

CLIMATOLOGICAL DATA.

IOWA SECTION

In co-operation with
IOWA WEATHER AND CROP BUREAU
CHARLES D. REED, Meteorologist

VOL. XXXIX DES MOINES, IOWA, JANUARY, 1928 No. 1

GENERAL SUMMARY

Mild winter weather prevailed during most of January. The first four days were the coldest of the month and zero weather was general throughout the State with the lowest temperature occurring on the 2d at most stations. From the 5th to the 19th, inclusive, a remarkable period of mild weather prevailed and during the entire period the temperature was considerably above normal. The daily excess was 20°, or more, above normal from seven days along the Missouri River to three days along the Mississippi, and along the Missouri it amounted to 30 degrees on the 10th and 12th. Unusually high maxima occurred from the 9th to 14th and while the State record for January was not broken, the record for several stations was. At Des Moines the record was exceeded by nearly two degrees. From the 20th till the end of the month the temperature averaged nearly normal, being somewhat below normal over the eastern half of the State and somewhat above over the western half. Zero weather occurred during this period over all portions of the State, the number of days ranging from seven in Emmet County to a single day in most of the southern portion.

The weather was favorable for all outdoor work. Plowing was possible and was reported from the southern portion of the State; some corn still in the fields was husked and stock needed very little protection and could get much of their forage from the open fields. Building operations were interrupted very little and at the end of the month ice harvest was generally completed though there was still a small amount being put up at a few places but the warm weather has reduced the thickness somewhat. The weather was not favorable for winter wheat and grasses, as most of the State was dry and had very little snow protection. In the wheat growing area there was practically no snow and there was damage from alternate freezing and thawing. The extreme dryness caused the surface soil of plowed ground to become dusty and whenever a moderately windy day occurred dust storms developed causing the soil to drift and much was blown from the roots of wheat. Water was scarce in many places and the soil was showing large cracks. Roads were the best ever known at this season of the year.

F. L. D

TEMPERATURE

The mean temperature of the State, derived from the means of nine districts of nearly equal area and based on records of 100

stations, was 25.2° or 6.6° above normal. Temperature departures were greatest in the western half of the State. In Audubon County the departure was more than 9°, and in Buena Vista, Carroll, Cherokee, Dallas, Emmet, Hancock, Story, Warren and Woodbury Counties 8°, or more above normal. Along the Mississippi River and in Ringgold County the excess was less than 5°, the least being 3.6° in Des Moines County. The highest mean was 29.5°, at Keokuk, and the lowest was 19.8° at Lake Park. The absolute range for the State was 90°, from 70°, at Little Sioux on the 10th, to -20° at Forest City and Sanborn on the 2d. The average number of days with the minimum temperature, 32° or lower was 29; minimum, zero or lower, 5; maximum, 32° or lower, 11.

COMPARATIVE DATA FOR THE STATE—JANUARY

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
1873	12.0	-6.6	55	-38	2.53	+1.46	3.56	0.50					
1874	19.6	+1.0	64	-24	1.67	+0.60	4.72	0.22					
1875	23.5	+4.9	62	-16	1.49	+0.42	3.96	0.00					
1876	13.7	-4.9	58	-31	1.09	+0.02	3.04	0.37					
1877	25.4	+6.8	55	-13	0.48	-0.59	5.00	0.00					
1878	16.1	-2.5	54	-30	0.48	-0.59	1.48	0.00					
1879	32.0	+13.4	68	-6	1.36	+0.29	4.52	0.20					
1880	9.6	-9.0	48	-40	0.94	-0.13	3.10	0.04					
1881	23.4	+4.8	60	-17	0.65	-0.42	1.80	0.09					
1882	8.0	-10.6	46	-38	1.31	+0.24	2.85	0.35					
1883	13.3	-5.3	52	-38	0.52	-0.55	1.50	0.02					
1884	9.4	-9.2	51	-42	1.28	+0.21	3.72	0.18					
1885	8.1	-10.5	52	-33	2.59	+1.52	4.85	0.68					
1886	8.8	-9.8	55	-34	1.13	+0.06	2.92	0.04					
1887	5.4	-13.2	58	-43	1.30	+0.23	4.00	0.40					
1888	21.6	+3.0	62	-25	1.22	+0.15	2.30	0.50					
1889	18.0	-0.6	64	-27	1.79	+0.72	3.46	0.35					
1890	26.0	+7.4	58	-4	1.75	+0.68	3.99	0.61		4	13	7	11
1891	15.3	-3.3	76	-38	1.09	+0.02	3.13	0.10	6.9	5	16	9	6
1892	9.3	-9.3	54	-34	0.74	-0.33	3.20	0.13	6.9	6	11	9	11
1893	19.3	+0.7	69	-37	1.09	+0.02	2.24	0.31	6.0	5	14	9	8
1894	13.6	-5.0	68	-31	0.85	-0.22	2.65	0.09	8.7	4	15	7	9
1895	23.4	+4.8	68	-20	0.48	-0.59	2.10	T.	2.8	3	10	10	11
1896	17.2	-1.4	66	-30	2.01	+0.94	6.16	0.15	8.2	7	12	7	12
1897	23.4	+4.8	52	-11	1.60	+0.53	5.32	T.	12.6	5	15	6	10
1898	19.8	+1.2	68	-34	0.28	-0.79	1.15	T.	1.5	3	15	10	6
1899	25.6	+7.0	66	-20	0.53	-0.54	2.47	T.	2.3	3	16	7	8
1900	23.7	+5.1	60	-21	0.74	-0.33	2.34	0.04	6.2	4	14	9	8
1901	22.4	+3.8	63	-31	0.88	-0.19	2.33	0.19	9.4	4	17	8	6
1902	23.0	+4.4	60	-12	0.28	-0.79	1.46	T.	2.0	4	13	7	11
1903	14.0	-4.6	57	-32	1.18	+0.11	3.68	0.02	6.1	6	12	8	11
1904	11.2	-7.4	56	-30	0.91	+0.16	1.82	0.12	11.1	7	14	7	10
1905	24.6	+6.0	69	-19	1.52	+0.45	4.71	0.23	11.3	5	14	6	11
1906	18.8	+0.2	68	-22	1.52	+0.45	5.30	0.10	6.0	7	8	7	16
1907	24.9	+6.3	60	-18	0.44	-0.63	1.50	0.06	4.8	2	17	8	6
1908	21.2	+2.6	72	-25	1.66	+0.59	3.74	0.41	7.8	6	9	6	16
1909	18.1	-0.5	56	-35	1.57	+0.50	3.15	0.55	12.6	6	13	7	11
1910	20.2	+1.6	66	-35	0.97	-0.10	3.73	0.11	7.3	5	9	8	14
1911	4.2	-14.4	49	-47	0.53	-0.54	1.90	T.	5.5	5	14	7	10
1912	20.9	+2.3	62	-25	0.77	-0.30	2.05	0.04	7.2	5	14	9	8
1913	27.8	+9.2	64	-10	0.88	-0.19	2.34	0.27	5.1	5	11	8	12
1914	17.5	-1.1	59	-32	1.63	+0.56	3.15	0.10	7.3	8	13	8	10
1915	17.8	-0.8	63	-34	2.62	+1.55	6.07	0.85	7.2	10	12	6	13
1916	17.0	-1.6	60	-28	0.83	-0.24	2.07	0.17	7.2	4	17	8	6
1917	8.6	-10.0	53	-35	1.02	-0.05	2.79	0.26	11.2	7	13	8	10
1918	26.8	+8.2	64	-32	0.24	-0.93	0.86	T.	2.8	2	20	5	6
1919	16.7	-1.9	58	-26	0.42	-0.65	1.05	T.	4.6	4	12	8	11
1920	28.4	+9.8	67	-9	0.51	-0.56	1.92	0.10	4.1	4	11	7	13
1921	19.8	+1.2	57	-29	0.89	-0.18	2.30	0.82	5.3	4	17	6	8
1922	26.7	+8.1	58	-10	0.85	-0.22	2.34	T.	6.5	6	10	7	14
1923	13.9	-4.7	59	-30	0.89	-0.18	2.47	T.	5.5	5	17	7	7
1924	19.4	+0.8	55	-21	0.40	-0.67	1.23	0.05	4.2	3	17	7	7
1925	22.7	+4.1	58	-22	1.03	+0.02	2.68	0.31	5.0	7	11	8	12
1926	21.7	+3.1	57	-22	0.29	-0.76	1.10	T.	3.0	4	14	8	9
1927	25.2	+7.6	62	-20	0.17	-0.90	1.04	T.	0.9	3	15	8	8

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

Climatological Data for January, 1928

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>Northwest District</i>																				
Akron	Plymouth	1,153	2							0.01	-0.58	0.01	T.	1	12	11	8	nw.	Orlan C. Moore	
Alta	Buena Vista	1,513	37	23.0	+ 7.0	55	10	-14	2	31	0.13	-0.63	0.06	0.5	2	15	8	8	nw.	D. E. Hadden
Alton	Sioux	1,305	23	22.0	+ 6.5	52	10	-13	2	37	0.08	-0.68	0.05	0.5	2	11	14	6	nw.	W. S. Slagle
Cherokee	Cherokee	1,196	8	23.4	+ 8.2	57	10	-15	2	37	0.13	-0.49	0.13	T.	1	20	2	9	nw.	J. E. Wirth
Etherville	Emmet	1,298	33	21.1	+ 8.0	49	10	-18	2	34	0.34	-0.24	0.15	3.5	4	15	14	2	nw.	A. O. Peterson
<i>Hawarden</i>																				
Inwood	Sioux	1,181	2							T.	-0.56	T.	T.	0	21	4	6	s.	Earl V. Slife	
Lake Park (near)	Lyon	1,474	24	20.4	+ 6.4	52	12	-18	2	35	0.28	-0.37	0.27	2.7	2	22	3	6	nw.	A. C. Hanson
Le Mars	Dickinson	1,489	15	19.8	+ 6.5	46	10	-19	2	35	0.43	-0.19	0.24	2.1	3	15	6	10	nw.	P. M. Lawrence
Marathon	Plymouth	1,224	32	24.4	+ 7.3	55	10	-14	1	37	0.04	-0.53	0.04	0.5	1	19	8	4	nw.	Henry Newell
	Buena Vista	1,390	2							0.16		0.11	0.5	3	17	2	12	nw.	E. G. Smith	
<i>Pocahontas</i>																				
Rock Rapids	Pocahontas	1,248	24	23.6	+ 7.6	59	12	-15	2	36	0.19	-0.59	0.10	0.9	4	14	8	9	sw.	F. E. Hronek
Sankborn	Lyon	1,349	29	20.0	+ 6.5	47	12	-18	2	40	0.08	-0.61	0.08	1.0	1	21	7	3	nw.	Nellie F. Medberry
Sheldon	O'Brien	1,553	14	20.8	+ 6.2	50	10	-20	2	35	T.	-0.70	T.	T.	0	16	4	11	sw.	J. W. Dow
Sioux Center	O'Brien	1,418	17	21.1	+ 6.8	52	10	-16	2	36	0.08	-0.64	0.06	0.7	3	12	13	6	nw.	Ross E. Forward
	Sioux	1,426	29	21.0	+ 5.9	54	10	-17	1	34	0.26	-0.48	0.20	2.6	3	13	6	12	nw.	J. De Ruyter
<i>Spencer</i>																				
Storm Lake	Clay	1,319	14	21.6	+ 6.9	50	10	-17	2	39	0.17	-0.53	0.10	0.7	3	15	7	9	sw.	E. W. LITTLE
Washta	Buena Vista	1,440	39	25.0	+ 8.2	56	10	-14	2	33	0.07	-0.63	0.05	0.1	3	19	3	9	nw.	George H. Fracker
West Bend	Cherokee	1,157	30	24.0	+ 7.4	58	10	-12	1	44	0.06	-0.55	0.06	T.	1	18	5	8	nw.	H. L. Felter
	Palo Alto	1,197	35	22.2	+ 7.2	55	10	-17	2	33	0.11	-0.84	0.04	1.4	3	16	9	6	nw.	Jos. Dorweiler
<i>Means and extremes</i>																				
				22.1	+ 7.0	59	12	-20	2	44	0.14	-0.54	0.27	0.9	2	16	7	8	nw.	
<i>North Central District</i>																				
Algona	Kossuth	1,213	55	22.6	+ 7.2	52	10	-16	2	32	0.20	-0.62	0.11	2.0	2	20	4	7	nw.	W. E. Laird
Allison (near)	Butler	1,044	14	22.0	+ 6.7	54	10	-19	2	33	0.35	-0.62	0.10	1.0	4	14	10	7	nw.	J. A. Bell
Belmond	Wright	1,181	18	22.3	+ 7.6	56	10	-17	2	41	0.13	-1.13	0.04	2.5	5	12	2	17	sw.	H. F. Luick
Britt	Hancock	1,236	41	22.4	+ 8.2	52	10	-18	2	37	0.11	-0.57	0.05	5.0	3	17	3	11	sw.	James S. Ross
Charles City	Floyd	1,015	37	21.0	+ 7.3	48	10	-17	2	33	0.27	-0.71	0.08	1.3	7	10	14	7	w.	U. S. Weather Bureau
<i>Forest City</i>																				
Hampton	Winnebago	1,226	34	21.3	+ 7.0	52	10	-20	2	38	0.34	-0.54	0.15	2.2	4	14	2	15	nw.	Dr. M. B. Neil
Humboldt	Franklin	1,145	3							0.21	-1.00	0.07	1.5	4					nw.	L. H. Davis
Mason City	Humboldt	1,095	40	22.8	+ 6.3	58	10	-17	2	39	0.28	-0.53	0.20	T.	2	11	6	14	nw.	H. C. Snitkey
Northwood	Cerro Gordo	1,148	31	20.9	+ 6.7	49	10	-19	2	39	0.26	-0.71	0.13	1.9	5	13	13	5	nw.	American Beet Sugar Co.
	Worth	1,222	32																nw.	Charles Dwelle
<i>Osage</i>																				
	Mitchell	1,163	34	21.0	+ 7.7	46	10	-18	2	32	0.32	-0.69	0.15	1.5	5	16	5	10	sw.	Dr. C. E. Juhl
<i>Means and extremes</i>																				
				21.8	+ 7.4	58	10	-20	2	41	0.25	-0.73	0.20	1.9	4	14	7	10	nw.	
<i>Northeast District</i>																				
Decorah	Winneschik	872	35	20.6	+ 5.4	45	10	-16	2	31	0.35	-0.89	0.10	3.0	5	12	13	6	nw.	M. D. Whitney
Dubuque	Dubuque	700	55	23.8	+ 4.7	54	10	-10	2	33	0.20	-1.10	0.13	0.7	5	11	9	11	nw.	U. S. Weather Bureau
Fayette	Fayette	1,003	40	22.6	+ 7.2	52	10	-15	2	34	0.47	-0.78	0.13	2.0	6	17	11	3	sw.	R. Z. Latimer
Independence	Buchanan	921	64	24.1	+ 7.2	53	10	-14	2	31	0.37	-0.80	0.21	1.6	2	14	7	10	sw.	Dr. Geo. Boody
Lansing	Allamakee	632	21																sw.	Mrs. Mary Spinner
<i>New Hampton</i>																				
Oelwein	Chickasaw	1,169	31	20.6	+ 6.1	46	10	-19	2	36	0.07	-0.91	0.07	T.	1	9	14	8	w.	D. W. Dawson
Postville	Fayette	1,036	5	22.1	+ 5.7	51	10	-14	2	31	0.16	-1.00	0.16	2.0	1	14	9	8	w.	John T. Ridler
Waterloo	Clayton	1,192	29	20.8	+ 5.6	46	10	-15	2	28	0.24	-0.99	0.05	1.2	6	10	18	3	sw.	F. L. Williams
Waverly	Black Hawk	854	45	23.2	+ 5.8	55	10	-17	2	33	0.15	-0.97	0.05	0.5	3	19	6	6	se.	R. B. Slippy
	Bremer	936	32																sw.	D. H. Murphy
<i>Means and extremes</i>																				
				22.2	+ 5.9	55	10	-19	2	36	0.25	-0.93	0.21	1.4	4	13	11	7	sw.	
<i>West Central District</i>																				
Audubon (near)	Audubon	1,297	33	26.3	+ 9.2	61	10	-11	1	30	0.06	-0.77	0.04	0	2	17	12	2	nw.	George Kibby
Carroll	Carroll	1,265	38	25.6	+ 8.2	62	10	-11	1	32	0.09	-0.69	0.07	T.	2	18	7	6	nw.	Mrs. Jos. J. Wolfe
Denison	Crawford	1,171	34	25.8	+ 7.6	63	10	-12	1	34	0.02	-0.64	0.02	T.	1	13	7	11	nw.	V. L. Byers
Guthrie Center	Guthrie	1,077	33			63p	10	-11	1	35p	0.15	-0.63	0.06	0	3	20	0	11	nw.	H. A. Stafford
Harlan	Shelby	1,192	29	25.5	+ 7.4	63	10	-13	1	37	T.	-0.80	T.	T.	0	21	6	4	nw.	Walter Bell
<i>Jefferson</i>																				
Little Sioux	Greene	1,052	29	26.0	+ 7.9	65	10	-11	2	39	0.03	-0.83	0.03	T.	1	16	5	10	sw.	W. I. Lyon
Logan	Harrison	1,040	23	27.2	+ 7.9	70	10	-12	1	42	0.17	-0.58	0.08	0	5	14	13	4	nw.	H. W. Kerr
Onawa	Harrison	1,120	61	27.0	+ 6.7	67	10	-11	1	38	0.05	-0.95	0.05	0	1	12	17	2	nw.	Amy Ann Stern
Rockwell City	Monona	1,051	27			61k	10	-11k	1	40k									nw.	Mrs. H. E. Colby
	Calhoun	1,232	32	24.4	+ 7.1	59	10	-12	2	35	T.	-1.00	T.	T.	0	14	7	10	nw.	A. W. McIsaac
<i>Sac City</i>																				
Sioux City	Sac	1,269	52	24.8	+ 7.6	59	10	-14	1	35	T.	-1.01	T.	T.	0	13	11	7	sw.	F. P. Kessler
	Woodbury	1,135	39	25.8	+ 8.0	62	10	-13	1	32	0.04	-0.59	0.03	0.3	3	13	11	7	nw.	U. S. Weather Bureau
<i>Means and extremes</i>																				
				25.8	+ 7.6	70	10	-14	1	42	0.06	-0.78	0.08	T.	2	15	9	7	nw.	
<i>Central District</i>																				
Ames	Story	926	51	26.5	+ 8.0	62	10	-12	2	33	T.	-0.90	T.	T.	0	16	3	12	nw.	Iowa State College
Baxter	Jasper	998	28	26.1	+ 6.7	62	10	-14	2	35	0.05	-0.85	0.03	0.1	3	9	16	6	sw.	Otto Sanderman
Boone (near)	Boone	1,134	23	25.6	+ 7.7	64	10	-10	2	41	0.02	-0.82	0.02	T.	1	14	7	10	sw.	C. F. Henning
Des Moines	Polk	861	50	28.0	+ 7.9	65	10	-8	1	32	0.11	-0.96	0.05	T.	3	14	7	10	nw.	U. S. Weather Bureau
Fort Dodge	Webster	1,114	28	23.5	+ 6.8	58	10	-17	2	37	0.21	-0.63	0.11	1.0	5	16	1	14	sw.	Samuel Sampson
<i>Grinnell</i>																				
Grundy Center	Poweshiek	1,031	34	26.4	+ 6.2	59	10	-12	2	33	0.10	-1.05	0.08	1.2	2	19	6	6	nw.	R. E. Bates
Iowa Falls	Grundy	976	37	25.5	+ 7.0	59	12	-15	2	45	0.21	-0.76	0.08	1.0	3	19	7	5	w.	M. G. Heiberger
Marshalltown	Hardin	1,127	35	23.5	+ 7.8	54	10	-16	2	47	0.29	-0.95	0.20	2.0	3	19	7	5	nw.	G. H. Gilbert
Monroe	Marshall	947	36</																	

Climatological Data for January, 1928—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>East Central District</i>																				
Belle Plaine	Benton	866	38	25.5	+ 6.7	58	9†	-13	2	31	0.17	-1.39	0.11	1.5	5	13	13	5	nw.	O. C. Burrows J. T. Wurster Dr. A. P. Bryant U. S. Weather Bureau Rex Shriver
Cedar Rapids	Linn	737	46	24.4	+ 5.5	57	10	-13	2	36	0.20	-1.20	0.08	1.5	4	16	3	12	nw.	
Clinton	Clinton	595	55	25.0	+ 4.4	60	14	-10	2	29	0.58	-1.24	0.43	1.8	5	15	7	9	w.	
Davenport	Scott	580	57	26.1	+ 4.3	61	14	-9	2	31	0.34	-1.08	0.17	2.5	7	11	8	12	w.	
Davenport, No. 2	Scott	690	3	26.4		61	14	-10	2	26	0.37		0.21	1.7	4					
Fairport	Muscatine	567	7	26.6	+ 4.7	62	14	-11	2	30	0.53	-1.22	0.25	4.0	3	16	0	15	nw.	
Iowa City	Johnson	733	68	26.0	+ 6.0	58	14	-11	2	28	0.19	-1.45	0.09	1.5	4	12	11	8	nw.	Bureau of Fisheries Prof. J. F. Reilly Margaret T. Disney John Strothoff William Molis
Le Claire	Scott	576	28																	
Maquoketa	Jackson	692	23	24.0	+ 5.4	56	14	-11	2	34	0.19	-1.16	0.13	2.0	2	18	5	8	sw.	
Muscatine	Mustatine	546	67																	
Olin	Jones	760	29	23.9	+ 5.7	57	14	-12	2	38	1.04	-0.39	0.80	3.0	2	24	2	5	sw.	Mrs. L. Stingley John Kroepfen Dr. F. C. Schadt
Tipton (near)	Cedar	807	29	25.2	+ 5.5	56	14	-11	2	35	0.10	-1.35	0.10	2.0	1	15	7	9	w.	
Williamsburg	Iowa	770	12	25.1	+ 6.1	57	10	-12	2	31	0.17	-1.23	0.08	1.1	6	22	7	2	nw.	
Means and extreme				25.3	+ 5.5	62	14	-13	2	38	0.35	-1.19	0.80	2.1	4	15	6	10	nw.	
<i>Southwest District</i>																				
Atlantic	Cass	1,164	37	26.8	+ 7.5	59	10	-11	1	32	0.13	-0.71	0.05	0.1	4	14	6	11	nw.	T. H. Whitney Dr. H. C. Hawley W. A. Seybold Carl E. Pollock George Mogridge
Clarinda	Page	1,009	38	29.0	+ 6.6	63	10	-11	1	38	0.15	-0.81	0.10	1.0	2	14	14	3	nw.	
Corning (near)	Adams	1,117	36	28.2	+ 7.2	61	10	-11	1	33	0.06	-0.86	0.06	0	1	24	1	6	sw.	
Cumberland (near)	Cass	1,225	29								0.04	-0.73	0.04	0	1	20	6	5	sw.	
Glenwood	Mills	1,100	30	29.3	+ 7.4	66	10	-10	1	40	0.02	-0.69	0.02	T.	1	12	9	10	nw.	
Lenox	Taylor	1,250	33	27.6	+ 6.0	60	10	-11	1	33	0.17	-0.50	0.10	0.2	3	15	10	6	nw.	
Oakland	Pottawattamie	1,105	9	27.4	+ 7.5	63	10	-11	1	39	0.15	-0.65	0.06	0	3	16	9	6	sw.	
Red Oak (near)	Montgomery	1,030	3								0.12		0.04	0	4	10	16	5	nw.	
Riverton (near)	Fremont	920	2								0.03		0.03	T.	1	17	4	10	nw.	
Thurman	Fremont	960	31	29.4	+ 6.8	67	10	-10	1	44	T.	-0.68	T.	T.	0	17	8	6	nw.	
Omaha, Neb.		1,105	57	29.6	+ 7.7	67	10	-11	1	31	0.01	-0.69	0.01	T.	1	13	11	7	nw.	U. S. Weather Bureau
Means and extremes				28.4	+ 7.1	67	10	-11	1	44	0.08	-0.72	0.10	0.1	2	16	8	7	nw.	
<i>South Central District</i>																				
Afton	Union	1,212	34	27.4	+ 6.3	59	10	-10	1	33	0.09	-0.77	0.06	0	2	19	7	5	sw.	S. R. Brown O. E. McBride Thomas Wood C. C. Burr
Albia	Monroe	949	30	28.4	+ 7.5	60	14	-7	1†	31	0.01	-1.18	0.01	T.	1	14	8	9	nw.	
Centerville	Appanoose	1,013	23	28.8	+ 6.2	60	14	-8	1	32	0.01	-1.24	0.01	T.	1	17	6	8	sw.	
Chariton (near)	Lucas	1,042	33	28.2	+ 7.2	58	10†	-11	1	31	T.	-1.07	T.	T.	0	14	9	8	sw.	
Corydon	Wayne	1,101	35																	
Creston	Union	1,291	23	26.3	+ 6.7	60	10	-11	1	39	0.10	-0.95	0.05	0	2	15	7	9	nw.	
Earlham (near)	Madison	1,126	26	26.8	+ 7.6	63	10	-8	1†	38	T.	-1.18	T.	0	0	22	1	8	sw.	
Indianola	Warren	972	37	28.0	+ 8.3	63	10	-9	1	32	0.08	-1.07	0.08	T.	1	17	7	7	sw.	
Knoxville	Marion	920	33	28.0	+ 6.6	62	10	-8	1†	31	T.	-1.23	T.	T.	0	16	7	8	sw.	
Lacona	Warren	824	29								0.18	-1.47	0.10	0	6	12	10	9	sw.	
Lamoni	Decatur	1,123	21	27.6	+ 6.2	59	14	-11	1	32	0.02	-1.04	0.02	T.	1	22	2	7	nw.	Mrs. N. Spangler George Phillips Seth F. Shenton W. J. Casey J. B. Alter
Mount Ayr	Ringgold	1,245	35	27.1	+ 4.9	59	10	-12	1	32	0.03	-0.09	0.03	T.	1	15	10	6	nw.	
Pella		850	1								0.06	-0.97	0.04	T.	2	19	5	7	sw.	
Tingley	Ringgold	1,275	3	27.1	+ 6.0	58	10†	-12	1	32	0.17	-0.73	0.17	T.	2	18	7	6	sw.	
Winterset	Madison	1,118	37	28.0	+ 7.3	62	10	-10	1	32	0.12	-0.80	0.05	T.	3	18	6	7	nw.	
Means and extremes				27.7	+ 6.7	63	10	-12	1	39	0.06	-1.06	0.17	T.	2	17	7	7	sw.	
<i>Southeast District</i>																				
Bonaparte (near)	Van Buren	563	37	27.2	+ 5.0	62	14	-10	2	28	0.03	-1.51	0.03	1.0	1	18	4	9	sw.	B. R. Vale John T. Donnelly Miss Musa Todd R. M. McKenzie U. S. Weather Bureau
Burlington	Des Moines	544	32	27.8	+ 3.6	62	14	-10	2	27	0.58	-1.18	0.37	3.0	3	20	6	5	sw.	
Columbus Junction	Louisa	595	27	26.8	+ 4.7	60	14	-10	2	29	0.23	-1.08	0.12	2.5	5	12	13	6	nw.	
Fairfield	Jefferson	780	44	26.7	+ 5.1	61	14	-10	2	28	0.37	-1.15	0.30	0.9	4	15	8	8	sw.	
Keokuk	Lee	614	57	29.5	+ 4.6	64	14	-10	2	27	0.41	-1.15	0.33	0.8	2	12	10	9	sw.	
Keosauqua	Van Buren	644	36	27.8	+ 5.8	61	14	-8	2†	33	0.07	-1.49	0.07	1.0	1	16	4	11	sw.	
Mt. Pleasant	Henry	730	47	28.1	+ 5.6	63	14	-10	2	29	0.17	-1.37	0.11	1.5	2	14	10	7	nw.	
Oskaloosa	Mahaska	835	52	27.2	+ 6.5	60	10†	-11	2	33	0.18	-0.85	0.11	0.4	5	14	5	12	nw.	
Ottumwa	Wapello	649	33	28.5	+ 5.9	61	14	-7	2	33	0.02	-1.50	0.02	0.2	1	19	4	8	nw.	
Sigourney (near)	Keokuk	790	32	27.2	+ 6.7	60	13	-10	2	30	0.10	-1.16	0.10	1.2	1	17	3	11	nw.	
Stockport	Van Buren	747	26	27.4	+ 6.0	63	14	-9	2	33	0.38	-1.00	0.21	2.0	3	17	7	7	sw.	C. L. Beswick D. D. Sherman
Washington	Washington	757	46	26.2	+ 5.2	61	14	-13	2	30	0.24	-1.24	0.15	2.5	4	9	11	11	sw.	
Means and extreme				27.5	+ 5.4	64	14	-13	2	33	0.23	-1.23	0.37	1.3	3	15	7	9	sw.	
State means and extremes				25.2	+ 6.6	70	10	-20	2	47	0.17	-0.90	0.80	0.9	3	15	8	8	nw.	

Temperature normals are based on the 46-year period July 3, 1875 to July 2, 1921; shorter records corrected to harmonize. Precipitation normals are based on the 50-year period ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1920 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.

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.

Daily Precipitation for January, 1928

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>Northwest District</i>																																			
Akron.....	Big Sioux.....																																	.01	
Alta.....	Raccoon.....													.05			T.	.02															T.	.01	
Alton.....	Floyd.....													.03			T.	.05															T.	.08	
Cherokee.....	Little Sioux.....															T.	.13																T.	.13	
Estherville.....	Des Moines.....														.03		T.	.15															T.	.34	
Hawarden.....	Big Sioux.....																																		
Inwood.....	Big Sioux.....																T.	.27																T.	.23
Lake Park (near)	Little Sioux.....																T.	.21																.01	
Le Mars.....	Floyd.....																																		
Marathon.....	Raccoon.....																																		
Pocahontas.....	Des Moines.....																																		
Rock Rapids.....	Big Sioux.....																																		
Sanborn.....	Floyd.....																																		
Sheldon.....	Floyd.....																																		
Sioux Center.....	Floyd.....																																		
Spencer.....	Little Sioux.....																																		
Storm Lake.....	Raccoon.....																																		
Washta.....	Little Sioux.....																																		
West Bend.....	Des Moines.....																																		
<i>North Central District</i>																																			
Algona.....	Des Moines.....																																		
Allison (near).....	Cedar.....																																		
Belmond.....	Iowa.....																																		
Britt.....	Iowa.....																																		
Charles City***.....	Cedar.....																																		
Forest City.....	Cedar.....																																		
Hampton|||.....	Cedar.....																																		
Humboldt.....	Des Moines.....																																		
Mason City.....	Cedar.....																																		
Northwood.....	Cedar.....																																		
Osage.....	Cedar.....																																		
<i>Northeast District</i>																																			
Decorah.....	Mississippi.....																																		
Dubuque***.....	Mississippi.....																																		
Fayette.....	Mississippi.....																																		
Independence.....	Wapsipicon.....																																		
Lansing|||.....	Mississippi.....																																		
New Hampton.....	Wapsipicon.....																																		
Oelwein.....	Wapsipicon.....																																		
Postville.....	Mississippi.....																																		
Waterloo.....	Cedar.....																																		
Waverly.....	Cedar.....																																		
<i>West Central District</i>																																			
Audubon (near).....	Nishnabotna.....																																		
Carroll.....	Raccoon.....																																		
Denison.....	Missouri.....																																		
Guthrie Center.....	Raccoon.....																																		
Harlan.....	Nishnabotna.....																																		
Jefferson.....	Raccoon.....																																		
Little Sioux.....	Little Sioux.....																																		
Logan.....	Missouri.....																																		
Onawa.....	Missouri.....																																		
Rockwell City.....	Raccoon.....																																		
Sac City.....	Raccoon.....																																		
Sioux City***.....	Missouri.....																																		
<i>Central District</i>																																			
Ames.....	Skunk.....																																		
Baxter.....	Skunk.....																																		
Boone (near).....	Des Moines.....																																		
Des Moines***.....	Des Moines.....																																		
Fort Dodge.....	Des Moines.....																																		
Grinnell.....	Iowa.....																																		
Grundy Center.....	Cedar.....																																		
Iowa Falls.....	Iowa.....																																		
Marshalltown.....	Iowa.....																																		
Monroe.....	Des Moines.....																																		
Perry.....	Raccoon.....																																		
Toledo.....	Iowa.....																																		
Van Meter|||.....	Raccoon.....																																		
Waukeo.....	Raccoon.....																																		
Webster City.....	Des Moines.....																																		
<i>East Central District</i>																																			
Belle Plaine.....	Iowa.....																																		
Cedar Rapids.....	Cedar.....																																		
Clinton.....	Mississippi.....																																		
Davenport***.....	Mississippi.....																																		
Davenport, No. 2.....	Mississippi.....																																		
Fairport.....	Mississippi.....			</																															

Daily Precipitation for January, 1928—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>Southwest District</i>																																			
Atlantic.....	Nishnabotna..															T.	.05		.05						T.	.02			.01						
Clarinda.....	Nodaway.....	.05															.10																		
Corning (near)...	Nodaway.....										T.														.06										
Cumberland (nr.)	Nodaway.....																								T.							T.			
Glenwood.....	Missouri.....		T.	T.	T.																														
Lenox.....	Missouri.....															T.	T.		.10						.05								.02		
Oakland.....	Nishnabotna..																.06		.05						.04										
Red Oak (near)...	Nishnabotna..	.02														.04			.02						.04										
Riverton (near)...	Nishnabotna..																.03								T.				T.						
Thurman.....	Missouri.....		T.														T.		T.						T.										
Omaha, Neb., **	Missouri.....		T.														T.	T.		.01					T.				T.						
<i>South Central District</i>																																			
Afton.....	Grand.....																		.06						.03										
Albia.....	Des Moines...																		.01	T.						T.				T.	T.	T.			
Centerville.....	Chariton.....																			.01	T.									T.					
Chariton (near)...	Chariton.....	T.																							T.										
Corydon.....	Chariton.....																																		
Creston.....	Missouri.....																																	T.	
Earlham (near)...	Des Moines...																																	T.	
Indianola.....	Des Moines...																																	T.	
Knoxville.....	Des Moines...	T.																																T.	
Lacona.....	Des Moines...																																		T.
Lamoni.....	Grand.....																																		T.
Mount Ayr.....	Grand.....																																		T.
Pella (near).....	Skunk.....																																		T.
Tingley.....	Platte.....																																		T.
Winterset.....	Des Moines...																																		T.
<i>Southeast District</i>																																			
Bonaparte (near)	Des Moines...						T.																												.03
Burlington.....	Mississippi...																																		.15
Columbus Jet.....	Iowa.....				T.																														.12
Fairfield.....	Skunk.....																																		.08
Keokuk***	Mississippi...																																		.06
Keosauqua.....	Des Moines...																																		.01
Mt. Pleasant.....	Skunk.....																																		.07
Oskaloosa.....	Des Moines...																																		.11
Ottumwa.....	Des Moines...																																		.02
Sigourney (near)...	Skunk.....																																		.10
Stockport.....	Skunk.....																																		.21
Washington.....	Skunk.....																																		.15

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.
 T. Precipitation is less than .01 inch rain or melted snow.

PRECIPITATION

The average precipitation for the State, derived from the averages of nine divisions of nearly equal area and from the records of 111 stations, was 0.17 inch, or 0.90 inch below normal. This is the least of record for Iowa in 56 Januarys. The east-central district had the largest average, 0.35 inch; and the west-central and the south-central districts had the smallest, 0.06 inch. The largest amount at a single station was 1.04 at Olin, and the smallest, a trace at ten stations. The greatest amount falling in 24 consecutive hours was 0.80 inch at Olin on the 19th. Rainy days (with 0.01 inch or more of precipitation) averaged three, or two less than usual, but not the least of record for the State. They were most frequent in the northeast, north-central and east-central districts, and least in the northwest, west-central, southwest and south-central districts.

SNOWFALL

The average snowfall for the State was 0.9 inch, or 5.8 inches less than the normal. This is the least January snowfall and also the least amount ever recorded in any winter month of record. The least previous average was 1.5 inches in 1899. The largest average was 2.1 inches in the east-central division and the least average was a trace in the west-central and south-central districts. A large portion of the State was bare the entire month.

MISCELLANEOUS PHENOMENA

- Auroras: 1st, 20th, 26th, 27th.
- Fog: 8th, 9th, 12th, 16th, 17th, 18th, 19th, 23d.
- Halos (lunar and solar): 1st, 2d, 3d, 6th, 7th, 8th, 9th, 26th, 27th, 28th.
- Sleet: 1st, 14th, 15th, 16th, 18th, 19th, 24th, 28th.
- Thunderstorm (1 station): 18th.

Daily Maximum and Minimum Temperature for the Month of January, 1928

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	
<i>Northern Division</i>																																	
Algona.....	{Maximum.....	-2	4	18	25	42	47	42	36	44	52	45	48	40	42	36	33	35	36	33	15	30	37	33	31	30	21	19	23	20	24	36	31.5
	{Minimum.....	-12	-16	-5	8	10	32	29	25	27	31	30	30	32	22	25	22	24	15	2	1	19	14	9	9	3	-2	-5	8	8	4	13.6	
Alta.....	{Maximum.....	-2	4	19	27	46	48	44	35	47	55	44	53	41	30	30	33	34	32	13	33	41	37	22	31	21	16	27	22	26	36	31.8	
	{Minimum.....	-12	-14	-7	8	15	31	31	23	28	31	32	33	31	30	21	25	21	23	9	2	3	18	14	7	8	3	-2	-4	10	12	10	14.1
Alton.....	{Maximum.....	-5	2	17	22	42	45	41	35	44	52	43	52	43	38	32	31	34	37	34	13	31	38	28	20	28	23	23	28	26	25	39	31.0
	{Minimum.....	-12	-13	-10	-4	5	26	29	22	27	30	29	30	33	32	20	27	19	20	13	3	-2	11	15	7	6	3	-5	-4	15	10	12.9	
Belmond.....	{Maximum.....	-7	4	20	28	44	47	42	35	46	56	44	50	42	43	35	33	36	33	11	31	39	36	33	32	18	18	20	18	21	35	31.5	
	{Minimum.....	-12	-17	-6	8	9	30	27	25	27	31	31	32	32	24	26	23	24	11	2	0	20	15	11	8	2	-2	-7	6	5	-6	13.1	
Charles City.....	{Maximum.....	4	2	17	26	40	45	39	34	41	48	42	47	37	44	29	32	34	40	33	8	27	39	34	25	31	16	15	17	15	21	30	29.1
	{Minimum.....	-14	-17	-4	8	9	29	28	25	27	31	32	32	34	29	24	26	23	24	4	3	2	18	16	12	4	-1	-3	-6	7	0	-3	12.9
Decorah.....	{Maximum.....	-4	0	14	23	36	43	39	35	40	45	43	44	40	43	38	32	33	39	39	13	21	36	32	27	29	18	15	15	18	27	28.6	
	{Minimum.....	-6	-16	-6	10	5	30	31	21	25	31	31	31	32	32	21	21	21	29	9	1	0	15	12	12	2	-2	-4	-9	5	5	-4	12.7
Dubuque.....	{Maximum.....	2	4	18	25	35	47	43	39	45	54	45	46	42	53	38	34	37	42	37	10	25	41	41	33	29	16	19	13	17	23	30	31.7
	{Minimum.....	-8	-10	0	8	14	30	34	28	28	31	33	30	34	34	26	28	28	29	4	3	5	23	20	14	7	3	-3	-5	10	10	5	15.9
Forest City.....	{Maximum.....	-1	5	20	27	43	47	43	39	43	52	45	48	42	43	36	32	34	37	35	11	29	38	34	28	33	25	16	18	17	24	33	31.5
	{Minimum.....	-14	-20	-8	3	10	27	29	23	27	32	28	30	32	32	21	23	19	20	10	0	-4	11	12	7	8	5	-5	-8	3	4	5	11.1
Independence.....	{Maximum.....	-4	1	19	22	38	42	42	43	43	53	50	47	48	50	45	32	36	39	37	28	28	43	42	40	34	32	20	18	21	28	33.3	
	{Minimum.....	-9	-14	-4	10	11	22	25	32	26	41	33	30	34	32	20	15	22	25	26	4	4	16	17	18	20	1	1	-5	4	8	3	14.9
Inwood.....	{Maximum.....	-4	0	13	17	39	41	38	34	41	50	41	52	41	39	29	29	36	34	33	12	31	38	28	21	27	28	18	15	27	30	29.1	
	{Minimum.....	-15	-18	-15	-10	4	29	27	17	27	32	29	32	31	28	15	25	16	19	10	2	-3	15	13	4	9	-7	2	-4	12	7	9	11.0
Lake Park.....	{Maximum.....	-6	0	16	23	41	43	44	37	42	46	44	45	39	39	28	30	33	35	34	9	31	34	26	17	26	19	17	24	26	21	35	29.0
	{Minimum.....	-15	-19	-9	1	6	31	27	23	29	29	31	32	31	32	27	17	23	17	19	8	0	-2	17	10	4	4	-7	-2	-6	3	1	5	10.7
Mason City.....	{Maximum.....	-5	1	17	25	40	48	41	34	42	49	43	47	41	42	35	32	33	38	34	8	29	37	32	30	30	18	19	18	21	32	30.0	
	{Minimum.....	-13	-19	-6	8	10	30	28	23	27	30	30	32	31	22	23	21	23	6	2	-1	17	11	10	9	4	-3	-8	1	3	-7	11.8	
New Hampton.....	{Maximum.....	0	1	16	25	37	44	39	33	40	46	42	45	37	45	36	32	32	40	34	20	26	39	34	31	31	25	17	16	16	21	30	30.0
	{Minimum.....	-17	-19	-8	5	6	25	28	22	25	28	29	30	32	32	23	22	20	22	9	0	-3	15	13	12	9	-4	-4	-9	5	3	-6	11.1
Northwood.....	{Maximum.....	0	6	20	28	45	49	45	35	48	57	45	59	44	42	35	33	35	37	34	16	34	41	38	33	33	21	20	28	25	23	37	33.7
	{Minimum.....	-12	-15	-5	6	9	30	30	25	27	32	32	30	31	30	22	27	22	21	14	1	1	17	14	9	8	4	0	-6	11	10	5	13.6
Postville.....	{Maximum.....	-2	2	15	24	35	43	40	33	42	46	42	45	39	45	36	31	32	39	33	11	24	40	33	28	26	24	11	11	15	21	27	28.7
	{Minimum.....	-11	-15	-5	8	9	29	32	24	26	30	31	31	32	32	21	22	22	22	10	4	2	18	14	12	8	-1	-2	-8	5	3	-1	13.0
Rock Rapids.....	{Maximum.....	-6	0	12	17	39	40	39	33	40	46	43	47	40	37	29	30	34	36	34	16	30	37	30	20	26	20	20	27	32	24	35	29.3
	{Minimum.....	-14	-18	-12	-10	-1	26	24	19	26	27	27	31	30	26	15	24	17	18	15	2	1	10	13	5	7	-5	3	-2	9	12	8	10.7
<i>Central Division</i>																																	
Belle Plaine.....	{Maximum.....	1	7	21	21	40	47	48	34	58	58	44	50	47	54	40	33	40	40	37	22	33	45	44	33	37	29	19	19	22	24	32	34.8
	{Minimum.....	-7	-13	-3	7	18	25	32	25	28	27	30	28	37	35	28	28	29	26	22	6	3	22	18	17	8	0	2	-6	9	14	6	16.2
Boone.....	{Maximum.....	4	8	22	34	48	48	46	34	52	61	50	59	46	51	40	34	39	39	35	25	36	45	40	34	36	31	19	26	26	25	41	36.7
	{Minimum.....	-9	-10	-6	9	7	21	29	25	24	25	30	25	32	29	27	20	25	6	3	16	3	16	13	15	4	0	4	-8	14	15	5	14.4
Carroll.....	{Maximum.....	0	6	21	31	48	46	45	47	50	62	51	60	43	46	37	33	36	36	33	21	35	43	42	33	33	28	21	29	25	40	35.7	
	{Minimum.....	-11	-10	-5	9	16	29	22	24	32	31	29	32	29	23	27	23	25	20	3	5	23	15	10	8	-2	4	-3	13	15	11	15.4	
Cedar Rapids.....	{Maximum.....	0	5	20	29	38	45	45	39	46	57	45	50	44	55	39	33	39	41	37	20	30	42	44	35	35	29	18	15	21	24	33	34.0
	{Minimum.....	-8	-13	-4	5	9	22	33	27	27	28	30	25	33	34	28	28	28	27	19	6	4	15	14	18	8	1	3	-5	9	12	3	14.7
Davenport.....	{Maximum.....	2	6	20	26	34	44	44	42	46	53	46	51	44	61	38	35	35	41	41	15	29	42	45	40	33	20	15	21	25	32	33.8	
	{Minimum.....	-6	-9	2	8	15	30	34	29	29	34	34	33	37	36	30	30	31	31	10	8	9	28	25	16	11	5	1	-2	10	13	9	18.4
Des Moines.....	{Maximum.....	6	9	20	34	44	43	47	37	55	65	50	60	46	54	37	38	41	41	36	18	36	49	38	35	39	21	22	27	26	28	44	37.1
	{Minimum.....	-8	-7	0	11	16	30	35	27	27	33	35	35	36	35	30	30	28	13	7	8	28	22	17	11	4	5	-2	17	17			

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE

REARRANGEMENT OF DATA

Stations	Barometric Pressure, Inches (Sea Level)					Relative Humidity, %				Wind					Sunshine		
	Mean	Highest	Date	Lowest	Date	Mean				Total movement	Average hourly velocity	Maximum					
						7 A. M.	12 Noon†	7 P. M.	Lowest			Date	Miles	From		Date	
																	% possible	Departure from normal
Chas. City.	30.10	30.70	2	29.40	19	88	70	73	46	22	5,061	6.8	29	nw.	19	62	+13
Davenport	30.12	30.69	2	29.35	19	85	69	78	29	25	5,188	7.0	30	nw.	19	61	+17
Des Moines	30.13	30.76	2	29.44	14	78	59	64	31	25	5,060	6.8	22	sw	19	64	+9
Dubuque....	30.09	30.66	2	29.32	19	86	66	76	39	21	4,664	6.3	32	nw.	20	59	+10
Keokuk.....	30.16	30.74	2	29.43	19	75	59	63	29	25	5,931	8.0	36	nw.	19	60	+10
Sioux City	30.16	30.83	2	29.42	14	84	68	70	23	19	7,814	10.5	45	nw.	19	63	+11
Omaha, Neb.....	30.16	30.80	2	29.44	14	77	64	62	27	25†	5,496	7.4	31	nw.	19	67	+11
Means and extreme	30.13					82	67	71				7.5				63	+12
Normals and records..	30.14		25th	29.32	19				23	19			45	nw.	19		
	31.09	1905	28.71	1906	3rd	85		78		19					6th	51	
									†23	1928			†72	nw.	1903		

‡Local mean time. †And other dates.
 †Sioux City. ‡Dubuque.
 ††January 1, 1928, 3-cup anemometers replaced the 4-cup instruments used since the establishment of the Weather Bureau stations. The new instruments will more accurately indicate the true wind movement. The records of the 4-cup instruments were somewhat too high at moderate velocities and considerably too high at the higher velocities. Tables of true velocities corresponding to indicated velocities appear below.

TRUE WIND VELOCITIES

Table 1

Correct or true velocities in miles an hour corresponding to velocities indicated by the 4-cup anemometer.

Indicated velocity	0	1	2	3	4	5	6	7	8	9
0			2.2	3.2	4.2	5.1	6.0	6.9	7.8	8.6
10	9.3	10.2	11.2	12.0	12.8	13.5	14.3	15.0	15.7	16.5
20	17.3	18.1	18.9	19.7	20.5	21.3	22.0	22.7	23.4	24.2
30	24.9	25.7	26.4	27.2	28.0	28.7	29.4	30.2	30.9	31.6
40	32.3	33.1	33.8	34.5	35.2	36.0	36.8	37.5	38.2	38.9
50	39.7	40.5	41.3	42.0	42.7	43.4	44.1	44.9	45.6	46.3
60	47.0	47.8	48.6	49.2	50.0	50.7	51.5	52.2	52.9	53.7
70	54.4	55.1	55.8	56.5	57.2	58.0	58.7	59.4	60.1	60.9
80	61.7	62.4	63.1	63.8	64.5	65.3	66.1	66.9	67.6	68.3
90	69.1	69.8	70.5	71.3	72.1	72.9	73.6	74.3	75.0	75.7
100	76.5	77.2	78.0	78.7	79.4	80.2	80.9	81.6	82.3	83.1
110	83.8	84.5	85.2	85.9	86.7	87.5	88.3	89.0	89.7	90.5
120	91.3	92.0	92.7	93.5	94.2	95.0	95.8	96.4	97.1	97.9
130	98.7	99.5	100.2	101.0	101.8	102.6	103.3	104.0	104.7	105.4
140	106.2	107.0	107.8	108.6	109.3	110.1	110.8	111.5	112.2	113.0
150	113.8	114.5	115.2	115.9	116.6	117.4	118.2	119.0	119.7	120.5
160	121.3	122.0	122.7	123.4	124.1	124.8	125.5	126.3	127.1	127.8
170	128.5	129.2	129.9	130.7	131.5	132.3	133.0	133.8	134.5	135.2
180	135.9	136.6	137.3	138.1	138.9	139.6	140.3	141.1	141.8	142.5

TRUE WIND VELOCITIES

Table 2

Correct or true velocities in miles an hour corresponding to velocities indicated by the standard 3-cup anemometer.

Indicated velocity	0	1	2	3	4	5	6	7	8	9
0			2.2	3.1	4.1	5.1	6.1	7.1	8.0	9.0
10	10.0	11.0	11.9	12.9	13.8	14.8	15.8	16.7	17.7	18.6
20	19.6	20.6	21.5	22.4	23.4	24.3	25.3	26.2	27.2	28.1
30	29.1	30.0	31.0	31.9	32.9	33.8	34.8	35.7	36.7	37.6
40	38.6	39.5	40.5	41.4	42.4	43.3	44.3	45.2	46.2	47.1
50	48.1	49.0	50.0	50.9	51.9	52.8	53.8	54.7	55.6	56.6
60	57.6	58.5	59.4	60.4	61.3	62.3	63.2	64.2	65.2	66.1
70	67.1	68.0	68.9	69.9	70.8	71.8	72.7	73.7	74.6	75.6
80	76.5	77.5	78.4	79.4	80.3	81.3	82.2	83.2	84.1	85.1
90	86.0	87.0	87.9	88.9	89.8	90.8	91.7	92.7	93.6	94.6
100	95.5	96.5	97.4	98.4	99.3	100.2	101.2	102.2	103.1	104.0
110	105.0	106.0	106.9	107.8	108.8	109.8	110.7	111.6	112.6	113.5
120	114.5	115.4	116.4	117.3	118.3	119.2	120.2	121.1	122.1	123.0
130	124.0	124.9	125.9	126.8	127.8	128.7	129.7	130.6	131.6	132.5
140	133.5									

There has been a well defined change in the location of observing stations in Iowa. Most of the early records were in the more populous eastern counties, but in recent years it has been difficult to maintain cooperative observing stations in the eastern counties, while in the western counties the Weather Bureau has been unable to furnish equipment for the large number of persons who desired to cooperate in the observation work.

The Bureau has been more liberal with rain gauges than with temperature equipment for it is almost impossible to have too many rainfall records. Some of the earlier directors of the Iowa weather service advocated a rainfall record in every township. Observing stations, particularly rainfall stations, have become more numerous per unit area in the western than in the eastern portions of the State. This has had a tendency to destroy the comparability of the older State means with the later State means, especially in precipitation, which decreases appreciably from east to west.

To correct these difficulties the State will hereafter be separated into nine nearly equal areas, called districts to distinguish them from the former separation into three divisions, north, central and south. The new districts will be (1) northwest, (2) north-central, (3) northeast, (4) west-central, (5) central, (6) east-central, (7) southwest, (8) south-central, and (9) southeast. This follows the districting system of the crop reporting service which will make it easier to compare crop and weather statistics. It will tend to prevent faulty distribution of stations from seriously influencing the State means.

This necessitated a rearrangement of normals and while this was being done, normals were prepared for several short record stations at which all available records were considered in connection with the normal maps. In the case of the temperature records this placed the short record stations on a basis of the uniform 46-year normals and the new precipitation normals are believed to be equivalent to those derived from 30 or more years of record. New precipitation normals for the first order Weather Bureau stations, based on the 50-year period ending with December 31, 1927, became effective January 1, 1928.

For the State, the normal annual precipitation is thus reduced from 30.22 inches to 30.11 inches. Part of this is due to the influence of the series of dry years since 1920, when the previous precipitation normal period ended.

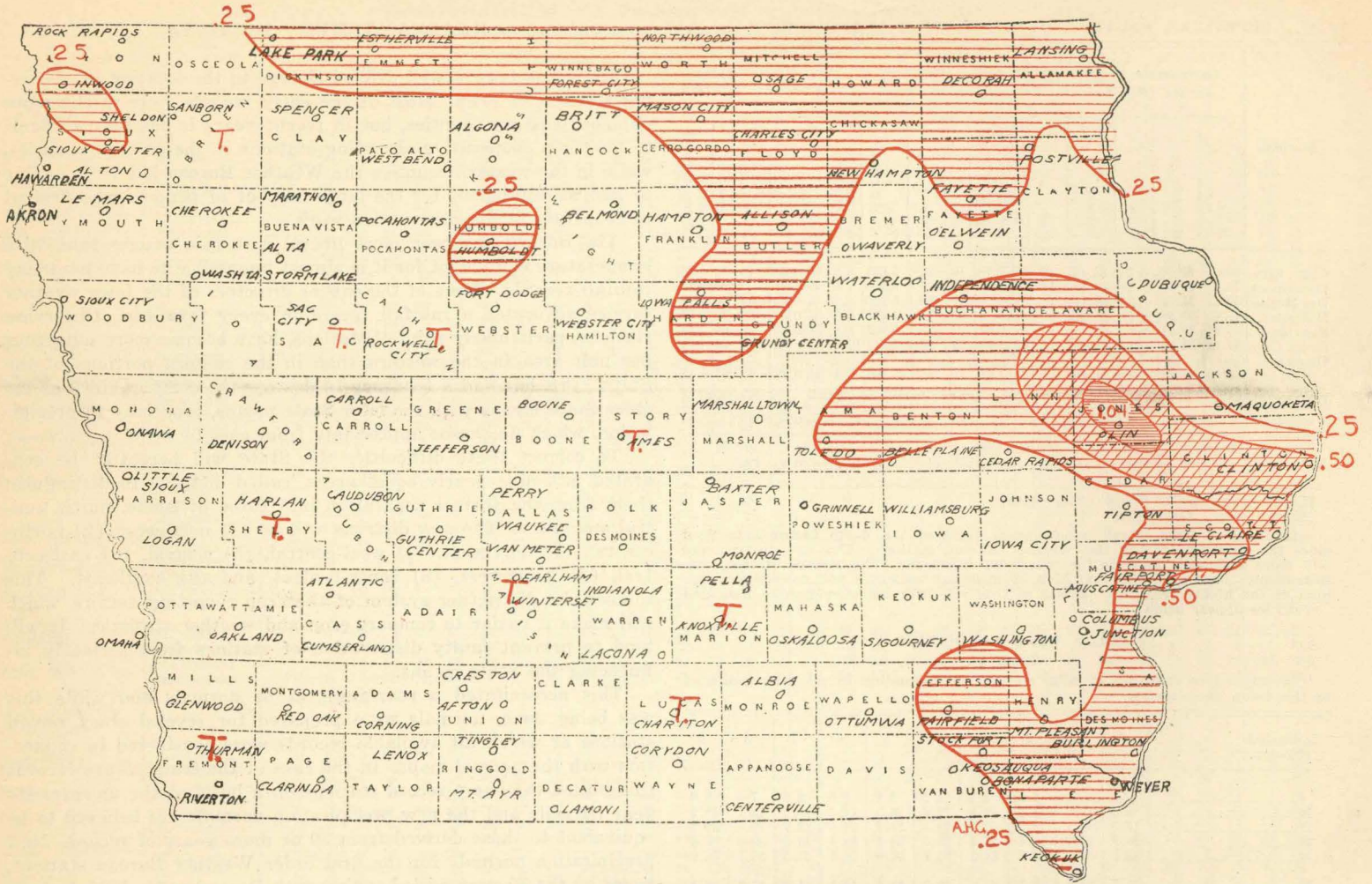
RIVERS

The Mississippi River averaged somewhat above the normal for January with considerable fluctuation but no important changes. There was a falling tendency during most of the first half of the month and rising thereafter. On the Missouri River moderate stages prevailed. Falling stages prevailed most of the first half of the month and rising stages the last. On interior rivers low and nearly stationary stages prevailed. The ice on all rivers was still intact at the end of the month with the thickness somewhat reduced but it had not commenced to get soft.

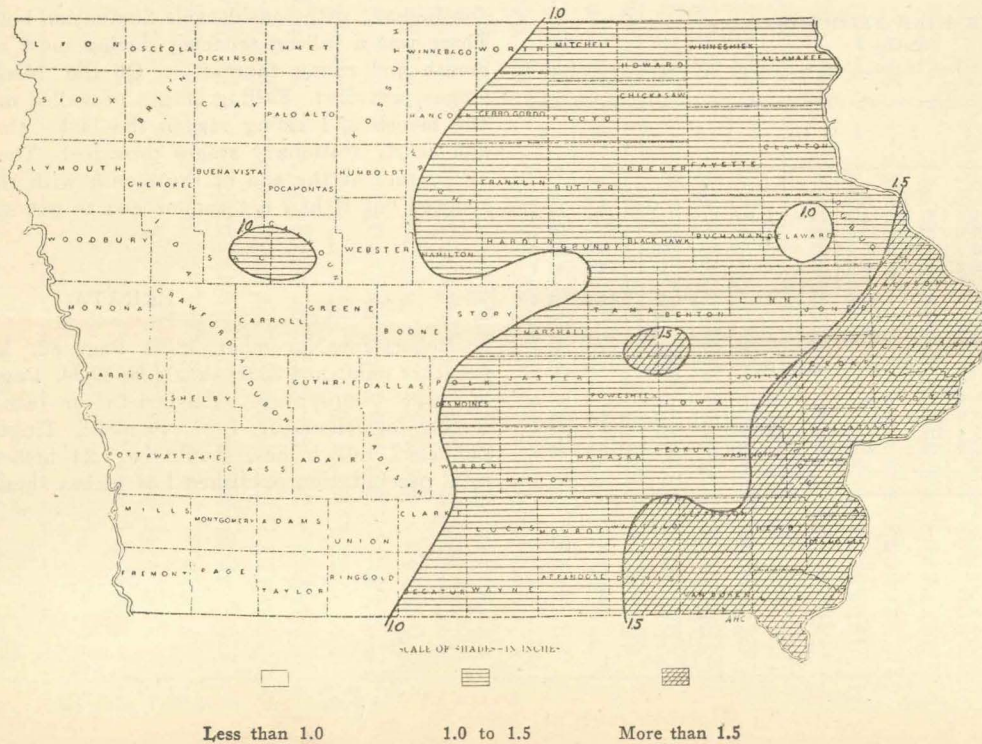
ERRATA

Report for November, 1927. Page 82. Maquoketa; mean temperature published 39.0d should be 39.5d. Page 83. Keosauqua; date of lowest temperature published 14° on 18th, should be 13° on 6th. Report for December, 1927. Page 91. Tingley; total precipitation published 1.04 inches, should be 1.24 inches. Page 93. Tingley; total precipitation published 1.04 inches should be 1.24 inches.

TOTAL PRECIPITATION, JANUARY, 1928



NORMAL PRECIPITATION, JANUARY (Based on station records of 30 years or more)



CLIMATOLOGICAL DATA.

IOWA SECTION

In co-operation with
IOWA WEATHER AND CROP BUREAU
CHARLES D. REED, Meteorologist

TEMPERATURE

The mean temperature for the State, derived from the means of nine districts of nearly equal area and based on the records of 99 stations, was 28.6°, or 6.0° above normal. The departures were quite uniform though the northeastern, east-central and north-central divisions reported the greatest excess. The highest mean was 34.2°, at Keokuk, and the lowest was 22.6°, at Inwood. The absolute range for the State was 79°, from 65° at Bonaparte on the 3d, to -14° at Postville on the 15th. The average number of days with the minimum temperature 32°, or lower, was 27; minimum zero or lower, 2; maximum 32, or lower, 8.

VOL. XXXIX DES MOINES, IOWA, FEBRUARY, 1928 No. 2

GENERAL SUMMARY

For the fifth consecutive year the weather during February was mild and for the third consecutive winter December was rather cold and January and February were considerably warmer than normal. Except for a small area in the extreme eastern portion of the State, where the temperature was slightly below normal on the 1st, the first sixteen days were continuously above normal and also the last four days; from the 17th till the 25th there were numerous fluctuations in temperature with cold weather predominating and on the 18th and 25th zero weather was general over most of the State. As has been the rule for several months the western half of the State averaged colder than the eastern though the departures were more uniform than before.

The dry condition that was universal over the State throughout January was relieved by a general period of precipitation extending from the 4th till the 8th. The precipitation was principally rain and was of great value in relieving a water shortage in many parts of the State as well as supplying much needed moisture to the soil which had become very dry and had drifted considerably. This storm developed into a glaze storm over a large area in the northwest portion and injured or destroyed a large number of fruit and shade trees and damaged telephone, telegraph and electric wires. There was also some sleet or glaze in some part of the State accompanying nearly every period of precipitation but about the only effect was to make traveling temporarily difficult. The snow storm of the 13th-14th and 17th-18th was accompanied by considerable wind and drifted considerably but travel was interrupted for only short periods. The mild weather was favorable for most outdoor work but on account of the soft condition of the soil there was very little farm work performed, though there was much of the State where the soil was free from frost, and about the only work done in the fields was the removal of corn stocks where it was possible. The weather was favorable for wintering stock and the general condition was good. Hog "flu" which had been troublesome earlier in the winter has almost disappeared.

