Geo. H. Smith.
Winterset	Madison	1,129	32	72.4	- 1.1	95	11	42	22	31	6.36	+2.54	1.40	0	11	20	6	5	se.	H. S. Ely.
Omaha, Nebr.		1,103	52	72.9	- 1.5	96	11	48	22	25	4.24	+0.62	2.44	0	15	13	10	8	ne.	U. S. Weather Bureau.
Means and extremes				72.5	- 0.7	102	11	38	22	43	4.90	+1.12	3.52	0	12	15	9	7	ne.	
State means and extremes				70.6	- 1.2	102	11	38	22	43	5.42	+1.74	5.22	0	12	15	9	7	ne.	

The departures 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.	12 Noon	7 p. m.			Miles	From						
						Lowest	Date	Date			Date	Date						
Charles City	29.99	30.31	22	29.67	21	84	57	65	32	14	3,713	5.0	22	nw.	3	59	-12	
Davenport	29.98	30.27	22	29.69	21	80	56	60	36	18	4,273	5.7	29	nw.	4	57	-14	
Des Moines	29.96	30.28	22	29.64	21	88	66	68	38	†23	3,927	5.3	34	e.	4	56	-16	
Dubuque	30.00	30.29	22	29.70	21	82	57	63	32	14	3,322	4.5	29	sw.	11	53	-11	
Keokuk	29.98	30.24	22	29.74	21	78	59	61	34	22	3,973	5.3	21	sw.	27	66	- 6	
Sioux City	29.99	30.33	22	29.61	21	86	60	62	35	14	6,028	5.1	36	w.	16	66	- 5	
Omaha, Neb.	29.97	30.31	22	29.64	21	85	64	63	41	19	4,685	6.3	38	n.	11	71	+ 2	
Means and extremes	29.98					83	60	63				5.7				61	- 9	
Normals and records	29.97		24th	29.61	21				32	14				n.	11			
		30.43	1909	29.40	1874						6.3			6th	70			
						†19	1918					†70			sw.	1916		

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

Daily Precipitation for August, 1923.

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		
Northern Division																																			
Algona	Des Moines		.15	.74				1.95				.30					.56											1.10	.10			1.76	7.04		
Allison	Cedar	.20		1.61			1.95			.10		.23				.65											.70	.52			T.	.77	7.60		
Alta	Raccoon	.19	.07		.19	.03		.27	.22		.35	.15	.15				1.07									.32	.67	.03				T.	.44	4.28	
Alton	Floyd	.35	.10		.03			.63			.36						.83									.30	.20				.02	1.26	4.47		
Belmond	Iowa	.36		.03	.01	T.		1.00			1.00		.15				.63	.09								.06	.37	.15	.25		.02	1.26	4.47		
Britt	Iowa	.05		.16	.64														.27								.05	1.16			.31	.82	3.88		
Charles City***	Cedar	.28		.93	.01		.12	.35			.14	T.					.31								.84	.32		.16	.20	.01	.31	T.	1.06	5.10	
Cherokee	Little Sioux	.11		.03	.17			.75			.52	.45	.05			1.00	.08									1.18	.47	.22	.56	.02	.71	5.43			
Decorah	Mississippi	.31			.02			.45			.02														.45	.92		.06	.55	.09		.50	3.59		
Estherville	Des Moines	.15		.18	.17			.35	.12		.10	.30					.15										.10	.15	.55			.70	4.75		
Fayette	Mississippi	.20			.18			1.24			.04	.06	.17				.07	.47										.15	.61	.73	.05	1.10	5.71		
Forest City	Cedar	.12	T.	.05	.04			.38	.12			.04					.18									.62	.62	.06	T.	.12	.62	2.81			
Humboldt	Des Moines	.16		.03	.14			.79			.34		.15				.66	.28			T.					.42	.32	.06		T.	1.64	5.12			
Inwood	Big Sioux	.89		.02	.01	T.		1.05		.03	.29	.04					.69										.23	.27		.05	T.	.62	4.39		
Le Mars	Floyd																																		
Mason City	Cedar	.04		.06	.04	.42		T.	.63			.02				.45										.23	.92		T.	.40	.12	.05	.83	3.86	
Milford (near)	Little Sioux	.13		.02				.86			.08		.02			.22										.16	.73		.05	T.	.92	.01	T.	1.84	5.56
New Hampton	Wapsipinicon	.42		1.20				.53			.04		.04			.07	.23								1.18	.98		.25	.43	.06		T.	1.44	6.87	
Nora Springs	Cedar	.04		.07	.03		.30	.35			.27					.28									1.10	.42		.38	.10	.13	.03	2.25	5.75		
Northwood	Cedar	.40		T.	1.30		.40	.35			T.					.15	.03											1.25	.10			1.00	5.80		
Oelwein	Wapsipinicon	.26		.78				1.32				.12				.85										.74	.76		.20	.76			1.66	7.45	
Pocahontas	Des Moines	.18		.07	.15			.75			.48	.03	.17			.66				T.						T.	.26		.38	.75	.46	T.	1.96	5.30	
Postville	Mississippi	.16		T.	.03			.57								T.	.34		.05							.56	1.44		.03	1.02	.31	T.	1.36	5.87	
Rock Rapids	Big Sioux		.33	.07	.97			1.13	T.		.25	.04				.50										.25	.38		.38	.40	.10		.68	5.38	
Sanborn	Floyd	.01			.04			.83			.25					.66											.15	.53		.27	.23	.12		1.57	4.70
Sioux Center	Floyd			T.		T.	.81		.02	.28	T.					.85										.07	.24		.31	.03	.50		T.	1.09	4.20
Spencer	Little Sioux	.03		.02	.01		1.26			.30						.50										.20	.73		.14	.10	.01		1.90	5.20	
Storm Lake	Raccoon			.11	.29			.67	.01		.39	.03	.13			1.12	.16									.01	.10		.25	.38		.01	.81	4.48	
Washta	Little Sioux	.14		.25	.48	T.		.88	.06		.63	.56				1.50										.18	.38		.42	1.12		.06	.51	6.99	
Waverly	Cedar	.21			.45			1.14			1.02		.08			.06	T.										.18	.55		.33	.81	1.03		.84	6.70
West Bend	Des Moines	.10		.20	.69			.90			.33		.03			.63											.04	.52		.12	.33	.23		1.43	5.55
Central Division																																			
Ames	Skunk	.91		.20	.24	T.		1.10			T.	.22		.60		T.	.66																T.	.63	8.42
Audubon	Nishnabotna	1.29		.18	.45	.10		.69		.48	1.90		.72			.15										.35		.55				T.	.42	7.28	
Baxter	Skunk	.81		T.	.25	.05		.25			.10	.10				.37										.04			.06	1.08	1.08	.16	T.	4.0	5.95
Belle Plaine	Iowa	.45	.01	.04	.09	.05	.01	.74			.01	.18	.08			T.	.42										.04			1.76	.10	.05	T.	.05	4.08
Boone	Des Moines	.51	.03	.22	.05	.17	.05	.24	.63	.33	.02	.31	.45			.70	.02										.06		.19	.05	2.10	T.	.03	6.16	
Carroll	Raccoon																																		6.14
Cedar Rapids	Cedar	.44	.30	.18	.20			.49	.95			.95		.10		1.20	.04										.02		.32		.54	.18		.23	6.14
Clinton	Mississippi	T.	.30			T.	.20	.70				.50	.20			.50														.50	.81	.36		.25	4.32
Davenport***	Mississippi		.05		.23	.06		.57			.02					.28														T.	.25		T.	1.46	
Davenport (No. 2)	Mississippi	.02	.35		.49	.06	T.	.02	T.		T.	.04	T.			.01	.06												T.	.55	T.			1.61	
Denison	Missouri			.13	1.46	.05		1.05	T.	.03	.82	.33	.16			.08	.95																T.	.34	7.52
Des Moines***	Des Moines	1.05		T.	1.84	.16		.49	T.	T.	.14	.04	.05			.09	.04											.12	.80	.23		.01	.28	5.34	
Dubuque***	Mississippi	.74			T.	.01		.99			.02	.18				.20	.28													.22	.54	.11		.79	4.77
Fairport	Mississippi	T.	.05		1.16	.05	T.				T.	T.				.15														.70	.10	.15		2.20	
Fort Dodge	Des Moines	.18	.38	.04	.47	.13	T.	.39	.26			.48	1.85			1.10											.05	.30		.10	.40	.25	.36	.21	6.95
Grinnell	Iowa	.88			.43	.12		1.18			.01		.02			.36																		.11	5.13
Grundy Center	Cedar	.40			.05	T.	2.65			.05	.35	.40			1.14	1.44										1.05	.25		.14	5.22	.32	.06		13.14	
Guthrie Center	Raccoon	1.40		.06	.41	.04		.57			1.06	.03			.12	.07												.32		1.03			1.05	6.16	
Harlan	Nishnabotna	1.30	.35		.55	.15		.55			1.73		.27			.14	.06												1.12			.01	.47	6.72	
Independence	Wapsipinicon	.21		.07				2.80			T.		1.60			.99												.14	.54		.21	.96		.49	9.48
Iowa City	Iowa	T.	.24			.82	.08	.81				.06	T.			.13													.02	.81	.80	.16		4.01	
Iowa Falls	Iowa	.33	.07	.01	T.	.10		1.61	.43			1.46	1.75			1.20		.02									.62	.35		.40	.41	.28	.08		9.53
Jefferson	Raccoon	.47		.37	.23	.10		1.00		.08	.52	.18	.17			.12	.86												.27	1.63		T.	1.34	7.38	
Le Claire	Mississippi		.48			.23	.12	.42	.02		.04	.04				.45												.14		.27	.25	T.		.32	2.44
Little Sioux	Little Sioux	.92				1.56	.04	.18	.84	.09	.21				.08	.18												.32		.56		.03	.32	6.28	
Logan	Missouri	.93		.06	.73	.15		1.48		.82	1.37		.43			.05	.22												.31		.33		.30	7.28	
Marshalltown	Iowa	.57	.06	.01	.01	.11	.02	.22	.45			.05	.52			.97	.01																		

Daily Precipitation for August, 1923—Continued.

Stations	Drainage	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		
Southern Division																																		
Afton	Grand	1.05		.10	1.56	.35	.08	.10	.05	.03	.70		.16			T.	.67									.28		.20	.32		.03	.82	6.50	
Albia	Des Moines	.30	.90		.05	1.45			T.	.01	T.	.14					.03	.01					T.				.05	.30	.05	.04	.01	3.34		
Atlantic	Nishnabotna	1.30	.06	.25		.79	.10	.92			.60		.28				.04								.29	.01	.33	.02		.12	5.11			
Bonaparte	Des Moines	.26	T.	T.	.54	T.	.18	.26	.11			.08					.25					T.			T.		.04		.18		2.90			
Burlington	Mississippi		.16			.25	.11					.08		.17			.45	.17										.35	.33	.02		2.17		
Centerville	Chariton	.25		T.	.68	.09	.30	T.	.30	.01	.22						.71	T.									.55		.05		T.	3.16		
Chariton	Chariton	.25			1.75	.08	.50	T.	T.	T.	T.					T.	.35								.12		.78		.34		5.17			
Clarinda	Nodaway	.47	.05	.51	.15	1.46	.48		.01	.01	.34		.05				.25	.28							T.	.06	.68	.01	.03	.27	5.11			
Columbus Jct.	Iowa	.17			.78	.05		.11	T.		.09	.07					T.							.10			.90		.20		2.47			
Corning	Nodaway	.67		.22	1.59	.35	.13		.14	1.22	.18		.40				.50								.30	.23			.90		6.83			
Corydon	Chariton	.27		.02	1.20	.24	.41		.34	.03	.04		.15			T.	.55	.01				T.			.23	T.	.25		.04	T.	.08	3.86		
Creston	Missouri	1.52			.52	1.30	.13	T.								T.	.22									.40	.13	1.28		T.		5.50		
Cumberland (near)	Nodaway	1.21		.09	1.90	.12		1.14	T.	T.	.65		.10			T.	T.								.29		.68		.01	.03	.27	6.47		
Earlham	Des Moines	1.56		.09	3.24	.14		1.25	T.	T.	.79		.11			T.	T.								.32		.40		T.	.87	8.77			
Fairfield	Skunk	.47			1.21	T.	.23	.04					.23				.13										1.38	.26	.09		4.04			
Glenwood	Missouri				1.90	1.90	.31	.03	.13				.89				.02											.02		.04	.30	5.54		
Greenfield	Nodaway																																	
Indianola	Des Moines	1.57			1.47	.20		1.33			.11		.18			.04	.01									.17		.30	.06		.33	5.77		
Keokuk***	Mississippi	.01		.02	.74	.04	.23	.29	.66				.08				1.02										.02	.20	.17	.01		3.63		
Keosauqua	Des Moines	.20		T.	.53	.02	.21	.05	.24			.03					.45											.15	.21	.24		3.38		
Knoxville	Des Moines	1.40		T.	1.40	.14	.05	.24	T.			.20	.38			T.	.09						T.				.12	.37	1.97		T.	.12	6.48	
Lacona	Des Moines	.70		.01	.76	.19	.07	.24	.01	.02	.03		.20			.01	.04	.01								.20	.01	2.05	.20	.01	.19	4.95		
Lamon	Grand	.30	.01	.04	.07	1.02	.61		.84	.07	.58						1.60	T.									.17	.45		.09		5.85		
Lenox	Missouri	.48		.27	1.14	.31	.28	.05	.08	.66	.12		.12				1.40	T.									.25	.05	.15	.20	1.00	6.56		
Mt. Ayr	Grand	.41		.13	1.14	.31	.39	.01	.22	2.53	.99		T.				1.42										.08	T.	.90	T.	.05	T.	.56	9.14
Mt. Pleasant	Skunk	.31	.05		.98	T.	.14		.23		T.	.02	.17				.25												1.36		.06		3.60	
Oakland	Nishnabotna	.31			2.35	.25		.68			.12	.41															.49				1.10	5.71		
Oskaloosa	Des Moines	.88		T.	1.23	.08	.02	.01	T.	T.			.28				.02	.04								.03	.04	1.08	.12	T.	T.	3.83		
Ottumwa	Des Moines	.58		.02	1.38	.21	.18		T.			.11					.01	.03								.01	.15		.22	.02		4.36		
Pella	Skunk	1.40	T.	T.	.45	.10		.45	T.		T.	T.	.20				T.	.06									.45	1.35	T.	.42	T.	.06	4.94	
Sigourney	Skunk	.49		.20	1.04	.04	.03				T.	.12					T.											1.02	.22		.04	3.20		
Stockport	Skunk	.41	.02	T.	.42	.02	.15	.15	.08			.22					.78											.42	.05	.10		2.82		
Thurman	Missouri	.12		2.82	3.10	.52	.24	T.	T.	.12							1.05											.48	T.		.12	.48	9.05	
Washington	Skunk	.28			1.08							.07															.09		1.11			2.63		
Wescott (near)	Mississippi		.10	T.	.76			T.	.82				.20				.45											.52				2.87		
Winterset	Des Moines	1.35		.02	1.28	.12	.01	1.40			1.15		.18														.22		.22		.41	6.36		
Omaha, Nebr.***	Missouri	.24	T.	.09	2.28	.24	.38	.09	T.	.02	.23	.03					.10	.03									.06	.13	T.		.01	.31	4.24	

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 northeast. The highest velocity reported from a regular Weather Bureau station was at the rate of 36 miles per hour from the west at Sioux City on the 15th.

SUNSHINE AND CLOUDINESS.

The average per cent of the possible amount of sunshine was 61, or 9 per cent less than the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 59; Davenport, 57; Des Moines, 56; Dubuque, 53; Keokuk, 66; Sioux City, 66; Omaha, Nebr., 71.

MISCELLANEOUS PHENOMENA.

Fog: 10th, 17th, 27th, 28th, 29th, 30th.
 Frost (light): 22d.
 Hail: 2d, 3d, 4th, 6th, 7th, 11th, 25th, 26th, 27th, 28th.
 Halos: 25th.
 Rainbow: 25th.
 Thunderstorms: All days during the month except 13th, 14th, 18th, 19th, 22d, 23d, 24th.
 Tornadoes: 4th, 11th, 25th.

RIVERS.

Unusually low stages prevailed on the Mississippi River and the Mississippi River Power Co. at Keokuk had difficulty in furnishing the power contracted for. Low to moderate stages

prevailed on the Missouri and interior rivers, with falling stages predominating. The heavy rains that occurred over much of the interior of the State were mostly taken up by the soil and produced only slight rises.

ERRATA.

Report for June, 1923. Page 42, Davenport, mean temperature published 73.7°, should be 73.6°; departure published +3.2°, should be +3.1°. Page 46, minimum temperature on 25th published 74°, should be 72°; mean minimum published 64.5°, should be 64.4°. Report for July, 1923. Page 50, Inwood, total precipitation published 2.58 inches, should be 2.59 inches; departure published -0.57 inch, should be -0.56 inch; days with 0.01 inch, or more precipitation published 6, should be 7; page 52; precipitation on 12th published 0, should be 0.01 and the total published 2.58 inches, should be 2.59 inches. Page 51, Glenwood; mean temperature published 77.6°, should be 77.4°.

LATE REPORT.

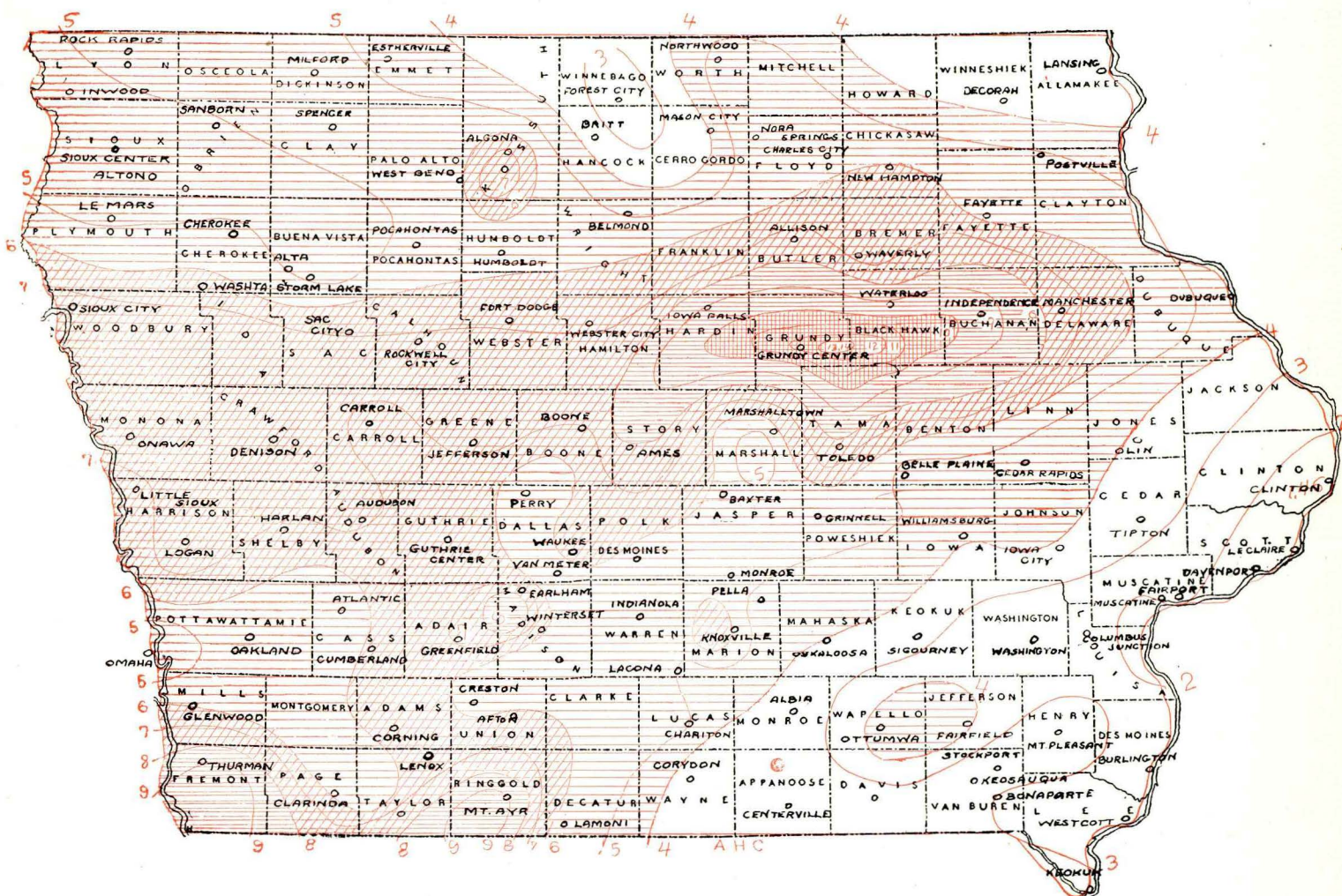
July, 1923; Belle Plaine, mean temperature, 76.7°; departure +3.3°; highest temperature 97° on the 7th, 10th, 22d and 23d; lowest temperature 54° on the 28th; greatest daily range 36°. Total precipitation 3.18 inches; departure -0.80; greatest precipitation in 24 hours 0.90 inch on the 15th; days with .01 inch or more precipitation 7; number of clear days, 18; partly cloudy, 13; cloudy, 0; prevailing direction of the wind, south.

Daily Maximum and Minimum Temperature for the Month of August, 1923.

Table with columns for Stations, days 1-31, and Mean. Rows are grouped 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 the record.

TOTAL PRECIPITATION, AUGUST, 1923



SCALE OF SHADES—IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In cooperation with

IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXIV DES MOINES, IOWA, SEPTEMBER, 1923 No. 9

GENERAL SUMMARY.

September, 1923, was characterized by an excess of precipitation, deficient sunshine and high humidity. These conditions were unfavorable for the normal development and maturing of the corn crop, which has been backward throughout the season, and the wet weather caused further damage to small grain in the shock due to sprouting and rotting.

The mean temperature for the State averaged nearly one degree above the normal, the greatest excess being in the northern division and diminished gradually to the south. A long, narrow strip running from Cherokee County southeastward to Lee County and another strip along the northeastern border, from Worth to Jackson Counties, had a slight deficiency in temperature. Generally speaking, the first week and the last ten days of the month were relatively warm and during the rest of the month, except for an occasional day, the temperature was below normal. Frost occurred on the 12th, 13th and 14th. The frost on the 12th and 13th was confined mostly to the western portion of the State, but on the 14th it was general and some damage to crops resulted in all sections of the State. An increase in cloudiness on the night of the 13th-14th saved the corn crop from damage in the western and southern counties, but freezing weather occurred over much of the north-central, northeastern and east-central sections, with the minimum below 30° over most of the area. Over most of this area corn was damaged from ten to thirty per cent, mostly in the lowlands, and the only hope of utilizing the damaged corn lay in immediate feeding. At the end of the month only about 75 per cent of the corn crop was safe from frost, ranging from about 90 per cent in the extreme northwestern and southeastern portions of the State to only 50 per cent in Grundy County. The excess of precipitation during the month and the relatively warm period during the last ten days created an unusual condition, relative to the sugar content for the maturing of sugar beets, making it necessary to extend the harvest period for a more perfect ripening. The wet weather also retarded fall plowing, but at the close of the month good progress had been made and considerable wheat had been seeded and a number of fields were up and looking well. Over much of the State winter wheat seeding was being intentionally delayed to avoid possible damage from Hessian fly.

The rainfall was, with three exceptions, the greatest ever recorded during September, and was above normal over nearly the entire State. Unusually heavy amounts occurred in areas on the 20th and 28th. At Pella 5.35 inches fell within two hours on the 28th. Small streams were out of banks and many culverts and bridges were washed out in the southern and western portions. Thunderstorms were unusually prevalent and severe, resulting in considerable loss to live stock from lightning. Corn in lowlands, particularly in Mahaska, Marion and the western part of Pottawattamie Counties, was badly damaged by high water and washing. Locally heavy rains in the vicinity of Council Bluffs caused a disastrous flood in that city and train service in that portion of the State had to be

temporarily suspended. The heavy rains were beneficial to pastures and a good third cutting of alfalfa was secured over most sections. Truck crops, where not killed by frost, also were greatly benefited, and at the end of the month there was an abundance, though tomatoes were injured somewhat by wet weather.

F. L. D.

PRESSURE

The mean pressure (reduced to sea level) for the State was 30.03 inches. The highest recorded was 30.40 inches, at Sioux City on the 13th, and Dubuque on the 14th, and the lowest was 29.56 inches, at Davenport on the 20th. The monthly range was 0.84 inches.

TEMPERATURE.

The mean temperature for the State, as shown by the records of 99 stations, was 64.2°, or 0.8° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 62.9°, or 1.1° higher than the normal; Central, 64.3°, or 0.8° higher than the normal; Southern, 65.4°, or 0.4° higher than the normal. The highest monthly mean was 67.3°, at Burlington, and the lowest was 60.3°, at Postville. The highest temperature reported was 92°, at Belmond, Monroe, Afton, Clarinda and Corydon on the 3d, and Thurman on the 4th, and the lowest was 28°, at Decorah and Mason City on the 14th. The monthly range for the State was 64°.

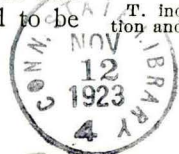
HUMIDITY.

The average relative humidity for the State at 7 a. m. was 86 per cent, and at 7 p. m. was 68 per cent. The mean for the month was 77 per cent, or 3 per cent above the normal. The highest monthly mean was 82 per cent, at Des Moines, and the lowest was 72 per cent, at Sioux City.

COMPARATIVE DATA FOR THE STATE—SEPTEMBER.

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	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	8
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	6.68	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
1922	67.1	+3.7	103	31	2.03	-1.33	4.34	0.31	-----	6	20	6	4
1923	64.2	+0.8	92	28	5.79	+2.43	12.14	1.88	-----	11	14	8	8

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



Climatological Data for September, 1923.