There was very little of the State covered with snow for any length of time and it is likely that winter wheat and grasses have been damaged by the lack of snow as well as some damage from glaze. After the first rain began roads became bad and during the rest of the month travel on dirt roads was almost impossible most of the time.

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
1873.	19.2	- 3.4	49	-25	1.17	- 0.03	2.52	0.30					
1874.	21.2	- 1.4	59	-20	1.23	- 0.08	2.88	0.16					
1875.	6.4	-16.2	48	-31	1.72	+ 0.52	6.75	0.82					
1876.	25.5	+ 2.9	68	-16	1.11	+ 0.09	3.63	0.15					
1877.	34.0	+11.4	63	- 5	0.21	+ 0.99	0.65	0.00					
1878.	34.4	+11.8	60	- 8	0.59	+ 0.61	2.95	0.00					
1879.	21.6	- 1.0	57	-20	0.68	- 0.52	1.90	0.10					
1880.	27.4	+ 4.8	68	-12	0.64	- 0.56	2.15	0.02					
1881.	17.0	- 5.6	57	-24	3.10	+ 1.90	6.35	0.97					
1882.	33.5	+10.9	72	-12	0.91	+ 0.29	1.85	0.10					
1883.	17.7	- 4.9	62	-33	1.89	+ 0.69	6.13	0.06					
1884.	18.3	- 4.3	56	-23	1.32	+ 0.12	3.50	0.30					
1885.	12.5	-10.1	54	-32	0.82	- 0.38	2.50	0.10					
1886.	21.2	- 1.4	56	-34	0.59	- 0.61	1.96	0.24					
1887.	17.1	- 5.5	60	-25	2.14	+ 0.94	5.64	0.12					
1888.	20.2	- 2.4	64	-34	1.01	- 0.19	3.10	0.15					
1889.	17.8	- 4.8	62	-28	0.47	- 0.73	1.70	0.00					
1890.	25.1	+ 2.5	68	-24	0.83	- 0.37	2.18	0.25					
1891.	19.4	- 3.2	70	-31	1.16	- 0.04	2.41	0.55		3	13	7	8
1892.	28.1	+ 5.5	68	-20	1.20	- 0.00	2.18	0.12	5.0	6	6	7	16
1893.	16.0	- 6.6	60	-28	1.39	+ 0.19	2.91	0.06	8.1	6	10	8	10
1894.	19.7	- 2.9	60	-19	0.89	- 0.31	2.41	T.	8.4	3	16	8	4
1895.	16.4	- 6.2	73	-33	0.49	- 0.71	1.34	0.02	3.3	4	13	9	6
1896.	27.4	+ 4.8	78	-13	0.71	- 0.49	2.40	0.04	5.4	4	12	9	8
1897.	24.7	+ 2.1	61	-21	0.89	- 0.31	1.81	0.22	8.0	5	6	10	12
1898.	24.2	+ 1.6	62	-18	1.20	- 0.00	3.65	0.10	7.8	5	10	9	9
1899.	12.2	-10.4	75	-40	0.89	- 0.31	4.32	0.12	7.1	5	11	10	7
1900.	14.8	- 7.8	60	-27	1.30	+ 0.10	4.57	0.18	9.9	6	10	8	10
1901.	17.5	- 5.1	49	-21	1.01	- 0.19	3.00	0.12	9.7	4	15	7	6
1902.	17.6	- 5.0	62	-21	0.73	- 0.47	2.39	0.02	2.6	4	13	8	7
1903.	19.8	- 2.8	56	-21	1.18	- 0.02	3.25	0.30	7.9	4	13	7	8
1904.	14.8	- 7.8	70	-26	0.41	- 0.79	1.99	T.	4.5	4	10	9	10
1905.	12.8	- 9.8	69	-41	1.57	+ 0.37	2.97	0.44	15.5	7	14	6	8
1906.	23.6	+ 1.0	66	-32	1.29	+ 0.09	2.91	0.20	6.1	5	14	7	7
1907.	25.0	+ 2.4	65	-31	0.71	- 0.49	1.95	0.06	4.6	4	14	6	8
1908.	24.3	+ 1.7	59	-16	1.69	+ 0.49	3.95	0.23	8.9	6	12	6	11
1909.	26.2	+ 3.6	62	-26	1.54	+ 0.34	4.72	0.30	7.7	5	11	6	11
1910.	17.8	- 4.8	58	-21	0.46	- 0.74	2.09	T.	4.0	3	14	8	6
1911.	27.3	+ 4.7	71	-13	2.76	+ 1.56	5.46	0.50	7.0	6	12	6	10
1912.	18.1	- 4.5	57	-30	1.21	+ 0.01	3.25	0.04	11.2	5	10	9	10
1913.	20.2	- 2.4	70	-24	0.82	- 0.38	2.39	0.07	7.3	4	14	7	7
1914.	16.8	- 5.8	59	-29	0.87	- 0.33	1.99	0.32	9.2	6	10	9	9
1915.	29.1	+ 6.5	62	- 8	2.93	+ 1.73	5.39	0.43	9.4	9	9	5	14
1916.	19.0	- 3.6	62	-32	0.55	- 0.65	1.38	0.05	6.0	4	14	8	7
1917.	15.2	- 7.4	68	-37	0.36	- 0.84	1.19	T.	3.5	3	14	8	6
1918.	23.0	+ 0.4	70	-36	0.95	- 0.25	2.10	0.09	6.0	5	14	7	7
1919.	24.9	+ 2.3	65	-16	2.42	+ 1.22	4.12	1.32	9.9	8	11	5	12
1920.	24.0	+ 1.4	59	-22	0.56	- 0.64	1.75	0.04	4.1	5	9	6	14
1921.	31.0	+ 8.4	76	- 5	0.77	- 0.43	2.00	T.	6.5	5	13	7	8
1922.	23.7	+ 1.1	70	-20	1.59	+ 0.39	4.56	0.40	1.3	4	14	7	7
1923.	20.1	- 2.5	61	-23	0.40	- 0.30	1.71	0.00	3.2	3	13	8	7
1924.	25.8	+ 3.2	70	-15	1.27	+ 0.07	4.00	0.30	11.2	7	15	5	9
1925.	28.4	+ 5.8	66	-16	0.82	- 0.38	3.69	T.	2.6	4	11	7	10
1926.	31.2	+ 8.6	67	- 2	0.76	- 0.44	2.13	0.04	3.3	4	10	7	11
1927.	30.6	+ 8.0	65	-17	1.15	- 0.05	3.60	0.13	4.4	5	13	6	9
1928.	28.6	+ 6.0	65	-14	1.95	+ 0.75	3.97	0.62	4.4	7	15	5	9

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



Climatological Data for February, 1928

STATIONS	COUNTIES	Elevation, feet	Length of record, years	Temperature, in Degrees Fahrenheit						Greatest daily range	Precipitation, in inches				Number of Days				OBSERVERS	
				Mean	Departure from normal	Highest	Date	Lowest	Date		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>Northwest District</i>																				
Akron	Plymouth	1,153	2								1.00	+ 0.12	0.49	6.0	7	14	9	6	s.	Orlan C. Moore D. E. Hadden W. S. Slagle J. E. Wirth A. O. Peterson
Alta	Buena Vista	1,513	37	25.2	+ 5.5	58	3	- 7	18	35	1.66	+ 0.64	0.73	7.0	5	14	10	5	nw.	
Alton	Sioux	1,305	23	24.5	+ 5.6	54	3	- 5	18	38	1.15	+ 0.19	0.26	9.0	7	11	13	5	nw.	
Cherokee	Cherokee	1,196	8	25.0	+ 5.5	58	3	- 7	18	39	1.19	+ 0.20	0.51	5.0	7	19	4	6	sw.	
Estherville	Emmet	1,298	33	24.6	+ 6.7	55	3	- 5	18	32	1.75	+ 0.91	0.60	3.5	5	8	15	6	nw.	
Hawarden	Sioux	1,181	2								1.27	+ 0.48	0.74	5.4	7	22	2	5	nw.	
Inwood	Lyon	1,474	24	22.6	+ 4.8	52	3	- 11	18	31	2.25	+ 1.38	1.09	12.4	6	21	3	5	nw.	
Lake Park (near)	Dickinson	1,489	15	23.4	+ 5.6	54	3	- 5	18	36	1.30	+ 0.38	0.61	5.8	6	14	3	12	nw.	
Le Mars	Plymouth	1,224	32	26.0	+ 5.1	55	3	- 5	18	40	1.63	+ 0.88	0.78	9.0	5	19	5	5	n.	
Marathon	Buena Vista	1,990	2								1.51		0.57	9.0	9	13	7	9	sw.	
Pocahontas	Pocahontas	1,248	24	25.4	+ 5.7	58	3	- 8	18	42	1.51	+ 0.39	0.58	9.0	9	15	4	10	n.	F. E. Hronek Nellie F. Medberry J. W. Dow Ross E. Forward J. De Ruyter
Rock Rapids	Lyon	1,349	29	23.4	+ 5.5	50	3	- 4	18	34	1.41	+ 0.73			7	23	1	5	nw.	
Sanborn	O'Brien	1,553	14	23.6	+ 5.1	54	3	- 5	23	36	1.18	+ 0.18	0.32	8.2	5	14	8	7	nw.	
Sheldon	O'Brien	1,418	17	24.1	+ 5.6	56	3	- 5	18	37	1.56	+ 0.58	0.79	7.9	8	13	11	5	nw.	
Sioux Center	Sioux	1,426	29	23.4	+ 4.7	55	3	- 10	18	36	2.06	+ 1.09	0.83	12.8	6	14	4	11	w.	
Spencer	Clay	1,319	14	24.6	+ 6.1	59	12	- 6	18	41	1.20	+ 0.29	0.40	8.5	7	16	6	7	nw.	
Storm Lake	Buena Vista	1,440	39	26.6	+ 6.2	57	3	- 7	18	35	1.26	+ 0.27	0.37	6.4	7	18	6	5	nw.	
Washita	Cherokee	1,157	30	25.9	+ 5.1	59	12	- 8	18	48	1.34	+ 0.40	0.44	6.5	7	18	5	6	w.	
West Bend	Palo Alto	1,197	35	24.5	+ 5.3	56	12	- 5	18	38	0.62	- 0.36	0.38	2.5	5	14	7	8	nw.	
Means and extremes				24.6	+ 5.6	59	12	- 11	18	48	1.42	+ 0.50	1.09	7.4	7	16	6	7	nw.	
<i>North Central District</i>																				
Algona	Kossuth	1,213	55	25.6	+ 6.8	55	12	- 4	18	34	1.49	+ 0.40	0.81		5	22	0	7	nw.	W. E. Laird J. A. Bell H. F. Luick James S. Ross U. S. Weather Bureau
Allison (near)	Butler	1,044	14	25.4	+ 6.1	51	3	- 3	18	34	2.75	+ 1.54	1.10	7.5	7	14	3	12	nw.	
Beimond	Wright	1,181	18	25.2	+ 6.9	55	12	- 3	1	41	2.11	+ 1.00	0.65	4.0	7	8	7	14	nw.	
Britt	Hancock	1,236	41	24.9	+ 7.3	53	3	- 4	18	36	1.33	+ 0.52	0.43	3.0	7	15	1	13	nw.	
Charles City	Floyd	1,015	37	25.2	+ 8.1	50	3	- 1	25	34	2.68	+ 1.55	0.87	3.5	8	13	5	11	nw.	
Forest City	Winnebago	1,226	34	24.8	+ 6.2	53	3	- 4	18	35	2.12	+ 1.18	0.81	4.5	6	13	7	9	nw.	
Hampton	Franklin	1,145	3								2.75	+ 1.45	1.05	5.5	6					
Humboldt	Humboldt	1,095	40	24.6	+ 4.1	57	3	- 9	18	45	1.81	+ 0.89	0.67	6.3	7	17	1	11	nw.	
Mason City	Cerro Gordo	1,148	31	24.6	+ 6.5	51	12	- 2	18	36	2.17	+ 1.22	0.84	2.3	7	14	6	9	nw.	
Northwood	Worth	1,222	32																	
Osage	Mitchell	1,163	34	24.5	+ 7.7	49	3	- 2	25	30	2.05	+ 0.99	0.99	6.5	5	13	8	8	nw.	
Means and extremes				25.0	+ 6.9	57	3	- 9	18	45	2.13	+ 1.05	1.10	4.8	6	14	4	11	nw.	
<i>Northeast District</i>																				
Decorah	Winneshiek	872	35	24.4	+ 6.6	47	3	- 13	25	36	2.65	+ 1.60	1.25	5.0	6	14	4	11	nw.	M. D. Whitney U. S. Weather Bureau R. Z. Latimer Dr. Geo. Boody Mrs. Mary Spinner
Dubuque	Dubuque	700	55	28.2	+ 6.0	51	3	- 0	25	31	1.69	+ 0.31	1.00	3.0	8	11	7	11	nw.	
Fayette	Fayette	1,003	40	26.8	+ 7.8	52	3	- 12	23	38	3.10	+ 1.82	1.05	4.5	8	17	4	8	nw.	
Independence	Buchanan	921	64	28.0	+ 6.8	52	3	- 2	25	39	2.31	+ 1.26	1.38	2.0	7	16	2	11	nw.	
Lansing	Allamakee	632	21																	
New Hampton	Chickasaw	1,169	31	24.8	+ 6.1	50	3	- 5	25	33	1.26	+ 1.21	0.65		7	10	9	10	nw.	
Oelwein	Fayette	1,036	5	27.2	+ 6.9	50	3	- 4	25	31	2.26	+ 0.18	0.50	2.0	6	17	2	10	w.	
Postville	Clayton	1,192	29	24.7	+ 6.4	49	3	- 14	25	33	2.81	+ 1.67	1.13	10.0	9	12	10	7	sw.	
Waterloo	Black Hawk	854	45	27.6	+ 6.7	54	3	- 1	25	39	2.30	+ 1.12	0.55	2.3	7	16	5	8	se.	
Waverly	Bremer	936	32	26.1	+ 6.1	52	3	- 5	25	37	1.75	+ 0.54	0.52	3.0	7	16	8	5	nw.	
Means and extremes				26.4	+ 6.6	54	3	- 14	25	39	2.25	+ 1.09	1.38	4.0	7	14	6	9	nw.	
<i>West Central District</i>																				
Audubon (near)	Audubon	1,297	33	27.6	+ 6.1	59	3	- 4	18	35	2.40	+ 1.37	0.75	13.5	10	14	7	8	nw.	George Kibby Mrs. Jos. J. Wolfe V. L. Byers H. A. Stafford Walter Bell
Carroll	Carroll	1,265	38	27.4	+ 5.5	61	3	- 5	18	39	1.61	+ 0.55	0.90	6.0	5	17	6	6	nw.	
Denison	Crawford	1,171	34	28.1	+ 5.7	59	12	- 6	18	40	1.04	+ 0.10	0.38	8.0	5	17	5	7	nw.	
Guthrie Center	Guthrie	1,077	33			60g	12	- 4	18	32g	2.18	+ 1.07	0.70	3.0	10	18	1	10	nw.	
Harlan	Shelby	1,192	29	27.8	+ 4.9	60	3	- 4	18	42	1.25	+ 0.12	0.55	4.6	3	21	1	7	w.	
Jefferson	Greene	1,052	29	27.4	+ 4.9	63	3	- 6	18	48	2.51	+ 1.48	1.08	7.0	6	19	4	6	sw.	
Little Sioux	Harrison	1,040	23	29.4	+ 5.5	63	12	- 3	18	45	1.72	+ 0.44	0.65	6.8	8	12	7	10	nw.	
Logan	Harrison	1,120	61	30.0	+ 5.0	62	11	- 3	18	45	0.74	- 0.45	0.27		5	13	9	7	nw.	
Onawa	Monona	1,051	27																	
Rockwell City	Calhoun	1,232	32	26.4	+ 5.2	61	3	- 7	18	43	2.65	+ 1.32	0.75	12.0	5	19	4	6	nw.	
Sac City	Sac	1,269	52	26.6	+ 6.1	59	3	- 5	18	41	1.27	+ 0.16	0.50	6.5	6	15	8	6	nw.	
Sioux City	Woodbury	1,135	39	27.8	+ 6.8	60	3	- 0	23	35	1.60	+ 0.78	0.98	8.4	5	10	12	7	nw.	
Means and extremes				27.8	+ 5.3	63	3	- 7	18	48	1.68	+ 0.57	1.08	8.1	6	16	6	7	nw.	
<i>Central District</i>																				
Ames	Story	926	51	29.3	+ 6.8	60	3	- 1	18	48	2.43	+ 1.49	0.68	3.6	9	16	3	10	nw.	Iowa State College Otto Sanderman C. F. Henning U. S. Weather Bureau Samuel Sampson
Baxter	Jasper	998	28	28.6	+ 5.7	60	3	- 3	18	43	3.54	+ 2.52	1.18	6.1	10	11	7	11	nw.	
Boone (near)	Boone	1,134	23	28.1	+ 4.8	61	3	- 6	25	50	2.60	+ 1.60	1.32	6.0	8	12	2	15	nw.	
Des Moines	Polk	861	50	30.4	+ 6.7	62	12	- 0	18	39	3.10	+ 1.98	1.36	6.5	10	9	7	13	nw.	
Fort Dodge	Webster	1,114	28	25.8	+ 3.5	58	12	- 8	18	44	2.86	+ 2.01	0.90	8.5	8	17	1	11	nw.	
Grinnell	Poweshiek	1,031	34	29.0	+ 5.8	57	3	- 0	18	37	1.13	- 0.09	0.59	2.5	6	16	1	12	nw.	
Gundy Center	Grundy	976	37	27.8	+ 5.8	56	3	- 1	18	38	2.15	+ 1.21	0.60	4.0	7	13	6	10	nw.	
Iowa Falls	Hardin	1,127	35	26.7	+ 5.7	54	3	- 2	18	38	3.60	+ 1.97	0.95	5.0	8	14	4	11	nw.	
Marshalltown	Marshall	947	36	28.4	+ 4.8	59	12	- 0	18	39	2.69	+ 1.48	0.73	4.5	7	15	2	12	nw.	
Monroe	Jasper	922	16	30.4	+ 5.8	59	3	- 1	18	37	2.51	+ 1.31	0.72	2.0	8	15	4	10	w.	
Perry	Dallas	975	27	29.1	+ 5.6	61	3	- 2	18	47	2.45	+ 1.13		6.0	9					

Climatological Data for February, 1928—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>East Central District</i>																				
Belle Plaine	Benton	866	38	29.8	+ 6.9	57	3	2	25	40	1.92	+ 0.32	0.46	5.0	8	12	6	11	nw.	O. C. Burrows
Cedar Rapids	Linn	737	46	28.8	+ 6.3	54	3	1	25	40	1.77	+ 0.37	0.70	2.0	7	12	3	14	nw.	J. T. Wurster
Clinton	Clinton	595	55	30.4	+ 5.8	55	3	0	25	39	1.90	- 0.06	0.84	1.8	9	15	3	11	n.	Dr. A. P. Bryant
Davenport	Scott	580	57	31.0	+ 6.1	54	3	5	25	31	1.61	+ 0.03	0.72	3.7	9	10	7	12	nw.	U. S. Weather Bureau
Davenport, No. 2	Scott	690	3	31.4		56	3	3	25	37	1.53		0.52	3.2	11					Rex Shriver
Fairport	Muscatine	567	7	31.5	+ 6.3	55	3	2	25	37	2.07	+ 0.32	0.98		8	13	2	14	nw.	Bureau of Fisheries
Iowa City	Johnson	733	68	30.4	+ 6.2	55	3	2	25	39	2.01	+ 0.50	1.29	2.5	8	14	4	11	nw.	Prof. J. F. Reilly
Le Claire	Scott	576	28																	Margaret T. Disney
Maquoketa	Jackson	692	23	28.6	+ 6.8	52	3	- 3	25	37	1.57	+ 0.22	0.86	1.7	9	13	6	10	nw.	John Strothoff
Muscatine	Muscatine	546	67																	William Molis
Olin	Jones	760	29	29.4	+ 7.3	51	3†	1	25	40	1.66	+ 0.01	0.95	1.5	6	17	2	10	nw.	Mrs. L. Stingley
Tipton (near)	Cedar	807	29	30.2	+ 6.4	53	3	1	25	36	1.84	+ 0.35	0.87	2.5	7	13	4	12	nw.	John Kroepfen
Williamsburg	Iowa	770	12	28.6	+ 5.8	55	3	2	25	41	1.48	+ 0.18	0.72	0.6	5	17	3	9	nw.	Dr. F. C. Schadt
Means and extremes				30.0	+ 6.5	57	3	- 3	25	41	1.76	+ 0.16	1.29	2.4	8	14	4	11	nw.	
<i>Southwest District</i>																				
Atlantic	Cass	1,164	37	29.4	+ 5.5	59	12	- 1	18	40	2.74	+ 1.60	0.90	12.5	11	11	8	10	sw.	T. H. Whitney
Clarinda	Page	1,009	38	33.2	+ 5.4	63	11†	3	18	41	0.65	- 0.49	0.18	0.3	5	14	9	6	nw.	Dr. H. C. Hawley
Corning	Adams	1,150	36																	C. A. Smith
Cumberland (near)	Cass	1,225	29								1.80	+ 0.71	0.93	2.5	6	16	5	8	nw.	Carl E. Pollock
Glenwood	Mills	1,100	30	31.8	+ 5.3	64	12	2	18	42	1.48	+ 0.61	0.60	1.8	8	12	7	10	nw.	George Mogridge
Lenox	Taylor	1,250	33	31.6	+ 6.1	62	12	- 1	18	36	2.18	+ 1.19	1.35	2.8	7	13	8	8	nw.	J. L. Hurley
Oakland	Pottawattamie	1,105	9	30.6	+ 6.0	62	12	- 1	18	45	1.52	+ 0.47	0.77		6	16	6	7	nw.	W. S. Matthews
Red Oak (near)	Montgomery	1,030	3								1.88	+ 0.75	1.40	1.5	7	12	9	8	nw.	B. R. Bridge
Riverton (near)	Fremont	920	2								1.90	+ 0.72	1.57	2.2	5	16	1	12	nw.	Geo. C. Rader
Thurman	Fremont	960	31	33.2	+ 5.3	64	12	5	23	46	1.43	+ 0.05	0.80	1.0	5	17	3	9	n.	H. H. Askew
Omaha, Neb.		1,105	57	31.6	+ 6.1	64	12	4	23	32	0.93	+ 0.04	0.42	5.5	7	12	9	8	nw.	U. S. Weather Bureau
Means and extremes				31.6	+ 5.8	64	12	- 1	18	46	1.65	+ 0.53	1.57	3.3	7	14	6	9	nw.	
<i>South Central District</i>																				
Afton	Union	1,212	34	31.7	+ 6.1	63	12	- 1	18	38	2.47	+ 1.30	1.38	1.8	8	17	2	10	nw.	S. R. Brown
Albia	Monroe	949	30	31.8	+ 6.4	62	12	0	18	34	1.74	+ 0.38	0.77	3.1	9	13	5	11	nw.	O. E. McBride
Centerville	Appanoose	1,013	23	32.8	+ 5.7	62	12	0	18	38	1.31	- 0.19	0.42	2.3	10	15	3	11	nw.	Thomas Wood
Chariton (near)	Lucas	1,042	33	31.6	+ 6.5	61	12	- 1	18	37	1.81	+ 0.68	0.66	1.0	4	18	2	9	nw.	C. C. Burr
Corydon	Wayne	1,101	35																	
Creston	Union	1,291	23	29.6	+ 4.9	60	12	- 2	18	39	1.28	- 0.06	0.60	T.	8	13	7	9	nw.	M. N. Spangler
Earlham (near)	Madison	1,126	26	29.8	+ 6.5	61	3	- 2	18	46	2.76	+ 1.35	1.00	2.9	11	18	1	10	sw.	Geo. E. Phillips
Indianola	Warren	972	37	30.8	+ 6.2	62	12	- 1	18	41	1.48	+ 0.27	0.40	4.0	7	17	3	9	nw.	Seth F. Shenton
Knoxville	Marion	920	33	31.1	+ 5.4	60	3†	0	18	41	2.12	+ 0.87	0.60	2.0	8	15	3	11	nw.	W. J. Casey
Lacona	Warren	824	29								3.97	+ 2.29	0.93	4.0	10	14	6	9		J. B. Aalter
Lamoni	Decatur	1,123	21	32.0	+ 4.6	63	12	0	18	36	2.05	+ 0.81	0.87	2.0	9	15	4	10	nw.	F. S. Parks
Mount Ayr	Ringgold	1,245	35	31.7	+ 5.3	61	12	- 2	18	35	1.95	+ 0.65	1.03	2.0	8	17	3	9	nw.	Alex Maxwell
Pella	Marion	850	1								2.37	+ 1.17	0.82	3.0	9	16	3	10	nw.	L. L. Langerak
Tingley	Ringgold	1,275	3	30.8	+ 4.7	61	12	- 2	18	36	2.05	+ 0.87	1.09	1.9	7	17	3	9	nw.	James A. Verploegh
Winterset	Madison	1,118	37	31.2	+ 6.4	62	12	- 1	18	39	2.93	+ 1.85	0.82	2.0	8	19	0	10	nw.	H. S. Ely
Means and extremes				31.2	+ 5.6	63	12	- 2	18	46	2.13	+ 0.83	1.38	2.3	8	16	3	10	nw.	
<i>Southeast District</i>																				
Bonaparte (near)	Van Buren	563	37	32.0	+ 5.2	65	3	4	18	42	1.94	+ 0.68	0.90	0.9	9	18	0	11	w.	B. R. Vale
Burlington	Des Moines	544	32	33.0	+ 4.3	56	12	6	18	31	1.75	- 0.06	0.80	2.0	8	13	5	11	nw.	John T. Donnelly
Columbus Junction	Louisa	595	27	31.3	+ 5.0	55	3	4	18	36	1.84	+ 0.44	1.00	2.5	8	10	8	11	nw.	Miss Musa Todd
Fairfield	Jefferson	780	44	30.7	+ 5.2	56	3†	2	18†	40	2.48	+ 0.89	1.47	1.8	9	15	3	11	nw.	R. M. McKenzie
Keokuk	Lee	614	57	34.2	+ 5.9	59	3	6	1	27	1.75	+ 0.20	0.73	1.7	8	11	5	13	nw.	U. S. Weather Bureau
Keosauqua	Van Buren	644	36	32.4	+ 5.1	58	12	1	25	45	2.17	+ 0.70	1.31	3.5	8	13	6	10	n.	J. H. Landes
Mt. Pleasant	Henry	730	47	32.7	+ 6.2	57	12	4	18	34	1.43	- 0.01	0.85	2.0	6	9	9	10	nw.	J. H. Jericho
Oskaloosa	Mahaska	835	52	30.8	+ 6.1	60	3	- 1	18	43	2.45	+ 1.30	0.76	5.4	12	13	3	13	nw.	Roy R. Robinson
Ottumwa	Wapello	649	33	32.6	+ 5.9	61	12	4	18	42	1.87	+ 0.42	0.76	1.0	9	18	1	10	nw.	C. L. Mikesch
Sigourney (near)	Keokuk	790	32	30.8	+ 6.1	57	3	2	18†	39	1.89	+ 0.49	0.73	2.3	8	14	3	12	nw.	W. E. Utterback
Stockport	Van Buren	747	26	31.6	+ 5.9	56	3†	3	25	38	1.96	+ 0.57	0.90	1.2	8	15	3	11	nw.	C. L. Beswick
Washington	Washington	757	46	32.0	+ 6.5	59	4	- 1	18	38	2.02	+ 0.73	0.95	3.0	8	8	10	11	nw.	D. D. Sherman
Means and extremes				32.0	+ 5.6	65	3	- 1	18	45	1.93	+ 0.50	1.47	2.3	8	13	5	11	nw.	
State means and extremes				28.6	+ 6.0	65	3	- 14	25	50	1.95	+ 0.75	1.57	4.4	7	15	5	9	nw.	

Temperature normals are based on the 46-year period July 3, 1875 to July 2, 1921; shorter records corrected to harmonize. Precipitation normals are based on the 50-year period ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1920 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.

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.

Daily Precipitation for February, 1928—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>Southwest District</i>																																				
Atlantic.....	Nishnabotna..				.05	.01	.90	.30	.25					.65	.20			.05				.05	.18	.10										2.74		
Clarinda.....	Nodaway.....					.18	.12	.17						.15	.03																			0.65		
Corning.....	Nodaway.....				T.		1.60	.12	.10					.31									T.											1.60		
Cumberland (nr.)	Nodaway.....				.10		.93	.30	.10					.27	.10								T.											1.48		
Glenwood.....	Missouri.....				.06		.60	.30	.02					.15	.03				T.					.02	.30											
Lenox.....	Missouri.....				T.		1.35	T.	.15					.50	.05			.05					T.	.05	.03									2.18		
Oakland.....	Nishnabotna..				.06		.77	.25	.09					.25										.10	T.									1.32		
Red Oak (near)..	Nishnabotna..						1.40	.14						.14	.10			.02						.04										1.88		
Riverton (near)..	Nishnabotna..				T.		1.57		.07					.18	.02			T.						.06										1.90		
Thurman.....	Missouri.....				T.	T.	.80	.41	T.					.14	.06			T.						.02										1.43		
Omaha, Neb., ***	Missouri.....				T.	T.	.40	.04	T.					.20	.07			.03					T.	.17	.02	T.								0.93		
<i>South Central District</i>																																				
Afton.....	Grand.....				.05	.02	1.38	.12	.08					.58	.16									.08											2.47	
Albia.....	Des Moines....				.08	.08	.77	.25	.03					.37	.01			.04					T.	T.	.11										1.74	
Centerville....	Chariton.....				.06	.02	.42	.21	.03					.30	.02			.22						.01	.02										1.31	
Chariton (near)..	Chariton.....					T.	T.	.66	.61	T.				.44	T.			.10								T.	T.								1.81	
Corydon.....	Chariton.....																																			
Creston.....	Missouri.....				.05	T.	.60	.09	.03	T.				.32	.03			T.					T.	.14	.02										1.28	
Earlham (near)..	Des Moines....				.20	.05	1.00	.47	.08					.68	.12			.04					.02	.08											2.76	
Indianola.....	Des Moines....				.06	T.	.30	.21	T.					.21	.10			.20							.40										1.48	
Knoxville.....	Des Moines....				T.	.05	.50	.60	.07					.58	.12			.15					T.	T.	.05		T.								2.12	
Lacona.....	Des Moines....				.05	.20	.90	.93	.32					.62	.48			.30						.07	.10										3.97	
Lamoni.....	Grand.....				.02	T.	.87	.43	.04					.50	.02			.02						.10	.05										2.05	
Mount Ayr.....	Grand.....				.03	T.	1.03	.11	.10					.50	.02			.04					T.	T.	.12	.14									1.95	
Pella (near)....	Skunk.....				.05	T.	.82	.39	.11					.52	.04			.18					T.	T.	.12	.14		T.							2.37	
Tingley.....	Platte.....				T.	T.	1.09	.10	.10					.55	.06			.04						.11	.11										2.05	
Winterset.....	Des Moines....				.30	.05	.82	.60	.15					.70	.16	T.		T.					T.	.15	T.										2.93	
<i>Southeast District</i>																																				
Bonaparte (near)	Des Moines....				.27	.09	.90	.13	.03					.36	.02			.05					T.	T.	.09										1.94	
Burlington.....	Mississippi...				.41	.02	.53	.27						.19	.03			.28						.02											1.75	
Columbus Jct....	Iowa.....				.17		.73	.27	.03					.22	.16			.16						.10		T.									1.84	
Fairfield.....	Skunk.....				.18	.02	1.15	.52	.03					.36	.04			.15					T.	T.	.03											2.48
Keokuk***.....	Mississippi...				T.	.60	T.	.73	T.	.08				.20	.01			.04					T.	.02	.07		T.								1.75	
Keosauqua.....	Des Moines....				.20	.10	.87	.44	T.					.30	.06			.15					T.	T.	.05										2.17	
Mt. Pleasant...	Skunk.....				.20		.59	.26	.06					.24				.08						T.												1.43
Oskaloosa.....	Des Moines....				T.		.07	.09	.76	.41	.09			.47	.09			.18	.03				.02	.05	.19	T.	T.								2.45	
Ottumwa.....	Des Moines....				.06	.04	.76	.34	.08					.42	.05			.06						.06												1.87
Sigourney (near).	Skunk.....				.12		.73	.40	.05					.29	.09			.14					T.	T.	.07											1.89
Stockport.....	Skunk.....				.32	.03	.90	.23	.08					.28	T.			.10					T.	T.	.02											1.96
Washington.....	Skunk.....				.12		.95	.33	.01					.18	.04			.25					T.	T.	.14											2.02

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.
- T. Precipitation is less than .01 inch rain or melted snow.

PRECIPITATION

The average precipitation for the State, derived from the averages of nine divisions of nearly equal area and from the records of 109 station, was 1.95 inches, or 0.75 inch above normal. Only five times during the last 55 years has a greater average occurred in February. The greatest average and also the greatest excess occurred in the central division. The greatest amount at a single station was 3.97 inches at Lacona, and the least was 0.62 inch at West Bend. The greatest amount occurring in 24 consecutive hours was 1.57 inches at Riverton on the 6th.

SNOWFALL

The average snowfall for the State was 4.4 inches, the same as last February, or 2.6 inches less than normal. The greatest average was 8.1 inches in the west-central division, and the least, 2.3 inches in the south-central and southeastern divisions. The greatest amount reported was 13.5 inches at Audubon and the least a trace at Creston. Six stations reported 10.0 inches, or more, and seven reported 1.0 inch or less.

MISCELLANEOUS PHENOMENA

- Aurora: 24th.
- Fog: 3d, 4th, 5th, 6th, 7th, 13th, 14th, 22d.
- Hail: 22d.
- Halos (lunar and solar): 1st, 2d, 3d, 5th, 11th, 15th, 17th, 28th, 29th.
- Haze: 3d.
- Parhelia: 2d, 3d.
- Sleet: 2d, 5th, 6th, 7th, 8th, 13th, 21st, 22d, 23d, 24th.
- Thunderstorms: 4th, 6th, 7th, 21st, 22d.

RIVERS

There was considerable fluctuation on the Mississippi. Due to the heavy rains of the 6th-7th, there was a rise, within three days, of from three or four feet; the other fluctuations were due mainly to changing ice conditions. The mean stage was above the average and at Dubuque it averaged the highest for February in the history of the station. Ice conditions changed during the month with floating ice general from the 12th to 20th but it was frozen from the 21st till the end of the month though there were numerous open spaces. The heavy rains of the 6th-7th also caused a marked rise on the Missouri River immediately following the rains; thereafter there was a gradually falling tendency except there was a marked rise in the lower course on the 25th. The interior rivers fluctuated considerably but no damaging stages developed. Ice gorges caused some local overflows but there was very little damage from the movements of gorges.

AN UNUSUAL OPTICAL PHENOMENON

A very complex solar halo was observed by a number of Co-operative Observers on February 2d and a number of descriptions were received in detail. A complete description accompanied by a drawing was furnished by Mr. D. E. Hadden, Co-operative Observer at Alta, Iowa, and the sketch and article was referred to the Chief of the Weather Bureau who made the following comment:

"I note that the various halos (counting the several distinct displays) sketched are: The 22° halo; the upper tangent arc, with extensions; the 46° halo; the parhelic circle; two parhelia; two paranthelia; one infralateral tangent arc.

"Although each of these several phenomena is well known, and its cause fully understood, the display as a whole was a very unusual one, at least for our latitudes, and I thank you again for kindly bringing it to my attention."

Daily Maximum and Minimum Temperature for the Month of February, 1928

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		
<i>Northern Division</i>																																		
Algona.....	(Maximum.....	26	36	52	45	35	32	33	33	34	43	45	55	51	31	35	30	21	14	30	17	28	38	18	17	26	38	39	39	35			33.7	
	(Minimum.....	1	16	18	31	26	29	30	27	27	27	28	34	30	24	13	16	3	4	6	3	10	17	0	4	1	15	20	29	24			17.4	
Alta.....	(Maximum.....	31	45	58	45	30	31	32	33	35	43	50	57	35	28	32	27	20	14	30	20	36	36	16	16	28	42	41	42	33			34.0	
	(Minimum.....	3	20	23	27	26	30	30	25	25	26	25	34	22	18	12	11	1	7	10	1	12	11	1	3	3	12	19	29	24			16.3	
Alton.....	(Maximum.....	31	39	54	44	32	32	34	33	34	40	45	49	35	28	32	26	23	12	31	19	33	33	23	15	24	38	36	40	36			32.8	
	(Minimum.....	4	11	16	29	26	30	32	22	25	20	24	32	25	22	12	16	2	5	9	4	14	12	2	3	4	12	18	29	25			16.2	
Belmond.....	(Maximum.....	26	39	54	45	33	33	33	34	32	44	42	55	41	34	32	28	20	13	32	16	30	36	20	14	25	39	41	40	33			33.3	
	(Minimum.....	-3	10	13	31	26	30	32	27	25	26	26	34	32	25	13	16	5	3	4	9	19	2	5	0	14	20	30	23			17.1		
Charles City.....	(Maximum.....	22	36	50	44	33	35	35	32	32	42	45	48	38	33	34	31	21	15	32	15	28	36	16	12	23	38	40	38	31			32.2	
	(Minimum.....	2	10	16	31	24	29	32	27	27	28	34	32	25	20	21	6	1	11	7	9	14	4	2	1	14	21	29	20			18.1		
Decorah.....	(Maximum.....	27	35	47	44	35	34	35	34	30	40	43	46	42	38	34	32	24	11	30	14	24	38	28	12	22	28	35	37	32			32.1	
	(Minimum.....	9	7	11	32	20	25	32	26	26	27	25	30	32	30	26	20	10	4	10	5	3	22	1	1	13	10	11	21	20			16.8	
Dubuque.....	(Maximum.....	20	40	51	48	38	38	40	36	35	48	47	47	41	37	34	35	24	18	36	17	29	41	27	15	20	43	40	43	37			35.3	
	(Minimum.....	7	12	20	31	27	30	36	28	29	31	32	32	37	32	28	24	13	6	11	10	8	27	10	3	0	15	25	26	22			21.1	
Forest City.....	(Maximum.....	29	40	53	47	35	33	34	35	33	44	35	53	35	37	34	31	22	17	33	21	28	37	21	16	25	41	42	39	35			34.0	
	(Minimum.....	-2	10	18	30	28	27	29	25	23	24	25	32	30	25	12	15	5	4	5	3	6	18	2	2	3	10	18	26	21			15.7	
Independence.....	(Maximum.....	32	29	52	51	43	35	38	38	32	45	43	50	48	38	35	34	27	22	35	29	30	34	38	24	21	41	41	41	38			36.7	
	(Minimum.....	4	14	13	29	25	29	31	29	27	28	29	31	35	32	22	22	11	2	7	8	9	25	4	6	2	20	21	27	26			19.4	
Inwood.....	(Maximum.....	33	38	52	37	31	32	33	35	37	41	41	41	37	37	31	29	21	13	29	18	30	33	16	15	24	38	37	40	33			31.8	
	(Minimum.....	2	10	21	28	24	30	30	24	6	19	18	33	23	18	9	11	-4	-11	7	-2	11	10	-5	-3	-1	14	15	26	22			13.3	
Lake Park.....	(Maximum.....	30	33	54	43	29	32	42	33	32	38	46	54	34	27	31	26	21	21	29	21	31	32	15	23	12	19	39	38	37	33			32.1
	(Minimum.....	-1	13	18	21	22	28	30	21	18	21	28	34	22	17	11	15	-1	5	7	2	10	10	3	0	-3	12	21	27	22			14.6	
Mason City.....	(Maximum.....	22	39	50	42	34	33	34	34	32	41	45	51	42	36	32	30	22	13	31	17	27	36	18	14	23	38	40	47	32			32.9	
	(Minimum.....	-1	10	14	30	23	28	31	26	24	24	25	31	30	25	17	19	4	-2	8	5	8	16	1	3	-2	13	19	27	20			16.4	
New Hampton.....	(Maximum.....	25	37	50	45	35	32	35	35	30	41	45	47	39	37	34	33	23	16	34	17	26	35	23	13	22	37	38	39	34			33.0	
	(Minimum.....	0	9	17	33	30	27	20	26	25	25	26	32	33	26	18	19	6	-1	6	5	9	19	1	-1	-5	10	17	24	22			16.5	
Northwood.....	(Maximum.....																																	
	(Minimum.....																																	
Pocahontas.....	(Maximum.....	30	44	58	45	33	32	32	32	35	45	47	56	43	28	34	27	28	15	32	23	31	36	16	17	27	40	39	40	34			34.4	
	(Minimum.....	5	15	16	32	27	29	31	28	26	27	28	33	28	21	12	11	0	-8	2	2	5	16	0	4	-1	11	21	30	25			16.4	
Postville.....	(Maximum.....	28	37	49	44	34	32	33	32	29	44	45	45	39	35	34	33	22	18	32	15	23	35	30	15	19	35	36	39	30			32.5	
	(Minimum.....	1	11	18	34	21	27	32	21	25	27	28	31	33	30	24	21	10	4	8	6	3	23	1	-3	-14	10	12	24	21			16.9	
Rock Rapids.....	(Maximum.....	32	36	50	44	32	32	34	34	36	40	43	44	36	29	31	29	25	11	29	20	33	33	15	14	25	37	37	40	36			32.3	
	(Minimum.....	2	9	16	25	23	30	30	23	23	25	20	31	25	20	12	14	0	-4	8	1	12	10	-3	0	2	9	10	26	23			14.6	
<i>Central Division</i>																																		
Belle Plaine.....	(Maximum.....	38	45	57	48	42	33	45	35	32	50	55	46	37	37	38	23	18	38	25	30	41	39	20	26	47	46	45	37			38.7		
	(Minimum.....	6	14	17	41	29	31	33	30	28	28	27	33	36	32	27	23	10	3	6	10	9	27	12	7	2	14	25	25	27			20.8	
Boone.....	(Maximum.....	36	47	61	52	42	33	36	35	36	45	50	60	48	39	36	32	22	15	37	30	32	40	28	19	28	43	44	44	37			35.2	
	(Minimum.....	5	13	11	33	30	31	33	31	30	23	24	34	34	27	10	13	10	-3	6	8	7	28	5	7	-6	9	18	22	28			18.0	
Carroll.....	(Maximum.....	30	47	61	49	48	43	33	32	36	44	47	58	47	30	32	29	23	14	35	22	32	38	22	16	28	42	41	43	37			36.5	
	(Minimum.....	4	20	22	37	28	29	30	28	26	25	28	31	28	23	12	12	3	-5	6	4	10	20	2	6	5	17	21	30	26			18.2	
Cedar Rapids.....	(Maximum.....	32	42	54	48	41	34	41	37	32	50	49	50	43	39	36	37	27	18	38	26	29	39	19	24	46	44	44	36			37.8		
	(Minimum.....	6	5	14	39	28	30	33	30	28	30	26	32	26	33	25	23	10	4	5	10	8	26	8	8	1	12	19	23	26			19.9	
Davenport.....	(Maximum.....	22	42	54	51	34	42	46	38	37	51	50	52	42	38	36	38	28	18	40	22	33	44	39	21	21	48	44	50	41			38.7	
	(Minimum.....	10	17	25	33	30	32	37	30	29	31	32	33	34	33	27	25	11	7	11	13	13	33	14	9	5	17	25	32	26			23.2	
Des Moines.....	(Maximum.....	32	47	60	51	39	36	39	36	36	51	51	62	43	35	37	32	27	15	39														

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE

THE WINTER OF 1927-1928

Stations	Barometric Pressure, Inches (Sea Level)				Relative Humidity, %				Wind					Sunshine			
	Mean	Highest	Date	Lowest	Date	Mean			Lowest	Date	Total movement	Average hourly velocity	Maximum		Date	% possible	Departure from normal
						7 A. M.	12 Noon	7 P. M.					Miles	From			
Chas. City	30.10	30.54	25	29.66	22	89	69	77	45	19	4,980	7.2	28	w.	19	61	+ 8
Davenport	30.10	30.55	25	29.56	14	81	69	74	38	3	5,218	7.5	26	nw.	19	52	0
Des Moines	30.09	30.54	25	29.57	7	80	62	67	32	2	4,792	6.9	20	sw.	3†	61	+ 5
Dubuque	30.09	30.58	25	29.58	14	80	61	74	36	3†	4,721	6.8	24	nw.	19	53	0
Keokuk	30.12	30.57	25	29.60	8	74	59	67	32	20	5,424	7.8	25	sw.	19	52	- 3
Sioux City	30.14	30.59	20	29.68	22	86	69	72	38	26	7,722	11.1	36	nw.	19	67	+10
Omaha, Neb.	30.13	30.56	20	29.63	22	78	64	68	32	12	6,107	8.8	31	nw.	23	62	+ 4
Means and extremes	30.11	.....	.....	.....	.....	82	64	71	.....	.....	8.0	.....	.....	.....	.....	58	+ 3
Normals and records	30.10	30.59	20	29.56	14	.....	.....	.....	32	2†	.....	.....	36	nw.	19	.....	.....
	30.10	.....	21st	.....	28th	84	.....	76	.....	22d	.....	.....	.....	.....	4th	55	.....
	.....	\$31.07	1918	*28.69	1902	.....	.....	.....	13	1880	.....	.....	\$69	nw.	1917	.....	.....

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

The mean temperature for the three winter months was 24.2°, which is 2.4° higher than the normal for the State and 0.5° lower than the mean of 1926-1927. The winter was similar to the two previous winters in that December has been consistently cold and January and February have been considerably warmer than normal. The highest temperature was 70° at Little Sioux on January 10th, and the lowest was -22° at Sanborn on December 8th.

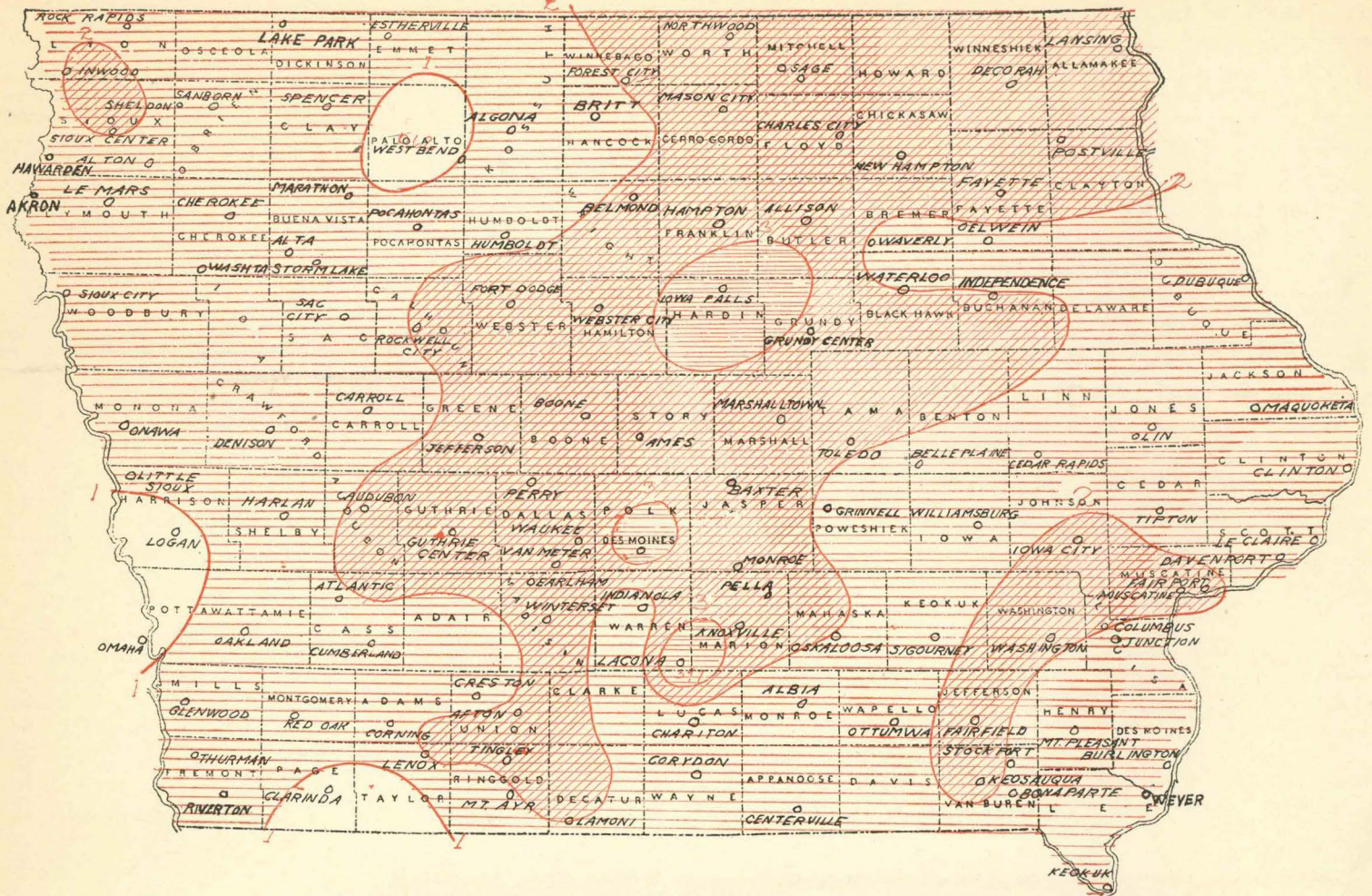
The average monthly precipitation for the State was 1.05 inches and the average total was 3.16 inches, or 0.25 inch less than the normal. December and January were below normal, December being only slightly below but January was the driest of record. The average snowfall was 9.7 inches or 10.0 inches less than normal.

The average number of days with 0.01 inch or more of precipitation was 15, or 2 more than the winter of 1926-1927. The average number of clear days was 43, partly cloudy 21, and cloudy 27, as compared with 37 clear days, 21 partly cloudy and 32 cloudy days during the winter of 1926-1927.

ERRATA

Report for January, 1928. Page 3. Earlham; lowest temperature reported -8 on the 1st, should be -9 on the 28th.

TOTAL PRECIPITATION, FEBRUARY, 1928

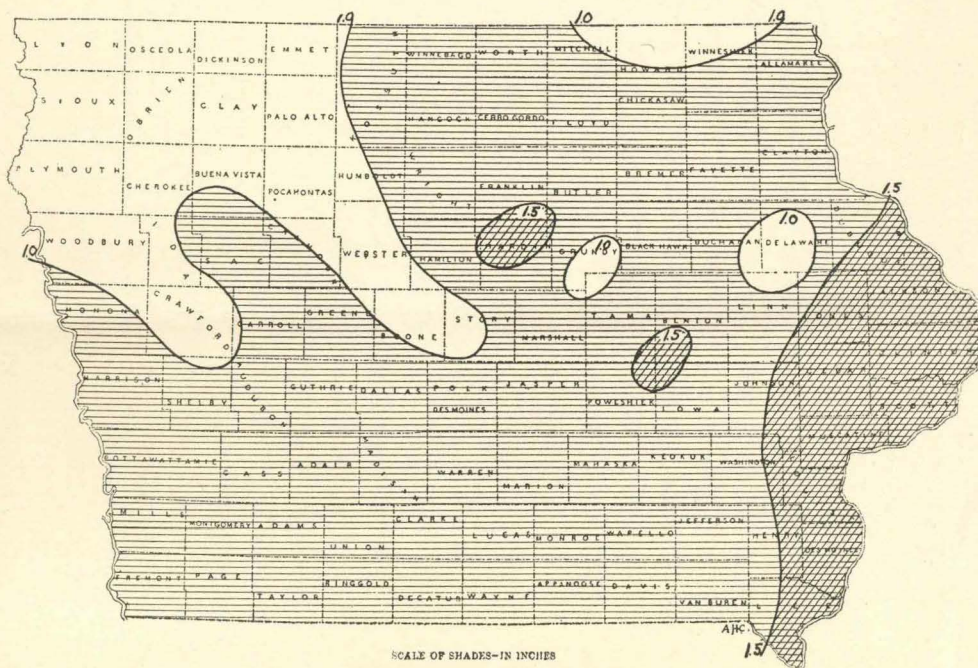


SCALE OF SHADES IN INCHES

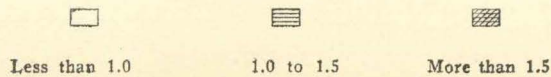


NORMAL PRECIPITATION, FEBRUARY

(Based on station records of 30 years or more)



SCALE OF SHADES-IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In co-operation with
IOWA WEATHER AND CROP BUREAU
CHARLES D. REED, Meteorologist

VOL. XXXIX DES MOINES, IOWA, MARCH, 1928 No. 3

GENERAL SUMMARY

The temperature during March, 1928, was much above normal, being similar in that respect to the two preceding months, but the excess was less than either. The month began with a mild period of three days followed by a decided change to cooler which lasted two days, but in this brief period, on the 5th, the lowest temperature for the month occurred throughout the State. The longest period of mild weather prevailed from the 6th to 14th, but the 23d was the warmest day during the next longest warm period 20th-25th. A number of stations in the northwest portion had the highest temperature of record but the record for the State was not equalled, though it has been 18 years since a higher maximum occurred in March.

The mild weather permitted much out door work. Plowing was possible early in the month over nearly all portions of the State and much seeding of oats was done and started very early. Freezing weather occurred almost daily and the alternate thawing injured winter wheat and grasses, in some localities, considerably. Vegetation made rapid advance; fruit buds had swelled prematurely; and in localities in the southern division trees were in full bloom and were badly injured by the freeze at the end of the month. The mild weather also induced market gardeners to make extensive plantings and the heavy precipitation at the end of the month caused some seed to rot in the ground and large plantings were up and in danger of being frozen.

Precipitation was deficient except in the northwestern and east-central districts, but it was ample for all needs in nearly all portions of the State. There were three principal periods. Very little occurred during the first week, but precipitation was general on the 8th, and until the 13th rainy weather prevailed but it was very light in most of the western half of the State; on the 26th precipitation was general and again on the 28th-29th rain or snow was general throughout the State. The snowfall was rather heavy over most of the northern division and the extreme eastern portion.

For the most part March was very pleasant. About the usual number of storms passed near the State, but except for the passage of two energetic storms along the eastern and southern edges during the last week, that were attended by disagreeable weather, the usual March characteristics were absent, and the wind movement was unusually light. A severe local hail storm occurred at Bedford on the 23d. The stones covered the ground and were about the size of walnuts and fell with such force

that automobile tops were punctured, but as light wind accompanied, no windows were broken. On the 24th a severe local wind storm occurred at Charles City and vicinity. Two plate glass windows were broken and a small milk house about 5 miles northeast was demolished, the total damage being about \$750. The blow occurred at 12:15 A. M., accompanied by one peal of thunder and by a roaring sound, suggesting the possibility of it being a small tornado.

Dirt roads were in poor condition following the periods of precipitation but during most of the month they were in very good condition. Stock were in good condition; the weather was favorable for young pigs and lambs and very little loss was sustained.

F. L. D.

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
1873	34.0	-0.6	72	-18	1.42	-0.34	3.70	0.33					
1874	31.7	-2.9	68	-4	1.43	-0.33	2.80	0.17					
1875	26.9	-7.7	80	-10	1.62	-0.14	3.80	0.45					
1876	27.2	-7.4	75	-6	3.24	+1.48	5.78	1.16					
1877	27.3	-7.3	72	-11	2.28	+0.52	6.54	0.20					
1878	45.6	+11.0	80	-20	3.36	+1.60	6.70	0.35					
1879	37.2	+2.6	80	-3	1.18	+0.58	4.50	0.20					
1880	33.6	+1.0	80	-21	1.26	+0.50	3.90	0.15					
1881	27.1	-7.5	56	0	1.91	+0.15	4.50	0.75					
1882	36.3	+1.7	78	4	1.82	+0.06	4.52	0.50					
1883	30.6	-4.0	72	-13	0.55	-1.21	1.40	0.00					
1884	32.0	-2.6	72	-16	2.57	+0.81	5.90	0.70					
1885	31.3	-3.3	65	-16	2.24	+1.52	1.25	0.00					
1886	30.6	-4.0	71	-9	1.72	-0.04	4.47	0.40					
1887	33.5	-1.1	76	-8	0.93	-0.83	3.50	0.00					
1888	26.4	-8.2	78	-12	3.04	+1.28	6.20	0.29					
1889	39.7	+5.1	80	8	0.47	-1.29	2.40	0.00					
1890	28.1	-6.5	75	-21	1.49	-0.27	3.67	0.32					
1891	26.8	-7.8	66	-19	2.60	+0.84	4.58	1.33					
1892	31.9	-2.7	84	-6	2.22	+0.46	4.58	0.57	3.9	6	11	8	12
1893	31.8	-2.8	84	-8	2.14	+0.38	4.40	0.64	4.0	8	9	11	11
1894	41.0	+6.4	84	-5	2.03	+0.27	4.52	0.26	2.7	6	13	10	8
1895	34.4	-0.2	94	-11	0.83	-0.93	2.60	0.22	2.9	4	16	8	7
1896	30.9	-3.7	81	-12	1.10	-0.66	3.99	0.16	5.4	5	12	9	10
1897	32.0	-2.6	72	-22	2.39	+0.63	6.16	0.29	5.5	8	9	8	14
1898	37.5	+2.9	72	-2	1.94	+0.18	6.21	0.33	3.7	6	12	9	10
1899	23.0	-11.6	75	-16	1.62	-0.14	5.90	0.37	8.0	6	7	12	12
1900	30.7	-3.9	81	-13	2.06	+0.30	5.15	0.45	6.6	5	12	9	10
1901	34.2	-0.4	76	-8	2.64	+0.88	5.25	0.70	12.6	7	10	8	13
1902	39.1	+4.5	79	-12	1.45	-0.31	4.33	0.13	1.3	7	9	11	11
1903	38.8	+4.2	82	6	1.88	-0.38	3.90	0.15	3.9	7	11	7	13
1904	34.8	-0.2	78	3	2.18	+0.42	4.57	0.50	4.4	7	8	8	15
1905	41.5	+6.9	84	1	2.04	+0.28	3.70	0.89	4.1	7	8	8	15
1906	27.1	-7.5	65	-14	2.34	+0.58	4.55	0.58	8.9	10	8	7	16
1907	40.6	+6.0	92	-7	1.35	-0.41	5.05	0.23	4.1	6	14	7	10
1908	37.9	+3.3	85	-8	1.58	-0.18	3.74	0.45	1.1	6	13	7	11
1909	32.5	-2.1	71	-15	1.53	-0.23	5.00	0.28	9.8	6	12	10	9
1910	48.9	+14.3	92	-10	0.17	-1.59	1.37	0.00	T.	1	23	6	2
1911	39.4	+4.8	83	2	0.93	-0.83	4.84	T.	1.9	5	16	9	6
1912	24.9	-9.7	70	-19	2.01	+0.25	5.25	0.60	19.1	7	15	6	10
1913	31.9	-2.7	78	-23	2.48	+0.72	5.88	0.74	5.3	9	11	10	16
1914	34.7	+0.1	78	-5	1.69	-0.07	3.84	0.28	1.8	7	12	8	11
1915	29.3	-5.3	61	-5	0.96	-0.80	2.12	0.17	8.8	5	8	9	14
1916	35.2	+0.6	80	-18	1.57	-0.19	5.80	0.23	2.9	6	11	9	11
1917	34.6	0.0	85	-12	1.84	-0.08	4.35	0.57	6.2	6	14	8	9
1918	42.9	+8.3	85	0	0.63	-1.13	2.12	0.03	2.6	3	19	7	5
1919	37.5	+2.9	78	-11	2.33	+0.57	5.40	0.81	1.1	6	15	8	8
1920	38.0	+3.4	80	-21	3.02	+1.26	5.70	0.47	2.4	7	15	7	9
1921	42.8	+8.2	86	4	1.57	-0.19	6.62	0.17	0.2	7	14	8	9
1922	38.3	+3.7	74	-5	1.97	+0.21	3.73	0.76	3.4	7	12	6	13
1923	29.4	-5.2	78	-22	2.87	+1.11	5.08	0.71	18.5	7	13	9	9
1924	31.9	-2.7	72	3	2.65	+0.89	4.76	1.26	10.5	8	8	15	8
1925	40.1	+5.5	82	-6	0.93	-0.83	2.34	0.10	2.9	4	17	9	5
1926	32.1	-2.5	78	-4	1.06	-0.70	2.62	0.20	8.1	6	12	9	10
1927	39.6	+5.0	75	0	1.92	+0.16	3.64	0.62	2.9	9	11	7	13
1928	38.9	+4.3	88	1	1.44	-0.32	2.75	0.36	3.0	5	15	8	8

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

Climatological Data for March, 1928

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>Northwest District</i>																				
Akron.....	Plymouth.....	1,153	2																	Orlan C. Moore D. E. Hadden W. S. Slagle J. E. Wirth A. O. Peterson Earl V. Slife A. C. Hanson P. M. Lawrence Henry Newell E. G. Smith F. E. Hronek Nellie F. Medberry J. W. Dow Ross E. Forward J. De Ruyter E. W. Little George H. Fracker H. L. Felter Jos. Dorweiler
Alta.....	Buena Vista.....	1,513	37	37.5	+ 4.5	85	23	10	5	45	1.53	+ 0.27	0.84	3.0	4	10	14	7	n.w.	
Alton.....	Sioux.....	1,305	23	36.2	+ 4.2	82	23	10	5	44	1.82	+ 0.27	1.00	3.5	4	13	10	8	n.	
Cherokee.....	Cherokee.....	1,196	8								1.27	+ 0.17	0.76	4.0	4	11	12	6	n.w.	
Estherville.....	Emmet.....	1,298	33	35.5	+ 3.9	83	23	9	5	45	1.35	+ 0.08	0.75	6.5	5	18	10	3	n.w.	
Hawarden.....	Sioux.....	1,181	2								1.60	+ 0.32	0.74	7.0	4	20	4	7	s.	
Inwood.....	Lyon.....	1,474	24	36.2	+ 3.5	85	23	11	5	46	1.49	+ 0.29	0.83	3.1	5	21	5	5	n.w.	
Lake Park (near).....	Dickinson.....	1,489	15	34.4	+ 3.0	82	23	1	5	48	1.45	+ 0.16	0.91	3.7	6	14	5	12	n.w.	
Le Mars.....	Plymouth.....	1,224	32	38.2	+ 4.9	85	23	12	5	44	1.43	+ 0.18	0.85	4.0	3	14	9	8	n.	
Marathon.....	Buena Vista.....	1,390	2								1.23		0.51	4.4	5	15	2	14	n.w.	
Pocahontas.....	Pocahontas.....	1,248	24	36.6	+ 4.3	85	23	9	5	45	1.68	+ 0.31	0.95	4.5	4	16	8	7	n.	
Rock Rapids.....	Lyon.....	1,349	29	35.5	+ 4.0	81	23	9	5	47	1.51	+ 0.19	0.85	3.7	6	22	5	4	n.w.	
Sankborn.....	O'Brien.....	1,553	14	35.4	+ 3.8	78	23	7	5	44	0.74	+ 0.66	0.62	4.0	2	14	6	11	n.e.	
Sheldon.....	O'Brien.....	1,418	17	36.4	+ 4.8	84	23	9	5	45	1.77	+ 0.47	0.99	5.4	4	11	14	6	n.w.	
Sioux Center.....	Sioux.....	1,426	29	35.8	+ 4.3	85	23	8	5	47	1.80	+ 0.54	0.90	7.0	3	16	0	15	w.	
Spencer.....	Clay.....	1,319	14	36.4	+ 4.0	87	23	8	5	46	1.55	+ 0.23	1.05	8.5	5	14	7	10	n.w.	
Storm Lake.....	Buena Vista.....	1,440	39	38.2	+ 5.6	83	23	11	5	43	1.48	+ 0.18	0.87	3.0	4	14	10	7	se.	
Washta.....	Cherokee.....	1,157	30	37.7	+ 4.4	83	23	8	5	50	1.54	+ 0.53	1.00	3.0	3	18	5	8	n.w.	
West Bend.....	Palo Alto.....	1,197	35	35.7	+ 3.7	84	23	8	5	43	0.39	+ 1.17	0.20	2.5	3	14	9	8	n.	
Means and extremes				36.4	+ 4.2	87	23	1	5	50	1.41	+ 0.11	1.05	4.5	4	15	8	8	n.w.	
<i>North Central District</i>																				
Algona.....	Kossuth.....	1,213	55	36.6	+ 5.1	81	23	8	5	39	1.57	+ 0.15	0.78		4	19	8	4	n.w.	W. E. Laird J. A. Bell H. F. Luick James S. Ross U. S. Weather Bureau Dr. M. B. Neil L. H. Davis H. C. Snitkey American Beet Sugar Co. Charles Dwelle Dr. C. E. Juhl
Allison (near).....	Butler.....	1,044	14	35.4	+ 3.3	79	23	5	5	39	1.31	+ 0.32	0.78	3.5	5	16	6	9	n.w.	
Belmond.....	Wright.....	1,181	18	35.7	+ 4.4	81	23	6	5	44	1.16	+ 0.17	0.61	4.5	3	9	7	15	n.w.	
Britt.....	Hancock.....	1,236	41																	
Charles City.....	Floyd.....	1,015	37	35.0	+ 4.3	78	23	7	5	40	1.34	+ 0.43	0.87	7.2	6	15	7	9	n.w.	
Forest City.....	Winnebago.....	1,226	34	35.2	+ 3.4	84	23	4	5	47	1.52	+ 0.09	0.85	7.0	4	14	7	10	n.w.	
Hampton.....	Franklin.....	1,145	3								1.21	+ 0.51	0.98	2.0	4					
Humboldt.....	Humboldt.....	1,095	40	36.2	+ 3.0	85	23	7	5	49	0.92	+ 0.52	0.46	5.0	3	10	12	9	s.	
Mason City.....	Cerro Gordo.....	1,148	31	34.0	+ 3.1	80	23	4	5	47	0.91	+ 0.46	0.64	7.5	4	11	15	5	n.w.	
Northwood.....	Worth.....	1,222	32	34.4	+ 5.2	78	23	6	5	42	1.05	+ 0.80	0.40	7.0	5	11	11	9	n.w.	
Osage.....	Mitchell.....	1,163	34	34.9	+ 5.0	79	23	6	5	40	0.68	+ 0.91	0.30	7.0	3	14	11	6	n.w.	
Means and extremes				35.3	+ 4.2	85	23	4	5	49	1.17	+ 0.36	0.98	5.6	4	13	9	9	n.w.	
<i>Northeast District</i>																				
Decorah.....	Winneshiek.....	872	35	34.4	+ 3.1	76	23	6	5	44	0.95	+ 0.85	0.50	4.5	4	13	6	12	n.w.	M. D. Whitney U. S. Weather Bureau R. Z. Latimer Dr. Geo. Boody Mrs. Mary Spinner D. W. Dawson John T. Ridler F. L. Williams R. B. Slippy D. H. Murphy
Dubuque.....	Dubuque.....	700	55	37.4	+ 3.4	80	23	10	5	40	2.14	+ 0.11	0.65	3.7	7	12	8	11	n.w.	
Fayette.....	Fayette.....	1,003	40																	
Independence.....	Buchanan.....	921	64	37.6	+ 3.5	81	23	8	5	48	1.62	+ 0.10	0.68	0.2	5	17	3	11	n.w.	
Lansing.....	Allamakee.....	632	21								1.18	+ 0.86	0.46	5.0	5					
New Hampton.....	Chickasaw.....	1,169	31																	
Oelwein.....	Fayette.....	1,036	5	36.2	+ 3.2	80	23	8	5	39	1.66	+ 0.16	1.20	2.0	3	12	10	9	n.w.	
Postville.....	Clayton.....	1,192	29	33.6	+ 3.0	76	23	6	5	39	1.22	+ 0.70	0.59	5.5	6	14	10	7	sw.	
Waterloo.....	Black Hawk.....	854	45	37.4	+ 3.0	83	23	7	5	44	1.58	+ 0.09	0.66	1.2	6	17	5	9	n.w.	
Waverly.....	Bremer.....	936	32	36.1	+ 3.2	80	23	7	5	43	0.69	+ 1.09	0.37	1.2	3	22	3	6	n.w.	
Means and extremes				36.1	+ 3.6	83	23	6	5	48	1.38	+ 0.50	1.20	2.9	5	15	7	9	n.w.	
<i>West Central District</i>																				
Audubon (near).....	Audubon.....	1,297	33	39.4	+ 5.6	84	23	11	5	45	1.07	+ 0.38	0.68	0.4	4	14	12	5	n.w.	George Kibby Mrs. Jos. J. Wolfe V. L. Byers H. A. Stafford Walter Bell W. I. Lyon H. W. Kerr Amy Ann Stern Mrs. H. E. Colby A. W. McIsaac F. P. Kessler U. S. Weather Bureau
Carroll.....	Carroll.....	1,265	38	39.3	+ 3.3	84	23	11	5	44	0.57	+ 1.12	0.44	0.5	3	19	5	7	n.w.	
Denison.....	Crawford.....	1,171	34	40.0	+ 5.0	85	23	12	5	47	0.83	+ 0.70	0.45	1.0	4	14	10	7	n.w.	
Guthrie Center.....	Guthrie.....	1,077	33	40.6	+ 5.4	85	25	11	5	44	1.22	+ 0.28	0.70		3	20	4	7	w.	
Harlan.....	Shelby.....	1,192	29	39.6	+ 4.3	85	23	11	5	52	0.62	+ 0.71	0.35	T.	2	17	6	8	n.w.	
Jefferson.....	Greene.....	1,052	29	38.6	+ 2.8	86	23	9	5	49	1.07	+ 0.39	0.73	T.	3	14	8	9	n.w.	
Little Sioux.....	Harrison.....	1,040	23	41.4	+ 5.3	88	23	12	5	51	0.93	+ 0.39	0.63	T.	4	12	14	5	n.w.	
Logan.....	Harrison.....	1,120	61	41.6	+ 4.4	88	23	12	5	53	0.78	+ 0.88	0.40		4	19	8	4	n.w.	
Onawa.....	Monona.....	1,051	27																	
Rockwell City.....	Calhoun.....	1,232	32	38.2	+ 4.4	84	23	10	5	44	1.11	+ 0.50	0.63	4.0	3				n.w.	
Sac City.....	Sac.....	1,269	52	38.0	+ 4.9	84	23	11	5	43	1.07	+ 0.36	0.75	1.5	3				n.	
Sioux City.....	Woodbury.....	1,135	39	40.0	+ 7.3	85	23	18	5	42	1.17	+ 0.91	0.77	2.0	5	11	7	13	n.w.	
Means and extremes				39.7	+ 4.8	88	23	9	5	53	0.95	+ 0.53	0.77	0.9	4	16	8	7	n.w.	
<i>Central District</i>																				
Ames.....	Story.....	926	51	40.4	+ 5.4	84	23	11	5	46	0.53	+ 0.89	0.16	0.1	3	17	4	10	n.w.	Iowa State College Otto Sanderman C. F. Henning U. S. Weather Bureau Samuel Sampson R. E. Bates M. G. Heiberger C. H. Gilbert C. C. Pigman J. A. Dibel Eugene N. Hastie H. P. Giger Calvin K. Smith Samuel F. Foft Frank A. Bonebright
Baxter.....	Jasper.....	998	28	39.1	+ 4.1	86	23	5	5	47	1.31	+ 0.50	0.49	1.5	5	7	16	8	n.w.	
Boone (near).....	Boone.....	1,134	23	38.3	+ 2.3	84	23	8	5	53	1.13	+ 0.31	0.68	T.	2	15	8	8	n.	
Des Moines.....	Polk.....	861	50	40.8	+ 4.9	84	23	14	5	42	1.71	+ 0.07	0.64	1.4	5	11	11	9	n.	
Fort Dodge.....	Webster.....	1,114	28	37.5	+ 3.2	85	23	6	5	49	1.11	+ 0.49	0.70	2.0	3	17	4	10	ne.	
Grinnell.....	Poweshiek.....	1,031	34	39.4	+ 4.1	83	23	8	5	40	1.76	+ 0.07	0.50	3.5	5	18	6	7	n.w.	
Grundy Center.....	Grundy.....	976	37	37.6	+ 2.9	83	23	7	5	41	2.05	+ 0.25	0.80	3.0	4	16	3	12	n.w.	
Iowa Falls.....	Hardin.....	1,127	35	37.2	+ 3.1	81	23	7	5	40	1.55	+ 0.32	0.85	4.0	4	18	6	7	n.w.	
Marshalltown.....	Marshall.....	947	36	38.5	+ 2.9	83	23	10	5	39	1.79	+ 0.07	0.62	1.0	6	13	9	9	n.w.	
Monroe.....	Jasper.....	922	16	40.6	+ 4.6	83	23	10	5	43										

Climatological Data for March, 1928—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>East Central District</i>																				
Belle Plaine.....	Benton.....	866	38	38.6	+ 3.7	83	23	7	5	43	2.51	+ 0.23	0.78	2.9	8	14	9	8	nw.	O. C. Burrows
Cedar Rapids.....	Linn.....	737	46	38.0	+ 3.3	81	23	8	5	47	2.38	+ 0.08	0.80	2.5	6	13	3	15	nw.	J. T. Wurster
Clinton.....	Clinton.....	595	55	38.6	+ 2.8	83	23	10	5	45	2.63	- 0.19	0.68	5.5	7	15	5	11	n.	Dr. A. P. Bryant
Davenport.....	Scott.....	580	57	40.0	+ 3.9	81	23	12	5	37	2.61	+ 0.30	0.68	5.2	7	13	8	10	nw.	U. S. Weather Bureau
Davenport, No. 2.....	Scott.....	690	3	40.3		83	23	11	5	42	2.75		0.64	11.1	8					Rex Shriver
Fairport.....	Muscatine.....	567	7	40.1	+ 3.1	80	23	9	5	38	2.44	- 0.02	0.67		7	15	5	11	nw.	Bureau of Fisheries
Iowa City.....	Johnson.....	733	68	39.4	+ 3.8	83	23	10	5	40	2.44	+ 0.04	0.77	T.	7	14	7	10	nw.	Prof. J. F. Reilly
Le Claire.....	Scott.....	576	28								2.58	+ 0.22	0.59	8.5	7					Margaret T. Disney
Maquoketa.....	Jackson.....	692	23								2.52	- 0.08	0.75	2.5	7					John Strothoff
Muscatine.....	Muscatine.....	516	67																	William Molis
Olin.....	Jones.....	766	29	38.2	+ 3.7	80	23	8	5	44	2.39	+ 0.13	1.05	1.0	6	16	5	10	nw.	Mrs. L. Stingley
Tipton (near).....	Cedar.....	807	29	39.0	+ 3.5	80	23	15	3	44	2.22	- 0.37	0.58	4.0	7	8	12	11	nw.	John Kroepfen
Williamsburg.....	Iowa.....	770	12	38.4	+ 1.0	81	23	8	5	43	2.06	- 0.05	0.61	1.3	5	19	5	7	nw.	Dr. F. C. Schadt
Means and extremes				39.1	+ 3.9	83	23	7	5	47	2.46	+ 0.06	1.05	4.0	7	14	7	10	nw.	
<i>Southwest District</i>																				
Atlantic.....	Cass.....	1,164	37	40.8	+ 4.8	84	23	13	5	52	0.94	- 0.65	0.33	3.0	5	10	9	12	nw.	T. H. Whitney
Bedford.....	Taylor.....										1.58	- 0.24	0.84	2.0	5	18	7	6	nw.	Arthur L. Bishop
Clarinda.....	Page.....	1,009	38	43.8	+ 5.7	87	23	10	5	54	0.94	- 0.78	0.30	1.7	6	16	12	3	ne.	Dr. H. C. Hawley
Corning.....	Adams.....	1,150	36			83	23	10	5		1.12	- 0.78	0.40	2.0	6	25	0	6	sw.	C. A. Smith
Cumberland (near).....	Cass.....	1,225	29								0.67	- 0.87	0.32	1.0	3	17	7	7	nw.	Carl E. Pollock
Glenwood.....	Mills.....	1,100	30	43.3	+ 5.4	86	23	12	5	52	0.58	- 0.76	0.34	T.	2	15	8	8	nw.	George Mogridge
Lenox.....	Taylor.....	1,250	33	41.9	+ 5.3	85	23	10	5	49	0.92	- 0.62	0.35	1.0	6	12	13	6	nw.	J. L. Hurley
Oakland.....	Pottawattamie.....	1,105	9	40.6a	+ 4.4	87a	25	13a	5	53a	0.36	- 1.11	0.32	T.	2	17	5	9	sw.	W. S. Matthews
Red Oak (near).....	Montgomery.....	1,030	3								0.45	- 1.15	0.17	2.5	3	13	13	5	nw.	B. R. Bridge
Riverton (near).....	Fremont.....	920	2								0.69	- 0.91	0.33	1.5	4	10	6	15	nw.	Geo. C. Rader
Thurman.....	Fremont.....	960	31	43.8	+ 5.8	87	23	14	5	53	0.49	- 0.99	0.27	T.	2	17	6	8	n.	H. H. Askew
Omaha, Neb.....		1,105	57	43.2	+ 6.2	84	23	18	5	45	0.47	- 0.90	0.22	0.3	4	12	9	10	nw.	U. S. Weather Bureau
Means and extremes				42.5	+ 5.5	87	23†	10	5	51	0.77	- 0.81	0.84	1.2	4	15	8	8	nw.	
<i>South Central District</i>																				
Afton.....	Union.....	1,212	34	41.8	+ 5.3	84	23	10	5	45	1.62	- 0.27	0.39	3.5	7	16	9	6	nw.	S. R. Brown
Albia.....	Monroe.....	949	30	41.4	+ 5.2	84	23	11	5	39	1.41	- 0.55	0.38	3.3	8	15	5	11	nw.	O. E. McBride
Appentown.....	Appanoose.....	1,013	23	42.8	+ 4.9	81	23	11	5	39	1.13	- 0.80	0.50	1.1	8	13	9	9	sw.	Thomas Wood
Chariton (near).....	Lucas.....	1,042	33	41.4	+ 5.4	82	23	11	5	41	1.59	- 0.15	0.48	1.0	6	11	13	7	sw.	C. C. Burr
Corydon.....	Wayne.....	1,101	35			83	23				2.06	+ 0.05	0.56	1.5	6	13	11	7	sw.	J. C. Davis
Creston.....	Union.....	1,291	23	40.7	+ 5.1	85	23	9	5	48	0.86	- 0.60	0.26	1.1	6	9	13	9	nw.	Mrs. N. Spangler
Earlham (near).....	Madison.....	1,126	26	39.6	+ 4.6	81	23	9	5	50	1.46	- 0.25	0.56	3.0	5	21	3	7	nw.	George Phillips
Indianola.....	Warren.....	972	37	41.3	+ 5.0	85	23	11	5	46	1.14	- 0.49	0.35	2.8	4	13	13	5	se.	Seth F. Shenton
Knoxville.....	Marion.....	920	33	41.1	+ 4.5	84	23	11	5	44	2.42	+ 0.62	0.78	4.0	6	15	9	7	nw.	W. J. Casey
Lacona.....	Warren.....	824	29								2.08	- 0.22	0.60	6.0	10	13	10	8		J. B. Alter
Lamoni.....	Decatur.....	1,123	21	41.8	+ 4.9	83	23	11	5	41	1.31	- 0.56	0.36	2.0	8	20	4	7	nw.	F. S. Parks
Mount Ayr.....	Ringgold.....	1,245	35	42.4	+ 5.1	83	23	8	5	41	1.50	- 0.40	0.40	3.5	8	13	11	7	nw.	Alex Maxwell
Pella (near).....	Marion.....	850	1								2.34	+ 0.86	0.88	3.2	7	16	8	7	nw.	L. L. Langerak
Tingley.....	Ringgold.....	1,275	3	40.8	+ 4.5	83	23	9	5	46	2.05	+ 0.25	0.71	4.0	7	16	9	6	sw.	James A. Verploegh
Winterset.....	Madison.....	1,118	37	41.1	+ 5.2	85	23	10	5	42	1.46	- 0.29	0.48	4.0	5	19	5	7	nw.	H. S. Ely
Means and extremes				41.4	+ 5.0	85	23	8	5	50	1.63	- 0.19	0.88	2.9	7	15	9	7	nw.	
<i>Southeast District</i>																				
Bonaparte (near).....	Van Buren.....	563	37	40.5	+ 3.1	80	23	12	5	39	0.83	- 1.42	0.36	0.9	5	22	1	8	n.	B. R. Vale
Burlington.....	Des Moines.....	544	32	41.9	+ 3.0	82	23	14	5	37	2.10	- 0.41	0.74	6.5	7	17	7	7	ne.	John T. Donnelly
Columbus Junction.....	Louisa.....	595	27	40.2	+ 3.2	82	23	12	5	41	1.77	- 0.27	0.68	2.5	8	13	11	7	nw.	Miss Musa Todd
Fairfield.....	Jefferson.....	780	44	40.0	+ 3.3	83	23	9	5	44	1.78	- 0.55	0.53	2.0	7	15	6	10	nw.	R. M. McKenzie
Keokuk.....	Lee.....	614	57	42.6	+ 3.7	81	23	15	5	35	1.39	- 0.99	0.52	3.1	7	11	8	12	nw.	U. S. Weather Bureau
Keosauqua.....	Van Buren.....	614	36	42.0	+ 4.1	83	23	12	5	56	1.09	- 1.18	0.60	2.5	5	13	10	8	ne.	J. H. Landes
Mt. Pleasant.....	Henry.....	730	47	41.6	+ 4.0	83	23	12	5	39	1.33	- 0.87	0.66	2.0	7	8	15	3	nw.	J. H. Jericho
Oskaloosa.....	Mahaska.....	835	52	40.4	+ 4.6	82	23	10	5	42	2.18	+ 0.27	0.57	7.9	8	14	8	9	nw.	Roy R. Robinson
Ottumwa.....	Wapello.....	649	33	42.5	+ 3.7	80	23†	12	5	41	2.37	+ 0.10	0.95	0.8	8	19	6	6	nw.	C. L. Mikesh
Sigourney (near).....	Keokuk.....	790	32	40.7	+ 4.6	83	23	10	5	41	2.43	+ 0.42	0.71	2.2	8	16	6	9	nw.	W. E. Utterback
Stockport.....	Van Buren.....	747	26	41.1	+ 4.7	82	23	12	5	40	1.21	- 0.96	0.49	2.5	7	17	6	8	s.	C. L. Sherwick
Washington.....	Washington.....	737	46	41.2	+ 4.7	85	23	10	5	42	2.19	0.0	0.65	4.5	7	11	10	10	sw.	D. D. Sherman
Means and extreme State means and extremes				41.2	+ 3.9	85	23	9	5	56	1.72	- 0.47	0.95	3.1	7	15	8	8	nw.	
				38.9	+ 4.3	88	23	1	5	56	1.44	- 0.32	1.20	3.0	5	15	8	8	nw.	

Temperature normals are based on the 46-year period July 3, 1875 to July 2, 1921; shorter records corrected to harmonize. Precipitation normals are based on the 50-year period ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1920 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.

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.

Daily Precipitation for March, 1928—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>Southwest District</i>																																		
Atlantic	Nishnabotna								.30		.01		T.														.33	.05		.25				0.94
Bedford	Nodaway								.30		T.			.10							T.					.84	.14		.20				1.58	
Clarinda	Nodaway								.30			.14		.06							.01						.26			.17			0.94	
Corning	Nodaway								.40		.20		.06														.25			.16	.05		1.12	
Cumberland (nr.)	Nodaway								.32		T.		T.							T.						.25			.10			0.67		
Glenwood	Missouri								.34																		.24			T.			0.58	
Lenox	Missouri								T.			.15	.05	.05							T.					T.	.22	T.		.10			0.92	
Oakland	Nishnabotna								.32																					.04			0.36	
Red Oak (near)	Nishnabotna								.14																		.14			.17			0.45	
Riverton (near)	Nishnabotna								.33		.05		T.							T.							.15			.16			0.69	
Thurman	Missouri								.27												T.						.22			T.			0.49	
Omaha, Neb., **	Missouri								.22				T.							T.	T.					.02	.20	T.	T.	.03			0.47	
<i>South Central District</i>																																		
Afton	Grand								.39			.30	.15	.23													.05	.32		.18			1.62	
Albia	Des Moines								T.		.38		.14	.16							T.						.08	.33	.02	.28	.02		1.41	
Centerville	Chariton	T.							.27		.05	.01	.20														.27	.23		.03	.07		1.13	
Chariton (near)	Chariton								.19	T.		.25	.28													.48	.27		.12			1.50		
Corydon	Chariton								.37			.34	.39													.56	.20		.20			2.06		
Creston	Missouri								.26			.11	.14													.05	T.	.19		.11			0.86	
Earlham (near)	Des Moines								.56			T.	.04	T.	.16												.40			.30			1.46	
Indianola	Des Moines								.28				.21															.35		.30	T.		1.14	
Knoxville	Des Moines								.33			.30		.78	.20												.18	.43		.40			2.42	
Lacona	Des Moines						.01		.12			.40	.38	.20												.02	.08	.27	.50	.10			2.08	
Lamoni	Grand								.36			.16	.25	.01												.15	.06	.16		.16			1.31	
Mount Ayr	Grand								.26			.10	.10	.19							T.					.14	.07	.24	T.	.40	T.		1.50	
Pella (near)	Skunk								.43			.25	.45	.43												.17	.31		.30			2.34		
Tingley	Platte								.23			.17	.04	.13												.71	.24	T.	.52			2.04		
Winterset	Des Moines								.25			.25	.08														.48		.40				1.46	
<i>Southeast District</i>																																		
Bonaparte (near)	Des Moines	T.			T.				.36			.24															T.	.14		.06	.03		0.83	
Burlington	Mississippi								.72			.13		.25													.02	.24		.06	.68		2.10	
Columbus Jct.	Iowa						.05		.65	.03		.32		.07													.44		.06	.15			1.77	
Fairfield	Skunk								.53	T.		.13	.08	.22														.37		.40	.05		1.78	
Keokuk**	Mississippi								.46			.20	T.													.47	.05	.02	.13	.06			1.39	
Keosauqua	Des Moines								.60			.05															.13	.11		.20	T.		1.09	
Mt. Pleasant	Skunk								.62	.04		.19		.12													T.	.21		.06	.09		1.33	
Oskaloosa	Des Moines	T.							.55	.02		.15	.42														T.	.08	.42		.46	.08	2.18	
Ottumwa	Des Moines		T.						.57	.01		.21		.33													.03	.27	T.	.20	.75		2.37	
Sigourney (near)	Skunk		T.						.52	.04		.23		.74													.14	.54		.10	.12		2.43	
Stockport	Skunk								.49			.15		.08													.02	.17		.25	.05		1.21	
Washington	Skunk	T.							.62	.03		.28		.56													.02	.48		T.	.20		2.19	

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.

T. Precipitation is less than .01 inch rain or melted snow.

TEMPERATURE

The mean temperature for the State, derived from the means of nine districts of nearly equal area and based on the records of 96 stations, was 38.9°, or 4.3° higher than the normal. The greatest departure occurred in the southwestern district and the least in the northeastern district. Dividing the State into three divisions from west to east the departure diminished uniformly there being an excess of 4.8° in the western portion, 4.3° in the central portion, and 3.8° in the eastern portion. The greatest excess at any station was 7.3° at Sioux City, and the least was 2.3° at Boone. The highest mean was 43.8° at Clarinda and Thurman, and the least was 33.6° at Postville. The average range for the State was 87°, ranging from 88° at Little Sioux and Logan on the 23d, to 1° above at Lake Park on the 5th. The average number of days with the minimum temperature 32°, or lower, was 25; zero, or lower, none and maximum with 32°, or lower, was 1.

PRECIPITATION

The average precipitation for the State, derived from the averages of nine districts of nearly equal area and from the records of 112 stations, was 1.44 inches, or 0.32 inch less than the normal. The east central district had the greatest average, 2.46 inches, and the southwestern district had the least, 0.77 inch. Two districts, the northwestern and east-central, reported a slight excess and all other districts were deficient. All stations in the southwestern district were below normal and all except a single station in the west-central. The greatest amount reported from a station was 2.75 inches at Davenport, No. 2, and the least was 0.36 inch at Oakland. The greatest amount falling in 24 consecutive hours was 1.20 inches at Oelwein on the 13th. The average number of days

with 0.01 inch or more of precipitation was greatest in the south-central, southeastern and east-central districts, with 7, and the least was 4 in four districts. The number of rainy days ranged from 2, at seven stations, to 10 at one station.

SNOWFALL

The average snowfall for the State was 3.0 inches, or 2.4 inches less than the normal. The greatest amount, 11.1 inches occurred at Davenport, No. 2; a trace occurred at 8 stations. The snowfall occurred in two principal storms; over most of the northern portion the heaviest snow occurred on the 8th-9th and over the rest of the State the heaviest fall was on the 28th-29th. As a rule the snow was moist and over most of the State it drifted very little and remained on the ground for very short periods.

RIVERS

There was considerable ice movement on the Mississippi River during February but no general breakup. Ice began to move on March 4th but no general movement began till the 10th and floating ice continued till the end of the third week, when navigation opened. Falling stages prevailed on the Mississippi till the middle of the second week when there was a marked rise, lasting several days. Mostly falling stages prevailed till about the 25th when another rise occurred lasting till the close of the month. On the Missouri River nearly stationary stages prevailed most of the month but a sharp rise occurred at the beginning of the 2d week and another on the 26th. There were no high stages on the interior rivers but moderate rises followed each principal precipitation period. The ice on the Raccoon River went out on the 6th, but it remained intact on the Cedar River at Charles City till the 21st.

Daily Maximum and Minimum Temperature for the Month of March, 1928

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	
<i>Northern Division</i>																																	
Algona.....	(Maximum.....	33	40	45	46	27	50	41	37	33	44	57	55	44	39	39	37	42	40	40	51	73	67	81	74	66	52	39	35	39	43	57	47.3
	(Minimum.....	19	25	18	15	8	26	21	32	20	24	30	40	29	24	22	20	20	24	23	22	34	38	43	41	41	26	20	27	25	20	27	25.9
Alta.....	(Maximum.....	32	42	49	36	33	54	47	36	37	50	61	52	37	43	35	40	44	42	35	56	79	77	85	75	66	48	38	30	38	42	61	48.4
	(Minimum.....	19	23	23	14	10	26	24	31	23	27	31	31	28	24	22	19	22	27	22	28	34	42	48	43	42	25	19	25	21	26	26.6	
Alton.....	(Maximum.....	32	41	48	37	28	50	43	38	34	47	55	51	39	40	33	35	43	40	37	53	74	66	82	66	63	50	37	37	40	57	46.2	
	(Minimum.....	20	25	22	15	10	20	25	32	25	30	25	35	29	25	22	20	24	29	25	25	30	33	42	41	37	28	20	28	25	23	25	26.3
Belmond.....	(Maximum.....	32	37	45	37	27	51	42	35	32	43	57	57	44	38	35	38	40	41	36	50	74	69	81	70	70	48	37	34	36	40	58	46.3
	(Minimum.....	20	26	11	14	6	26	23	31	22	23	29	35	29	26	23	20	19	24	23	23	30	36	44	40	34	26	19	26	25	20	26	25.1
Charles City.....	(Maximum.....	32	33	42	36	28	45	39	35	30	38	52	59	34	36	35	37	39	40	37	49	69	67	78	69	71	46	36	34	38	42	57	44.7
	(Minimum.....	20	20	14	11	7	27	26	28	21	21	28	32	29	26	24	22	20	23	25	26	29	36	41	42	37	24	21	26	21	27	25.3	
Decorah.....	(Maximum.....	32	33	42	36	28	45	38	32	30	40	42	46	42	35	36	38	41	40	41	45	64	64	76	71	75	55	36	34	40	42	55	41.3
	(Minimum.....	25	25	10	13	6	22	23	26	20	16	30	32	30	28	21	21	18	19	25	24	24	36	32	45	31	26	19	24	26	26	32	24.1
Dubuque.....	(Maximum.....	35	39	40	37	30	39	44	39	33	43	49	64	41	39	37	37	38	40	43	44	63	67	80	72	76	54	36	35	33	41	56	45.9
	(Minimum.....	20	24	16	14	10	27	29	32	28	28	37	41	33	31	26	26	24	25	28	31	28	41	40	55	43	23	20	28	27	30	29	28.8
Forest City.....	(Maximum.....	34	33	44	43	26	48	45	35	33	39	54	56	45	38	35	37	42	40	37	58	75	70	84	70	67	57	40	37	37	45	60	47.2
	(Minimum.....	16	23	12	13	4	22	20	28	19	21	28	35	25	22	20	17	18	22	20	20	28	38	40	40	39	24	17	25	21	20	23	23.2
Independence.....	(Maximum.....	34	38	43	42	29	42	43	43	34	41	51	60	57	40	38	39	38	39	41	56	62	67	81	71	77	75	38	36	34	42	58	48.1
	(Minimum.....	21	25	15	21	8	23	28	31	22	25	34	35	30	28	25	24	22	24	25	30	27	37	40	45	38	27	24	28	25	25	26	27.0
Inwood.....	(Maximum.....	33	42	46	37	27	49	42	36	33	49	57	53	38	42	33	37	41	47	38	59	78	72	85	66	67	42	33	33	39	42	59	46.9
	(Minimum.....	19	24	23	13	11	19	24	32	15	28	30	36	28	22	19	17	25	30	28	25	32	32	42	37	42	27	16	26	23	19	26	25.5
Lake Park.....	(Maximum.....	31	36	46	37	22	48	37	36	36	40	54	53	36	37	32	35	43	38	36	54	73	64	82	64	60	48	47	37	36	43	55	45.0
	(Minimum.....	17	22	19	10	1	17	19	29	19	23	30	30	24	22	20	19	23	24	21	26	32	33	34	39	40	27	17	25	22	23	27	23.7
Mason City.....	(Maximum.....	32	33	43	38	28	41	40	35	31	38	53	59	42	37	36	37	41	40	38	50	71	68	80	70	69	50	38	33	38	42	56	45.4
	(Minimum.....	18	24	10	12	4	21	22	28	19	19	26	33	27	23	20	18	15	20	21	21	24	35	38	38	31	25	12	25	23	21	25	22.5
New Hampton.....	(Maximum.....	32	34	42	36	28	45	42	32	30	40	49	54	36	35	36	36	38	38	40	58	70	63	78	66	68	49	37	37	40	41	51	44.6
	(Minimum.....	18	22	12	12	6	20	23	29	22	23	29	36	27	23	20	18	19	22	23	23	28	37	39	40	37	24	18	28	23	22	23	24.1
Pocahontas.....	(Maximum.....	33	40	47	37	30	53	41	35	34	49	59	54	41	39	34	37	41	40	37	54	76	70	85	70	68	53	38	33	38	41	60	47.3
	(Minimum.....	18	25	24	10	9	27	25	31	21	24	30	39	29	25	23	20	20	27	24	25	31	38	40	41	38	25	18	27	23	19	26	25.9
Postville.....	(Maximum.....	32	35	39	35	28	37	36	31	31	36	42	54	36	35	34	35	36	37	41	42	63	61	76	70	74	51	35	32	32	39	53	42.5
	(Minimum.....	16	21	11	12	6	22	24	28	25	15	34	36	29	24	22	21	20	21	23	25	28	38	37	48	39	26	17	25	25	24	25	24.8
Rock Rapids.....	(Maximum.....	33	39	45	40	26	48	45	37	36	48	55	51	40	39	33	36	41	46	36	56	75	69	81	70	63	51	36	34	40	44	58	46.6
	(Minimum.....	18	23	20	11	9	18	23	22	21	30	25	37	28	23	19	17	22	28	28	25	28	30	38	38	35	25	17	27	23	22	25	24.1
<i>Central Division</i>																																	
Belle Plaine.....	(Maximum.....	37	46	47	39	31	46	48	39	37	48	60	61	51	43	36	41	41	41	44	48	70	72	83	75	82	69	42	36	32	42	60	50.0
	(Minimum.....	20	26	23	19	7	28	22	35	29	27	37	37	31	26	24	23	21	24	20	28	27	34	45	49	39	30	17	29	17	22	24	27.1
Boone.....	(Maximum.....	35	48	49	40	32	57	51	39	38	52	63	59	51	45	36	41	43	39	53	77	73	84	73	82	58	39	40	34	45	62	51.0	
	(Minimum.....	24	27	18	19	8	30	25	35	29	27	29	33	32	23	20	22	17	21	19	24	30	37	42	33	30	18	30	28	25	21	25.6	
Carroll.....	(Maximum.....	35	48	49	43	31	55	50	42	38	55	63	57	46	44	38	39	43	44	39	54	78	75	84	76	75	60	40	35	34	45	62	50.9
	(Minimum.....	21	25	23	18	11	27	24	32	27	27	31	40	29	24	21	19	21	29	21	26	34	40	47	46	45	25	19	27	25	24	28	27.7
Cedar Rapids.....	(Maximum.....	38	43	45	38	31	42	48	38	38	48	57	64	57	40	36	40	42	41	43	47	67	71	81	73	78	67	40	35	33	43	69	49.5
	(Minimum.....	20	26	14	18	8	25	24	33	28	28	36	36	32	26	25	25	19	21	23	27	24	36	36	46	36	29	19	28	28	23	22	26.5
Davenport.....	(Maximum.....	40	47	44	40	31	40	50	41	38	49	58	68	47	44	37	39	39	42	45	44	64	73	81	73	78	63	39	37	35	43	55	49.2
	(Minimum.....	22	28	19	16	12	27	30	32	31	31	37	45	33	30	29	28	25	26	28	29	33	48	44	55	53	28	21	29	26	26	30	30.7
Des Moines.....	(Maximum.....	38	53	48	40	33	55	48	41	37	56	63	62	43	47	36	42	43															

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE

MISCELLANEOUS PHENOMENA

Stations	Barometric Pressure, Inches (Sea Level)				Relative Humidity, %				Wind					Sunshine			
	Mean	Highest	Date	Lowest	Date	Mean			Total movement	Average hourly velocity	Maximum				% possible		
						7 A. M.	12 Noon	7 P. M.			Miles	From	Date	Departure from normal			
Chas. City	30.00	30.47	5	29.41	25	80	57	64	34	24	4,849	6.5	31	nw	24	63	+ 6
Davenport	29.99	30.50	5	29.32	26	79	54	60	26	5	5,392	7.2	26	e.	29	66	+ 11
Des Moines	29.99	30.46	5	29.33	25	78	52	56	29	23	5,020	6.7	26	sw.	23	60	+ 4
Dubuque	29.98	30.49	5	29.37	25	73	53	59	32	30	5,160	6.9	28	nw.	4	55	+ 2
Keokuk	30.00	30.51	1	29.31	26	76	49	51	29	19	5,711	7.7	25	w.	12	69	+ 6
Sioux City	30.02	30.46	15	29.37	12	80	56	59	22	23	7,421	10.0	31	nw.	12	60	+ 12
Omaha, Neb.	30.00	30.43	5	29.40	5	74	48	49	22	23	5,824	7.8	31	nw.	4	66	+ 9
Means and extremes	30.00					77	53	57				7.5				63	+ 6
Normals		30.51	1	29.31	26				22	23			31	nw.	4		
and records	30.04		29th		29th	80		67		18th					16th	57	
		\$30.82	1921	*28.79	1924				* 5	1918			\$53	w.	1920		

§Sioux City. *Des Moines. ‡Local mean time. †And other dates.
 ††January 1, 1928, 3-cup anemometers replaced the 4-cup instruments used since the establishment of the Weather Bureau stations. The new instruments will more accurately indicate the true wind movement. The records of the 4-cup instruments were somewhat too high at moderate velocities and considerably too high at the higher velocities. Tables of true velocities corresponding to indicated velocities appear in the January, 1928 Climatological Data. For purposes of comparison the highest velocity of record in the lower line of the table has been converted into a 3-cup velocity.

Birds, (migration of): Atlantic, Robins, 9th; Belmont, Robins, 9th; Boone, Blue Birds, 1st; Robins, 5th; Black Birds, 12th; Red Headed Wood Pecker, 15th; Flicker, Brown Creeper, 17th; Chewink, 18th; Blue Heron, Mourning Dove, 23d; Phoebe, 24th; Turkey Buzzard, 30th; Earlham, Robin, 12th; Marathon, Robins, 6th; Oskaloosa, Robins, Black Birds, 10th; Postville, Robins, Blue Birds, 12th; Spencer, Robins, 11th; Washta, Robins, 7th; Blue Birds, 10th.

Fog: 8th, 10th, 12th, 25th.

Hail: 8th, 24th, 28th.

Halos, (lunar and solar): 2d, 3d, 5th, 6th, 7th, 8th, 11th, 15th, 16th, 24th, 27th, 30th, 31st.

Haze: 11th.

Sleet: 8th, 9th, 26th, 28th, 29th.

Tornado, (Oskaloosa): 24th.

Thunderstorms: 10th, 11th, 12th, 13th, 24th, 25th, 27th, 28th, 29th, 30th.

ERRATA

Report for February, 1928, Page 10, Fayette, date of lowest temperature published 23, should be 25. Page 11. Mt. Pleasant, number of cloudy days published 10, should be 11.

Highest wind velocities of record in the state expressed in 4-cup velocities should be converted into 3-cup velocities for comparison with current data as follows: Report for January, page 7, make 72 read 58; report for February, page 15, make 69 read 56.

CLIMATOLOGICAL DATA.

IOWA SECTION

In co-operation with
IOWA WEATHER AND CROP BUREAU
CHARLES D. REED, Meteorologist

VOL. XXXIX DES MOINES, IOWA, APRIL, 1928 No. 4

GENERAL SUMMARY

The mild weather that prevailed throughout most of March continued until beyond the middle of the first week of April, when a severe, slow moving storm passed near the southern and eastern borders of the state, causing general precipitation that began as rain over most of the State and changed to snow. The storm developed into one of the most damaging of its nature in recent years. Over a large portion of the State the chief damage was due to drifting snow that blocked highways and delayed most all classes of traffic, but over an area of approximately 4,000 square miles, centering around Council Bluffs, very heavy loss was sustained due to a heavy wet snow that clung to overhead wires and froze, and before the storm ended wire service in the area was completely paralyzed. In the vicinity of Council Bluffs it was reported that not a telegraph pole was left standing and after a lapse of a month all telegraph wires in that city were lying on the ground in cables. About 10,000 telephone poles were down and the larger per cent were unfit for further use; this does not include local and rural telephone lines whose loss was severe and of which no reliable estimate can be obtained. The damage to telephone and telegraph lines is estimated at \$700,000. Communication by wire was so completely demoralized that the only means, for a time, was by radio. Communication was opened between the radio stations at Des Moines and Omaha and in this manner it was possible to dispatch repair crews and material at once.

From the 5th to the 28th, temperatures were continuously below normal and freezing weather occurred almost daily with the last general killing frost of the month on the 27th. A storm of more than ordinary severity occurred on the 13th-15th, giving general precipitation and locally very heavy snow. Precipitation also occurred, 16th-18th, but during the rest of the month only a few light scattered amounts occurred.

The month was decidedly unfavorable from an agricultural standpoint. The frequent severe freezes further damaged winter wheat and grasses; also early seeded oats, some fields being killed and some failed to germinate. As a result the intended acreage will be reduced. Many market gardeners lost practically all the early seeding and some of the most hardy crops failed to germinate and practically all that came up were cut down by the hard freezes. Large plantings of cabbage and Bermuda onions had been made and the loss was almost total. However, the cold weather had a beneficial effect on fruit. The development during March was rapid, but during prac-

tically all of April the buds remained dormant so that apparently no damage had been done at the end of the month.

During the last two weeks the weather was favorable for outdoor work and preparation for corn planting was progressing rapidly. During the last three days of the month dust storms developed that affected the entire State. The dust was so dense at times that the sun was entirely obscured. The soil drifted considerably in the western and central portions of the State, in places as high as two feet, and loose soil was blown from the roots of growing crops. The fine particles of drifting sand cut down a great many plants that had been set out in the fields.

F. L. D.

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
1873.....	43.2	- 5.7	83	24	3.13	+ 0.17	5.65	1.24	.....	.....	.....	.....	.....
1874.....	41.9	- 7.0	76	16	1.90	- 1.06	3.15	0.65	.....	.....	.....	.....	.....
1875.....	43.0	- 5.9	77	10	2.20	- 0.76	4.00	0.89	.....	.....	.....	.....	.....
1876.....	48.1	- 0.7	78	24	3.06	+ 0.10	6.80	0.85	.....	.....	.....	.....	.....
1877.....	47.5	- 1.4	91	14	3.33	+ 0.37	8.61	1.10	.....	.....	.....	.....	.....
1878.....	52.4	+ 3.5	82	26	3.14	+ 0.18	5.87	1.32	.....	.....	.....	.....	.....
1879.....	50.3	+ 1.4	88	12	1.13	- 1.83	3.70	0.00	.....	.....	.....	.....	.....
1880.....	47.9	- 1.0	92	15	2.08	- 0.88	5.65	0.35	.....	.....	.....	.....	.....
1881.....	42.5	- 6.4	84	10	2.26	- 0.70	5.40	0.45	.....	.....	.....	.....	.....
1882.....	48.8	- 0.1	91	20	3.73	+ 0.77	8.08	1.60	.....	.....	.....	.....	.....
1883.....	49.9	+ 1.0	90	24	2.25	- 0.71	5.00	0.58	.....	.....	.....	.....	.....
1884.....	46.8	- 2.1	86	18	2.54	- 0.42	5.40	0.83	.....	.....	.....	.....	.....
1885.....	47.5	- 1.4	80	16	2.94	- 0.02	7.82	0.73	.....	.....	.....	.....	.....
1886.....	50.3	+ 1.4	88	4	2.70	- 0.26	6.90	0.70	.....	.....	.....	.....	.....
1887.....	51.1	+ 2.2	94	9	1.38	- 1.58	2.65	1.10	.....	.....	.....	.....	.....
1888.....	48.8	- 0.1	90	20	2.65	- 0.31	7.80	0.40	.....	.....	.....	.....	.....
1889.....	50.3	+ 1.4	86	10	2.35	- 0.23	6.03	0.25	.....	.....	.....	.....	.....
1890.....	51.2	+ 2.3	88	2	1.73	- 0.23	5.15	0.25	.....	.....	.....	.....	.....
1891.....	50.6	+ 1.7	93	13	2.15	- 0.81	5.06	0.59	.....	.....	.....	.....	.....
1892.....	45.4	- 3.5	88	14	4.75	+ 1.79	8.38	2.43	5.7	8	14	7	9
1893.....	45.5	- 3.4	96	15	4.21	+ 1.25	8.51	1.24	6.0	10	8	9	13
1894.....	51.7	+ 2.8	93	12	3.07	+ 0.11	6.91	0.55	0.2	9	11	11	8
1895.....	54.2	+ 5.3	98	8	2.62	- 0.34	5.88	0.28	2.1	5	14	8	8
1896.....	54.5	+ 5.6	94	10	5.02	+ 2.06	9.67	2.35	4.5	11	11	10	9
1897.....	47.9	- 1.0	89	19	5.35	+ 2.39	9.86	2.22	T.	11	9	9	12
1898.....	48.1	- 0.8	91	14	2.56	- 0.40	4.82	0.27	T.	8	13	9	8
1899.....	48.9	- 0.0	89	1	2.40	- 0.56	5.76	0.56	2.0	7	12	11	7
1900.....	52.2	+ 3.3	89	19	2.67	- 0.29	6.62	0.43	0.9	6	12	9	9
1901.....	49.9	+ 1.0	92	15	1.79	- 1.17	3.47	0.66	2.0	5	14	8	8
1902.....	48.2	- 0.7	96	9	1.71	- 1.25	4.15	0.40	T.	5	14	11	5
1903.....	49.8	+ 0.9	86	17	2.98	+ 0.62	6.00	0.74	0.8	9	11	9	10
1904.....	44.1	- 4.8	86	13	3.63	+ 0.67	8.97	1.52	1.4	7	15	6	9
1905.....	47.5	- 1.4	90	10	3.03	+ 0.07	5.49	0.63	1.2	8	12	8	10
1906.....	52.5	+ 3.6	94	22	2.42	- 0.54	5.55	0.53	0.6	8	14	9	7
1907.....	41.5	- 7.4	80	10	1.32	- 1.64	3.22	0.24	2.7	6	12	8	10
1908.....	50.5	+ 1.6	91	8	2.24	- 1.72	4.59	0.67	0.3	8	14	8	8
1909.....	43.8	- 5.1	86	14	4.58	+ 1.62	9.43	0.83	3.1	12	9	9	12
1910.....	52.5	+ 3.6	99	15	1.48	- 1.48	4.86	0.10	3.0	7	14	7	9
1911.....	46.7	- 2.2	86	3	3.09	+ 0.13	6.04	1.33	3.6	9	11	8	11
1912.....	49.9	+ 1.0	84	20	2.66	- 0.30	5.66	0.78	1.1	8	13	8	9
1913.....	50.2	+ 1.3	88	16	3.28	+ 0.32	7.43	1.12	2.7	9	15	5	10
1914.....	48.6	- 0.3	88	11	2.52	- 0.44	5.03	0.37	0.3	8	10	8	12
1915.....	57.2	+ 8.3	95	18	1.41	- 1.55	4.02	0.05	T.	7	15	10	5
1916.....	47.1	- 1.8	90	11	2.62	- 0.34	5.92	1.13	1.1	10	10	9	11
1917.....	45.5	- 3.4	88	17	4.55	+ 1.59	7.84	2.05	3.8	11	9	7	14
1918.....	44.8	- 4.1	79	12	2.32	- 0.64	4.20	1.01	3.5	9	12	8	10
1919.....	48.4	- 0.5	81	20	4.78	+ 1.82	9.00	1.94	0.7	14	8	8	14
1920.....	42.4	- 6.5	78	22	4.59	+ 1.63	7.13	1.93	2.0	12	8	9	13
1921.....	52.4	+ 3.5	88	14	3.24	+ 0.38	6.69	0.99	3.6	10	13	7	10
1922.....	49.9	+ 1.0	87	21	3.06	+ 0.10	6.70	1.04	1.0	9	11	9	10
1923.....	48.4	- 0.5	85	11	2.09	- 0.87	4.26	0.47	0.8	8	15	7	8
1924.....	50.5	+ 1.6	90	-	1.38	- 1.58	4.53	0.38	1.4	7	16	8	6
1925.....	56.5	+ 7.6	95	21	2.20	- 0.76	5.94	0.71	T.	8	14	9	7
1926.....	46.1	- 2.8	95	9	0.91	- 2.05	2.29	0.06	1.5	4	16	7	7
1927.....	49.2	+ 0.3	91	15	4.84	+ 1.88	9.06	2.09	2.6	14	9	7	14
1928.....	44.3	- 4.6	88	6	2.24	- 0.72	4.37	0.22	4.9	8	12	9	9

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

Climatological Data for April, 1928

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>Northwest District</i>																				
Akron	Plymouth	1,153	2																	Orlan C. Moore
Alta	Buena Vista	1,513	37	41.5	-5.6	81	2	9	9	40	2.71	-0.38	1.10	12.5	8	11	11	8	w.	D. E. Hadden
Alton	Sioux	1,305	23	41.8	-5.2	78	2	13	9	41	0.72	-1.77	0.26	4.0	3	6	15	9	n.e.	W. S. Slagle
Cherokee	Cherokee	1,196	8	41.7	-4.7	80	2	13	8†	42	1.01	-1.98	0.71	9.0	3	12	7	11	n.	J. E. Wirth
Esherville	Emmet	1,298	33	40.8	-4.1	79	2	12	8†	39	2.20	-0.43	0.80	24.0	6	15	11	4	n.w.	A. O. Peterson
<i>Hawarden</i>																				
Hawarden	Sioux	1,181	2																	Earl V. Slife
Inwood	Lyon	1,474	24	40.8	-5.9	82	2	11	8	42	1.21	-1.32	0.78	0.8	6	14	7	9	n.w.	A. C. Hanson
Lake Park (near)	Dickinson	1,489	15	38.8	-6.8	73	2	9	14	39	1.17	-1.21	0.70	3.8	4	11	8	11	n.w.	P. M. Lawrence
Le Mars	Plymouth	1,224	32	43.7	-4.1	87	2	14	8†	45	0.88	-1.94	0.32	5.0	4	19	6	5	n.	Henry Newell
Marathon	Buena Vista	1,390	2								2.93		1.21	19.5	9	7	14	9	n.w.	E. G. Smith
<i>Pocahontas</i>																				
Pocahontas	Pocahontas	1,248	24	41.7	-5.4	80	2	12	8†	43	2.47	-0.25	0.80	9.3	10	15	7	8	n.	F. E. Hronek
Rock Rapids	Lyon	1,349	29	40.4	-5.9	80	2	11	8†	43	1.44	-1.36	0.93	4.1	6	23	3	4	n.w.	Nellie F. Medberry
Sanborn	O'Brien	1,553	14	39.8	-6.7	79	2	9	8†	41	0.65	-2.35	0.37	3.5	4	9	7	14	n.w.	J. W. Dow
Sheldon	O'Brien	1,418	17	40.8	-6.2	80	2	12	8†	44	1.04	-1.91	0.41	4.2	6	11	10	9	n.w.	Ross E. Forward
Sioux Center	Sioux	1,426	29	41.0	-5.5	80	2	10	8	40	1.63	-1.19	0.70	4.0	3	9	5	16	n.w.	J. De Ruyter
<i>Spencer</i>																				
Spencer	Clay	1,319	14	40.8	-6.2	80	2	10	14	40	2.12	-0.78	0.76	17.0	6	15	7	8	n.w.	E. W. Little
Storm Lake	Buena Vista	1,440	39	42.2	-5.2	80	2	12	8	37	2.65	-0.28	1.11	8.5	7	11	6	13	n.w.	George H. Fracker
Washta	Cherokee	1,157	30	41.8	-5.7	81	2	12	9†	47	2.18	-0.44	1.08	8.0	3	14	8	8	n.	H. L. Felter
West Bend	Palo Alto	1,197	35	40.0	-7.4	78	2	12	16	49	0.98	-1.89	0.40	8.0	5	9	14	7	n.w.	Jos. Dorweiler
<i>Means and extremes</i>																				
				41.1	-5.7	87	2	9	8†	49	1.51	-1.26	1.21	7.7	5	12	9	9	n.w.	
<i>North Central District</i>																				
Algona	Kossuth	1,213	55	41.8	-5.8	77	2†	13	9	35	2.48	-0.14	0.97	10.6	6	16	6	8	n.w.	W. E. Laird
Allison (near)	Butler	1,060	14	41.4	-5.9	75	2	13	15	35	2.30	-0.28	0.66	3.5	9	10	14	6	n.w.	J. A. Bell
Belmond	Wright	1,181	18	41.0	-5.7	77	2†	9	9	40	2.35	-0.91	1.06	12.0	8	5	8	17	n.w.	H. F. Luick
Britt	Hancock	1,236	41																	James S. Ross
Charles City	Floyd	1,015	37	41.1	-5.3	74	2	15	15	37	2.81	+0.19	1.05	6.0	10	11	10	9	n.w.	U. S. Weather Bureau
<i>Forest City</i>																				
Forest City	Winnebago	1,226	34	40.9	-5.4	78	4	8	15	41	1.73	-0.75	0.48	11.5	9	10	8	12	n.w.	Dr. M. B. Neil
Hampton	Franklin	1,145	3								2.32	-0.87	0.92	5.0	9					L. H. Davis
Humboldt	Humboldt	1,095	10	41.8	-6.3	79	4	12	9	47	3.29	+0.61	1.07	8.0	6	11	7	12	n.	H. C. Snitkey
Mason City	Cerro Gordo	1,148	31	39.4	-7.1	74	4	6	15	43	3.39	+0.84	1.10	11.0	11	10	12	8	n.w.	American Beet Sugar Co.
Northwood	Worth	1,222	32	40.2	-4.9	76	4	9	15	34	2.40	-0.34	0.53	14.0	10	6	18	6	n.w.	Charles Dwelle
<i>Osage</i>																				
Osage	Mitchell	1,163	34	41.0	-4.9	75	2	12	15	39	2.80	+0.34	0.66	9.5	8					Dr. C. E. Juhl
<i>Means and extremes</i>																				
				41.0	-5.6	79	4	6	15	47	2.59	-0.11	1.10	9.1	9	10	10	10	n.w.	
<i>Northeast District</i>																				
Decorah††	Winneshiek	872	35	41.6	-5.7	74	2	9	15	46	2.29	-0.26	0.65	10.0	9	12	8	10	n.w.	M. D. Whitney
Dubuque	Dubuque	700	55	44.2	-4.4	75	2	21	9	30	1.71	-1.14	0.51	3.5	12	8	12	10	n.w.	U. S. Weather Bureau
Fayette	Fayette	1,003	40	43.0	-3.9	75	2	15	15	43	3.18	+0.08	0.86	6.0	8	14	7	9	n.w.	R. Z. Latimer
Independence	Buchanan	921	64	43.6	-5.1	78	2	18	14†	38	1.42	-1.09	0.48	3.1	7	13	7	10	n.w.	Dr. Geo. Boody
Lansing	Allamakee	632	21								1.61	-0.95	0.39	5.2	8					Mrs. Mary Spinner
<i>New Hampton††</i>																				
New Hampton††	Chickasaw	1,169	31	40.2	-6.8	73	2	10	15	41	1.68	-0.92	0.36	7.0	7	7	8	15	n.	D. W. Dawson
Oelwein	Fayette	1,036	5	42.6	-5.0	74	2	17	15	40	2.22	-0.56	0.60	9.0	7	13	9	8	n.w.	John T. Ridler
Postville	Clayton	1,192	29	40.6	-5.7	71	2	14	15	39	1.81	-1.20	0.92	5.5	7	10	14	6	sw.	F. L. Williams
Waterloo	Black Hawk	854	45	43.6	-5.2	76	2	15	15	43	2.26	-0.27	0.62	2.5	8	12	10	8	se.	R. B. Slippy
Waverly	Bremer	936	32	42.8a	-4.8	76a	2	15a	15	41a	1.99	-1.01	0.63	4.5	9					D. H. Murphy
<i>Means and extremes</i>																				
				42.9	-4.7	78	2	14	15	43	2.02	-0.73	0.92	4.9	8	12	10	8	n.w.	
<i>West Central District</i>																				
Audubon (near)	Audubon	1,297	33	43.8	-3.8	83	2	11	14	40	2.04	-1.08	0.75	9.0	6	14	11	5	n.w.	George Kibby
Carroll	Carroll	1,265	38	43.5	-5.0	82	2	12	9	42	1.51	-1.44	0.80	3.0	7	18	5	7	n.w.	Mrs. Jos. J. Wolfe
Denison	Crawford	1,171	34	43.8	-5.4	83	2	11	9	43	1.63	-1.20	0.85	7.0	4	12	6	12	n.w.	V. L. Byers
Guthrie Center	Guthrie	1,077	33	43.1a	-6.3	84a	2	14a	9	49a	2.81	-0.32	1.01	2.0	6					H. A. Stafford
Harlan	Shelby	1,192	29	44.7	-4.3	82	2	13	9	45	1.34	-1.54	0.40	3.5	6	11	11	8	n.w.	Walter Bell
<i>Jefferson</i>																				
Jefferson	Greene	1,052	29	43.2	-5.3	84	2	13	9	45	2.62	-0.23	0.83	10.5	7	8	8	14	n.w.	W. I. Lyon
Little Sioux	Harrison	1,040	23	46.6	-3.9	86	2†	13	9	50	2.01	-0.66	1.28	10.0	7	5	19	6	n.	H. W. Kerr
Logan	Harrison	1,120	61	46.2	-4.6	86	2	10	8	49	2.20	-0.59	1.30	8.0	4	12	14	4	n.	Amy Ann Stern
Onawa	Monona	1,051	27	44.4	-5.7	83	2	16	8	40										Mrs. H. E. Colby
Rockwell City	Calhoun	1,232	32	42.0	-6.2	82	2	11	9	39	1.83	-1.22	0.60	6.0	7	19	4	7	n.w.	A. W. McIsaac
<i>Sac City</i>																				
Sac City	Sac	1,269	52	42.4	-5.4	81	2	13	9	42	1.10	-1.84	0.50	4.0	3	14	8	8	n.w.	F. P. Kessler
Sioux City	Woodbury	1,135	39	44.2	-3.6	83	2	15	8	40	0.22	-2.42	0.08	1.5	5	9	8	13	n.w.	U. S. Weather Bureau
<i>Means and extremes</i>																				
				44.0	-5.0	86	2†	10	8	50	1.75	-1.13	1.30	5.9	6	13	9	8	n.w.	
<i>Central District</i>																				
Ames	Story	926	51	45.3	-3.5	79	2	18	8†	39	1.88	-1.10	0.52	1.1	9	10	10	10	n.w.	Iowa State College
Baxter	Jasper	998	28	44.6	-4.4	79	2	14	15	46	2.85	-0.21	0.75	1.4	9	3	22	5	n.w.	Otto Sanderman
Boone (near)	Boone	1,134	23	44.3	-4.7	82	2	14	15	44	1.97	-0.91	0.55	4.0	8	9	8	13	n.w.	C. F. Henning
Des Moines	Polk	861	50	45.4	-4.7	80	2	19	9	35	1.95	-0.96	0.63	3.1	9	7	7	16	n.	U. S. Weather Bureau
Fort Dodge	Webster	1,114	28	42.0	-5.6	82	2	10	9	40	2.55	-0.19	0.94	8.5	9	11	11	8	n.w.	Samuel Sampson
<i>Grinnell</i>																				
Grinnell	Poweshiek	1,031	34	43.0	-6.4	76	2	14	9	41	2.42	-1.29	0.80	3.0	9	13	10	7	se.	R. E. Bates
Grundy Center	Grundy	976	37	43.6	-5.5	77	2	15	9	36	3.23	0.00	0.75	6.0	8	14	5	11	n.w.	M. G. Helberger
Iowa Falls	Hardin	1,127	35	43.2	-4.6	77	2	14	15	39	3.84	+0.72	0.90	7.0	8	10	8	12	n.w.	C. H. Gilbert
Marshalltown																				

Climatological Data for April, 1928—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>East Central District</i>																				
Belle Plaine.....	Benton.....	866	38	45.2	- 4.2	79	2	16	9	42	3.01	- 0.40	0.74	4.5	9	9	11	10	sw.	O. C. Burrows
Cedar Rapids.....	Linn.....	737	46	44.3	- 4.9	78	2	17	9†	44	2.00	- 1.25	0.55	5.2	10	7	7	16	nw.	J. T. Wurster
Clinton.....	Clinton.....	595	55	45.8	- 4.0	77	2	18	15	41	3.70	+ 0.66	1.45	3.9	12	12	7	11	s.	Dr. A. P. Bryant
Davenport.....	Scott.....	580	57	46.8	- 3.1	78	2	22	15	30	3.86	+ 1.17	1.51	1.5	10	9	9	12	nw.	U. S. Weather Bureau
Davenport, No. 2.....	Scott.....	690	3	47.1		79	2	20	15	37	3.08		1.39	2.7	10					Rex Shriver
Fairport.....	Muscatine.....	567	7	46.6	- 4.1	77	2	18	15	43	3.62	+ 0.64	1.57	1.0	9	13	2	15	nw.	Bureau of Fisheries
Iowa City.....	Johnson.....	733	68	45.7	- 4.2	79	2	18	9	40	2.77	- 0.41	1.09	2.5	9	12	10	8	nw.	Prof. J. F. Reilly
Le Claire.....	Scott.....	576	28								4.12	+ 1.24	1.10	2.5	12					Margaret T. Disney
Maquoketa.....	Jackson.....	692	23	44.8	- 2.5	78	4	17	15	42	1.78	- 1.04	0.77	1.3	9	11	5	14	nw.	John Strodtfoff
Muscatine.....	Muscatine.....	546	67								3.27	- 0.01	0.95	2.5	9					William Molis
Olin.....	Jones.....	769	29	45.0	- 4.2	76	2	17	15	42	1.83	- 0.98	0.70		11	12	10	8	nw.	Mrs. L. Stingley
Tipton (near).....	Cedar.....	807	29	45.0	- 5.0	77	2	15	15	37	2.37	- 0.87	1.35	1.1	8	7	10	13	nw.	John Kroeplen
Williamsburg.....	Iowa.....	770	12	44.5	- 4.5	79	2	16	9	44	2.04	- 1.31	0.45	1.0	7	18	7	5	nw.	Dr. F. C. Schadt
Means and extremes				45.5	- 3.9	79	2	15	15	44	2.88	- 0.20	1.57	2.5	10	11	8	11	nw.	
<i>Southwest District</i>																				
Atlantic.....	Cass.....	1,164	37	46.2	- 3.6	84	2	16	9	48	1.73	- 1.41	0.71	8.5	8	11	10	9	nw.	T. H. Whitney
Bedford.....	Taylor.....	1,200									1.96	- 0.90	1.17		6	21	6	3	nw.	Arthur L. Bishop
Clarinda.....	Page.....	1,009	38	48.4	- 2.7	87	2	16	9	46	3.02	+ 0.11	1.45		7	9	17	4	sw.	Dr. H. C. Hawley
Corning.....	Adams.....	1,150	36	46.8	- 2.5	85	2	15	9	51	1.98	- 1.15	1.00		6	20	7	3	sw.	C. A. Smith
Cumberland (near).....	Cass.....	1,225	29								1.47	- 1.27	0.85	3.0	6	14	9	7	nw.	Carl E. Pollock
Glenwood.....	Mills.....	1,100	30	47.4	- 3.9	86	3	16	9	46	1.24	- 1.65	0.60	6.5	4	15	7	8	nw.	George Mogridge
Lenox.....	Taylor.....	1,250	33	46.4	- 3.8	85	2	13	9	44	2.07	- 1.17	0.93	0.6	8	16	8	6	nw.	J. L. Hurley
Oakland.....	Pottawattamie.....	1,139	9	45.9	- 4.2	88	2	15	9	52	1.32	- 1.54	0.85	6.0	5	15	9	6	sw.	W. S. Matthews
Red Oak (near).....	Montgomery.....	1,030	3								1.59	- 1.47	0.87	6.1	4	13	11	6	nw.	B. R. Bridge
Riverton (near).....	Fremont.....	920	2								3.36	+ 0.38	2.10	3.3	6	12	6	12	n.	Geo. C. Rader
Thurman.....	Fremont.....	960	31	48.4	- 3.6	87	2†	17	9	46	1.13	- 2.02	0.67	3.0	4	16	4	10	n.	H. H. Askew
Omaha, Neb.....		1,105	57	47.4	- 3.8	88	3	19	9	38	1.51	- 1.00	0.98	8.9	5	10	8	12	nw.	U. S. Weather Bureau
Means and extremes				47.1	- 3.5	88	2†	13	9	52	1.86	- 1.10	2.10	5.1	6	14	9	7	nw.	
<i>South Central District</i>																				
Afton.....	Union.....	1,212	34	46.6	- 3.6	82	2	16	9	41	4.37	+ 0.87	1.01		6	16	8	6	nw.	S. R. Brown
Albia.....	Monroe.....	949	30	46.2	- 4.5	78	2	18	9	39	1.82	- 1.26	0.95	3.3	8	11	6	13	sw.	O. E. McBride
Centerville.....	Appanoose.....	1,013	23	47.6	- 4.4	78	1	19	9†	39	1.92	- 1.58	0.60	4.0	7	10	10	10	nw.	Thomas Wood
Chariton (near).....	Lucas.....	1,042	33	46.2	- 3.3	78	2	18	9†	39	1.53	- 1.77	0.86	T.	3	7	17	6	sw.	C. C. Burr
Corydon.....	Wayne.....	1,050	35	46.6	- 3.9	79	2	18	9†	39	2.18	- 1.23	0.68	0	8	9	11	10	nw.	J. C. Davis
Creston.....	Union.....	1,291	23	45.6	- 3.9	84	2	13	9	44	1.96	- 1.47	0.75		7	3	12	15	nw.	Mrs. N. Spangler
Earlham (near).....	Madison.....	1,126	26	45.0	- 3.7	83	2	16	9†	47	1.40	- 1.95	0.58	3.0	5	17	4	9	nw.	George Phillips
Indianola.....	Warren.....	972	37	45.7	- 4.8	80	2	17	9†	38	2.11	- 1.05	0.62	3.3	8	10	9	11	nw.	Seth F. Shenton
Knoxville.....	Marion.....	920	33	45.9	- 4.7	78	2	18	9†	40	2.22	- 1.18	0.87	2.0	6	12	9	9	nw.	W. J. Casey
Lacona.....	Warren.....	821	29								2.10	- 0.97	1.00	3.0	9	11	7	12		J. B. Alter
Lamoni.....	Decatur.....	1,123	21	46.4	- 4.1	79	1†	17	9	37	1.66	- 1.76	0.59	1.0	6	15	5	10	nw.	F. S. Parks
Mount Ayr.....	Ringgold.....	1,240	35	47.4	- 2.8	81	2	16	9	37	1.78	- 1.58	0.79	T.	7	14	7	9	nw.	Alex Maxwell
Pella (near).....	Marion.....	850	1								2.13	- 0.97	0.67	2.0	9	15	4	11	se.	L. L. Langerak
Tingley.....	Ringgold.....	1,275	3	45.2	- 4.5	81	2	15	9	39	1.84	- 1.54	0.72	0.2	5	15	9	6	ne.	James A. Verploegh
Winterset.....	Madison.....	1,118	37	46.2	- 4.1	81	2	12	9	52	1.98	- 1.60	0.71	3.0	7	15	9	6	nw.	H. S. Ely
Means and extremes				46.2	- 4.0	84	2	12	9†	52	2.07	- 1.27	1.01	1.9	7	12	8	10	nw.	
<i>Southeast District</i>																				
Bonaparte (near).....	Van Buren.....	563	37	46.6	- 4.2	80	2	21	9†	39	3.08	- 0.12	1.77	0.4	8	16	3	11	nw.	B. R. Vale
Burlington.....	Des Moines.....	544	32	48.7	- 3.4	80	2	22	9	38	2.78	- 0.32	0.83	3.5	9	14	6	10	nw.	John T. Donnelly
Columbus Junction.....	Louisa.....	595	27	46.3	- 4.9	80	2	20	9†	42	2.99	+ 0.01	1.35	2.5	11	9	13	8	nw.	Miss Musa Todd
Fairfield.....	Jefferson.....	780	44	46.0	- 4.1	81	2	18	9†	43	3.51	- 0.15	1.55	2.5	7	12	6	12	nw.	R. M. McKenzie
Keokuk.....	Lee.....	614	57	48.7	- 3.6	82	2	23	9	34	2.79	- 0.20	1.12	2.3	11	10	5	15	n.	U. S. Weather Bureau
Keosauqua.....	Van Buren.....	644	36	46.8	- 4.3	87	3	17	15	44	2.38	- 1.01	1.58	1.0	6	9	13	8	e.	J. H. Landes
Mt. Pleasant.....	Henry.....	730	47	47.3	- 4.2	82	2	21	9†	39	3.37	+ 0.40	1.49	1.0	9	6	16	8	nw.	J. H. Jericho
Oskaloosa.....	Mahaska.....	835	52	45.4	- 4.7	77	2	17	15	39	2.70	- 0.15	0.64	7.0	9	11	6	13	nw.	Roy R. Robinson
Ottumwa††.....	Wapello.....	649	33								2.02	- 0.89	0.94	1.0	8	15	9	6	nw.	C. L. Mikesh
Sigourney (near).....	Keokuk.....	790	32	46.0	- 4.0	79	2	19	9	40	2.44	- 0.84	0.88	4.1	9	12	6	12	nw.	W. E. Utterback
Stockport.....	Van Buren.....	747	26	46.0	- 3.8	80	2	20	9†	41	3.05	- 0.07	1.48	2.0	8	15	7	8	nw.	C. L. Beswick
Washington.....	Washington.....	757	46	46.8	- 3.9	81	2	19	9†	41	2.93	+ 0.18	1.45	2.5	9	9	7	14	sw.	D. D. Sherman
Wever.....	Lee.....	552									2.81		0.95		6					
Means and extremes				46.8	- 4.2	87	3	17	15	44	2.90	- 0.20	1.77	2.6	9	11	8	11	nw.	
State means and extremes.....				44.3	- 4.6	88	2†	6	15	52	2.24	- 0.72	2.10	4.9	8	12	9	9	nw.	