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
Northern Division																				
Algona	Kossuth	1,213	50	63.2	+ 1.0	85	5	35	14	33	10.97	+7.73	3.45	0	10	18	5	7	se.	W. E. Laird.
Allison	Butler	1,044	11	62.1	-----	88	5	30	14	33	5.49	-----	1.88	0	9	15	5	10	s.	J. A. Bell.
Alta	Buena Vista	1,513	32	63.4	+ 1.5	87	4	39	13	28	6.20	+3.12	2.00	0	12	16	7	7	s.	D. E. Hadden.
Alton	Sioux	1,305	18	63.1	+ 0.7	84	4	35	14	34	8.53	-----	2.76	0	11	16	5	6	se.	W. S. Slagle.
Belmond	Wright	1,205	13	64.4	-----	92	3	32	14	34	5.83	-----	3.06	0	10	10	14	6	s.	Geo. P. Hardwick.
Britt	Hancock	1,236	36	63.6	+ 2.1	89	5	34	14	36	8.52	+5.03	2.76	0	11	13	14	3	se.	L. M. Goodman.
Charles City	Floyd	1,015	32	62.4	+ 0.7	87	5	33	14	29	7.12	+4.32	3.31	0	10	9	12	9	se.	U. S. Weather Bureau.
Cherokee	Cherokee	1,196	1	63.1 ^b	-----	87 ^b	4	33 ^b	14	34 ^b	7.20	-----	1.82	0	12	-----	-----	-----	s.	J. E. Wirth.
Decorah	Winnesiek	875	30	61.6	- 0.6	85	3	28	14	31	6.44	+2.50	1.54	0	9	15	9	6	se.	M. D. Whitney.
Estherville	Emmet	1,298	28	62.4	+ 2.3	88	5	32	14	36	5.55	+1.86	2.10	0	10	16	11	3	s.	A. O. Peterson.
Fayette	Fayette	1,003	33	61.8	+ 0.5	86	4	29	14	33	4.91	+1.55	2.00	0	8	19	5	6	sw.	R. Z. Latimer.
Forest City	Winnebago	1,226	29	63.0	+ 1.7	87	4	34	14	33	7.12	+3.67	2.05	0	10	12	9	9	se.	Dr. M. B. Neil.
Humboldt	Humboldt	1,095	35	64.3	+ 2.0	89	5	32	14	35	6.60	+3.56	2.04	0	8	12	11	7	s.	H. C. Smitkey.
Inwood	Lyon	1,474	19	64.0	+ 1.5	89	5	34	12	38	3.50	+0.69	2.00	0	10	21	6	3	s.	F. B. Hanson.
Le Mars	Plymouth	1,224	27	63.8	+ 1.4	89	4	34	14	35	7.35	+4.10	3.78	0	11	20	5	5	se.	Mrs. M. C. Woolley.
Mason City	Cerro Gordo	1,148	26	62.6	+ 1.2	87	5	28	14	35	7.51	+5.06	1.75	0	8	17	7	6	se.	Northern Sugar Corp.
Milford (Near)	Dickinson	1,430	3	61.2 ^b	-----	82 ^b	5	39 ^b	13	27 ^b	4.76	-----	2.11	0	12	-----	-----	-----	s.	Dr. F. J. Smith.
New Hampton	Chickasaw	1,169	26	62.0	+ 1.1	88	5	32	14	31	5.79	+2.67	1.84	0	8	7	15	8	s.	A. F. Kemman.
Nora Springs	Floyd	1,064	11	63.9	-----	90	5	30	14	35	6.99	-----	1.44	0	13	13	12	5	s.	Arthur Betts.
Northwood	Worth	1,222	27	60.9	- 0.1	85	5	34	14	29	10.80	+7.54	3.03	0	10	13	8	9	se.	Chas. Dwelle.
Oelwein	Fayette	1,036	0	62.8	-----	86	5	33	14	31	5.05	-----	2.55	0	7	13	7	10	sw.	John T. Ridler.
Pocahontas	Pocahontas	1,248	19	63.7	+ 1.3	88	4	34	14	36	7.93	+4.14	1.65	0	11	16	3	11	se.	F. E. Hronek.
Postville	Clayton	1,180	24	60.3	- 0.8	81	5	32	14	24	4.85	+1.16	1.64	0	8	11	8	11	sw.	F. L. Williams.
Rock Rapids	Lyon	1,358	24	62.6	+ 0.6	85	4	36	14	34	5.22	+2.80	1.53	0	10	22	5	3	se.	J. K. Medberry.
Sanborn	O'Brien	1,553	9	64.4	-----	89	5	35	14	35	5.54	-----	1.50	0	11	17	6	7	s.	J. W. Dow.
Sioux Center	Sioux	1,426	24	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Spencer	Clay	1,319	9	64.0	-----	90	4	34	14	40	4.12	+0.92	2.55	0	10	15	9	6	se.	J. de Ruyter.
Storm Lake	Buena Vista	1,440	34	64.1	+ 1.9	87	5	39	14	30	6.45	+3.39	1.39	0	10	22	1	7	se.	E. W. Little.
Washita	Cherokee	1,157	25	62.2	- 1.1	86	4	31	14	36	4.98	+1.46	1.60	0	13	17	7	6	se.	Geo. H. Fracker.
Waverly	Bremer	948	27	62.4	+ 0.2	86	5	31	14	32	5.84	+2.85	2.04	0	12	19	5	6	se.	H. L. Felter.
West Bend	Palo Alto	1,197	30	64.0	+ 2.4	90	4	35	14	36	7.98	+4.91	2.84	0	11	16	8	6	s.	D. H. Murphy.
Means and extremes.				62.9	+ 1.1	92	3	28	14	40	6.51	+3.46	3.78	0	10	15	8	7	se.	Jos. Dorweiler.
Central Division																				
Ames	Story	926	46	64.6	+ 1.2	87	4	33	14	32	6.50	+2.83	1.72	0	11	14	8	8	s.	Iowa State College.
Audubon	Audubon	1,297	29	64.2	+ 1.7	91	3	35	14	33	6.08	+2.68	2.10	0	11	14	10	6	se.	Geo. Kibby.
Baxter	Jasper	998	23	64.0	+ 0.5	88	3	35	14	31	5.76	+2.14	1.75	0	11	9	13	8	s.	Henry Geise.
Belle Plaine	Benton	886	33	64.4	+ 1.2	89	4	31	14	36	4.96	+1.82	1.30	0	11	9	11	10	se.	O. C. Burrows.
Boone	Boone	1,134	18	63.2	+ 0.7	87	3	30	14	38	6.85	+3.29	1.50	0	12	14	8	8	se.	C. F. Henning.
Carroll	Carroll	1,265	33	63.8	+ 1.8	87	4	34	14	40	6.29	+3.21	1.97	0	10	22	3	5	nw.	Mrs. Jos. J. Wolfe.
Cedar Rapids	Linn	737	41	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Clinton	Clinton	593	50	65.8	+ 2.3	90	4	33	14	33	4.05	+0.72	1.11	0	13	11	12	7	se.	H. F. Paar.
Davenport	Scott	580	52	65.6	0.0	87	4	40	14	28	4.53	+1.39	0.97	0	11	7	8	15	e.	Dr. A. P. Bryant.
Davenport (No. 2)	Scott	690	-----	65.2	-----	90	4	31	14	34	4.82	-----	1.30	0	12	-----	-----	-----	-----	-----
Denison	Crawford	1,171	29	64.8	+ 1.3	89	4	34	14	35	4.02	+1.09	1.02	0	13	15	9	6	se.	U. S. Weather Bureau.
Des Moines	Polk	861	45	65.2	- 0.4	87	3	39	14	29	5.17	+2.10	1.61	0	12	9	11	10	se.	U. S. Weather Bureau.
Dubuque	Dubuque	698	50	62.8	- 1.2	86	5	35	14	27	5.04	+1.45	2.09	0	10	6	10	14	s.	U. S. Weather Bureau.
Fairport	Muscatine	567	2	65.2	-----	85	4	37	14	28	5.94	-----	1.95	0	11	13	5	12	se.	Bureau of Fisheries.
Fort Dodge	Webster	1,114	23	63.8	+ 1.2	89	5	32	14	37	7.55	+3.24	2.20	0	12	23	0	7	se.	Samuel Sampson.
Grinnell	Poweshiek	1,031	29	65.2	+ 0.6	90	22	36	14	43	5.89	+2.30	0.75	0	13	10	14	6	se.	Paul P. Meyers.
Grundy Center	Grundy	976	32	63.9	+ 0.3	87	3	32	14	36	4.70	+1.27	1.37	0	11	14	5	11	se.	M. G. Heiberger.
Guthrie Center	Guthrie	1,077	28	64.9	+ 1.2	89	3	34	14	34	5.26	+1.73	1.94	0	10	17	8	5	s.	E. L. Nesselroad.
Harlan	Shelby	1,192	24	-----	-----	88 ^a	4	35 ^a	25	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Independence	Buchanan	921	59	63.8	+ 1.2	85	4	32	14	33	3.77	-0.09	1.37	0	8	15	4	11	se.	W. K. Colburn.
Iowa City	Johnson	733	63	64.3	+ 0.7	88	4	32	14	32	9.27	+5.59	2.26	0	15	8	10	12	se.	Dr. Geo. Boody.
Iowa Falls	Hardin	1,107	30	62.4	+ 1.5	84	5	30	14	30	5.14	+1.60	1.46	0	13	13	10	7	s.	Prof. J. F. Reilly.
Jefferson	Greene	1,052	24	62.9	- 0.3	87	5	32	14	32	5.82	-----	1.00	0	13	16	6	8	se.	J. B. Parmelee.
Little Sioux	Harrison	1,040	18	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Logan	Harrison	1,035	56	64.4	- 0.1	88	4	36	14	28	7.60	+4.26	2.03	0	9	16	7	7	sw.	W. I. Lyon.
Marshalltown	Marshall	947	31	65.0	+ 1.6	89	3	33	14	33	3.40	-0.34	1.16	0	12	16	5	9	se.	S. B. Terry.
Monroe	Jasper	922	11	65.6	-----	92	3	36	14	32	7.80	-----	2.63	0	12	16	5	9	se.	Mary Jean Stern.
Olin	Jones	760	24	62.2	- 0.8	87	6	29	14	33	4.92	+1.72	1.10	0	9	15	5	10	se.	C. C. Pigman.
Onawa	Monona	1,051	23	64.6	-----	87	4	36	14	31	7.82	+4.36	2.80	0	11	15	5	10	s.	J. A. Dibel.
Perry	Dallas	975	22	63.6	- 0.2	88	4	33	14	33	4.74	+1.60	1.30	0	12	12	11	7	se.	Mrs. L. Stingley.
Rockwell City	Calhoun	1,134	27	64.0 ^b	+ 1.2	87 ^b	4	35 ^b	14	36 ^b	4.80	+0.85	1.15	0	11	-----	-----	-----	s.	Mrs. H. E. Colby.
Sac City	Sac	1,344	47	63.4	+ 0.3	87	4	36	14	31	5.25	+2.02	1.40	0	11	15	9	6	s.	F. N. Bartlett.
Sioux City	Woodbury	1,135	34	65.3	+ 1.9	90	4	42	14	31	7.36	+4.89	3.93	0						

Climatological Data for September, 1923—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	
Southern Division																					
Afton	Union	1,212	29	65.4	+ 0.9	92	3	35	14	34	5.54	+1.57	1.54	0	11	16	6	8	se.	S. R. Brown.	
Albia	Monroe	959	25	65.4	+ 0.8	90	3†	37	14	34	3.52	-0.13	0.80	0	12	14	7	9	se.	O. E. McBride.	
Atlantic	Cass	1,164	32	65.2	+ 1.1	90	3†	35	14	38	6.98	+3.46	1.34	0	14	13	12	5	sw.	J. N. Reynolds.	
Bonaparte	Van Buren	32	32	66.5	+ 1.0	90	4	35	14	30	3.73	-0.47	1.45	0	9	11	13	6	se.	B. R. Vale.	
Burlington	Des Moines	544	27	67.3	+ 1.2	88	4	38	14	32	3.60	-0.05	1.49	0	12	14	6	10	se.	Mrs. E. M. Donnelly.	
Centerville	Appanoose	1,013	18	65.7	-----	88	4	36	13†	32	1.88	-2.37	0.84	0	8	11	12	7	se.	Leo. J. Allen.	
Chariton	Lucas	1,042	28	64.8	+ 0.1	86	3	34	14	36	3.31	-0.01	1.10	0	7	14	7	9	sw.	C. C. Burr.	
Clarinda	Page	1,009	33	66.6	+ 2.0	92	3	37	14	37	3.23	+0.24	0.80	0	15	13	11	6	se.	A. S. Van Sandt.	
Columbus Jet	Louisa	595	22	65.6	+ 0.3	88	29	38	14	30	8.12	+4.96	2.30	0	9	22	4	4	w.	J. B. Johnston.	
Corning	Adams	1,117	31	64.4	+ 0.5	89	3†	35	14	36	4.74	+1.46	1.21	0	9	18	2	10	se.	Jerome Smith.	
Corydon	Wayne	1,101	30	66.6	+ 0.6	92	3†	34	14	35	2.68	-0.80	0.66	0	16	11	13	6	se.	May C. Miller.	
Creston	Union	1,312	18	64.2	+ 0.6	83	3†	39	14	31	4.59	-----	0.93	0	12	9	15	6	se.	Mrs. S. O. Stanley.	
Cumberland (Near)	Cass	1,225	24	64.8	-----	87	4	33	14	34	5.28	+1.50	1.21	0	10	15	6	9	se.	Carl E. Pollock.	
Earlham	Madison	1,126	21	64.1	+ 0.8	87	4	30	14	34	4.43	+0.83	1.26	0	12	18	2	10	se.	Geo. Phillips.	
Fairfield	Jefferson	780	39	65.4	+ 0.2	89	4	32	14	37	6.87	+3.60	1.82	0	11	18	4	8	s.	Prof. R. M. McKenzie.	
Glenwood	Mills	1,100	25	66.8	-----	91	4	36	14	34	3.60	-----	1.73	0	10	10	14	6	se.	Dr. Geo. Mogridge.	
Greenfield	Adair	1,368	31	64.4	+ 0.7	90	4	34	14	36	3.62	+0.23	1.45	0	6	14	8	8	sw.	C. E. McCaslen.	
Indianola	Warren	972	32	65.2	+ 0.2	87	3	34	14	33	3.33	-0.09	0.67	0	11	13	10	7	se.	Seth F. Shenton.	
Keokuk	Lee	614	52	67.1	- 1.4	88	4	40	14	29	4.64	+0.67	1.27	0	12	8	6	16	se.	U. S. Weather Bureau	
Keosauqua	Van Buren	644	31	65.7	+ 1.2	90	4	30	14	37	4.74	+0.48	1.77	0	9	7	11	12	se.	J. H. Landes.	
Knoxville	Marion	920	28	65.3	0.0	89	3	33	14	37	6.77	+3.19	3.95	0	9	12	6	12	se.	W. J. Casey.	
Lacona	Warren	24	24	64.8	-----	86	4	35	14	34	4.49	+0.75	1.30	0	13	7	17	6	se.	J. B. Alter.	
Lamoni†	Decatur	1,123	16	64.8	- 0.5	90	3	35	14	34	4.56	+0.67	1.20	0	10	14	7	9	se.	C. E. Wight.	
Lenox	Taylor	1,250	28	65.5	+ 0.8	90	3	35	14	35	3.63	+0.23	0.78	0	11	12	13	5	se.	J. L. Hurley.	
Mt. Ayr	Ringgold	1,245	30	64.8	+ 1.1	87	3†	36	14	30	5.75	+2.17	2.11	0	14	14	7	9	se.	Alex Maxwell.	
Mt. Pleasant	Henry	729	42	65.8	+ 0.4	86	3†	35	14	31	2.70	-0.53	0.66	0	10	8	18	4	e.	J. H. Jericho.	
Oakland	Pottawattamie	1,105	4	64.8 ^b	-----	86 ^b	2	34 ^b	14	39 ^b	3.86	-----	0.94	0	8	-----	-----	-----	-----	s.	M. E. Gray.
Oskaloosa	Mahaska	825	47	64.0	- 0.7	86	4	34	14	34	7.66	+4.61	4.02	0	14	9	9	12	se.	Roy R. Robinson.	
Ottumwa	Wapello	649	28	66.8	-----	91	4	35	14	37	3.71	+0.02	1.01	0	13	17	7	6	se.	C. L. Mikesh.	
Pella	Marion	877	30	64.4	- 0.8	85	3†	31	14	35	10.15	+6.92	5.35	0	11	19	2	9	s.	J. H. Ver Steeg.	
Sigourney	Keokuk	790	27	63.6	- 1.4	89	4	32	14	34	7.65	+4.43	1.85	0	11	14	7	9	se.	W. E. Utterback.	
Stockport	Van Buren	754	21	64.6	- 0.3	91	4	31	14	35	4.03	+0.10	1.13	0	11	15	5	10	s.	C. L. Beswick.	
Thurman	Fremont	975	26	65.6	+ 0.4	92	4	38	14	32	3.59	-0.91	0.84	0	10	6	22	2	ne.	C. R. Paul.	
Washington	Washington	769	41	64.8	+ 0.1	86	4	37	14	34	12.14	+9.13	3.65	0	11	6	14	10	sw.	Wm. A. Cook.	
Wescott (Near)	Lee	1	64.8	-----	-----	86	4	33	14	30	4.55	-----	1.75	0	9	10	13	7	se.	Geo. H. Smith.	
Winterset	Madison	1,129	32	65.7	+ 0.9	89	4	35	14	31	4.38	+1.04	0.94	0	9	18	5	7	se.	H. S. Ely.	
Omaha, Nebr.	-----	1,103	52	67.4	+ 0.6	92	4	44	14	28	9.32	+6.29	6.80	0	12	10	11	9	se.	U. S. Weather Bureau.	
Means and extremes	-----	-----	-----	65.4	+ 0.4	92	3†	30	14	39	5.08	+1.52	6.80	0	11	13	9	8	se.	-----	
State means and extremes	-----	-----	-----	64.2	+ 0.8	92	3†	28	14	43	5.79	+2.43	6.80	0	11	14	8	8	se.	-----	

The departures 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.	7 p. m.		Miles	From	Date							
Charles City	30.04	30.34	14	29.59	20	88	59	74	36	113	3,985	5.5	24	se.	16	52	-11	
Davenport	30.05	30.36	14	29.56	20	87	61	68	33	15	4,018	5.6	23	nw.	11	45	-19	
Des Moines	30.01	30.36	13	29.58	20	89	71	76	37	12	4,089	5.7	28	s.	26	52	-10	
Dubuque	30.08	30.40	14	29.59	20	88	66	73	39	16	3,234	4.5	19	se.	16	49	-10	
Keokuk	30.05	30.38	14	29.60	20	83	58	65	29	8	4,293	6.0	26	sw.	8	52	-13	
Stoux City	30.00	30.40	13	29.68	19	83	58	61	33	12	5,045	11.2	40	se.	24	65	+1	
Omaha, Neb.	30.00	30.32	13	29.63	20	84	59	62	31	8	4,911	6.8	36	n.	28	67	+1	
Means and extremes	30.03	-----	-----	-----	20	86	62	68	-----	-----	-----	6.5	-----	-----	-----	55	-----	-----
Normals and records	30.02	-----	-----	-----	26 th	83	-----	64	-----	-----	7.2	-----	-----	-----	-----	7 th	63	-----
	*30.65	1909	29.27	1878	-----	18	1921	-----	-----	-----	72	-----	-----	-----	-----	-----	-----	-----

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

Daily Precipitation for September, 1923.

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	1.24				.51											.84		.16	2.13						.48	.48		.46	1.22	3.45		10.97	
Allison	Cedar	.78				1.20	T.										1.02	.04	.03	1.38									.62	.14	.28		5.49	
Alta	Raccoon	.38	.02				.20										.42	.04		2.00	.03						.28		.06	.75	1.72	.30		6.20
Alton	Floyd	.20				.13					.02						.23			1.96	1.77						.02	.30	2.76	1.12			8.53	
Belmond	Iowa	.31		.09		.06	T.									.03	.69		.06	3.06								.67	.20	.66		5.83		
Britt	Iowa	.92				.14	T.				T.					.23	.40	.10	.10	2.75				.14				.35	.63	2.76		8.52		
Charles City***	Cedar	2.91				.37	T.				T.					.14	.69		.84	.34					.01			.28	.99	.55		7.12		
Cherokee	Little Sioux	.61	.02			.19					T.	T.				.19	.16		1.00	1.35				T.	.19	.14	.59	.94	1.82			7.20		
Decorah	Mississippi	1.54	.52				.21									.32	.18	1.54			.02								1.41	1.70			6.44	
Estherville	Des Moines	1.30	.30									T.				.40	.05		2.10	.05						.15		.05	.95	.20			5.55	
Fayette	Mississippi	.70					.08										.13	.64	2.00									T.	.07	.53	.79		4.94	
Forest City	Cedar	1.45	T.				.37									.55	.05		1.57	.25						.12		.02	2.05	.69			7.12	
Humboldt	Des Moines	2.04				.12					T.					.71		.44	1.70							.10		.72		.27			6.60	
Inwood	Big Sioux	.30					.02				.01					.31	T.		2.00	.01							.08		.13	.35	.29		3.50	
Le Mars	Floyd	.12				.04					T.					.26	.01		2.16	1.62					T.	.08	.06	.45	.98	1.57			7.35	
Mason City	Cedar	1.75		T.		.44										.92			1.42						T.	.02	.40	.86	1.70				7.51	
Milford (near)	Little Sioux	1.18	.01			.04				.02						.08	.26		.99	1.12					.13		.03	.80	.10				4.76	
New Hampton	Wapsipinicon	1.84				.06	.08									.60			T.	1.15							.22	1.25	.59				5.79	
Nora Springs	Cedar	.87	.05	.20		.43				T.		.04				.42			1.81	1.35					.30		.29	1.44	1.21				6.99	
Northwood	Cedar	2.00				.28					.10					1.20		.05	1.90						.37		.37	3.03	1.50				10.80	
Oelwein	Wapsipinicon	2.55														.40			.77								.10	.20	.83	.20			5.05	
Pocahontas	Des Moines	1.65				.83					T.					.05	.25	.03	.51	1.08					1.29			.85	.95	.44			7.93	
Postville	Mississippi	1.35														.51	.19	T.	1.64							.05	.02	.93	.16				4.85	
Rock Rapids	Big Sioux	.20				.03				.02						.30	.25		.75	1.50								.24	.40	1.53			5.22	
Sanborn	Floyd	.25				.04				.02						.15	.18		.70	1.43						.09		.34	1.50	.84			5.54	
Sioux Center	Floyd																		.37	2.58				T.			.42	1.43	3.15				**	
Spencer	Little Sioux	.26	.02			.04										.25		.45	2.10						.07		.25	.53	.15				4.12	
Storm Lake	Raccoon					.37										.11	.37		.44	1.19					1.39		.65	.85	1.32	.36			6.45	
Washita	Little Sioux	.08				.10				.02	.03					.22	.08		.75	1.60					.16		.15	.83	.62	.34			4.98	
Waverly	Cedar	1.51		.01		.22	.03									.79		.07	1.97	.01							.02	.42	.53	.26			5.84	
West Bend	Des Moines	1.20				.16					.03					.04	.48		.30	2.54						.34		.51	.98	1.40			7.98	
<i>Central Division</i>																																		
Ames	Skunk	.70	.42								T.	.28				T.	.95		.22	.90					.12		.42	1.72	.12	.65			6.50	
Audubon	Nishnabotna	.11		.34		.52				.02	T.					.47	.58		.52	.47						T.	.50	2.10	.45				6.08	
Baxter	Skunk	.08				.60					1.02					.70	.04	1.75	.03						.05		.12	1.17	.20	T.			5.76	
Belle Plaine	Iowa	.19	T.			.64	.05				.30					.54	T.	.15	1.15								.54	.75	.38	.27			4.96	
Boone	Des Moines	1.46	.09			.46				.03		.22				.38	.50		1.01	T.					.08		.25	1.50	.87				6.85	
Carroll	Raccoon	.55			.14			.44								.41	.11		1.20								.20	1.97	1.08	.19			6.29	
Cedar Rapids	Cedar																																	
Clinton	Mississippi	.04	.07		.93	.11					.28					.25	.08	.31	.22	.07							.04		.52	.13			4.05	
Davenport***	Mississippi	.75				.97	T.				.42					.06	.16	.27	.59							T.	.26	.68	.01	.36			4.53	
Davenport (No. 2)	Mississippi	.57				1.30	.04				.35					.08	.29	.14	.75							T.	.34	.69	.04	.23			4.82	
Denison	Missouri	.03				.05				.09	.02					.10	.19	.02	.59	.23							.30	.90	1.02	.48			4.02	
Des Moines***	Des Moines	.31				.39					T.	.09				.42	.58		.74	.01					T.	.13	.26	1.45	.71	.08			5.17	
Dubuque***	Mississippi	1.44	.09			.27	T.	T.			.49	T.				.34		.51	1.60							T.	.04	.17	.09				5.04	
Fairport	Mississippi	1.03				1.95	T.				.21					.07	.50	.04	.40								.65	.66	.02	.41			5.94	
Fort Dodge	Des Moines	2.20	.61				.17									.60	.39		1.95	.26					.13			.04	.38	.75	.07		7.55	
Grinnell	Iowa	.37				.63	.16				.66					.28	.70	.70	.75						.10		.19	.56	.34	.45			5.89	
Grundy Center	Cedar	.65	.08			.50	T.									.72	.03	.08	1.37								.09	.80	.18	.20			4.70	
Guthrie Center	Raccoon					.59				.20					.22	1.08		.20	.45						.03		.41	1.94	.14				5.26	
Harlan	Nishnabotna	.35				.19					.02																	.70	1.80	2.40				**
Independence	Wapsipinicon	1.14				.11					T.					.37			1.37								.04	.11	.19	.44			3.77	
Iowa City	Iowa	.94	1.04			.38	1.94	.24				.39					.92		.56	.22					.02	.01	1.07	.27	.37	.90			9.27	
Iowa Falls	Iowa	1.13	.14			.15		.03								.34	.56		1.37	.00					.07		.04	.54	.41	.27			5.14	
Jefferson	Raccoon	.32				.18				.05	.06					.71		.31	.33							.21	.75	.88	.68	1.00			5.82	
Le Claire	Mississippi					.25	.15	T.				.47					.33	T.	.29	.4						.12	T.	1.24	.17			3.61		
Little Sioux	Little Sioux																																	
Logan	Missouri					.89										.20	.36		.86	.97						.14		2.03	1.04	1.67			7.60	
Marshalltown	Iowa	.28	.10			T.	.07				.21					.24	.32	T.	1.16	.04						.15	.30	.47	.06			3.40		
Monroe	Skunk	.06				.50	T.				.30					T.	.40	.23	.63	1.53						.16	2.63	1.30	T.			7.80		
Muscatine	Mississippi	.66	1.25			.45	.85				.27					.24		.52	.42								.75	.02	1.16	.12			6.71	
Olin	Wapsipinicon	.80	1.10			.35	.60				.50						.50		.30								.32		.45				4.92	
Onawa	Missouri	.10				.20					.03					.44	.05		.30	1.80					.20									

Daily Precipitation for September, 1923—Continued.

Table with columns: Stations, Drainage, Day of Month (1-31), Totals. Rows include stations like Afton, Albia, Atlantic, Bonaparte, Burlington, Centerville, Chariton, Clarinda, Columbus Jet, Corning, Corydon, Creston, Cumberland, Earlham, Fairfield, Glenwood, Greenfield, Indianola, Keokuk, Keosauqua, Knoxville, Laeona, Lamoni, Lenox, Mt. Ayr, Mt. Pleasant, Oakland, Oskaloosa, Ottumwa, Pella, Sigourney, Stockport, Thurman, Washington, Wescott, Winterset, Omaha.

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.

PRECIPITATION

The average precipitation for the State, as shown by the records of 101 stations, was 5.79 inches, or 2.43 inches more than the normal. By divisions, the averages were as follows: Northern, 6.51 inches, or 3.46 inches more than the normal; Central, 5.77 inches, or 2.31 inches more than the normal; Southern, 5.08 inches, or 1.52 inches more than the normal. The greatest amount, 12.14 inches, occurred at Washington, and the least, 1.88 inches, occurred at Centerville. The greatest amount in 24 consecutive hours, 5.35 inches, occurred at Pella.

SUNSHINE.

The average per cent of the possible amount of sunshine was 55, which is 8 per cent below the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 52; Davenport, 45; Des Moines, 52; Dubuque, 49; Keokuk, 52; Sioux City, 65; Omaha, Nebr., 67.

WIND.

The prevailing direction of the wind was from the southeast. The highest velocity reported from a regular Weather Bureau Station was at the rate of 40 miles per hour from the southeast, at Sioux City, on the 24th.

RIVERS.

Unusually low stages prevailed on the Mississippi River with only slight fluctuations. On the Missouri River moderate and nearly stationary stages prevailed, except moderate rises occurred at the end of the third week and at the end of the month. On the interior rivers mostly low stages prevailed, though there were sharp rises on the lower reaches after the heavy rains on the 20th and 28th. Many small streams in the southern and western portion of the State were out of banks the last of the month, but the larger streams kept within banks.

MISCELLANEOUS PHENOMENA.

- Aurora: 26th, 27th.
Fog: 2d, 4th, 5th, 14th, 17th, 19th, 21st, 22d, 23d, 24th, 26th, 28th, 29th, 30th.
Frost: 12th, 13th, 14th.
Hail: 4th, 7th, 28th, 29th, 30th.
Halos (lunar and solar): 19th, 23d, 28th.
Rainbow: 6th, 8th, 27th.
Thunderstorms: 1st, 2d, 3d, 4th, 5th, 6th, 7th, 10th, 11th, 16th, 17th, 18th, 19th, 20th, 24th, 25th, 26th, 27th, 28th, 29th, 30th.
Tornado: 28th.

Daily Maximum and Minimum Temperature for the Month of September, 1923.

Table with columns for Stations, days 1-31, and Mean. Rows are categorized into Northern Division (Algona, Alta, Alton, Belmont, Charles City, Decorah, Forest City, Inwood, Mason City, Milford, New Hampton, Northwood, Pocahontas, Postville) and Southern 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, Albia, Atlantic, Burlington, Columbus Jet, Corning, Corydon, Fairfield, Keokuk, Lamoni, Pella, Sigourney, Winterset, Thurman, Omaha, Nebr.).

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

**REPORT ON TORNADO AND FLOOD AT COUNCIL BLUFFS, IOWA,
SEPTEMBER 28, 1923.**

By Millard V. Robins, Meteorologist.

Weather Bureau Office, Omaha, Nebr., October 6, 1923.

On Friday night, September 28, 1923, a small tornado occurred in the southeastern part of Council Bluffs, Iowa, across the Missouri River from Omaha, Nebr. The storm struck about 7:50 p. m., and, owing to darkness and a torrential rain, but few people saw the tornado cloud. One man, whose house stands on the top of a steep hill overlooking the area of worst damage, said: "It was a long, funnel-shaped cloud with a black column extending from the ground high in the air. I heard it roaring as it swept this way and my family and I rushed into the basement. When we emerged several minutes later we found a large tree down in our back yard almost blocking the door. Trees were uprooted, roofs blown from houses and sheds were blown down all around the neighborhood." Another man reported what he saw resembled a ball of fire. Opinions differ as to the sound accompanying the tornado, some saying there was a roar and others that it was like steam escaping from an engine, and it is probable that the metallic roar frequently heard was dulled to a considerable extent by the almost constant thunder and the drumming of the rain.

The cloud moved from the south, especially over that part of the path where most of the destruction occurred; this was confined largely to one street to the east of which is a high bluff about 200 feet high and running due north and south. The path was narrow, a few hundred feet, and probably not to exceed three miles in length, only a part of which was settled, so the damaged area was but a few blocks long. After the storm passed through the inhabited territory it continued over the hills for a short distance, uprooting or breaking some trees, and finally dissipated.

The damage done by the tornado was less than anticipated at first, and probably did not exceed \$15,000; one house was demolished, a considerable number damaged in varying degrees, electric and telephone wires broken in many places by falling trees and some railroad cars were blown from the tracks. The damaged buildings were mostly small and some were in poor condition already.

Debris was thrown in all directions, but the trees observed were mostly torn out by the roots and were lying in a northerly direction or toward the northeast. A few roofs were torn off or partly so, one showing that the part away from the direction of approach was completely gone while that on the south re-

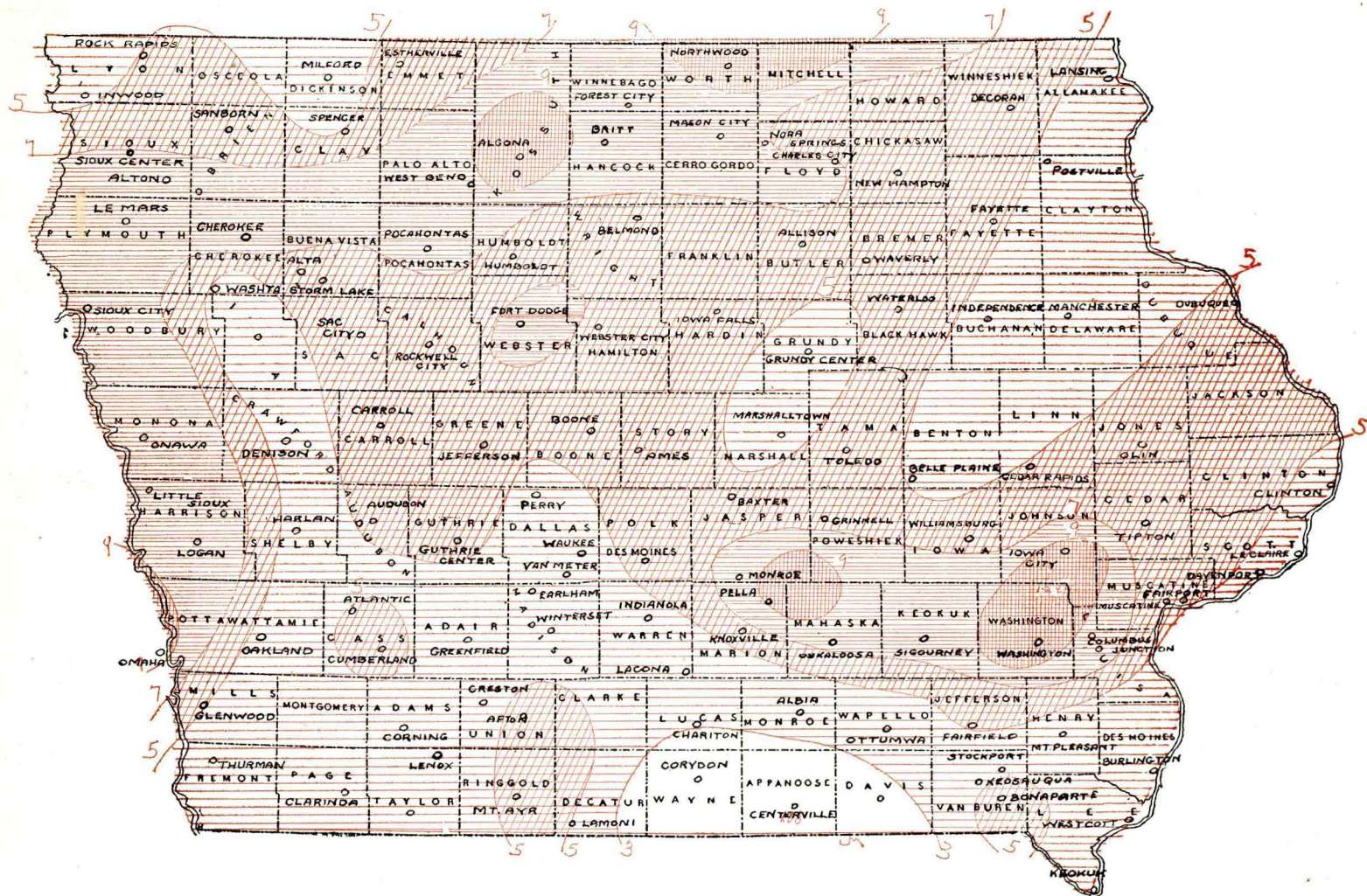
mained almost intact, showing the explosive action of the vortex.