Temperature normals are based on the 46-year period July 3, 1875 to July 2, 1921; shorter records corrected to harmonize. Precipitation normals are based on the 50-year period ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1920 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.

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.

Daily Precipitation for April, 1928

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>Northwest District</i>																																				
Akron.....	Big Sioux.....					.01					T.		.07		T.			.18																	0.26	
Alta|||.....	Raccoon.....					.60	.40				T.	.01	.04	1.10			.04	T.	.42		.10													2.71		
Alton.....	Floyd.....					.26					T.		.20		T.	T.		.26		T.														0.72		
Cherokee.....	Little Sioux.....				T.	.20							.71	.10	T.	T.		.10		T.												T.		1.01		
Estherville|||.....	Des Moines.....					.80						.05		.80			.05			.20	.30													2.26		
Hawarden.....	Big Sioux.....					.01						T.	.01	.01	T.			.33																0.35		
Inwood|||.....	Big Sioux.....											T.	.01	.08	.09			.78	.23		.01													1.21		
Lake Park (near).....	Little Sioux.....					.18							.21					.70			.08													1.17		
Le Mars.....	Floyd.....					.25						.01	.30		T.	T.		.32																0.88		
Marathon.....	Raccoon.....				T.	.47	.55		T.		T.	T.	.06	1.15		.02	.21	.01	.42		.04												T.	2.93		
Pocahontas.....	Des Moines.....				.06	.55	.05						.70	.10	.04	.02	.12	.80		T.	.03													2.47		
Rock Rapids.....	Big Sioux.....					.06							.30		.04	.08		.93			.03													1.44		
Sanborn.....	Floyd.....					.08							.16					.37			.04														0.65	
Sheldon.....	Floyd.....					.16						.01	.37		.01	.08	T.	.41		T.														1.04		
Sioux Center.....	Floyd.....				T.	.53							.70		T.	T.		.40		T.													T.	1.63		
Spencer.....	Little Sioux.....					.75						T.	.35		.08		.08	.76			.10													2.12		
Storm Lake.....	Raccoon.....					.95						T.	1.11		T.	.01	.01	.54			.01													2.65		
Washta.....	Little Sioux.....					.55		T.					1.08				.55																	T.	2.18	
West Bend.....	Des Moines.....					.40							.10		.15		.10	.23																	0.98	
<i>North Central District</i>																																				
Algona.....	Des Moines.....				.24	.64						.08		.44		.11		.97																2.48		
Allison (near).....	Cedar.....				.30	.66	.10					.20		.35	.35			.24																2.30		
Belmond.....	Iowa.....				T.	.12	.67						.84	.22	.05	.05		.36																2.35		
Britt.....	Iowa.....					.22	.01	.82	.18	T.		.19		.89	.18	.05		.26	T.																2.81	
Charles City***.....	Cedar.....					.22	.01	.82	.18	T.		.19		.89	.18	.05		.26	T.																2.81	
Forest City|||.....	Cedar.....				T.	.03	.08	.38	T.				.10	.02	.40		.22		.48																1.73	
Hampton.....	Cedar.....				.08	.20	.83	.09				.09		.43	.30			.25																	2.32	
Humboldt.....	Des Moines.....				T.	.85						.10	1.07		T.		.28	.85		T.	.14													3.29		
Mason City.....	Cedar.....				1.10	.32	.56	.02	T.			.12	.41	.30	.05	.07		.36		T.														T.	3.39	
Northwood.....	Cedar.....				.25	.51	.10					.10	.50	.30	.05	.05		.53		T.														T.	2.40	
Osage.....	Cedar.....					.66		.50				.42	.25	.32		.18		.37																	2.80	
<i>Northeast District</i>																																				
Decorah|||.....	Mississippi.....				T.	.42	.40	.31	.06				.05		.65		.05		.28																2.29	
Dubuque***.....	Mississippi.....				.11	.33	.36	.18	T.			.03	.24	.16	.01	.01		.26																	1.71	
Fayette.....	Mississippi.....				.66	T.	.67	.86				T.	.37	.26		.05		.22																	3.18	
Independence.....	Wapsipinicon.....				.08	.34	.08					.03	.15	.26				.48																	1.42	
Lansing|||.....	Mississippi.....				.39	.20	.28	.23					T.	.17	.06	.04		.24																	1.61	
New Hampton.....	Wapsipinicon.....				.25	.36	.30					.09	.13	.30			.25																		1.68	
Oelwein.....	Wapsipinicon.....				.60	.50	.24						.10	.48			.20																		2.22	
Postville.....	Mississippi.....				T.	.15	.92	.02				.02	.27	.25			.18																		1.81	
Waterloo|||.....	Cedar.....				.48	.42	.10	.02	T.			.05	.55			T.	T.	.62																T.	2.26	
Waverly.....	Cedar.....				.20	.63	.18					.18	.34	.18			.22																		1.99	
<i>West Central District</i>																																				
Audubon (near).....	Nishnabotna.....				.50		.75					.10	.40	.20	T.		T.	.11			.09														2.04	
Carroll|||.....	Raccoon.....				.07	.05	.13					.02	.18	.18			.30	.08																	1.51	
Denison.....	Missouri.....					.85							.65	.80		T.		.03																	1.63	
Guthrie Center.....	Raccoon.....				1.01		1.01					.07	.45					.02																		2.81
Harlan.....	Nishnabotna.....				.03	T.	.40	T.				.20	.40	T.	T.			T.			.20	.11													1.34	
Jefferson.....	Raccoon.....				.83	.05	.80	T.	T.			T.	.53	.20	T.	T.		.08			.13														2.62	
Little Sioux.....	Little Sioux.....				T.	1.28						.08	.02	.45			.02			.03	.13														2.01	
Logan.....	Missouri.....					1.30						.10	.74					.06																		2.20
Onawa.....	Missouri.....																																			2.20
Rockwell City.....	Raccoon.....				.30		.60					.10	.60	.08			.05				.10														1.83	
Sac City.....	Raccoon.....					.32							.50			T.		.28																	1.10	
Sioux City***.....	Missouri.....					T.	.08					.03	.07			T.		.03			.01														0.22	
<i>Central District</i>																																				
Ames.....	Skunk.....				.30		.52	.01				.06	.28	.10			.16	.28																	1.88	
Baxter.....	Skunk.....				.75	.66	.04					.12	.18	.18			.30	.08																		2.85
Boone (near)|||.....	Des Moines.....				.01	.53	.36			T.		.05	T.	.55		T.	.06			.17															1.97	
Des Moines***.....	Des Moines.....				.41	.12	.61	.15	T.			.06	.24	.08	T.	T.		T.			.24	.04													1.95	
Fort Dodge|||.....	Des Moines.....					.25		.33	.49			.05	T.	.94	.03			.14	.19		.13														2.55	
Grinnell.....	Iowa.....				.80	.48	T.	.24				.10	.15	.12		T.	.12	.03		T.	.38														2.42	
Grundy Center.....	Cedar.....				.65		.75	.24	T.			.20	.35	.24			.65			.15															3.23	
Iowa Falls|||.....	Iowa.....					.55	.76	.80	T.			.14	.90				.07		.56		.06														3.84	
Marshalltown|||.....	Iowa.....				T.	1.02	.57	.43	T.	T.		.08	.54				.28	.02	.14		.28														3.36	
Monroe.....	Des Moines.....				.43	.68	.11	T.	T.			.14	.28	.18		T.	.09	.04		.31															2.26	
Perry.....	Raccoon.....				.12	T.	.48	.07	T.			.07	.33	.15																						

Daily Precipitation for April, 1928—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>Southwest District</i>																																	
Atlantic|||	Nishnabotna					.71	.25	.30				.05	.05	.30								.06		.01									
Bedford	102			.38	.79	.51					.05		.08								.12												
Clarinda|||	Nodaway			1.45		.92	.33					.10	.02	.18								.02											
Corning	Nodaway			*	1.00	.80					.05		.05	.08																			
Cumberland (nr.)	Nodaway			.17	.14	.85	T.				.05		.16	.10	T.									T.									
Glenwood	Missouri				.38	.60					.08		.18									T.											
Lenox	Missouri			.15	.93	.72					.05		.10	.03								.02	.07										
Oakland	Nishnabotna			.04	.06	.85					.06		.31	T.																			
Red Oak (near)	Nishnabotna			.14	.48	.87					T.		T.	.10								T.											
Riverton (near)	Nishnabotna			.23	.75	2.10					.04		.23													.01							
Thurman	Missouri				.35	.67					.03		.08	T.								T.											
Omaha, Neb., ***	Missouri			T.	.01	.98					.05		.45		T.							.02					T.		T.				
<i>South Central District</i>																																	
Afton	Grand				1.01	.75					.80		.90	.80								T.	.11										
Albia|||	Des Moines				.10	.95	.32	.06				.05		.18					.07		T.		.09	T.									
Centerville	Chariton				.32	.60	.41				.04		.33	.02									.20		T.								
Chariton (near)	Chariton				.86	.51	T.						.16	T.																			
Corydon	Chariton			.43	.68	.56	.12				.12		.21	.01									.05										
Creston|||	Missouri				.75	.70	.14					.07		.12				T.	T.				.17	.01									
Earlham (near)	Des Moines			.30	.22	.58	.20				T.		T.	.10	T.							T.			T.								
Indianola	Des Moines			.38	.34	.62	.23				.13		.11	.11									.19										
Knoxville	Des Moines				.43	.87	.20				.14		.20			T.			T.				.38		T.			T.					
Lacona	Des Moines			.20	.12	1.00	.20				.12		.33	.10				.02					.01										
Lamoni|||	Grand				.59	.51	.10	T.				.13		.30									.03										
Mount Ayr	Grand			.10	.79	.58	T.				.06		.18	.04								T.	.03										
Pella (near)	Skunk			.04	.39	.67	.21	T.			.10		.22	.07				T.					.39										
Tingley	Platte			.15	.72	.63					T.		.28	.06																			
Winterset	Des Moines				.71	.66	.20				.07		.05	.04									.25		T.								
<i>Southeast District</i>																																	
Bonaparte (near)	Des Moines			.08	1.77	.29	.01				.05		.25	.03									.60								T.		
Burlington|||	Mississippi				.29	.83	.35	.27				.06		.42	T.			.12					.42	.02							T.		
Columbus Jct.	Iowa			.17	1.35	.27	.12	.02			.03		.37	.04				.37					.24							.01			
Fairfield	Skunk				1.55	.31	.25				T.		.27	.70				.17	T.				.26										
Keokuk***	Mississippi			.14	.81	.47	.14				.08		.58	.05			.02	.01				.16	.33		T.								
Keosauqua	Des Moines				1.58	.25	.03				.05		T.			.04							.43										
Mt. Pleasant	Skunk			.06	1.49	.35	.22				.06		.38	.11				.26					.44			T.							
Oskaloosa	Des Moines				.64	.42	.45	T.	T.		.07		.43	.25	T.	T.	.09						.33			.02							
Ottumwa	Des Moines				.94	.40	.11				.01		.24	.02	T.	.12	T.						.18										
Sigourney (near)	Skunk			T.	.88	.37	.40	T.			.04		.22	.13			T.	.16					.22		T.					.02			
Stockport	Skunk				1.48	.27	.15				.07		.47	.05				.17					.39										
Washington	Skunk				1.45	.12	.40	T.			.03		.22	.30				.18								T.					.01		
Wever	Mississippi				.28	.95	.39						.65	.08									.46										

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.
- T. Precipitation is less than .01 inch rain or melted snow.

TEMPERATURE

The mean temperature for the State, derived from the means of nine districts of nearly equal area and based on the records of 100 stations, was 44.3°, or 4.6° lower than the normal. The greatest deficiency occurred in the northwestern division and the least in the southwestern. The greatest deficiency at any station was 7.4° at West Bend and the least was 2.5° at Corning and Maquoketa. The highest mean was 48.7° at Burlington and Keokuk, and the lowest was 38.8° at Lake Park. The monthly range for the State was 82°, the highest temperature being 88° at Oakland on the 2d, and the lowest was 6° at Mason City on the 15th. The average number of days with the minimum temperature 32°, or lower, was 16, ranging from 21 in the northwestern division to 13 in the southwestern; the average number of days that the maximum was 32°, or lower, was less than one, the average being 1 in the north-central, northeastern and east-central divisions and less than one-half in the rest of the State.

PRECIPITATION

The average precipitation for the State, derived from the averages of nine districts of nearly equal area and based on the records of 114 stations, was 2.24 inches, or 0.72 inch less than the normal. The southeastern division reported the greatest average, 2.90 inches, and the northwestern, 1.51 inches, the least. All divisions were below normal and all stations in the northwestern and west-central divisions. The greatest amount reported from any station was 4.37 inches at Afton, and the least was 0.22 inch at Sioux City which is the least ever recorded at that City in April. The greatest amount falling in 24 consecutive hours was 2.10 inches at Riverton, on the 6th. The average number of days with 0.01 inch or more of precipitation was greatest in east-central division, and least in the northwestern division, the number being respectively ten and five. Three stations along the Mississippi River, Dubuque, Clinton and Le Claire reported a total of 12 and seven stations in the northwestern and west-central divisions reported only three.

Daily Maximum and Minimum Temperature for the Month of April, 1928

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
<i>Northern Division</i>																																
Algona.....	(Maximum.....	70	77	68	77	57	43	38	34	39	57	53	55	50	28	36	36	43	43	36	45	55	63	60	50	57	57	59	70	67	66	53.0
	(Minimum.....	39	45	48	55	32	28	24	14	13	31	39	28	23	14	17	15	28	35	19	25	35	31	35	29	28	29	27	35	50	44	30.5
Alta.....	(Maximum.....	78	81	76	69	48	39	37	30	42	57	53	59	43	29	37	38	19	12	40	49	50	65	52	51	59	57	63	71	66	66	53.2
	(Minimum.....	38	44	39	48	32	27	24	11	9	30	38	26	20	12	19	25	28	26	18	27	36	31	35	27	30	34	31	35	50	44	29.8
Alton.....	(Maximum.....	73	78	72	68	53	42	40	34	49	57	57	60	57	32	40	47	41	38	45	52	65	54	51	56	55	61	71	66	67	54.1	
	(Minimum.....	32	50	37	52	30	26	11	13	28	38	23	23	14	22	20	27	28	18	28	37	25	37	27	22	30	24	34	53	44	29.4	
Belmond.....	(Maximum.....	71	77	69	77	57	42	35	30	37	57	50	55	45	26	37	39	46	44	36	47	58	62	52	48	55	55	58	70	68	65	52.3
	(Minimum.....	34	46	35	57	34	28	25	14	9	30	37	30	24	17	12	21	30	33	20	25	37	32	34	29	25	26	25	30	50	45	29.8
Charles City.....	(Maximum.....	67	74	67	71	50	39	33	31	40	56	45	53	45	28	37	41	50	45	36	46	58	61	50	45	51	53	56	68	61	64	50.9
	(Minimum.....	34	45	41	50	37	28	26	20	16	31	33	31	23	18	15	29	33	28	25	26	37	35	33	41	34	30	27	31	49	46	31.3
Decorah.....	(Maximum.....	68	74	70	71	68	48	34	29	39	55	54	51	45	33	39	45	55	47	43	45	60	62	58	48	55	55	60	69	70	62	53.7
	(Minimum.....	30	40	39	58	38	32	24	21	14	27	29	31	28	23	9	30	28	33	24	20	35	29	30	30	29	25	23	23	42	45	29.6
Dubuque.....	(Maximum.....	67	75	69	67	57	47	35	32	38	53	56	53	51	31	39	47	52	57	42	50	56	61	52	43	55	51	54	65	68	65	53.0
	(Minimum.....	40	46	51	55	41	35	28	22	21	32	37	34	29	21	21	33	37	35	29	29	39	37	38	31	37	34	33	35	50	47	35.4
Forest City.....	(Maximum.....	67	75	72	78	64	46	36	34	36	55	51	55	50	28	35	37	46	45	38	45	57	63	57	51	56	55	57	72	68	65	53.1
	(Minimum.....	33	42	36	58	31	29	24	14	10	27	36	27	33	15	8	18	26	37	18	21	33	30	30	27	26	29	28	31	48	43	28.7
Independence.....	(Maximum.....	69	78	75	70	72	45	42	38	39	55	56	54	54	43	41	48	53	54	50	50	57	61	61	51	54	54	55	67	68	67	56.0
	(Minimum.....	35	42	42	58	40	36	28	21	27	37	32	31	36	18	17	27	27	36	25	25	25	25	38	31	30	30	29	30	30	30	31.3
Inwood.....	(Maximum.....	72	82	67	62	51	41	45	31	52	62	62	60	49	34	42	42	46	43	39	41	53	66	50	57	58	55	62	73	67	59	54.1
	(Minimum.....	33	42	34	43	29	30	25	11	13	28	36	21	21	12	22	12	24	25	16	28	33	28	32	24	32	20	34	50	49	46	27.4
Lake Park.....	(Maximum.....	71	73	65	63	54	42	39	30	43	52	52	56	45	27	32	36	40	42	34	48	50	62	48	48	55	56	60	72	65	68	50.9
	(Minimum.....	32	35	33	35	29	28	24	11	13	27	36	24	20	9	16	23	29	28	17	26	23	27	31	27	27	28	25	33	40	49	26.8
Mason City.....	(Maximum.....	67	73	66	74	58	42	33	30	35	55	49	52	45	26	35	39	47	49	35	45	58	61	50	46	55	53	56	68	66	64	51.1
	(Minimum.....	29	42	34	56	33	26	23	15	10	27	33	28	22	17	6	18	28	32	20	21	33	31	29	28	25	24	23	25	48	43	27.6
New Hampton.....	(Maximum.....	62	73	67	70	59	43	33	30	37	55	47	51	45	32	36	41	49	45	39	46	58	60	51	45	55	53	57	67	67	70	51.5
	(Minimum.....	32	42	37	55	31	29	23	18	20	28	34	29	31	16	10	28	30	34	23	22	35	33	29	23	26	26	28	27	41	29	29.0
Northwood.....	(Maximum.....	65	72	65	76	54	45	36	32	45	45	51	41	37	40	42	51	43	36	45	58	60	52	46	54	53	59	65	66	64	51.0	
	(Minimum.....	31	40	49	54	34	25	24	17	12	25	24	29	23	17	9	23	23	30	21	24	32	31	31	29	28	29	29	47	38	44	29.1
Pocahontas.....	(Maximum.....	72	80	72	76	55	41	38	32	43	59	53	59	50	28	38	37	44	44	37	49	55	63	56	50	57	57	59	74	68	67	53.8
	(Minimum.....	35	40	38	55	33	27	24	12	12	30	39	26	21	15	17	24	29	30	20	27	37	31	36	29	28	28	27	31	41	45	29.6
Postville.....	(Maximum.....	61	71	70	65	60	41	33	29	34	51	51	50	45	37	35	43	50	45	41	44	55	59	50	40	48	51	52	64	67	64	50.3
	(Minimum.....	36	41	31	59	40	32	25	24	15	29	34	30	29	18	14	30	30	24	23	25	35	31	31	29	28	28	31	45	43	40	30.9
Rock Rapids.....	(Maximum.....	73	80	65	64	49	43	43	36	50	60	56	59	54	35	37	39	44	42	39	40	51	65	54	51	57	55	62	71	65	67	53.5
	(Minimum.....	30	40	33	45	30	30	25	11	13	27	37	20	20	11	21	19	23	27	17	27	33	25	31	26	24	27	24	33	49	40	27.3
<i>Central Division</i>																																
Belle Plaine.....	(Maximum.....	72	79	74	74	68	43	39	33	43	59	59	58	62	42	44	51	48	52	43	50	55	63	60	51	58	57	57	70	73	69	56.9
	(Minimum.....	33	46	45	60	40	37	27	22	16	31	34	29	42	20	17	31	34	39	25	33	37	36	40	29	28	29	28	49	39	39	33.5
Boone.....	(Maximum.....	73	82	76	78	67	44	40	35	46	60	54	60	51	31	44	47	45	48	42	52	54	63	57	52	59	61	60	69	72	69	56.4
	(Minimum.....	29	46	39	63	37	31	28	18	15	34	40	28	31	20	14	30	35	40	23	28	38	36	41	28	23	26	23	25	49	47	32.2
Carroll.....	(Maximum.....	74	82	77	77	58	42	38	36	43	59	54	60	54	30	42	44	50	47	42	52	50	63	61	52	59	58	61	70	70	68	55.8
	(Minimum.....	38	40	40	57	34	28	24	15	12	32	40	27	23	16	20	27	32	33	20	27	36	31	39	27	27	33	27	37	50	43	31.2
Cedar Rapids.....	(Maximum.....	70	78	75	71	63	48	42	31	42	56	58	56	55	41	42	51	50	56	45	50	55	63	57	48	58	55	56	68	73	69	56.0
	(Minimum.....	29	45	43	60	43	40	26	22	17	30	33	30	31	20	17	31	33	37	26	27	37	34	38	28	28	26	30	24	49	45	32.6
Davenport.....	(Maximum.....	71	78	76	66	60	44	30	40	53	58	56	52	38	41	56	53	64	46	51	52	60	55	47	58	56	54	66	72	69	66	56.2
	(Minimum.....	41	48	58	56	46	42	29	25	22	33	36	35	38	23	22	33	36	37	30	31	39	38									

IOWA STORMS, APRIL, 1928

Date	County	Township	Nature of Storm	Time	Storm Moved From	Width of Path	Length of Path	Area of Sq. Miles	Size of Hailstones Inches	Damage	Persons Injured	Persons Killed
4	Page, Fremont.....	Morton and Fisher.	Tornado.....	3:45 P	SW to NE	Narrow			1 1/2 1 1/2	\$1,550 3,000		
4	Cass.....	Franklin.....	Wind and Hail...	4:00 P	NW to SE					400		
4	Marion.....	Indiana and Liberty	Wind.....	7:00 P	SW to NE					Bldgs.		
4	Decatur.....	Richmond, Long Creek and Franklin	Tornado.....	5:00 P	SW to NE	1/8 Mile				200		
4	Jasper.....	Palo Alta and Buena Vista	Wind.....	7:00 P	SW to NE					Bldgs.		
5	Mahaska.....	Garfield.....	Tornado.....	7:00 P						Bldgs.		
5	Hamilton.....	Boone.....	Hail.....	4:30 P		1 Mile	1 Mile	1	2 1/2	4,000		
6	Crawford, Harrison, Shelby, Pottawattamie, Cass, Mills, Montgomery, Fremont and Page.....		Wind and Snow.	During night to 7 P. M.	SW to NE			4,000		Wires and Poles \$700,000		

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		% possible	Departure from normal	
						7 A. M.	12 Noon					Miles	From			Date
						7 P. M.										
Chas. City	29.93	30.59	27	29.35	29	77	54	59	19	28	6.116	8.5	26 s	4	62 + 4	
Davenport	29.92	30.33	9	29.38	29	74	53	59	22	26†	6.117	8.5	28 sw.	30	65 + 2	
Des Moines	29.92	30.36	27	29.37	29	73	51	51	12	30	6.154	8.5	28 sw.	2	57 + 2	
Dubuque	29.92	30.36	27	29.34	29	74	51	59	25	9†	5.615	7.8	26 nw.	30	59 + 2	
Keokuk	29.94	30.38	8	29.38	6	71	50	52	13	30	6.276	8.7	31 w.	14	65 + 2	
Sioux City	29.95	30.43	27	29.35	29	74	48	46	16	30	9.710	12.1	48 nw.	18	58 + 4	
Omaha, Neb.....	29.93	30.40	27	29.40	29	66	44	41	12	30	6.785	9.4	42 n.	13	69 + 10	
Means and extremes	29.93				29	73	50	52				9.1			62 + 5	
Normals and records..	29.98		9th		20th	76		57		†25				25th	57	
		\$30.78	1918	*28.90	1898				†10	1902					1902	

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

††January 1, 1928, 3-cup anemometers replaced the 4-cup instruments used since the establishment of the Weather Bureau stations. The new instruments will more accurately indicate the true wind movement. The records of the 4-cup instruments were somewhat too high at moderate velocities and considerably too high at the higher velocities. Tables of true velocities corresponding to indicated velocities appear in the January, 1928 Climatological Data. For purposes of comparison the highest velocity of record in the lower line of the table has been converted into a 3-cup velocity.

ERRATA

Report for March, 1928. Page 18. Alton; number of cloudy days published 6, should be 8.

SNOWFALL

The average snowfall for the State was 4.9 inches, or 3.0 inches greater than the normal. The greatest amount reported from any station was 24.0 inches at Estherville and the least was 0.0 at Corydon; Mt. Ayr and Chariton reported traces. The snowfall occurred in two principal storms; the first on the 5th and 6th and the other on the 13th. The average for the State was greater than March or any of the winter months. The snow remained on the ground generally for only short periods but in portions of the northwestern division sleighing was good for several days following the heavy snow of the 6th.

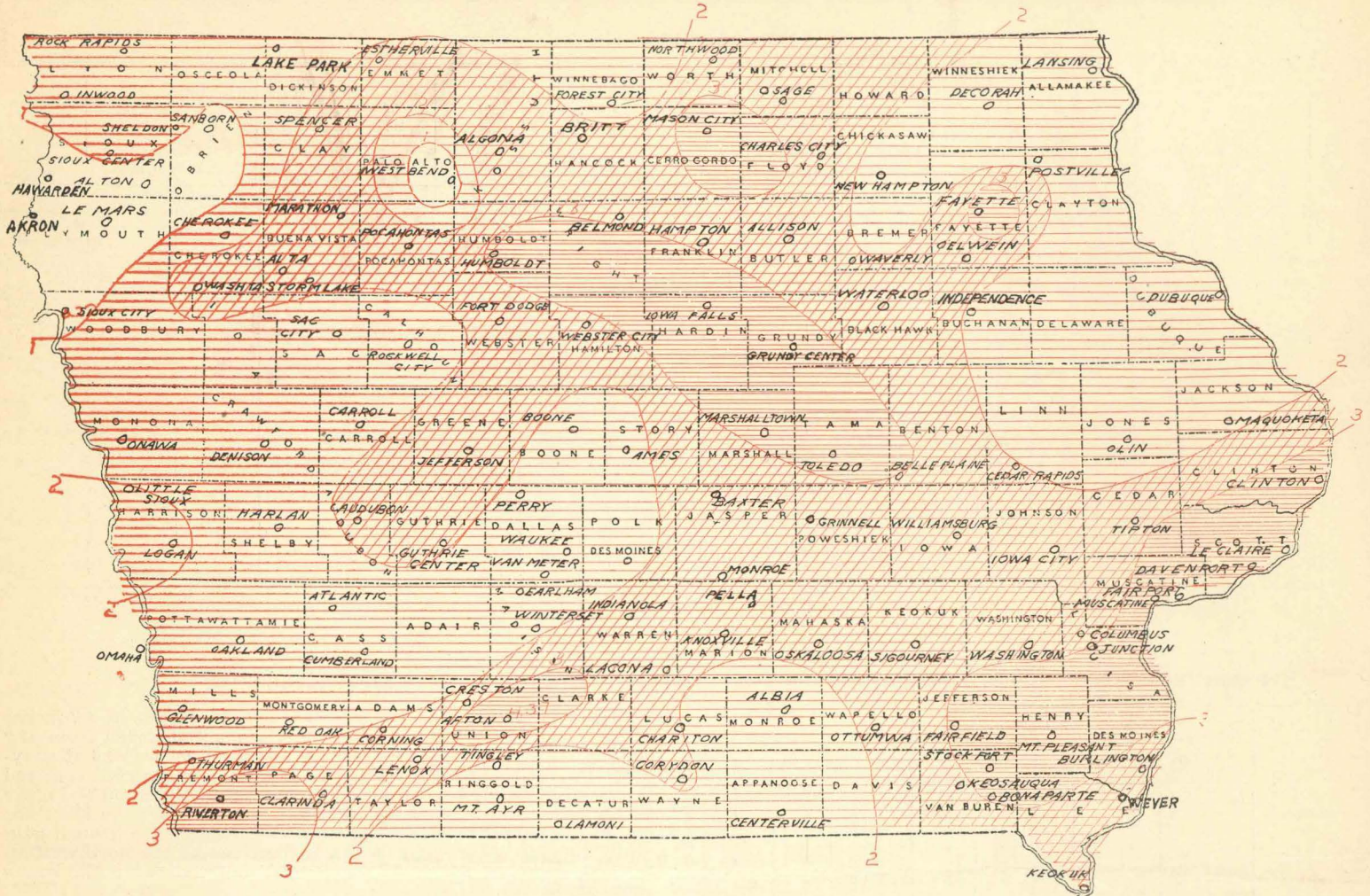
MISCELLANEOUS PHENOMENA

Aurora: 14th.
 Dust storms: 28th, 29th, 30th.
 Fog: 16th, 22d.
 Hail: 4th, 17th, 23d.
 Halos (lunar and solar): 1st, 2d, 7th, 10th, 11th, 14th, 15th, 16th, 19th, 20th, 25th, 26th, 29th.
 Haze: 2d, 3d.
 Sleet: 5th, 6th, 7th, 13th, 14th, 16th, 20th, 23d.
 Thunderstorms: 4th, 5th, 6th, 18th, 21st, 29th.
 Winds, strong: 7th, 8th, 10th, 12th, 18th, 28th, 29th, 30th.

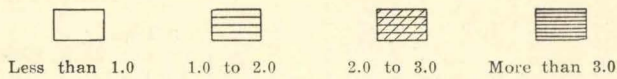
RIVERS

There was a rise on the Mississippi River during the first nine days of the month and a general falling tendency during the rest of the month though there were several slight rises. The average stage was rather high but crest stages were well below the flood stage. At Dubuque the average stage for the month was the highest in six years. Moderate stages prevailed on the Missouri River with a gradual falling tendency except for a few slight rises. On all interior rivers rather low stages prevailed with very little fluctuation.

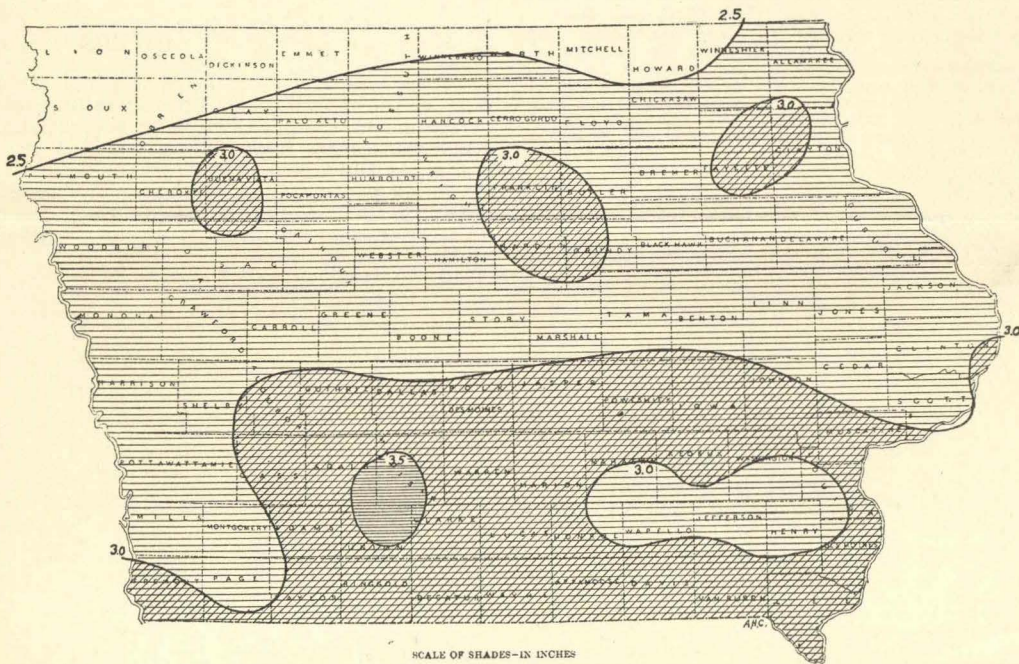
TOTAL PRECIPITATION, APRIL, 1928



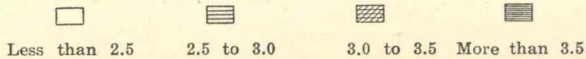
SCALE OF SHADES IN INCHES



NORMAL PRECIPITATION, APRIL
(Based on station records of 30 years or more)



SCALE OF SHADES—IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In co-operation with

IOWA WEATHER AND CROP BUREAU

CHARLES D. REED, Meteorologist

VOL. XXXIX DES MOINES, IOWA, MAY, 1928 No. 5

GENERAL SUMMARY

Following an unusually cold month, temperatures above normal predominated during May. There were a great many fluctuations but the periods in which the temperature was below normal were of short duration, and the only protracted cool weather during the month occurred during the last five days. The longest period of warm weather prevailed from the 14th to 20th, inclusive, but the highest temperature occurred generally either on the 9th or 24th. Frosts occurred at frequent intervals, the heaviest and most general being on the 12th, but following a period of dry weather, the damage was less than would be expected, for staple crops had not advanced sufficiently, and the damage was confined to tender truck crops. The heaviest damage was from the frost on the 28th. While a large area was affected the damage occurred principally in spots. Fields of tomatoes and peppers were completely destroyed, while fields adjoining and apparently no more favorably situated were uninjured. A number of market gardeners had the entire planting of tomatoes killed. Strawberries also suffered somewhat but the crop had been damaged by the dry weather to such an extent that the frost damage was of little consequence.

Precipitation was but slightly more than half the normal and occurred in two principal rain periods, both periods being followed by protracted dry periods in which only a few light and widely scattered showers occurred. This condition resulted in unusually low humidity. The deficiency was general throughout the State but greatest in the central and eastern portions, where conditions became somewhat drouthy in localities but were relieved by the protracted rainy period beginning on the 15th. At the close of the month rain was generally needed. Severe storms were almost entirely lacking. The one exception was a tornado on the 2d that moved northeastward across Woodbury and Cherokee counties, the center of greatest damage being in the vicinity of Cherokee.

The weather was ideal for farm operations. Corn was planted generally earlier than usual and under the most favorable conditions. The crop came up to a good stand in nearly all fields and the development has been up to or in advance of the average. Cultivation has progressed and fields are starting out clean. Due to dry weather, small

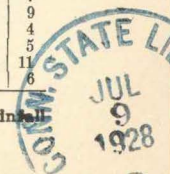
grain did not develop normally and pastures and hay at many places in the eastern, central and southern sections were injuriously affected by the lack of timely rains. The prospects for potatoes are unusually favorable. Fruit deteriorated considerably. Apples were falling badly and the set of small tree fruit was less than that anticipated. The prospects for blackberries and black raspberries was excellent and with favorable weather these fruits will yield good crops. Road conditions, except following the rainy period at the middle of the month, were good.

F. L. D.

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
1873.....	56.5	- 3.6	86	38	5.99	+ 1.41	9.10	3.42					
1874.....	64.1	+ 4.0	94	41	1.88	- 2.70	4.49	0.50					
1875.....	60.5	+ 0.4	91	26	2.94	- 1.64	6.70	1.63					
1876.....	61.1	+ 1.0	90	32	2.84	- 1.74	7.38	1.09					
1877.....	60.3	+ 0.2	92	29	4.30	- 0.28	11.00	1.60					
1878.....	55.7	- 4.4	88	32	5.01	+ 0.43	11.95	2.14					
1879.....	62.9	+ 2.8	93	26	4.38	- 0.20	8.70	1.40					
1880.....	66.3	+ 6.2	96	37	4.06	- 0.52	8.45	1.47					
1881.....	66.7	+ 6.6	95	35	3.73	- 0.85	9.30	0.40					
1882.....	54.3	- 5.8	83	24	5.42	+ 0.84	12.55	1.50					
1883.....	54.6	- 5.5	90	31	6.25	+ 1.67	11.68	1.30					
1884.....	59.6	- 0.5	88	33	3.15	- 1.43	6.36	1.00					
1885.....	57.4	- 2.7	86	27	3.44	- 1.14	9.33	1.05					
1886.....	62.5	+ 2.4	96	30	3.38	- 1.20	7.63	1.30					
1887.....	64.6	+ 4.5	96	34	1.55	- 3.03	5.84	0					
1888.....	53.8	- 6.3	88	22	6.58	+ 2.00	10.85	2.00					
1889.....	59.2	- 0.9	92	22	4.06	- 0.52	8.54	1.40					
1890.....	56.5	- 3.6	96	26	3.64	- 0.94	6.44	1.60					
1891.....	58.3	- 1.8	94	21	3.18	- 1.40	7.10	1.46					
1892.....	51.0	- 6.1	88	29	8.77	+ 4.19	12.61	4.87	T.	16	5	9	17
1893.....	56.6	- 3.5	96	26	3.45	- 1.13	5.82	1.65		0	9	13	9
1894.....	61.1	+ 1.0	96	22	1.87	- 2.71	4.77	0.33		0	6	17	10
1895.....	61.7	+ 1.6	104	24	3.19	- 1.39	5.79	0.84		0	9	11	12
1896.....	65.5	+ 5.4	100	34	6.69	+ 2.11	11.79	3.40		0	12	11	12
1897.....	58.5	- 1.6	96	20	1.92	- 2.66	3.59	0.21		0	5	16	10
1898.....	59.6	- 0.5	92	26	4.67	+ 0.09	7.82	2.22		0	12	9	10
1899.....	30.2	+ 0.1	90	27	6.23	+ 1.65	11.47	3.09		0	13	9	12
1900.....	63.2	+ 3.1	98	22	3.31	- 1.27	6.98	0.96		0	8	14	10
1901.....	60.7	+ 0.6	95	28	2.35	- 2.23	4.57	0.72		0	7	16	9
1902.....	63.8	+ 3.7	97	25	5.39	+ 0.81	18.04	0.87		0	13	10	12
1903.....	61.6	+ 1.5	91	24	8.55	+ 3.97	15.45	2.88		0	16	9	12
1904.....	59.6	- 1.5	93	27	3.78	- 0.80	8.15	1.50		0	8	13	10
1905.....	58.3	- 0.8	88	28	5.95	+ 1.37	10.83	2.57		0	14	12	11
1906.....	60.8	+ 0.7	95	24	3.54	- 1.04	10.72	0.89		0	11	13	10
1907.....	53.5	- 6.6	96	14	3.48	- 1.10	7.68	0.71	1.0	10	11	10	10
1908.....	59.4	- 0.7	93	13	8.34	+ 3.76	14.33	1.33		0	15	9	11
1909.....	57.9	- 2.2	97	18	4.34	- 0.24	7.85	1.86	0.1	9	12	12	7
1910.....	55.4	- 4.7	89	18	3.41	- 1.17	6.91	1.29	T.	10	15	7	9
1911.....	64.9	+ 4.8	98	23	3.76	- 0.82	8.73	0.42	0.7	9	16	9	6
1912.....	62.7	+ 2.6	97	29	3.33	- 1.25	6.41	0.72		0	10	14	11
1913.....	59.4	- 0.7	102	30	6.24	+ 1.66	10.25	3.14		0	13	11	8
1914.....	62.2	+ 2.1	98	25	3.31	- 1.27	6.90	0.30	T.	10	14	11	6
1915.....	56.1	- 4.0	99	25	7.34	+ 2.76	13.21	3.82	T.	14	9	9	13
1916.....	59.9	- 0.2	94	27	4.93	+ 0.35	10.44	2.14	T.	12	13	10	8
1917.....	55.1	- 5.0	95	18	3.87	- 0.71	7.33	1.69	0.6	10	15	8	8
1918.....	64.9	+ 4.8	98	25	6.87	+ 2.29	11.98	2.72	T.	13	13	11	7
1919.....	58.2	- 1.9	93	30	3.11	- 1.47	7.14	0.73	0	9	13	11	7
1920.....	59.4	- 0.7	89	29	3.26	- 1.32	5.73	0.62		0	8	14	9
1921.....	63.3	+ 3.2	99	25	4.23	- 0.35	9.41	1.32		0	10	14	10
1922.....	63.4	+ 3.3	91	34	3.53	- 1.05	8.36	0.47		0	12	13	10
1923.....	59.6	- 0.5	90	20	2.84	- 1.74	6.55	1.07	T.	10	14	10	7
1924.....	54.1	- 6.0	94	26	1.71	- 2.87	3.28	0.78	0.1	9	13	9	9
1925.....	57.8	- 2.3	102	20	1.16	- 3.42	2.62	0.30	T.	6	19	8	4
1926.....	64.5	+ 4.4	97	25	2.76	- 1.82	6.83	0.52		0	9	15	11
1927.....	58.4	- 1.7	91	30	4.69	+ 0.11	9.07	0.86	T.	11	10	10	11
1928.....	62.6	+ 2.5	93	26	2.47	- 2.11	6.19	0.61		0	8	17	8

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



Climatological Data for May, 1928

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>Northwest District</i>																					
Akron	Plymouth	1,153	2									4.20	+ 0.45	1.04	0	9	17	9	5	s.	Orlan C. Moore D. E. Hadden
Alta	Buena Vista	1,513	37	62.2	+ 3.6	90	9	35	12	41	3.50	- 1.41	1.40	0	8	17	8	6	n.		
Alton	Sioux	1,305	23	61.2	+ 2.6	90	9†	30	1	51	3.61	- 1.21	1.27	0	10	11	15	5	n.w.	W. S. Slagle	
Cherokee	Cherokee	1,196	8	60.7	+ 2.7	89	24	33	12	47	4.32	- 0.35	1.75	0	10	15	12	4	n.	J. E. Wirth	
Estherville	Emmet	1,298	33	62.5	+ 5.5	91	24	32	12	43	3.20	- 1.27	2.60	0	7	22	7	2	s.	A. O. Peterson	
<i>Hawarden</i>																					
Inwood	Sioux	1,181	2								4.55	+ 0.80	1.85	0	12	14	5	12	se.	Earl V. Slife	
Lake Park (near)	Lyon	1,474	24	61.2	+ 3.5	93	9	30	1	53	2.42	- 1.78	0.91	0	9	20	6	5	s.	A. C. Hanson	
Le Mars	Dickinson	1,489	15	61.5	+ 4.0	91	9†	32	11	45	2.92	- 1.11	1.60	0	6				n.w.	P. M. Lawrence	
Marathon	Plymouth	1,224	32	62.0	+ 3.0	90	9†	32	1†	51	4.25	- 0.28	1.85	0	10	20	8	3	s.	Henry Newell	
	Buena Vista	1,390	2								3.84		1.41	0	9	19	4	8	n.w.	E. G. Smith	
<i>Pocahontas</i>																					
Pocahontas	Pocahontas	1,248	24	61.4	+ 2.6	91	9	32	12	44	3.42	- 1.01	1.16	0	9	19	6	6	n.	F. E. Hronek	
Rock Rapids	Lyon	1,349	29	60.8	+ 2.8	90	9	28	1	53	3.34	- 0.21	1.17	0	8	22	6	3	s.	Nellie F. Medberry	
Sanborn	O'Brien	1,553	14	60.6	+ 2.5	89	24	29	12	44	2.83	- 1.96	1.24	0	8	12	10	9	sw.	J. W. Dow	
Sheldon	O'Brien	1,418	17	61.4	+ 3.2	91	9	28	1	53	2.89	- 1.86	1.28	0	9	19	8	4	n.w.	Ross E. Forward	
Sioux Center	Sioux	1,426	29	61.0	+ 2.8	91	24	30	1	52	2.70	- 2.01	0.78	0	7	14	8	9	s.	J. De Ruyter	
<i>Spencer</i>																					
Storm Lake	Clay	1,319	14	62.0	+ 3.5	93	24	30	1†	51	3.91	- 0.29	2.00	0	8	15	9	7	ne.	E. W. Little	
Washita	Buena Vista	1,440	39	61.9	+ 2.8	90	24	35	12	39	3.65	- 0.84	0.97	0	9	17	8	6	se.	George H. Fracker	
West Bend	Cherokee	1,157	30	60.3	+ 2.0	90	24	30	1†	51	4.82	+ 0.20	1.55	0	9	22	4	5	s.	H. L. Felter	
	Palo Alto	1,197	35	61.6	+ 2.3	91	24	30	12	45	1.60	- 2.50	0.40	0	7	20	8	3	n.w.	Jos. Dorweiler	
<i>Means and extremes</i>																					
				61.4	+ 3.1	93	9†	28	1	53	3.47	- 0.91	2.60	0	9	17	8	6	s.		
<i>North Central District</i>																					
Algona	Kossuth	1,213	55	62.7	+ 3.5	90	9	35	12	37	3.17	- 1.11	0.70	0	7	24	4	3	se.	W. E. Laird	
Allison	Butler	1,060	14	60.4	+ 1.7	90	24	34	12†	38	3.29	- 1.19	2.24	0	6	17	9	5	n.	E. W. Detra	
Beimond	Wright	1,181	18	61.2	+ 2.6	92	24	30	12	41	2.49	- 2.72	1.41	0	7	10	10	11	n.w.	H. F. Luick	
Britt	Hancock	1,236	41																	James S. Ross	
Charles City	Floyd	1,015	37	60.5	+ 2.7	90	24	34	12	37	2.44	- 2.00	1.46	0	8	20	8	3	n.w.	U. S. Weather Bureau	
<i>Forest City</i>																					
Hampton	Winnebago	1,226	34	60.8	+ 2.7	92	24	36	12†	38	2.22	- 2.42	1.01	0	9	18	8	5	n.w.	Dr. M. B. Neill	
Humboldt	Franklin	1,145	3								2.39	- 2.61	1.54	0	4					L. H. Davis	
Mason City	Humboldt	1,095	40	61.6	+ 1.6	93	24	30	12	46	2.14	- 2.18	1.02	0	8	18	7	6	n.	H. C. Snitker	
Northwood	Cerro Gordo	1,148	31	59.2	+ 1.2	88	9	29	12	40	1.01	- 3.08	0.85	0	6	14	15	2	n.w.	American Beet Sugar Co.	
	Worth	1,222	32	60.8	+ 3.5	89	24	35	12	35	3.68	- 1.41	1.00	0	6	17	9	5	n.w.	Charles Dwelle	
<i>Osage</i>																					
	Mitchell	1,163	34	60.8	+ 3.0	90	24	34	12	35	1.92	- 2.76	0.97	0	7	17	8	6	n.w.	Dr. C. E. Juhl	
<i>Means and extremes</i>																					
				60.9	+ 2.5	93	24	29	12	46	2.54	- 2.17	2.24	0	7	17	9	5	n.w.		
<i>Northeast District</i>																					
Decorah	Winneshiek	872	35	60.3	+ 1.9	90	24	29	12	45	1.71	- 2.95	0.95	0	5	20	3	8	n.w.	M. D. Whitney	
Dubuque	Dubuque	700	55	62.4	+ 2.1	90	24	39	12	36	1.55	- 2.67	0.42	0	11	9	14	8	n.w.	U. S. Weather Bureau	
Fayette	Fayette	1,003	40	61.4	+ 3.4	91	24	29	12	45	2.54	- 2.32	1.20	0	7	21	6	4	n.w.	R. Z. Latimer	
Independence	Buchanan	921	64	62.1	+ 2.5	90	9†	32	1	41	2.31	- 1.96	1.45	0	6	24	1	6	se.	Dr. Geo. Boody	
Lansing	Allamakee	632	21								1.85	- 3.15	0.61	0	7					Mrs. Mary Spinner	
<i>New Hampton</i>																					
Osceola	Chickasaw	1,169	31								2.10	- 2.32	1.10	0	3	20	7	4	s.	D. W. Dawson	
Postville	Fayette	1,036	5	61.8	+ 3.1	91	24	34	12	37	2.10	- 2.32	1.10	0	3	20	7	4	s.	John T. Ridler	
Waterloo	Clayton	1,192	29	58.8	+ 1.4	87	24	31	12	43	1.73	- 3.33	0.92	0	8	17	11	3	n.w.	F. L. Williams	
Waverly	Black Hawk	854	45	62.8	+ 2.6	91	9	30	12	38	3.10	- 0.99	1.40	0	7	20	5	6	n.w.	R. B. Slippy	
	Bremer	936	32	61.6	+ 2.8	92	24	31	12	42	2.20	- 2.24	1.10	0	7	27	2	2	n.	D. H. Murphy	
<i>Means and extremes</i>																					
				61.4	+ 2.5	92	24	29	12	45	2.12	- 2.46	1.45	0	7	20	6	5	n.w.		
<i>West Central District</i>																					
Audubon (near)	Audubon	1,297	33	62.0	+ 2.7	91	24	37	12	40	4.01	- 0.37	1.40	0	10	18	8	5	n.	George Kibby	
Carroll	Carroll	1,265	38	62.1	+ 2.2	90	24	35	12	41	3.48	- 1.08	1.07	0	8	20	5	6	n.w.	Mrs. Jos. J. Wolfe	
Denison	Crawford	1,171	34	62.8	+ 2.7	91	24	34	12	42	4.07	- 0.21	0.88	0	9	14	8	9	n.w.	V. L. Byers	
Guthrie Center	Guthrie	1,077	33	62.6	+ 3.1	90	9†	34	12	41	2.76	- 1.94	0.81	0	10	19	3	9	n.w.	H. A. Stafford	
Harlan	Selby	1,192	29	61.6	+ 1.5	89	9	35	12	47	4.28	- 0.28	1.64	0	8	15	9	7	n.	Walter Bell	
<i>Jefferson</i>																					
Little Sioux	Greene	1,052	29	61.6	+ 1.8	90	24	32	12	44	3.39	- 1.16	1.34	0	8	15	6	10	sw.	W. I. Lyon	
Logan	Harrison	1,040	23	63.8	+ 2.7	92	24	36	1	50	3.65	- 0.79	1.30	0	12	11	16	4	n.	H. W. Kerr	
Onawa	Harrison	1,120	61	63.4	+ 2.1	92	24	35	12	48	3.19	- 1.05	1.27	0	8	14	13	4	ne.	Amy Ann Stern	
Rockwell City	Monona	1,051	27	62.0	+ 1.1	93	9	29	4	45	3.20	- 1.63	0.93	0	6	19	3	9	s.	Mrs. H. E. Colby	
	Calhoun	1,232	32	60.8	+ 2.0	90	24	32	12	42	2.89	- 2.04	0.85	0	7	21	2	8	n.w.	A. W. McIsaac	
<i>Sac City</i>																					
Sioux City	Sac	1,269	52	61.1	+ 2.4	90	9†	35	12	41	2.56	- 1.60	1.25	0	7	17	7	7	n.	F. P. Kessler	
	Woodbury	1,135	39	63.0	+ 2.6	92	9	39	12	33	5.36	+ 1.47	1.85	0	12	11	11	9	n.	U. S. Weather Bureau	
<i>Means and extremes</i>																					
				62.2	+ 2.2	93	9	29	4	50	3.57	- 0.89	1.85	0	9	16	8	7	n.		
<i>Central District</i>																					
Ames	Story	926	51	63.6	+ 2.8	91	24	36	12†	39	1.91	- 2.60	0.75	0	6	21	1	9	n.w.	Iowa State College	
Baxter	Jasper	998	28	62.7	+ 2.2	90	24	35	12	39	1.50	- 3.86	0.56	0	6	9	19	3	sw.	Otto Sanderman	
Boone (near)	Boone	1,134	23	61.5	+ 1.6	91	24	29	12	51	3.27	- 1.76	1.60	0	7	15	8	8	s.	C. F. Henning	
Des Moines	Polk	861	50	64.2	+ 2.9	91	24	40	28	36	2.63	- 1.93	2.94	0	9	12	8	11	n.	U. S. Weather Bureau	
Fort Dodge	Webster	1,114	28	61.3	+ 2.1	90	9†	30	12	46	2.14	- 2.44	1.16	0	9	20	5	6	sw.	Samuel Sampson	
<i>Grinnell</i>																					
Grundy Center	Poweshiek	1,031	34	62.2	+ 1.4	89	9	36	28	42	2.32	- 2.65	1.30	0	6	15	10	6	se.	R. E. Bates	
Iowa Falls	Grundy	976	37	62.4	+ 1.8	92	24	34	12	41	2.46	- 2.48	0.68	0	6	19	7	5	sw.	M. G. Heiberger	
Marshalltown	Hardin	1,127	35	61.8	+ 3.0	91															

Climatological Data for May, 1928—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>East Central District</i>																					
Belle Plaine	Benton	866	38	63.0	+ 2.6	91	9	31	12	40	2.92	- 1.89	1.52	0	10	12	15	4	sw.	O. C. Burrows J. T. Wurster Dr. A. P. Bryant U. S. Weather Bureau Rex Shriver	
Cedar Rapids	Linn	737	46	62.0	+ 1.3	90	24	28	12	44	2.54	- 2.16	1.08	0	6	12	9	10	nw.		
Clinton	Clinton	595	55	62.2	+ 1.1	89	24	30	12	42	1.76	- 2.84	0.62	0	10	15	6	10	n.		
Davenport	Scott	580	57	64.2	+ 2.9	88	9	38	7	34	1.08	- 2.86	0.79	0	6	11	14	6	nw.		
Davenport, No. 2	Scott	690	3	64.1		90	3†	33	7†	38	1.19		0.80	0	9	22	6	3	sw.		
Fairport	Muscatine	567	7	63.3	+ 1.4	87	9	35	12	38	1.56	- 2.62	0.95	0	4	19	0	12	s.	Bureau of Fisheries Prof. J. F. Reilly Margaret T. Disney John Strothoff William Molis	
Iowa City	Johnson	733	68	62.6	+ 2.3	88	9	34	12	39	1.58	- 2.95	0.93	0	6	16	9	*6	nw.		
Le Claire	Scott	576	28								1.32	- 3.09	0.43	0	9				n.		
Maquoketa	Jackson	692	23	60.3	+ 1.3	88	9	27	12	44	2.74	- 1.76	0.85	0	6	19	6	6	nw.		
Muscatine	Muscatine	546	67								1.75	- 2.67	0.53	0	8				n.		
Olin	Jones	760	29	62.2	+ 1.9	89	9†	29	12	46	3.42	- 1.27	0.93	0	5	18	8	5	nw.	Mrs. L. Stingley John Kroepfen Dr. F. C. Schadt	
Tipton (near)	Cedar	807	29	61.6	+ 0.8	89	9	29	12	41	1.80	- 3.09	0.84	0	5	6	17	8	n.		
Williamsburg	Iowa	770	12	62.2	+ 2.4	90	9	29	12	42	1.61	- 2.99	0.89	0	6	23	5	3	se.		
Means and extremes						62.5	+ 1.9	91	9	27	12	46	1.94	- 2.58	1.52	0	7	16	8	7	nw.
<i>Southwest District</i>																					
Atlantic	Cass	1,164	37	63.6	+ 2.9	90	9†	37	1†	37	4.02	- 0.21	1.46	0	13	13	6	12	ne.	T. H. Whitney Arthur L. Bishop Dr. H. C. Hawley C. A. Smith Carl E. Pollock	
Bedford	Taylor	1,200									2.55	- 2.04	0.60	0	8	17	9	5	nw.		
Page	Page	1,009	38	63.1	+ 0.2	91	9†	37	1†	46	2.37	- 2.58	0.75	0	8	16	11	4	n.		
Corning	Adams	1,150	36	62.8	+ 2.3	89	9†	32	1†	49	1.89	- 3.15	0.50	0	7	21	7	3	ne.		
Cumberland (near)	Cass	1,225	29								2.94	- 1.24	0.79	0	7	15	8	8	nw.		
Glenwood	Mills	1,100	30	64.4	+ 3.1	90	24	36	1	50	2.34	- 2.27	0.72	0	9	18	6	7	nw.	George Mogridge J. L. Hurley W. S. Matthews B. R. Bridge Geo. C. Rader	
Lenox	Taylor	1,250	33	64.6	+ 2.7	91	24	40	1†	43	2.55	- 2.13	0.91	0	7	18	10	3	nw.		
Oakland	Pottawattamie	1,139	9	62.1	+ 0.9	89	24	35	1†	49	2.60	- 1.71	0.92	0	7				nw.		
Red Oak (near)	Montgomery	1,030	3								6.19	+ 1.44	1.98	0	7	14	14	3	s.		
Riverton (near)	Fremont	920	2								3.37	- 1.43	1.10	0	6	13	7	11	n.		
Thurman	Fremont	960	31	64.6	+ 1.9	92	24	36	1	50	2.82	- 2.13	1.10	0	6	19	4	8	n.	H. H. Askew U. S. Weather Bureau	
Omaha, Neb.	Fremont	1,105	57	65.1	+ 2.7	92	24	46	12	36	1.97	- 1.80	0.79	0	8	12	11	8	n.		
Means and extremes						63.8	+ 2.1	92	24	32	1†	50	2.97	- 1.60	1.98	0	8	16	8	7	nw.
<i>South Central District</i>																					
Afton	Union	1,212	34	64.2	+ 2.8	90	9	36	12	40	1.47	- 3.30	0.46	0	6	16	8	7	ne.	S. R. Brown O. E. McBride Thomas Wood C. C. Burr J. C. Davis	
Albia	Monroe	949	30	64.3	+ 3.0	90	9	37	12	40	0.61	- 4.38	0.25	0	6	12	7	12	nw.		
Centerville	Appanoose	1,013	23	63.9	+ 2.5	88	9†	36	28	38	0.76	- 3.83	0.35	0	9	19	6	6	nw.		
Chariton (near)	Lucas	1,042	33	63.2	+ 3.1	91	24	36	12	40	1.03	- 3.49	0.36	0	4	17	12	2	n.		
Corydon (near)	Wayne	1,050	35	63.8	+ 2.5	90	9	38	28	38	0.93	- 3.74	0.28	0	6	17	9	5	nw.		
Creston	Union	1,291	23	63.6	+ 2.9	90	9	37	28	39	1.53	- 3.01	0.58	0	8				nw.	Mrs. N. Spangler George Phillips Seth F. Shenton W. J. Casey J. B. Alter	
Earlham (near)	Madison	1,126	26	61.6	+ 1.4	90	24	29	12	44	1.98	- 2.46	0.63	0	7	21	6	4	sw.		
Indianola	Warren	972	37	64.1	+ 2.6	90	9†	38	28	39	1.62	- 2.83	0.80	0	7	15	11	5	nw.		
Knoxville	Marion	920	33	63.7	+ 2.2	89	9	34	12	38	1.98	- 2.27	0.87	0	7	14	13	4	ne.		
Lacona	Warren	824	29								1.85	- 2.98	1.08	0	6	12	15	4	n.		
Lamoni	Decatur	1,123	21	63.8	+ 2.6	89	9†	38	12	38	1.77	- 3.18	0.48	0	7	18	8	5	nw.	F. S. Parks Alex Maxwell L. L. Langerak James A. Verploegh H. S. Ely	
Mount Ayr	Ringgold	1,240	35	64.6	+ 3.3	89	24	38	12	40	1.30	- 4.17	0.37	0	9	16	8	7	n.		
Pella (near)	Marion	850	1								1.67	- 2.73	1.14	0	7	20	5	6	se.		
Tingley	Ringgold	1,275	3	62.9	+ 2.5	90	9	36	12	41	1.98	- 2.99	0.81	0	6	16	9	6	nw.		
Winterset	Madison	1,118	37	64.2	+ 2.6	90	9†	35	12	36	3.24	- 1.28	1.68	0	8	17	10	4	sw.		
Means and extremes						63.7	+ 2.6	91	24	29	12	44	1.58	- 3.11	1.68	0	7	16	9	6	nw.
<i>Southeast District</i>																					
Bonaparte (near)	Van Buren	563	37	62.5	+ 1.2	87	24	36	12	37	1.09	- 3.54	0.30	0	6	18	11	2	nw.	B. R. Vale John T. Donnelly Miss Musa Todd R. M. McKenzie U. S. Weather Bureau	
Burlington	Des Moines	544	32	65.1	+ 2.2	90	3†	38	12	38	2.31	- 2.22	0.83	0	6	23	5	3	sw.		
Columbus Junction	Louisa	595	27	62.6	+ 0.4	89	3†	34	12	37	1.26	- 3.05	0.77	0	7	12	16	3	nw.		
Fairfield	Jefferson	780	44	62.1	+ 1.0	89	9	31	12	42	1.74	- 3.70	0.77	0	7	11	11	9	n.		
Keokuk	Lee	614	57	64.8	+ 1.0	88	10	40	7	32	2.55	- 1.38	1.30	0	8	9	9	13	n.		
Keosauqua	Van Buren	644	36	63.2	+ 1.9	89	24	33	28	45	1.56	- 3.32	0.55	0	7	10	15	6	se.	J. H. Landes J. H. Jericho Roy R. Robinson C. L. Mikesh W. E. Utterback	
Mt. Pleasant	Henry	730	47	64.0	+ 1.5	89	9†	35	7†	38	1.64	- 2.98	0.67	0	8	8	21	2	nw.		
Oskaloosa	Mahaska	835	52	62.9	+ 1.7	90	9	35	12	38	1.32	- 2.93	0.82	0	7	12	11	8	sw.		
Ottumwa	Wapello	649	33	64.5	+ 1.5	90	9	35	28	42	1.21	- 3.44	0.50	0	8	18	13	0	se.		
Sigourney (near)	Keokuk	790	32	63.4	+ 2.6	89	9†	36	12	39	2.53	- 1.74	1.70	0	7	17	7	7	n.		
Stockport	Van Buren	747	26	62.0	+ 1.5	89	24	31	12	44	0.94	- 3.72	0.25	0	7	18	7	6	n.	C. L. Beswick D. D. Sherman H. G. Liddle	
Washington	Washington	757	46	64.7	+ 3.2	91	3†	35	7	48	1.96	- 2.20	1.18	0	6	16	7	8	se.		
Wever	Lee	552									1.68		0.58	0	8				n.		
Means and extremes						63.5	+ 1.7	91	3†	31	12	48	1.68	- 2.85	1.70	0	7	14	11	6	n.
State means and extremes						62.6	+ 2.5	93	9†	26	12	53	2.47	- 2.11	2.60	0	8	17	8	6	nw.

Temperature normals are based on the 46-year period July 3, 1875 to July 2, 1921; shorter records corrected to harmonize. Precipitation normals are based on the 50-year period ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1920 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.

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.

Daily Precipitation for May, 1928

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>Northwest District</i>																																		
Akron.....	Big Sioux.....			1.04	.55					.08					.22	.40	.93	.33		.08											.57	T.	4.20	
Alta|||.....	Raccoon.....			.27	1.40				T.						.10	1.22	.08	.08	.20	T.	.13										.10		3.50	
Alton.....	Floyd.....			T.	1.27	.94			T.	.02					.22	.58	.29	.59		.04											.25	.01	3.61	
Cherokee.....	Little Sioux.....			.17	1.75	.40			T.	T.					T.	.19	.52	.19	.79		.01									T.	.29	.01	4.32	
Estherville|||.....	Des Moines.....			1.50	1.10										.05	.20	T.	.05		.20	.10												3.20	
Hawarden.....	Big Sioux.....			.01	1.16	.69			.01	.06					T.	.37	.36	.05	1.15		.08									T.	.55	.06	4.55	
Inwood|||.....	Big Sioux.....			.51	.91						.09				T.	.22	.20	.03	.01		.28											.17	2.42	
Lake Park (near)	Little Sioux.....			1.10	.50										.71	.18				.23						.20						2.92		
Le Mars.....	Floyd.....			T.	1.85	.64			.02	.04					T.	.01	.24	.37	.60	.45	.03											T.	4.25	
Marathon.....	Raccoon.....			.24	1.28					.02					T.	.17	1.41	T.	.14	.51		.04					.03				T.	T.	3.84	
Pocahontas.....	Des Moines.....			.32	.63						.03				.12	.56	1.16	.54		.04							.02						3.42	
Rock Rapids.....	Big Sioux.....			1.17	.78					.03					.43	.03	.55			.25											.10		3.34	
Sanborn.....	Floyd.....			1.24	.55										.38	.25	.12	.12		.12											.05		2.83	
Sheldon.....	Floyd.....			T.	1.28	.65				T.	.01				T.	.30	.17	.25	.06		.09								T.	T.	T.	.08	T.	2.89
Sioux Center.....	Floyd.....			.78	.54				T.	T.					T.	.42	.32	T.	.24		.07										.33	T.	2.70	
Spencer.....	Little Sioux.....			2.00	.75										.41	.15	.40	.10		.05							.05						3.91	
Storm Lake.....	Raccoon.....			.97	.86				.03						T.	.28	.87	.22	.20		.06										.16	T.	3.65	
Washta.....	Little Sioux.....			1.55	.64						T.				T.	.35	.41	.87	.40		.16										.42	.02	4.82	
West Bend.....	Des Moines.....			.20	.22										.07	.36	.30	.40		.05													1.60	
<i>North Central District</i>																																		
Algona.....	Des Moines.....			.26	.70										.60	.70	.55	.26			.10												3.17	
Allison (near)	Cedar.....			.45											.24	2.24		.15	.02								.19						3.29	
Belmond.....	Iowa.....			.16	.72										.10	1.31	.06	.12		.02													2.49	
Britt.....	Iowa.....																																	2.44
Charles City***	Cedar.....			.10	.23						T.				.38	1.08	.55	.06		.02								.02					2.44	
Forest City|||	Cedar.....			.04	1.01				T.						.02	.04	.45	.02	.57		.04												2.22	
Hampton.....	Cedar.....			.48											.10	1.54	.27																2.39	
Humboldt.....	Des Moines.....			.04	1.02				T.		.08				.18	.48	.26	.04		.04													2.14	
Mason City.....	Cedar.....			.25	.85				.01		T.				.65	1.00		.70		.16	.04												1.61	
Northwood.....	Cedar.....			.06	.87						T.																						3.68	
Osage.....	Cedar.....			.18	.28										.28	.97		.11	.06	.04													1.92	
<i>Northeast District</i>																																		
Decorah|||.....	Mississippi.....				.95											.18	.37	.15	.06		T.												1.71	
Dubuque***	Mississippi.....			T.	.09				T.		.03				.13	.25	.02	.42	.02	.03													1.55	
Fayette.....	Mississippi.....			.06	.75						.02				.50	.85		.31	.05	T.						.42	.03	.11	T.	T.			2.54	
Independence.....	Wapsipinicon.....				.18										.08	1.45		.53	.04	.03													2.31	
Lansing|||.....	Mississippi.....			T.	.61	.31										.02	.40	.04	.45														1.85	
New Hampton.....	Wapsipinicon.....																																2.10	
Oelwein.....	Wapsipinicon.....				.60						T.				T.	1.10		.40															1.73	
Postville.....	Mississippi.....			T.	.08	.10				.04					.17	.92		.20	.19	.03													3.10	
Waterloo|||.....	Cedar.....				.30	T.					T.					1.40	.65	.55	.10		T.										.05	.05	3.10	
Waverly.....	Cedar.....			.03	.53										.16	1.10		.18	.11														2.20	
<i>West Central District</i>																																		
Audubon (near)...	Nishnabotna.....			.02	.06	1.40					.02				T.	.40	1.10		.28		.03										.60	.10	4.01	
Carroll|||.....	Raccoon.....				.90										T.	.20	.86	.07	1.07	.06		.10									.22		3.48	
Denison.....	Missouri.....			.41	.71										.38	.70	.72	.16		.16											.78	.05	4.07	
Guthrie Center.....	Raccoon.....			.03	.08	.47									.27	.81	.01	.39	.03	.01											.66		2.76	
Harlan.....	Nishnabotna.....			.07	.64				T.		T.				T.	.57	1.64		.85	.17											.33	.01	4.28	
Jefferson.....	Raccoon.....			.06	.17	.58					T.				T.	.27	1.07	.85	.25		T.										.14	T.	3.39	
Little Sioux.....	Little Sioux.....				.65	.43				.01				.01	.02	1.30	.02	.10		.57							.02				.40	T.	3.65	
Logan.....	Missouri.....			1.27	.49										.07	.65	.23	.14		.14											.32	.02	3.19	
Onawa.....	Missouri.....			.45	.93										T.	.25	.50	.50	.80		.27										.27	T.	3.20	
Rockwell City.....	Raccoon.....			T.	.75										.37	.85	.50	.25	.05	T.											.12		2.89	
Sac City.....	Raccoon.....				.22	.40					T.					.20	1.25	.09	T.		.12										.28	T.	2.56	
Sioux City***	Missouri.....			.83	1.39	.02				T.	.10	T.			T.	.01	.34	.26	1.64	.29	.03										.44	.01	5.36	
<i>Central District</i>																																		
Ames.....	Skunk.....			T.	.75										.13	.16	.70	.11	.06														1.91	
Baxter.....	Skunk.....				.38						T.				.31	.18	.01	.56	.06														1.50	
Boone (near)|||	Des Moines.....				.58										.06	.29	.64	1.60	.05		T.										.05		3.27	
Des Moines***	Des Moines.....			.01	.08	.12					.03				T.	.21	.01	1.80	.24		T.										.13		2.63	
Fort Dodge|||	Des Moines.....				1.16				.01	.04					.08	.52	.11	.16	.01		.05												2.14	
Grinnell.....	Iowa.....			T.	.24						T.				.41	.10	T.	1.30	.08	T.								.19	T.				2.32	
Grundy Center.....	Cedar.....				.60										.15	.73		.68	.10												.20		2.46	
Iowa Falls|||	Iowa.....				.56				T.						.03	.31	.56	.46	T.	T.											.08		2.00	
Marshalltown|||	Iowa.....			T.	.33					T.					.01	.61	.16	.31	.24		.02										.03	.04	1.75	
Monroe.....	Des Moines.....			.02							T.				.28	.09	1.17	2.01	.12	T.		.02											3.69	
Perry.....	Raccoon.....			T.	.27	.18					T.				T.	.24	.36	.66	.29		.10										.13	.05	2.28	
Toledo.....	Iowa.....			.25	.20																													

Daily Precipitation for May, 1928—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>Southwest District</i>																																		
Atlantic|||	Nishnabotna			.32	1.26						.06				.13	1.46	.08	.52	.01		.02											.01	.15	4.02
Bedford	102	.29	.51												.42	.60	.32	.30														.06	.05	2.55
Clarinda|||	Nodaway		.02	.75											.43	.38	.34	.22				.15											.08	2.37
Corning	Nodaway			.50						.01				.15	.35	.50	.18															.20	1.89	
Cumberland (nr.)	Nodaway	.14	.22	.49						T.				T.	.41	.72		.79			T.							T.			.17	2.94		
Glenwood	Missouri		.15	.72						.02	.03			.04	.63	.36		.37			.02												2.34	
Lenox	Missouri	.03		.50						T.				.25	.55	.91		.06													.25	2.55		
Oakland	Nishnabotna			.92						.06				.02	.52	.80					.04									.24	2.60			
Red Oak (near)	Nishnabotna	T.	.68	1.30						T.				.04	1.64	1.60		.40												.53	6.19			
Riverton (near)	Nishnabotna	T.		1.10						T.				.23	1.05	.16	.30													.53	3.37			
Thurman	Missouri		T.	.58										.06	.40	.55		1.10			T.									.13	2.82			
Omaha, Neb., **	Missouri		.79							.09			T.	.18	.51	.10	T.	.21			.07				T.				T.	.02	1.97			
<i>South Central District</i>																																		
Afton	Grand		T.	.46											.34	.34		.12		T.	.02						T.			.19	1.47			
Albia|||	Des Moines			T.							T.				.05	.25	T.	.20	.03		.01							T.			.07	0.61		
Centerville	Chariton		T.	.01						.01	.03				.21	.14		.07				.07								.21	.01	0.76		
Chariton (near)	Chariton			.18											.16		T.	.33			T.									.36	T.	1.03		
Corydon (near)	Chariton			.07							.09			.27		.09		.13									T.			.28	T.	0.93		
Creston|||	Missouri			.10	.40	.01					T.				.04	.58	.01	.27												.12	1.53			
Earlham (near)	Des Moines		T.	T.	.40						.03				.14	.15	.08	.55												.63	1.98			
Indianola	Des Moines		T.	.22						T.	T.				.13	.20	.06	.80	.04	T.							T.		.17	1.62				
Knoxville	Des Moines		T.	.17							T.				.26	.10	.28	.87	.20	T.							T.		.10	1.98				
Lacona	Des Moines			.30											.08	.10	1.08	.04											.25	1.85				
Lamoni|||	Grand			.42							.18				.07	.48	.01	.45												.16	1.77			
Mount Ayr	Grand		.06	.29							T.			.03	.19	.37		.06		T.	.03						T.		T.	.18	.09	1.30		
Pella (near)	Skunk		T.	.11							T.				.29	.03	.70	.44			.03									.07	1.67			
Tingley	Platte		.15	.40									T.	T.	.23	.58		.42			T.								T.	.20	1.98			
Winterset	Des Moines		T.	T.	.22						T.			T.	.22	.05	.49	1.68			.02						.01			.55	3.24			
<i>Southeast District</i>																																		
Bonaparte (near)	Des Moines			.07							T.				.29	.29	T.	.30			.11											1.09		
Burlington|||	Mississippi				.05							.31				.83	T.	.24	.80		.08			T.								2.31		
Columbus Jct.	Iowa			.04	.01						.09				.16	.11		.77			.08											1.26		
Fairfield	Skunk			.04						.21					.03	.77	.19	.45			T.	.05						T.				1.74		
Keokuk***	Mississippi			.01							.15	.01			.77	.53	T.	.92			.07				.09			T.				2.55		
Keosauqua	Des Moines			T.							.02	T.			.41	.55	T.	.24			.13									.03	1.56			
Mt. Pleasant	Skunk			.08						.14	.04				.34	.22	.09	.67			.06							T.				1.64		
Oskaloosa	Des Moines		T.	.06							T.	T.		T.	.29	.04	T.	.82		.04	T.						T.	.03	T.		.04	1.32		
Ottumwa	Des Moines			.01							.15				.50	.08	.12	.14			.17										.04	1.21		
Sigourney (near)	Skunk			T.							T.				.48	.10	T.	1.70	.11	.04							.04	.06			2.53			
Stockport	Skunk			.03							T.	.07			.21	.23	.06	.25			.09									T.	0.94			
Washington	Skunk			T.							T.				.15	.60	.01	1.18			.01										1.96			
Wever	Mississippi				.03							.24			.55	.04	.16	.58			.05									T.	1.68			

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.
 T. Precipitation is less than .01 inch rain or melted snow.

TEMPERATURE

The mean temperature for the State, derived from the means of nine districts of nearly equal area, and based on the records of 103 stations, was 62.6°, or 2.5° higher than the normal. The excess was general throughout the State and quite uniform, ranging from 3.2° in the central division to 1.7° in the southeastern division. The highest monthly mean was 65.1° at Burlington, and the lowest was 58.8° at Postville. The absolute range for the State was 67°, ranging from 93° at Inwood and Onawa on the 9th and Humboldt and Spencer on the 24th, to 26° at Webster City on the 12th. The average number of days with the maximum temperature, 90°, or above was 1, and the average number with the minimum 32°, or lower was also 1. More than two-thirds of the stations reported temperatures of 90° or higher, while considerably less than one-half reported temperatures of 32°, or lower.

PRECIPITATION

The average precipitation for the State, derived from the averages of nine divisions of nearly equal area, and based upon the records of 118 stations, was 2.47 inches, or 2.11 inches less than the normal. The deficiency was general except in a few small areas. There were but two general precipitation periods, the first during the middle of the 1st week and the other covering most of the 3d week; during the rest of the month a few scattered showers occurred and at the end of the month drouthy conditions were developing at many places in the eastern and southern portions of the State. The greatest amount reported from a single station was 6.19 inches at Red Oak, and the least was 0.61 inch at Albia. The greatest amount occurring in 24 consecutive hours was 2.60 inches at Estherville on the 3d-4th.

Daily Maximum and Minimum Temperature for the Month of May, 1928

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.

IOWA STORMS, MAY, 1928

Date	County	Township	Nature of Storm	Time	Storm Moved From	Width of Path Miles	Length of Path Miles	Area of Sq. Miles	Size of Hailstones Inches	Damage	Persons Killed	Persons Injured
2	Cherokee	Cherokee, Rock and Willow	Tornado	7:30 p. m.	SW to NE	3				\$350,000		3
2	Buena Vista	Barnes and Lee	Tornado	7:30 p. m.	SW to NE	1						
2	Buena Vista	Poland	Wind	9:00 p. m.	SW to NE							
2	Clay	Gillett's Grove	Wind	7:00 p. m.	SW to NE					500		
2	Monona	Fairview	Wind	7:00 p. m.						1,000		
2	Woodbury	Union and Wolf Creek	Tornado	7:30 p. m.	SW to NE	2				100,000		1
17	Blackhawk	Lester	Hail	5:00 p. m.	SW to NE	1½				Fruit		
17	Buena Vista	Hayes	Hail									
17	Grundy	Grant and Blackhawk	Hail	6:00 p. m.	SW to NE	1½			½	Fruit		
17	Hamilton	Williams	Hail									
17	Hancock	Crystal	Hail									
17	Plymouth	Preston	Hail									
17	Sac	Eureka	Hail									
17	Tama	Lincoln	Hail	6:00 p. m.	SW to NE	1½			½	Fruit		
18	Des Moines	Union and Flint River	Hail	4:30 p. m.	NW to SE					Hazel nuts		
18	Lee	Green Bay	Hail	4:30 p. m.	NW to SE	1				Marbles		
22	Grundy	Grant	Hail	5:30 p. m.	W to E				½			
22	Blackhawk	Blackhawk	Hail	5:30 p. m.	W to E				½			
24	Clarke	Green Bay	Hail									
24	Dubuque	Dubuque	Hail									
24	Mahaska	Spring Creek	Hail	9:00 p. m.	NW to SE	¼				Marbles	1,200	

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			% possible			
						7 A. M.	12 Noon	7 P. M.	Lowest		Date	Average hourly velocity	Miles			From	Date
Chas. City	29.97	30.48	12	29.62	9	64	39	42	19	13	4,291	5.8	27	s.w.	2	82	+20
Davenport	29.96	30.48	12	29.60	26	63	40	44	20	13	4,612	6.2	21	e.	26	75	+13
Des Moines	29.95	30.46	12	29.60	9	65	40	41	16	1	4,699	6.3	29	s.w.	2	70	+10
Dubuque	29.95	30.51	12	29.63	9	65	40	47	20	1	4,323	5.8	26	n.w.	24	69	+11
Keokuk	29.96	30.49	12	29.62	26	63	41	43	17	13	4,737	6.4	24	w.	24	71	+6
Sioux City	29.97	30.48	12	29.50	2	66	46	45	12	25	7,140	9.6	35	s.	8	74	+17
Omaha, Nb.	29.95	30.44	12	29.56	2	60	43	44	16	1	5,120	6.9	23	n.	4	71	+9
Means and extremes	29.96					64	41	44				6.7				73	+12
Normals and records	29.95	*30.58	4th 1910	29.50	2	77	77	59	3rd 1875	10	1889		67	n.w.	21st 1894	61	

‡Local mean time *Dubuque §Omaha ||Also at Sioux City, 9th, 1927 ¶Sioux City †Also other dates.

‡January 1, 1928, 3-cup anemometers replaced the 4-cup instruments used since the establishment of the Weather Bureau stations. The new instruments will more accurately indicate the true wind movement. The records of the 4-cup instruments were somewhat too high at moderate velocities and considerably too high at the higher velocities. Tables of true velocities corresponding to indicated velocities appear in the January, 1928 Climatological Data. For purposes of comparison the highest velocity of record in the lower line of the table has been converted into a 3-cup velocity.

MISCELLANEOUS PHENOMENA

Aurora: 27th.
 Dust storms: 1st, 2d, 11th.
 Fog: 17th.
 Frost: 1st, 5th, 6th, 7th, 12th, 21st, 28th.
 Hail: 3d, 17th, 18th, 24th, 26th.
 Halos (lunar and solar): 5th, 8th, 14th, 20th, 28th.
 Haze: 8th, 22d, 23d, 24th, 28th.
 Thunderstorms: 2d, 3d, 4th, 8th, 9th, 10th, 15th, 16th, 17th, 18th, 20th, 24th, 25th, 26th, 30th, 31st.
 Tornado: 2d.
 Winds (strong): 1st, 2d, 4th, 7th.

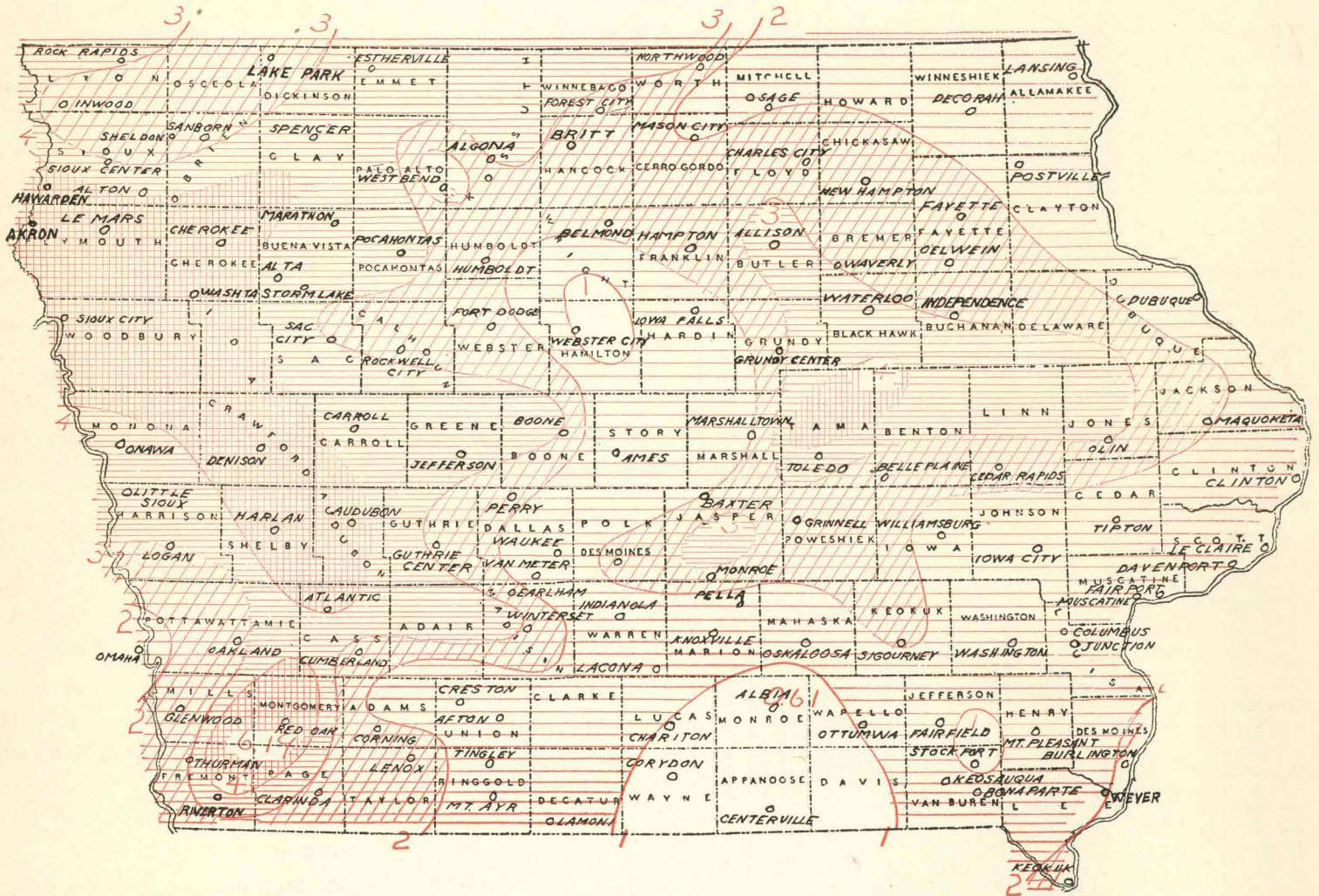
RIVERS

Except for slight rises at the beginning and about the middle of the month there was a gradual falling tendency on the Mississippi River, with the average stage slightly below normal; on the Missouri River the opposite condition prevailed and for the most of the month the stage gradually increased. On most interior rivers rising stages prevailed until near the middle of the month and a gradual fall the rest of the month. No damaging high water was reported from any stream.

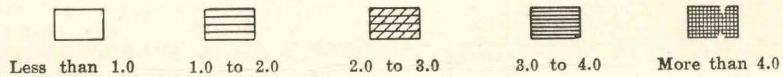
ERRATA

Report for April, 1928. Page 26. Inwood; days with 0.01 inch, or more, precipitation published 6, should be 7. Sioux Center; mean temperature published 41.0°, should be 40.8°; departure published -5.5°, should be -5.7°. Page 27. Williamsburg; total precipitation published 2.04 inches, should be 2.09 inches; departure published, -1.31 inches, should be -1.26 inches.

TOTAL PRECIPITATION, MAY, 1928



SCALE OF SHADES IN INCHES



U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.
 CHARLES F. MARVIN, Chief.

CLIMATOLOGICAL DATA.

IOWA SECTION

In co-operation with

IOWA WEATHER AND CROP BUREAU

CHARLES D. REED, Meteorologist

crop, while light, promised good quality. Due to the frequent showers, dirt roads were in poor condition most of the time. Pastures generally showed rank growth toward the close of the month, and stock continued in good condition.

F. L. D.

VOL. XXXIX DES MOINES, IOWA, JUNE, 1928 No. 6

COMPARATIVE DATA FOR THE STATE—JUNE

GENERAL SUMMARY

The outstanding feature of the weather during June was the persistent coolness. The average number of days with the temperature below normal was 26, and on those days which were above normal the excess was slight. The general impression that the month was cool was fully verified by the mean temperature for the State, which was 64.5°, equalling the previous low record for the State. There were a number of unusually cool days, but no abnormally low minima occurred and most of the deficiency was due to low maxima. No maxima as high as 90° occurred and the maximum for the State was the lowest of record for June. On only one other occasion in June has the maximum failed to reach 90°.

The precipitation for the State averaged nearly one inch above normal, but in about one-third, embracing nearly all the northern portion, there was a deficiency. There was no station that did not receive more than one-half of the normal precipitation and the amount, due to the cool weather, was ample in all the State. Conditions were rather dry during most of the first week, but before its close a general shower period set in and during the rest of the month shower periods were frequent and general. The showers were generally moderate; excessive falls occurred only at scattered places. Storms of a destructive nature occurred on a large number of days, the first on the 6th and the last on the 28th. Four distinct tornadoes occurred, the most destructive being in Adams county on the 18th.

From an agricultural standpoint the weather was mostly favorable. All crops advanced satisfactorily, but in some localities in the eastern and southern portions, cultivation of corn was impossible and fields were becoming grassy. Haying was interfered with considerably. Cool weather crops developed rapidly. Early potatoes showed good yields and truck crops and gardens were very promising, though weeds and grass became troublesome. Raspberries were ripening at the end of the month, other small fruit showed good prospects, and the apple

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
1873.....	74.5	+ 5.2	96	56	4.68	+ 0.19	8.40	1.20					
1874.....	71.4	+ 2.1	98	47	5.83	+ 1.34	8.55	2.60					
1875.....	67.5	- 1.8	92	45	7.81	+ 3.32	10.80	1.63					
1876.....	67.6	- 1.7	92	41	4.09	- 0.40	10.34	0.25					
1877.....	66.9	- 2.4	92	40	6.80	+ 2.31	13.12	3.21					
1878.....	66.7	- 2.6	94	44	6.34	+ 1.85	11.60	2.78					
1879.....	69.4	+ 0.1	92	40	5.12	- 0.63	10.60	1.47					
1880.....	71.0	+ 1.7	96	42	4.40	- 0.09	11.12	1.03					
1881.....	70.4	+ 1.1	100	40	7.37	+ 2.88	17.37	2.75					
1882.....	68.1	- 1.2	98	33	7.48	+ 2.99	15.41	2.93					
1883.....	67.6	- 1.7	96	38	6.69	+ 2.20	14.20	1.30					
1884.....	70.2	+ 0.9	95	36	3.65	- 0.84	8.80	0.70					
1885.....	67.9	- 1.4	89	42	5.08	+ 0.59	11.04	1.31					
1886.....	69.3	0.0	98	34	1.73	- 2.76	3.42	0.10					
1887.....	72.1	+ 2.8	103	40	2.93	- 1.56	7.92	0.96					
1888.....	69.4	+ 0.1	102	34	2.93	- 1.56	6.01	0.96					
1889.....	66.7	- 2.6	98	33	4.75	+ 0.26	9.87	1.69					
1890.....	72.2	+ 2.9	106	39	6.67	+ 2.18	16.53	1.57		11	12	10	8
1891.....	69.1	- 0.2	99	37	5.39	- 0.90	19.88	1.68		11	8	10	12
1892.....	69.2	- 0.1	102	42	5.19	- 0.70	14.16	0.67		10	12	11	7
1893.....	71.2	+ 1.9	100	40	3.91	- 0.58	7.56	1.36		8	15	11	4
1894.....	73.2	+ 3.9	104	34	2.67	- 1.82	6.20	0.57		7	16	10	4
1895.....	69.7	+ 0.4	102	34	4.32	- 0.17	9.26	0.98		10	11	11	8
1896.....	69.1	- 0.2	100	40	3.11	- 1.38	7.89	0.81		9	12	13	5
1897.....	69.1	- 0.2	103	29	3.81	- 0.68	9.38	1.03		10	10	12	8
1898.....	71.4	+ 2.1	99	42	4.72	+ 0.23	12.48	1.90		9	13	10	7
1899.....	70.7	+ 1.4	100	42	5.04	+ 0.55	11.99	1.10		10	12	13	5
1900.....	69.7	+ 0.4	102	38	3.98	- 0.51	12.35	0.67		5	17	10	3
1901.....	72.3	+ 3.0	106	30	3.71	- 0.78	7.84	1.05		9	15	11	4
1902.....	65.2	- 4.1	97	32	7.16	+ 2.67	16.04	1.46		14	8	11	11
1903.....	64.6	- 4.7	96	30	2.86	- 1.63	6.04	0.75		10	13	10	7
1904.....	67.1	- 2.2	94	35	3.45	- 1.04	8.35	0.44		7	13	10	7
1905.....	69.9	+ 0.6	100	36	5.53	+ 1.04	14.89	1.80		10	12	11	7
1906.....	67.9	- 1.4	99	37	3.92	- 0.57	8.27	1.48		8	15	10	5
1907.....	66.5	- 2.8	98	36	5.35	+ 0.86	9.33	2.07		11	14	9	7
1908.....	67.1	- 2.2	94	35	5.06	+ 1.17	11.88	1.77		13	12	10	8
1909.....	69.1	- 0.2	96	40	6.41	+ 1.92	13.30	2.80		13	12	10	8
1910.....	69.5	+ 0.2	105	33	1.99	- 2.50	5.51	0.05		7	18	7	5
1911.....	75.7	+ 6.4	108	36	1.82	- 2.67	6.28	0.06		5	20	8	2
1912.....	66.2	- 3.1	101	34	2.74	- 1.75	5.71	0.78		7	15	9	6
1913.....	71.5	+ 2.2	102	33	3.31	- 1.18	8.95	0.74		7	19	8	3
1914.....	72.2	+ 2.9	101	40	5.57	+ 1.08	13.24	1.17		13	12	14	4
1915.....	65.1	- 4.2	91	31	4.16	- 0.33	9.99	1.72		11	12	12	6
1916.....	64.5	- 4.8	96	38	3.71	- 0.78	7.96	1.41		10	13	11	6
1917.....	66.0	- 3.3	100	32	6.65	+ 2.16	13.82	3.04		12	13	10	7
1918.....	70.8	+ 1.5	104	38	5.29	+ 0.80	10.19	1.55		11	16	10	4
1919.....	71.9	+ 2.6	98	41	6.13	+ 1.64	12.25	1.82		13	12	12	6
1920.....	70.7	+ 1.4	99	40	3.56	- 0.93	8.48	1.25		9	16	10	4
1921.....	74.7	+ 5.4	100	40	3.76	- 0.73	8.85	0.56		9	16	10	4
1922.....	72.2	+ 2.9	104	38	1.82	- 2.67	7.19	0.28		6	19	8	3
1923.....	70.9	+ 1.6	100	40	4.93	+ 0.44	7.69	2.43		12	14	10	6
1924.....	66.8	- 2.5	96	35	8.10	+ 3.61	14.92	4.00		14	11	14	5
1925.....	70.4	+ 1.1	98	38	6.64	+ 2.15	13.30	2.99		12	15	9	6
1926.....	66.2	- 3.1	105	32	4.52	+ 0.03	12.09	1.05		8	16	9	5
1927.....	66.4	- 2.9	101	35	2.42	- 2.07	7.05	0.55		9	16	7	7
1928.....	64.5	- 4.8	88	31	5.38	+ 0.89	10.31	2.31		12	10	10	10

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

Climatological Data for June, 1928

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>Northwest District</i>																				
Akron	Plymouth	1,153	2																	Orlan C. Moore
Alta	Buena Vista	1,513	37	63.9	-4.0	85	20	44	10	33	3.12	-2.04	0.97	0	13	10	18	2	ne.	D. E. Hadden
Alton	Sioux	1,305	23	63.2	-5.2	83	19	39	10	37	3.97	+0.01	1.14	0	12	6	16	8	ne.	W. S. Slagle
Cherokee	Cherokee	1,196	8	62.4	-5.1	82	20	40	2	32	2.31	-2.13	0.63	0	12	16	10	4	s.	J. E. Wirth
Estherville	Emmet	1,298	33	63.7	-3.2	86	15	38	3	38	3.60	-0.74	0.70	0	12	15	12	3	nw.	A. O. Peterson
Hawarden	Sioux	1,181	2																	Earl V. Slife
Inwood	Lyon	1,474	24	63.3	-4.4	82	6†	38	10	40	6.31	+1.00	1.61	0	14	15	6	9	nw.	A. C. Hanson
Lake Park (near)	Dickinson	1,489	15	62.2	-5.1	83	19	39	2†	36	5.80	+1.80	1.65	0	11	13	7	10	nw.	P. M. Lawrence
Le Mars	Plymouth	1,224	32	64.4	-4.2	83	15†	39	10	37	2.65	-1.73	0.82	0	12	16	6	8	w.	Henry Newell
Marathon	Buena Vista	1,390	2																	E. G. Smith
Pocahontas	Pocahontas	1,248	24	63.7	-4.6	84	20	40	2†	36	4.76	+0.12	1.70	0	12	9	11	10	se.	F. E. Hronek
Rock Rapids	Lyon	1,349	29	62.7	-5.2	83	14	36	10	40	7.10	+2.48	1.77	0	12	22	3	5	s.	Nellie F. Medberry
Sanborn	O'Brien	1,553	14	62.2	-5.5	84	30	38	2	36	4.58	-0.15	1.00	0	15	11	7	12	sw.	J. W. Dow
Sheldon	O'Brien	1,418	17	63.2	-4.3	83	14	38	10	37	4.84	+0.44	1.20	0	14	11	12	7	nw.	Ross E. Forward
Sioux Center	Sioux	1,426	29	63.1	-4.4	82	19	41	10	34	4.85	+0.79	1.02	0	12	11	8	11	se.	J. De Ruyter
Spencer	Clay	1,319	14	63.6	-4.9	84	29	38	3†	40	5.45	+1.25	1.45	0	9	9	8	13	ne.	E. W. Little
Storm Lake	Buena Vista	1,440	39	63.8	-4.7	82	20	44	2†	33	3.26	-1.74	0.64	0	14	12	11	7	se.	George H. Fracker
Washta	Cherokee	1,157	30	60.8	-7.3	82	16	38	2†	35	3.84	-0.74	0.84	0	11	12	9	9	s.	H. L. Felter
West Bend	Palo Alto	1,197	35	62.8	-5.6	84	21	39	2†	34	2.86	-1.43	0.80	0	11	14	12	4	se.	Jos. Dorweiler
Means and extremes				63.1	-4.8	86	15	36	10	40	4.28	-0.20	1.77	0	12	12	10	8	se.	
<i>North Central District</i>																				
Algona	Kossuth	1,213	55	63.6	-5.0	85	20	42	2	36	5.11	+0.60	1.05	0	10	19	5	6	se.	W. E. Laird
Allison	Butler	1,060	14	62.0	-6.1	84	20	40	1†	34	4.80	+1.05	1.50	0	9	7	16	7	n.	E. W. Detra
Beimond	Wright	1,181	18	63.2	-5.3	84	20	38	3	36	3.34	-1.42	0.63	0	11	7	9	14	nw.	H. F. Luick
Britt	Hancock	1,236	41	63.2	-4.2	85	15	40	2	34	3.93	-0.60	0.80	0	9	11	0	19	sw.	James S. Ross
Charles City	Floyd	1,015	37	62.8	-3.7	84	20	41	10	33	2.85	-1.55	0.94	0	10	6	13	11	nw.	U. S. Weather Bureau
Forest City	Winnebago	1,226	34	62.5	-5.3	83	20	39	2†	30	3.18	-1.37	0.68	0	10	8	11	11	nw.	Dr. M. B. Neil
Hampton	Franklin	1,145	3																	L. H. Davis
Humboldt	Humboldt	1,095	40	63.2	-6.1	87	20	38	3	37	3.86	-0.52	0.80	0	11	6	16	8	s.	H. C. Snitkey
Mason City	Cerro Gordo	1,148	31	61.0	-6.6	82	20	31	2	45	3.86	-1.28	0.99	0	9	6	15	9	se.	American Beet Sugar Co.
Northwood	Worth	1,222	32	62.7	-4.0	82	15†	41	2†	36	6.03	+1.17	3.50	0	10	8	12	10	nw.	Charles Dwelle
Osage	Mitchell	1,163	34	62.1	-5.1	83	20	40	3†	32	3.39	-1.36	1.07	0	8	7	13	10	nw.	Dr. C. E. Juhl
Means and extremes				62.5	-5.3	87	20	31	2	45	4.04	-0.56	3.50	0	10	8	11	11	nw.	
<i>Northeast District</i>																				
Decorah	Winneshiok	872	35	62.7	-5.3	85	20	32	10	45	3.52	-1.00	0.78	0	11	12	7	11	nw.	M. D. Whitney
Dubuque	Dubuque	700	55	64.5	-4.9	83	12	46	10	27	3.87	-0.44	1.03	0	13	4	8	18	nw.	U. S. Weather Bureau
Fayette	Fayette	1,003	40	63.8	-3.5	85	20	37	10	41	5.11	+0.27	1.70	0	11	13	9	8	nw.	R. Z. Latimer
Independence	Buchanan	921	64	63.8	-4.7	81	12	41	10	34	4.36	-0.26	1.14	0	11	16	2	12	se.	Dr. Geo. Boody
Lansing	Allamakee	632	21																	Mrs. Mary Spinner
New Hampton	Chickasaw	1,169	31																	D. W. Dawson
Oelwein	Fayette	1,036	5	63.4	-4.4	82	20	38	10	37	4.25	-0.21	1.20	0	7	13	6	11	w.	John T. Ridler
Postville	Clayton	1,192	29	60.8	-4.9	78	30	40	3	29	3.42	-1.24	1.00	0	9	7	15	8	sw.	F. L. Williams
Waterloo	Black Hawk	854	45	65.4	-4.0	85	20†	39	10	38	5.02	+0.89	2.25	0	11	11	10	9	nw.	R. B. Slippy
Waverly	Bremer	936	32	63.6	-4.6	84	20	39	10	36	5.27	+1.00	1.95	0	11	20	5	5	n.	D. H. Murphy
Means and extremes				63.5	-4.5	85	20†	32	10	45	4.35	-0.14	2.25	0	10	12	8	10	nw.	
<i>West Central District</i>																				
Audubon (near)	Audubon	1,297	33	64.2	-4.1	85	20	45	6	33	5.25	+1.23	1.24	0	13	10	15	5	sw.	George Kibby
Carroll	Carroll	1,265	38	64.0	-4.4	87	20	43	2	35	4.08	-0.70	0.92	0	10	17	3	10	se.	Mrs. Jos. J. Wolfe
Denison	Crawford	1,171	34	64.4	-4.7	85	20	44	2†	34	4.51	+0.42	1.26	0	12	12	8	10	sw.	V. L. Byers
Guthrie Center	Guthrie	1,077	33																	H. A. Stafford
Harlan	Shelby	1,192	29	63.8	-5.3	85	20†	40	6	37	5.45	+0.82	1.18	0	14	9	7	14	nw.	Walter Bell
Jefferson	Greene	1,052	29	63.5	-5.7	84	20	41	2†	34	5.44	+1.24	3.00	0	10	12	4	14	ne.	W. I. Lyon
Little Sioux	Harrison	1,040	23	63.3	-4.8	85	20	42	10	36	4.98	+0.72	1.05	0	14	7	17	6	n.	H. W. Kerr
Logan	Harrison	1,120	61	63.2	-4.6	85	20	43	10	33	5.06	-0.12	1.41	0	13	10	15	5	n.	Amy Ann Stern
Onawa	Monona	1,051	27	64.6	-5.4	83	15	43	10	34	3.62	-1.08	0.92	0	11	7	11	12	s.	Mrs. H. E. Colby
Rockwell City	Rockwell	1,232	32																	A. W. McIsaac
Sac City	Sac	1,269	52	64.0	-5.3	85	20	43	2	36	3.95	-0.80	0.75	0	8					F. P. Kessler
Sioux City	Woodbury	1,135	39	65.0	-4.5	82	16	45	10	31	3.07	-0.67	0.90	0	14	3	13	14	nw.	U. S. Weather Bureau
Means and extremes				64.4	-4.9	87	20	40	6	37	4.54	+0.08	3.00	0	12	10	10	10	nw.	
<i>Central District</i>																				
Ames	Story	926	51	66.0	-3.9	86	20	43	10	32	6.38	+2.01	1.60	0	11	16	0	14	nw.	Iowa State College
Baxter	Jasper	998	28	64.8	-4.8	85	20†	41	10	35	3.66	-0.93	1.11	0	11	0	19	11	nw.	Otto Sanderman
Boone (near)	Boone	1,134	23	63.8	-5.2	86	20	37	2	37	6.92	+2.39	2.03	0	11	11	8	11	n.	C. F. Henning
Des Moines	Polk	861	50	66.2	-4.4	86	20	48	2	30	6.62	+1.86	2.06	0	15	4	10	16	n.	U. S. Weather Bureau
Fort Dodge	Webster	1,114	28	63.1	-5.9	87	20	38	2	37	4.89	+0.47	2.13	0	10	9	11	10	se.	Samuel Sampson
Grinnell	Poweshiek	1,031	34	64.0	-5.6	85	20	40	2	34	4.39	-0.16	1.06	0	11					R. E. Bates
Grundy Center	Grundy	976	37	64.0	-5.7	84	20	41	10	36	5.01	-0.07	1.12	0	7	11	11	8	w.	M. G. Heiberger
Iowa Falls	Hardin	1,127	35	63.1	-4.8	85	20	40	2	33	6.57	+1.11	1.36	0	13	11	6	13	nw.	C. H. Gilbert
Marshalltown	Marshall	947	36	65.0	-5.3	87	20	43	10	31	4.53	-0.04	1.04	0	14	9	8	13	nw.	C. C. Pigman
Monroe	Jasper	922	16	65.4	-4.4	82	19†	46	2	28	6.50	+2.00	1.96	0	10	17	7	9	s.	J. A. Dibel
Perry	Dallas	975	27	64.0	-6.5	87	21	40	2†											

Climatological Data for June, 1928—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>East Central District</i>																				
Belle Plaine	Benton	866	38	64.4	- 4.8	85	20	39	10	37	5.69	+ 1.34	1.99	0	13	6	12	12	n.w.	O. C. Burrows J. T. Wurster Dr. A. P. Bryant U. S. Weather Bureau Rex Shriver
Cedar Rapids	Linn	737	46	64.3	- 4.8	84	12†	38	10	37	4.33	- 0.02	0.77	0	14	7	6	17	n.w.	
Clinton	Clinton	595	55	65.6	- 4.8	85	12†	40	10	35	5.51	+ 1.12	1.47	0	16	6	7	17	n.	
Davenport	Scott	580	57	66.7	- 3.8	84	18	49	5	27	4.55	+ 0.44	1.70	0	14	3	13	14	n.w.	
Davenport, No. 2	Scott	690	3	66.4		86	18†	42	10	35	5.12		1.77	0	14	16	6	8	sw.	
Fairport	Muscatine	567	7	66.5	- 3.9	84	18	45	2	31	5.68	+ 1.41	0.93	0	17	8	7	15	s.	
Iowa City	Johnson	733	68	65.4	- 3.7	85	19†	41	10	34	6.65	+ 2.16	1.95	0	14	9	9	12	n.w.	Bureau of Fisheries Prof. J. F. Reilly Margaret T. Disney John Strodthoff William Molis
Le Claire	Scott	576	28								4.29	- 0.13	1.10	0	13					
Maquoketa	Jackson	692	23	64.0	- 3.6	84	12†	38	10	36	5.60	+ 0.80	0.99	0	11				n.w.	
Muscatine	Muscatine	546	67								4.58	+ 0.15	0.70	0	15					
Olin	Jones	760	29	65.2	- 4.3	85	19	39	10	38	4.26	+ 0.08	0.92	0	8	15	7	8	n.w.	Mrs. L. Stingley John Kroepfen Dr. F. C. Schadt
Tipton (near)	Cedar	807	29	64.4	- 6.3	82	12†	42	10	33	4.61	+ 0.51	0.85	0	14	4	14	12	s.	
Williamsburg	Iowa	770	12	64.9	- 3.5	85	19†	38	10	38	2.54	- 1.96	1.17	0	7	14	12	4	se.	
Means and extremes				65.3	- 4.2	86	18†	38	10	38	4.88	+ 0.54	1.99	0	13	9	9	12	n.w.	
<i>Southwest District</i>																				
Atlantic	Cass	1,164	37	65.0	- 4.4	87	20	44	6	35	5.24	+ 0.18	1.13	0	15	4	8	18	ne.	T. H. Whitney Arthur L. Bishop Dr. H. C. Hawley C. A. Smith Carl E. Pollock
Bedford	Taylor	1,200									7.05	+ 2.96	1.95	0	12	8	11	11	n.w.	
Clarinda	Page	1,009	38	65.4	- 6.0	88	20	44	2†	36	8.20	+ 3.49	1.71	0	15	9	16	5	n.w.	
Corning	Adams	1,150	36	65.4	- 4.1	88	20	40	2†	41	9.24	+ 5.11	3.00	0	11	20	6	4	ne.	
Cumberland (near)	Cass	1,225	29								7.24	+ 2.92	1.62	0	10	10	8	12	n.w.	
Glenwood	Mills	1,100	30	66.2	- 4.2	86	14†	42	10	34	5.75	+ 0.88	2.06	0	11	8	13	9	se.	
Lenox	Taylor	1,250	33	65.8	- 5.0	88	20	41	6	39	7.10	+ 2.93	3.17	0	14	12	12	6	n.w.	George Mogridge J. L. Hurley W. S. Matthews B. R. Bridge Geo. C. Rader
Oakland	Pottawattamie	1,139	9	64.6	- 5.6	87	7	43	2	31	4.45	- 0.35	1.16	0	14	13	5	12	n.w.	
Red Oak (near)	Montgomery	1,030	3								6.74	+ 2.09	1.63	0	13	6	24	0	s.	
Riverton (near)	Fremont	920	2								6.52	+ 1.66	2.00	0	11	1	9	20	n.	
Thurman	Fremont	960	31	66.9	- 5.2	88	20	45	2	37	5.37	+ 0.17	1.36	0	11	14	5	11	n.	H. H. Askew U. S. Weather Bureau
Omaha, Neb.	Fremont	1,105	57	67.1	- 4.5	87	20	51	10	25	5.20	+ 0.64	2.26	0	12	11	9	10	n.	
Means and extremes				65.8	- 4.9	88	20	40	2†	41	6.51	+ 1.89	3.17	0	12	10	10	10	n.w.	
<i>South Central District</i>																				
Afton	Union	1,212	34	65.8	- 3.6	86	20	42	6	37	6.36	+ 1.43	1.72	0	12	13	6	11	sw.	S. R. Brown O. E. McBride Thomas Wood C. C. Burr J. C. Davis
Albia	Monroe	949	30	66.0	- 4.4	86	20	45	2	34	7.67	+ 3.35	1.67	0	15	7	3	20	n.w.	
Centerville	Appanoose	1,013	23	66.0	- 4.5	84	19†	44	2	34	7.24	+ 2.84	2.64	0	15	7	10	13	n.w.	
Chariton (near)	Lucas	1,042	33	65.2	- 3.6	85	20	45	2†	33	6.19	+ 1.81	1.40	0	8	5	18	7	sw.	
Corydon (near)	Wayne	1,050	35	64.5	- 5.7	81	20	41	7	36	8.51	+ 3.87	1.97	0	14	5	14	11	n.w.	
Creston	Union	1,291	23	65.0	- 3.7	84	14†	41	6	39	8.63	+ 3.68	2.68	0	15	2	12	16	n.w.	
Earlham (near)	Madison	1,126	26	64.5	- 4.0	85	20	40	2†	36	4.24	- 0.19	0.93	0	9	15	5	10	se.	Mrs. N. Spangler George Phillips Seth F. Shenton W. J. Casey J. B. Alter
Indianola	Warren	972	37	65.8	- 4.2	85	20	47	2	31	5.83	+ 1.39	1.36	0	13	10	11	9	n.w.	
Knoxville	Marion	920	33	66.0	- 4.5	85	20	45	2	30	6.61	+ 2.51	1.67	0	10	12	10	8	ne.	
Lacona	Warren	824	29								8.36	+ 3.79	2.85	0	13	8	15	7		
Lamoni	Decatur	1,123	21	65.2	- 4.4	84	20	41	6	37	8.59	+ 3.74	2.74	0	16	10	12	8	n.w.	F. S. Parks Alex Maxwell
Mount Ayr	Ringgold	1,240	35	66.2	- 3.8	87	20†	41	6	39	9.18	+ 4.44	3.97	0	13	10	11	9	se.	
Pella (near)	Marion	850	1																	L. L. Langerak James A. Verploegh H. S. Ely
Tingley	Ringgold	1,275	3	64.4	- 5.4	86	20	41	6	37	6.33	+ 1.66	2.57	0	10	14	9	7	n.w.	
Winterset	Madison	1,118	37	65.5	- 4.9	86	20	40	6	38	5.58	+ 0.71	1.85	0	9	14	7	9	ne.	
Means and extremes				65.4	- 4.4	87	20†	40	2†	39	7.09	+ 2.54	3.97	0	12	10	10	10	n.w.	
<i>Southeast District</i>																				
Bonaparte (near)	Van Buren	563	37	65.6	- 4.5	83	21	47	2	31	6.70	+ 2.34	2.30	0	13	14	6	10	w.	B. R. Vale John T. Donnelly Miss Musa Todd R. M. McKenzie U. S. Weather Bureau
Burlington	Des Moines	544	32	67.8	- 3.9	87	15†	49	6	33	5.27	+ 0.98	1.49	0	14	13	10	7	sw.	
Columbus Junction	Louisa	595	27	65.2	- 5.5	81	19	44	10	31	5.10	+ 0.80	1.53	0	15	5	19	6	n.w.	
Fairfield	Jefferson	780	44	65.2	- 4.6	84	18	42	2	34	9.13	+ 4.30	2.34	0	13	5	10	15	n.	
Keokuk	Lee	614	57	66.8	- 5.7	85	21	50	6	26	5.15	+ 1.02	1.56	0	12	4	7	19	n.w.	
Keosauqua	Van Buren	644	36	66.0	- 4.2	85	21	42	2	34	10.31	+ 5.84	3.28	0	13	6	18	6	se.	
Mt. Pleasant	Henry	730	47	66.4	- 5.2	84	14†	43	25	35	7.20	+ 2.17	1.26	0	14	1	18	11	se.	J. H. Jericho Roy R. Robinson C. L. Mikesh W. E. Utterback
Oskaloosa	Mahaska	835	52	64.9	- 4.7	83	12†	45	2†	34	8.54	+ 4.56	2.16	0	12	4	16	10	n.w.	
Ottumwa	Wapello	649	33	66.6	- 5.1	86	19†	43	2	38	9.15	+ 5.14	2.60	0	13	9	17	4	se.	
Sigourney (near)	Keokuk	790	32	65.8	- 3.9	86	20	45	10	34	7.70	+ 3.44	1.72	0	12	8	5	17	n.w.	
Stockport	Van Buren	747	26	65.7	- 4.0	83	17	43	2	31	7.50	+ 3.01	2.03	0	14	11	13	6	n.w.	C. L. Beswick D. D. Sherman H. G. Liddle
Washington	Washington	757	46	66.3	- 3.9	84	15†	44	2	33	7.91	+ 4.00	2.95	0	10	13	6	11	sw.	
Wever	Lee	552		66.7		85	14	48	7	34	4.54		1.20	0	10					
Means and extremes				66.1	- 4.5	87	15†	42	2	38	7.25	+ 2.91	3.28	0	13	8	12	10	n.w.	
State means and extremes				64.5	- 4.8	88	20	31	2	45	5.38	+ 0.89	3.97	0	12	10	10	10	n.w.	

Temperature normals are based on the 46-year period July 3, 1875 to July 2, 1921; shorter records corrected to harmonize. Precipitation normals are based on the 50-year period ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1920 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.

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.

MISCELLANEOUS PHENOMENA

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

RIVERS

Stages on all rivers averaged below normal. The highest stages occurred generally on the Mississippi on the 1st and there was a gradual fall till near the middle of the month after which there was no material change but numerous slight fluctuations. On the Missouri River there was a gradual rise until the first part of the 2d week and then a fall till the first part of the 3d week, when a moderate rise occurred; thereafter nearly stationary stages prevailed. There were numerous fluctuations on the interior rivers with moderate rises following the heaviest rain periods, the most important being at the close of the month. The only damage occurred on small streams and was local.