Five persons were instantly killed, Mrs. Lars Kalstrup and her three sons, George, aged 7; Richard, aged 6, and Chester, aged 4; the home was demolished and the bodies were found under a tree in the yard, apparently crushed by the tree as it fell. Fred Roupple, aged 35, a stockman of Wellsville, Mo., was killed by flying timbers near the Wabash yard office as he fled from a restaurant that had the front blown away. The occupants that were in the restaurant were uninjured. A girl 12 years old, Goldie Collier, was severely injured and died a day or two later. Her father and a number of men were injured, but not seriously.

By far the greatest damage suffered by the city of Council Bluffs was from the excessive rainfall that was in progress during the passage of the tornado, which was estimated from five to seven inches. A fall of 3.04 inches was recorded in two hours, and 6.80 inches in 24 hours at Omaha. The direct damage and loss on account of the flood cannot be determined definitely, but it has been estimated at near \$1,000,000. About one square mile of the city was flooded and hundreds of people in the lower sections were driven from their homes, and even many business houses were flooded and the floors covered with mud and water. Mud from the hills covered lower Broadway and some other streets for blocks, in some places to a depth of more than a foot. Hundreds of homes had their basements filled with water and scores had their first floors covered with mud and water. A large number of people, thinking that a severe flood would not occur, refused to leave, and some had to be rescued from the roofs with boats. It was the worst flood since the memorable one in the spring of 1881, which was due to the high water in the Missouri River and came up slowly with plenty of warning, while this one came from the high ground with very little warning.

At the Weather Bureau Office in Omaha, about 7 miles in an air line from the devastated area, during the passage of the tornado nothing unusual occurred other than a severe thunderstorm was in progress with the rain falling at an excessive rate. The barogram showed no more marked fluctuations than frequently occur in ordinary thunderstorms. The wind reached a maximum velocity of 36 miles an hour from the north at 8:04 p. m.

TOTAL PRECIPITATION, SEPTEMBER, 1923.



SCALE OF SHADES—IN INCHES



CLIMATOLOGICAL DATA.

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

VOL. XXXIV DES MOINES, IOWA, OCTOBER, 1923 No. 10

GENERAL SUMMARY.

October was characterized by a marked deficiency in both temperature and precipitation. The mean temperature was 2.3° below the normal and only four times since 1890 has the mean temperature for October been lower. The maximum temperature, 81°, is the lowest maximum of record for October. There were only two periods, 8th to 11th and the 16th and 17th, that had a marked excess in temperature. The last two weeks were continuously below normal over practically the entire State. The first ten days were very pleasant, with almost continuous sunshine, and vegetation that had not been killed by the frost in September remained in vigorous condition till the general freezing weather occurred during the latter part of the third week. Though damaging frosts occurred in portions of the State on September 14th and in some localities early in October, the first general killing frosts and freezes occurred October 19th and 21st.

Precipitation for the State was less than half the normal and only two stations reported an excess. Only three times, since State-wide records have been kept, has the average precipitation for October been less and only four times in October has there been more snow.

The general weather conditions were favorable for farm work. Seeding of winter wheat was completed and practically all was up and most fields were showing green and looking well. The soil was in good condition for plowing and considerable was accomplished. While weather conditions were favorable for shucking corn, the progress was poor on account of the condition of the corn. The wet weather in September left the corn in a very moist condition and the fields that were not mature made very slow progress toward maturity. Relatively cold weather, high humidity and a wind velocity about 25 per cent below normal prevented the drying of corn and much that was cribbed heated and spoiled and many ears in the fields were found to be moldy. All corn showed an unusually high per cent of moisture and unless seed corn was gathered before the hard freezing weather occurred it will be difficult to secure satisfactory seed.

The season was unfavorable for the production of honey. The quantity was unusually small and the quality was mostly poor. Some colonies did not produce enough to carry them through the winter. Pastures remained in good condition throughout the month and were protected by snow during the coldest weather.

F. L. D.

PRESSURE.

The mean pressure (reduced to sea level) for the State was 30.19 inches. The highest recorded was 30.57 inches, at Sioux City, on the 30th, and the lowest was 29.50 inches, at Sioux City, on the 17th. The monthly range was 1.07 inches.

TEMPERATURE.

The mean temperature for the State, as shown by the records of 101 stations, was 48.5°, or 2.3° lower than the normal. By

divisions, three tiers of counties to the division, the means were as follows: Northern, 47.0°, or 2.0° lower than the normal; Central, 48.8°, or 2.1° lower than the normal; Southern, 49.7°, or 2.9° lower than the normal. The highest monthly mean was 51.3°, at Clarinda, and the lowest was 45.2°, at Decorah. The highest temperature reported was 81°, at Belle-Plaine and Toledo, on the 10th, and the lowest was 10°, at Allison and Pella, on the 30th. The temperature range was 71°.

HUMIDITY.

The average relative humidity for the State at 7 a. m. was 84 per cent, and at 7 p. m. was 62 per cent. The mean for the month was 73 per cent, or 1 per cent higher than the normal. The highest monthly mean was 79 per cent, at Charles City, and the lowest was 68 per cent, at Keokuk. The lowest observed relative humidity was 24 per cent, at Keokuk, on the 10th and 23d.

PRECIPITATION

The average precipitation for the State, as shown by the records of 102 stations, was 1.22 inches, or 1.24 inches less than the normal. By divisions the averages were as follows: Northern, 1.02 inches, or 1.32 inches less than the normal; Central, 1.16 inches, or 1.33 inches less than the normal; Southern, 1.47 inches, or 1.07 inches less than the normal. The greatest amount, 3.67 inches, occurred at Forest City, and the least, 0.29 inch, at Rockwell City. The greatest amount in any 24 consecutive hours, 3.17 inches, occurred at Forest City on the 1st.

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	0
1891	50.0	-0.8	92	19	2.77	+0.31	6.53	0.56		6	15	7	0
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	6	0
1894	51.7	+0.9	90	20	2.67	+0.21	5.25	0.03	0.2	8	14	8	0
1895	46.0	-4.8	88	4	0.47	-1.99	1.33	0.00	T.	19	8	4	7
1896	47.9	-2.9	88	12	3.13	+0.67	5.05	1.51	T.	18	6	8	6
1897	56.8	+8.0	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	6
1902	53.5	+2.7	83	20	2.54	+0.08	6.66	0.28	T.	5	16	7	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	6	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	6
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	1.03	T.	6	21	3	8
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	6
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	2.0	2.0	8	16	7	8
1917	42.9	-7.9	85	0	1.41	-1.05	4.00	0.15	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	13
1920	57.7	+6.9	90	11	2.13	-0.33	4.64	0.48	T.	6	19	6	6
1921	54.6	+3.8	90	21	1.96	-0.50	3.61	0.21	T.	6	17	8	6
1922	56.1	+5.3	96	14	1.81	-0.65	3.93	0.06	T.	5	21	4	6
1923	48.5	-2.3	81	10	1.22	-1.24	3.67	0.29	1.7	6	18	6	7

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



Climatological Data for October, 1923.

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	50	47.4	-1.4	74	10	16	30	32	0.71	-1.53	0.55	1.1	3	21	6	4	nw.	W. E. Laird.
Allison	Butler	1,044	11	46.6	---	77	10	10	30	42	0.74	---	0.25	1.0	5	18	4	9	nw.	J. A. Bell.
Alta	Buena Vista	1,513	32	47.0	-1.8	74	9†	14	30	28	1.99	-0.96	0.80	2.5	6	18	6	7	nw.	D. E. Hadden.
Alton	Stioux	1,305	18	46.6	-2.4	75	9	16	30	30	0.81	---	0.24	4.0	6	16	7	8	nw.	W. S. Slagle.
Belmond	Wright	1,205	13	47.8	---	76	10	13	30	37	0.62	---	0.28	0.7	7	14	11	6	nw.	Geo. P. Hardwick.
Britt	Hancock	1,236	36	47.2	-1.4	77	10	12	30	39	0.39	-1.94	0.21	1.0	4	15	11	5	s.	L. M. Goodman.
Charles City	Floyd	1,015	32	47.0	-1.2	76	10	16	30	37	0.61	-1.42	0.27	0.2	7	17	3	11	se.	U. S. Weather Bureau.
Cherokee	Cherokee	1,196	1	46.9	---	75	9†	14	30	36	1.02	---	0.50	4.2	6	14	13	4	nw.	J. E. Wirth.
Decorah	Winneshiek	875	30	45.2	-3.9	71	10	17	30	40	0.85	-1.92	0.60	T.	4	18	4	9	nw.	M. D. Whitney.
Estherville	Emmet	1,298	28	46.6	-0.7	78	9	14	30	44	1.08	-1.34	0.58	T.	6	18	10	3	nw.	A. O. Peterson.
Fayette	Fayette	1,003	33	46.6 ^a	-2.1	75 ^a	10	15 ^a	30	41 ^a	1.18	-1.28	0.57	1.2	8	---	---	---	nw.	R. Z. Latimer.
Forest City	Winnebago	1,226	29	47.4	-0.9	77	10	15	30	37	3.67	+1.26	3.17	0.2	6	17	6	8	nw.	Dr. M. B. Neil.
Humboldt	Humboldt	1,095	35	48.5	-2.3	79	10	13	30	41	0.61	-1.51	0.37	T.	4	16	6	9	n.	H. C. Snitkey.
Inwood	Lyon	1,474	19	46.3	-2.6	75	9	13	30	41	0.89	-1.33	0.25	2.9	9	22	5	4	nw.	F. B. Hanson.
Le Mars	Plymouth	1,224	27	47.4	-1.9	76	9	15	30	42	0.71	-1.51	0.22	2.0	4	20	5	6	sw.	Mrs. M. C. Woolley.
Mason City	Cerro Gordo	1,148	26	47.1	-1.7	78	10	14	30	40	1.46	-0.68	0.70	0.2	6	18	4	9	nw.	Northern Sugar Corp.
Milford (Near)	Dickinson	1,430	3	46.5	---	69	11	17	30	36	1.28	---	0.62	0.2	6	15	11	5	nw.	Dr. F. J. Smith.
New Hampton	Chickasaw	1,169	26	47.0	-1.1	76	10	14	30	37	0.62	-1.65	0.28	0.5	6	17	7	7	nw.	A. F. Kemman.
Nora Springs	Floyd	1,064	11	48.8	---	79	10	16	30	42	0.84	---	0.25	0.2	6	17	6	8	s.	Arthur Betts.
Northwood	Worth	1,222	27	45.6 ^d	-2.1	73 ^d	2†	15 ^d	30	30 ^d	0.83	-1.77	0.38	0.5	7	19	6	6	nw.	Chas. Dwelle.
Oelwein	Fayette	1,036	0	48.2	---	75	10	15	30	37	1.10	---	0.80	0.7	4	23	2	6	sw.	John T. Ridler.
Pocahontas	Pocahontas	1,248	19	47.6	-1.8	77	9†	12	30	39	0.66	-1.81	0.33	2.2	5	22	2	7	nw.	F. E. Hronek.
Postville	Clayton	1,180	24	46.0	-3.1	70	10†	14	30	29	0.93	-1.65	0.56	0.2	6	15	9	7	nw.	F. L. Williams.
Rock Rapids	Lyon	1,358	24	46.1	-0.8	74	9†	15	30	34	1.36	-0.96	0.59	2.7	7	20	4	7	se.	J. K. Mansberry.
Sanborn	O'Brien	1,553	9	46.8	---	77	9	15	30	34	1.04	---	0.31	2.0	6	20	5	6	nw.	J. W. Dow.
Sioux Center	Sioux	1,426	24	46.7 ^a	-2.0	75 ^a	9	15 ^a	30	32 ^a	0.61	-1.45	0.25	4.5	6	---	---	---	s.	J. de Ruyter.
Spencer	Clay	1,319	9	47.4	---	78	9	14	30	38	1.34	-0.53	1.00	0.5	7	16	7	8	nw.	E. W. Little.
Storm Lake	Buena Vista	1,440	34	48.3	-1.9	75	9	15	30	29	1.17	-0.71	0.81	0.7	6	19	7	5	se.	Geo. H. Fracker.
Washita	Cherokee	1,157	25	45.5	-4.1	76	10	11	31	40	0.88	-1.16	0.32	3.0	5	19	6	6	s.	H. L. Felter.
Waverly	Bremer	948	27	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	D. H. Murphy.
West Bend	Palo Alto	1,197	30	47.8	-0.3	77	9†	11	30	35	0.62	-1.31	0.29	0.2	8	21	7	3	s.	Jos. Dorweiler.
Means and extremes.	---	---	---	47.0	-2.0	79	10	10	30	44	1.02	-1.32	3.17	1.3	6	18	6	7	nw.	---
<i>Central Division</i>																				
Ames	Story	926	46	49.0	-2.3	78	10	15	30	41	0.68	-2.06	0.32	T.	4	17	5	9	w.	Iowa State College.
Audubon	Audubon	1,207	29	48.6	-1.7	77	9	11	30†	33	0.66	-1.62	0.38	1.5	4	19	5	7	s.	Geo. Kibby.
Baxter	Jasper	998	23	48.4	-3.1	77	10	13	30	34	1.05	-1.74	0.30	2.5	7	16	7	8	nw.	Henry Geise.
Belle Plaine	Benton	886	33	49.2	-1.8	81	10	13	30	43	1.77	-0.79	0.64	2.8	9	17	4	10	nw.	O. C. Burrows.
Boone	Boone	1,134	18	47.8	-2.8	78	10	12	30	45	0.92	-1.79	0.31	3.0	8	21	0	10	n.	C. F. Henning.
Carroll	Carroll	1,265	33	48.3	-1.0	77	9†	14	30	36	0.63	-1.93	0.24	1.0	3	21	4	6	nw.	Mrs. Jos. J. Wolfe.
Cedar Rapids	Linn	737	41	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	H. F. Paar.
Clinton	Clinton	593	50	50.6	-0.4	78	9†	22	31	39	1.67	-0.72	0.41	1.0	8	18	5	8	s.	Dr. A. P. Bryant.
Davenport	Scott	580	52	50.5	-3.2	77	11	23	30	31	1.18	-1.21	0.35	0.4	8	17	4	10	nw.	U. S. Weather Bureau.
Davenport (No. 2)	Scott	690	---	49.8	---	76	10†	22	30†	38	1.80	---	0.38	1.0	9	---	---	---	---	Rex Shriver.
Denison	Crawford	1,171	29	48.2	-2.6	75	10	15	30	39	1.21	-0.91	0.90	4.0	6	19	4	8	nw.	V. L. Byers.
Des Moines	Polk	861	45	50.0	-3.4	77	10	19	30	34	1.10	-1.58	0.38	2.5	7	16	3	12	nw.	U. S. Weather Bureau.
Dubuque	Dubuque	698	50	48.4	-3.5	75	11	21	30	34	1.07	-1.61	0.58	1.4	9	17	7	12	nw.	U. S. Weather Bureau
Fairport	Muscatine	567	2	48.3	---	74	9	22	30	32	1.76	---	0.80	1.0	8	17	3	11	w.	Bureau of Fisheries.
Fort Dodge	Webster	1,114	23	47.6	-2.3	79	10	12	30	36	1.03	-1.96	0.86	1.0	5	25	0	6	sw.	Samuel Sampson.
Grinnell	Poweshiek	1,031	29	49.4	-3.0	78	10	15	30	33	1.86	-0.82	0.59	1.5	8	19	4	8	se.	Paul P. Meyers.
Grundy Center	Grundy	976	32	48.3	-2.5	78	10	12	30	39	0.90	-1.70	0.30	2.0	5	15	6	10	nw.	M. G. Heiberger.
Guthrie Center	Guthrie	1,077	28	50.2	-1.1	77	9†	16	30	40	0.81	-1.72	0.36	3.0	6	19	5	7	nw.	E. L. Nesselroad.
Harlan	Shelby	1,192	24	48.2	-2.2	77	9	14	30	40	0.86	-1.68	0.58	2.5	5	22	3	6	s.	W. K. Colburn.
Independence	Buchanan	921	59	49.0	-0.9	72	10†	15	30	34	1.18	-1.38	0.57	1.1	7	17	4	10	nw.	Dr. Geo. Boody.
Iowa City	Johnson	733	63	48.7	-2.3	76	11	18	30†	38	2.35	-0.3	1.23	2.0	8	19	1	11	nw.	Prof. J. F. Reilly.
Iowa Falls	Hardin	1,107	30	47.2	-1.2	75	10	12	30	42	0.85	-1.51	0.40	1.0	5	18	3	10	nw.	J. B. Parmelee.
Jefferson	Greene	1,052	24	47.8	-3.2	75	10	14	30	40	0.68	---	0.38	3.0	4	19	5	7	se.	W. I. Lyon.
Little Sioux	Harrison	1,040	18	49.5 ^d	-3.3	78 ^c	9	11 ^d	31	44 ^c	0.71	---	0.33	3.0	5	---	---	---	nw.	S. B. Terry.
Logan	Harrison	1,035	56	49.9	-1.9	76	9	14	30	38	1.16	-1.19	0.52	3.0	3	19	6	6	sw.	Mary Jean Stern.
Marshalltown	Marshall	947	31	49.2	-1.4	80	10	16	30	36	1.18	-1.54	0.34	2.4	10	20	2	9	nw.	C. C. Pigman.
Monroe	Jasper	922	11	50.2	---	79	10	13	30	36	1.42	---	0.54	2.4	5	17	3	11	s.	J. A. Dibel.
Olin	Jones	760	24	47.8	-3.0	77	12	16	31	39	1.58	-0.80	0.62	0.1	5	16	5	10	se.	Mrs. L. Stingley.
Onawa	Monona	1,051	23	47.8	---	75	9†	11	31	33	0.91	-1.29	0.60	3.0	3	21	1	9	se.	Mrs. H. E. Colby.
Perry	Dallas	975	22	48.0	-3.3	75	10	13	30	40	0.60	-2.14	0.16	3.1	9	19	4	8	nw.	F. N. Bartlett.
Rockwell City	Calhoun	1,134	27	48.2	-2.5	78	9	12	30	38	0.29	-2.25	0.14	0.5	3	20	3	8	nw.	A. W. McIsaac.
Sac City	Sac	1,344	47	48.0	-2.3	76	9†	17	30	34	0.84	-1.31	0.33	2.0	5	20	3	8	nw.	F. P. Kessler.

Climatological Data for October, 1923—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	29	50.3	-1.2	78	9	17	30	34	1.60	-1.07	0.65	1.8	8	19	3	9	nw.	S. R. Brown.
Albia.....	Monroe.....	959	25	49.8	-2.1	79	10	17	30	41	2.14	-0.40	0.75	3.0	10	19	0	12	nw.	O. E. McBride.
Atlantic.....	Cass.....	1,164	32	50.0	-1.0	77	9	17	30	41	1.09	-1.47	0.60	1.6	7	18	6	7	nw.	J. N. Reynolds.
Bonaparte.....	Van Buren.....		32	49.6	-3.8	76	10†	20	31	37	1.63	-0.28	0.70	T.	9	19	2	10	nw.	B. R. Vale.
Burlington.....	Des Moines.....	544	27	51.0	-2.7	76	10†	22	31	32	1.13	-1.13	0.26	0	6	20	1	10	ne.	Mrs. E. M. Donnelly.
Centerville.....	Appanoose.....	1,013	18	49.9	-----	78	10	20	30	38	-----	-----	-----	-----	4	19	5	7	nw.	Leo. J. Allen.
Chariton.....	Lucas.....	1,042	28	49.8	-3.0	77	10	17	30†	33	1.10	-1.41	0.62	1.0	4	19	5	7	nw.	C. C. Burr.
Clarinda.....	Page.....	1,009	33	51.3	-0.6	79	9	18	30†	42	1.23	-1.35	0.36	1.8	6	16	6	9	nw.	A. S. Van Sandt.
Columbus Jct.....	Louisa.....	595	22	50.2	-2.7	74	10†	22	30†	29	1.30	-0.28	0.70	T.	3	23	2	6	nw.	J. B. Johnston.
Corning.....	Adams.....	1,117	31	49.0	-2.4	77	9	13	30	45	1.89	-0.78	0.61	2.0	5	20	1	10	s.	Jerome Smith.
Corydon.....	Wayne.....	1,101	30	50.8	-3.1	80	10	18	30	38	1.70	-1.12	0.65	3.0	10	17	5	9	nw.	May C. Miller.
Creston.....	Union.....	1,312	18	49.2	-2.1	72	9†	12	30	31	1.72	-1.00	0.25	5	5	19	5	7	n.	Mrs. S. O. Stanley.
Cumberland (Near).....	Cass.....	1,225	24	-----	-----	-----	-----	-----	-----	-----	0.59	-2.33	0.22	2.0	6	19	4	8	s.	Carl E. Pollock.
Earlham.....	Madison.....	1,126	21	48.2	-3.6	76	10	13	30	36	1.06	-1.59	0.41	4.0	7	19	3	9	nw.	Geo. Phillips.
Fairfield.....	Jefferson.....	780	39	48.2 ^a	-4.5	78 ^a	10	20 ^a	30†	37 ^a	1.77	-1.06	0.71	2.0	6	18	2	11	s.	Prof. R. M. McKenzie.
Glenwood.....	Mills.....	1,100	25	50.8	-----	78	9	18	30	40	1.20	-----	0.86	2.0	5	13	8	10	nw.	Dr. Geo. Mogridge.
Greenfield.....	Adair.....	1,368	31	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	C. E. McCaslen.
Indianola.....	Warren.....	972	32	49.8	-3.1	76	9†	16	30	37	1.47	-1.01	0.54	3.0	8	17	6	8	nw.	Seth F. Shenton.
Keokuk.....	Lee.....	614	52	51.2	-4.2	76	11	25	31	29	0.82	-1.67	0.30	T.	9	15	5	11	nw.	U. S. Weather Bureau
Keosauqua.....	Van Buren.....	644	31	49.0	-3.2	76	10†	20	22†	42	1.47	-0.52	0.91	0.5	6	16	5	10	se.	J. H. Landes.
Knoxville.....	Marion.....	920	28	50.0	-3.5	78	10	16	30	39	2.00	-0.39	0.85	3.0	8	18	5	8	nw.	W. J. Casey.
Lacona.....	Warren.....	24	-----	-----	-----	-----	-----	-----	-----	-----	1.30	-1.64	0.58	3.0	6	10	13	8	-----	J. B. Alter.
Lamoni.....	Decatur.....	1,123	16	49.2	-3.7	77	10	16	30	38	1.64	-1.41	0.68	0.5	5	18	6	7	nw.	C. E. Wight.
Lenox.....	Taylor.....	1,250	28	50.0	-2.2	77	9†	16	30	33	1.40	-1.46	0.40	1.0	9	22	6	3	nw.	J. L. Hurley.
Mt. Ayr.....	Ringgold.....	1,245	30	49.8	-3.8	75	10	18	30	32	2.25	-0.54	1.11	2.5	7	17	4	10	nw.	Alex Maxwell.
Mt. Pleasant.....	Henry.....	729	42	50.3	-2.4	77	10	22	30†	34	1.58	-0.88	0.66	T.	6	19	2	10	nw.	J. H. Jericho.
Oakland.....	Pottawattamie.....	1,105	4	48.8 ^d	-----	78 ^d	9†	13 ^c	30	37 ^d	0.80	-----	0.66	1.0	3	21	5	5	n.	M. E. Gray.
Oskaloosa.....	Mahaska.....	825	47	49.0	-3.5	75	10	16	30	36	2.27	+0.09	1.23	2.5	7	17	1	13	nw.	Roy R. Robinson.
Ottumwa.....	Wapello.....	649	28	50.6	-----	80	10	22	30	42	2.24	-0.27	0.70	0.4	8	20	3	8	se.	C. L. Mikesh.
Pella.....	Marion.....	877	30	49.0	-4.1	76	10	10	30	42	1.77	-0.97	0.85	3.5	5	20	0	11	nw.	J. H. Ver Steeg.
Sigourney.....	Keokuk.....	790	27	48.6	-4.0	76	11	17	30	36	2.06	-0.30	1.05	2.8	5	20	3	8	se.	W. E. Utterback.
Stockport.....	Van Buren.....	754	21	48.4	-4.4	76	9†	20	22†	42	1.56	-0.53	0.58	2.5	8	19	2	10	nw.	C. L. Beswick.
Thurman.....	Fremont.....	975	26	48.4	-4.2	70	9†	18	30	28	0.85	-2.03	0.64	1.0	3	10	16	5	se.	C. R. Paul.
Washington.....	Washington.....	769	41	49.4	-3.1	76	11	20	30†	32	1.80	-0.37	0.74	1.5	7	20	4	7	nw.	Wm. A. Cook.
Wescott (Near).....	Lee.....	-----	1	49.0	-----	71	10	22	22	34	0.99	-----	0.31	0	6	18	4	9	nw.	Geo. H. Smith.
Winterset.....	Madison.....	1,129	32	50.6	-1.7	76	9	16	30	31	1.31	-1.17	0.38	3.0	6	20	5	6	se.	H. S. Ely.
Omaha, Nebr.....	-----	1,103	52	51.8	-2.5	77	9	19	30	29	0.71	-1.64	0.66	2.8	7	15	8	8	nw.	U. S. Weather Bureau.
Means and extremes.....	-----	-----	-----	49.7	-2.9	80	10	10	30	45	1.47	-1.07	1.23	1.8	6	18	4	9	nw.	-----
State means and extremes.....	-----	-----	-----	48.5	-2.3	81	10	10	30	45	1.22	-1.24	3.17	1.7	6	18	5	8	nw.	-----

The departures 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	Maximum			Per cent of possible	Departure from normal					
						7 a. m.	12 Noon	7 p. m.		Average hourly velocity	Miles	From			Date				
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----				
Charles City.....	30.19	30.45	22	29.53	17	88	51	70	30	23	4,034	5	4	20	nw.	18	62	+4	
Davenport.....	30.18	30.50	22	29.55	17	85	52	60	26	10	3,933	5	3	22	nw.	19	66	+4	
Des Moines.....	30.18	30.47	21	29.52	17	86	56	63	33	21	4,207	5	7	20	nw.	19	64	+1	
Dubuque.....	30.20	30.52	8	29.57	17	87	54	63	27	21	3,385	4	5	22	n.	18	53	-2	
Keokuk.....	30.20	30.50	22	29.55	17	79	49	58	24	10	3,609	4	9	24	w.	19	63	+1	
Sioux City.....	30.19	30.57	30	29.50	17	81	52	58	28	21	7,796	10	5	34	s.	8	62	+3	
Omaha, Neb.....	30.18	30.53	30	29.55	17	81	61	63	34	23	5,160	6	9	31	nw.	18	67	+5	
Means and extremes.....	30.19	30.57	30	29.50	17	84	54	62	-----	-----	6.2	-----	-----	-----	-----	8	62	+2	
Normals and records.....	30.03	-----	31 st	-----	20 th	81	-----	62	-----	-----	8.1	-----	-----	-----	-----	-----	16 th	60	-----
-----	-----	*30.66	1913	28.96	1876	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

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

Daily Precipitation for October, 1923.