Daily Precipitation for June, 1928

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>Northwest District</i>																																				
Akron	Big Sioux						.29	.02			.10	.93				.22			T.		.12	.55	.14	.37			.27	.14	.03	.07			3.25			
Alta	Raccoon						T.	.20				.97				.45			.44		T.	.15	.47				.30	.14					3.12			
Alton	Floyd						.21	.02			.02	.72				.16						.06	.60	.67	.31			.36	.78		.03			3.97		
Cherokee	Little Sioux						.17	.02			T.	.40				T.	.39	.04				.10	.53	.05	.26			.29	.03					2.31		
Estherville	Des Moines						T.	.35				.35	.05			.10						.65	.35	.35	.10			.70	.05					3.60		
Hawarden	Big Sioux						.17	.05			.44	.93				.13						.03	.73	.14	.66			.45	.05		.11			3.92		
Inwood	Big Sioux			.02			.11	.10			T.	1.61	.02			.30	1.02			T.	T.	.04	1.09	.10	.75	.01		.96	.18					6.31		
Lake Park (near)	Little Sioux						.35				.14	.62				1.65	.03					1.39	.28	.08			.49	.74		.03				5.80		
Le Mars	Floyd						.13	.03			.03	.53				.08	T.					.14	.82	.12	.31			.27	.18		.01			2.65		
Marathon	Raccoon						1.23	T.			.54					T.	.71					.09		.05	.30	.08	.31	.02	.96	.58					4.87	
Pocahontas	Des Moines				.01	.02	.26	.10			.05	.73				.48	T.						.58		.55			.24	1.70	.04	T.			4.76		
Rock Rapids	Big Sioux						.50				.18	1.00				.65	.03					.10	1.08	.75	.30		.67	1.77		.07				7.10		
Sanborn	Floyd						.28	.03			.03	.78			.03	.06	.48	.01				.10	1.00	.10	.91			.20	.54		.03			4.58		
Sheldon	Floyd						.23	.04			.30	.62				.25	.11	T.				.06	.04	.99	.32	.34		.30	1.20		.04			4.84		
Sioux Center	Floyd			T.			.24	.04			.25	.82				.27				T.	.07		1.02	.28	.90			.35	.49		.12			4.85		
Spencer	Little Sioux						.50				T.	.47				.70	1.00				.05		T.	.90	T.	.15		.23	1.45					5.45		
Storm Lake	Raccoon						.20	.02			.09	.37	.02		.09	T.	.48	T.				.02	.39	.01	.64			.20	.25		T.			3.26		
Washta	Little Sioux						.14	T.			.05	.84				.50	.25	.43					.73	.11	.46	T.		.17	.16		T.			3.84		
West Bend	Des Moines				T.	.06	.22	.14			.03	.80	.02			.01	.57						.45					.22	.34					2.86		
<i>North Central District</i>																																				
Algona	Des Moines				.12		.70	.90			.10	.60				.10	.55						.69				.30	1.05						5.11		
Allison	Cedar				.05	T.	.09	.01				.66				.56		.25	.85	T.		.83						1.50						4.80		
Belmond	Iowa				T.		.30	.33			T.	.31	.01			.50		.37	.43			.42	.01				.15	.51						3.34		
Britt	Iowa						.30	.50				.35				.80		.12	.66			.30					.10	.80							3.93	
Charles City***	Cedar				T.	T.	.11	.26				.67				.15	.10	.06	T.		.08		.94		T.			.27	.21					2.85		
Forest City	Cedar							.50				.22	.10				.68		.05			.44	.25	.19				.55	.20					3.18		
Hampton	Cedar				T.		.28	.24			1.20					.29	.22		.65	.44	.18						.40	.20							4.10	
Humboldt	Des Moines						.21	.75			T.	.22	T.			T.	.53	T.		.10	T.		.42		.27			.16	.80	.32	.08				3.86	
Mason City	Cedar				T.	T.	.29	.10			T.	.99	T.			T.	.25	T.		.17	.75		.40		T.			.02	.89						3.86	
Northwood	Cedar				T.		.15	.08			T.	.55				3.50	.60			.12	.17		.26					.02	.58						6.03	
Osage	Cedar				T.		T.	.20				.79					.06			.48	.04		1.07				.04	.71							3.39	
<i>Northeast District</i>																																				
Decorah	Mississippi						.06				.10				.45	T.			.45	.13	.03		.30	.63	.09			.78	.50					3.52		
Dubuque***	Mississippi				.03	.63	.07	.02	.10		T.	.23	T.			.50	.16	.97		T.	.60				.05	.01			.50						3.87	
Fayette	Mississippi				.07		.04	.21			1.36				.86		.16	.25		1.36	.34						.23	.23							5.11	
Independence	Wapsipicon						.26	.04	.06			.40				1.14	.04	.83		.04	.96							.45	.14						4.36	
Lansing	Mississippi						.13					.65				T.	.60	.10					1.52	.06		.01		1.00	.23						4.30	
New Hampton	Wapsipicon							.20			1.20					.75		.80		.20	.80							.30							4.25	
Oelwein	Wapsipicon						.02				1.00					.58		.04	T.				.94	.01	.03				.77						3.42	
Postville	Mississippi						.07					.40				.43	.05	2.25		.46	.45		.50					.19	.21					5.02		
Waterloo	Cedar				T.		.03	.07	.01			.66				.52	.05	.61	.27	.06	.88							1.95							5.27	
Waverly	Cedar				.05	.11	.05	.11				.66																								5.27
<i>West Central District</i>																																				
Audubon (near)	Nishnabotna						.36	.02			.02	.46				1.24	.92	.78		.14	.39	.26	.30				.03	.33		T.				5.25		
Carroll	Raccoon						.20	.02			.07					.92		.60			.35		.27	.03				.42	.60						4.08	
Denison	Missouri						.49	.02			.18	.56				1.26	.36				.35		.16	.40			.05	.64	.04						4.51	
Guthrie Center	Raccoon																																			
Harlan	Nishnabotna				T.	T.	T.		.12			.07	.83		.05		.04	.91	1.18	T.	T.	.35	.49	.37	.27		.11	.61		.02					5.45	
Jefferson	Raccoon					T.	.59	.02			T.	.32				2.10	.90	T.			.63	.12	.06				.19	.51							5.44	
Little Sioux	Little Sioux			.02			.14				.22	.78				.67	.12	1.05	.03		.05	.26	.71	.53			.21	.19							4.98	
Logan	Missouri		T.	.02	T.	.07	.04				.27	.70		.02		.66	1.41	T.		.12		.25	.27				.04	1.19							5.06	
Onawa	Missouri			T.			.50	T.			.10	.75				T.	.92	.05	.05			.17	.10	.55			.18	.25							3.62	
Rockwell City	Raccoon																											.90								**
Sac City	Raccoon						.39	.65			.15	.41				.75					T.	.50	.70				.40								3.95	
Sioux City***	Missouri				T.		.40	.01			.10	.54				.90		.16	.01		T.	.35	.15	.08			.25	.10	.01	.01					3.07	
<i>Central District</i>																																				
Ames	Skunk					.02	.84	.11			1.02				1.60	.72	.02					.43		.44			.20	.98							6.38	
Baxter	Skunk					.04	.40	.10			.11				1.11	.08						.32	.40				.14	.51							3.66	
Boone (near)	Des Moines				T.		.03				1.10	.04			2.03		.41	T.				.59	.08	.86			.43	.47							6.92	
Des Moines***	Des Moines			.14	.03	.02	.62	.02			.87	T.			1.06	.17	.03	T.		.19	.41	.31	.69				.30	1.76		T.					6.62	
Fort Dodge	Des Moines							.49	.01			.25	.02			.51		.12				.78	.13				.45	2.13							4.89	
Grinnell	Iowa					.07	.01	.13			1.06	T.			.87	.07	.18				.44	.45		.50				.61							4.39	
Grundy Center	Cedar				T.		.18	.28			1.12				1.04	.06	T.					.85		T.			T.	.88								5.01
Iowa Falls	Iowa					T.	.05		.30	.24		.05	1.36																							

Daily Precipitation for June, 1928—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>Southwest District</i>																																			
Atlantic	Nishnabotna		.02	.01	.37			.22				.65	.03				1.13	.23	.01		.14	.60		.95	.02			.30	.56				5.24		
Bedford	Nishnabotna		.29	.12	.25		1.07					.18				1.95	.38		.05		.95		.28				1.11	.42					7.05		
Clarinda	Nodaway		.11	.21	.41			.23				.10	.36				1.24	1.71	.10			1.16	.07	.37	.40			1.55	.18				8.20		
Corning	Nodaway		.08	.40								.30				3.00		2.15				.08		2.50	.09			.57	.05	.02			9.24		
Cumberland (nr.)	Nodaway		T.	T.	T.	.60		.80				.65				T.	1.62	.01	T.		.20	.86	1.27	.35			T.	.88					7.24		
Glenwood	Missouri		.17	.06	.02	.14						.18				.28	2.06	T.	T.			.80		.28			1.16	.60					5.75		
Lenox	Missouri		.05	.13	.16	.27		.50	.57			.23				3.17					.05	.65	.11	.52			.10	.59					7.10		
Oakland	Nishnabotna		.04			.30		.11	.20			.42					1.16	.02			.26	.90	.18	.41			.13	.29					4.45		
Red Oak (near)	Nishnabotna		.43	.04	1.63		T.				.21					.14	1.24	.04				.78	.33	.14			1.33	.33		.10			6.74		
Riverton (near)	Nishnabotna		.20	.26	.80			.04				.20				2.00	.57					.55	.11	.27			1.52						6.52		
Thurman	Missouri		T.	.21	.23	.20		.36				.32				.55	.70					.75	T.	.13			.56	1.36					5.37		
Omaha, Neb., **	Missouri		.14	T.	T.	.01		T.	.11			.10	.43	T.		2.16	.14	.08	T.	T.		1.14	.18	.09			.62	T.					5.20		
<i>South Central District</i>																																			
Afton	Grand		T.	T.		.21		1.72				.26				.02	1.37	.01	.15		.60	.55	.02	.80				.65						6.36	
Albia	Des Moines					.10	.12	.01	1.67				.64				1.07	.45	.50	T.	.95	.06	.56	.42	.16			.42	.51					7.67	
Centerville	Chariton			.01	T.	.25	T.	.24	1.21			.17	.08			.05	2.64	.12	.08	T.	.37	.51	T.	.88	T.			.62	.01	T.				7.24	
Chariton (near)	Chariton					T.	T.	T.	.90				.22			T.	.95	.32	T.		.75	.65	T.	1.40	T.			1.00		T.				6.19	
Corydon (near)	Chariton		.01			.06		1.42				.79				1.97	.43	.63	.03		1.01	.65	.73	.32			.33	.13						8.51	
Creston	Missouri		T.		.02	T.	.18	T.		2.68		.02	.05			1.24	.16	1.52	.01	.75	.64	.01	.60	.16				.50	T.					8.63	
Earlham (near)	Des Moines					.16		.60				.16				.93	T.			.14	.62	.61	.29				T.	.73						4.24	
Indianola	Des Moines					.24	.02	.65	.16			.25				1.36	.02	.03		.15	.57	.15	1.00					1.23						5.83	
Knoxville	Des Moines					T.	.17	.07	.97			.79				1.67	T.	.05		.46	.41		.77					T.	1.25					6.61	
Lacona	Des Moines				.02	.18	.01	1.10	1.75			.40				1.33	.12			.35	.65	1.00	.60					.85						8.36	
Lamoni	Grand			.01	.18	.26	.02		2.72				.53			2.74	.34	.01	.03	.12	.17	.22	.46	.05				.73	T.					8.59	
Mount Ayr	Grand		T.	.21	.07	.25		T.	1.84			.61				3.97	.01	.02			15	1.02	.02	.21				T.	.80					9.18	
Pella (near)	Skunk											.66				T.	2.57		.05		.04	.22	T.	.54				.74						6.33	
Tingley	Platte		T.	.10	T.	.20		1.21								T.	2.57		.05		.04	.22	T.	.54				.74						6.33	
Winterset	Des Moines					.22		1.85	.05			.76				.93	T.	T.			.06	.41		.65				.65							5.58
<i>Southeast District</i>																																			
Bonaparte (near)	Des Moines					.17		.11	.89			.10	.07			T.	.70	2.30	.06		.22	.16		1.21	.03			T.	.68						6.70
Burlington	Mississippi				.06	.10			1.24				.13			.22	.77	T.	.06	.02	T.	.13	.63	.06			.33	.03	1.49						5.27
Columbus Jct.	Iowa				.18	.02	.03	.54				.04	.18			.32	.29	.01		.19	.40		1.14		.15		1.53	.08							5.10
Fairfield	Skunk				.51	.01	.23	.65				.45	.05			2.34	.19	.22		.23	.75		2.10				1.40								9.13
Keokuk**	Mississippi				T.	.02	.20	.01	1.56	T.		.12				T.	1.01	.72	.12	.01	T.	.22		.34				T.	.82						5.15
Keosauqua	Des Moines				.27		.08	1.72				.24	.07			3.28	1.50	.42	.01	.14	.20		1.55				.83								10.31
Mt. Pleasant	Skunk				.18		.11	.85				.39				.65	1.12	.03	1.12	.21	.16		1.00	.01				1.00	.08						7.20
Oskaloosa	Des Moines				T.	.18	.02	.28	.21			.11	T.			T.	1.24		.07	T.	1.68	.47	2.16	T.			2.08	.04							8.54
Ottumwa	Des Moines				.25		.03	.62				.14	.20			T.	1.87	.45	.40		.88	.37	1.24				2.60	.10							9.15
Sigourney (near)	Skunk				T.	.35		.41	.28			.35				1.52	.22	.08		.65	.65	1.44				.03	1.72								7.70
Stockport	Skunk				.19		.19	.72				.40	.06			2.63	1.38	.42	.02	.25	.16		1.15	.03			.50								7.50
Washington	Skunk				.22			.61				.45	.07			1.03	.38			.42	.38		1.40				2.95								7.91
Wever	Mississippi				.22	T.	T.	1.20				T.	.20			.27	.62	.03	T.	.12		.75	T.	.13			1.00								4.54

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.
- T. Precipitation is less than .01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE

TEMPERATURE

Stations	Barometric Pressure, Inches (Sea Level)				Relative Humidity, %				Wind				Sunshine				
	Mean	Highest	Date	Lowest	Mean		Lowest	Date	Total movement	Average hourly velocity	Maximum		% possible departure from normal	Date			
					7 A. M. 12 Noon	7 P. M.					Miles	From					
Chas. City	29.83	30.17	15	29.39	12	76	52	55	22	3	4,039	5.6	22	sw.	12	60	-8
Davenport	29.82	30.19	15	29.48	17	79	57	59	29	1	4,495	6.2	34	se.	7	55	-14
Des Moines	29.81	30.14	15	29.44	12	80	51	56	24	1	4,314	5.9	35	sw.	12	57	-9
Dubuque	29.81	30.21	15	29.48	13	76	54	56	27	3	4,226	5.9	26	sw.	12	49	-15
Keokuk	29.83	30.20	15	29.51	17	79	56	60	27	1	4,477	6.2	26	s.	12	48	-26
Sioux City	29.83	30.12	10	29.27	12	79	54	52	24	10	6,945	9.6	36	sw.	12	65	+2
Omaha, Nb.	29.82	30.10	10	29.39	12	77	51	55	26	1†	4,593	6.4	26	n.	24	62	+6
Means and extremes	29.82				12	78	54	56				6.5				57	-10
Normals and records	29.93		10	29.27	12	79		60							22d	67	
	*30.61	1913	§29.04	1880		†13		1926					†68	w.	1917		

‡Local meantime *Dubuque §Omaha †Sioux City ‡Also other dates.

††January 1, 1928, 3-cup anemometers replaced the 4-cup instruments used since the establishment of the Weather Bureau stations. The new instruments will more accurately indicate the true wind movement. The records of the 4-cup instruments were somewhat too high at moderate velocities and considerably too high at the higher velocities. Tables of true velocities corresponding to indicated velocities appear in the January, 1928 Climatological Data. For purposes of comparison the highest velocity of record in the lower line of the table has been converted into a 3-cup velocity.

The mean temperature for the State, derived from the means of nine districts of nearly equal area, and based on the records of 103 stations, was 64.5°, or 4.8° lower than the normal. The deficiency was general, pronounced and uniform in all divisions, the deficiency ranging from 5.2° in the north-central division to 4.2° in the east-central division. The highest monthly mean was 67.8° at Burlington and the lowest was 60.8° at Postville and Washta. The absolute range for the State was 57°, ranging from 88° at Clarinda, Corning, Lenox and Thurman on the 20th, to 31° at Mason City on the 2d. Two stations reported temperatures 32° or lower and none 90° or higher. While this condition is not without precedent it does not occur often.

PRECIPITATION

The average precipitation for the State, derived from the averages of nine divisions of nearly equal area, and based upon the records of 116 stations, was 5.38 inches, or 0.89 inch more than the normal. The excess was greatest in the southeastern division and least in the north-central division. All divisions in the northern portion of the State were below normal, though some stations had rather large excesses. In the central and southern portions of the State all divisions reported excesses and a few stations in the southern portion reported amounts more than twice the normal. The longest period of fair weather occurred during the first week. During the rest of the month showers occurred at frequent intervals and the longest showerless period was four days. The greatest monthly amount was 10.31 inches, at Keosauqua, and the least was 2.31 inches at Cherokee. The greatest amount occurring in 24 consecutive hours was 3.97 inches at Mount Ayr, on the 17th.

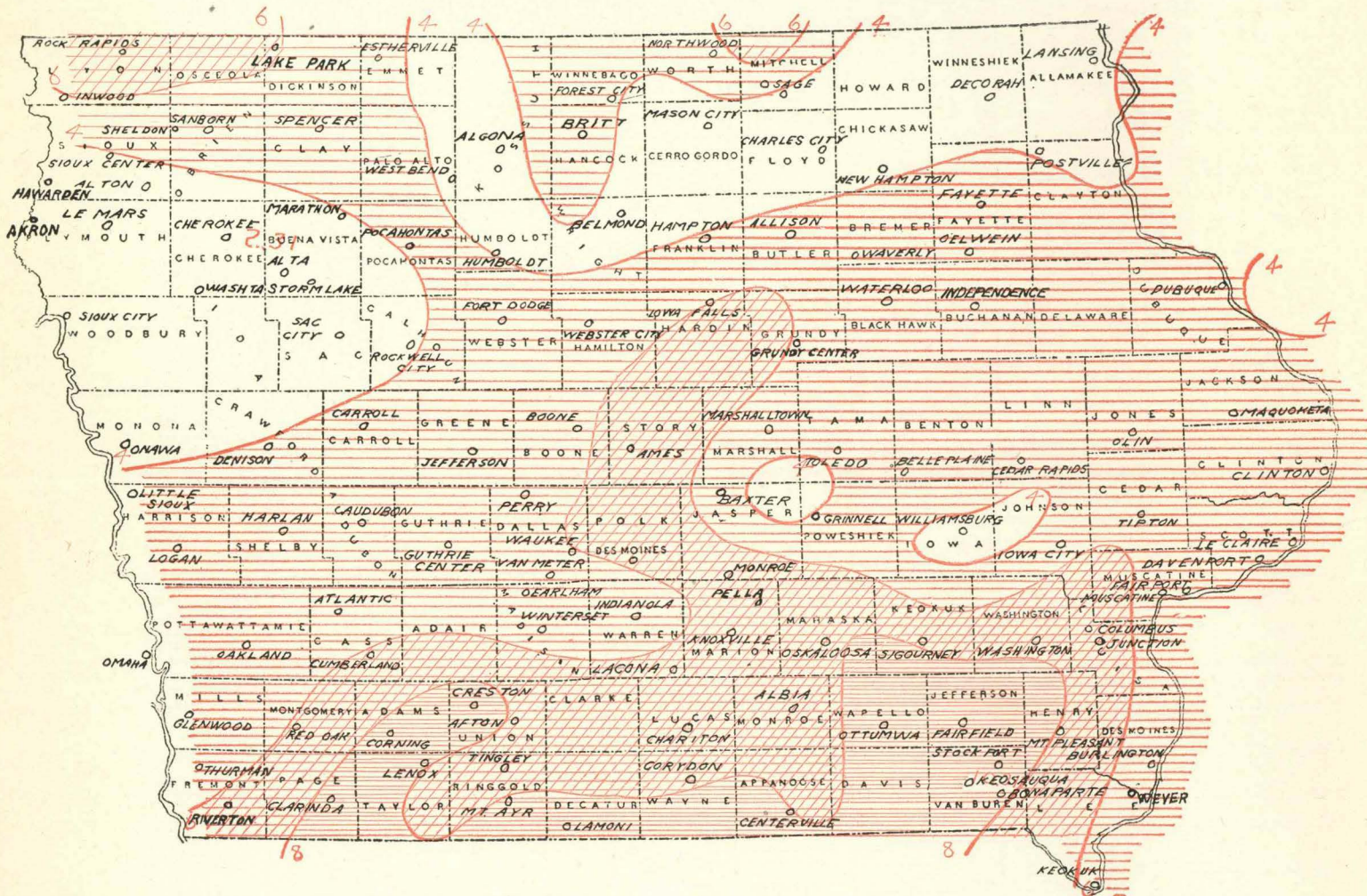
Daily Maximum and Minimum Temperature for the Month of June, 1928

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
<i>Northern Division</i>																																
Algona.....	Maximum.....	74	70	72	70	70	81	69	75	68	75	69	77	76	79	81	77	74	75	82	85	80	70	77	70	72	78	76	68	80	76	74.9
	Minimum.....	53	42	43	47	48	51	54	55	49	43	51	60	53	58	45	58	55	57	62	60	55	60	50	52	44	46	52	57	53	60	52.4
Alta.....	Maximum.....	73	69	74	67	70	81	68	73	68	76	66	78	73	84	83	79	74	74	83	85	74	70	70	64	72	79	68	71	83	81	74.3
	Minimum.....	52	45	50	48	50	50	55	56	48	44	53	58	50	51	55	59	54	58	62	59	57	56	52	54	46	52	54	56	56	57	53.2
Alton.....	Maximum.....	72	74	71	69	72	80	73	71	69	76	70	75	72	81	81	82	74	73	83	81	76	68	67	65	70	77	70	72	80	81	74.2
	Minimum.....	40	44	45	46	49	47	56	55	50	39	53	58	50	50	55	62	57	56	61	60	57	55	50	55	48	46	54	57	56	58	52.3
Belmond.....	Maximum.....	75	69	74	70	66	80	69	73	67	75	77	74	80	82	80	75	77	79	84	77	72	75	69	72	79	76	71	80	78	74.8	
	Minimum.....	50	39	38	46	51	50	51	56	48	39	50	59	53	50	55	60	59	59	63	57	55	57	48	53	47	43	49	56	52	54	51.6
Charles City.....	Maximum.....	72	67	72	70	62	78	70	73	65	74	74	77	72	77	80	78	71	75	76	84	76	66	74	60	68	77	77	70	79	80	73.1
	Minimum.....	50	41	41	50	54	52	51	54	48	41	52	59	55	52	54	56	60	62	60	55	58	56	51	51	51	47	51	55	53	57	52.6
Decorah.....	Maximum.....	72	69	75	74	64	80	80	76	65	77	77	78	72	79	81	80	72	77	82	85	78	75	73	61	68	81	81	75	82	83	75.7
	Minimum.....	53	38	35	41	50	48	48	53	49	32	46	63	56	49	45	51	60	60	60	53	53	50	53	51	48	41	45	54	51	52	49.7
Dubuque.....	Maximum.....	74	69	74	70	56	73	76	76	62	72	75	83	67	76	77	76	73	77	81	82	79	73	73	62	58	76	78	77	77	82	73.5
	Minimum.....	58	49	47	54	49	50	51	58	50	46	53	63	57	54	54	51	63	63	63	65	63	60	57	51	49	51	54	60	59	61	55.5
Forest City.....	Maximum.....	78	68	70	69	67	80	70	74	73	73	72	78	75	77	81	78	73	77	83	74	74	76	71	71	79	75	68	78	77	77	74.3
	Minimum.....	50	39	39	45	49	48	46	56	45	40	47	58	50	49	54	57	59	60	55	55	54	49	45	53	54	48	53	51	55	53	50.7
Independence.....	Maximum.....	74	75	74	71	68	74	76	73	72	72	73	81	77	75	79	79	78	77	80	80	80	77	73	72	65	75	74	78	79	79	75.2
	Minimum.....	58	45	45	51	50	50	42	54	51	41	49	59	56	51	51	54	60	60	64	57	59	38	54	54	50	48	51	57	56	58	52.4
Inwood.....	Maximum.....	77	73	76	74	75	82	72	77	70	78	63	77	74	81	82	81	76	73	82	80	77	71	69	68	75	77	70	79	80	75.3	
	Minimum.....	45	39	41	48	47	48	57	55	47	38	51	57	47	49	55	62	52	57	60	58	55	55	49	52	45	47	56	53	58	51.3	
Lake Park.....	Maximum.....	74	71	74	74	70	81	70	76	62	75	65	76	72	81	82	76	72	77	83	82	79	68	73	60	71	78	68	67	80	76	73.8
	Minimum.....	48	39	41	44	42	49	54	52	40	39	49	61	50	46	55	59	63	54	59	58	54	53	49	52	45	48	52	54	53	57	50.6
Mason City.....	Maximum.....	71	76	72	70	65	78	71	72	64	72	69	76	71	76	78	77	76	74	76	82	75	68	73	66	70	76	75	68	80	78	73.2
	Minimum.....	48	31	34	43	48	48	47	51	46	34	48	58	54	48	51	55	59	60	60	61	51	54	46	50	47	43	45	55	48	52	48.8
New Hampton.....	Maximum.....	72	67	70	69	65	80	70	73	66	77	71	76	76	80	82	79	73	71	78	82	78	68	74	64	69	78	75	79	81	79	74.1
	Minimum.....	44	41	43	47	52	51	46	53	46	41	49	58	52	50	51	56	59	61	59	58	54	52	49	52	48	51	58	51	56	51	51.3
Pocahontas.....	Maximum.....	75	70	71	68	70	78	78	75	69	76	69	77	73	81	83	82	82	74	81	84	80	67	75	66	72	78	75	70	81	77	75.2
	Minimum.....	52	40	43	43	51	50	58	57	49	40	50	59	53	51	54	61	54	57	62	54	55	57	54	55	48	48	52	56	55	55	52.2
Postville.....	Maximum.....	70	65	68	67	59	71	72	73	68	70	72	75	67	72	75	74	70	72	74	77	74	64	68	64	60	73	74	71	76	78	70.4
	Minimum.....	56	44	40	47	50	47	48	46	41	47	59	55	48	48	51	60	60	54	53	57	53	59	51	48	45	52	56	55	55	51.1	
Rock Rapids.....	Maximum.....	73	74	75	74	77	79	73	73	70	76	76	74	83	81	77	75	74	82	80	78	69	69	61	48	44	73	73	80	79	75.2	
	Minimum.....	43	37	38	42	47	46	55	57	48	36	50	55	48	46	55	60	54	56	60	57	55	54	49	54	44	44	53	55	56	50.2	
<i>Central Division</i>																																
Belle Plaine.....	Maximum.....	78	72	74	69	63	77	76	73	69	76	78	83	73	76	82	83	79	81	83	85	81	77	77	66	66	79	79	73	81	81	76.3
	Minimum.....	58	40	44	53	48	42	46	57	50	39	49	63	57	54	46	46	56	61	68	58	64	61	50	54	50	44	49	59	53	57	52.5
Boone.....	Maximum.....	76	71	71	73	64	80	68	76	69	75	71	77	75	80	81	80	79	80	80	86	83	73	76	68	72	78	74	74	82	77	75.6
	Minimum.....	52	37	49	51	50	46	44	55	48	38	47	59	56	46	57	62	57	61	63	56	58	47	55	50	42	47	59	55	53	51	51.9
Carroll.....	Maximum.....	73	70	70	68	65	81	72	73	69	75	74	76	77	79	81	80	78	76	80	87	82	75	75	66	71	79	71	70	79	75	74.9
	Minimum.....	53	43	52	49	50	46	55	37	47	45	47	56	53	52	54	60	55	58	62	58	58	59	51	53	48	47	54	57	55	57	53.0
Cedar Rapids.....	Maximum.....	78	72	73	69	65	76	73	74	68	75	75	84	72	81	80	79	80	84	84	81	76	75	66	63	78	77	76	80	81	75.8	
	Minimum.....	55	44	43	55	47	48	45	53	50	38	43	63	58	44	55	53	60	63	65	57	60	54	54	50	46	48	60	59	55	52.8	
Davenport.....	Maximum.....	78	72	74	69	53	66	78	76	66	73	77	83	71	81	82	81	82	84	82	82	84	78	76	66	59	76	78	77	78	83	75.5
	Minimum.....	59	49	56	50	49	50	53	62	54	51	55	64	60	57	56	54	67	66	66	68	66	61	59	55	52	54	58	63	61	62	57.9
Des Moines.....	Maximum.....	76	72	70	67	61	78	71	76	69	74	73	77	75	81	81	82	80	78	83	86	84	72	77	68	74	78	74	70	79	77	75.4
	Minimum.....	61	48	57	55	51	50	56	61	53	49	53	61	58	54	60	60	60	62	68	62	64	59	53	54	53	48	55	63	58	61	57.0
Ft. Dodge.....	Maximum.....	75	68	75	71	65	80	71	73	68	76	73	79	74	82	84	81	77	78	81	87	81	71	75	67	72	79	76	76	79	76	75.7
	Minimum.....	50	38	41	47	51	45	50	48	47	39	50	59	52	50	54	60	56	55	60	54	53	57	47	53	46	41	50	55	53	53	50.5
Grinnell.....	Maximum.....	76	74	72	68	66	77	75	75	72	76	74	71	80	81	80	80	78	80	82	85	82	77	74	71	67	78	75	71	76	77	75.6
	Minimum.....	56	40	49	55	47	48	47	55	48	41	48	60	55	48	54	55	58	59	67	58	58	60	51	52	49	48	49	57	43	56	52.4
Guthrie Center.....	Maximum.....	76	73	75	70	63	75	75	76	67	75	78	84	70	81	82	81	79	82	85	85	82	75	76	68	62	77	78	79	78	81	76.3
	Minimum.....	57	43	47	56	48	50	47	51	51	41	48																				

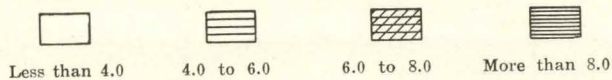
IOWA STORMS, JUNE, 1928

Date	County	Township	Nature of Storm	Time	Storm Moved From	Width of Path Miles	Length of Path Miles	Area of Sq. Miles	Size of Hailstones Inches	Damage	Persons Killed	Persons Injured
6	Crawford	Union	Wind and Hail						1/2	Some to crops		
6	Shelby	Greeley, Grove and Union	Wind and Hail						Hen Eggs	Crops		
7	Adair	Lincoln and Jefferson	Hail	11:30 p. m.					2	Crops		
7	Adams	Douglas, Grant, Lincoln and Washington	Wind and Hail	5:30 p. m.	SW to NE					Buildings		
7	Audubon	Cameron, Greeley and Leroy	Wind and Hail	11:00 a. m.	NW to SE	1			1/4	Some to Crops		
7	Benton	Eldorado and Fremont	Wind	7:30 p. m.	NW to SE					Buildings		
7	Cass	Union and Edna	Wind	4:00 p. m.						Crops		
7	Clinton	Lincoln	Wind	7:00 p. m.						Slight		
7	Crawford	Nishnabotna	Hail	11:00 a. m.						Marbles		
7	Deatur	Burrell and Fayette	Wind and Hail	5:30 p. m.	W to E	2 1/2			1 1/2	Crops		
7	Fremont	Scott	Hail	4:30 p. m.	SW to NE				Walnuts	Slight		
7	Guthrie	Beaver, Grant, Penn, Thompson and Stuart	Hail	12:30 p. m.	NW to SE				1 1/4	Windows and Auto Tops	1	
7	Jones	Rome	Wind							\$1,000		
7	Keokuk	Prairie	Wind	6:00 a. m.						Small Bldgs. and Trees		
7	Lee	Jackson	Wind	7:00 p. m.								
7	Linn	Cedar, Franklin and Linn	Wind	9:00 p. m.	S to N					\$400		
7	Lucas	Benton	Wind	6:30 p. m.	NW to SE					\$2,800		
7	Madison	Douglas, Jackson Lincoln, Union and Scott	Wind and Hail	1:00 p. m.	S to N	2			Hen Eggs	Considerable to Crops		
7	Ringgold	Clinton, Grant, Jefferson, Lincoln and Washington	Wind and Hail	6:00 p. m.	NW to SE	1/8				\$15,000		
7	Union	Douglas, Grant, Highland, Paulding and Union	Wind and Hail	5:00 p. m.	NW to SE	4				Crops and Buildings		1
7	Wayne	Union	Wind	7:00 p. m.	W to E					\$1,600		
11	Cherokee	Pitcher	Wind and Hail							Windows and Trees		
11	Lyon	Richland	Wind							Trees and Phone Lines		
11	Osceola	Fairview	Wind							Some to Trees and Buildings		
12	Boone	Jackson	Wind	6:00 a. m.	S to N					Slight		
12	Cass	Grove and Pymos	Tornado	5:00 a. m.	SW to NE				1/4	\$2,500		
12	Cedar	Fremont and Pioneer	Wind							Buildings and Trees		
12	Cherokee	Pitcher	Wind and Hail	4:00 a. m.						Trees and Phone lines		
12	Dubuque	Dubuque	Wind							Trees and Crops		
12	Grundy	Shiloh	Tornado	7:30 p. m.	SW to NE					Buildings and Live Stock		
12	Hamilton	Freedom	Tornado	7:00 a. m.	W to E					\$500		
12	Louisa	Columbus City	Tornado	7:00 a. m.	SW to NE					Buildings and Chickens		
12	Lyon	Liberal, Midland, Riverside and Rock	Tornado	3:00 a. m.	SW to NE					\$3,000		
12	Mitchell	Burr Oak, Cedar Mitchell, Osage	Wind							Buildings and Live Stock		
12	Page	Amity, Colfax, Harlem, Nodaway	Wind	5:00 a. m.						Buildings		
12	Pottawattamie	Knox and Pleasant	Wind							Crops and Windows		
12	Scott	Blue Grass and Davenport	Wind	7:00 p. m.	SW to NE					Crops and Trees		
12	Wayne	Jackson and Wright	Wind and Hail	4:30 p. m.	SW to NE					\$500 to Crops		
12	Woodbury	Rock	Tornado	3:30 a. m.						Buildings and Chickens		
16	Boone	Des Moines	Wind and Flood	8:00 p. m.						Trees and Telephone		
16	Crawford	Nishnabotna	Wind and Rain	7:30 p. m.						\$1,500		
17	Van Buren	Henry and Washington	Wind							Trees and Telegraph		
18	Adams	Grant, Jasper, Mercer, Union	Tornado	7:30 p. m.	SW to NE	4	6	24	Hen Eggs	\$125,000		
18	Benton	Taylor	Rain and Flood	8:30 p. m.						Crops		
18	Hamilton	Boone	Rain and Flood	8:30 p. m.						Crops		
18	Marshall	Linn and Marshall	Hail	5:00 p. m.						\$200 to Green-houses		
18	Union	Douglas	Tornado	8:00 p. m.	SW to NE					\$10,000		
19	Grundy	Beaver and Lincoln	Hail	6:00 p. m.	W to E	2 1/2	3	7 1/2		\$20,000		
20	Grundy	Grant	Wind	10:00 p. m.	NW to SE	1	4	4	Hazel Nuts	\$5,000		
21	Des Moines	Yellow Springs	Wind and Hail							Crops, Bldgs.		
21	Mahaska	Spring Creek	Hail	5:15 a. m.	NW to SE				Hazel Nuts	Crops and Fruit Trees		
21	Mills	Ingraham	Rain and Hail							Crops		
21	Wayne	Warren	Wind	5:30 a. m.	NW to SE	1	1	1		Slight		
22	Washington	Washington	Tornado	10:00 p. m.	SW to NE	1	3 1/2	3 1/2		\$2,000		
27	Sioux	Sheridan	Hail	10:30 a. m.	W to E	1/2				Crops		
28	Des Moines	Burlington, Franklin, Huron and Yellow	Wind, Hail and Flood	3:00 p. m.	NW to SE				1/4	\$30,000		
28	Keokuk	Washington	Tornado	1:30 p. m.	SW to NE				1/2	\$7,500		
28	Lucas	Jackson, Union and Warren	Tornado	4:00 p. m.	NW to SE					\$3,000		
28	Sioux	Sheridan, Welcome	Wind and Hail	7:00 a. m.	W to E					\$30,000		

TOTAL PRECIPITATION, JUNE, 1928



SCALE OF SHADES IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In co-operation with
IOWA WEATHER AND CROP BUREAU
CHARLES D. REED, Meteorologist

VOL. XXXIX DES MOINES, IOWA, JULY, 1928 No. 7

GENERAL SUMMARY

The mean temperature averaged very near the normal. There was a slight excess for the State and also in each division except the central, where the deficiency was 0.5°, and the greatest excess was 0.4° in two divisions. The first part of the month was the warmer, with a rather protracted warm period beginning on the first and continuing into the second week when there was considerable accumulated excess and the month promised to rank as warm. However, there was considerable oscillation above and below normal after the end of the warm period, in which the positive and negative departures about offset each other until the 27th, when a cool period set in, that continued till the end of the month and the accumulated excess was nearly consumed. As a whole, the month was pleasant, though the humidity was slightly higher than normal. There were no abnormally warm periods and but few consecutive days in any part of the State, with the maximum temperature 90° or higher. The warmest day generally was the 6th and the coolest the 28th. The nights, with a few exceptions, were pleasant.

Over most of the State the precipitation was quite uniform but considering all the State there were great variations as to amounts and frequency. Nearly all the southern half had amounts greater than the normal, while more than half of the northern portion was deficient though the amounts were mostly ample for agricultural purposes. However, in several areas in the northwestern division and small areas in the adjoining divisions, the amounts were decidedly deficient and crop growth was not good. Heavy rains occurred at a large number of stations which caused considerable damage. In towns and cities, basements were flooded and in country districts small streams went out of banks and carried away shocked grain. Some grain had to be spread out to dry and re-shocked. Roads were washed out in places and bridges and culverts destroyed. Storms were numerous but not unusually severe. The first of consequence was of two different types on the night of the 3d-4th, affecting most of the State, but most pronounced in the central and southern portions. Early in the night, 3d-4th, numerous local storms developed in the western portion of the State and moved east, accompanied by considerable wind and some hail, but the chief characteristic was rotating horizontal clouds and a terrifying roar that could be heard for a great distance and caused much alarm. There was very little damage from these storms for they were too far aloft, probably at least two miles. The second type of storm in the early morning of the 4th was accompanied by wind, hail, rain and lightning, which damaged crops, trees and buildings.

A singularly poor distribution of rainfall occurred in the vicinity of Sioux City, where measurable rain occurred on but two days, mostly on the 21st, when one of the most intense rainstorms in the history of Iowa set new State records for periods of 10 and 15 minutes and 1 hour. This will be discussed more fully in a later issue of this report.

The persistent wet weather over most of the State delayed threshing to some extent, caused grain in the shock to sprout and some threshed grain to heat in the bins. Threshing made fair progress, however, due to the fact that most of the rain occurred at night. The wet weather was a great benefit to corn, which made excellent progress and at close of the month its condition was very good to excellent. Pastures, except the dry areas, were green and gardens and truck crops were excellent. Bush fruits were damaged somewhat by too much rain but the yield was the best in years. The wet weather and favorable temperature caused weeds to make rank growth and gave some trouble in corn fields and will interfere with the harvesting of certain truck crops. Dirt roads in the eastern and southern portions of the State were in poor condition most of the month.

F. L. D.

TEMPERATURE

The mean temperature for the State, derived from the means of nine districts of nearly equal area, and based on the records of 104 stations, was 73.9°, or 0.2° higher than the normal. All divisions reported an excess except the central division which had a deficiency of 0.5°. The average excess in the other divisions ranged

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
1873	74.0	+ 0.3	96	54	2.78	- 1.04	7.73	0.85					
1874	77.8	+ 4.1	101	56	3.04	- 0.78	6.15	0.55					
1875	72.8	- 0.9	97	56	6.05	+ 2.23	9.70	1.60					
1876	71.2	- 0.5	95	54	6.15	+ 2.33	11.92	1.84					
1877	74.0	+ 0.3	97	54	2.35	- 1.47	7.58	0.38					
1878	76.5	+ 2.8	104	52	5.13	+ 1.31	13.20	0.90					
1879	76.0	+ 2.3	102	55	2.20	- 1.62	8.66	0.00					
1880	73.8	+ 0.1	98	48	4.16	+ 0.34	10.40	1.30					
1881	75.9	+ 2.2	100	50	5.33	+ 1.51	16.31	0.28					
1882	69.1	- 4.6	94	46	3.66	- 0.16	7.30	0.85					
1883	72.9	- 0.8	100	46	5.14	+ 1.32	13.99	1.26					
1884	71.0	- 2.7	96	50	5.41	+ 1.59	11.51	0.70					
1885	74.6	+ 0.9	102	48	4.73	+ 0.91	11.45	0.68					
1886	76.2	+ 2.5	103	48	0.50	- 3.32	2.20	0.00					
1887	77.0	+ 3.3	105	45	2.85	- 0.97	8.43	0.87					
1888	75.9	+ 2.2	103	38	4.31	+ 0.49	8.45	1.17					
1889	72.6	- 1.1	102	40	4.00	+ 0.18	8.25	1.15					
1890	75.2	+ 1.5	110	45	2.04	- 1.78	6.16	0.66					
1891	68.5	- 5.2	99	41	4.22	+ 0.40	8.20	1.67		8	13	13	5
1892	73.0	- 0.7	104	38	5.29	+ 1.47	12.86	1.71		9	16	10	5
1893	75.0	+ 1.3	102	47	3.33	- 0.49	8.84	1.49		7	19	10	2
1894	76.4	+ 2.7	109	39	0.63	- 3.19	3.50	T.		3	22	8	1
1895	72.1	- 1.6	104	35	3.40	- 0.42	10.10	0.45		7	15	12	4
1896	73.6	- 0.1	104	42	6.90	+ 3.08	12.67	1.61		9	14	11	6
1897	75.6	+ 1.9	106	42	3.26	- 0.56	7.60	1.01		6	18	10	3
1898	73.4	- 0.3	102	42	2.98	- 0.84	12.88	0.55		7	19	9	3
1899	73.1	- 0.6	101	38	3.07	- 0.75	8.66	0.42		7	16	10	5
1900	73.4	- 0.3	102	37	6.15	+ 2.33	18.45	1.80		9	16	10	5
1901	82.4	+ 8.7	113	46	2.34	- 1.48	5.97	0.27		5	21	9	1
1902	73.1	- 0.6	99	41	8.67	+ 4.85	13.57	4.82		13	14	10	7
1903	72.9	- 0.8	100	40	4.83	+ 1.01	12.72	0.94		9	17	9	5
1904	70.6	- 3.1	100	38	4.41	+ 0.59	11.97	1.28		10	16	9	6
1905	70.6	- 3.1	102	40	2.91	- 0.91	7.08	0.69		9	14	10	7
1906	70.9	- 2.8	102	42	3.04	- 0.78	7.05	0.26		8	18	10	3
1907	73.7	- 0.0	102	41	7.27	+ 3.45	13.66	3.97		13	16	11	4
1908	73.0	- 0.7	100	42	3.66	- 0.16	9.21	0.70		8	16	10	5
1909	72.3	- 1.4	102	46	4.77	+ 0.95	12.20	1.20		10	15	8	8
1910	74.5	+ 0.8	108	43	1.86	- 1.96	5.69	0.12		7	19	8	4
1911	75.5	+ 1.8	111	38	2.27	- 1.55	6.62	0.08		7	18	10	3
1912	74.6	+ 0.9	103	38	3.71	- 0.11	7.56	1.17		10	17	10	4
1913	76.1	+ 2.4	108	45	1.82	- 2.00	6.23	T.		5	21	8	2
1914	76.6	+ 2.9	109	43	2.27	- 1.55	6.50	0.44		5	20	8	3
1915	69.5	- 4.2	92	40	8.32	+ 4.50	15.83	3.68		14	10	12	9
1916	79.7	+ 6.0	105	48	1.78	- 2.04	6.87	0.10		5	23	7	2
1917	74.3	+ 0.6	106	38	2.27	- 1.55	6.06	0.23		7	21	8	1
1918	73.1	- 0.6	105	40	3.17	- 0.65	8.05	0.26		8	19	8	4
1919	77.4	+ 3.7	104	41	2.86	- 0.96	7.82	0.39		6	22	8	1
1920	72.3	- 1.4	102	45	4.22	+ 0.40	7.49	1.11		9	19	9	3
1921	77.9	+ 4.2	104	41	2.53	- 1.29	7.45	0.42		7	19	9	3
1922	71.5	- 2.2	98	40	6.31	+ 2.49	11.72	3.13		11	14	12	5
1923	76.5	+ 2.8	102	47	1.75	- 2.07	5.54	0.29		5	19	9	3
1924	70.2	- 3.5	99	41	3.67	- 0.15	8.90	0.57		9	16	11	4
1925	74.1	+ 0.4	105	40	2.66	- 1.16	7.93	0.80		8	19	10	2
1926	74.8	+ 1.1	109	38	3.72	- 0.10	9.02	0.82		10	15	10	6
1927	72.9	- 0.8	102	45	1.96	- 1.86	4.80	0.09		7	18	10	3
1928	73.9	+ 0.2	98	43	4.43	+ 0.61	9.32	0.65		8	18	10	3

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

from 0.1° to 0.4° though there were stations in all divisions that were slightly deficient in temperature. The highest monthly mean was 77.4° at Keokuk, and the lowest was 69.9° at Postville. The absolute range for the State was 56°, ranging from 98° at Burlington and Sioux City on the 6th, to 43° at Mason City on the 28th. The average number of days with the maximum temperature 90°, or above, was 6. The average number was highest, 12, in the southwestern district, and least in the northwestern and north-eastern districts, the average being 4.

PRECIPITATION

The average precipitation for the State, derived from the average of nine divisions, of nearly equal area, and based on the records of 116 stations, was 4.43 inches, or 0.61 inch more than the normal. There was an excess in all except the northwestern and west-central divisions. The excess was pronounced in the east-central and all southern divisions. The average number of rainy days varied greatly, ranging from 5 in the northwestern division to 10 in the east-central division and the station extremes ranged from 2 at Sioux City to 14 at Des Moines. The shower periods were numerous, rather protracted and covered large portions of the State. The most protracted and extensive period occurred from the 18th to 21st, inclusive. The greatest amount reported from a single station was 9.32 inches at Mt. Ayr, and the least was 0.65 inch at Estherville. The greatest amount occurring in 24 consecutive hours was 4.30 inches at Mt. Ayr on the 21st.

Climatological Data for July, 1928

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
Northwest District																				
Akron	Plymouth	1,153	2															Orlan C. Moore		
Alta	Buena Vista	1,513	37	74.1	+ 1.7	96	6	52	28	31	4.66	+ 0.85	3.37	0	4	23	7	D. E. Hadden		
Alton	Sioux	1,305	23	73.4	- 0.1	95	6	50	28	30	5.02	+ 1.46	3.47	0	4	20	11	W. S. Slagle		
Cherokee	Cherokee	1,196	8	72.5	+ 1.4	92	6	47	28	32	2.41	- 1.41	1.31	0	4	7	24	J. E. Wirth		
Estherville	Emmet	1,298	33	74.0	+ 2.1	94	6	48	28	35	0.65	- 3.51	0.35	0	5	24	6	A. O. Peterson		
Hawarden	Sioux	1,181	2								3.25	- 0.38	1.99	0	6	17	6	Earl V. Slife		
Inwood	Lyon	1,474	24	73.2	+ 0.6	96	6	45	28	39	1.75	- 1.62	1.33	0	4	25	6	A. C. Hanson		
Lake Park (near)	Dickinson	1,489	15	72.4	+ 0.4	92	6†	49	28	32	1.16	- 1.64	0.70	0	5	20	10	P. M. Lawrence		
Le Mars	Plymouth	1,224	32	73.8	+ 0.5	95	6	48	28	33	4.57	+ 0.49	2.25	0	6	29	2	Henry Newell		
Marathon	Buena Vista	1,390	2								2.05		1.10	0	7	22	8	E. G. Smith		
Pocahontas	Pocahontas	1,248	24	73.4	+ 0.7	94	6	48	28	34	4.25	+ 0.80	1.83	0	7	21	10	F. E. Hronek		
Rock Rapids	Lyon	1,349	29	72.2	- 0.4	93	6	45	28	34	1.44	- 1.93	0.80	0	4	29	2	Nellie F. Medberry		
Sanborn	O'Brien	1,553	14	72.2	- 0.6	93	6†	45	28	36	1.74	- 1.76	0.67	0	7	14	13	J. W. Dow		
Sheldon	O'Brien	1,418	17	72.6	- 0.4	92	6	45	28	34	3.29	- 0.81	1.36	0	7	18	13	Ross E. Forward		
Sioux Center	Sioux	1,426	29	72.8	- 0.2	93	6	49	28	31	3.80	- 0.03	2.28	0	4	18	9	J. De Ruyter		
Spencer	Clay	1,319	14	74.0	+ 0.6	95	6	46a	28	34a	1.48	- 2.02	0.59	0	8	20	11	E. W. Little		
Storm Lake	Buena Vista	1,440	39	73.9	+ 0.4	92	6	50	28	27	2.60	- 1.47	1.46	0	5	23	7	George H. Fracker		
Washta	Cherokee	1,157	30	76.2	- 1.1	94	6	44	28	34	2.08	- 2.15	1.50	0	5	21	9	H. L. Felter		
West Bend	Palo Alto	1,197	35	73.2b	0.0	92	6†	52c	23	34c	3.05	- 0.42	1.35	0	5	16	12	Jos. Dorweiler		
Means and extremes				73.1	+ 0.4	96	6†	44	28	39	2.70	- 1.02	3.47	0	5	20	9	2	s.	
North Central District																				
Algona	Kossuth	1,213	55	74.3	+ 1.3	93	6	51	28	28	4.32	+ 1.26	2.89	0	4	28	3	W. E. Laird		
Allison	Butler	1,060	14	71.9	- 0.9	92	6	47	28	34	4.73	+ 1.11	1.32	0	9	18	13	E. W. Detra		
Belmond	Wright	1,181	18	72.6	- 1.0	94	6	45	28	39	7.15	+ 3.53	1.85	0	9	20	10	H. F. Luick		
Britt	Hancock	1,236	41	73.7	+ 2.5	93	6	49	28	35	2.50	- 1.48	0.99	0	7	26	0	E. P. Healy		
Charles City	Floyd	1,015	37	72.8	+ 0.5	92	6	49	28	28	3.94	+ 0.29	1.61	0	10	16	11	U. S. Weather Bureau		
Forest City	Winnebago	1,226	34	73.0	+ 0.8	94	27	48	28	35	2.02	- 1.55	0.97	0	8	8	20	Dr. M. B. Neil		
Hampton	Franklin	1,145	3								4.25	+ 0.60	1.67	0	9			L. H. Davis		
Humboldt	Humboldt	1,095	40	73.3	- 0.8	97	26	46	28	37	2.46	- 1.28	1.03	0	6	19	11	H. C. Snitkey		
Mason City	Worth	1,148	31	71.0	- 1.4	91	6	43	28	36	3.80	+ 0.28	1.24	0	9	13	15	American Beet Sugar Co.		
Northwood	Worth	1,222	32	71.6	+ 0.4	94	6	45	28	29	2.27	- 1.56	0.54	0	8	13	16	Charles Dwelle		
Osage	Mitchell	1,163	34	72.3	+ 0.4	92	6†	48	28	33	3.19	- 0.08	0.72	0	9	13	14	Dr. C. E. Juhl		
Means and extremes				72.6	+ 0.1	97	26	43	28	39	3.69	+ 0.10	2.89	0	8	18	11	2	sw.	
Northeast District																				
Decorah	Winneshiak	872	35	72.0	- 0.2	91	7†	45	28	35	5.03	+ 0.98	1.41	0	12	18	11	M. D. Whitney		
Dubuque	Dubuque	700	55	73.6	- 0.5	92	7	51	29	26	3.22	- 0.72	1.72	0	11	9	11	U. S. Weather Bureau		
Fayette	Fayette	1,003	40	73.2	+ 1.3	93	7	47	28	34	3.66	- 0.17	1.23	0	12	20	10	R. Z. Latimer		
Independence	Buchanan	921	64	72.6	- 0.4	90	2†	48	28	28	3.87	- 0.27	0.91	0	8	22	6	Dr. Geo. Boody		
Lansing	Allamakee	632	21								5.80	+ 1.77	1.84	0	11			Mrs. Mary Spinner		
New Hampton	Chickasaw	1,169	31															D. W. Dawson		
Oelwein	Fayette	1,036	5	72.8	+ 0.6	93	6	49	28	31	4.70	+ 0.78	1.40	0	8	18	9	John T. Ridler		
Postville	Clayton	1,192	29	69.9	- 0.1	87	7	47	28	26	4.45	+ 0.06	1.81	0	10	18	13	F. L. Williams		
Waterloo	Black Hawk	854	45	73.7	0.0	93	2†	49	28†	33	3.34	- 0.64	0.70	0	12	23	5	R. B. Slippy		
Waverly	Bremer	936	32	73.0	+ 0.5	92	6	49	28	32	5.13	+ 1.38	1.72	0	10	24	5	D. H. Murphy		
Means and extremes				72.6	+ 0.2	93	2†	45	28	35	4.36	+ 0.38	1.84	0	9	19	9	3	sw.	
West Central District																				
Audubon (near)	Audubon	1,297	33	73.6	+ 0.9	92	6	53	28	26	4.48	+ 0.81	1.11	0	8	19	12	George Kibby		
Carroll	Carroll	1,265	38	73.8	+ 0.6	94	6†	51	28	30	1.48	- 2.10	0.40	0	6	23	8	Mrs. Jos. J. Wolfe		
Denison	Crawford	1,171	34	73.6	+ 0.2	94	6	51	28	29	2.66	- 1.09	0.88	0	7	17	13	V. L. Byers		
Guthrie Center	Guthrie	1,077	33	73.8	+ 0.2	91	3†	53	30	29	6.97	+ 2.75	1.92	0	7			H. A. Stafford		
Harlan	Shelby	1,192	29	72.5	- 0.6	93	6	50	28	33	3.04	- 0.84	1.02	0	8	17	12	Walter Bell		
Jefferson	Greene	1,052	29	72.9	- 0.4	93	6	50	28	28	3.87	+ 0.19	1.54	0	6	21	7	W. I. Lyon		
Little Sioux	Harrison	1,010	23	74.9	+ 0.5	97	6	52	28	30	4.02	- 0.18	2.01	0	10	12	18	H. W. Kerr		
Logan	Harrison	1,120	61	74.4	+ 0.2	96	6	50	28	29	4.41	- 0.00	0.92	0	9	11	20	Amy Ann Stern		
Onawa	Monona	1,051	27	74.2	- 0.1	96	6	52	28	30	1.89	- 2.26	0.53	0	6	21	8	Mrs. H. E. Colby		
Rockwell City	Calhoun	1,232	32	72.2d	- 0.9	91d	26	48d	28	35d				0				A. W. McIsaac		
Sac City	Sac	1,269	52	72.8	- 1.0	96	6	51	28	30	3.45	- 0.22	1.25	0	6	13	17	F. P. Kessler		
Sioux City	Woodbury	1,135	39	75.3	+ 1.0	98	6	53	28	27	3.83	+ 0.54	3.24	0	2	8	17	U. S. Weather Bureau		
Means and extremes				73.6	+ 0.1	98	6	48	28	35	3.82	- 0.04	3.24	0	7	15	14	2	sw.	
Central District																				
Ames	Story	926	51	74.5	+ 0.5	95	6	52	14†	31	3.28	- 0.58	1.10	0	8	24	0	Iowa State College		
Baxter	Jasper	998	28	73.1	- 1.1	94	6	49	28	32	3.55	- 0.34	1.17	0	12	4	27	Otto Sanderman		
Boone	Boone	894	23	73.4	- 0.1	94	6	48	28	35	3.58	- 0.14	1.16	0	10	13	15	C. F. Henning		
Boone (near)	Polk	861	50	75.4	0.0	95	6	57	30	27	5.63	+ 2.18	1.20	0	14	12	13	U. S. Weather Bureau		
Des Moines	Webster	1,114	28	72.7	- 1.3	95	6	47	28	34	3.42	- 0.49	1.37	0	7	23	4	Samuel Sampson		
Fort Dodge	Webster	1,114	28	72.7	- 1.3	95	6	47	28	34	3.42	- 0.49	1.37	0	7	23	4	Samuel Sampson		
Grinnell	Poweshiek	1,031	34	72.9	- 1.4	94	6	48	29	32	3.25	- 1.12	1.02	0	9	19	11	R. E. Bates		
Grundy Center	Grundy	976	37	73.4	- 0.7	93	6	48	28	29	3.70	- 0.03	1.28	0	7	22	5	M. G. Heiberger		
Iowa Falls	Hardin	1,127	35	73.0	+ 0.7	95	6	48	28	30	3.34	- 0.60	1.52	0	7	18	8	C. H. Gilbert		
Marshalltown	Marshall	947	36	74.7	- 0.6	97	6	51	28	29	3.78	- 0.23	1.16	0	12	20	7	C. C. Pigman		
Monroe	Jasper	922	16	74.2	- 0.8	95	6	51	27	33	5.26	+ 1.70	1.36	0	8	17	13	J. A. Dibel		
Perry	Dallas	975	27	73.9	- 0.3	94	6	50	28	32	5.02	+ 0.98	1.61	0	10	14	16	Eugene N. Hastie		
Toledo	Tama	847	34	73.0	- 1.2	92	6	48	29	33	5.81	+ 2.27	2.80	0	9	22	9	H. P. Giger		
Van Meter	Dallas	872	9																	

Climatological Data for July, 1928—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>East Central District</i>																				
Belle Plaine	Benton	866	38	73.6	+ 0.1	93	6	49	29	33	6.42	+ 2.47	2.23	0	8	16	14	1	s.	O. C. Burrows J. T. Wurster Dr. A. P. Bryant U. S. Weather Bureau Rex Shriner
Cedar Rapids	Linn	737	46	73.2	- 0.8	92	6	47	29	34	5.06	+ 1.16	1.80	0	12	18	5	8	sw.	
Clinton	Clinton	595	55	74.5	- 0.3	93	7	49	29	33	3.38	- 0.51	1.85	0	10	17	6	8	s.	
Davenport	Scott	580	57	76.0	+ 0.7	94	7	54	28	26	4.57	+ 1.24	2.05	0	9	14	9	8	s.	
Davenport, No. 2	Scott	690	3	76.4		97	7	49	29	35	5.57		2.40	0	10	21	4	6	sw.	
Fairport	Muscatine	567	7	74.9	- 0.1	92	6†	51	29	27	4.57	+ 0.96	2.82	0	8	12	10	9	sw.	Bureau of Fisheries Prof. J. F. Reilly Margaret T. Disney John Strothoff William Moils
Iowa City	Johnson	733	68	74.1	+ 0.3	93	6	50	29	31	6.20	+ 2.08	1.60	0	12	16	11	4	nw.	
Le Claire	Scott	576	28								5.79	+ 2.26	2.02	0	10					
Maquoketa	Jackson	692	23	72.8	+ 1.6	92	3†	46	29	35	5.57	+ 1.78	1.24	0	10	16	7	8	sw.	
Muscatine	Muscatine	546	67								5.45	+ 1.74	2.62	0	10					
Olin	Jones	760	29	73.7	- 0.3	93	7	47	29	34	6.55	+ 2.70	2.53	0	10	20	7	4	se.	Mrs. L. Stingley John Kroepfen Dr. F. C. Schadt
Tipton (near)	Cedar	807	29	73.4	- 1.1	91	7	47	29	32	3.83	0.00	1.12	0	8	5	22	4	nw.	
Williamsburg	Iowa	770	12	73.8	+ 0.4	94	6	48	29	33	7.01	+ 3.06	3.44	0	8	24	6	1	se.	
Means and extremes				74.2	+ 0.2	97	7	46	29	35	5.38	+ 1.59	3.44	0	10	16	9	6	sw.	
<i>Southwest District</i>																				
Atlantic	Cass	1,164	37	74.8	+ 0.6	95	6	54	28†	28	5.24	+ 1.70	1.86	0	11	10	11	10	sw.	T. H. Whitney Arthur L. Bishop Dr. H. C. Hawley C. A. Smith Carl E. Pollock
Bedford††	Taylor	1,200									8.34	+ 4.39	3.24	0	8	17	12	2	s.	
Clarinda	Page	1,009	38	75.0	- 0.5	94	6	52	27	31	5.64	+ 1.31	2.10	0	12	17	12	2	s.	
Corning	Adams	1,150	36	76.0	+ 1.9	94	6†	51	28	37	4.91	+ 0.18	1.85	0	5	30	1	0	sw.	
Cumberland (near)	Cass	1,225	29								6.12	+ 2.44	2.56	0	8	14	15	2	s.	
Glenwood	Mills	1,100	30	75.4	+ 0.1	96	6†	52	28	30	4.72	+ 1.12	1.86	0	8	14	16	1	se.	George Mogridge J. L. Hurley W. S. Matthews B. R. Bridge Geo. C. Rader
Lenox	Taylor	1,250	33	75.3	+ 0.2	95	3	53	28	32	4.43	+ 0.22	2.50	0	7	21	10	0	nw.	
Oakland	Pottawattamie	1,139	9	73.8	- 0.5	94	6	51	28	28	4.70	+ 0.86	2.77	0	6	21	9	1	sw.	
Red Oak (near)	Montgomery	1,030	3								7.25	+ 3.20	3.75	0	9	13	18	0	sw.	
Riverton (near)	Fremont	920	2								2.54	- 1.40	0.68	0	10	13	5	13	s.	
Thurman	Fremont	960	31	76.2	+ 0.6	96	6	53	28	31	2.94	- 1.23	1.55	0	8	19	8	4	s.	H. H. Askew U. S. Weather Bureau
Omaha, Neb.		1,105	57	77.1	+ 0.4	99	6	58	28	28	6.55	+ 3.01	3.86	0	7	13	16	2	se.	
Means and extremes				75.4	+ 0.3	99	6	51	28	37	4.95	+ 1.03	3.86	0	8	17	11	3	s.	
<i>South Central District</i>																				
Afton	Union	1,212	34	75.4	+ 1.6	96	6	52	28	33	5.14	+ 1.17	2.35	0	8	20	9	2	sw.	S. R. Brown O. E. McBride Thomas Wood C. C. Burr J. C. Davis
Albia	Monroe	949	36	75.0	+ 0.5	94	6	52	28	29	3.59	- 0.55	0.84	0	13	17	9	5	sw.	
Centerville	Appanoose	1,013	23	75.2	+ 0.3	93	6	52	28	29	3.56	- 0.37	2.19	0	10	14	9	8	nw.	
Chariton (near)	Lucas	1,042	33	74.2	+ 0.9	93	6	52	28	28	4.74	+ 0.43	1.78	0	7	14	16	1	sw.	
Corydon (near)	Wayne	1,050	35	74.2	- 0.4	92	26	54	29	25	3.42	- 0.39	1.05	0	10	15	12	4	se.	
Creston	Union	1,291	23	74.0	+ 0.6	93	6	53	28†	27	5.94	+ 1.94	3.06	0	9	8	15	8	s.	Mrs. N. Spangler George Phillips Seth F. Shenton W. J. Casey J. B. Alter
Earlham (near)	Madison	1,126	26	72.6	- 0.2	92	6	50	28	32	6.42	+ 2.76	2.70	0	10	26	3	2	sw.	
Indianola	Warren	972	37	74.7	- 0.1	94	6	54	28	29	5.45	+ 1.66	1.04	0	11	19	10	2	sw.	
Knoxville	Marion	920	23	74.6	+ 0.1	94	6	53	28†	29	4.96	+ 0.99	1.35	0	10	17	8	6	se.	
Lacona	Warren	824	29								4.38	+ 0.60	1.12	0	12	14	10	7		
Lamoni	Decatur	1,123	21	74.5	+ 0.6	93	6	54	28	28	7.93	+ 3.99	4.10	0	10	18	11	2	sw.	F. S. Parks S. E. Hollen L. L. Langerak James A. Verploegh H. S. Ely
Mount Ayr	Ringgold	1,240	35	74.6	+ 0.3	92	4†	56	28	28	9.32	+ 4.90	4.30	0	9	11	20	0	se.	
Pella (near)	Marion	850	1								4.61	+ 1.32	1.13	0	9	21	8	2	se.	
Tingley	Ringgold	1,275	3	73.9	+ 0.5	95	6	51	28	30	6.73	+ 2.59	2.72	0	6	21	10	0	sw.	
Winterset	Madison	1,118	37	75.0	+ 0.1	94	6	51	28	29	4.44	+ 0.04	1.05	0	8	27	4	0	sw.	
Means and extremes				74.5	+ 0.4	96	6	50	28	33	5.38	+ 1.41	4.30	0	9	18	10	3	sw.	
<i>Southeast District</i>																				
Bonaparte (near)	Van Buren	563	37	74.2	- 0.2	91	6	51	1†	32	4.55	+ 0.69	1.02	0	9	25	6	0	w.	B. R. Vale John T. Donnelly Miss Musa Todd R. M. McKenzie U. S. Weather Bureau
Burlington	Des Moines	544	32	77.2	+ 1.2	98	6	54	28†	32	5.07	+ 1.66	1.68	0	10	22	8	1	sw.	
Columbus Junction	Louisa	595	27	73.1	- 1.9	90	2†	49	29	27	8.64	+ 5.07	3.70	0	10	21	10	0	se.	
Fairfield	Jefferson	780	44	74.5	+ 0.1	94	6	51	29	33	5.68	+ 1.86	2.12	0	8	16	10	5	s.	
Keokuk	Lee	614	57	77.4	+ 0.5	96	6	56	28	28	2.93	- 0.48	1.44	0	7	13	7	11	s.	
Keosauqua	Van Buren	614	36	75.3	+ 0.6	95	6	49	1	38	4.49	+ 0.50	1.39	0	8	15	13	3	se.	J. H. Landes J. H. Jericho Roy R. Robinson C. L. Mikesh W. E. Utterback
Mt. Pleasant	Henry	730	47	75.8	+ 0.1	95	6	52	28†	29	6.03	+ 2.37	2.37	0	9	7	19	5	sw.	
Oskaloosa	Mahaska	835	52	73.6	- 0.1	92	2†	53	28	27	7.16	+ 3.44	1.69	0	11	16	10	5	sw.	
Ottumwa	Wapello	619	33	76.5	+ 0.2	94	6	54	28	32	4.81	+ 1.25	2.49	0	10	23	8	0	sw.	
Sigourney (near)	Keokuk	790	32	74.8	+ 0.7	94	6	51	28†	32	6.01	+ 2.16	1.43	0	12	18	5	8	nw.	
Stockport	Van Buren	747	26	75.0	+ 1.2	93	3†	50	29	32	4.85	+ 0.26	1.37	0	8	23	4	4	s.	C. L. Beswick D. D. Sherman H. G. Liddle
Washington	Washington	757	46	74.9	+ 0.4	93	2†	51	28	29	6.77	+ 3.43	3.40	0	10	11	13	7	se.	
Wever	Lee	552		75.8		96	3†	50	29	82	5.70		2.35	0	6					
Means and extremes				75.2	+ 0.2	98	6	49	1†	38	5.59	+ 1.86	3.70	0	9	18	9	4	sw.	
State means and extremes				73.9	+ 0.2	99	6	43	28	39	4.43	+ 0.61	4.30	0	8	18	10	3	sw.	