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															.05	.55																.11	0.71
Allison	Cedar	.20										T.				.25	.15										.04	T.			.10		0.74	
Alta	Raccoon	.72							.12							.17	.63											.13	.22			.22	1.99	
Alton	Floyd	.03					T.		.10			.04				.24												.20	.20			.20	0.81	
Belmond	Iowa	.09							T.			T.				.07	.28	.03	.02								T.		.05	.08			0.62	
Britt	Iowa	.02														.06	.21	T.										T.		.10		0.39		
Charles City***	Cedar	.01														.13	.19	.14									.04	.07	.03		.03		0.61	
Cherokee	Little Sioux	.01							.10			.02				.50												.14	.25	T.		.10	1.02	
Decorah	Mississippi															T.	.60	.10									.10	.05	T.		.05	0.85		
Estherville	Des Moines	.05							.25		.05						.58											.10	.05			.05	1.08	
Fayette	Mississippi	.11											.05	.04			.57	.10										.12	.09		.10		1.18	
Forest City	Cedar	.17							T.			T.				.33	.03										T.	T.	.10	.02	.02		3.67	
Humboldt	Des Moines								T.			T.				.07	.37											.10	.07			.07	0.61	
Inwood	Big Sioux	.06							.25			.04	.03			.01	.19	.02										.15	.14			.14	0.89	
Le Mars	Floyd								.13							.22	T.											.21	.15	T.		.15	0.71	
Mason City	Cedar	.70														.10	.35	.20										.08		.03			1.46	
Milford (near)	Little Sioux	.01							.47			.03				T.	.62											.13	.02			.02	1.28	
New Hampton	Wapsipinicon	.03										T.				.28	.14										.06	.06	T.	.05			0.62	
Nora Springs	Cedar															.25	.15	.14									.13	.14	.03		.03		0.84	
Northwood	Cedar	.03							.05							T.	.38	.17									.05	.07	.08	T.			0.83	
Oelwein	Wapsipinicon												.23				.70	.10												.07			1.10	
Pocahontas	Des Moines	.05														.08	.25										.08	.20					0.66	
Postville	Mississippi	.04														T.	.56	.16									.06	.09		.02			0.93	
Rock Rapids	Big Sioux	.14							.59	T.		.05	.04				.27										.22	.05		.02			1.36	
Sanborn	Floyd								.24			.22					.31	.02									.15	.10					1.04	
Sioux Center	Floyd								.07			.03				T.	.04	.02		T.								.25	.20				0.61	
Spencer	Little Sioux	.02							.07			T.				.15	.03	1.00	.02								.15	.05		.00			1.34	
Storm Lake	Raccoon	.03														.12	.81											.09	.09	.03			1.17	
Washta	Little Sioux								.12			.07					T.	.32										.12	.25			.25		0.88
Waverly	Cedar																																	
West Bend	Des Moines	.03								T.			.01	.04			.11	.29	.01										.11	.02				0.62
<i>Central Division</i>																																		
Ames	Skunk															T.	.19	.32	.07															0.68
Audubon	Nishnabotna															T.	.10	.38										T.	.04	.14				0.66
Baxter	Skunk											T.	.10	.11		.20	.30	.15									.04	T.	.15				1.05	
Belle Plaine	Iowa	.10														.41	.16	T.	.64	.08								.10	T.	.02	.05	.21		1.77
Boone	Des Moines	.15										T.	T.	.12		.05	.31	T.									T.	.03	.06	.02	.18		0.92	
Carroll	Raccoon																.16	.28																0.63
Cedar Rapids	Cedar																																	
Clinton	Mississippi															.05	.32		.03	.41	.26							.20	.05			.32		1.67
Davenport***	Mississippi															.24	.13	.05	T.	.27	.21							.11				.15		1.18
Davenport (No. 2)	Mississippi	.03														.13	.38	.04	.05	.32	.27						.37	T.			.21		1.80	
Denison	Missouri								.07							.06	.84										.03	.06		.15				1.21
Des Moines***	Des Moines	T.										.01	.37	.01		.24	.18	.08									T.	T.	.21				1.10	
Dubuque***	Mississippi	T.														.02	.01	.11	.11								.10	T.	.07	.07			1.07	
Fairport	Mississippi															.39	.41	.06	.09	.15	.35						.08				.23		1.76	
Fort Dodge	Des Moines	.86															.04	.02										.02		T.	.09		1.03	
Grinnell	Iowa	.39										.59	.16		.06	.41	.05										.05			T.	.15		1.86	
Grundy Center	Cedar	.15														.05	.30										.20	T.	.20				0.90	
Guthrie Center	Raccoon															.06	.30											.04	.18	.12			0.81	
Harlan	Nishnabotna															.12	.46										T.	.03	.15	.10			0.86	
Independence	Wapsipinicon	.07										.09	.11		T.	.57	.17										.06		T.	.11			1.18	
Iowa City	Iowa	.25										1.23	.10			.28	.19	T.									.03		T.	.10			2.35	
Iowa Falls	Iowa	T.														T.	.40	.14									.05	T.	.16				0.85	
Jefferson	Raccoon															.09	.29										T.	T.	.10	.10			0.68	
Le Claire	Mississippi	.09														T.	.23	.01		.01	.41	.28	.02					.27			.30		1.62	
Little Sioux	Little Sioux								.04			.04					.22											.08		.33			0.71	
Logan	Missouri											.39				.52															.25		1.16	
Marshalltown	Iowa	.33														.01	.07		.06	.34	.13						.07	.01	.10		.09		1.18	
Monroe	Skunk	T.														.43			.11	.54	.13						T.	T.			.21		1.42	
Muscatine	Mississippi	.45														T.	1.20	.02		.10	.12	.54	.01					.03			.21		2.68	
Olin	Wapsipinicon											.60	.62				.25	.19												.01			1.58	
Onawa	Missouri									T.			.08			T.	.23													.60			0.91	
Perry	Raccoon															.07	.06											.03	.02	.05	.09		0.60	
Rockwell City	Raccoon															.05												.14	.10	T.			0.29	
Sac City	Raccoon	T.							.13							.07	.33										T.	.11	.20				0.84	
Sioux City***	Missouri								.10							T.	.12											.14	.23			.23		0.59
Tipton	Cedar	.05														.81	.15				.15	.13						.04			.22		1.65	
Toledo	Iowa	.15														T.	.32	.10		.04	.40	.08					.05</							

Daily Precipitation for October, 1923—Continued.

Stations	Drainage	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	
Southern Division																																	
Afton	Grand												.65	.20		.18	.35	.02													.06	.12	1.80
Albia	Des Moines	.29											.75	.15		.08	.46	.04										.02	.01	.04	.30	2.14	
Atlantic	Nishnabotna												.03	.03		.18	.60											.03		.15	.07	1.09	
Bonaparte	Des Moines												.70	.18		.05	.09	.11	.09								.03		.09	.29	1.63		
Burlington	Mississippi	.20											.04	.26			T.	.25	.13											.25	1.13		
Centerville	Chariton	T.														**	**	**								T.	.02			.38	**		
Chariton	Chariton	T.											.62	.12		T.	.22													.14	1.10		
Clarinda	Nodaway										T.		.36	.21		.15	.39	T.									T.	.03		.18	1.23		
Columbus Jct.	Iowa												.85						.20											.25	1.30		
Corning	Nodaway												.35	.21		.36	.61													.36	1.89		
Corydon	Chariton	.01									T.		.65	.17		.22	.25	.02									.06		.02	.05	1.70		
Creston	Missouri												.20	.20		.15	.17													1.00	1.72		
Cumberland (near)	Nodaway										T.		.03	.07		.13	.22									T.		.03	.11	0.59			
Earlham	Des Moines												.41	.13		.13	.12													.10	1.06		
Fairfield	Skunk											.02	.71	.30			.27	.12												.35	1.77		
Glenwood	Missouri										T.		.04			.03	.83											T.		.20	1.20		
Greenfield	Nodaway																.03	.83															
Indianola	Des Moines											.03	.54	.18		.15	.21	.01									T.	T.		.26	1.47		
Keokuk***	Mississippi	T.										.13	.21		.04	.05	.11	.14								.01			.12	0.82			
Keosauqua	Des Moines											.70	.21		T.	.14	.16	.02								T.			.24	1.47			
Knoxville	Des Moines										T.		.85	.10		.08	.37	.08									.04		T.	.10	2.00		
Lacona	Des Moines												.58	.07		.17	.18													.20	1.30		
Lamoni	Grand															.68	.46	.11												.24	1.64		
Lenox	Missouri	.01									T.		.30	.25		.27	.40	.02										.03		.05	1.40		
Mt. Ayr	Grand	.01									T.		1.11	.09		.21	.45	T.									T.		T.	.08	2.25		
Mt. Pleasant	Skunk												.66	.30				.10	.22								.06			.24	1.58		
Oakland	Nishnabotna															.13	.53													.14	0.80		
Oskalosa	Des Moines												1.23	.08		.12	.53	.08									T.	T.	T.	.21	2.27		
Ottumwa	Des Moines												.64	.26		.02	.70	.26	T.								.03		.05	.28	2.24		
Pella	Skunk	T.											.85			T.	.35	.02									.10		T.	.45	1.77		
Sigourney	Skunk												1.05	.03		T.	.36	.13	T.								T.		T.	.49	2.06		
Stockport	Skunk												.58	.28		T.	.19	.14	.08								.03		.03	.23	1.56		
Thurman	Missouri												T.	T.		.06	.64										T.		.15		0.85		
Washington	Skunk	.18											.74			.17	.33	.07									.03			.28	1.80		
Wescott (near)	Mississippi	.14											.02	.31			.06	.26	.20								T.				0.99		
Winterset	Des Moines												T.	.38	.15		.10	.30												.08	1.31		
Omaha, Nebr.***	Missouri	.01															.25	.11									.01		.02	.30	0.71		

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.

|| Precipitation on October 1 is for 36 hours, beginning 7:00 a. m., September 30.

SUNSHINE AND CLOUDINESS.

The average per cent of the possible amount of sunshine was 62, or 2 per cent greater than the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 62; Davenport, 66; Des Moines, 64; Dubuque, 53; Keokuk, 63; Sioux City, 62; Omaha, Nebr., 67.

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 34 miles per hour, from the south, at Sioux City, on the 8th.

SNOW.

Snow occurred over the northwest portion of the State on the 27th and on the 29th and 30th snow was general except over the extreme southeast and extreme northeast corners. The greatest amount recorded was 4.5 inches, at Sioux Center. The average for the State, 1.7 inches, has been exceeded but four times in the last 34 years.

RIVERS.

Low and nearly stationary stages prevailed on the Mississippi River, with a general falling tendency. The extreme stages were less than one foot and at Lansing there was a difference of only 0.3 foot between the high and low stage. Low stages prevailed on the interior rivers most of the month, with falling stages after the first week. A moderate rise occurred on the Raccoon and Des Moines Rivers during the first week, but thereafter there was a gradual fall. Moderate stages prevailed on the Missouri River. A gradual rise occurred till the beginning of the second week, after which there was a gradual fall till the end of the month.

MISCELLANEOUS PHENOMENA.

Fog: 1st, 2d, 3d, 4th, 5th, 6th, 7th, 8th, 14th, 15th, 17th, 18th, 21st, 22d, 23d.

Frost (Killing): 4th, 5th, 13th, 14th, 19th, 20th, 21st.

Halos (Lunar and Solar): 2d, 6th, 10th, 17th.

Rainbow: 16th.

Sleet: 27th, 29th.

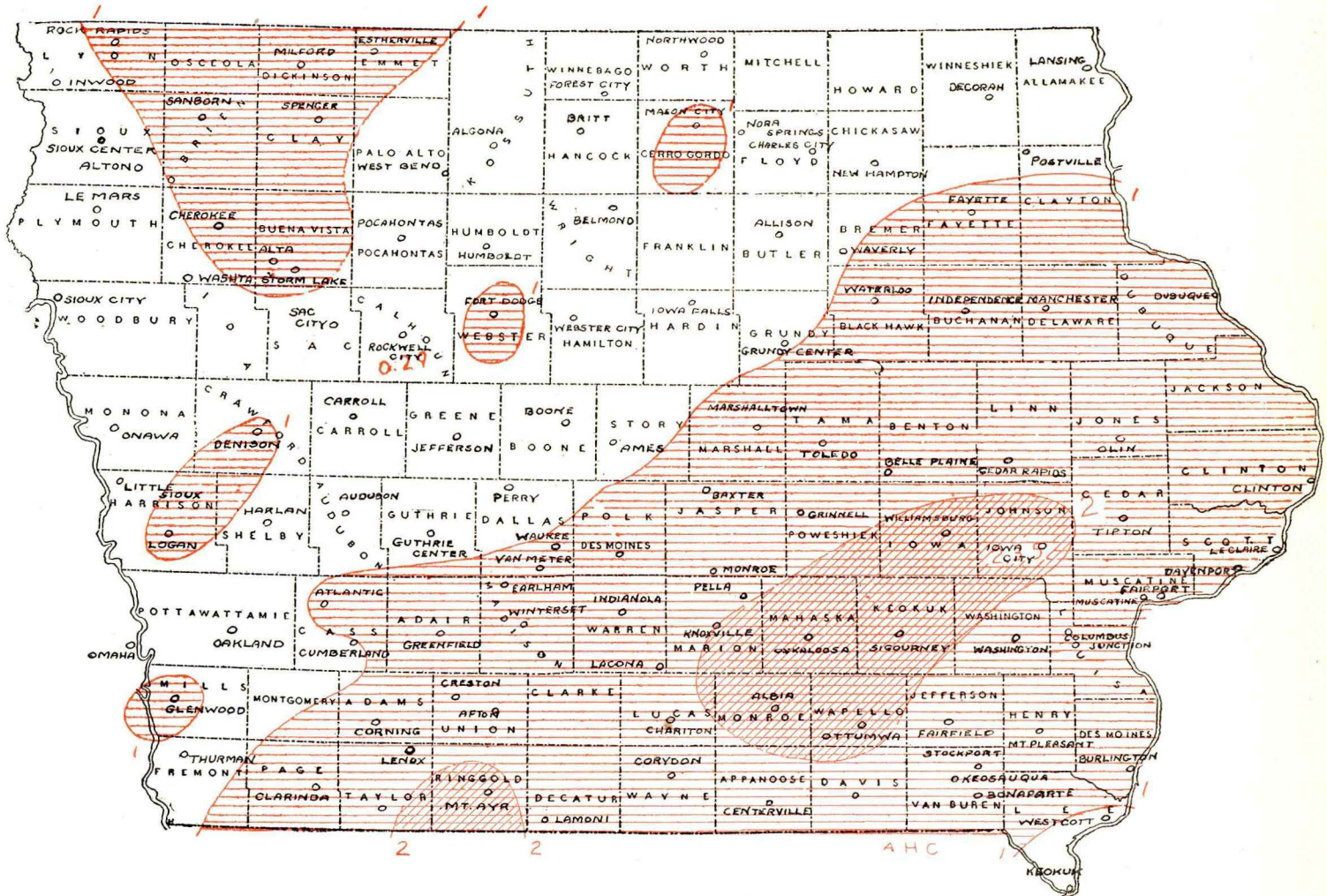
Thunderstorms: 1st, 8th, 12th.

Daily Maximum and Minimum Temperature for the Month of October, 1923.

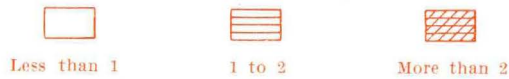
Table with columns for Stations, days 1-31, and Mean. Rows are categorized into Northern Division, Central Division, and Southern Division, listing various Iowa cities and their daily temperature ranges.

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

TOTAL PRECIPITATION, OCTOBER, 1923



SCALE OF SHADES—IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In cooperation with
IOWA WEATHER AND CROP SERVICE.

CHARLES D. REED, Meteorologist

VOL. XXXIV DES MOINES, IOWA, NOVEMBER, 1923 No. 11

GENERAL SUMMARY.

November was characterized by warm and dry weather, the entire absence of severe storms, and sunshine considerably above the normal. While there have been many Novembers warmer and drier than the present month, seldom, if ever, have weather elements combined to make conditions more pleasant and agreeable than those that prevailed throughout the month under discussion.

The temperature was above normal over the entire State, the excess being greatest in the northern division and diminishing slightly to the south. The daily mean was remarkably uniform and, except short periods at the beginning and ending of the month, the temperature was mostly above normal. There were no great extremes, the maximum being much below and the minimum much above the extremes usually experienced in November.

The weather was ideal for outdoor work and in much of the northern and western portions there was not sufficient precipitation to interfere with any class of work. Corn gathering progressed rapidly under most favorable conditions and in the State as a whole the amount that had been gathered at the end of the month compared favorably with the average and in sections the entire crop was in the crib. Building operations were pushed and there was very little delay on account of freezing temperatures. The absence of rain generally caused all roads to keep in unusually good condition, though some were very dusty.

The only storm of consequence occurred on the afternoon and night of the 29th in the southeastern and south-central sections, where a heavy fall of snow ranging from 5.0 to 8.0 inches covered a number of counties. Rail traffic was delayed in the area affected and travel by automobile was almost impossible for a time. The snow clung to all objects that it came in contact with and caused considerable damage to wires and trees.

The soil was too dry for the development of winter wheat and water was scarce in portions of the State. Pastures continued in generally good condition and grass remained green throughout the month.

F. L. D.

PRESSURE.

The mean pressure (reduced to sea level) for the State was 30.10 inches. The highest was 30.46 inches, at Keokuk, on the 1st, and the lowest was 29.55 inches, at Dubuque, on the 25th. The monthly range was 0.91 inch.

TEMPERATURE.

The mean temperature for the State, as shown by the records of 98 stations, was 40.1°, or 5.1° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 38.3°, or 5.5° higher than the normal; Central, 40.2°, or 5.1° higher than the normal; Southern, 41.7°, or 4.6° higher than the normal. The highest monthly mean was 43.6°, at Keokuk, and the lowest was 36.6°, at North-

wood. The highest temperature reported was 72°, at Mt. Pleasant and Ottawa, on the 10th, and the lowest was 9°, at Decorah, on the 22d. The temperature range for the State was 63°.

PRECIPITATION.

The average precipitation for the State, as shown by the records of 101 stations, was 0.58 inch, or 0.93 inch less than the normal. By divisions, the averages were as follows: Northern, 0.29 inch, or 1.12 inches less than the normal; Central, 0.60 inch, or 0.93 inch less than the normal; Southern, 0.85 inch, or 0.73 inch less than the normal. The greatest amount, 1.84 inches, occurred at Ottumwa, and the least, 0.0 inch, at Algona. The greatest amount in any 24 consecutive hours, 1.09 inches, occurred at Albia on the 29th and 30th.

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 41 miles per hour, from the northwest, at Sioux City on the 25th.

SNOWFALL.

The average snowfall for the State was 1.2 inches, or 1.3 inches less than the normal. The snowfall was confined mostly to the eastern half of the State. Most of the western half reported no snow whatever and a large area adjoining reported only a trace. Heavy snowfall occurred in Mahaska, Monroe, Wapello, Wayne and Appanoose counties on the 29th and diminishing amounts in the adjoining counties. No part of the State had a snow cover for more than two days, but a large portion of the southeastern and south-central sections was still covered, at the end of the month, with the snow that fell on the 29th.

COMPARATIVE DATA FOR THE STATE—NOVEMBER.

YEAR	Temperature				Precipitation				Number of Days				
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With precipitation of 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	+2.3	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
1922	42.2	+7.2	74	11	3.54	+2.03	5.23	1.96	0.3	9	11	6	13
1923	40.1	+5.1	72	9	0.58	-0.93	1.84	0.00	1.2	3	16	6	8

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



Climatological Data for November, 1923.

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
Northern Division																				
Algona	Kossuth	1,213	50	38.5	+ 5.8	61	11	16	22	36	0	-1.30	0	0	0	20	4	6	nw.	W. E. Laird.
Allison	Butler	1,044	11	38.3	-----	63	10	13	22	39	0.19	-----	0.13	1.0	15	8	7	nw.	J. A. Bell.	
Alta	Buena Vista	1,513	32	38.7	+ 6.3	63	11	17	28	33	0.27	-1.11	0.25	0	15	7	8	nw.	D. E. Hadden.	
Alton	Sioux	1,305	18	37.6	+ 5.0	63	11	16	28	39	0.30	-----	0.27	T.	14	8	8	sw.	W. S. Slagle.	
Belmond	Wright	1,205	13	38.3	-----	61	11†	12	22	37	0.23	-----	0.10	1.0	4	12	11	7	nw.	Geo. P. Hardwick.
Britt	Hancock	1,236	36	39.8	+ 7.9	62	6†	16	28	40	0.11	-1.28	0.11	T.	1	15	12	3	s.	L. M. Goodman.
Charles City	Floyd	1,015	32	37.9	+ 4.9	62	10	15	22	34	0.33	-1.06	0.17	1.5	2	11	10	9	nw.	U. S. Weather Bureau.
Cherokee	Cherokee	1,196	1	38.8	-----	65	11	12	22	42	0.23	-----	0.21	0	16	6	9	s.	J. E. Wirth.	
Decorah	Winneshiek	875	30	37.6	+ 3.9	60	10	9	22	36	0.49	-1.34	0.25	2.5	4	15	10	5	nw.	M. D. Whitney.
Estherville	Emmet	1,298	28	-----	-----	-----	-----	15	21	-----	0.20	-1.19	0.10	0	2	16	13	1	s.	A. O. Peterson.
Fayette	Fayette	1,003	33	37.0	+ 4.3	61	10†	10	22	42	0.70	-0.88	0.42	3.0	4	15	8	7	sw.	R. Z. Latimer.
Forest City	Winnebago	1,226	29	39.2	+ 7.5	63	6	13	22	39	0.15	-1.28	0.12	0.3	2	19	3	8	nw.	Dr. M. B. Neil.
Humboldt	Humboldt	1,095	35	38.8	+ 4.5	66	11	14	22	45	0.02	-1.57	0.02	T.	1	15	9	6	nw.	H. C. Snitkey.
Inwood	Lyon	1,474	19	37.6	+ 5.8	61	11	13	28	37	0.47	-0.37	0.39	0.1	2	16	7	7	s.	J. F. Hanson.
Le Mars	Plymouth	1,224	27	38.9	+ 5.8	63	11	16	28	41	0.25	-0.82	0.25	T.	1	18	4	8	sw.	Mrs. M. C. Woolley.
Mason City	Cerro Gordo	1,148	26	38.8	+ 5.9	60	11†	12	22	35	0.40	-1.28	0.25	2.0	2	18	3	9	nw.	Northern Sugar Corp.
Mason (Near)	Dickinson	1,430	3	37.4	-----	58	6†	17	22†	33	0.17	-----	0.11	T.	2	12	9	9	nw.	Dr. F. J. Smith.
New Hampton	Chickasaw	1,169	26	38.4	+ 5.4	62	11	14	22	36	0.43	-1.20	0.26	2.0	3	14	11	5	nw.	A. F. Kemman.
Nora Springs	Floyd	1,064	11	40.4	-----	65	10	15	22	40	0.55	-----	0.31	1.0	2	13	11	6	s.	Arthur Betts.
Northwood	Worth	1,222	27	36.6 ^b	+ 4.6	58 ^c	11	13 ^b	22	34 ^c	0.30	-1.46	0.20	0.5	3	17	8	5	sw.	Chas. Dwelle.
Oelwein	Fayette	1,036	0	39.6	-----	66	10	10	22	35	0.10	-----	0.10	0	1	16	2	12	sw.	John T. Ridler.
Pocahontas	Pocahontas	1,248	19	38.8	+ 6.0	62	10	16	22	39	0.15	-1.51	0.14	9	2	17	4	9	nw.	F. E. Hronek.
Postville	Clayton	1,180	24	37.2	+ 3.9	61	10	13	22	30	0.59	-1.06	0.30	3.0	3	13	8	9	sw.	F. L. Williams.
Rock Rapids	Lyon	1,358	24	37.5	+ 6.0	60	11	16	28	40	0.37	-0.69	0.32	0.5	2	17	6	7	nw.	J. K. Medberry.
Sanborn	O'Brien	1,553	9	36.8	-----	64	12	15	28	36	0.30	-----	0.26	0	3	15	4	11	nw.	J. W. Dow.
Sioux Center	Sioux	1,426	24	38.2	+ 6.3	62	17	15	28	36	0.33	-0.47	0.31	T.	2	15	6	9	nw.	J. de Ruyter.
Spencer	Clay	1,319	9	37.8	-----	62	6†	15	22	42	0.12	-1.51	0.12	T.	1	16	7	7	nw.	E. W. Little.
Storm Lake	Buena Vista	1,440	34	40.4	+ 6.8	64	11	19	28	33	0.25	-0.88	0.25	0	1	20	4	6	se.	Geo. H. Fracker.
Washta	Cherokee	1,157	25	38.4	+ 5.0	65	11	12	22	47	0.21	-0.92	0.21	T.	1	17	5	8	s.	H. L. Felter.
Waverly	Bremer	948	27	37.9 ^b	+ 3.8	61 ^b	10	13 ^b	22	37 ^b	0.53	-1.06	0.41	2.5	3	-----	-----	-----	s.	D. H. Murphy.
West Bend	Palo Alto	1,197	30	39.0	+ 6.5	65	11	17	22	42	0.27	-1.17	0.27	0	1	17	6	7	nw.	Jos. Dorweiler.
Means and extremes				38.3	+ 5.5	66	10†	9	22	47	0.29	-1.12	0.42	0.7	2	16	7	7	nw.	
Central Division																				
Ames	Story	926	46	40.4	+ 5.0	66	10	15	22	39	0.27	-1.06	0.17	T.	3	16	4	10	nw.	Iowa State College.
Audubon	Audubon	1,297	29	39.0	+ 4.1	67	11	11	27†	35	0.24	-1.12	0.14	0	2	15	10	5	nw.	Geo. Kibby.
Baxter	Jasper	998	23	40.7	+ 4.9	66	10	18	22	37	0.65	-0.75	0.48	1.0	2	11	13	6	s.	Henry Geisse.
Belle Plaine	Benton	886	33	40.2	+ 4.8	69	10	15	22	40	1.10	-0.63	0.41	1.8	5	14	4	12	nw.	O. C. Burrows.
Boone	Boone	1,134	18	39.4	+ 4.8	67	10	12	22	46	0.37	-1.00	0.20	T.	3	15	4	11	s.	C. F. Henning.
Carroll	Carroll	1,265	33	40.2	+ 6.8	66	11	17	28	38	0.05	-1.20	0.05	0	1	19	5	6	nw.	Mrs. Jos. J. Wolfe.
Cedar Rapids	Linn	737	41	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	H. F. Paar.
Clinton	Clinton	593	50	41.2	+ 5.2	67	10	19	22	34	1.14	-0.80	0.38	T.	7	14	7	9	s.	Dr. A. P. Bryant.
Davenport	Scott	580	52	42.0	+ 3.0	68	10	25	22	29	1.02	-0.74	0.49	T.	8	12	4	14	nw.	U. S. Weather Bureau.
Davenport (No. 2)	Scott	690	---	41.4	-----	68	10	17	22	35	0.99	-----	0.21	T.	7	-----	-----	-----	-----	Rex Shriver.
Denison	Crawford	1,171	29	40.0	+ 6.7	66	11	13	30	41	0.11	-1.07	0.69	0	9	15	10	5	nw.	V. J. Byers.
Des Moines	Polk	861	45	42.2	+ 3.8	67	10	22	22	36	0.55	-0.93	0.33	0.3	3	12	10	8	nw.	U. S. Weather Bureau.
Dubuque	Dubuque	698	50	40.0	+ 3.0	65	10	18	22	32	1.19	-0.62	0.99	3.0	8	6	11	13	nw.	U. S. Weather Bureau
Fairport	Muscatine	567	2	40.8	-----	66	10	20	22	30	1.21	-----	0.46	T.	6	10	5	15	sw.	Bureau of Fisheries.
Fort Dodge	Webster	1,114	23	38.8	+ 5.2	65	11	14	22	43	0.16	-1.32	0.15	0	2	21	2	7	nw.	Samuel Sampson.
Grinnell	Poweshiek	1,031	29	41.6	+ 5.1	66	11	20	22	37	1.03	-0.69	0.43	0.3	4	13	9	8	nw.	Paul P. Meyers.
Grundy Center	Grundy	976	32	40.0 ^a	+ 4.6	69 ^a	10	15 ^a	22	42 ^a	0.58	-0.82	0.38	2.0	3	-----	-----	-----	-----	M. G. Heiberger.
Guthrie Center	Guthrie	1,077	28	41.8	+ 6.1	68	10	15	22	43	0.34	-1.09	0.19	0	2	18	8	4	nw.	E. L. Nesselroad.
Harlan	Shelby	1,192	24	40.0 ^c	+ 5.6	65 ^c	11	16 ^c	22	41 ^c	0.38	-0.81	0.38	0	1	-----	-----	-----	-----	W. K. Colburn.
Independence	Buchanan	921	59	40.8	+ 6.3	62	10	14	22	36	0.64	-0.74	0.46	4.6	3	19	1	10	sw.	Dr. Geo. Boody.
Iowa City	Johnson	733	63	40.4	+ 5.5	68	10	16	22	38	1.13	-1.13	0.67	2.0	5	13	5	12	nw.	Prof. J. F. Reilly.
Iowa Falls	Hardin	1,107	30	38.6	+ 6.0	62	10	12	22	39	0.52	-1.02	0.28	2.0	3	17	8	5	nw.	J. B. Parmelee.
Jefferson	Greene	1,052	24	39.2	+ 4.2	66	11	14	22	45	0.35	-----	0.20	T.	2	16	6	8	nw.	W. I. Lyon.
Little Sioux	Harrison	1,040	18	40.9	+ 5.1	68	11	15	28	40	0.30	-----	0.29	0	2	20	4	6	nw.	S. B. Terry.
Logan	Harrison	1,035	56	39.9	+ 4.2	65	11	17	27†	40	0.12	-1.15	0.12	0	1	21	5	4	sw.	Mary Jean Stern.
Marshalltown	Marshall	947	31	41.3	+ 6.7	66	10†	19	22	38	0.67	-0.80	0.40	2.0	3	18	5	7	nw.	C. C. Pigman.
Monroe	Jasper	922	11	42.6	-----	70	10	21	22	42	0.33	-----	0.17	T.	2	20	2	8	s.	J. A. Dibel.
Olin	Jones	760	24	37.8	+ 2.7	66	11	14	22	43	0.60	-0.86	0.50	1.0	2	15	4	11	se.	Mrs. L. Stingley.
Onawa	Monona	1,051	23	39.6	-----	65	11	15	28	40	0.26	-0.97	0.26	0	1	20	5	5	nw.	Mrs. H. E. Colby.
Perry	Dallas	975	22	40.2 ^b	+ 4.7	65 ^b	10	18 ^b	1	40 ^b	0.24	-1.38	0.18	T.	3	-----	-----	-----	-----	F. N. Bartlett.
Rockwell City	Calhoun	1,134	27	39.8	+ 5.4	66	11	18	28	41	0.35	-1.23	0.30	T.	2	12	10	8	nw.	A. W. McIsaac.
Sac City	Sac	1,278	47	39.7 ^a	+ 5.8	63 ^a	11	18 ^a	28	37 ^a	0									

Climatological Data for November, 1923—Continued.

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	
Southern Division																					
Afton.....	Union.....	1,212	29	42.2	+ 5.2	71	11	19	27†	39	0.63	-0.86	0.33	1.5	3	22	5	3	nw.	S. R. Brown.	
Albia.....	Monroe.....	959	25	40.9	+ 4.1	70	11	22	22†	39	1.65	-0.05	1.09	8.0	6	15	4	11	nw.	O. E. McBride.	
Atlantic.....	Cass.....	1,164	32	42.6	+ 7.0	70	11	20	9	43	0.28	-0.94	0.15	0	2	13	11	6	nw.	Miss Oza Cunningham	
Bonaparte.....	Van Buren.....	563	32	42.2	+ 4.0	70	10	21	1†	37	0.63	-1.20	0.37	2.0	5	14	6	10	nw.	B. R. Vale.	
Burlington.....	Des Moines.....	544	27	43.1	+ 4.9	69	10	25	22	31	1.11	-0.78	0.46	T.	7	16	2	12	sw.	Mrs. E. M. Donnelly.	
Centerville.....	Appanoose.....	1,013	18	42.7	-----	69	11	21	27†	40	1.59	-0.01	0.77	7.7	3	13	10	7	nw.	W. E. VanSyoc.	
Chariton.....	Lucas.....	1,042	28	41.8	+ 4.7	70	11	16	1	40	0.78	-0.69	0.42	1.0	3	17	5	8	sw.	C. C. Burr.	
Clarinda.....	Page.....	1,009	33	42.4	+ 6.4	70	10	15	28	42	0.23	-1.21	0.19	0	2	16	8	6	nw.	A. S. Van Sandt.	
Columbus Jct.....	Louisa.....	595	22	41.6	+ 4.1	66	10	21	22	33	1.61	-0.85	0.49	-----	4	15	1	14	n.	J. B. Johnston.	
Corning.....	Adams.....	1,117	31	40.2	+ 4.5	70	11	15	27	45	0.71	-0.66	0.38	0	3	23	4	3	sw.	Jerome Smith.	
Corydon.....	Wayne.....	1,101	30	42.2	+ 4.0	71	11	20	27†	38	0.80	-0.64	0.39	5.0	5	15	7	8	sw.	May C. Miller.	
Creston.....	Union.....	1,312	18	41.5	+ 6.3	64	11	19	27	32	0.55	-----	0.30	0	2	21	6	3	s.	Mrs. S. O. Stanley.	
Cumberland (Near).....	Cass.....	1,225	24	-----	-----	-----	-----	-----	-----	-----	0.30	-0.75	0.19	0	2	17	7	6	nw.	Carl E. Pollock.	
Earlham.....	Madison.....	1,126	21	39.6	+ 4.8	69	10	12	22	44	0.44	-1.22	0.25	0	3	21	3	6	nw.	Geo. Phillips.	
Fairfield.....	Jefferson.....	780	39	40.4	+ 2.5	67	10	17	22	39	1.07	-1.19	0.55	4.0	5	13	5	12	s.	Prof. E. M. McKenzie.	
Glenwood.....	Mills.....	1,100	25	42.4	-----	68	11	18	28	40	0.28	-----	0.20	0	2	15	10	5	nw.	Dr. Geo. Mogridge.	
Greenfield.....	Adair.....	1,368	31	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	C. E. McCaslen.
Indianola.....	Warren.....	972	32	41.8	+ 4.7	69	11	20	22	40	0.44	-1.04	0.25	0.5	4	15	9	6	s.	Seth F. Shenton.	
Keokuk.....	Lee.....	614	52	43.6	+ 2.5	70	10	26	27	32	1.26	-0.59	0.55	3.7	8	11	8	11	s.	U. S. Weather Bureau	
Keosauqua.....	Van Buren.....	644	31	41.2	+ 4.0	69	11	17	22	43	0.89	-0.68	0.42	4.0	5	10	7	13	se.	J. H. Landes.	
Knoxville.....	Marion.....	920	28	42.3	+ 4.4	69	10†	19	22	42	1.17	-0.35	0.45	3.0	4	16	4	10	nw.	W. J. Casey.	
Lacona.....	Warren.....	-----	24	-----	-----	-----	-----	-----	-----	-----	0.76	-0.93	0.55	2.0	5	11	12	7	nw.	J. B. Alter.	
Lamoni.....	Decatur.....	1,123	16	40.8	+ 2.9	68	10	15	30	40	0.67	-0.82	0.33	3.0	3	18	7	5	n.	C. E. Wight.	
Lenox.....	Taylor.....	1,250	28	42.0	+ 5.5	69	11	18	28	38	0.69	-0.71	0.50	0.6	5	19	8	3	nw.	J. L. Hurley.	
Mt. Ayr.....	Ringgold.....	1,245	30	42.0	+ 4.1	68	10†	16	30	39	0.77	-0.75	0.40	2.3	5	19	5	6	s.	Alex Maxwell.	
Mt. Pleasant.....	Henry.....	729	42	43.0	+ 5.2	72	10	20	22	38	0.85	-0.94	0.45	0.2	4	14	7	9	nw.	J. H. Jericho.	
Oakland.....	Pottawattamie.....	1,105	4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	M. E. Gray.
Oskaloosa.....	Mahaska.....	835	47	41.4	+ 4.6	69	10†	20	22	41	1.75	+0.20	0.77	5.9	5	13	6	11	nw.	Roy R. Robinson.	
Ottumwa.....	Wapello.....	649	28	42.4	-----	72	10	20	1†	44	1.84	+0.51	0.82	3.4	6	16	3	11	nw.	C. L. Mikesch.	
Pella.....	Marion.....	877	30	40.7	+ 3.3	66	11	11	8	46	1.26	-0.42	0.51	1.0	4	19	3	8	nw.	J. H. Ver Steeg.	
Sigourney.....	Keokuk.....	790	27	40.2	+ 3.3	67	10	17	22	38	1.10	-0.57	0.71	3.3	5	15	5	10	nw.	W. E. Utterback.	
Stockport.....	Van Buren.....	745	21	40.6	+ 3.1	70	10	15	22	38	0.94	-0.73	0.44	3.0	6	13	4	13	s.	C. L. Beswick.	
Thurman.....	Fremont.....	975	26	38.6	+ 1.8	64	11	13	28	38	0.07	-1.54	0.05	0	2	9	17	4	nw.	C. R. Paul.	
Washington.....	Washington.....	769	41	41.4	+ 4.2	68	10	22	1†	36	0.99	-0.68	0.55	3.0	5	13	8	9	sw.	Wm. A. Cook.	
Wescott (Near).....	Lee.....	-----	1	41.4	-----	64	11	20	8	32	1.71	-----	0.60	0	6	15	6	9	sw.	Geo. H. Smith.	
Winterset.....	Madison.....	1,129	32	42.2	+ 5.6	70	11	21	28	40	0.42	-1.07	0.42	T.	1	19	7	4	nw.	H. S. Ely.	
Omaha, Nebr.....	-----	1,103	52	43.8	+ 5.3	65	11	21	28	30	0.27	-0.79	0.24	T.	3	16	10	4	nw.	U. S. Weather Bureau.	
Means and extremes.....	-----	-----	-----	41.7	+ 4.6	72	10	11	8	46	0.85	-0.73	1.09	2.0	4	16	6	8	nw.	-----	
State means and extremes.....	-----	-----	-----	40.1	+ 5.1	72	10	9	22	47	0.58	-0.93	1.09	1.2	3	16	6	8	nw.	-----	

The departures 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		Lowest	Date	Total movement	Average hourly velocity	Maximum					
						7 a. m.	12 Noon†					7 p. m.	Miles	From	Date		
Charles City.....	30.09	30.38	27	29.56	25	87	57	70	32	9	4,583	6.4	23	n.	16	58	+11
Davenport.....	30.09	30.42	1	29.57	30	84	60	68	37	6	4,552	6.3	23	nw.	25	48	-2
Des Moines.....	30.11	30.40	28	29.59	25	85	69	74	38	15	4,570	6.3	23	sw.	1	63	+7
Dubuque.....	30.10	30.44	1	29.55	25	82	59	63	36	2	4,236	5.9	23	nw.	26	44	-1
Keokuk.....	30.11	30.46	1	29.57	29	79	56	65	30	2	4,734	6.6	23	w.	25	52	-3
Sioux City.....	30.10	30.45	16	29.58	25	81	57	61	37	25	7,409	10.3	41	nw.	25	64	+8
Omaha, Neb.....	30.10	30.43	27	29.63	25	78	59	60	42	10	4,693	6.5	28	nw.	25	68	+13
Means and extremes.....	30.10	-----	-----	-----	78	60	65	-----	-----	-----	6.9	-----	-----	-----	-----	57	+5
Normals and records.....	30.07	-----	2d	29.55	25	-----	-----	-----	30	2	-----	-----	41	nw.	25	-----	-----
-----	-----	*30.96	1896	-----	28th	81	-----	-----	70	-----	6th	-----	8.2	-----	10th	52	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	16	1916	-----	63	sw.	1919	-----

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

Daily Precipitation for November, 1923—Continued.

Stations	Drainage	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											.33											.22							.08		0.63	
Albia	Des Moines			T.							.40	.05												.10		.01			1.00	.09	1.65		
Atlantic	Nishnabotna										.13												.15								0.28		
Bonaparte	Des Moines			.03	.01						T.				T.	T.								.31					.13	.15	0.63		
Burlington	Mississippi			.07	.09						T.	.12	T.	.02	T.									.35				.14	.32	1.11			
Centerville	Chariton										*	.82																.77		1.59			
Chariton	Chariton										.42													.18					.18		0.78		
Clarinda	Nodaway			T.							.19												.04								0.23		
Columbus Jet	Iowa				.22						T.				.06									.24				.49		1.01			
Corning	Nodaway										.38												.13	.20							0.71		
Corydon	Chariton										.37	.02											T.	.02				.21	.18		0.80		
Creston	Missouri										.30													.25							0.55		
Cumberland (near)	Nodaway										.11												.19								0.30		
Earlham	Des Moines										.19		T.										.03	.22							0.44		
Fairfield	Skunk			.06	.04						T.	T.												.42				.45	.10		1.07		
Glenwood	Missouri										.20												.08								0.28		
Greenfield	Nodaway																																
Indianola	Des Moines										.16												.01	.25				T.	.02		0.44		
Keokuk***	Mississippi			.10	.01						.09	.01			.04								.46			T.		.48	.07		1.26		
Keosauqua	Des Moines			.03	T.						.02	T.												.42				.22	.20		0.89		
Knoxville	Des Moines			T.							.45	.04												.38			T.	T.	.30		1.17		
Lacona	Des Moines			.01																			.28	.27				.10	.10		0.76		
Lamoni	Grand										.22													.12				.33			0.67		
Lenox	Missouri										.50												.11	.02				.03	.03		0.69		
Mt. Ayr	Grand			T.							.40												.06	.08				.16	.07		0.77		
Mt. Pleasant	Skunk										.05				T.									.45				.13	.22		0.85		
Oakland	Nishnabotna																																
Oskaloosa	Des Moines			T.							.62	.06			T.									.30		T.	T.	.08	.69		1.75		
Ottumwa	Des Moines			.03	T.						.44	.11												.20				.24	.82		1.84		
Pella	Skunk			T.							.45	.05												.51			T.		.25		1.26		
Sigourney	Skunk			T.							.10	.08			T.	T.								.21				.10	.61		1.10		
Stockport	Skunk			T.		.09	.08				T.				T.	T.								.44		.02		.25	.06		0.94		
Thurman	Missouri										.05																				0.07		
Washington	Skunk			.08							.01														.35			.30	.25		0.99		
Wescott (near)	Mississippi			.60	.02						.03	.12	T.											.45		T.		.49		1.71			
Winterset	Des Moines																							.42					T.		0.42		
Omaha, Nebr.***	Missouri										.17	.07		T.										.03				T.			0.27		

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. 65 per cent. The mean for the month was 72 per cent, or 4 per cent less than the normal. The highest monthly mean was 80 per cent, at Des Moines, and the lowest was 71 per cent, at Sioux City.

SUNSHINE.

The average per cent of the possible amount of sunshine was 57, or 5 per cent more than the normal. The per cent of the possible amounts at the regular Weather Bureau stations was as follows: Charles City, 58; Davenport, 48; Des Moines, 63; Dubuque, 44; Keokuk, 52; Sioux City, 64; Omaha, Nebr., 68.

MISCELLANEOUS PHENOMENA.

- Fog: 3d, 6th, 11th, 12th, 13th, 14th, 15th, 19th, 20th, 30th.
- Hail: 12th.
- Halos (lunar and solar): 1st, 13th 17th 20th, 21st, 26th, 29th.
- Rainbow: 12th.
- Sleet: 12th, 22d, 23d, 29th.
- Thunderstorms: 21st, 22d, 23d.

RIVERS.

Low and nearly stationary stages prevailed on all rivers. On the Mississippi and most interior rivers the extremes were less than half a foot and the least range in river stages was only 0.2 foot. The extremes on the Missouri River were less than a foot.

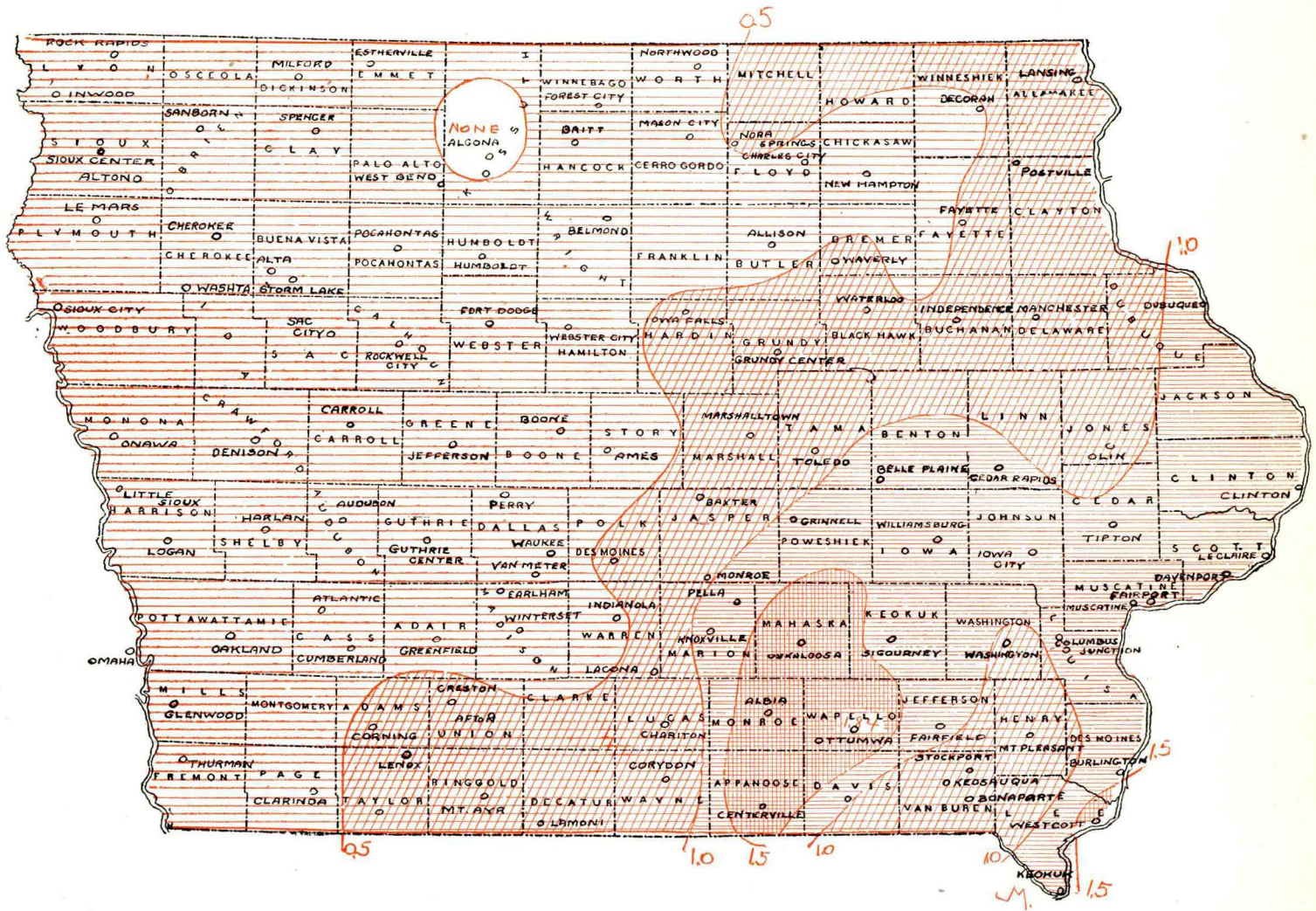
ERRATA.

Report for October, 1923. Page 74; Davenport, mean temperature recorded 50.5°, should be 50.6°; departure recorded -3.2°, should be -3.1°. Page 78; Davenport, maximum temperature on 12th, recorded 63°, should be 65°; mean maximum temperature recorded 59.6°, should be 59.7°. Page 75; Charles City, per cent of sunshine recorded 62, +4, should be 63, +5. Page 77; Charles City, sunshine recorded 62 per cent, should be 63 per cent. Page 74; Little Sioux, mean temperature recorded 49.5°, should be 48.9°; lowest temperature recorded 11°, on the 31st, should be 4°, on the 30th. Page 78; Little Sioux, minimum temperature on 30th, blank, should be 4°; mean of minimum 36.8°, should be 35.6°. Page 73. The lowest temperature for the month reported as 10° at Allison and Pella on 10th, should be 4°, at Little Sioux on the 10th; lowest temperature in "Comparative Data for the State, October" recorded 10, should be 4.

Daily Maximum and Minimum Temperature for the Month of November, 1923.

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean
Northern Division																																
Algona.....(Maximum.....)	50	48	58	47	50	59	48	42	56	61	56	52	48	46	42	60	53	53	52	46	40	39	50	55	36	31	40	42	50	-----	49.0	
.....(Minimum.....)	22	31	43	28	22	28	25	19	27	27	30	40	35	40	31	27	32	27	34	24	16	27	27	34	30	23	21	23	23	-----	28.0	
Alta.....(Maximum.....)	49	46	55	47	49	59	48	46	57	58	63	52	52	45	49	41	60	54	55	50	40	40	39	54	52	34	24	42	49	-----	48.5	
.....(Minimum.....)	24	36	36	28	27	28	22	28	38	31	47	36	35	35	28	27	32	30	35	21	21	27	28	30	22	20	17	25	26	-----	28.9	
Alton.....(Maximum.....)	50	46	52	47	47	58	48	45	58	56	63	53	54	48	50	42	58	52	55	52	44	37	35	54	52	36	30	45	45	-----	48.7	
.....(Minimum.....)	20	37	33	27	19	22	26	21	22	27	24	48	36	35	28	30	25	29	25	27	24	18	26	28	36	25	22	16	22	-----	26.6	
Belmond.....(Maximum.....)	51	48	60	50	50	66	50	47	54	60	61	50	61	47	44	41	60	53	52	54	45	40	38	48	54	40	30	37	44	-----	49.3	
.....(Minimum.....)	20	35	41	29	23	25	23	19	25	35	26	42	46	32	39	26	23	30	22	33	22	12	28	26	34	27	23	17	23	-----	27.3	
Charles City.....(Maximum.....)	50	54	58	48	51	59	46	42	56	62	61	49	59	47	45	41	60	52	50	55	40	40	36	40	52	35	35	34	40	-----	48.2	
.....(Minimum.....)	22	32	42	30	24	26	24	19	26	30	25	41	42	35	38	26	26	29	25	34	17	15	29	28	33	28	19	18	24	-----	27.6	
Decorah.....(Maximum.....)	43	53	54	46	48	56	52	42	53	60	56	49	50	52	45	40	55	50	47	53	44	44	36	36	48	45	33	36	33	-----	46.9	
.....(Minimum.....)	17	31	41	33	23	20	24	15	24	38	21	38	44	44	39	31	30	30	21	36	32	9	30	27	28	29	23	17	24	-----	28.3	
Forest City.....(Maximum.....)	52	48	60	48	52	63	50	46	57	60	62	52	56	49	46	40	62	54	52	53	49	39	39	44	55	45	37	49	42	-----	50.4	
.....(Minimum.....)	20	34	40	27	25	27	25	20	22	33	30	40	45	34	38	32	23	30	23	34	23	13	28	25	31	25	23	25	22	-----	27.9	
Inwood.....(Maximum.....)	49	51	47	51	54	60	52	47	59	66	61	54	52	51	50	51	52	50	53	40	48	40	33	40	43	35	24	50	46	-----	48.3	
.....(Minimum.....)	24	34	33	24	29	27	20	26	25	27	25	48	37	37	33	30	26	27	28	26	27	18	20	26	30	23	15	13	29	-----	27.0	
Mason City.....(Maximum.....)	54	49	59	48	50	59	46	40	59	59	60	49	59	49	45	41	60	51	52	53	46	39	36	43	54	35	32	46	43	-----	48.9	
.....(Minimum.....)	22	35	35	29	22	24	16	26	38	40	41	45	35	40	30	25	44	21	35	25	12	28	25	34	28	20	15	28	17	-----	28.6	
Milford (near).....(Maximum.....)	49	46	53	45	47	58	47	47	55	54	58	51	52	49	47	39	58	51	53	40	37	35	50	52	35	27	43	44	47	-----	47.4	
.....(Minimum.....)	20	36	34	26	23	26	27	21	24	34	26	46	35	36	39	29	25	29	25	31	22	17	25	29	33	26	20	17	22	-----	27.5	
New Hampton.....(Maximum.....)	50	55	56	47	50	60	50	44	56	61	62	50	56	52	43	40	58	52	48	54	45	40	37	38	50	45	35	32	45	-----	48.7	
.....(Minimum.....)	20	29	40	33	24	25	19	22	33	31	38	43	39	38	33	22	34	26	14	30	22	14	30	22	30	25	15	24	25	-----	28.0	
Northwood.....(Maximum.....)	43	49	-----	-----	52	44	41	55	57	58	48	57	48	44	46	48	58	49	50	53	44	39	32	43	54	37	32	35	42	-----	46.6 ^c	
.....(Minimum.....)	20	20	-----	25	30	25	18	26	34	27	38	42	38	38	28	24	31	20	13	27	26	31	28	20	15	20	24	24	-----	26.5 ^b		
Pocahontas.....(Maximum.....)	51	48	59	49	51	61	51	48	58	62	61	52	54	47	49	43	60	51	51	53	42	40	41	52	53	40	34	42	45	-----	50.0	
.....(Minimum.....)	19	37	42	27	24	33	25	19	22	35	22	47	36	32	36	30	26	24	31	21	16	25	25	34	27	22	18	21	21	-----	27.6	
Postville.....(Maximum.....)	49	53	51	48	41	56	45	39	53	61	59	50	49	54	45	40	53	51	47	55	45	40	36	37	42	36	34	30	35	-----	46.1	
.....(Minimum.....)	22	32	41	36	24	28	25	19	23	39	31	34	42	39	38	31	28	37	31	41	27	22	30	31	37	27	24	23	26	-----	32.4	
Central Division																																
Belle Plaine.....(Maximum.....)	53	60	60	52	52	59	51	47	58	69	66	52	57	56	48	45	57	59	56	65	46	46	37	47	53	47	33	37	35	-----	51.7	
.....(Minimum.....)	20	33	38	37	23	20	26	20	20	33	26	42	47	46	36	32	26	30	23	36	26	15	30	26	33	28	17	23	25	-----	28.8	
Boone.....(Maximum.....)	51	52	57	52	52	60	53	47	59	67	66	53	63	54	49	46	63	60	56	60	43	45	45	52	55	47	27	39	39	-----	52.1	
.....(Minimum.....)	15	39	43	31	23	18	25	17	16	30	20	46	47	27	43	30	62	61	60	55	45	47	43	54	56	40	24	41	39	-----	26.7	
Carroll.....(Maximum.....)	51	51	58	49	51	62	53	49	59	64	66	55	60	49	54	43	62	61	60	55	45	47	43	54	56	40	24	41	39	-----	51.8	
.....(Minimum.....)	21	21	42	29	25	25	27	22	28	41	28	47	39	37	40	33	25	29	27	38	27	18	29	25	34	22	19	17	24	-----	28.7	
Davenport.....(Maximum.....)	53	56	52	48	48	54	49	42	54	68	64	57	48	52	51	44	56	58	53	64	50	45	39	43	51	38	34	35	36	-----	49.5	
.....(Minimum.....)	29	40	43	38	33	31	34	29	29	39	36	36	45	47	43	34	28	37	33	41	29	25	33	30	37	33	30	29	29	-----	34.4	
Des Moines.....(Maximum.....)	51	53	60	51	51	60	52	46	58	67	67	55	63	58	50	43	64	59	56	62	43	44	44	54	54	37	29	39	38	-----	51.9	
.....(Minimum.....)	25	40	46	37	32	28	31	28	25	41	31	46	46	38	40	30	28	37	31	41	27	22	30	31	37	27	24	23	26	-----	32.4	
Dubuque.....(Maximum.....)	50	55	57	47	49	56	45	40	54	65	61	55	48	56	48	42	55	53	49	62	45	43	37	42	48	36	31	31	36	-----	47.9	
.....(Minimum.....)	25	36	45	36	30	26	32	24	27	39	29	37	44	45	42	33	27	36	31	41	25	18	33	31	35	31	24	22	25	-----	32.0	
Fort Dodge.....(Maximum.....)	52	48	57	51	50	60	55	46	57	64	65	57	58	49	47	41	61	56	50	51	48	40	42	49	53	39	31	38	35	-----	50.0	
.....(Minimum.....)	20	35	42	28	20	25	18	23	35	22	46	40	31	39	34	23	28	28	35	28	14	27	35	35	28	22	19	21	17	-----	27.6	
Grinnell.....(Maximum.....)	51	56	59	53	49	58	42	46	57	65	66	57	63	58	52	45	62	57	54	63	51	46	41	48	55	49	34	37	35	-----	52.3	
.....(Minimum.....)	23	34	41	38	27	26	29	24	25	39	34	41	49	38	32	37	25	32	27	36	34	20	30	25	36	31	25	22	25	-----	31.0	
Guthrie Center.....(Maximum.....)	52	50	56	53	50	60	59	50	60	68	67	65																				

TOTAL PRECIPITATION, NOVEMBER, 1923



SCALE OF SHADES—IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In cooperation with

IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXIV DES MOINES, IOWA, DECEMBER, 1923 No. 12

GENERAL SUMMARY

The chief characteristic of the weather during December was the decided excess in temperature, the mean temperature for the state, 33.5°, being the highest ever recorded in December since state wide records began in 1890, and exceeding the previous high mean of December, 1918, by 0.8°. The excess was general and uniform. This month was not, however, the warmest December in the history of the state as all stations that have longer records show that in 1877 and 1889 the mean was considerably higher than the current month. The temperature was continuously above normal till the 30th, except that the 2d and 13th were normal or slightly below, and there were several days in all sections of the state when the minimum did not reach the freezing point. A cold wave spread over the state on the 30th-31st and by the evening of the 31st zero or lower was reached throughout the state except a small area in the southeast corner. The average number of days on which the maximum temperatures was below the freezing point was less than three and at several stations the maximum temperature was above freezing every day in the month.

The precipitation was below normal over all divisions, though there were small areas in each division that had a slight excess, and until the 30th, was mostly in the form of rain. There were three principal precipitation periods. The first on the 12th gave moderate precipitation over most of the southern division, very little over the central division, and nearly none over the northern division; the next period began on the 19th and continued for several days over most of the state; on the 30th and 31st most of the total for the month occurred in the form of a blizzard. The snow was heavy over most of the northern and central divisions, amounting to 12.0 inches at Rockwell City, and from 6.0 to 10.0 inches over much of the state. The snow drifted badly, especially over the northern half of the state and train schedules were seriously retarded and travel by automobile was almost impossible. Deep drifts were general and before travel by automobile could be resumed it was necessary to cut through the drifts and on account of the dryness of the snow the operation was necessary several times. During the greater portion of the month the main highways were in fine condition in the drier sections of the state, though dirt and gravel roads were dusty. Over some southern and eastern sections the roads were rough and slippery due to freezing and thawing and travel was impossible without chains.

For all outdoor activities weather conditions were ideal. Building operations were interrupted very little and all unfinished farm work was completed. The ground was not frozen except in northern slopes and plowing was possible and considerable was accomplished as late as the 29th. What snow fell prior to the 30th soon disappeared and stock were on pasture except on a few days. Grass made perceptible growth and dandelions were in bloom during the month. On some of the warmer days insects could be seen in the air

and caterpillars and bugs were noted crawling on the ground. Bees were able to make flight on a large number of days and on account of their activity their stores were greatly depleted. The lack of moisture, in connection with the dry condition that has prevailed during the two months previous, caused a shortage of water over portions of the state. Winter wheat needed moisture badly in the southwest counties, but fortunately was mostly protected by snow just before the severe cold set in at the close of the month.

F. L. D.

PRESSURE

The mean pressure (reduced to sea level) for the state was 30.07 inches. The highest recorded was 30.71 inches at Sioux City on the 10th, and the lowest was 29.22 inches at Charles City on the 7th. The monthly range was 1.49 inches.

TEMPERATURE

The mean temperature for the state, as shown by the records of 96 stations, was 33.5°, or 9.6° higher than the normal. By divisions, three tiers of counties to the division, the means were as follows: Northern, 31.2°, or 10.0° higher than the normal; Central, 34.0°, or 9.9° higher than the normal; Southern, 35.4°, or 9.0° higher than the normal. The highest monthly mean was 39.2°, at Keokuk, and the lowest was 28.0°, at Sanborn. The highest temperature recorded was 68°, at Oakland on the 17th, and the lowest was -21° on the 31st. The temperature range for the state was 89°.

HUMIDITY

The average relative humidity for the state at 7 a. m. was 81 per cent, and at 7 p. m. was 68 per cent. The mean for the month was 74 per cent, which is 6 per cent below the normal. The highest monthly mean was 82 per cent at Davenport, and the lowest was 66 per cent at Sioux City.

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	7
1891.....	32.3	+8.4	72	-14	2.41	+1.19	4.50	1.21	-----	6	14	9	8
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	0.52	-0.70	1.69	T.	4.2	3	12	6	6
1906.....	25.7	+1.8	65	-9	1.43	+0.21	2.81	0.37	1.4	6	11	7	13
1907.....	28.8	+4.9	62	-9	1.00	-0.22	2.28	0.05	4.7	5	10	7	14
1908.....	27.2	+3.3	67	-17	0.57	-0.65	2.07	0.05	3.8	3	15	8	8
1909.....	15.1	-8.8	60	-26	2.18	+0.96	6.10	0.89	13.7	11	10	5	16
1910.....	23.4	-0.5	57	-14	0.37	-0.85	1.39	0.01	3.0	3	15	7	9
1911.....	27.9	+4.0	60	-24	2.57	+1.35	4.43	0.62	12.6	7	13	6	12
1912.....	29.2	+5.3	64	-13	0.74	-0.48	1.75	0.10	1.1	3	18	7	6
1913.....	32.0	+8.1	65	-13	1.02	-0.20	4.73	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	2.00	0.35	6.7	6	15	8	8
1917.....	14.5	-9.4	62	-40	0.56	-0.66	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	0.54	-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	66	-22	1.02	-0.20	3.72	T.	2.9	4	14	9	8
1922.....	24.0	+0.1	65	-25	0.37	-0.85	0.97	T.	2.2	3	16	7	8
1923.....	33.5	+9.6	68	-21	0.76	-0.46	2.22	T.	4.4	4	14	6	11

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



Climatological Data for December, 1923.