Temperature normals are based on the 46-year period July 3, 1875 to July 2, 1921; shorter records corrected to harmonize. Precipitation normals are based on the 50-year period ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1920 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.

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.

MISCELLANEOUS PHENOMENA

- Aurora: 7th, 20th, 21st, 22d, 23d.
- Fog: 1st, 12th, 13th.
- Hail: 2d, 3d, 4th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 19th, 20th, 21st, 26th.
- Halos (lunar and solar): 7th, 23d, 28th, 29th.
- Thunderstorms: All dates except 5th, 6th, 14th, 15th, 16th, 23d, 24th, 25th.

RIVERS

The mean stage of the Mississippi was below the July average. There were no important rises though numerous slight fluctuations

with falling stages predominating. The greatest extremes were 1.5 feet for the entire month while at one station the extremes were less than 1.0 foot. On the Missouri River the lowest stage occurred at the beginning of the month and the highest the last of the 2d week and the beginning of the 3d. The extremes ranged from 2.3 feet at Sioux City to 3.7 feet at Omaha. Fluctuations were frequent though generally slight. On the principal interior streams there were no important rises. The highest stages occurred mostly during the 1st week. Following the rainy period from the 18th to 21st, inclusive, a large number of small streams in the southern portion of the state were out of banks for several days.

Daily Precipitation for July, 1928

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>Northwest District</i>																																			
Akron	Big Sioux	.08		1.08							T.							.13																	3.37
Alta	Raccoon			1.40	.04						.35			T.																				.22	
Alton	Floyd	.18		1.19				.06			.09		T.						T.		.01													3.47	
Cherokee	Little Sioux			1.31			T.				.12			.04					T.	T.	T.													.94	
Estherville	Des Moines	.05	.10								.05																							.35	
Hawarden	Big Sioux	.23		.90											.03				.09		.01													1.99	
Inwood	Big Sioux	.11	T.	.29	.02										.08																			1.33	
Lake Park (near)	Little Sioux			.07				.70			.08				.08																			.23	
Le Mars	Floyd			1.96							.33				.01					.01	.01													2.25	
Marathon	Raccoon	.07	1.10					.20						.11																			.03		
Pocahontas	Des Moines			1.83				.43			.05			.05					1.24	.14													.51		
Rock Rapids	Big Sioux			.29				.33					.02																					.80	
Sanborn	Floyd	.15		.15				.67					.06	.25							.06													.40	
Sheldon	Floyd	.11		1.36	T.	T.	.87	.38					.20								.13												.24		
Sioux Center	Floyd			2.28			T.	.28											T.		.02												1.22		
Spencer	Little Sioux	.09		.25				.15					.15	.04		.17					.04												.59		
Storm Lake	Raccoon			1.46				.29	.12				.01						T.	T.													.72		
Washta	Little Sioux			1.50				.10					T.	.20						.03	T.												.25		
West Bend	Des Moines			1.35				.38	.10				T.						.64															.58	
<i>North Central District</i>																																			
Algona	Des Moines			1.10							.08								2.89														.25		
Allison	Cedar			1.32				.43	.20				.22	.06						.93	.34												.80		
Belmond	Iowa			1.85				.12	.12	.05			.02						1.76	1.23								1.50					.43		
Britt	Iowa	.02		.99															.72	.48	.02							.22					.05		
Charles City***	Cedar	T.		1.02		T.		.32			.35		.05						1.03	.59	.35						.13					.07			
Forest City	Cedar	.04		.34	.36				.06					.13						.97								.08					.04		
Hampton	Cedar			1.67				.50	.27	T.	.14								.64	.05	.04						.20						.74		
Humboldt	Des Moines			.78				.18											1.00	.03							.19						.28		
Mason City	Cedar	T.		.84		T.		.33					.07						.26	.75	1.24						.07						.18		
Northwood	Cedar	.20		.45			T.	.16					.27	T.					.54	T.	.10						.05						.50		
Osage	Cedar	.28		.47				.52					T.	.51	.05				.72		.34						.03						.27		
<i>Northeast District</i>																																			
Decorah	Mississippi	.15	.20	T.	.35			.04	1.41					.61					.74	.19	.84					.15						.27			
Dubuque***	Mississippi	.15		.18				.21			.04	T.	.33	.02					.03	.31	1.63						T.					.05	T.		
Fayette	Mississippi		.08	.66				1.23	.07	.20	.16		.07	.03					.68		.29						.09						.10		
Independence	Wapsipinicon	.19	.65					.81			.05		.11						.54	.91	.61												.38		
Lansing	Mississippi	.77	.93	T.	.14			1.84			.05			.35	.01				.50	.18	.20					.23							.65		
New Hampton	Wapsipinicon			.20	.40			.80					.30						1.00	1.40													.50		
Oelwein	Wapsipinicon			.28	.51			1.81	.11				.72		.06					.59	.13						.08						.16		
Postville	Mississippi			.22	.25	.60		.22	.30				.15	.05					.70	T.	.50	.03	.02			.30									
Waterloo	Cedar			.22	.25	.60		.22	.30				.15	.05					.70	T.	.50	.03	.02			.30									
Waverly	Cedar			.69				.80			.16		.37	.15					1.72		.22	.05	.42			.55							.42		
<i>West Central District</i>																																			
Audubon (near)	Nishnabotna			.45				.50	.35										1.11		.60	.43				.32							.48		
Carroll	Raccoon			.40				.33			.18				.04						.25	.28											.48		
Denison	Missouri			.43				.26	.47		.88								T.	.04	.25	.33											.66		
Guthrie Center	Raccoon	1.40						1.60	.70										.25	.62	.48	1.92											6.97		
Harlan	Nishnabotna			.57				1.02	.37	.21	.10									.32		.42	.03				T.						T.		
Jefferson	Raccoon			1.54				.15	.35										T.	.09	T.	1.13					.61						3.87		
Little Sioux	Little Sioux			.63				2.01	.23	.16	.03	.01							.02	.23	.29	.41											4.02		
Logan	Missouri			.60				.82	.44		.28									.33	.92	.20											.41		
Onawa	Missouri			.53				T.	.18		.30								T.	.08	.30	.50				.79							1.89		
Rockwell City	Raccoon							.35											.25			.85											**		
Sac City	Raccoon			.75				.75	.25				.35							.10			1.25										3.45		
Sioux City***	Missouri	T.		.59				T.	T.		T.	T.	T.						T.		T.	3.24											3.83		
<i>Central District</i>																																			
Ames	Skunk			1.10				.15											.33	.02	.02	.11										1.05			
Baxter	Skunk		.05	1.17				.24			.03	.42	.03	.04						.69	.04	.26	.08				.50						3.55		
Boone (near)	Des Moines		T.	1.16				.23	T.	.03	T.	.16		.04					.58	.59	.03	.14											3.58		
Des Moines***	Des Moines	.20		1.20				.03	.20	.77	.02	.37		.90					.05	.52	.07	.30	.72				.33						5.68		
Fort Dodge	Des Moines			.41				.22												1.37	.67		.53					.17					3.42		
Grinnell	Iowa			1.02				.24			.02	.03								1.01	.45	.03	.43										3.25		
Grundy Center	Cedar			1.28				.74	.06	.20	T.									1.12		.22				.08							3.70		
Iowa Falls	Iowa			.84	.68				.16		T.									.56		.45	.30					.35					3.34		
Marshalltown	Iowa		.03	1.16				.25	.58		.08			T.	.20					.28	.04	.01	.12	.05				.98					3.78		
Monroe	Des Moines			T.	1.22			.22	.58	.64	.04									1.08	T.	.16	1.36				.54						5.26		
Perry	Raccoon	T.		1.02				.18			.61	.01		.28					.20	.85		.23	.25					.39					5.02		
Toledo	Iowa	.04	.05	1.35				.65												2.80	.20	.10	.20				.42						5.81		
Van Meter	Raccoon			1.00				.40			.62	.10	.68	.29						.18	.45	.40	.50					.25					4.87		
Wauke	Raccoon	T.	T.	.69				.61			.69	.21	T.	.07																					

Daily Precipitation for July, 1928—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	
Southwest District																																	
Atlantic	Nishnabotna			.35				1.14		.04	.08	.01							.20	.03	.48	1.86						1.04			.01	5.24	
Bedford	102			T.			.90		.05	1.49					.22			T.	.25	2.11	3.24					.08		T.			8.34		
Clarinda	Nodaway						.50			.05						.05			.12	.84	2.10	.64	.04				.31	.05		.03	5.64		
Corning	Nodaway						.42							.03							1.66	1.85				.35					4.51		
Cumberland (nr.)	Nodaway			T.	.10		.72		.02		.15				T.			.49		1.43	2.56					.65		T.	T.		6.12		
Glenwood	Missouri				.10		.41	.97		.10					.11			.46		1.86	.68										4.72		
Lenox	Missouri				.05		.47					.03			.05					1.10	2.50					.23					4.43		
Oakland	Nishnabotna				.25		2.77	.21							.07				.07	.83	.57								T.		4.70		
Red Oak (near)	Nishnabotna						.08		.73	.06	.43	.14			T.	1.13	3.75	.73									.20				7.25		
Riverton (near)	Nishnabotna				.01		.64	.73		.15		.06			.02					.07	.68	.51				.36		.04	T.		2.54		
Thurman	Missouri				.01		.60			.15		.22						.04		1.55	.33							.04	T.		2.94		
Omaha, Neb., **	Missouri				.43		1.72	.32	T.	.04	T.	T.			T.			.18	1.18	2.68								T.			6.55		
South Central District																																	
Afton	Grand							.43		.08		.20								.28	1.52	2.35						.27			.01	5.14	
Albia	Des Moines	T.		T.	.56		.04	.29		.01	.08	.13			.02	.40	.08	.84	.61						.25			.25			.28	3.59	
Centerville	Chariton				.06		.30		.05	.09	.09					.55	.09	2.19							.13		.01		T.		3.56		
Chariton (near)	Chariton						.36		T.	T.	.48					.96	.48	5.01	1.78						.18					T.		4.74	
Corydon (near)	Chariton			T.			.06	.96		.33	.23	.14			.07	.09	.46	1.05							.03						3.42		
Creston	Missouri	T.		T.	.05		.76	T.			T.	.12			.01	.10	1.71	3.06	.04						.09						5.94		
Earlham (near)	Des Moines			1.16			.24		.04	.23					2.70	.06	.45	.56						.96	.02						6.42		
Indianola	Des Moines			.61			.28		.62	.03	.34	.35			1.04	.78	.39	.80							.21						5.45		
Knoxville	Des Moines			.16			.70		.29		.04	T.			.30	1.10	3.15							.41						.29	4.96		
Lacona	Des Moines			.17	.18				.25	.02	.05	.13			.52	.60	1.12	1.00						.25				.09			4.38		
Lamoni	Grand						.24		.61	.14	.19				1.42	.10	.90	4.10	.20					.03							7.93		
Mount Ayr	Grand			T.			.16	.80	T.	.07	.77				T.	.61	1.22	4.30						1.35				T.	.04		9.32		
Pella (near)	Skunk			.46			.68		.50	T.	T.				.60	.30	.23	1.13						.44					.27		4.61		
Tingley	Platte			T.			.95	T.			.79				.86	.69	2.72							.72					T.		6.73		
Winterset	Des Moines			.50			.70		.10						1.04	.40	.53	1.05						.12				T.			4.44		
Southeast District																																	
Bonaparte (near)	Des Moines			1.02			.18		.04	T.	.89					.57		.62						.02	.22				.99		4.55		
Burlington	Mississippi			.46	.01			.37		.20		.08			.64	1.68	.64	.01										.98			5.07		
Columbus Jct.	Iowa			.29	3.70		.39		.74	T.	.04				.02	.84	T.	1.75						.03				.84			8.64		
Fairfield	Skunk			2.12			.71			.54					.11	.48		1.48						.11				.13			5.68		
Keokuk**	Mississippi			.32			.22		.49		.23				T.	.20		T.						.03				1.44			2.93		
Keosauqua	Des Moines			1.39			.24		T.	.30	.81					.20		.71						.30				.54			4.49		
Mt. Pleasant	Skunk			1.46			.32		.15	.03	.15				.10	.51		.84						.25				2.37			6.03		
Oskaloosa	Des Moines			1.35			.70		.33	T.	.25				1.14	.60	1.2	1.69						.12	.07			.79			7.16		
Ottumwa	Des Moines			1.01			.26		.02	.07	.32				.03	.53	.03	2.49						.05				.05			4.81		
Sigourney (near)	Skunk			.91			.91	.17	.05	.39					.48	.31	.13	1.03						.08	.12			1.43			6.01		
Stockport	Skunk			1.37			.39		.03	.125						.57		.56								.08			.60			4.85	
Washington	Skunk			3.40			.28	.09	1.08		.09				.06	.44	.02	.80										.52			6.77		
Wever	Mississippi			.80			.65				.09				1.41		.40											2.35			5.70		

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.
- T. Precipitation is less than .01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE

Stations	Barometric Pressure, Inches (Sea Level)				Relative Humidity, %				Wind				Sunshine					
	Mean	Highest	Date	Lowest	Mean		Lowest	Date	Total movement	Average hourly velocity	Maximum			% possible				
					7 A. M.	12 Noon					7 P. M.	Miles	From		Date			
Chas. City	29.96	30.26	29	29.68	2	82	56	64	36	15†	3,226	4.3	18	s.	2	79	+ 4	
Davenport	29.97	30.28	29	29.74	2	80	59	60	37	15	13,174	14.3	22	w.	8	75	+ 1	
Des Moines	29.95	30.24	29	29.82	2	85	56	60	40	22	3,925	5.3	23	sw.	7	74	+ 1	
Dubuque	29.96	30.27	29	29.68	2	82	58	62	36	15	3,482	4.7	21	nw.	19	66	+ 4	
Keokuk	29.98	30.29	29	29.79	2	79	52	58	35	29	3,800	5.1	27	sw.	19	76	+ 0	
Sioux City	29.94	30.26	29	29.63	6	81	53	52	33	12†	6,262	8.4	33	n.	21	71	+ 1	
Omaha, Nb.	29.94	30.23	29	29.68	4	78	54	56	38	6†	4,024	5.4	32	sw.	4	80	+ 5	
Means and extremes	29.96					82	55	59				5.4				74	+ 1	
Normals and records	29.97		7th	29.63	6			33	12†						21			
		*30.47	1892	29.29	1926	79		57		25th					13th	73		
						13		1894							152	n.e.	1905	

*Davenport †Sioux City ‡Des Moines ||Omaha †Record for 28 days. ‡Local mean time †And other dates.

††January 1, 1928, 3-cup anemometers replaced the 4-cup instruments used since the establishment of the Weather Bureau stations. The new instruments will more accurately indicate the true wind movement. The records of the 4-cup instruments were somewhat too high at moderate velocities and considerably too high at the higher velocities. Tables of true velocities corresponding to indicated velocities appear in the January, 1928 Climatological Data. For purposes of comparison the highest velocity of record in the lower line of the table has been converted into a 3-cup velocity.

ERRATA

Report for March, 1928, Page 20, Clinton; total precipitation should be 2.63 inches. Report for May, 1928, Page 34, Grundy Center; greatest 24-hour precipitation should be 0.73 inch. Page 39, Charles City; lowest barometric pressure should be 29.61 inches. Report for June, 1928, Page 42, Hawarden; greatest 24-hour precipitation should be 0.93 inch. Jefferson; mean temperature should be 63.6° and the departure -5.6°. Grinnell; the greatest daily range should be 35°. Monroe, the number of clear days should be 14. Page 46, Davenport; maximum temperature on the 8th should be 77°.

DEATH REMOVES FAITHFUL OBSERVERS

On July 14, 1928, Mr. Alex Maxwell, Cooperative Observer at Mount Ayr, died at the Methodist Hospital in Des Moines, where the writer had a pleasant visit with him a short time before his death. Mr. Maxwell was born in Londonderry, Ireland, March 22, 1853. Upon arrival in America he came at once to Mount Ayr on September 2, 1880. In June, 1912, he became the cooperative observer and did not miss making a report till the time of his death, except during a few short absences when he provided a competent substitute.

Last December this service lost a devoted cooperater through the death of Mr. J. K. Medberry, who had been the observer at Rock Rapids for almost exactly 10 years. His daughter, Miss Nellie F. Medberry, is continuing the work.

Both of these men, though very accurate in taking and recording observations, were of the type that accepted occasional corrections and suggestions charitably, gracefully and profitably. A missing observation cannot be found in their records except when some instrument failed.

Daily Maximum and Minimum Temperature for the Month of July, 1928

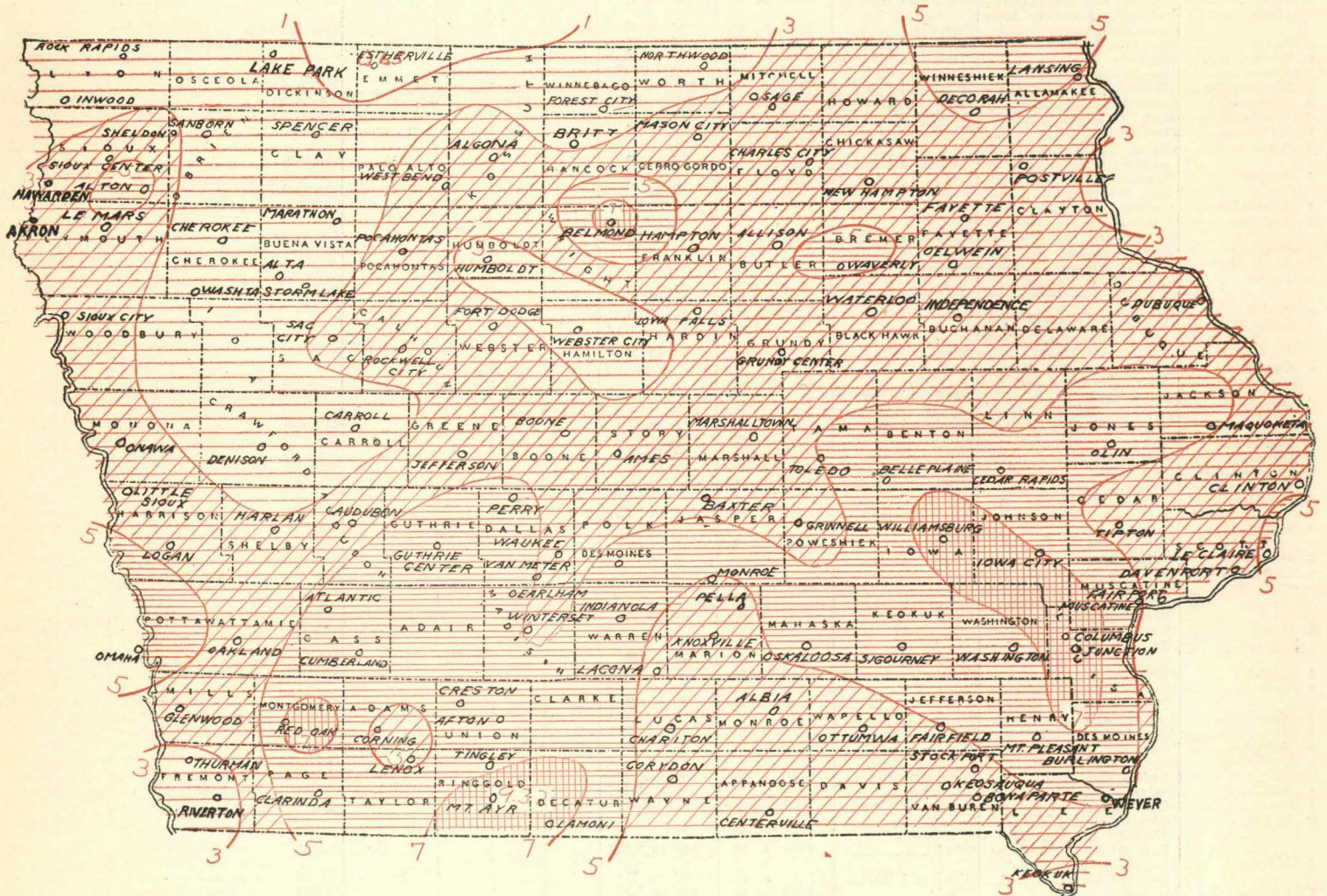
Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean		
<i>Northern Division</i>																																		
Algona.....	{Maximum.....	85	90	88	82	85	93	92	83	82	90	85	83	81	83	85	87	89	91	91	84	83	84	83	85	89	92	80	77	83	81	86	85.5	
	{Minimum.....	60	72	63	75	63	72	73	60	62	66	62	61	57	55	62	63	69	70	71	65	70	62	57	60	62	64	58	51	55	55	60	63.1	
Alta.....	{Maximum.....	90	88	92	86	89	92	80	86	90	82	83	83	85	86	87	86	79	90	90	85	84	84	87	91	91	76	80	81	80	91	86.1		
	{Minimum.....	61	72	62	62	65	71	67	64	55	64	62	62	56	56	62	61	67	67	66	63	66	61	58	62	64	64	54	52	57	55	67	62.1	
Alton.....	{Maximum.....	88	86	87	82	86	95	91	79	85	86	82	80	80	85	86	87	85	81	89	88	84	82	82	85	90	88	76	77	79	80	88	84.5	
	{Minimum.....	63	73	60	65	64	73	71	66	57	64	63	60	56	55	60	63	70	64	65	63	65	60	58	60	62	64	55	50	55	56	70	62.3	
Belmond.....	{Maximum.....	86	89	92	80	85	94	92	83	83	88	86	83	80	82	81	85	91	86	84	88	85	82	84	88	91	93	81	77	82	81	88	85.5	
	{Minimum.....	58	75	61	64	60	70	74	66	59	62	58	58	55	72	55	60	63	67	57	64	57	51	54	54	54	54	54	45	52	54	66	59.8	
Charles City.....	{Maximum.....	84	90	88	77	85	92	91	79	82	87	83	81	77	82	84	86	87	83	89	82	83	81	84	84	88	90	70	73	78	79	81	83.2	
	{Minimum.....	57	71	63	67	61	69	73	65	61	64	59	59	56	56	56	63	67	69	69	66	69	61	58	60	65	65	57	49	53	56	66	62.3	
Decorah.....	{Maximum.....	85	88	90	84	86	90	91	86	79	86	86	79	77	86	87	89	88	86	85	87	83	81	87	88	91	86	71	74	79	78	84	84.4	
	{Minimum.....	53	62	61	65	58	64	72	65	60	61	56	60	54	52	52	58	66	67	69	65	64	59	58	58	61	60	60	45	49	51	64	59.6	
Dubuque.....	{Maximum.....	84	90	90	75	86	89	92	89	81	85	81	74	72	80	85	86	87	83	86	84	81	84	85	86	88	89	74	70	77	79	75	82.8	
	{Minimum.....	60	70	71	66	63	65	75	69	65	68	66	61	59	56	59	61	70	72	69	69	67	68	63	65	64	67	56	53	51	57	68	64.3	
Forest City.....	{Maximum.....	77	85	89	90	87	85	92	92	88	83	88	87	82	78	83	87	88	90	81	90	85	83	84	82	87	92	94	83	78	82	88	85.8	
	{Minimum.....	53	72	60	63	59	60	71	63	60	60	61	58	57	53	56	58	65	66	68	65	66	59	54	55	59	60	48	52	54	65	60.3		
Independence.....	{Maximum.....	84	90	90	85	84	90	90	90	81	84	82	80	76	79	82	84	86	86	87	89	81	82	83	84	83	86	77	70	77	79	77	83.2	
	{Minimum.....	56	68	67	65	59	71	73	66	60	65	62	61	56	56	55	59	66	70	69	61	68	65	60	63	62	64	60	48	51	54	65	62.1	
Inwood.....	{Maximum.....	86	85	89	87	86	96	92	79	87	89	82	83	82	87	88	88	85	84	88	88	86	85	84	89	90	70	73	78	79	81	86.1		
	{Minimum.....	63	67	58	65	64	73	74	64	53	58	57	57	52	55	58	63	71	60	66	60	63	59	55	58	60	65	51	45	53	54	68	60.3	
Lake Park.....	{Maximum.....	84	87	90	85	86	92	90	77	82	86	85	82	80	83	86	86	82	80	89	86	87	84	84	89	91	92	75	80	82	86	84.8		
	{Minimum.....	58	70	58	64	62	71	63	63	62	59	58	53	56	58	58	65	66	61	62	65	63	61	54	59	57	62	52	49	54	58	71	59.6	
Mason City.....	{Maximum.....	83	88	89	82	84	91	90	78	81	87	83	81	80	83	84	86	86	81	88	84	84	81	82	84	88	90	73	74	79	78	85	83.5	
	{Minimum.....	55	72	59	63	55	67	71	63	58	61	54	55	52	47	50	58	66	67	67	62	65	57	52	52	57	61	56	43	51	54	65	58.5	
New Hampton.....	{Maximum.....																																	
	{Minimum.....																																	
Northwood.....	{Maximum.....	84	87	90	80	85	94	90	77	80	84	84	81	77	80	84	85	87	81	88	84	82	80	81	84	89	87	70	73	79	79	84	82.9	
	{Minimum.....	56	67	61	65	61	67	71	65	59	61	58	57	55	55	58	60	66	62	65	62	67	61	56	59	62	62	56	45	53	55	66	60.4	
Pocahontas.....	{Maximum.....	85	89	89	86	85	94	92	89	83	88	88	83	81	83	83	87	87	85	90	86	85	83	82	85	88	92	90	79	81	80	89	86.0	
	{Minimum.....	59	73	59	61	61	72	70	65	57	62	61	60	56	53	58	60	66	67	66	63	69	61	55	58	60	62	56	48	53	51	67	60.9	
Postville.....	{Maximum.....	80	86	84	72	80	86	87	83	75	81	77	75	72	76	80	82	83	81	83	85	78	78	78	80	84	83	68	67	76	76	75	79.1	
	{Minimum.....	56	66	65	62	58	63	73	65	60	63	57	57	56	54	59	60	67	69	65	65	64	60	60	62	62	63	56	47	50	53	61	60.7	
Rock Rapids.....	{Maximum.....	87	85	89	85	88	93	90	80	85	88	81	82	82	84	85	88	82	83	87	88	85	83	84	89	89	86	76	79	80	81	86	84.8	
	{Minimum.....	60	69	59	65	62	69	74	64	54	62	54	58	53	52	58	61	71	69	64	59	63	59	54	56	60	63	53	45	51	52	66	59.7	
<i>Central Division</i>																																		
Belle Plaine.....	{Maximum.....	86	92	90	83	87	93	86	84	84	84	84	80	83	87	88	90	83	90	86	85	86	85	87	89	92	75	75	82	81	81	85.5		
	{Minimum.....	55	71	66	66	61	70	72	66	60	60	63	63	59	53	54	57	65	70	69	69	70	62	56	60	57	64	61	50	49	53	65	61.8	
Boone.....	{Maximum.....	86	90	91	85	87	94	91	82	85	90	87	83	80	86	83	87	89	86	91	88	87	86	84	89	89	92	75	77	80	80	89	86.1	
	{Minimum.....	55	72	61	60	62	72	72	66	60	60	64	65	55	53	55	58	64	68	67	68	68	58	53	51	57	58	59	48	53	50	67	60.7	
Carroll.....	{Maximum.....	87	89	90	85	84	94	91	82	84	89	88	81	81	84	81	86	89	86	94	86	82	85	82	88	88	94	81	75	79	80	90	85.6	
	{Minimum.....	59	72	62	61	64	71	70	64	56	64	64	64	57	56	61	61	62	68	67	66	65	60	58	59	61	64	57	51	59	52	67	62.0	
Cedar Rapids.....	{Maximum.....	84	91	89	82	85	92	91	88	83	87	84	78	78	82	86	82	89	79	88	87	81	85	86	87	88	90	78	74	79	80	78	84.2	
	{Minimum.....	53	71	59	65	61	69	72	68	63	62	65	65	59	52	54	64	70	68	68	71	67	60	61	58	64	63	51	47	52	65	62.2		
Davenport.....	{Maximum.....	85	92	93	83	85	92	94	91	83	91	85	76	77	82	86	88	89	85	87	88	82	87	86	88	90	89	82	75	80	81	80	85.5	
	{Minimum.....	64	74	67	66	66	76	70	69	70	69	61	60	59	63	68	70	72	71	74	69	68	64	67	69	70	62	54	56	63	66	66.5		
Des Moines.....	{Maximum.....	87	92	90	86	86	95	94	82	84	89	86	83	79	82	82	87	90	84	91	85	82	88	84	86	87	91	75	75	78	78	87	85.3	
	{Minimum.....	60	75	72	63	67	72	69	68	62	67	68	61	60	60	64	65	70	69	71	70	68	65	63	63	66	65	63	57	60	67	66	65.4	
Ft. Dodge.....	{Maximum.....	86	90	91	83	87	95	92	80	83	91	88	80	82	85	84	87	90	85	91	87	85	84	83	87	90	93	74	80	82	81	89	86.0	
	{Minimum.....	58	71	59	53	61	70	70	64	55	60	60	58	53	51	56	59	65	65	65	62	66	57	53	56	58	61	58	47	52	52	65	59.4	
Grinnell.....	{Maximum.....	84	91	90	86	85	94	91	87	84	89	84	83	77	83	80	86	89	85	90	86	82	83											

IOWA STORMS, JULY, 1928

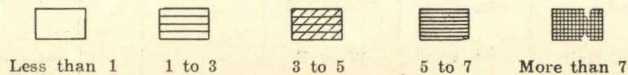
Date	County	Township	Nature of Storm	Time	Storm Moved From	Width of Path Miles	Length of Path Miles	Area of Sq. Miles	Size of Hailstones Inches	Damage	Persons Killed	Persons Injured
2	Howard	Jamestown	Hail	4:30 p. m.	W to E				1 1/2	\$16,000		
2	Mitchell	Otranto	Hail	4:00 a. m.	SW to NE				Peas	Some to Crops		
2	Winneshiek	Highland	Hail	3:00 a. m.	E to W				Hic'ry Nuts	Crops Damaged 10%		
3	Adair	Jefferson, Jackson and Lincoln	Wind	6:00 p. m.						Slight		
3	Audubon	Cameron	Wind and Flood	11:00 p. m.						Slight		
3	Benton	Eldorado, Fremont and Monroe	Wind and Hail	11:00 p. m.	SW to NE					Slight		
3	Blackhawk	Lester	Wind	11:00 p. m.	SW to NE					Some to Crops		
3	Boone	Cass and Colfax	Wind and Hail	9:30 p. m.	W to E				1/4	Considerable to Crops		
3	Buchanan	Madison and Sumner	Wind	11:00 p. m.	SW to NE					Slight		
3	Cedar	Massena	Wind and Hail	10:30 p. m.	W to E				1/2	Slight		
3	Cherokee	Liberty	Wind	p. m.	SW to NE					Slight		
3	Clinton	Liberty	Wind	10:00 p. m.	SW to NE					Crops Damaged 5%		
3	Crawford	East Boyer	Tornado	p. m.	SW to NE					\$17,000		
3	Dallas	Boone and Walnut	Wind and Hail	9:00 p. m.	W to E				1/4	Slight		
3	Delaware	Adams, Coffins Grove, and Delaware	Wind	9:00 p. m.	SW to NE					Slight		
3	Franklin	Oakland	Wind and Hail	5:00 p. m.	NE to SW				Cherry	\$20,000		
3	Fremont	Locust Grove and Prairie	Wind and Hail	2:00 p. m.	W to E					Some to Crops and Trees		
3	Greene	Bristol and Dawson	Wind and Hail	p. m.	SW to NE					\$500 to Bldgs.; Crops		
3	Guthrie	Beaver and Dodge	Wind and Hail	p. m.	W to E					Slight		
3	Hardin	Buckeye and Eldora	Wind and Hail	9:00 p. m.	W to E					Slight		
3	Harrison	Jefferson	Wind	11:00 p. m.						\$6,000		
3	Henry	Center and Marion	Wind	11:00 p. m.	E to W					\$2,000		
3	Jackson	Brandon and Union	Wind	11:00 p. m.						\$200		
3	Kossuth	Algona	Wind	6:00 p. m.						Crops Damaged 20%		
3	Linn	Brown	Wind and Hail	11:00 p. m.						Slight		
3	Louisa	Oakland	Wind	9:00 p. m.						Crops Damaged 10%		
3	Lucas	Pleasant	Wind	11:00 p. m.						Slight		
3	Madison	Jackson	Wind	11:50 p. m.	W to E					Slight		
3	Mahaska	Monroe	Wind	p. m.						Some to Crops		
3	Marshall	Liberty	Wind and Hail	10:00 p. m.	SW to NE					Slight		
3	Montgomery	Lincoln	Wind	11:00 p. m.	W to E					Considerable to Crops		
3	Muscatine	Lake, Montpelier, Sweetland and Wilton	Wind and Hail	9:00 p. m.	W to E				Hic'ry Nuts	Some to Crops		
3	Palo Alto	Ellington	Wind and Hail	p. m.	SE to NW				Peas	Small		
3	Polk	Des Moines, Lee, Saylor, Walnut and Webster	Wind and Hail	11:00 p. m.	W to E				3/8	Slight		
3	Poweshiek	Jackson, Madison and Sugar Creek	Wind	11:00 p. m.	W to E					Slight		
3	Scott	Lincoln and Rockingham	Wind and Hail	6:00 p. m.	W to E					\$3,000		
3	Shelby	Fairview, Jackson, Monroe and Shelby	Tornado	9:00 p. m.	W to E					Considerable to Crops, Bldgs		
3	Story	Franklin & Indian Creek	Wind and Hail	9:00 p. m.	W to E				Peas	Crops Damaged 5%		
3	Tama	Carlton, Howard, Perry	Wind, Hail, Flood	10:00 p. m.	W to E				Hic'ry Nuts	Considerable to Crops		
3	Union	Douglas and Jones	Wind and Hail	9:00 p. m.	NW to SE					Some to Crops		
3	Washington	Dutch Creek, Lime Creek	Wind and Flood	10:00 p. m.	NW to SE					Some to Crops		
3	Winneshiek	Orleans	Wind and Hail	6:00 p. m.	SW to NE				Hazel Nuts	Slight		
3	Woodbury	Rock	Wind	11:00 p. m.	SE to NW					Slight		
3	Worth	Hartland	Wind	9:00 p. m.	W to E				Marbles	\$4,000		
4	Adair	Grand, Jackson, Richland and Summit	Wind and Hail	2:30 a. m.	W to E				1/4	\$15,000		
4	Adams	Jasper, Quincy, Union, and Washington	Wind and Hail	1:00 a. m.	W to E					Crops Damaged 10%		
4	Allamakee	Ludlow and Post	Wind	4:00 a. m.	SW to NE					\$5,000		
4	Audubon	Audubon, Exira, Hamlin, Leroy and Oakfield	Wind and Hail	2:30 a. m.	W to E				1/4	\$50,000		
4	Benton	Taylor	Wind	1:00 a. m.	W to E					Considerable to Crops		
4	Black Hawk	Mt. Vernon and Union	Wind and Hail	2:00 a. m.						Slight		
4	Boone	Cass, Pilot Mound, Peoples and Yell	Wind and Hail	3:00 a. m.	W to E					Slight		
4	Butler	Butler	Wind	5:00 a. m.	W to E					Slight		
4	Calhoun	Center, Greenfield, Jackson, Sherman, Twin Lakes and Union	Wind and Hail	3:00 a. m.	W to E				1/4	\$50,000		
4	Carroll	Glidden, Kniest, Richland, Sheridan and Washington	Wind and Hail	3:00 a. m.	W to E				Peas	Crops Damaged 10%		
4	Cass	Franklin, Grant, Grove, Massena and Victoria	Wind and Hail	2:30 a. m.	W to E					\$50,000		
4	Cherokee	Pitcher	Wind	3:00 a. m.	SW to NE					Slight		
4	Clarke	Osceola	Wind	3:00 a. m.	W to E					Slight		
4	Clinton	Deer Creek	Wind	1:00 a. m.	W to E					Some to Crops		
4	Chickasaw	Bedford	Wind	4:00 a. m.	W to E					Slight		
4	Crawford	Denison, Goodrich, Milford and Nishnabotna	Wind and Hail	2:30 a. m.	SW to NE				Marbles	\$20,000		
4	Dallas	Dallas, Lincoln, Sugar Grove and Union	Wind	3:00 a. m.	SW to NE					\$4,500		
4	Decatur	Woodland	Wind	4:00 a. m.	W to E					Slight		
4	Floyd	Rockford	Wind	3:00 a. m.	SW to NE					Slight		
4	Fremont	Benton, Greene, Madison, Prairie, Sidney and Washington	Wind	2:00 a. m.	W to E					\$30,000		
4	Grant	Cedar, Grant, Greenbrier, Jackson, Junction, Kendrick, Paton & Scranton	Wind and Hail	3:00 a. m.	W to E					\$15,000		
4	Grundy	Felix	Wind	3:00 a. m.	SW to NE					Slight		
4	Guthrie	Beaver, Cass, Jackson, Penn, Richland, Stuart	Wind	3:00 a. m.	W to E					\$100,000		
4	Hamilton	Lyon and Marion	Wind	4:00 a. m.	SW to NE					Crops Damaged 10%		
4	Hancock	Amsterdam and Magor	Wind	3:00 a. m.	W to E					Slight		
4	Hardin	Grant	Wind	1:00 a. m.	W to E					\$2,000		
4	Harrison	Boyer, Jefferson, St. John, Union and Washington	Wind and Hail	2:30 a. m.	SW to NE				Peas	\$25,000		
4	Ida	Plaine	Wind	3:00 a. m.	SW to NE					Slight		
4	Iowa	Honey Creek	Wind and Flood	1:00 a. m.	NW to SE					Slight		
4	Jasper	Independence, Kellogg, Mound, Prairie, and Palo Alto	Wind	3:00 a. m.	SW to NE					Slight		
4	Jefferson	Buchanan, Cedar and Des Moines	Wind and Hail	2:00 a. m.	W to E				Peas	Slight		
4	Johnson	Madison	Wind	1:30 a. m.	SW to NE					\$2,000		
4	Kossuth	Lotts Creek, Luverne, and Sherman	Wind and Hail	3:00 a. m.	S to N					\$12,000		
4	Lucas	Lincoln and Union	Wind and Hail	5:00 a. m.	W to E					\$1,000		
4	Marion	Perry and Swan	Wind and Hail	3:00 a. m.	SW to NE				Small	Slight		
4	Marshall	Eden, Iowa, Marshall, State Center and Washington	Wind and Hail	4:00 a. m.	W to E					\$2,000		

Date	County	Township	Nature of Storm	Time	Storm Moved From	Width of Path Miles	Length of Path Miles	Area of Sq. Miles	Size of Hailstones Inches	Damage	Persons Killed	Persons Injured
4	Mills	Center, Glenwood, Ingraham, Plattville and White Cloud	Wind	2:00 a. m.	SW to NE					\$40,000		
4	Montgomery	East, Frankfort, Garfield, Grant, Scott, Washington, and West	Wind	2:30 a. m.	W to E					\$10,000		
4	Page	Grant, Lincoln, Morton, Nodaway, Pierce, Washington and Valley	Wind	2:30 a. m.	W to E					\$1,500		
4	Pocahontas	Grant	Wind and Hail	2:00 a. m.	S to N				1/4	\$2,000		
4	Polk	Allen, Crocker, Jefferson, Lee, Madison & Walnut	Wind and Hail	3:30 a. m.	W to E				Peas	\$20,000		
4	Pottawattamie	Belknap, Boomer, Keg Creek, Knox, Lincoln, Macedonia, Minden, Rockford, Silver Creek, Waveland and Valley	Wind and Hail	2:30 a. m.	W to E				Hazel Nuts	\$60,000		
4	Ringgold	Poe	Wind	3:30 a. m.	NW to SE				Slight	\$20,000		
4	Sac	Sac	Wind	3:30 a. m.	SW to NE							
4	Shelby	Clay, Fairview, Greeley, Lincoln, Monroe, Shelby, and Westphalia	Wind and Hail	2:30 a. m.	W to E				Hazel Nuts	\$75,000		
4	Story	Milford, Howard, Richmond, Union, Washington	Wind and Hail	3:30 a. m.	W to E				Very Small	\$2,000		
4	Tama	Lincoln	Wind and Hail	4:00 a. m.	W to E				1/8	\$200		
4	Taylor	Marshall	Wind	4:00 a. m.	NW to SE					Some to Crops		
4	Union	Grant	Wind	3:00 a. m.	NW to SE					\$1,000		
4	Van Buren	Cedar, Chequest, Van Buren, Vernon and Washington	Wind and Flood	3:30 a. m.	W to E					Slight		
4	Wapello	Highland	Wind and Hail	3:00 a. m.	W to E				1/2	\$1,000		
4	Warren	Greenfield, Jefferson and Union	Wind	3:00 a. m.	SW to NE					Slight		

TOTAL PRECIPITATION, JULY, 1928



SCALE OF SHADES IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In co-operation with

IOWA WEATHER AND CROP BUREAU

CHARLES D. REED, Senior Meteorologist

VOL. XXXIX DES MOINES, IOWA, AUGUST, 1928 No. 8

GENERAL SUMMARY

There were no unusual temperature features during August, 1928. The mean temperature was one degree above normal and the weather was generally pleasant. The period from the 6th to the 16th inclusive, was the warmest during the month and there were several short periods that were rather cool. There were about the usual number of days in which the temperature was above 90° but there were no abnormally warm periods, and the nights, as a rule, were pleasantly cool. Light frost occurred on lowlands in some localities, mostly in the north-central district, on the 24th and 25th, but no damage resulted.

The most important feature of the month's weather was the heavy rainfall that occurred over almost the entire State. The falls were characterized by unusually heavy downpours that covered most of the State on several dates. The average for the State has been exceeded but twice during the last 56 years, while a number of stations in the northeastern and north-central divisions had the greatest August total of record, and two stations reported the greatest total for any month. The development of storms was unusually rapid and many were accompanied by destructive winds, damaging hail and terrifying thunder and lightning. During the period, 7th to 15th inclusive, there was practically no rainfall, but during the rest of the month there were no periods of more than three days without rain. Threshing made good progress during the second week but slow the rest of the month. However, 93% of the threshing was done by the close of the month, the most backward districts being the northeast and west-central. The rainy weather caused shocked grain to sprout, interfered with and delayed threshing, and caused considerable threshed grain to heat in bins to such an extent that it will be unfit for seed. In local areas corn lodged so badly that it will be impossible to harvest except by "hogging" and in the large trucking centers the major crops were damaged by the continuous wet weather and the shipments will be greatly reduced. Small streams in many localities were out of banks and carried away farm animals, stacked grain and small buildings, and also damaged bridges, caused numerous washouts and interfered with road construction.

In connection with the marked storm activity, a series of tornadoes developed on two different dates. The first developed on the 20th and was felt in Calhoun, Hamilton, Hardin, Pocahontas, Story and Webster counties. In this storm three persons were killed, Mrs. G. A. Speer, Havelock, Miss Stella Powell, Traer, and infant daughter of Mr. and Mrs. Arthur Neaubauer, near Ellsworth, a number injured and great property damage sustained. The second series on the 26th, affected Adams, Cass, Mills, Montgomery and Pottawattamie counties. In this storm four persons were killed, F. T. Jervis, D. D. Jervis, and Richard T. Smith of Elliot, and Kenneth Hyatt of Mt. Etna, a large number injured, many head of livestock killed, and much property destroyed.

There was considerable plowing during the second week but during the rest of the month it was generally too wet. The copious rainfall kept pastures in vigorous condition but interfered somewhat with haying, and likely injured clover seed. Late potatoes were benefitted and are promising, gardens were in vigorous condition throughout the month, and the outlook was promising for fruit. Dirt roads were rough or muddy most of the month.

F. L. D.

TEMPERATURE

The mean temperature for the State, derived from the means of nine districts of nearly equal area, and based on the records of 101 stations, was 72.7°, or 1.0° higher than the normal. There was an excess in each division, ranging from 1.4° in the west-central, east-central and southwestern divisions to 0.5° in the central. There was one or more stations in each division, except the west-central, east-central and south-eastern divisions that showed a slight deficiency in temperature. The highest monthly mean was 75.9° at Keokuk, and the lowest was 68.4° at Postville. The absolute range for the State was 63°, ranging from 100° at Inwood on the 1st, to 37° at Rock Rapids and Sheldon on the 24th. The average number of days with the maximum temperature 90°, or above, was 8. The

number was greatest, 12 in the south-western division and least, 5 in the north-central and north-eastern divisions. At only one station did the maximum fail to reach 90°.

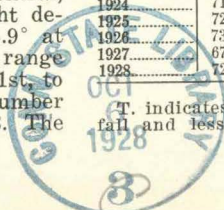
PRECIPITATION

The average precipitation for the State, derived from the average of nine divisions, of nearly equal area, and based on the records of 116 stations, was 6.42 inches, or 2.98 inches more than the normal. There was an excess in each division and pronounced in the north-central and north-eastern divisions, where the average was nearly three times the normal. Most of the stations along the southern border and a few along the Missouri River were slightly deficient. The average number of rainy days was quite uniform for the State, being 9, and the range was from 10 in three divisions to 7 in the south-western and south-central. The greatest number of rainy days, 13, was reported from two stations and the least, 4, was reported from one station. Except for the period 7th, to 15th inclusive, when there was practically no rain, showers occurred at frequent intervals, mostly at night. The greatest amount reported from a single station was 12.80 inches at Decorah, and the least was 2.16 inches at Chariton. Heavy to excessive amounts occurred over practically the entire State, there being but 6 stations that reported a fall during 24 hours of less than one inch. The greatest amount occurring in 24 consecutive hours was 5.08 inches at Guthrie Center on the 3d.

COMPARATIVE DATA FOR THE STATE—AUGUST

YEAR	Temperature				Precipitation				Number of Days				
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	Clear	Partly cloudy	Cloudy
1873	75.7	+ 4.0	102	54	4.17	+ 0.73	8.40	0.00					
1874	74.3	+ 2.6	99	55	3.12	+ 0.32	9.16	0.85					
1875	68.9	- 2.8	92	41	4.04	+ 0.60	7.60	1.07					
1876	73.2	+ 1.5	96	46	5.15	+ 1.71	10.04	1.50					
1877	71.9	+ 0.2	100	53	4.36	+ 0.92	12.65	0.10					
1878	74.4	+ 2.7	100	50	3.22	- 0.22	9.15	0.43					
1879	72.0	+ 0.3	100	42	2.70	- 0.74	7.50	0.45					
1880	72.5	+ 0.8	104	41	4.77	+ 1.33	9.88	0.77					
1881	76.5	+ 4.8	104	48	2.71	- 0.73	6.85	0.32					
1882	71.5	+ 0.2	96	43	1.61	- 1.83	6.90	0.02					
1883	69.2	- 2.5	98	42	2.58	- 0.86	8.95	0.27					
1884	68.5	- 3.2	93	44	4.00	+ 0.65	8.34	1.98					
1885	66.9	- 4.8	98	40	5.90	+ 2.46	12.68	2.79					
1886	74.2	+ 2.5	103	34	2.02	- 1.42	7.13	0.30					
1887	70.8	+ 0.9	103	34	2.75	- 0.69	8.85	0.51					
1888	70.4	+ 1.3	110	40	4.37	+ 0.93	8.40	0.95					
1889	71.3	+ 0.4	104	37	1.87	- 1.57	9.95	1.12					
1890	68.1	- 3.6	102	34	3.25	- 0.19	6.44	1.03					
1891	69.1	- 2.6	106	34	4.24	+ 0.80	13.02	1.23		8	13	12	6
1892	71.4	+ 0.3	102	40	2.24	- 1.20	4.69	0.65		5	18	9	4
1893	69.4	- 2.3	101	30	2.32	- 1.12	6.22	0.40		4	19	9	3
1894	74.6	+ 2.9	108	38	1.58	- 1.86	4.53	T.		5	21	8	2
1895	71.9	+ 0.2	103	37	4.43	+ 0.99	10.63	0.67		7	17	9	5
1896	71.7	+ 0.0	104	34	3.52	+ 0.08	12.25	0.86		8	15	11	5
1897	68.9	- 2.8	104	35	1.86	- 1.58	4.98	0.47		6	15	11	5
1898	71.2	+ 0.5	103	40	3.41	+ 0.00	10.55	0.58		6	17	9	5
1899	74.4	+ 2.7	100	41	3.68	+ 0.24	10.45	1.12		7	17	10	4
1900	77.4	+ 5.7	103	44	4.65	+ 1.21	10.43	1.26		6	18	10	3
1901	73.8	+ 2.1	105	40	1.29	- 2.15	4.46	T.		5	20	9	2
1902	69.1	- 2.6	98	37	6.58	+ 3.14	15.47	1.57		11	11	11	9
1903	69.1	- 2.6	101	41	6.64	+ 3.20	17.74	2.55		11	12	10	9
1904	69.1	- 2.6	97	35	3.43	- 0.01	6.75	0.60		7	17	8	6
1905	74.3	+ 2.6	104	44	4.05	+ 0.61	8.47	1.04		9	16	9	6
1906	74.1	+ 2.4	101	33	3.95	+ 0.51	10.51	0.92		9	17	9	5
1907	71.1	+ 0.6	99	37	4.33	+ 0.89	9.67	1.05		9	17	9	5
1908	70.0	+ 1.7	101	38	4.77	+ 1.33	10.55	1.35		9	17	9	5
1909	76.1	+ 4.4	103	33	1.81	- 1.63	8.21	T.		5	21	8	2
1910	71.9	+ 0.2	104	36	3.88	+ 0.44	11.22	0.37		8	15	10	6
1911	71.7	+ 0.0	107	34	3.32	- 0.12	9.47	0.44		9	16	10	5
1912	71.0	+ 0.7	101	40	3.78	+ 0.34	7.90	0.89		10	15	10	6
1913	76.6	+ 4.9	108	40	2.68	- 0.76	7.13	0.08		6	17	10	4
1914	73.7	+ 2.0	103	40	2.19	- 1.25	4.90	0.42		7	17	10	4
1915	65.9	- 5.8	91	30	2.81	- 0.63	9.14	0.27		8	16	8	7
1916	74.0	+ 2.3	106	35	2.58	- 0.86	6.23	0.49		7	18	9	4
1917	69.4	- 2.3	102	31	2.29	- 1.15	6.31	0.70		7	19	8	4
1918	76.0	+ 4.3	113	38	3.61	+ 0.17	8.38	0.54		8	16	10	5
1919	71.5	+ 0.2	103	38	2.59	- 0.85	5.72	0.97		7	19	9	3
1920	69.3	- 2.4	98	39	3.35	- 0.09	8.52	0.44		7	18	8	5
1921	72.1	+ 0.4	102	37	5.04	+ 1.60	9.04	2.20		8	19	8	4
1922	73.8	+ 2.1	102	42	3.06	- 0.38	9.80	0.33		8	19	8	7
1923	70.6	+ 1.1	102	38	5.42	+ 1.98	13.14	1.46		12	15	9	7
1924	71.7	+ 0.0	100	40	5.35	+ 1.91	12.38	1.90		10	16	10	5
1925	72.4	+ 0.7	99	39	3.47	+ 0.03	8.36	0.31		8	18	9	4
1926	73.5	+ 1.8	103	47	3.80	+ 0.36	7.33	1.64		10	16	10	5
1927	67.9	- 3.8	99	35	2.36	- 1.08	5.68	0.67		8	15	10	6
1928	72.7	+ 1.0	100	37	6.42	+ 2.98	12.80	2.16		9	19	8	4

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



Climatological Data for August, 1928

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>Northwest District</i>																			
Akron	Plymouth	1,153	2																Orlan C. Moore
Alta	Buena Vista	1,513	37	72.5	+ 2.2	98	9	43	24	32	4.23	+ 1.72	1.20	0	9	15	11	5	D. E. Hadden
Alton	Sioux	1,305	23	72.1	+ 1.2	95	17	39	24	31	5.12	+ 2.02	2.12	0	11	15	12	4	W. S. Slagle
Cherokee	Cherokee	1,196	8	72.1	+ 2.1	98	9	38	24	36	2.75	+ 0.45	1.18	0	9	18	12	1	J. E. Wirth
Estherville	Emmet	1,298	33	71.7	+ 2.9	97	9	42	24	37	6.61	+ 3.42	2.30	0	13	19	9	3	A. O. Peterson
Hawarden	Sioux	1,181	2																
Inwood	Lyon	1,474	24	72.0	+ 1.5	100	1	40	24	37	6.63	+ 3.85	1.92	0	10	18	2	11	Earl V. Slife
Lake Park (near)	Dickinson	1,489	15			94h	77	42h	31	36h	7.08	+ 4.49	1.73	0	11	20	8	3	A. C. Hanson
Le Mars	Plymouth	1,224	32	72.5	+ 1.5	95	97	40	24	32	8.59	+ 5.09	4.80	0	5				P. M. Lawrence
Marathon	Buena Vista	1,390	2								2.98	+ 0.30	0.91	0	7	23	6	2	Henry Newell
Pocahontas	Pocahontas	1,248	24	72.1	+ 1.5	96	14	41	24	35	3.75		1.52	0	11	20	11	0	E. G. Smith
Rock Rapids	Lyon	1,349	29	70.6	+ 0.9	95	17	37	24	35	4.65	+ 1.28	1.56	0	9	23	6	2	F. E. Hronek
Sanborn	O'Brien	1,553	14	70.2	+ 0.3	97	9	40	24	37	7.25	+ 4.90	2.04	0	9	23	6	2	Nellie F. Medberry
Sheldon	O'Brien	1,418	17	71.1	+ 0.6	97	9	37	24	36	8.72	+ 5.51	3.12	0	9	18	2	11	J. W. Dow
Sioux Center	Sioux	1,426	29	70.3	+ 0.2	96	17	42	24	36	8.08	+ 5.08	2.81	0	10	17	9	5	Ross E. Forward
Spencer	Clay	1,319	14	72.6	+ 2.0	99	77	38	24	39	9.96	+ 7.14	3.23	0	10	18	3	10	J. De Ruyter
Storm Lake	Buena Vista	1,440	39	73.1	+ 1.7	95	9	42	24	29	6.04	+ 2.64	2.50	0	8	18	11	2	E. W. Little
Washita	Cherokee	1,157	30	71.3	+ 0.7	96	9	38	24	41	4.46	+ 1.32	1.87	0	8	25	4	2	George H. Fracker
West Bend	Palo Alto	1,197	35	70.8	+ 0.2	97	9	40	24	35	5.45	+ 2.51	2.36	0	9	17	11	3	H. L. Felter
Means and extremes				71.7	+ 1.3	100	1	37	24	41	5.96	+ 2.88	4.80	0	9	19	8	4	Jos. Dorweiler
<i>North Central District</i>																			
Algona	Kossuth	1,213	55	70.8	+ 0.5	96	9	40	24	32	8.56	+ 5.01	1.50	0	8	21	4	6	W. E. Laird
Allison	Butler	1,060	14	70.8	+ 0.3	94	8	43	31	33	4.63	+ 1.25	2.00	0	9	20	5	6	E. W. Detra
Belmond	Wright	1,181	18	71.4	+ 1.6	94	87	41	24	30	10.03	+ 6.95	2.85	0	12	13	5	13	H. F. Luick
Britt	Hancock	1,236	41	71.2	+ 0.0	96	9	43	24	32	11.30	+ 7.53	3.50	0	8				U. P. Healy
Charles City	Floyd	1,015	37	70.1	+ 1.0	92	8	44	31	27	12.78	+ 9.13	3.70	0	10	20	3	8	E. S. Weather Bureau
Forest City	Winnebago	1,226	34	70.7	+ 0.5	94	87	43	24	33	8.93	+ 5.56	2.41	0	11	15	11	5	Dr. M. B. Neil
Hampton	Franklin	1,145	3								6.97	+ 3.52	2.10	0	8				L. H. Davis
Humboldt	Humboldt	1,095	40	70.8	+ 1.0	96	8	39	24	37	8.16	+ 4.86	3.35	0	9	19	10	2	H. C. Snitkey
Mason City	Cerro Gordo	1,148	31			92	8	39	31	33	12.28	+ 8.54	3.86	0	13	17	7	7	American Beet Sugar Co.
Northwood	Worth	1,222	32	68.9	+ 0.4	91	9	45	24	28	11.92	+ 7.96	4.10	0	11	17	9	5	Charles Dwelle
Osage	Mitchell	1,163	34	70.8	+ 2.1	97	8	43	24	35	11.25	+ 8.12	4.42	0	9	17	7	7	Dr. C. E. Juhl
Means and extremes				70.6	+ 0.8	97	8	39	24	37	10.22	+ 6.73	4.10	0	10	17	7	7	
<i>Northeast District</i>																			
Decorah	Winneshiek	872	35	69.9	+ 1.4	95	8	39	31	34	12.80	+ 9.50	4.46	0	12	19	6	6	M. D. Whitney
Dubuque	Dubuque	700	55	71.8	+ 0.1	92	9	49	31	26	9.38	+ 6.14	3.73	0	10	13	8	10	U. S. Weather Bureau
Fayette	Fayette	1,003	40	70.4	+ 1.0	96	9	41	31	36	9.36	+ 5.82	2.00	0	10	23	3	5	R. Z. Latimer
Independence	Buchanan	921	64	71.1	+ 0.2	91	8	45	24	27	9.45	+ 6.24	3.04	0	8	20	5	6	Dr. Geo. Boody
Lansing	Allamakee	632	21								8.06	+ 5.11	2.25	0	12				Mrs. Mary Spinner
New Hampton	Chickasaw	1,169	31	69.5	+ 0.3	92	9	40	24	30	10.40	+ 6.90	2.70	0	7	17	9	5	D. W. Dawson
Oelwein	Fayette	1,036	5	71.5	+ 1.3	93	8	43	31	27	9.30	+ 5.98	2.30	0	11	19	6	6	Joha T. Ridler
Postville	Clayton	1,192	29	68.4	+ 0.6	88	87	43	31	31	8.73	+ 5.28	2.97	0	7	20	6	5	F. L. Williams
Waterloo	Black Hawk	854	45	72.2	+ 0.7	95	87	43	24	31	10.06	+ 6.75	3.65	0	10	19	8	4	R. B. Slippy
Waverly	Bremer	936	32	71.6a	+ 1.0	94a	9	43a	24	32a	7.66	+ 4.42	2.26	0	12	25	1	5	D. H. Murphy
Means and extremes				70.7	+ 0.6	96	9	39	31	36	9.52	+ 6.21	4.46	0	10	19	6	6	
<i>West Central District</i>																			
Audubon (near)	Audubon	1,297	33	72.8	+ 2.0	94	9	44	24	28	4.57	+ 0.94	1.61	0	9	19	10	2	George Kibby
Carroll	Carroll	1,265	38	72.0	+ 0.9	95	9	43	24	30	9.43	+ 5.58	4.82	0	10	23	4	4	Mrs. Jos. J. Wolfe
Denison	Crawford	1,171	34	72.8	+ 1.3	95	9	44	24	29	3.55	+ 0.26	1.53	0	9	16	12	3	V. L. Byers
Guthrie Center	Guthrie	1,077	33	73.0	+ 1.3	95	87	44	24	30	7.35	+ 3.49	5.08	0	8	24	2	5	H. A. Stafford
Harlan	Shelby	1,192	29	72.0	+ 1.0	94	9	41	24	32	5.12	+ 1.46	1.45	0	11	18	6	7	Walter Bell
Jefferson	Greene	1,052	29																
Little Sioux	Harrison	1,040	23	74.6	+ 2.0	96	9	41	24	29	3.67	+ 0.07	1.14	0	9	18	12	1	W. I. Lyon
Logan	Harrison	1,120	61	73.4	+ 0.7	96	9	43	24	37	5.74	+ 2.05	2.00	0	9	12	16	3	H. W. Kerr
Onawa	Monona	1,051	27	73.8	+ 1.7	95	17	41	24	31	3.47	+ 0.59	1.10	0	9	17	9	5	Amy Ann Stern
Rockwell City	Calhoun	1,232	32	72.3	+ 1.2	95	8	40	24	31	3.74	+ 0.12	1.05	0	10	25	5	1	Mrs. H. E. Colby
Sac City	Sac	1,269	52	72.4	+ 0.8	96	17	45	24	39	4.29	+ 0.90	1.20	0	9	16	10	5	A. W. McIsaac
Sioux City	Woodbury	1,135	39	73.8	+ 1.8	98	8	42	24	29	2.67	+ 0.36	1.06	0	8	13	12	6	F. P. Kessler
Means and extremes				73.0	+ 1.4	98	8	40	24	39	4.87	+ 1.24	5.08	0	9	18	9	4	U. S. Weather Bureau
<i>Central District</i>																			
Ames	Story	926	51	73.7	+ 1.9	94	27	45	25	32	5.74	+ 2.30	2.25	0	10	25	6	0	Iowa State College
Baxter	Jasper	998	28	72.0	+ 0.2	93	9	43	24	32	6.68	+ 3.45	2.05	0	10	10	19	2	Otto Sanderman
Boone (near)	Boone	894	23	72.2	+ 1.3	96	9	42	24	34	6.71	+ 3.15	2.68	0	9	15	11	5	C. F. Henning
Des Moines	Polk	861	50	73.8	+ 0.7	94	2	49	24	27	7.75	+ 4.23	3.07	0	11	16	8	7	U. S. Weather Bureau
Fort Dodge	Webster	1,114	28	71.3	+ 0.5	96	87	39	24	36	7.49	+ 3.89	3.10	0	12	24	3	4	Samuel Sampson
Grinnell	Poweshiek	1,031	34	72.4	+ 0.2	94	15	45	24	33	6.48	+ 2.78	2.19	0	9	20	8	3	R. E. Bates
Grundy Center	Grundy	976	37	72.4	+ 0.5	95	9	44	24	34	6.95	+ 3.65	2.96	0	11	19	8	4	M. G. Heiberger
Iowa Falls	Hardin	1,127	35	71.4	+ 0.3	95	8	42	24	32	7.26	+ 3.85	3.96	0	9	20	8	3	C. H. Gilbert
Marshalltown	Marshall	947	36	73.6	+ 0.8	96	8	47	31	32	7.19	+ 4.19	2.88	0	10	15	11	5	J. C. Pigman
Monroe	Jasper	922	16			92k	27	55j	12	28j	8.81	+ 5.41	2.41	0	8				C. A. Dibel
Perry	Dallas	975	27	72.4b	+ 0.5	95	9	42e	25	34e	7.51	+ 3.44	2.88	0	9	19	8	4	Eugene N. Hastie
Toledo	Tama	847	34	72.4	+ 0.3	94	87	41	24</										