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
Northern Division																				
Algona	Kossuth	1,213	50	31.9	+10.6	58	18	-6	31	31	1.09	+0.12	1.05	9.0	3	20	4	7	nw.	W. E. Laird.
Allison	Butler	1,044	11	32.2	-----	57	18	-7	31	31	0.71	-----	0.60	6.0	3	16	3	12	nw.	J. A. Bell.
Alta	Buena Vista	1,513	32	31.0	+10.0	58	18	-11	31	29	0.73	-0.22	0.70	7.0	3	13	10	8	nw.	D. E. Hadden.
Alton	Sioux	1,305	18	30.2	+8.9	56	18	-8	31	36	0.62	-----	0.60	6.0	2	14	10	7	sw.	W. S. Slagle.
Belmond	Wright	1,205	13	31.4	-----	59	18	-9	31	31	0.72	-----	0.30	5.1	6	9	11	11	s.	Geo. P. Hardwick.
Britt	Hancock	1,236	36	31.0	+10.3	60	18	-12	31	44	0.32	-0.51	0.25	2.9	4	16	11	4	s.	L. M. Goodman.
Charles City	Floyd	1,015	32	31.4	+12.4	59	18	-13	31	30	1.19	-0.09	0.76	9.4	6	12	6	13	w.	U. S. Weather Bureau.
Cherokee	Chickasaw	1,196	1	31.0	-----	58	18	-8	31	32	0.67	-----	0.45	6.7	2	11	12	8	sw.	J. F. Wirth.
Decorah	Winneshiak	875	30	31.6	+9.4	52	18	-5	31	28	1.24	-0.10	-----	8.0	6	16	4	11	nw.	M. D. Whitney.
Estherville	Emmet	1,298	28	30.4 ^c	+10.5	60 ^c	18	-10	31	31 ^c	0.20	-0.61	0.10	4.0	2	15	14	2	nw.	A. O. Peterson.
Fayette	Fayette	1,003	33	31.9	+11.0	52	18	-7	31	28	1.01	-0.52	0.40	6.6	6	14	3	14	sw.	R. Z. Latimer.
Forest City	Winnebago	1,226	29	32.2	+12.6	59	18	-10	31	35	0.27	-0.70	0.25	2.5	2	15	3	13	nw.	Dr. M. B. Neil.
Humboldt	Humboldt	1,095	35	32.4	+9.2	61	18	-6	31	35	0.60	-0.26	0.60	6.0	2	10	6	15	sw.	H. C. Snitkey.
Inwood	Lyon	1,474	19	29.6	+9.6	58	18	-8	31	40	0.62	-0.06	0.43	5.7	6	21	5	5	nw.	F. B. Hanson.
Le Mars	Plymouth	1,224	27	31.0	+8.5	57	18	-7	31	34	0.28	-0.65	0.18	2.8	2	20	1	10	sw.	Mrs. M. C. Woolley.
Mason City	Cerro Gordo	1,148	26	30.8	+9.3	61	18	-11	31	34	1.21	-0.19	0.75	9.0	3	16	7	8	nw.	Northern Sugar Corp.
Milford (Near)	Dickinson	1,430	3	29.7	-----	50	8	-9	31	34	0.45	-----	0.26	3.8	3	10	11	10	sw.	Dr. F. J. Smith.
New Hampton	Chickasaw	1,169	26	32.0	+11.1	54	18	-8	31	33	1.34	+0.21	0.60	10.0	6	15	4	12	n.	A. F. Kemman.
Nora Springs	Floyd	1,064	11	33.9	-----	62	18	-7	31	37	1.77	-----	0.85	10.0	5	16	4	11	s.	Arthur Betts.
Northwood	Worth	1,222	27	31.0 ^a	+11.0	57 ^c	18	-11	31	34 ^c	1.05	-0.19	0.45	9.0	4	16	4	11	sw.	Chas. Dwelle.
Oelwein	Fayette	1,036	0	33.1	-----	54	19	-8	31	32	-----	-----	-----	-----	-----	-----	-----	-----	sw.	John T. Ridler.
Pocahontas	Pocahontas	1,248	19	32.1	+10.2	59	18	-8	31	36	0.43	-0.43	0.20	6.0	3	16	3	12	sw.	F. E. Hronek.
Postville	Clayton	1,180	24	31.2	+9.8	53	18	-9	31	24	0.81	-0.65	0.30	4.9	6	16	1	14	sw.	F. L. Williams.
Rock Rapids	Lyon	1,358	24	28.7	+9.1	56	18	-8	31	40	0.51	-0.07	0.28	4.6	4	19	3	9	sw.	J. K. Medberry.
Sunborn	O'Brien	1,553	9	28.0	-----	56	18	-21	31	34	0.52	-----	0.40	5.0	3	18	4	9	sw.	J. W. Dow.
Sioux Center	Sioux	1,42 ^c	24	30.2	+9.1	58	18	-10	30 ⁺	36	0.60	-0.29	0.60	6.0	1	15	6	10	w.	J. de Ruyter.
Spencer	Clay	1,311	9	30.2	-----	59	18	-9	31	39	0.72	+0.04	0.40	9.0	2	19	5	7	nw.	E. W. Little.
Storm Lake	Buena Vista	1,44	34	33.0	+10.6	57	18	-7	31	27	0.43	-0.39	0.33	4.0	2	17	3	11	se.	Geo. H. Fracker.
Washta	Cherokee	1,15	25	30.6	+8.1	57	17	-7	31	42	0.52	-0.28	0.40	6.0	3	14	11	6	s.	H. L. Felter.
Waverly	Bremer	95 ^a	27	31.8 ^a	+9.0	56 ^a	18	-9 ^a	31	33 ^a	1.04	-0.22	0.55	8.0	5	---	---	---	sw.	D. H. Murphy.
West Bend	Palo Alto	1,197	30	32.0	+10.2	60	18	-10	31	34	0.30	-0.93	0.16	3.0	3	14	12	5	nw.	Jos. Dorweiler.
Means and extremes				31.2	+10.0	62	18	-21	31	44	0.72	-0.35	1.05	6.1	4	15	6	10	sw.	
Central Division																				
Ames	Story	926	46	32.8	+8.4	60	18	-5	31	35	0.28	-0.94	0.15	2.0	4	13	5	13	s.	Iowa State College.
Audubon	Audubon	1,297	29	32.5	+8.6	58	17	-10	31	32	0.61	-0.32	0.50	4.5	4	15	10	6	sw.	Geo. Kibby.
Baxter	Jasper	998	23	34.4	+10.1	58	17	-4	31	34	0.47	-0.52	0.24	4.0	3	12	9	10	sw.	Henry Geise.
Belle Plaine	Benton	866	33	34.2	+10.3	58	18	-7	31	30	0.50	-0.51	0.26	5.3	6	13	4	14	sw.	O. C. Burrows.
Boone	Boone	1,134	18	33.0	+9.9	60	18	-3	31	41	0.66	-0.31	0.36	7.0	3	13	4	14	s.	C. F. Henning.
Carroll	Carroll	1,265	33	33.2	+10.0	59	17	-9	31	33	0.75	-0.27	0.29	5.5	4	17	5	9	nw.	Mrs. Jos. J. Wolfe.
Cedar Rapids	Linn	737	41	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	sw.	D. M. Perham.
Clinton	Clinton	595	50	36.4	+10.7	57	18	-4	31	30	1.95	+0.10	0.91	3.5	7	11	6	14	s.	Dr. A. P. Bryant.
Davenport	Scott	580	52	36.8	+9.7	55	18	-5	31	30	1.59	-0.17	0.67	6.0	10	9	7	15	sw.	U. S. Weather Bureau.
Davenport (No. 2)	Scott	690	-----	36.8	-----	57	8	-4	31	38	1.81	-----	0.71	1.5	10	-----	-----	-----	sw.	Res Shriver.
Denison	Crawford	1,171	29	32.8	+8.3	56	17	-8	31	32	0.45	-0.45	0.28	5.5	4	15	4	19	s.	V. L. Byers.
Des Moines	Polk	861	45	35.8	+9.8	59	17	-5	31	29	0.61	-0.70	0.49	6.2	4	10	8	13	sw.	U. S. Weather Bureau.
Dubuque	Dubuque	698	50	34.4	+9.7	54	18	-7	31	27	0.99	-0.20	0.40	7.3	9	9	7	15	s.	U. S. Weather Bureau.
Fairport	Muscatine	567	2	35.7	-----	52	18	4	31	31	2.68	-----	0.65	1.5	10	8	11	19	w.	Bureau of Fisheries.
Fort Dodge	Webster	1,114	23	32.6	+10.7	59	18	-7	31	32	0.92	+0.30	0.45	9.0	3	20	0	11	sw.	Samuel Sampson.
Grinnell	Poweshiek	1,031	29	35.3	+9.8	58	18	-4	31	30	0.43	-0.70	0.11	1.2	5	13	8	10	sw.	Paul P. Meyers.
Grundy Center	Grundy	976	32	34.0	+10.3	56	17	-9	31	33	1.78	+0.63	1.07	6.5	4	14	7	10	nw.	M. G. Heiberger.
Guthrie Center	Guthrie	1,077	28	35.0	+9.8	60	17	-5	31	36	0.61	-0.51	0.40	8.0	2	16	6	9	sw.	E. L. Nesselroad.
Harlan	Shelby	1,109	24	32.6	+8.8	58	17	-6	31	33	0.65	-0.41	0.25	6.5	3	18	5	8	s.	W. K. Colburn.
Independence	Buchanan	921	59	34.0	+11.2	54	18	-2	31	33	0.59	-0.79	0.28	4.2	5	15	0	16	sw.	Dr. Geo. Boody.
Iowa City	Johnson	733	63	35.0	+10.9	54	18	-3	31	29	0.73	-0.88	0.28	2.0	7	9	14	8	s.	Prof. J. F. Reilly.
Iowa Falls	Hardin	1,107	30	32.9	+11.6	57	18	-7	31	29	0.95	-0.42	0.75	8.0	3	17	1	13	nw.	J. B. Parmelee.
Jefferson	Greene	1,052	24	33.1	+8.9	59	17	-7	31	36	0.91	-----	0.50	8.5	5	15	5	11	sw.	W. I. Lyon.
Little Sioux	Harrison	1,040	18	33.2	+7.8	58	16	-5	31	37	0.75	-----	0.68	5.0	3	13	8	10	s.	S. B. Terry.
Logan	Harrison	1,035	56	32.6	+7.4	57	8	-5	31	33	0.58	-0.60	0.30	6.0	3	16	7	8	sw.	Mary Jean Stern.
Marshalltown	Marshall	947	31	35.0	+11.9	57	17	-5	31	30	0.57	-0.78	0.26	4.0	4	17	1	13	nw.	C. C. Pigman.
Monroe	Jasper	922	11	36.2 ^b	-----	60 ^d	17	-3 ^a	31	32 ^e	0.56	-0.45	0.50	6.3	3	16	4	11	s.	J. A. Dibel.
Olin	Jones	760	24	-----	-----	-----	-----	-----	-----	-----	0.30	+1.19	0.20	3.0	2	-----	-----	-----	sw.	Mrs. L. Stingley.
Onawa	Monona	1,051	23	31.4	-----	55	18	-6	31	32	1.50	+0.35	0.80	10.0	3	16	3	12	nw.	Mrs. H. E. Colby.
Perry	Dallas	975	22	34.1	+9.5	58	18	-5	31	29	0.32	-0.87	0.16	3.0	5	16	4	11	nw.	F. N. Bartlett.
Rockwell City	Calhoun	1,131	27	32.9	+9.0	64	15	-7	31	38	1.25	+0.20	0.60	12.0	2	11	4	16	w.	A. W. McIsaac.
Sac City	Sac	1,278	47	32.7	+8.9	59 ^a	18	-8	31	34 ^a	0.75	-0.40	0.50	7						

Climatological Data for December, 1923—Continued.

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>Southern Division</i>																				
Afton	Union	1,212	29	34.8	+ 8.6	60	17	- 6	31	35	0.36	-0.98	0.25	3.0	4	18	1	12	nw.	S. R. Brown.
Albia	Monroe	969	25	35.5	+10.2	59	17	- 3	31	29	0.74	-0.41	0.29	1.8	8	17	1	13	sw.	O. E. McBride.
Atlantic	Cass	1,104	32	37.6	+12.8	61	17	- 5	31	28	0.40	-0.80	0.20	4.0	5	15	3	13	sw.	Miss Oza Cunningham
Bonaparte	Van Buren	563	32	37.2	+ 9.3	57	7†	- 1	31	35	1.60	+0.25	0.95	T.	5	13	7	11	sw.	B. R. Vale.
Burlington	Des Moines	544	27	38.2	+10.3	55	7	5	31	32	1.43	-0.35	0.54	0.5	10	14	4	13	sw.	Mrs. E. M. Donnelly.
Centerville	Appanoose	1,013	18	36.4	-----	57	16	0	31	30	0.71	-0.58	0.39	0.7	5	7	13	11	sw.	Leo J. Allen.
Chariton	Lucas	1,042	28	35.5	+ 9.1	57	17	- 2	31	28	0.44	-0.88	0.32	1.0	5	14	8	9	sw.	O. C. Burr.
Clarinda	Page	1,009	33	35.2	+10.5	61	17	- 3	31	39	0.27	-0.90	0.17	1.8	5	14	7	10	nw.	A. S. Van Sandt.
Columbus Jct.	Louisa	565	22	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	J. B. Johnston.
Corning	Adams	1,111	31	33.4	+ 8.7	58	17	- 6	31	38	T.	-1.34	T.	T.	0	15	7	9	nw.	Jerome Smith.
Corydon	Wayne	1,101	30	35.7	+ 8.3	55	16†	- 2	31	29	0.69	-0.73	0.24	3.0	4	11	10	10	sw.	May C. Miller.
Creston	Union	1,311	18	34.6	+ 9.9	55	17†	- 3	31	28	0.26	-----	-----	-----	1	17	4	10	nw.	Mrs. S. O. Stanley.
Cumberland (Near)	Cass	1,225	24	-----	-----	-----	-----	-----	-----	-----	0.68	-1.02	0.08	0.8	1	16	5	10	sw.	Carl E. Pollock.
Earlham	Madison	1,126	21	35.2	+ 9.8	61	17	- 6	31	33	0.30	-1.11	0.20	3.0	2	15	4	12	nw.	Geo. Phillips.
Fairfield	Jefferson	780	39	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	Prof. R. M. McKenzie.
Glenwood	Mills	1,100	25	35.1	-----	60	17	- 3	31	37	0.35	-----	0.18	2.0	4	13	7	11	nw.	Dr. Geo. Mogridge.
Greenfield	Adair	1,365	31	33.1	+ 8.1	58	17	- 9	31	38	0.92	-1.16	0.02	T.	1	12	13	6	nw.	Mrs. C. Cornell.
Indianola	Warren	972	32	34.4 ^b	+ 9.6	59 ^b	17	- 4	31	32 ^b	0.62	-0.83	0.50	5.0	3	14	10	7	n.	Seth F. Shenton.
Keokuk	Lee	614	52	39.2	+ 8.1	60	7	0	31	30	1.79	-0.08	0.93	1.1	8	7	8	16	sw.	U. S. Weather Bureau
Keosauqua	Van Buren	644	31	36.1	+ 9.4	57	7	0	31	34	1.69	+0.26	0.87	2.0	8	13	5	13	sw.	J. H. Landes.
Knoxville	Marion	920	28	35.8	+ 9.3	60	17	- 2	31	33	0.38	-0.99	0.15	1.5	4	15	3	13	nw.	W. J. Casey.
Lacona	Warren	-----	24	-----	-----	-----	-----	-----	-----	-----	0.80	-0.90	0.48	3.0	5	8	15	8	-----	J. B. Alter.
Lamoni	Decatur	1,123	16	34.1	+ 7.4	59	16	- 5	31	34	0.46	-0.76	0.20	0.5	4	18	5	8	s.	C. E. Wight.
Lenox	Taylor	1,250	28	34.4	+ 8.7	57	7†	- 5	31	31	0.37	-0.76	0.15	1.0	4	14	8	9	nw.	J. L. Hurley.
Mt. Ayr	Ringgold	1,245	30	35.5	+ 8.5	59	17	0	31	31	0.46	-0.93	0.20	2.2	5	14	6	11	s.	Alex Maxwell.
Mt. Pleasant	Henry	729	42	37.2	+ 9.4	57	18	0	31	34	2.22	+0.86	0.83	1.0	8	15	4	12	nw.	J. H. Jericho.
Oakland	Pottawattamie	1,105	4	33.8	-----	68	17	- 3	31	43	T.	-----	T.	T.	0	18	3	10	s.	M. E. Gray.
Oskaloosa	Mahaska	835	47	35.2	+ 9.1	57	17†	- 4	31	30	1.00	-0.15	0.31	3.2	6	12	6	13	sw.	Roy R. Robinson.
Ottumwa	Wapello	649	28	36.2	-----	58	17	- 2	31	34	1.03	-0.27	0.40	0.7	8	15	5	11	nw.	C. L. Mikesch.
Pella	Marion	877	30	34.0	+ 7.4	56	18	- 4	31	40	0.56	-0.52	0.17	2.5	6	15	2	14	s.	J. H. Ver Steeg.
Sigourney	Keokuk	790	27	34.4	+ 7.7	55	17†	- 3	31	32	0.76	-0.47	0.28	3.2	4	15	2	14	sw.	W. E. Utterback.
Stockport	Van Buren	745	21	35.4	+ 7.8	57	17	- 2	31	35	1.86	+0.58	0.92	2.0	8	11	7	13	s.	C. L. Beswick.
Thurman	Fremont	975	26	32.5	+ 6.8	59	17	- 5	31	40	0.48	-0.87	0.20	2.1	6	7	17	7	nw.	C. R. Paul.
Washington	Washington	769	41	35.6	+ 8.5	55	17†	- 4	31	36	1.31	-0.05	0.57	2.0	5	9	11	11	sw.	Wm. A. Cook.
Wescott (Near)†	Lee	-----	1	35.8	-----	48	20†	10	31	25	2.25	-----	1.00	0	4	14	4	13	sw.	Geo. H. Smith.
Winterset	Madison	1,120	32	35.6	+ 9.5	58	17	- 5	31	28	0.50	-0.80	0.50	5.0	1	17	8	6	sw.	E. S. Ely.
Omaha, Nebr.	-----	1,103	52	35.2	+ 8.8	61	17	- 6	31	29	0.58	-0.33	0.29	5.9	5	8	11	12	nw.	U. S. Weather Bureau.
Means and extremes	-----	-----	-----	35.4	+ 9.0	68	17	- 9	31	43	0.71	-0.64	0.95	2.1	4	13	7	11	sw.	-----
State means and extremes	-----	-----	-----	33.5	+ 9.6	68	17	- 21	31	44	0.76	-0.46	1.07	4.4	4	14	6	11	sw.	-----

The departures 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		Date	Total movement	Average hourly velocity	Maximum		Per cent of possible	Departure from normal				
						7 a. m.	7 p. m.				Miles	From						
Charles City	30.06	30.64	10	29.22	7	87	62	70	29	14	5,141	6.9	28	sw.	14	51	+4	
Davenport	30.05	30.65	11	29.31	7	86	70	77	42	11	5,471	7.4	24	w.	27	43	+0	
Des Moines	30.06	30.68	11	29.27	7	82	62	67	33	14	5,510	7.4	33	sw.	14	58	+5	
Dubuque	30.07	30.66	11	29.28	7	82	68	72	33	11	4,919	6.6	23	nw.	13	59	-5	
Keokuk	30.08	30.66	11	29.37	7	78	64	70	29	12	5,711	7.7	31	nw.	31	49	+4	
Sioux City	30.09	30.71	10	29.23	7	75	55	58	25	18	5,176	11.0	40	nw.	12	57	+5	
Omaha, Neb.	30.06	30.73	11	29.27	7	77	62	64	32	28	5,850	7.9	33	n.	29	52	0	
Means and extremes	30.07	30.73	11	29.22	7	81	63	68	-----	-----	7.8	-----	-----	-----	12	50	+3	
Normals and records	30.12	-----	29th	-----	13th	84	-----	77	-----	12th	8.1	-----	-----	24th	47	-----	-----	
		*31.09	1917	\$29.00	1920	-----	-----	-----	-----	-----	†18	1922	-----	-----	*58	nw.	1907	-----

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

Daily Precipitation for December, 1923—Continued.

Stations	Drainage	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	
Southern Division																																		
Afton	Grand																			.03		T.				.03					.05	.25	0.36	
Albia	Des Moines	.01										.20	.01							.27	.02	T.				.02				.04	.17	0.74		
Atlantic	Nishnabotna								T.			T.								.05	.01									.12	.20	0.40		
Bonaparte	Des Moines			T.	T.				T.	T.		.76	.19							T.	.06		.47	T.	.02	.12				T.	T.	1.60		
Burlington	Mississippi	.01		.11								.36	.18							.09	.07		.03		.18				T.	.05	1.43			
Centerville	Chariton								T.			.39	.03							.15		T.									.09	0.71		
Chariton	Chariton	T.										T.								.32	T.		T.		.05					T.	.09	0.71		
Clarinda	Nodaway									T.		.02			T.					.03	.02									.12	.20	0.44		
Columbus Jet	Iowa																													.03	.17	0.27		
Corning	Nodaway	T.								T.			T.																			T.		
Corydon	Chariton									T.		.20									.24				T.		.13			T.	.12	0.69		
Creston	Missouri	T.																												T.	.26	0.26		
Cumberland(near)	Nodaway								T.		T.		T.								T.	T.								T.	.08	0.08		
Earlham	Des Moines										T.																			T.	.10	.20	0.30	
Fairfield	Skunk										T.																							
Glenwood	Missouri									T.		T.	T.								T.	T.									.02	.18	0.35	
Greenfield	Nodaway										T.	T.	T.								.02					.04	.11			T.	.18	.30	0.80	
Indianola	Des Moines	T.										T.									.07			T.							T.	.05	.50	0.62
Keokuk***	Mississippi	T.		.16						T.		.93								.19		T.	.32	T.	.15	.01		T.			.01	.09	1.79	
Keosauqua	Des Moines	T.		T.	T.					T.	T.	.84	.03							.07	.09	T.	.33	.07	.15	.01					.06	.20	1.69	
Knoxville	Des Moines	T.							T.			.06								.08		T.				.09					T.	.15	0.38	
Lacona	Des Moines																			.10	.12					.10					T.	.30	0.80	
Lamoni	Grand											.11									.10					.20					T.	.05	0.46	
Lenox	Missouri									T.	T.		.02							.15			T.			.10					T.	.10	0.37	
Mt. Ayr	Grand											.05				T.				.04	T.	T.		.05		.12					T.	.20	0.46	
Mt. Pleasant	Skunk			T.								.83	.10							.04	.66	T.	.43	.02		.04					T.	.10	2.22	
Oakland	Nishnabotna									T.	T.																					T.	T.	
Oskaloosa	Des Moines	T.										.21	T.							.22	.18	T.	T.			.08	T.				.06	.25	1.00	
Ottumwa	Des Moines			.62	T.							.49	.10							.12	.13					.08	T.				.04	.06	1.03	
Pella	Skunk	T.										.07	T.							.07	.17					.03	.08		T.		.07	.15	0.56	
Sigourney	Skunk	T.										.28	T.							.09	.15	T.	T.								T.	.24	0.76	
Stockport	Skunk	T.		T.	T.					T.	T.	.76	.16							.06	.12		.37			.17					.02	.20	1.86	
Thurman	Missouri											.06								.06	T.	T.	T.			.05	.09					.02	.20	0.48
Washington	Skunk											.57								.22	.22										.10	.20	1.31	
Wescott (near)	Mississippi			.15									1.00							.18			.92						T.				2.25	
Winterset	Des Moines																			T.	T.										T.	.50	0.50	
Omaha, Nebr.***	Missouri										.13	.02									T.	T.	T.			.03			T.		.29	.11	0.58	

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 50, or 3 per cent greater than the normal. The per cent of the possible amount at the regular Weather Bureau stations was as follows: Charles City, 51; Davenport, 43; Des Moines, 58; Dubuque, 39; Keokuk, 49; Sioux City, 57; Omaha, Neb., 52.

PRECIPITATION

The average precipitation for the state, as shown by the records of 99 stations, was 0.76 inch, or 0.46 inch less than the normal. By divisions the averages were as follows: Northern, 0.72 inch, or 0.35 inch less than the normal; Central, 0.85 inch, or 0.40 inch less than the normal; Southern, 0.71 inch, or 0.64 inch less than the normal. The greatest amount, 2.22 inches, occurred at Mt. Pleasant, and the least, a trace, at Corning and Oakland. The greatest amount in 24 consecutive hours, 1.07 inches, occurred at Grundy Center on the 20th.

WIND

The prevailing direction of the wind was from the southwest. The highest velocity reported from a regular Weather Bureau station was at the rate of 40 miles per hour, from the northwest, at Sioux City on the 12th.

SNOWFALL

The average snowfall for the state was 4.4 inches, or 1.8 inches less than the normal. The greatest amount, 12.0 inches occurred at Rockwell City, and the least a trace at Bonaparte, Corning, Greenfield and Oakland. Practically all the snowfall occurred on the 30th and 31st.

MISCELLANEOUS PHENOMENA

Fog: 1st, 2d, 4th, 6th, 11th, 12th, 17th, 19th, 20th, 21st, 22d, 23d, 24th, 26th, 27th.

Glaze: 31st.

Halos (Lunar and Solar): 2d, 11th, 14th, 16th, 18th, 20th, 28th, 31st.

Parhelia: 31st.

Sleet: 27th, 30th, 31st.

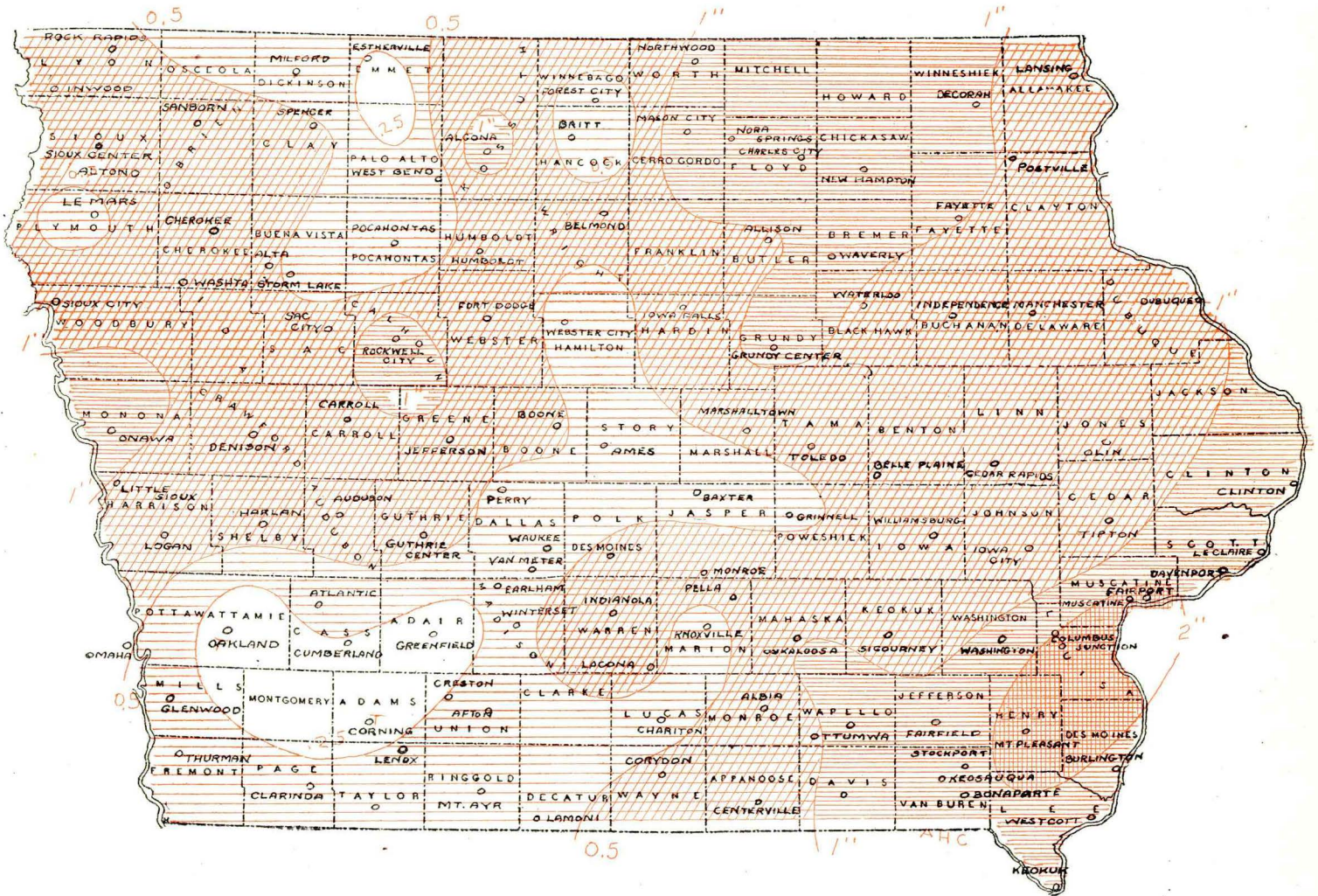
RIVERS

Low and nearly stationary stages prevailed on the Mississippi and all rivers within the state, the extremes being generally less than one foot. On the Missouri River moderate, gradually falling stages prevailed, the highest stage being on the 1st and the lowest around the last of the month. The extremes at Sioux City and Omaha, were 2.5 feet and 3.0 feet respectively.

Daily Maximum and Minimum Temperature for the Month of December, 1923.

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean
Northern Division																																
Algona	47	37	43	40	42	43	48	52	44	37	42	40	33	43	51	48	54	58	45	44	43	44	37	45	39	39	51	39	35	24	10	41.8
Alta	42	37	45	40	42	43	48	51	36	38	40	41	34	42	51	54	56	58	43	47	42	39	43	43	40	47	37	42	31	11	0	40.7
Alton	40	35	44	40	42	42	51	52	46	37	42	42	35	43	50	52	53	56	44	45	43	39	41	42	39	45	38	40	28	15	-2	40.6
Belmond	44	37	45	31	44	46	48	53	40	39	41	37	33	43	51	51	55	59	47	44	43	42	36	44	40	39	38	40	31	18	10	40.9
Charles City	42	36	45	41	41	43	46	53	39	40	44	37	30	43	52	51	53	59	49	44	44	39	34	42	39	41	36	38	28	23	10	40.7
Decorah	48	32	39	40	37	39	44	49	34	34	36	40	40	40	49	48	45	52	52	44	44	41	39	38	38	40	36	39	37	24	-21	40.1
Forest City	45	38	45	40	46	47	47	55	44	39	45	40	46	45	54	54	59	59	56	44	43	42	37	42	41	40	36	39	33	24	-21	43.2
Inwood	47	46	45	42	43	45	54	43	36	38	40	45	36	43	52	50	49	58	47	43	40	37	33	38	40	40	28	40	29	18	-12	40.8
Mason City	42	37	44	41	41	41	48	37	38	45	38	33	44	51	50	53	61	48	44	43	41	33	42	34	39	35	39	26	23	5	40.2	
Milford (near)	42	37	42	37	41	41	49	59	35	37	42	41	33	40	50	45	52	55	46	43	42	36	40	42	38	40	38	38	30	13	6	39.7
New Hampton	48	44	43	39	39	43	44	53	38	40	42	37	35	46	50	51	50	54	48	42	44	43	34	40	38	38	46	45	29	35	18	41.8
Northwood	43	35	39	40	41	41	50	36	31	43	39	28	42	52	49	52	52	54	49	44	40	39	37	39	38	40	39	39	38	24	-8	41.0
Pocahontas	45	40	41	41	41	47	48	59	39	42	41	36	43	53	53	56	59	58	45	45	49	40	44	48	42	45	38	42	29	21	-5	42.2
Postville	49	33	39	39	35	42	48	51	37	40	40	37	34	40	49	49	46	50	42	42	42	36	39	35	38	37	32	29	25	16	39.0	
Central Division																																
Belle Plaine	40	36	43	36	39	46	48	54	41	44	44	41	36	43	52	54	56	58	46	49	47	40	38	45	42	40	40	44	35	33	23	43.0
Boone	45	36	44	42	45	49	51	57	40	43	43	39	38	44	51	56	59	60	46	50	49	44	43	49	45	46	40	46	33	22	-7	44.6
Carroll	40	37	44	40	47	49	55	54	42	39	37	39	40	43	56	52	59	58	44	50	45	41	45	47	46	49	42	47	34	30	-7	43.9
Davenport	51	40	41	37	36	44	52	52	40	44	44	34	40	45	50	53	55	55	52	51	50	46	39	42	39	40	47	39	37	36	-25	43.7
Des Moines	45	38	46	49	43	46	52	56	43	43	42	41	35	45	55	54	59	57	45	52	46	42	47	46	45	42	48	37	30	15	-4	44.4
Dubuque	46	37	39	37	33	45	48	51	43	43	43	41	31	44	52	49	54	48	44	48	42	45	36	40	38	40	40	34	33	21	-20	41.2
Fort Dodge	45	39	44	40	44	45	47	55	47	39	42	39	39	44	52	55	56	59	50	46	46	45	40	45	42	40	40	40	38	30	-10	43.3
Grinnell	41	41	42	37	40	47	49	53	47	42	43	41	37	45	52	54	56	58	50	51	48	45	37	45	43	41	40	47	41	34	-24	44.2
Guthrie Center	46	41	42	41	47	47	52	55	47	41	41	38	35	43	57	55	60	58	49	56	50	43	47	50	46	47	44	45	44	38	-8	45.2
Independence	45	40	40	40	38	44	46	51	49	41	41	40	38	41	51	52	52	54	52	44	46	46	42	41	41	38	39	37	34	35	-31	43.0
Iowa City	46	40	42	37	36	45	50	50	46	44	43	42	38	41	48	50	53	54	48	50	48	46	37	42	42	38	43	41	36	34	-26	43.1
Iowa Falls	45	41	45	40	42	45	47	56	38	40	41	37	39	43	52	54	54	57	47	45	48	44	35	44	40	39	38	40	34	-29	42.3	
Little Sioux	45	37	50	43	45	47	58	54	44	38	45	45	44	49	56	57	58	58	50	48	48	47	48	45	45	50	43	49	46	36	-6	45.5
Marshalltown	45	42	42	38	40	46	49	54	41	42	44	40	37	49	52	54	57	57	47	49	47	43	36	44	42	40	39	44	36	32	-20	43.3
Olin	42	36	42	37	36	46	50	56	43	43	42	42	32	42	50	50	53	54	48	48	40	40	35	30	21	27	28	27	19	26	-5	42.6
Sioux City	40	36	46	41	44	45	54	47	38	38	40	45	38	42	55	50	54	59	42	45	41	36	40	42	44	46	36	48	33	10	-2	41.1
Southern Division																																
Albia	45	38	44	36	40	44	53	54	46	44	44	42	37	42	51	54	59	58	46	52	45	40	41	45	44	45	43	46	40	35	-25	44.5
Atlantic	44	41	48	42	47	49	53	55	47	38	36	46	36	44	56	57	61	57	44	54	47	40	47	47	46	48	42	47	44	34	-18	45.6
Burlington	52	50	42	37	37	44	55	54	48	46	43	45	45	49	43	54	53	53	50	51	50	49	41	42	42	42	50	42	43	40	37	45.8
Columbus Jct.	42	37	47	40	47	48	50	56	57	43	37	37	37	35	34	45	58	46	44	52	46	42	47	48	45	44	46	41	51	38	-32	44.4
Corning	42	37	47	40	47	48	50	56	57	43	37	37	37	35	34	45	58	46	44	52	46	42	47	48	45	44	46	41	51	38	-32	44.4
Corydon	41	39	44	36	39	43	53	53	46	43	41	40	36	39	49	52	55	53	45	51	47	42	42	45	43	46	43	44	51	37	-27	44.1
Fairfield	41	20	27	26	21	24	31	36	32	30	19	34	18	19	39	42	31	31	36	36	36	35	28	21	27	29	32	24	29	26	-2	27.3
Keokuk	59	43	42	37	36	45	60	54	52	44	46	47	35	41	45	58	59	56	53	52	52	43	38	44	45	46	55	46	44	41	30	46.9
Lamoni	40	36	46	36	41	47	55	55	45	44	40	39	36	42	51	59	54	57	44	54	47	45	44	40	40	40	40	40	31	2	30.0	
Pella	42	42	43	37	36	37	51	46	45	43	42	42	37	35	42	53	52	56	45	52	50	42	39	45	44	42	41	41	40	38	-36	43.1
Sigourney	38	38	40	35	35	45	50	52	47	43	41	41	38	40	49	51	55	55	44	50	45	43	38	44	41	40	42	45	36	-28	42.7	
Thurman	45	34	40	41	32	38	53	52	44	44	33	38	38	37	51	50	50	54	46	43	44	41	36	38	40	48	42	34	42	8	41.6	
Winterset	43	42	47	40	44	49	54	46	44	43	42	40	38	43	57	57	58	50	45	51	48	43	46	49	46	48	43	48	39	15	-17	45.0
Omaha, Nebr.	43	37	46	41	45	47	52	52	41	37	35	44	38	45	55	53	61	59</														

TOTAL PRECIPITATION, DECEMBER, 1923



SCALE OF SHADES—IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In cooperation with

IOWA WEATHER AND CROP SERVICE

CHARLES D. REED, Meteorologist

VOL. XXXIV DES MOINES, IOWA, ANNUAL, 1923 No. 13

GENERAL SUMMARY

The year 1923, with a mean temperature of 49.0 degrees, was somewhat warmer than normal. January was unusually warm and December was the warmest since state-wide records began 34 years ago. June, July, September and November were also above normal while the other months were below. March was remarkable for its extremes of temperature and severe blizzards. Relative humidity, precipitation, sunshine, and wind movement were below the average, but snowfall was above, due to the heavy snows of March. The average precipitation for the state was 29.50 inches or 2.47 inches below normal.

A cool spring, a cool, wet August, and a wet September with killing frost on the 14th in the north-central and east portions of the state were conditions not the best for corn which yielded 40.7 bushels per acre—the least since 1918. Twenty-five per cent of the crop was damaged by frost. Other crops were fairly satisfactory.

SYNOPSIS BY MONTHS

January, 1923, was mild and free from severe storms. The daily excess in temperature averaged 8.8 degrees. Except a few days during the first week the temperature was continuously above normal. Less than half the state reported zero weather. Precipitation averaged below normal though there was a slight excess in the northwestern and some southwest counties. Sleet and glaze occurred on a large number of days, making the ground very slippery over a large portion of the state, and causing numerous accidents to pedestrians and automobiles. Snow cover continued throughout the month in the extreme north, but the days of snow cover diminished toward the south, amounting to less than five days along the southern border. Conditions were favorable for outdoor work, and a good crop of ice was harvested. Plowing was done at intervals in the extreme south. Winter wheat did not apparently suffer for lack of snow cover.

February was the coldest month of the winter 1922-1923, though most of the cold weather occurred in the first 18 days, during which three rather severe cold waves occurred. The cold waves were made more bitter by very strong winds. This occasioned considerable suffering in sections of the larger cities, where the coal supply of individual families became exhausted. The strong winds that attended the cold wave of the 14th badly drifted the snow which preceded the cold wave, particularly in the northeast counties, where automobile and rail traffic was abandoned till a passage could be put through the drifts. In some places the drifts were packed so solid that automobiles could go over them without breaking through. Some wagon roads were still blocked at the end of the month. Days with zero weather ranged from twelve along the northern border to about three along the southern border. Though precipitation was generally deficient, winter wheat apparently suffered

very little from lack of moisture or snow cover. The three winter months were warmer and drier than usual.

March was unusually stormy and the temperature was subject to great extremes and sudden changes. The month opened mild and on the first two days the highest temperature ever recorded so early in the season occurred over almost the entire state, while the rest of the month was colder than usual, and on the 19th temperatures were the lowest ever recorded so late in the season, the lowest reported being -22 at Boone. Over most of the state the minimum temperatures were lower than in the preceding three winter months. Snowfall was abnormally heavy, averaging 18.5 inches, which has been exceeded but once (19.1 inches in 1912) since records have been kept. The storm of the 3d-4th was in the nature of an "old fashioned blizzard" over the northwestern half of the state, blocking roads for nearly a week and causing general transportation delay and inconvenience. The storm of the 11th-12th was exceptionally severe in the eastern portion of the state, where it played havoc with trees, telephone and telegraph poles and wires, and caused a suspension of rail traffic. Thousands of poles were snapped off, large limbs were broken from trees, and not a wire in large sections escaped damage. The damage to telephone and telegraph companies in the vicinity of Dubuque amounted to more than \$100,000. Several stations reported 25 to 30 inches of snow in the week 12th to 18th. On Sunday, the 18th, occurred one of the worst blizzards ever experienced. For details, see monthly report.

April was cold and disagreeable with frequent light rains and numerous temperature fluctuations until the 18th, which caused further heavy losses to young pigs, and greatly delayed farm work. After the 18th conditions were more favorable and farm work was pushed rapidly, so that practically all seeding of small grain was finished and preparation for corn planting was well advanced over the southern half of the state, and good progress had been made over most of the northern portion. Deficient precipitation caused slow and uneven germination of spring grains. Grass was unusually late in starting. Fruit buds began to swell toward the close of the month but practically no bloom appeared except in a few southern counties. The last general frost of the season occurred on the 28th, but as vegetation was backward there was practically no damage.

May opened warm but from the 5th till toward the close of the month temperatures were generally below normal, and frost was reported over portions of the state as late as the 25th. A hard freeze occurred over practically the entire state on the morning of the 9th, but the relatively strong wind and the usually dry condition of the atmosphere prevented the formation of frost. Heavy ice formed on exposed water surfaces. Fruit buds and blossoms were not damaged. Even bean and tomato plants that were known to be exposed to a temperature of 28 degrees for several hours were not injured. Precipitation was very deficient except a few small areas that had locally heavy rains on the 11th and 29th. Damaging storms were less frequent than usual in May, though a few bridges were washed out in Fremont and Page counties, and a few local windstorms occurred in Louisa, Des Moines, and Lee counties, and there was a tornado in Grant township, Mahaska county, on the afternoon of the 29th which did little damage. The ground



was too cold for proper germination of corn; much seed rotted in the ground, necessitating replanting; and that which came up made poor growth. At the close of the month 90 per cent of the corn planting had been completed, which is about the average.

There was a pronounced warm period June 15th to 26th, during which maximum temperatures of 90 degrees were reported over portions of the state for a larger number of consecutive days than ever before in June. These, with high relative humidity, were very trying on man and beast, causing many heat prostrations. Many horses died. This was followed by an abnormal change to cooler and on the 29th the lowest temperatures of record so late in the month occurred. Rainfall was ample and well distributed except in the northeastern and southern portions of the state, where it was not sufficient for agricultural needs; and hay, oats and spring wheat were damaged. Hail was unusually prevalent, but the storms were lighter than usual and the amount of damage was small considering the number of storms. The greatest damage was on the 27th in Iowa, Boone, Fremont, Taylor, Adams, Ringgold and Clarke counties. Wind squalls broke off 500 telephone poles in Linn county. Six deaths were caused by lightning. Further replanting of corn continued till the middle of June. Rains of early June, together with the slow germination of the corn, made cultivation impossible, and the fields became overrun with weeds. During the hot period, 15th to 26th, corn made unusually good progress and was well up to average by the close of the month.

July was warm and drier except the first four days, which were cool. From the 15th to the 27th very little rain fell, and at the end of the month the state was suffering from a severe drouth. This, with the high temperatures, checked the growth of corn. Temperatures of 100 degrees or higher were frequent in the northern part of the state. Upland corn curled and fired badly. Late oats and spring wheat ripened prematurely, and pastures, over large portions, were burned brown, so that stock feeding became general. The hay crop suffered greatly in Winnebago county, where it was reported the lightest in 50 years.

August averaged too cool for the best development of corn. The coolest part was from the 21st to the 25th, and light frost was reported on lowlands in nearly all sections of the state on the 22nd, the larger number of reports being in the southern division. Rainfall was unusually heavy and frequent for the month of August. This, together with deficient sunshine, contributed to the slow development of the corn crop. Thrashing was considerably delayed, and shocked grain was saturated and damaged by rotting and sprouting, particularly in the west-central counties. Corn was blown down badly over much of the central and southern division on the 4th, and a little on the 7th-11th, and 25th-26th. Severe hail occurred over scattered areas over the west portion of the state on the 4th, and the east-central section on the 11th, but the most damaging hail occurred in the north-central and central sections on the 25th and 26th. The total damage probably exceeded a million dollars. Tornadoes were reported on the 4th, 11th and 25th.

Wet weather continued in September and further delayed the maturing of corn and damaged small grain in shock. Though temperatures for the month averaged slightly above normal, several days about the middle of the month were abnormally cool with some frost on the 12th and 13th, and a damaging frost on the 14th. The worst damage occurred in the north-central and eastern districts. Over most of this

area corn was damaged 10 to 30 per cent, and at the end of the month only 75 per cent of the crop was safe from frost. Fall plowing was delayed by the wet weather. Winter wheat seeding was delayed to avoid damage by Hessian fly. Locally heavy rain in Mahaska, Marion and some of the Missouri River counties caused damaging floods and there was a tornado at Council Bluffs on the 28th.

(Continued on page 104)

SUPPLEMENTAL PRECIPITATION TABLE, YEAR 1923.

Stations	January	February	March	April	May	June	July	August	September	October	November	December	Annual
<i>Northern Division</i>													
Estherville-----	0.75	-----	0.81	2.58	2.36	5.40	0.93	4.75	5.55	1.08	0.20	0.20	-----
Lansing-----	-----	-----	-----	2.31	2.03	7.08	1.34	3.22	4.49	0.78	-----	-----	-----
Oelwein-----	-----	-----	-----	-----	2.09	7.09	1.75	4.45	5.05	1.10	0.10	-----	-----
Sioux Center-----	0.85	0.05	1.50	3.81	2.37	4.54	3.05	4.20	-----	0.61	0.33	0.60	-----
<i>Central Division</i>													
Cedar Rapids-----	1.05	0.30	3.61	1.45	-----	4.40	1.35	4.32	8.47	-----	-----	-----	-----
Davenport No. 2-----	-----	-----	-----	-----	-----	-----	-----	2.17	4.82	1.80	0.99	1.81	-----
Le Claire-----	-----	-----	5.86	1.04	3.21	6.92	0.86	2.44	3.61	1.62	-----	-----	-----
Little Sioux-----	0.93	0.12	2.19	4.26	2.88	4.63	1.86	6.28	-----	0.71	0.30	0.75	-----
Muscatine-----	-----	-----	4.95	1.36	2.58	3.95	1.37	1.65	6.71	2.68	-----	-----	-----
Van Meter-----	-----	-----	-----	1.63	3.53	3.50	1.36	4.72	4.34	0.85	0.10	-----	-----
Webster City-----	1.30	0.40	2.20	2.45	1.63	3.66	0.46	6.49	-----	-----	-----	0.27	-----
<i>Southern Division</i>													
Atlantic-----	-----	T.	3.14	2.57	2.42	4.40	1.83	5.11	6.98	1.09	0.28	0.40	-----
Centerville-----	0.47	0.51	2.85	0.86	1.90	4.01	3.14	3.16	1.88	-----	1.59	0.71	-----
Fairfield-----	0.82	0.80	4.35	1.30	1.98	5.06	1.07	4.04	6.87	1.77	1.07	-----	-----
Greenfield-----	0.10	0.15	4.33	-----	-----	-----	-----	-----	3.62	-----	-----	-----	0.02
Lamoni-----	-----	0.45	2.70	1.88	1.19	3.78	2.28	5.85	4.56	1.64	0.67	0.46	-----
Ottumwa-----	-----	0.62	4.11	1.12	3.05	4.38	0.91	4.36	3.71	2.24	1.84	1.03	-----
Wescott (near)---	1.18	0.71	5.00	1.35	3.01	3.41	1.41	2.87	4.55	0.99	1.71	2.25	28.45

COMPARATIVE DATA FOR THE STATE—Annual.

Year	Temperature				Precipitation in Inches				
	Mean annual	Highest	Date	Lowest	Date	Annual	Greatest annual	Least annual	Average 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.....	52.90	49.05	23.48	-----
1892	46.6	104	July 11.....	-36	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	15.05	19.2
1895	47.2	104	May 28.....	-33	February 1.....	26.77	35.25	18.57	26.6
1896	48.6	104	July 3.....	-20	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.....	-10	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	50.53	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	19.63	32.8
1907	47.4	102	July 5.....	-31	February 5.....	31.61	43.90	24.93	24.0
1908	49.5	101	August 3.....	-18	January 29.....	35.26	49.98	24.11	24.7
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	15.12	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.....	-17	January 12.....	28.89	33.13	15.25	39.5
1913	49.7	108	July* 16.....	-25	January 8.....	29.95	45.18	20.21	25.4
1914	49.1	109	July 12.....	-31	December 26.....	31.93	44.11	23.31	27.5
1915	47.8	99	May 14.....	-32	January 23.....	39.53	51.15	27.29	27.3
1916	47.2	106	August 4.....	-34	January 18.....	28.90	46.34	22.43	29.5
1917	44.8	106	July 30.....	-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
1922	50.2	104	June 23.....	-29	January 6.....	29.98	44.20	19.08	13.5
1923	49.0	102	July* 22.....	-23	February* 3.....	29.50	37.47	21.36	36.3

*And other dates.

CLIMATOLOGICAL DATA FOR THE YEAR, 1923.

STATIONS	COUNTIES	Elevation, feet	Temperature, in Degrees Fahrenheit					Precipitation, in Inches					Number of Days				Prevailing direction of wind			
			Length of record, year	Mean	Highest	Date	Lowest	Date	Length of record, years	Total	Greatest monthly	Month	Least monthly	Month	Total snowfall (unmelted)	Precipitation 0.01 inch or more		Clear	Partly cloudy	Cloudy
<i>Northern Division</i>																				
Algona	Kossuth	1,213	50	47.5	99	July 23	-17	Feb. 3	50	34.63	10.97	Sept.	0.00	Nov.	50.6	70	227	62	76	nw.
Allison	Butler	1,044	11	47.2	101	July 22	-19	Feb. 3	11	28.96	7.60	Aug.	0.19	Nov.	40.5	80	157	105	103	nw.
Alta	Buena Vista	1,513	32	47.0	93	July 9†	-16	Feb. 3	32	33.59	6.85	June	0.27	Nov.	38.6	97	159	118	88	nw.
Alton	Sioux	1,305	18	47.1	96	July 9†	-18	Feb. 4	18	30.35	8.53	Sept.	0.07	Feb.	30.2	81	155	121	89	nw.
Belmond	Wright	1,205	13	47.5	100	July 23	-19	Feb. 3	13	26.81	5.83	Sept.	0.23	Nov.	41.7	104	88	190	87	nw.
Britt	Hancock	1,236	36	47.0	98	July 20†	-20	Feb. 3	36	25.01	8.52	Sept.	0.11	Nov.	20.5	73	180	135	50	s.
Charles City	Floyd	1,015	32	46.5	96	July 23	-19	Feb. 3	32	29.20	7.12	Sept.	0.33	Nov.	49.3	106	142	105	118	se.
Cherokee	Cherokee	1,196	1	46.9	94	July 23	-17	Feb. 3	1	31.16	7.20	Sept.	0.17	Feb.	34.7	89				s.
Decorah	Winneshiak	875	30	46.1	99	July 22	-22	Feb. 3†	30	26.82	6.44	Sept.	0.49	Nov.	56.7	78	196	77	92	nw.
Estherville	Emmett	1,298	28		98	July 22			28		5.55	Sept.	0.20	Nov.*						nw.
Fayette	Fayette	1,003	33	46.2	98	July 23	-20	Feb. 3†	33	27.33	5.71	Aug.	0.35	Feb.	39.8	92				sw.
Forest City	Winnebago	1,226	29	46.4	100	July 23	-21	Feb. 3	29	24.68	7.12	Sept.	0.15	Nov.	32.6	79	153	98	114	nw.
Humboldt	Humboldt	1,095	35	48.1	99	July 22†	-15	Feb. 3	35	32.24	6.60	Sept.	0.02	Nov.	42.2	80	153	105	107	s.
Inwood	Lyon	1,474	19	46.8	96	July 23	-22b	Feb. 4	19	24.05	4.39	Aug.	0.00	Feb.	31.1	100				s.
Le Mars	Plymouth	1,224	27	47.8	97	July 23	-15	Feb. 3	27	32.74	7.35	Sept.	0.10	Feb.	19.7	80	219	60	86	sw.
Mason City	Cerro Gordo	1,148	26	46.3	98	July 22†	-22	Feb. 3	26	29.79	7.51	Sept.	0.40	Nov.	53.5	79	200	82	83	se.
Milford (near)	Dickinson	1,430	3	45.5	91b	July 23	-18	Feb. 3	3	26.00	5.36	Aug.	0.17	Nov.	24.0	90				nw.
New Hampton	Chickasaw	1,169	26	46.6	97	July 7	-22	Feb. 3	26	31.11	6.87	Aug.	0.43	Nov.	51.0	85	153	122	90	nw.
Nora Springs	Floyd	1,064	11	48.2	102	July 22	-21	Feb. 4	11	33.47	6.99	Sept.	0.55	Nov.	47.6	108	159	124	82	s.
Northwood	Worth	1,222	27	45.6	99a	July 22	-22a	Feb. 3	27	34.46	10.80	Sept.	0.30	Nov.	54.7	87	150	127	88	sw.
Oelwein	Fayette	1,036			96	July 22†					7.69	June	0.10	Nov.						sw.
Pocahontas	Pocahontas	1,248	19	47.5	96	July 23	-18	Feb. 4	19	31.92	7.93	Sept.	0.15	Nov.	40.6	98	189	77	99	se.
Postville	Clayton	1,180	24	45.3	93	July 22	-23	Feb. 3	24	27.40	5.87	Aug.	0.59	Nov.	38.1	81	152	101	112	sw.
Rock Rapids	Lyon	1,358	24	46.7	95	June 24†	-23	Feb. 4	24	28.80	5.38	Aug.	0.08	Feb.	23.9	97	218	79	68	sw.
Sanborn	O'Brien	1,553	9	45.9	96	July 22	-22	Feb. 2†	9	28.25	5.54	Sept.	0.05	Feb.	23.9	84	180	78	107	nw.
Sioux Center	Sioux	1,426	24		98	July 23	-19	Feb. 3	24				0.05	Feb.	36.8					s.
Spencer	Clay	1,319	9	47.0	99c	July 21†	-20	Feb. 3	9	25.55	5.20	Aug.	0.12	Nov.	36.0	85				nw.
Storm Lake	Buena Vista	1,440	34	48.1	94	July 23	-15	Feb. 3	34	32.10	7.30	June	0.25	Nov.	29.8	91				se.
Washa	Cherokee	1,157	25	46.4	93	July 10†	-19	Feb. 4	25	32.41	7.67	June	0.15	Feb.	39.0	91	191	85	89	se.
Waverly	Bremer	936	27	47.3	98b	July 22	-18	Feb. 3	27	32.07	6.70	Aug.	0.10	Feb.		81				se.
West Bend	Palo Alto	1,197	30	47.7	97	July 21†	-19	Feb. 3	30	30.31	7.98	Sept.	0.27	Nov.	27.7	92	178	118	69	nw.
<i>Central Division</i>																				
Ames	Story	926	44	49.1	98	July 10	-13	Feb. 3	44	29.93	8.42	Aug.	0.27	Nov.	17.6	71	175	83	107	s.
Audubon	Audubon	1,297	29	48.3	96	July 10†	-15	Feb. 3†	29	31.79	7.28	Aug.	0.18	Feb.	45.3	81	166	115	84	sw.
Baxter	Jasper	908	23	49.4	99a	July 22	-13	Feb. 3†	23	29.93	7.45	June	0.32	Feb.	31.5	77				s.
Belle Plaine	Benton	886	33	49.5	98	Aug. 11	-20	Mch. 19	33	29.87	4.96	Sept.	0.48	Feb.	58.7	115	143	113	109	se.
Boone	Boone	1,134	18	48.4	98	July 10	-22	Mch. 19	18	33.00	6.85	Sept.	0.27	Feb.	44.0	93				s.
Carroll	Carroll	1,265	33	48.8	96	July 23	-14	Mch. 19	33	33.13	6.79	June	0.05	Nov.	33.0	81	239	48	78	nw.
Clinton	Clinton	593	50	50.7	99	July 22	-11	Mch. 19	50	26.25	4.52	June	0.32	Feb.	33.8	96	200	82	83	s.
Davenport	Scott	580	52	51.0	99	July 22	-10	Feb. 3†	52	28.50	6.03	June	0.59	Apr.	41.2	114	134	100	131	e.
Denison	Crawford	1,171	29	48.9	96	July 23	-13	Feb. 3†	29	29.98	7.52	Aug.	0.11	Nov.	38.6	95	188	84	93	nw.
Des Moines	Polk	861	45	50.7	98	July 23	-10	Mch. 19	45	30.62	5.34	Aug.	0.36	Feb.	44.8	104	120	113	132	nw.
Dubuque	Dubuque	698	50	48.6	97	June 24	-16	Feb. 3	50	25.62	5.04	Sept.	0.40	Feb.	42.8	110	96	117	152	nw.
Fairport	Muscataine	567	2	50.4	98	Aug. 11	-13	Mch. 19	2	28.43	5.94	Sept.	0.69	Feb.		91	163	69	133	w.
Fort Dodge	Webster	1,114	23	48.2	99	July 23	-16	Feb. 3†	23	31.81	7.55	Sept.	0.16	Nov.	54.8	88	224	47	94	se.
Grinnell	Poweshiek	1,031	29	50.2	97	June 24†	-14	Feb. 3	31	29.80	5.89	Sept.	0.30	Feb.		95	161	124	80	se.
Grundy Center	Grundy	976	32	48.8	98	July 21	-18	Feb. 3	32	34.28	13.14	Aug.	0.20	Feb.	40.0	79				nw.
Guthrie Center	Guthrie	1,077	28	50.0	97	July 10	-12	Feb. 3†	28	32.10	6.16	Aug.	0.27	Feb.	49.0	85	201	76	78	nw.
Harlan	Shelby	1,192	24	49.5	96	July 10	-14	Mch. 19	24	32.41	6.72	Aug.	0.05	Feb.	37.5	79				s.
Independence	Buchanan	921	59	48.7	95	July 23†	-17	Feb. 3	59	31.52	9.48	Aug.	0.41	Feb.	47.4	87	199	32	134	nw.
Iowa City	Johnson	733	63	49.6	98	July 10†	-14	Mch. 19	60	36.15	9.27	Sept.	0.67	Feb.	36.0	102	124	127	114	nw.
Iowa Falls	Hardin	1,107	30	47.5	96	July 22	-18	Feb. 3†	30	29.66	9.53	Aug.	0.52	Nov.	51.7	100	179	78	108	nw.
Jefferson	Greene	1,052	24	48.1	95	July 10	-19	Mch. 19	24	33.05	7.38	Aug.	0.27	Feb.	44.5	86	168	84	113	sw.
Little Sioux	Harrison	1,040	18		99	July 23	-11	Feb. 3	18		6.28	Aug.	0.12	Feb.	32.1					se.
Logan	Harrison	1,035	56	49.9	96	July 23	-18	Mch. 19	56	36.65	7.60	Sept.	0.12	Nov.	40.0	77	193	93	79	sw.
Marshalltown	Marshall	947	31	49.9	98	July 7	-14	Feb. 3	31	28.93	6.56	June	0.45	Feb.	51.0	103	207	63	95	nw.
Monroe	Jasper	922	11	51.2	97	July 22†	-12	Mch. 19	11	30.41	7.80	Sept.	0.23	Feb.	49.6	62				s.
Olin	Jones	760	24		98	June 24†	-19	Mch. 19	24	26.00	4.92	Sept.	0.30	Feb.	57.1	55				se.
Onawa	Monona	1,051	22	48.6	98	July 23	-12	Feb. 3	22	36.09	7.82	Sept.	T.	Feb.	35.5	68				nw.
Perry	Dallas	975	22	49.2	100	July 10	-11a	Mch. 19	22	25.89	5.71	Aug.	0.17	Feb.		90				nw.
Rockwell City	Calhoun	1,134	27		96	July 7†	-15	Feb. 3	27	30.87	7.78	Aug.	0.29	Oct.	54.5	78				nw.
Sac City	Sac	1,278	47		94a	July 23	-14a	Feb. 3	47	29.37	7.10	Aug.	0.20	Nov.	48.5	77				nw.
Sioux City	Woodbury	1,135	34	49.3	99	July 23	-11	Feb. 3	34	34.50	7.63	Aug.	0.08	Feb.	37.5	104	127	137	101	s.
Tipton	Cedar	807	24		98	July 10†	-19	Mch. 19	24	25.15	6.84	Sept.	0.63	Feb.	42.0	108	182	82	101	se.
Toledo	Tama	856	29	49.6	99	July 22	-15	Feb. 3†	29	32.61	7.88	Aug.	0.43	Feb.	53.5	94	208	61		

CLIMATOLOGICAL DATA FOR THE YEAR, 1923—Continued.

Table with columns: STATIONS, COUNTIES, Elevation, Temperature (Mean, Highest, Date, Lowest), Precipitation (Total, Greatest, Month, Least), Number of Days (Clear, Partly cloudy, Cloudy), and 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. *Also in December.

MONTHLY STATE DATA FOR 1923

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

* Normal Central Time. § Local Mean Time. † 7 a. m. and 7 p. m. observations only.

MEAN MONTHLY AND ANNUAL TEMPERATURES, WITH DEPARTURES FROM THE NORMAL, FOR 1923.

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
Northern Division																										
Algona	23.0	+ 8.7	16.9	- 0.7	26.6	- 4.0	46.6	- 0.4	59.0	- 0.3	70.6	+ 2.5	77.0	+ 3.7	69.3	- 1.5	63.2	+ 1.0	47.4	- 1.4	38.5	+ 5.8	31.9	+10.6	47.5	+ 2.0
Allison	23.2	+ 16.8	25.9	0.0	46.4	0.0	58.7	0.0	58.2	- 0.8	68.8	+ 1.2	75.2	+ 2.4	68.1	- 2.5	63.4	+ 1.5	47.0	- 1.8	38.7	+ 6.3	31.0	+10.0	47.0	+ 1.9
Alta	24.0	+ 8.8	17.5	- 0.2	27.1	- 4.2	46.8	0.0	58.1	- 1.4	69.6	+ 1.9	76.4	+ 3.4	68.4	- 3.0	63.1	+ 0.7	46.6	- 2.4	37.6	+ 5.0	30.2	+ 8.9	47.1	+ 1.4
Alton	22.6	+ 15.8	25.4	0.0	46.0	0.0	59.2	0.0	58.3	- 0.4	70.0	+ 2.6	77.2	+ 4.5	70.1	- 0.1	63.6	+ 2.1	47.2	- 1.4	39.8	+ 7.9	31.0	+10.3	47.0	+ 2.1
Britt	22.6	+ 8.3	14.9	- 1.8	23.8	- 6.3	46.2 ^a	- 0.4	58.8	+ 0.4	70.0	+ 2.6	77.2	+ 4.5	70.1	- 0.1	63.6	+ 2.1	47.2	- 1.4	39.8	+ 7.9	31.0	+10.3	47.0	+ 2.1
Charles City	21.9	+ 10.5	14.4	- 0.7	24.1	- 5.1	45.4	- 0.9	58.3	- 1.2	70.5	+ 1.7	76.3	+ 2.8	68.1	- 2.6	62.4	+ 0.7	47.0	- 1.2	37.9	+ 4.9	31.4	+12.4	46.5	+ 1.9
Cherokee	23.6	+ 17.8	26.2	0.0	46.9	0.0	57.4	0.0	58.6	- 0.6	70.0	+ 2.6	77.2	+ 4.5	70.1	- 0.1	63.6	+ 2.1	47.2	- 1.4	39.8	+ 7.9	31.0	+10.3	47.0	+ 2.1
Decorah	22.1	+ 8.2	13.6	- 4.0	24.3	- 5.9	44.2	- 2.7	58.2	- 1.8	71.2	+ 2.7	75.4	+ 2.0	68.3	- 2.9	61.6	+ 0.6	45.2	- 3.9	37.6	+ 3.9	31.6	+ 9.4	46.1	+ 0.4
Fayette	22.2	+ 8.7	15.4	- 2.0	25.4	- 5.2	43.4	- 3.0	57.8	- 0.2	70.2	+ 3.4	75.2	+ 3.1	67.3	- 2.3	61.8	+ 0.5	46.6 ^a	- 2.1	37.0	+ 4.3	31.9	+11.0	46.2	+ 1.4
Forest City	21.0	+ 8.2	14.9	- 0.2	23.8	- 5.1	44.0	- 1.9	56.5	- 2.0	69.9	+ 2.4	76.4	+ 3.8	69.0	- 1.1	63.0	+ 1.7	47.4	- 0.9	39.2	+ 7.5	32.2	+12.6	46.4	+ 2.0
Humboldt	23.9	+ 7.9	17.9	- 1.3	26.8	- 5.5	47.1	- 1.1	59.6	+ 0.2	70.6	+ 2.5	77.6	+ 4.4	69.6	- 1.2	64.3	+ 2.0	48.5	- 2.3	38.8	+ 4.5	32.4	+ 9.2	48.1	+ 1.6
Inwood	22.2	+ 8.4	17.1 ^b	+ 0.9	26.8	- 3.8	46.2	- 0.4	57.8	- 1.3	69.4	+ 1.8	76.0	+ 3.1	68.8	- 2.2	64.0	+ 1.5	46.3	- 2.6	37.6	+ 5.8	29.6	+ 9.6	46.8	+ 1.7
Le Mars	24.8	+ 8.6	19.9	+ 1.6	28.2	- 3.9	47.7	+ 0.3	58.0	- 1.9	69.7	+ 1.6	76.0	+ 3.0	68.8	- 2.0	63.8	+ 1.4	47.4	- 1.9	38.9	+ 5.8	31.0	+ 8.5	47.8	+ 1.7
Mason City	21.2	+ 6.7	14.0	- 3.3	24.0	- 6.1	45.6 ^b	- 0.8	57.0	- 1.8	70.1	+ 2.7	75.9	+ 3.0	68.6	- 1.4	62.6	+ 1.2	47.1	- 1.7	38.9	+ 5.9	30.8	+ 9.3	46.3	+ 1.1
Milford (near)	20.5	+ 14.7	24.1	0.0	45.1	0.0	57.2	0.0	58.3	- 0.3	70.7	+ 3.5	75.1	+ 2.9	68.4	- 0.9	61.2 ^b	+ 1.1	47.0	- 1.1	38.4	+ 5.4	32.0	+11.1	47.0	+ 1.9
New Hampton	21.8	+ 8.5	15.0	- 1.6	25.1	- 4.4	44.9	- 1.5	58.2	- 0.3	70.7	+ 3.5	75.1	+ 2.9	68.4	- 0.9	61.2 ^b	+ 1.1	47.0	- 1.1	38.4	+ 5.4	32.0	+11.1	47.0	+ 1.9
Nora Springs	23.7	+ 16.4	26.2	0.0	47.3	0.0	58.8	0.0	58.8	- 0.3	71.3	+ 3.6	77.4	+ 3.7	69.7	- 2.0	63.9	+ 0.9	48.8	- 2.1	36.6 ^a	+ 4.6	31.0	+11.0	45.6	+ 1.3
Northwood	20.0	+ 7.4	12.2 ^a	- 4.1	24.6	- 4.8	44.2	- 1.9	58.1 ^b	- 0.3	70.4 ^b	+ 3.6	75.7 ^a	+ 3.8	67.6 ^a	- 2.0	60.9	+ 0.1	45.6 ^a	- 2.1	36.6 ^a	+ 4.6	31.0	+11.0	45.6	+ 1.3
Pocahontas	23.6	+ 8.1	18.0	+ 0.4	26.9	- 4.1	47.0	0.0	58.6	- 0.7	69.6	+ 2.5	75.6	+ 3.1	69.0	- 1.8	63.7	+ 1.3	47.6	- 1.8	38.8	+ 6.0	32.1	+10.2	47.5	+ 1.9
Postville	21.7	+ 7.3	14.2	- 3.5	24.4	- 6.2	44.0	- 2.6	57.0	- 1.7	68.6	+ 2.0	72.9	+ 1.2	66.4	- 2.8	60.3	+ 0.8	46.0	- 3.1	37.2	+ 3.9	31.2	+ 9.8	45.3	+ 0.3
Rock Rapids	23.0	+10.4	17.4	+ 1.8	26.4	- 3.4	46.2	+ 1.1	59.0	+ 0.5	69.8	+ 1.8	75.6	+ 1.8	68.4	- 3.0	62.6	+ 0.6	46.1	- 0.8	37.5	+ 6.0	28.7	+ 9.1	46.7	+ 2.1
Samborn	20.6	+ 13.9	23.1	0.0	46.5	0.0	57.6	0.0	58.2	- 0.3	70.7	+ 3.5	75.1	+ 2.9	68.4	- 0.9	61.2 ^b	+ 1.1	47.0	- 1.1	38.4	+ 5.4	32.0	+11.1	47.0	+ 1.9
Spencer	22.1	+ 16.0	26.0	0.0	46.1	0.0	58.2	0.0	58.2	- 0.3	70.7	+ 3.5	75.1	+ 2.9	68.4	- 0.9	61.2 ^b	+ 1.1	47.0	- 1.1	38.4	+ 5.4	32.0	+11.1	47.0	+ 1.9
Storm Lake	24.6 ^c	+ 9.3	19.4	+ 2.3	26.9	- 3.9	47.0	+ 0.2	58.6	- 0.7	69.2	+ 1.6	76.4	+ 3.5	69.4	- 1.7	64.1	+ 1.9	48.3	- 1.9	40.4	+ 6.8	33.0	+10.6	48.1	+ 2.3
Washta	24.0	+ 7.6	18.6	- 0.1	26.6	- 5.1	46.3	- 0.8	55.9	- 3.1	68.4	+ 1.0	73.8	+ 1.1	67.0	- 4.2	62.2	+ 1.1	45.5	- 4.1	38.4	+ 5.0	30.6	+ 8.1	46.4	+ 0.3
Waverly	23.5 ^c	+ 8.5	16.4	- 2.2	27.2	- 4.3	47.6 ^a	- 0.2	59.4	- 0.5	71.4	+ 3.7	75.4 ^b	+ 2.4	69.3 ^b	- 1.3	62.4	+ 0.2	45.3 ^b	- 4.8	37.9 ^b	+ 3.8	31.8	+ 9.0	47.3	+ 1.2
West Bend	3.5	+ 8.8	17.5	0.0	26.4	- 4.4	46.7	- 0.5	58.8	- 0.4	70.6	+ 2.4	76.8	+ 3.8	69.8	- 0.4	64.0	+ 2.4	47.8	- 0.3	39.0	+ 6.5	32.0	+10.2	47.7	+ 2.3
Central Division																										
Ames	26.0	+ 7.9	20.2	- 0.5	29.0	- 5.0	48.8	- 0.8	59.8	- 1.4	71.0	+ 1.8	77.2	+ 3.2	69.9	- 2.4	64.6	+ 1.2	49.0	- 2.3	40.4	+ 5.0	32.8	+ 8.4	49.1	+ 1.3
Audubon	26.6	+ 8.7	20.0	- 0.7	28.2	- 5.4	47.2	- 1.5	58.8	- 1.4	69.4	+ 1.2	75.8	+ 2.5	69.3	- 2.0	64.2	+ 1.7	48.6	- 1.7	39.0	+ 4.1	32.5	+ 8.6	48.3	+ 1.2
Baxter	26.8	+ 8.8	21.1	0.0	29.9	- 4.0	49.2	- 0.1	60.0	+ 0.6	70.8	+ 1.8	76.8 ^a	+ 3.2	71.0	- 0.8	64.0	+ 0.5	48.4	- 3.1	40.7	+ 4.9	34.4	+10.1	49.4	+ 1.7
Belle Plaine	26.5	+ 9.0	20.3	- 0.5	29.8	- 3.5	49.4	+ 0.5	60.6	+ 0.2	71.8	+ 2.8	76.7	+ 3.3	70.9	- 0.4	64.4	+ 1.2	49.2	- 1.8	40.2	+ 4.8	34.2	+10.3	49.5	+ 2.2
Boone	26.5 ^a	+ 8.7	20.4	+ 1.4	29.4	- 3.0	48.2	+ 0.3	59.2	+ 0.5	70.0	+ 1.0	75.2	+ 0.9	69.2	- 2.6	63.2	+ 0.7	47.8	- 2.8	39.4	+ 4.8	33.0	+ 9.9	48.4	+ 1.6
Carroll	26.8	+ 9.8	20.6	+ 1.6	29.4	- 2.6	47.8	+ 0.6	59.7	+ 0.5	69.8	+ 2.0	76.0	+ 3.2	69.8	- 0.8	63.8	+ 1.8	48.3	- 1.0	40.2	+ 6.8	33.2	+10.0	48.8	+ 2.7
Clinton	28.4	+ 7.8	21.1	- 1.8	34.4	- 3.4	49.4	- 0.3	61.0	+ 0.5	73.0	+ 2.6	77.4	+ 3.2	72.6	+ 0.7	65.8	+ 2.3	50.6	- 0.4	41.2	+ 5.2	36.4	+10.7	50.7	+ 2.1
Davenport	9.2	+ 7.4	21.2	+ 3.7	1.6	- 4.5	49.6	- 0.3	60.8	- 0.5	73.6	+ 3.1	78.4	+ 3.1	72.9	- 0.2	65.6	+ 2.0	50.6	- 3.1	42.0	+ 3.0	36.8	+ 9.7	51.0	+ 1.1
Denison	27.4	+ 9.6	21.1	+ 1.0	34.4	- 4.4	48.4	- 0.2	59.0	- 0.9	69.6	+ 1.5	75.4	+ 1.9	70.2	- 1.5	64.8	+ 1.3	48.2	- 2.6	40.0	+ 6.7	32.8	+ 8.3	48.9	+ 1.7
Des Moines	9.3	+ 9.2	22.4	+ 1.3	1.5	- 4.4	50.2	+ 0.1	60.7	- 0.6	72.0	+ 1.4	78.2	+ 2.8	71.4	- 1.7	65.1	+ 0.5	50.0	- 3.4	42.2	+ 3.8	35.8	+ 9.8	50.7	+ 1.2
Dubuque	25.8	+ 6.7	18.3	- 3.9	7.6	- 6.4	47.0	- 1.6	60.0	- 0.3	72.7	+ 3.3	76.8	+ 2.7	69.6	- 2.1	62.8	+ 1.2	48.4	- 3.5	40.0	+ 3.0	34.4	+ 9.7	48.6	+ 0.5
Fairport	8.3	+ 21.6	2.4	- 5.0	50.0	0.2	72.5	0.0	60.2	- 0.3	72.7	+ 3.3	76.8	+ 2.7	69.6	- 2.1	62.8	+ 1.2	48.4	- 3.5	40.0	+ 3.0	34.4	+ 9.7	48.6	+ 0.5
Fort Dodge	24.7	+ 9.7	19.4	+ 1.8	28.0	- 3.1	46.8	- 0.4	59.4	- 0.3	70.2	+ 1.6	77.1	+ 3.5	69.4	- 2.2	63.8	+ 1.2	47.6	- 2.3	38.8	+ 5.2	32.6	+ 10.7	48.2	+ 2.2
Grinnell	27.8	+ 8.9	21.0	- 1.1	30.4	- 4.6	49.7	- 0.1	61.0	+ 0.4	72.2	+ 2.7	77.6	+ 3.1	71.8	- 0.9	65.2	+ 0.6	49.4	- 3.0	41.6	+ 5.1	35.3	+ 9.8	50.2	+ 1.6
Grundy Center	25.2 ^b	+ 8.3	19.8	+ 0.2	29.2	- 3.4	47.3	- 1.5	59.8	- 0.7	71.2	+ 2.4	77.2	+ 2.9	69.8	- 2.0	63.9	+ 0.3	48.3	- 2.5	40.0 ^a	+ 4.6	34.0	+10.3	48.8	+ 1.6
Hughes Center	28.9	+ 9.3	22.8	+ 1.2	31.3	- 3.1	49.4	- 0.2	59.5	- 1.9	69.7	+ 1.0														

MONTHLY AND ANNUAL PRECIPITATION, WITH DEPARTURE FROM THE NORMAL FOR 1923.

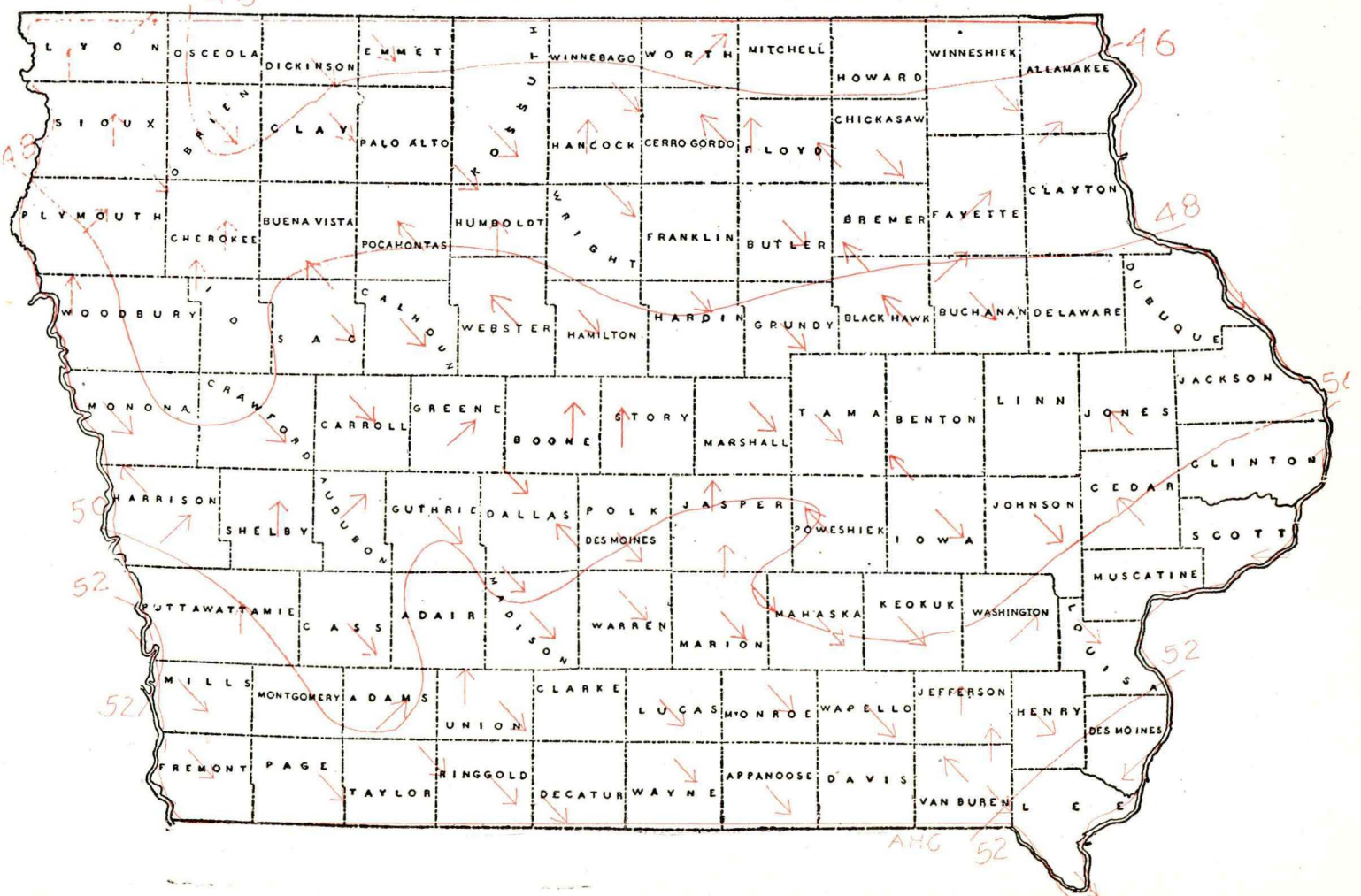
Table with columns for STATIONS, months (January-December), and Annual. Each month has two sub-columns: Precipitation and Departure. The table lists numerous stations across three divisions: Northern, Central, and Southern. Each row represents a station, and each column represents a month's data. The final column shows the annual total precipitation and departure.

DATES OF KILLING FROSTS, 1923

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 9	Oct. 6†	Ames.....	May 9†	Oct. 20†	Afton.....	May 9†	Sept. 14
Allison.....	May 9	Sept. 14	Audubon.....	May 9†	Sept. 14	Albia.....	May 9†	Oct. 19
Alta.....	May 12	Oct. 19	Baxter.....	May 9	Oct. 20	Atlantic.....	May 9†	Oct. 20†
Alton.....	May 12	Oct. 13	Belle Plaine.....	May 9	Sept. 14	Bonaparte.....	April 17†	Oct. 14†
Belmond.....	May 17†	Sept. 14	Boone.....	May 17	Sept. 14	Burlington.....	April 16†	Oct. 20
Britt.....	May 9†	Oct. 14	Carroll.....	May 9†	Oct. 19†	Centerville.....	May 9†	Oct. 18
Charles City.....	April 17	Sept. 14	Cedar Rapids.....	April 17	Sept. 14	Chariton.....	May 13	Sept. 14
Cherokee.....	May 9†	Oct. 13	Clinton.....	April 17	Sept. 14	Clarinda.....	May 9	Oct. 20
Decorah.....	May 17†	Sept. 14	Davenport.....	April 17	Oct. 21	Columbus Jct.....	April 17	Oct. 21
Estherville.....	May 12†	Sept. 14	Denison.....	May 9†	Oct. 20	Corning.....	May 9†	Oct. 19†
Fayette.....	May 9	Sept. 14†	Des Moines.....	April 9	Oct. 20	Corydon.....	May 9	Oct. 20
Forest City.....	May 9	Sept. 19	Dubuque.....	April 12	Oct. 20	Creston.....	May 9	Oct. 19†
Humboldt.....	May 9	Oct. 14	Fairport.....	May 9†	Oct. 20	Cumberland.....	May 9	Oct. 20
Inwood.....	May 12	Oct. 13	Fort Dodge.....	May 9	Sept. 14†	Earlham.....	May 9†	Oct. 21
Le Mars.....	May 12†	Oct. 13	Grinnell.....	May 9†	Oct. 19†	Fairfield.....	April 18†	Sept. 14†
Mason City.....	May 9†	Sept. 14	Grundy Center.....	May 9†	Sept. 14†	Glanwood.....	April 17†	Sept. 14
Milford (near).....	May 9	Oct. 19	Guthrie Center.....	May 9†	Oct. 21	Greenfield.....	May 9	Oct. 19†
New Hampton.....	May 9†	Sept. 14	Harlan.....	May 9†	Oct. 27	Indianola.....	May 9†	Oct. 19†
Nora Springs.....	May 9	Sept. 14	Independence.....	May 9†	Sept. 14†	Keokuk.....	April 16	Oct. 20
Northwood.....	May 9†	Oct. 19†	Iowa City.....	May 9	Oct. 20	Keosauqua.....	April 18†	Sept. 14
Oelwein.....	May 9†	Oct. 19†	Iowa Falls.....	May 9†	Sept. 14	Knoxville.....	April 17†	Oct. 20†
Pocahontas.....	May 9†	Sept. 14	Jefferson.....	May 9†	Sept. 14†	Lamoni.....	May 9	Oct. 14†
Postville.....	May 9	Sept. 14	Little Sioux.....	May 9	Sept. 14†	Lenox.....	May 9	Oct. 19†
Rock Rapids.....	May 9	Oct. 19†	Logan.....	May 9	Oct. 19†	Mt. Ayr.....	May 9†	Oct. 19
Samborn.....	May 9	Oct. 5	Marshalltown.....	May 9	Oct. 21	Mt. Pleasant.....	May 9	Oct. 14
Sioux Center.....	May 12†	Oct. 13†	Monroe.....	May 9†	Oct. 19	Oakland.....	May 9†	Oct. 14
Spencer.....	May 12	Oct. 5†	Olin.....	May 13†	Sept. 14†	Oskaloosa.....	May 9	Oct. 20
Storm Lake.....	May 9†	Oct. 23†	Onawa.....	May 9†	Oct. 21	Pella.....	April 18†	Sept. 14
Washta.....	May 9	Oct. 20	Perry.....	May 9	Oct. 19†	Sigourney.....	May 9†	Sept. 14
Waverly.....	May 9†	Sept. 14	Rockwell City.....	May 9†	Oct. 19†	Stockport.....	April 18†	Oct. 20
West Bend.....	May 12†	Oct. 13†	Sac City.....	May 9†	Oct. 19	Thurman.....	May 9†	Oct. 19†
			Sioux City.....	April 17	Oct. 19	Washington.....	May 9†	Oct. 19
			Tipton.....	May 9	Oct. 21	Washington (near).....	April 16†	Sept. 14
			Toledo.....	May 9†	Sept. 14†	Winterset.....	May 9	Oct. 19
			Waterloo.....	May 9†	Sept. 14†	Omaha, Nebr.....	April 8	Oct. 20
			Waukee.....	May 9	Oct. 19			
			Webster City.....	May 9†	Oct. 20			
			Williamsburg.....	May 9†	Oct. 20			

† Date of last temperature of 32° or lower in the spring, or first temperature of 32° or lower in autumn (as the case may be) when frost was not reported.
 The minimum temperature of May 9, though considerably below 32° over most of the state, caused very little frost and very little damage, because the air was so dry that the dew point was far below the minimum temperature; because freezing temperatures prevailed for but a few hours; and because there was considerable wind movement.

MEAN ISOTHERMS AND PREVAILING WINDS, YEAR 1923.



GENERAL SUMMARY

(Continued from page 98)

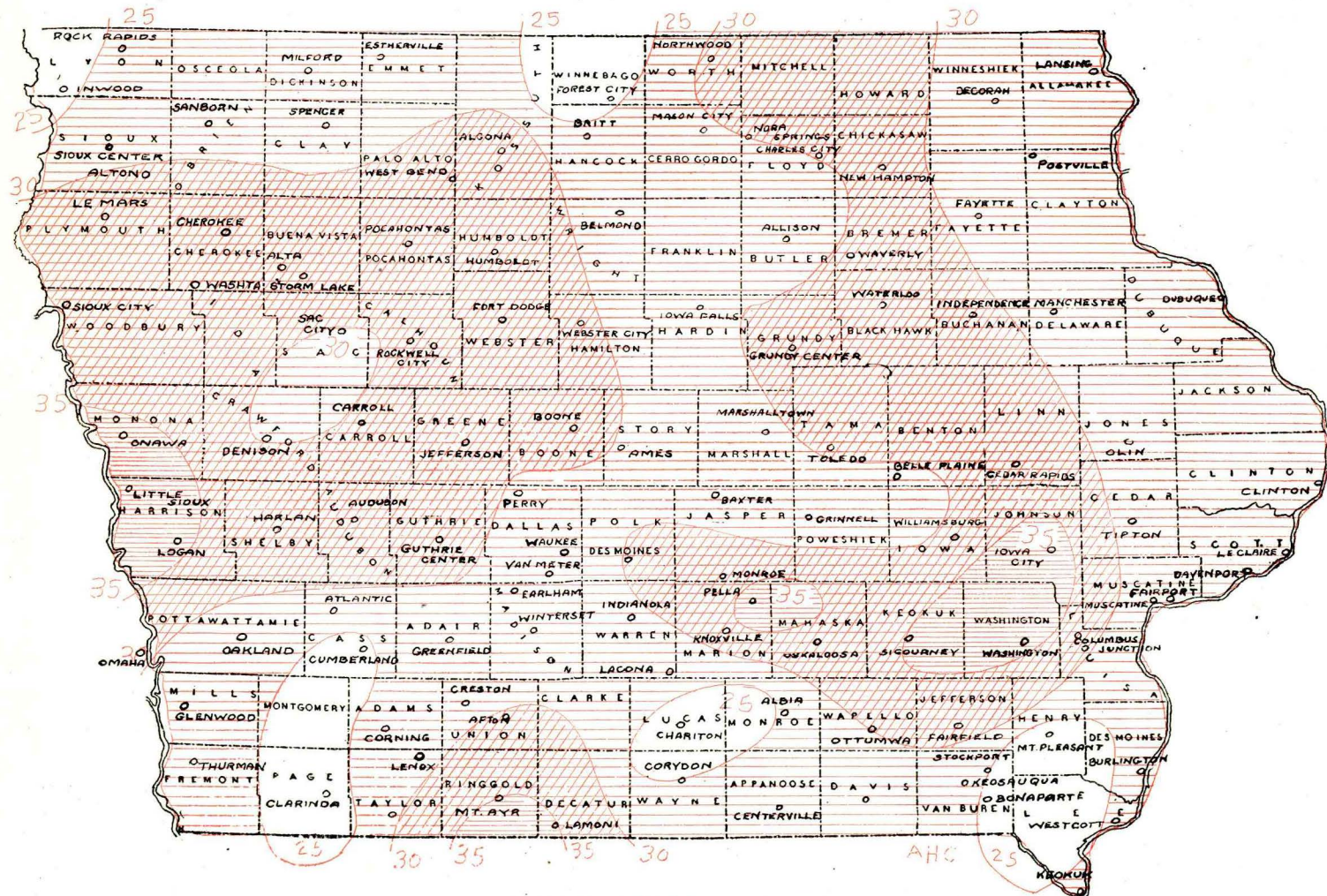
October was generally dry and cool. The killing frost and freezes of the 19th-21st killed and damaged the remaining 25 per cent of the corn crop that was not matured sufficiently. Soil conditions were very good for seeding and germination of winter wheat, which occurred rapidly in the early portion of the month, though some seeding continued till near the close. Corn that was cribbed toward the close of the month heated and spoiled in the cribs on account of the high moisture content. Snow covered most of the state from the 27th to the 30th.

November was generally warm, dry and pleasant. The weather was ideal for outdoor work. Corn husking progressed rapidly and by the close of the month a little more than the usual portion of the crop was in the crib. A heavy snow storm occurred on the afternoon and night of the 29th in the southeastern and south-central sections, the fall of snow ranging from 5 to 8 inches in a number of counties. Rail traffic was delayed and automobile travel was almost impossible for a time. Wires and trees were damaged.

Toward the close of the month the soil became too dry for the best development of winter wheat.

December was the mildest since state-wide records began in 1890, though the records of the older stations indicate that December, 1877 and 1889, were considerably higher than the current month. A cold wave spread over the State on the 30th-31st. Precipitation was less than normal over most of the state, but considerable snow fell in the blizzard of the 30th-31st, amounting to 12 inches at Rockwell City, and from 6 to 10 inches over much of the State. It drifted badly, especially in the northern half, where it interfered seriously with train schedules and travel by automobile. The ground was not frozen except on northern slopes, and plowing was done as far north as the northern tier of counties, and as late as the 29th. Stock grazed in the fields, grass and winter wheat made perceptible growth, insects were abroad, and occasional dandelions were in bloom. The continued deficient precipitation of the last two months caused a shortage of water in some sections, and winter wheat needed moisture badly in the southwest counties, but fortunately wheat was mostly protected by snow just before the cold wave at the close of the month.

TOTAL PRECIPITATION, YEAR 1923.



SCALE OF SHADES—IN INCHES