Climatological Data for August, 1928—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>East Central District</i>																					
Belle Plaine.....	Benton.....	866	38	73.1	+ 1.6	95	2†	44	31	34	6.46	+ 3.23	1.89	0	10	18	11	2	s.	O. C. Burrows J. T. Wurster Dr. A. P. Bryant U. S. Weather Bureau Rex Shriver	
Cedar Rapids.....	Linn.....	737	46	72.0	+ 0.2	93	8†	43	31	33	5.72	+ 2.22	1.35	0	9	14	6	11	se.		
Clinton.....	Clinton.....	595	55	73.9	+ 1.2	94	8†	45	31	31	6.16	+ 2.53	2.47	0	8	18	5	8	n.		
Davenport.....	Scott.....	580	57	74.7	+ 1.6	93	15	52	31	25	6.57	+ 3.08	2.09	0	10	13	12	6	s.		
Davenport, No. 2.....	Scott.....	690	3	74.4		95	16	46	31	34	6.16		1.44	0	8	25	2	4	nw.		
<i>Fairport.....</i>																					
Fairport.....	Muscatine.....	567	7	74.5	+ 1.5	92	2†	48	31	28	6.92	+ 2.97	2.30	0	8	21	3	7	s.	Bureau of Fisheries Prof. J. F. Reilly Margaret T. Disney John Strothoff William Molis	
Iowa City.....	Johnson.....	733	68	73.4	+ 1.4	93	8†	48	31	30	5.88	+ 1.78	2.39	0	11	15	9	7	s.		
Le Claire.....	Scott.....	576	28								4.86	+ 1.83	1.20	0	11						
Maquoketa.....	Jackson.....	692	23	71.4	+ 1.8	94	8	43	31	35	4.04	+ 0.90	0.98	0	8	19	5	7	se.		
Muscatine.....	Muscatine.....	546	67								6.45	+ 2.31	1.67	0	11						
<i>Olin.....</i>																					
Olin.....	Jones.....	760	20	72.6	+ 1.0	96	16	45	31	37	7.00	+ 3.40	1.34	0	9	24	4	3	se.	Mrs. L. Stingley John Kroepfen Dr. F. C. Schadt	
Tipton (near).....	Cedar.....	807	29	72.5	+ 0.3	93	3	41	31	34	7.95	+ 4.13	2.73	0	10	16	8	7	se.		
Williamsburg.....	Iowa.....	770	12	72.4	+ 2.3	93	2†	42	24	34	5.50	+ 2.00	2.29	0	9	23	8	0	se.		
Means and extremes					73.2	+ 1.4	96	16	42	24	37	6.13	+ 2.54	2.73	0	9	19	7	5	s.	
<i>Southwest District</i>																					
<i>Atlantic.....</i>																					
Atlantic.....	Cass.....	1,164	37	74.2	+ 1.5	94	1	44	24	37	5.31	+ 1.84	1.37	0	9	12	13	6	sw.	T. H. Whitney Arthur L. Bishop Dr. H. C. Hawley C. A. Smith Carl E. Pollock	
Bedford.....	Taylor.....	1,200									3.15	- 0.41	0.92	0	6	23	5	3	s.		
Clarinda.....	Page.....	1,009	38	74.3	- 0.3	94	15	44	24	33	3.28	- 0.25	1.14	0	9	22	8	1	s.		
Corning.....	Adams.....	1,150	36	74.6	+ 2.4	95	8†	44	24†	38	2.54	- 1.24	1.37	0	8	25	3	3	sw.		
Cumberland (near).....	Cass.....	1,225	29								6.97	+ 3.52	4.08	0	8	19	5	7	sw.		
<i>Glenwood.....</i>																					
Glenwood.....	Mills.....	1,100	30	75.3	+ 1.3	94	2†	42	24	30	5.08	+ 1.72	2.50	0	7	20	8	3	se.	George Mogridge J. L. Hurley W. S. Matthews B. R. Bridge Geo. C. Rader	
Lenox.....	Taylor.....	1,250	33	74.6	+ 0.9	96	15	44	24	35	2.50	- 0.86	0.80	0	6	21	6	4	nw.		
Oakland.....	Pottawattamie.....	1,139	9	75.2h	+ 2.3	96h	15	43h	24	39h											
Red Oak (near).....	Montgomery.....	1,030	3								3.98	+ 0.34	2.36	0	7	14	16	1	s.		
Riverton (near).....	Fremont.....	920	2								6.14	+ 2.46	2.42	0	6	18	4	9	s.		
<i>Thurman.....</i>																					
Thurman.....	Fremont.....	960	31	75.6	+ 1.2	96	2	42	24	34	3.58	- 0.49	1.88	0	6	24	2	5	s.	H. H. Askew U. S. Weather Bureau	
Omaha, Neb.....	Fremont.....	1,105	57	76.0	+ 1.6	96	9	48	24	26	3.12	+ 0.07	1.00	0	8	17	10	4	se.		
Means and extremes					75.0	+ 1.4	96	2†	42	24	39	4.15	+ 0.61	4.08	0	7	20	7	4	s.	
<i>South Central District</i>																					
<i>Afton.....</i>																					
Afton.....	Union.....	1,212	34	74.3	+ 1.7	96	15	45	24	35	2.70	- 0.68	1.15	0	9	22	5	4	sw.	S. R. Brown O. E. McBride Thomas Wood C. C. Burr J. C. Davis	
Albia.....	Monroe.....	949	30	74.4	+ 1.8	94	2†	48	24	30	6.17	+ 2.84	1.91	0	8	19	3	9	sw.		
Centerville.....	Appanoose.....	1,013	23	74.2	+ 1.0	93	2	49a	24	28a	4.83	+ 1.35	2.30	0	7	22	5	4	sw.		
Chariton (near).....	Lucas.....	1,042	33	73.9	+ 2.0	96	15	47	24	31	2.29	- 1.40	0.85	0	6	20	8	3	sw.		
Corydon (near).....	Wayne.....	1,050	35	73.4	+ 0.2	92	15†	48	24	34	2.16	- 1.08	1.17	0	7	18	9	4	sw.		
<i>Creston.....</i>																					
Creston.....	Union.....	1,291	23	73.0	+ 1.0	92	2†	45	24	29	3.11	- 0.15	1.33	0	9	11	17	3	s.	Mrs. N. Spangler George Phillips Seth F. Shenton W. J. Casey J. B. Alter	
Earlham (near).....	Madison.....	1,126	26	72.2	+ 0.8	92	15	40	25	36	6.06	+ 2.23	1.95	0	7	24	1	6	sw.		
Indianola.....	Warren.....	972	37	74.7	+ 1.6	94	15	51	31	31	5.56	+ 1.72	2.96	0	9	20	8	3	se.		
Knoxville.....	Marion.....	920	33	73.4	+ 1.0	92	2†	48	24†	30	6.29	+ 2.38	1.85	0	7	21	6	4	se.		
Lacona.....	Warren.....	824	29								7.40	+ 3.95	2.60	0	9	18	8	5	se.		
<i>Lamoni.....</i>																					
Lamoni.....	Decatur.....	1,123	21	73.6	+ 1.2	93	2†	45	24	28	2.24	- 1.54	0.95	0	7	22	6	3	sw.	F. S. Parks S. E. Hollen L. L. Langerak James A. Verploegh H. S. Ely	
Mount Ayr.....	Ringgold.....	1,240	35	72.8	- 0.2	90	2†	44	28	42	3.05	- 0.35	1.42	0	7	13	14	4	s.		
Pella (near).....	Marion.....	850	1								5.20	+ 2.00	1.63	0	7	22	5	4	se.		
Tingley.....	Ringgold.....	1,275	3	72.9	+ 0.7	94	15	44	24	31	3.14	- 0.34	0.99	0	4	23	4	4	se.		
Winterset.....	Madison.....	1,118	37	74.0	+ 0.8	94	2†	44	24	32	3.59	+ 0.10	1.15	0	9	25	3	3	se.		
Means and extremes					73.6	+ 1.0	96	15	40	25	42	4.25	+ 0.73	2.96	0	7	20	7	4	sw.	
<i>Southeast District</i>																					
<i>Bonaparte (near).....</i>																					
Bonaparte (near).....	Van Buren.....	563	37	73.3	+ 0.5	90	2†	50	31	26	5.57	+ 2.08	1.85	0	8	23	7	1	e.	B. R. Vale John T. Donnelly Miss Musa Todd R. M. McKenzie U. S. Weather Bureau	
Burlington.....	Des Moines.....	544	32	75.7	+ 1.3	95	15	53	25	30	6.09	+ 2.36	1.88	0	8	23	5	3	sw.		
Columbus Junction.....	Louisa.....	595	27								4.64	+ 0.30	1.80	0	10	22	8	1	sw.		
Fairfield.....	Jefferson.....	780	44	73.6	+ 0.8	94	2†	49	31	33	5.79	+ 2.32	3.58	0	8	20	5	6	sw.		
Keokuk.....	Lee.....	614	57	75.9	+ 0.9	94	16	56	25	25	2.67	- 0.53	1.23	0	7	15	9	7	s.		
<i>Keosauqua.....</i>																					
Keosauqua.....	Van Buren.....	644	36	74.4	+ 1.2	96	16	46	31	32	5.63	+ 2.36	3.85	0	7	14	13	4	se.	J. H. Landes J. H. Jericho Roy R. Robinson C. W. Mikes W. E. Utterback	
Mt. Pleasant.....	Henry.....	730	47	74.4	+ 0.8	94	15†	49	31	30	5.15	+ 1.88	2.60	0	10	14	13	4	sw.		
Makaloosa.....	Mahaska.....	835	52	72.2	+ 0.1	92	2	47	24	31	6.59	+ 3.50	1.76	0	10	16	10	5	se.		
Ottumwa.....	Wapello.....	649	33	75.0	+ 1.0	95	15†	49	25	33	6.05	+ 2.60	2.64	0	9	21	10	0	ne.		
Sigourney (near).....	Keokuk.....	790	32	73.6	+ 1.0	95	15	49	24†	31	6.16	+ 3.06	3.22	0	9	20	4	7	se.		
<i>Stockport.....</i>																					
Stockport.....	Van Buren.....	747	26	73.8	+ 1.6	94	8†	49	31	32	9.83	+ 6.73	4.41	0	10	21	5	5	s.	C. L. Beswick D. D. Sherman H. G. Liddle	
Washington.....	Washington.....	757	46	73.9	+ 1.5	93	2†	49	31	28	4.31	+ 0.66	1.38	0	8	19	4	8	s.		
Wever.....	Lee.....	552		74.7		96	15	50	31	33	4.58		2.30	0	5						
Means and extremes					74.2	+ 1.0	96	15†	46	31	33	5.62	+ 2.19	4.41	0	8	19	8	4	sw.	
State means and extremes					72.7	+ 1.0	100	1	37	24	42	6.42	+ 2.98	5.08	0	9	19	8	4	s.	

Temperature normals are based on the 46-year period July 3, 1875 to July 2, 1921; shorter records corrected to harmonize. Precipitation normals are based on the 50-year period ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1920 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.

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.

MISCELLANEOUS PHENOMENA

Aurora: 5th.

Fog: 1st, 3d, 4th, 10th, 15th, 18th, 26th.

Frost (light): 24th, 25th.

Hail: 1st, 2d, 5th, 6th, 13th, 19th, 20th, 22d, 23d, 26th.

Halos (lunar and solar): 3d, 7th, 8th, 9th, 13th, 15th, 31st.

Thunderstorms: 1st, 2d, 3d, 4th, 5th, 6th, 7th, 16th, 17th, 19th, 20th, 21st, 22d, 23d, 24th, 25th, 26th, 27th, 28th, 29th.

Tornado: 20th, 26th.

RIVERS

Rather low stages prevailed on the Mississippi River at the beginning of the month with a rather sharp rise during the latter part of the 1st week after which there were no important changes though many fluctuations until the beginning of the

Daily Precipitation for August, 1928

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>Northwest District</i>																																		
Akron.....	Big Sioux.....	.52			.96	1.20										.58			.01	.02			.63			T.	.15		.57				4.64	
Alta|||.....	Raccoon.....		1.04				.09									.10	.14	T.	T.	T.			.54	.14					.18				4.23	
Alton.....	Floyd.....	.66			.23	.62										.31			.16	.14			.48			.03	.35		2.12		.02		5.12	
Cherokee.....	Little Sioux.....	.32	.02			.02										.37			.05	.04			.60			T.	1.18		.15				2.75	
Estherville|||.....	Des Moines.....	1.45	.43				.10									.03	.10			.10	.05		2.30	.15		.10		1.50		.05			6.61	
Hawarden.....	Big Sioux.....	1.56			.60	1.32								T.		.76			.42	.18			.41				.20		1.17		.01		6.63	
Inwood|||.....	Big Sioux.....	.10	.83	.02		1.19	T.									.56	.03		1.31	.03	T.		.82	T.			.46		1.73	T.			7.08	
Lake Park (near).....	Little Sioux.....	4.80				.67										.23							.76						2.13				8.59	
Le Mars.....	Floyd.....	.42	.01			.49										.52				.91							.43		.20				2.98	
Marathon.....	Raccoon.....	T.	.47	.02		.02										.26			.05	.13			.76	.16		1.52		.13	.23				3.75	
Pocahontas.....	Des Moines.....	.95	.27			.16										.12			.04	.44			.05	.70		.05	1.56		.31				4.65	
Rock Rapids.....	Big Sioux.....	1.68			.08	.50										.43			.22	2.04			.15			.29		1.86					7.25	
Sanborn.....	Floyd.....	3.12			.10	.65										.14			.13	.95			.23			1.10		2.30					8.72	
Sheldon.....	Floyd.....	2.81	T.		.30	.73										.14			.13	.40			.36			T.	1.24		1.94		.03		8.08	
Sioux Center.....	Floyd.....	3.23			1.22	.77										.28			.63	.17			.80			1.17		1.67		.02			9.96	
Spencer.....	Little Sioux.....	1.80				.10										.02						.67			.40		.05	.50		2.50			6.04	
Storm Lake.....	Raccoon.....	1.11	.08			.44													.04	.02			.64			T.	1.87		.26				4.46	
Washta.....	Little Sioux.....	1.48	T.			.10										.05			.62	.04			.73			T.	2.36		.05		.02		5.45	
West Bend.....	Des Moines.....	1.15	.22			.22									T.	.02			T.	.67			.97			T.	1.92		1.05				6.30	
<i>North Central District</i>																																		
Algona.....	Des Moines.....	1.25	.85			.40															1.10		.81	1.45			1.20		1.50				8.56	
Allison.....	Cedar.....	.22	1.14													.07			.89			2.00	.07			.04		.10	.10				4.63	
Belmond.....	Iowa.....	2.85	2.42			.25	.16									.05			.80			.02	1.07			.05	1.50		.40	.46			10.03	
Britt.....	Iowa.....	3.50	1.30			.10													.52			.90	2.55				.45	1.98					11.30	
Charles City***.....	Cedar.....	.68	2.47	1.00		.15										T.					2.67		2.78	.92		.08	.22		1.81				12.78	
Forest City|||.....	Cedar.....	.62	2.15	.53		.37											T.					.03	.60			2.41	T.		.33	.83	.82		8.93	
Hampton.....	Cedar.....	2.00	.50			.34										.51			.64			*	.84				2.10	.04					6.97	
Humboldt.....	Des Moines.....	1.22	.54			.24										.27			.64				.64			T.	3.35		.40	.46		T.	8.16	
Mason City.....	Cedar.....	.60	3.02	1.40	.02	.14										.01	T.		.41			1.00	3.86	.01			.24	.01	1.56				12.28	
Northwood.....	Cedar.....	.90	2.70	1.10		.20									T.	T.			.60			.50	4.10			T.	.31	.21	1.10				11.92	
Osage.....	Cedar.....	.55	2.62	.46		.48																.61		.35	4.42			.26		1.50				11.25
<i>Northeast District</i>																																		
Decorah|||.....	Mississippi.....	2.05	1.55	.42		.16		.12								.51			1.11	1.13			4.46				.83		.10	.36			12.80	
Dubuque***.....	Mississippi.....	1.45	.87	.52		.03										.32			1.12			.93	2.80				.92		.62				9.38	
Fayette.....	Mississippi.....	.77	2.00	.44		.03										.01			.85			1.64	1.50				1.25		.87				9.36	
Independence.....	Wapsipinicon.....	T.	1.51	1.15												.98						.47	.89				3.04		.31				9.45	
Lansing|||.....	Mississippi.....	1.12	1.20	.27		.08	.13	.26									.32				T.	1.22		2.25	.06		.50		.65				8.06	
New Hampton.....	Wapsipinicon.....	.62	1.00	2.45		.10										.48						2.50		2.70			.65						10.40	
Oelwein.....	Wapsipinicon.....	.40	1.20	.60		.09										.10			.90	1.20			2.30			2.10	.10	.30					9.30	
Postville.....	Mississippi.....	2.97	.68			.09			T.							T.			1.04				1.86			.74		1.35					8.73	
Waterloo|||.....	Cedar.....	1.35	1.35	.30		.05										1.63			.13	.40			1.15			3.65		.05					10.06	
Waverly.....	Cedar.....	.70	.48	.06		.17										.10						.93	.01	.91	2.26		1.30	.40	.34				7.66	
<i>West Central District</i>																																		
Audubon (near).....	Nishnabotna.....		1.61			.25	.49									.04	.66		.02	T.			.43				1.04		.03				4.57	
Carroll|||.....	Raccoon.....	.02	1.54	.70		.26											4.82		.40				.27	.07			1.20		.15				9.43	
Denison.....	Missouri.....		.15			.43										.03	.88		.16				.33				.18	1.35		.04				3.55
Guthrie Center.....	Raccoon.....		5.08			.44										.36			.14				.33				.42	.44		.14				7.35
Harlan.....	Nishnabotna.....	T.	1.45			.65	.55									.27	.41		.09	.02			.41				1.08	.16	.03				5.12	
Jefferson.....	Raccoon.....		.97			.22	.13									.01	.30					.05		.83			1.14	.02	T.				3.67	
Little Sioux.....	Little Sioux.....		.76			2.00	.53									.08	.80					.05		.47			.36	.72	.02				5.74	
Logan.....	Missouri.....		.24			.17										.21	.85					.40	.20			.10	1.10	.05	.05				3.47	
Onawa.....	Raccoon.....	.25	.85			.05													.40	.20			.20				.90	.10	.24				3.74	
Rockwell City.....	Raccoon.....		.75	.40		.25										.30						.18		.54			1.20	.62	.05				4.29	
Sac City.....	Missouri.....	.57	T.		T.										.04	.04					T.	.08		.66	.21		1.06		T.		.01		2.67	
Sioux City***.....	Missouri.....																																	
<i>Central District</i>																																		
Ames.....	Skunk.....		1.93	.02		.30											.22					.15	.06				.25	2.00		.10				5.74
Baxter.....	Skunk.....	.85	2.05	.45		.34										.16			T.			.46		1.00			.15	1.12		.10				6.68
Boone (near)|||.....	Des Moines.....		2.09	.12		.45										.36			T.	.04	.04			.77	T.		2.68		.16				6.71	
Des Moines***.....	Des Moines.....	1.90	1.27			.31										1.24	1.16			.02	.04		.60			1.14	.02	.05					7.75	
Fort Dodge|||.....	Des Moines.....	.02	1.13	1.07		.28											.13			.02	T.	.36		.83	.03		3.10	.31	.21				7.49	
Grinnell.....	Iowa.....		2.19	.82		.14											.17						.45		1.27	T.		.10	1.22		.12			6.48
Grundy Center.....	Cedar.....	.20	1.20	.12		.08										.85				.20	.25		.85			.16	2.96		.08					6.95
Iowa Falls|||.....	Iowa.....		1.54	.36		.27										.06				T.	.15		.78				3.96	.04	.10				7.26	
Marshalltown|||.....	Iowa.....	.40	2.15	.44		.20										.06				.05	.35	</												

Daily Precipitation for August, 1928—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>Southwest District</i>																																	
Atlantic	Nishnabotna		1.37	.52				.37									.56			.09			.22			1.34	.73		.11				5.31
Bedford	102		.49	.48												.49						.92			.75			.02					3.15
Clarinda	Nodaway		.36	.78												.87	.03					.70	.02		.36			.08					3.28
Corning	Nodaway		.70	.67												.38						.30			.35	.05		.08			.01		2.54
Cumberland (nr.)	Nodaway		1.51												.46	.29		.03	T			.29			.30	3.78		.31				6.97	
Glenwood	Missouri		1.60												2.06	.44						.33			.23						.02		5.08
Lenox	Missouri		.70	.10											.42	.39						.58			.31				T		T		2.50
Oakland	Nishnabotna		1.29																.05														
Red Oak (near)	Nishnabotna		2.33												.30	.68						.33			.22				.08		.04		3.98
Riverton (near)	Nishnabotna		2.02												2.42	.03							1.18		.23				.26	T			6.14
Thurman	Missouri		1.38												.80	.48							.65		T			.25		.02		3.58	
Omaha, Neb., ***	Missouri		.41	.59											.79	.01					T		.08		.37		.80		.07	T		3.12	
<i>South Central District</i>																																	
Afton	Grand		1.15	.25				.11								.02	.51	.02					.32			.29	.03	T	T		T		2.70
Albia	Des Moines		1.55	1.91				.84								.28	.01				.72		.80			.06			T				6.17
Centerville	Chariton		2.30	.71				.09							T						.62		.54			.25			T				4.83
Chariton (near)	Chariton		.23	.85				.38								.26					.22			.35		T				T			2.29
Corydon (near)	Chariton		1.17					.13							.01	.10					.18			.35			.22		T				2.16
Creston	Missouri		.38	.61				.10								1.33	T				.02		.29	.02		.31			T	.05			3.11
Earlham (near)	Des Moines		1.20	T			1.03								.49	.25							.29			.85	1.95						6.06
Indianola	Des Moines		2.96	.30				.76							.16	.35						.11			.50				.01				5.56
Knoxville	Des Moines		1.10	1.85				.43							.63							.35		1.00		.93			T				6.29
Lacona	Des Moines		1.75	2.60				.12							.23	1.52						.12				.28		.72		.06			7.40
Lamoni	Grand		.23	.72												.35	.10						.65	.10			.09			T			2.24
Mount Ayr	Grand		1.42	.25											.01	.38					T		.48			.10	.31						3.05
Pella (near)	Des Moines		1.63	.81				.07							T	T	.90					.41		.90		.48			T				5.20
Tingley	Platte		.99								T					.77						T		.56		.82			T				3.14
Winterset	Des Moines		1.15	.25				.57								.27						T		.35		.05	.90	.02	.03				3.59
<i>Southeast District</i>																																	
Bonaparte (near)	Des Moines		1.27	1.85				.23								.11						1.29	.10	.43		T	T		T	.29			5.57
Burlington	Mississippi		.58	1.88	.20											.04	1.28					1.02		1.06	.03		T		T				6.09
Columbus Jct.	Iowa		.82	.98				.39								.07					.02	.54	.15	.81		.04		.82					4.64
Fairfield	Skunk		3.58	.73				.23								.11						.28	.02	.72		.12							5.79
Keokuk***	Mississippi		.70	.53				T								T	.10				.31	.34	.60		T			.09				2.67	
Keosauqua	Des Moines		2.45	1.40												.66					.25		.55		.02				.30				5.63
Mt. Pleasant	Skunk		.74	2.60	.10			.23								.01						.20		.88		.02		.02	.35				5.15
Oskalosa	Des Moines		1.20	.47				.56							.12	1.46						.86	.18	1.58		.08		.08					6.59
Ottumwa	Des Moines		2.64	.59	.02			.32								.47						.61		1.29		.09		.02					6.05
Sigourney (near)	Skunk		3.22	.47	.09			.18								T	.29				T	.64	.39	.85		.03							6.16
Stockport	Skunk		4.41	2.45	.20			.41								.35						.81	.24	.88		.03		.05					9.83
Washington	Skunk		1.38	1.30	T											.08						.48	.12	.92		.02		.01					4.31
Wever	Mississippi		.14	1.03												2.30						.36	T	.75		T							4.58

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.

T. Precipitation is less than .01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE

Stations	Barometric Pressure, Inches (Sea Level)				Relative Humidity, %				Wind				Sunshine				
	Mean	Highest	Date	Lowest	Mean				Total movement	Average hourly velocity	Maximum			% possible departure from normal			
					7 A. M.	12 Noon†	7 P. M.	Lowest			Miles	From			Date		
Chas. City	29.98	30.37	31	29.51	20	86	59	71	37	10	3,624	4.9	23	sw.	6	75	+ 4
Davenport	29.99	30.32	31	29.61	20	85	58	61	39	31	4,045	5.4	29	sw.	20	77	+ 7
Des Moines	29.97	30.35	31	29.50	20	87	60	64	42	24	4,345	5.7	27	sw.	20	74	+ 4
Dubuque	29.99	30.34	31	29.57	20	86	58	66	39	31	3,641	4.9	30	sw.	20	72	+ 8
Keokuk	30.01	30.31	31	29.67	20	81	56	62	32	31	4,096	5.5	24	s.	20	78	+ 6
Sioux City	29.96	30.36	31	29.53	22	82	55	57	34	8†	7,715	10.4	45	w.	26	67	- 3
Omaha, Nb	29.95	30.31	31	29.56	23	82	57	58	38	21	4,517	6.1	26	n.	23	70	- 0
Means and extremes	29.98					84	58	63				6.1				73	+ 4
Normals and records..	29.97	30.43	1919	29.40	1874	82	61	5th					57	sw.	1916		

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

††January 1, 1928, 3-cup anemometers replaced the 4-cup instruments used since the establishment of the Weather Bureau stations. The new instruments will more accurately indicate the true wind movement. The records of the 4-cup instruments were somewhat too high at moderate velocities and considerably too high at the higher velocities. Tables of true velocities corresponding to indicated velocities appear in the January, 1928 Climatological Data. For purposes of comparison the highest velocity of record in the lower line of the table has been converted into a 3-cup velocity.

INTENSE RAINSTORM RECORDS BROKEN

New State records for intense rainfall were broken at Sioux City on July 21, when 1.40 inches fell in 10 minutes, 1.75 inches in 15 minutes, and 2.94 inches in one hour. Heretofore Dubuque has held all records up to 24 hours and Dubuque still holds the records for 5 minutes, 30 minutes and 2 hours, as shown in the table, while Omaha, which may be said to represent southwest Iowa, has the record for 24 hours.

The large amounts occasionally recorded in 24 hours at cooperative stations makes it probable that some of these stations would have shown larger amounts in short periods of time if they had been equipped with recording gauges. The greatest 24-hour rainfall recorded in Iowa at a cooperative observing station is 13.00 inches at Primghar, O'Brien county, July 14th-15th, 1900, though as a close second stands Larrabee, Cherokee county, with 12.99 inches, June 24, 1891, and not far behind is Bonaparte, Van Buren county, with 12.10 inches on June 10, 1905. At Perry, Dallas county, 6.00 inches fell in 9 hours on June 24th-25th, 1909.

MAXIMUM PRECIPITATION IN SHORT PERIODS OF TIME

	Length of Record Years	5	10	15	30	1	2	24
		Min.	Min.	Min.	Min.	Hr.	Hrs.	Hrs.
Charles City	23	0.57	0.87	0.99	1.54	1.85	2.92	3.87
Davenport	23	0.61	1.04	1.33	1.88	2.71	2.74	5.18
Des Moines	31	0.66	1.12	1.36	1.91	2.65	3.44	5.14
Dubuque	25	0.80	1.20	1.52	2.23	2.70	4.50	5.40
Keokuk	20	0.58	0.96	1.24	1.66	2.38	2.45	4.80
Sioux City	21	0.77	1.40	1.75	2.17	2.94	3.20	4.65
Omaha, Neb.	31	0.67	1.01	1.27	1.71	2.53	3.17	7.03
State Record	25	0.80	1.40	1.75	2.23	2.94	4.50	7.03

*Approximated †Record for 56 years ‡Record for 49 years †Record for 39 years ||Record for 57 years.

Daily Maximum and Minimum Temperature for the Month of August, 1928

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.....	90	87	74	79	80	85	90	92	96	86	78	83	85	91	91	88	80	82	89	83	78	79	72	70	75	77	88	77	79	71	69	82.1
	Minimum.....	63	62	67	62	60	59	68	68	68	65	54	53	65	62	67	70	65	50	65	66	56	60	54	40	45	61	62	59	59	50	43	59.6
Alta.....	Maximum.....	91	89	74	81	84	88	93	97	98	92	85	87	93	93	86	81	84	87	88	84	82	76	75	77	80	90	79	79	71	68	84.7	
	Minimum.....	66	67	65	60	55	63	63	67	69	66	56	61	65	65	70	70	62	51	63	65	54	60	52	43	49	62	62	58	60	50	48	60.3
Alton.....	Maximum.....	95	89	76	78	80	86	91	90	95	88	85	86	95	94	84	77	83	85	82	80	82	78	69	75	80	87	78	78	68	69	83.2	
	Minimum.....	65	65	65	60	58	62	62	68	70	67	58	65	68	69	69	70	60	52	63	70	56	60	51	39	48	64	63	60	62	50	49	61.0
Belmond.....	Maximum.....	89	91	72	80	84	89	91	94	94	91	81	83	87	88	94	87	80	74	89	84	79	78	70	71	75	76	90	82	70	71	82.7	
	Minimum.....	61	66	67	62	54	63	62	68	70	64	57	56	62	68	67	69	63	69	60	66	57	57	54	41	45	65	64	59	48	41	60.1	
Charles City.....	Maximum.....	85	77	75	78	81	87	89	92	92	84	78	80	84	87	90	87	77	80	87	82	75	76	70	68	73	77	88	71	80	70	70	80.3
	Minimum.....	67	66	68	61	57	66	63	69	72	65	59	56	61	60	68	69	58	54	63	64	59	57	50	45	48	59	64	58	50	44	59.9	
Decorah.....	Maximum.....	86	82	77	84	84	86	93	95	92	86	77	79	84	86	93	91	80	84	90	90	79	75	76	74	73	77	89	86	81	73	73	83.1
	Minimum.....	64	63	66	62	55	63	59	67	63	63	51	49	55	55	61	62	59	50	59	62	58	53	55	41	41	52	64	62	54	50	39	56.7
Dubuque.....	Maximum.....	85	89	79	79	77	84	90	92	92	86	79	78	83	86	90	90	83	79	85	83	75	79	75	69	74	77	89	80	77	73	70	81.5
	Minimum.....	67	68	68	68	64	64	66	70	72	70	60	57	59	60	68	70	65	61	59	61	58	56	57	52	51	59	65	64	61	54	49	62.0
Forest City.....	Maximum.....	85	85	73	72	77	87	92	94	94	87	80	84	87	89	92	87	80	83	89	85	79	77	68	72	72	76	89	84	81	74	70	82.1
	Minimum.....	64	64	65	66	56	64	59	67	67	65	56	55	62	60	68	67	64	52	61	68	55	56	60	43	47	61	63	58	58	49	41	59.3
Independence.....	Maximum.....	86	88	89	80	80	84	88	91	90	90	83	78	82	85	89	90	79	80	85	83	82	78	77	68	72	77	77	89	78	78	70	82.1
	Minimum.....	65	69	62	65	61	65	62	68	69	66	57	57	57	60	67	69	63	54	60	60	61	55	63	45	48	56	56	62	58	53	46	60.1
Inwood.....	Maximum.....	100	88	83	83	78	89	95	95	98	87	86	88	96	95	94	87	80	85	84	80	81	83	77	76	78	80	88	77	76	71	67	84.7
	Minimum.....	63	65	63	58	58	60	60	65	63	65	63	65	68	64	68	70	67	69	54	55	60	51	40	48	48	63	62	59	61	49	48	59.2
Lake Park.....	Maximum.....	84	80	.....	81	88	94	94	94	94	78	.....	84	92	92	91	84	.....	.....	.....	.....	87	78	72	.....	74	78	86	76	78	79	78	.....
	Minimum.....	72	57	.....	60	66	73	73	73	63	.....	64	70	71	70	69	.....	.....	.....	.....	.....	61	62	55	.....	58	61	65	60	62	55	42	.....
Mason City.....	Maximum.....	84	83	73	74	80	83	90	92	91	84	78	80	84	87	90	85	77	80	88	82	76	76	66	70	72	75	85	80	80	66	70	80.1
	Minimum.....
New Hampton.....	Maximum.....	85	82	76	81	82	85	89	91	92	85	78	78	84	86	90	89	80	80	87	83	76	75	70	70	72	76	88	80	80	79	69	81.2
	Minimum.....	65	64	66	63	57	63	60	66	69	64	55	52	56	57	64	68	64	52	58	63	58	54	51	40	44	50	62	60	55	49	40	57.8
Northwood.....	Maximum.....	82	82	76	77	79	85	88	90	91	82	77	79	84	85	88	84	78	80	86	78	75	75	68	68	72	75	86	78	68	67	68	79.1
	Minimum.....	62	62	67	56	59	57	61	68	71	65	56	55	60	60	67	67	60	53	62	63	56	55	54	45	46	57	63	57	58	51	46	58.7
Pocahontas.....	Maximum.....	94	90	73	80	83	89	92	95	95	87	80	84	90	96	92	85	79	83	89	86	81	79	75	72	77	77	89	88	83	72	70	84.1
	Minimum.....	65	64	66	61	54	63	60	66	68	63	54	60	64	67	66	71	65	48	64	70	55	59	55	41	49	65	62	69	63	49	45	60.1
Postville.....	Maximum.....	81	80	76	75	77	83	86	88	87	80	73	76	85	82	87	88	76	76	83	80	70	76	72	65	70	82	85	80	75	71	66	78.4
	Minimum.....	65	65	66	66	65	64	60	67	66	66	54	50	54	55	63	66	62	54	60	62	60	60	54	45	44	54	58	61	55	50	43	58.5
Rock Rapids.....	Maximum.....	95	86	78	80	78	87	92	94	95	86	85	86	92	92	84	79	83	81	81	80	81	78	72	75	80	85	77	75	68	68	82.7	
	Minimum.....	60	63	63	57	54	60	59	64	63	61	55	63	68	68	68	69	55	50	62	61	52	68	56	37	45	60	61	58	48	45	58.5	
Central Division																																	
Belle Plaine.....	Maximum.....	93	95	85	81	86	90	92	95	94	88	81	84	87	90	93	94	82	83	87	84	81	81	76	71	79	80	92	82	84	78	74	85.2
	Minimum.....	68	74	68	66	59	64	62	66	68	64	58	53	57	57	66	70	69	53	63	68	61	54	58	45	46	58	66	72	65	44	61.0	
Boone.....	Maximum.....	92	93	76	83	85	88	90	94	96	88	83	81	87	90	95	90	82	83	87	86	84	82	74	72	76	75	90	80	79	72	84.5	
	Minimum.....	67	73	69	66	55	63	62	64	66	62	55	55	63	58	65	66	66	52	59	71	60	54	51	42	42	57	67	63	62	50	46	59.8
Carroll.....	Maximum.....	94	92	71	81	82	88	91	94	95	88	82	85	90	90	81	87	80	81	85	85	82	80	75	73	75	76	90	84	79	78	67	83.6
	Minimum.....	67	67	67	61	56	64	63	68	70	67	56	59	63	63	67	70	64	54	60	62	56	60	56	43	46	60	65	60	60	49	47	60.3
Cedar Rapids.....	Maximum.....	90	91	84	83	81	84	90	93	93	89	79	80	83	87	93	92	84	81	87	84	81	80	78	72	75	79	91	81	83	78	71	83.8
	Minimum.....	66	73	67	68	62	60	61	67	68	69	60	51	53	54	64	68	69	55	54	64	63	50	62	49	45	53	67	68	58	53	43	60.1
Davenport.....	Maximum.....	89	92	86	78	79	88	91	92	92	88	79	81	86	89	93	92	85	82	85	85	79	81	80	72	79	91	81	85	78	71	84.3	
	Minimum.....	71	72	70	69	66	66	69	73	75	69	61	58	62	64	69	71	68	62	63	62	64	60	62	55	55	63	72	70	66	59	52	65.1
Des Moines.....	Maximum.....	92	94	80	83	84	88	89	92	92	89	80	84	86	90	92	89	81	81	86	87	80	81	74	71	77	76	91	80	81	79	71	83.9
	Minimum.....	71	70	69	68	63	67	65	70	72	70	64	58	65	63	69	70	66	61	64	69	63	60	55	49	51	62	68	65	64	55	53	63.8
Ft. Dodge.....	Maximum.....	94	92	73	80	85	89	93	96	96	89	85	85	89	92	94	88	80	85	89	85	81	80	68	73	78	90	81	82	78	74	84.5	
	Minimum.....	65	64	65	60	52	63	60	65	65	60	54	56	63	60	65	68	63	49	62	66	55	56	53	39	45	59	61	58	58	48	43	58.1
Grinnell.....	Maximum.....	90	93	90	79	85	87	90</																									

IOWA STORMS, JULY, 1928—(Continued From July Issue)

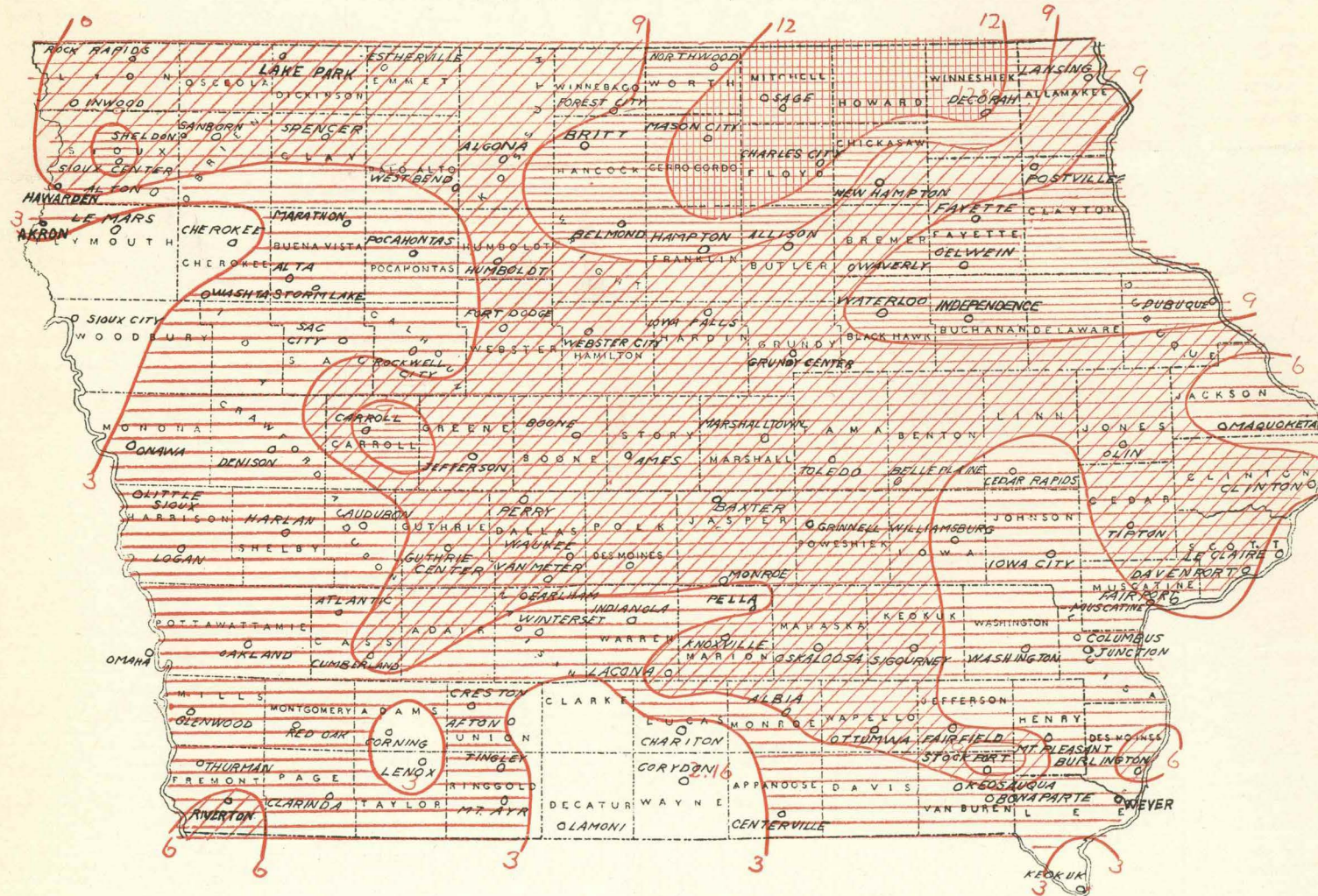
Date	County	Township	Nature of Storm	Time	Storm Moved From	Width of Path Miles	Length of Path Miles	Area of Sq. Miles	Size of Hailstones Inches	Damage	Persons Killed	Persons Injured
4	Webster	Dayton, Gorrie, Lost Grove and Roland	Wind and Hail	3:00 a. m.	SW to NE					Hic'ry Nuts \$20,000		
4	Worth	Bristol, Deer Creek and Fertile	Wind	4:00 a. m.	SW to NE					Slight		
4	Wright	Belmond and Iowa	Wind	5:00 a. m.	SW to NE					\$10,000		
7	Buchanan	Byron and Liberty	Wind and Hail	6:00 p. m.	SW to NE					Considerable to Crops		
7	Calhoun	Twin Lakes	Wind	5:30 p. m.	SW to NE					Some to Crops		
7	Carroll	Washington	Wind and Hail	6:00 p. m.	SW to NE					Slight		
7	Fremont	Prairie	Hail	5:00 p. m.	NW to SE				1/4	\$5,000		
7	Kossuth	Ramsey	Wind and Hail	5:30 p. m.	SW to NE				1/2	Crops Damaged 20%		
7	Mills	Plattville	Wind and Hail	4:00 p. m.	SW to NE					Marbles \$4,000		
7	Muscatine	Lake	Wind	10:00 p. m.	SW to NE					\$5,000		
7	Muscatine	Montpelier	Wind	7:00 p. m.	SW to NE					\$1,000		
7	Osceola	Ocheyedan	Wind and Hail	7:00 p. m.	SW to NE					\$5,000		
7	Palo Alto	Ellington, Emmetsburg and Nevada	Wind and Hail	6:00 p. m.	SW to NE					Marbles \$1,500		
7	Plymouth	Elkhorn	Wind and Hail	5:00 p. m.	SW to NE					Small Slight		
7	Pocahontas	Sherman	Wind and Hail	4:30 p. m.	W to E					\$2,000 to Bldgs.; \$1,200 to Crops; \$1,800 to Livestock.		
7	Pottawattamie	Belknap, Keg Creek and Rockford	Wind and Hail	6:00 p. m.	SW to NE					\$4,000		
7	Union	Grant	Wind and Hail	6:30 p. m.	NW to SE					\$15,000		
8	Allamakee	Lansing and Post	Wind and Flood	2:00 p. m.	SW to NE					\$6,000		
8	Benton	Taylor	Wind	12:00 p. m.	NW to SE					\$1,000		
8	Clayton	Farmersburg	Wind and Hail	1:45 p. m.	NW to SE					Some to Crops		
8	Fayette	Dover	Wind	1:30 p. m.	NW to SE					Some to Crops		
8	Jones	Fairview and Greenfield	Wind	2:00 p. m.	SW to NE					Some to Crops		
8	Kossuth	Luverne	Hail	5:30 a. m.	NW to SE				1 1/2	Crops Damaged 10%		
8	Linn	Brown and Linn	Wind	2:00 p. m.	SW to NE					Some to Crops		
8	Woodbury	Liston	Wind and Hail	8:30 p. m.	SW to NE					Pig'n Eggs Slight		
9	Carroll	Washington	Wind and Hail	6:00 p. m.	W to E				1/2	Crops Damaged 10%		
9	Ida	Garfield, Grant, Hayes	Hail	8:00 p. m.	W to E	1			1/2	Considerable to Crops		
9	Jasper	Elk Creek	Hail	9:30 p. m.						Slight		
9	Polk	Crocker and Madison	Hail	9:00 p. m.	NW to SE					Marbles Many Windows Broken; Crops Damaged 10%		
9	Winnebago	Norway	Wind and Hail	4:00 p. m.	SW to NE					Dove Eggs Crops Damaged 10%; Some to Livestock		
9	Woodbury	Little Sioux and Willow	Wind and Hail	7:00 p. m.	SW to NE					\$10,000		
10	Benton	Kane and Union	Wind and Hail			1/2	2	1		Considerable to Crops		
10	Appanoose	Caldwell	Wind and Hail	1:15 p. m.	NW to SE					Hic'ry Nuts \$5,000		
10	Guthrie	Richland	Hail	9:00 a. m.	NW to SE				1/2	Crops Damaged 35%		
11	Iowa	Marengo	Wind and Hail	3:00 p. m.						Some to Crops		
11	Monroe	Troy	Wind and Hail	2:30 p. m.	W to E					Slight		
11	Ringgold	Riley	Hail	12:00 p. m.	NW to SE					Small Considerable to Crops		
11	Shelby	Greeley	Hail	7:00 p. m.						Hazel Nuts Some to Crops		
12	Allamakee	Ludlow	Hail	4:00 p. m.	NW to SE				1/2	\$3,000		
12	Benton	Eldorado and St. Clair	Wind and Hail	4:00 p. m.	NE to SW				1/2	\$20,000		
12	Boone	Grant and Pilot Mound	Wind and Hail	7:30 p. m.	NW to SE	1	12	12	1/2	Considerable to Crops		
12	Bremer	Polk	Hail	4:00 p. m.	NW to SE					Oats Damaged 20%; Corn About 10%		
12	Butler	Fremont	Hail	3:00 p. m.	N to S					Hen Eggs Some to Crops		
12	Cerro Gordo	Owen and Portland	Wind and Hail	8:00 p. m.	N to S					Slight		
12	Cherokee	Marcus, Tilden, Willow	Wind and Hail	7:00 p. m.	N to S					Slight		
12	Chickasaw	Bradford	Wind and Hail	3:30 a. m.	NW to SE				1/2	\$25,000		
12	Fayette	Eden, Ilyria, Jefferson and Scott	Hail	3:00 p. m.	NW to SE					Small \$40,000		
12	Floyd	Riverton and St. Charles	Hail	3:00 p. m.	N to S	2	9	18		Hen Eggs \$10,000		
12	O'Brien	Baker and Caledonia	Wind and Hail	7:00 p. m.	N to S				1/2	Crops Damaged 15%		
12	Polk	Webster	Wind and Hail	8:00 p. m.	NE to SW					Marbles \$2,500		
12	Story	Nevada, Palestine and Washington	Hail	8:00 p. m.	NW to SE					Cherries \$60,000		
12	Washington	Clay and Dutch Creek	Hail	4:00 p. m.	NW to SE	1	3	3		Hic'ry Nuts \$11,000		
13	Worth	Deer Creek	Hail	p. m.						\$2,000		
18	Warren	White Oak	Wind	7:00 p. m.						Some to Crops		
19	Black Hawk	Spring Creek, Lester, Orange and Washington	Wind and Hail	5:45 p. m.	NW to SE					Pig'n Eggs Some to Crops		
19	Clark	Osceola	Wind and Hail	p. m.	W to E					Considerable to Crops		
19	Clinton	Deer Creek	Wind	2:00 a. m.	NW to SE					Some to Crops		
19	Fayette	Union	Wind and Flood	4:20 p. m.						Some to Crops		
19	Howard	Howard and Oak Dale	Wind	3:00 a. m.	W to E				1/2	\$10,000		
19	Jackson	Farmers Creek	Wind and Hail	7:15 p. m.						\$10,000		
19	Monroe	Wayne	Fornado	6:00 a. m.	W to E	1/8				\$1,000 to Bldgs.		
19	Pottawattamie	Kane and Lewis	Wind and Flood	10:30 p. m.						Considerable to Crops		
20	Adams	Jasper and Quincy	Wind and Flood	1:00 a. m.	W to E					Some to Crops		
20	Fremont	Walnut	Wind and Hail	1:00 a. m.	W to E					Small \$1,000		
20	Ida	Logan	Wind and Hail	2:00 a. m.	NW to SE					\$2,500		
20	Montgomery	Frankfort	Wind and Flood	2:00 a. m.	NW to SE					\$70,000 to Crops		
20	Page	Lincoln and Washington	Wind	3:00 a. m.	NW to SE					\$10,000 to Bldgs.		
21	Buena Vista	Brooke	Wind and Flood	4:00 a. m.	W to E					Crops Damaged 5%		
21	Cherokee	Marcus	Wind and Flood	3:00 p. m.	NW to SE					Slight		
21	Clay	Logan	Wind	3:00 a. m.	SW to NE					\$5,000		
21	Greene	Jackson	Wind	3:00 a. m.	SW to NE					Slight		
21	Plymouth	Stanton	Wind and Hail	1:00 a. m.	NW to SE					Peas Slight		
21	Woodbury	General over the county	Wind and Flood	1:00 a. m.						Considerable to Crops		
26	Black Hawk	Washington	Hail	p. m.	NW to SE					Peas \$2,000		
26	Boone	Gordon	Hail	5:45 p. m.	N to S					Slight		
26	Bremer	Washington	Hail	3:00 a. m.	NW to SE					Hic'ry Nuts Some to Crops		
26	Butler	Shell Rock	Hail	3:00 p. m.	NW to SE					Crops Damaged 5%		
26	Chickasaw	Jacksonville	Hail	2:00 p. m.	NW to SE					Slight		
26	Franklin	Grant	Wind and Hail	8:00 p. m.	NW to SE					\$25,000		
26	Greene	Bristol and Grant	Wind and Hail	6:00 p. m.	W to E					Crops Damaged 2%		
26	Hamilton	Blairsburg, Clear Lake and Liberty	Wind and Hail	3:00 p. m.	N to S	3 1/2				Peas Slight		
26	Hardin	Eldora	Hail	3:30 p. m.	NW to SE					Hazel Nuts \$20,000		
26	Madison	Douglas, Jackson, Lincoln and Penn.	Wind and Hail	7:00 p. m.	N to S	1	4	4		Hen Eggs \$40,000		
26	Marshall	Lipscomb, Marshall and Taylor	Wind and Hail	4:30 p. m.	NW to SE				1/2	\$12,000 to Crops		
26	Monroe	Monroe	Wind	8:00 p. m.	NW to SE					Slight		
26	Story	Milford	Hail	4:00 p. m.	NW to SE					Small Slight		
26	Tama	Crystal, Grant, Lincoln	Hail	5:00 p. m.	NW to SE				1/4	Crops Damaged 30%		
26	Winneshek	Bluffton and Glenwood	Wind and Hail	3:30 p. m.	NW to SE					Small Slight		
26	Worth	Union	Wind and Hail	p. m.	NW to SE					Crops Damaged 15%		
26	Wright	Dayton	Wind and Hail	2:30 p. m.	NW to SE				1/2	Crops Damaged 10%		

IOWA STORMS, AUGUST, 1928

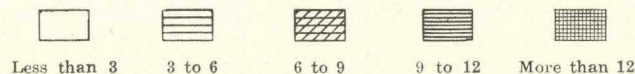
Date	County	Township	Nature of Storm	Time	Storm Moved From	Width of Path Miles	Length of Path Miles	Area of Sq. Miles	Size of Hailstones Inches	Damage	Persons Killed	Persons Injured
1	Chickasaw	Jacksonville	Hail	1:00 p. m.	NW to SE					Dove Eggs		
2	Benton	Harrison	Wind	8:00 p. m.	W to E	1/2				Some to Crops		
2	Floyd	Rockford, Rock Grove	Wind and Hail	5:00 p. m.	NW to SE					Some to Crops		
2	Hancock	Magor	Wind and Rain	4:00 p. m.	N to S					\$75,000		
2	Plymouth	Washington	Wind and Hail	3:00 p. m.	SW to NE					Considerable to Crops		
6	Clay	Sioux	Wind	p. m.						Slight		
6	Dickinson	Spirit Lake, Superior	Wind and Flood	p. m.						\$1,000 to Buildings		
6	Harrison	Allen, Boyer, Jefferson, La Grange, Magnolia, Morgan, Union, Raglan and Washington	Wind and Hail	5:30 p. m.	NW to SE	6	30	180		Walnuts	\$350,000	
6	Osceola	East Holman, West Holman, Ocheyedan	Wind and Hail	3:30 p. m.	W to E					Hen Eggs	\$50,000	
6	Plymouth	Elgin, Fredonia and Hungerford	Hail	4:00 p. m.	W to E					Hazel Nuts	\$20,000	
6	Winnebago	Lincoln	Wind	p. m.						Some to Buildings		
6	Worth	Iartland	Wind	5:00 p. m.	W to E					Some to Crops		
13	Lyon	Cleveland and Rock	Hail	2:30 p. m.						Some to Crops		
19	Crawford	Milford, Morgan, Otter Creek and Stockholm	Hail	6:00 a. m.	NW to SE					Hazel Nuts	Considerable to Crops	
19	Ida	Blaine and Hayes	Wind and Hail	3:00 a. m.	W to E					Sp'row Egg	\$100,000	
19	Jackson	Brandon	Wind and Hail	4:00 a. m.	NW to SE					Considerable to Crops		
19	Kossuth	Algona	Wind and Hail	5:00 a. m.	SW to NE	2				Marbles	\$50,000	
19	Plymouth	America, Elgin, Elkhorn, Grant, Henry, Lincoln, Stanton, Washington	Wind and Hail	4:30 a. m.	NW to SE	8	30	240	1/2	\$400,000		
19	Pottawattamie	Kane and Lewis	Wind and Hail	5:00 a. m.						\$60,000		
19	Sac	Wheeler	Wind and Hail	6:00 a. m.	NW to SE				1/4	\$75,000		
19	Sioux	Center, Eagle, Garfield, Reading, Settlers, Sioux and Washington	Wind and Hail	3:00 a. m.	NW to SE	7	24	168	1/2	\$200,000		
19	Woodbury	Arlington, Grant, Miller, Oto and Wolf Creek	Wind and Hail	4:00 a. m.	NW to SE	4	15	60		Walnuts	\$100,000	

Continued in September Issue.

TOTAL PRECIPITATION, AUGUST, 1928



SCALE OF SHADES IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In co-operation with

IOWA WEATHER AND CROP BUREAU

CHARLES D. REED, Senior Meteorologist

VOL. XXXIX DES MOINES, IOWA, SEPTEMBER, 1928 No. 9

GENERAL SUMMARY

Cool weather predominated during September. The first week was generally below normal and moderately cool; the second week was above normal making the first half of the month average just about normal. The last half of the month, except for a day or two along the Missouri River, was continuously below normal, and the period from the 22d to the 28th ranked as one of the coolest periods ever experienced in any September. Light frost was reported from a few scattered places, on low lands, on the 3d and 4th, but there was no further frost until the 21st, when light frost occurred in northern districts and from then until the 29th frost occurred daily in some part of the State. Killing frost occurred over most of the State on the 24th and 25th and hard freezes were reported as late as the 28th, but some portions of the State entirely escaped killing frost. Corn had made such good progress that there was very little damage and in the entire State there was less than 15% of the corn that was subject to injury. Also, the portion of the State that had the most corn immature, had the least frost. Truck crops and gardens suffered the most injury and a large amount of grapes that were slow in ripening were badly damaged, many so badly that they were unfit for use.

Except for a protracted rainy period during the second week, the precipitation was light and somewhat scattered. Over most of the State by far the greatest amount occurred during a single 24-hour period. Heavy rains in the northeastern portion of the State caused streams to overflow, doing a great deal of damage. Crops were washed away, many farm animals drowned, fences and small buildings carried away and rail traffic was delayed. A number of bridges on highways were washed out and the highways badly damaged, which interfered with automobile travel for some time. During the first part of the month mosquitoes were almost a plague in many parts of the State. Horses doing field work became almost unmanageable; in the canning districts it was necessary to build smudges to harvest crops and protect workers in the factories, and cattle were severely annoyed. During the last half of the month farm work made good progress and much plowing was done and the soil was generally in good condition. The sunshine was much above normal and this caused the corn to dry satisfactorily and with further favorable weather there will be very little that will be soft. Pastures were generally good and supporting a large amount of stock, and silos were mostly filled before frost. Cattle were in healthy condition except there were some cases of hog cholera in scattered places.

F. L. D.

TEMPERATURE

The mean temperature for the State, derived from the means of nine districts of nearly equal area, and based on the records of 104 stations was 60.5°, or 3.8° lower than the normal. The deficiency was greatest in the southeastern division and least in the northwestern, the range being 1.4°; over most of the division the range was less than 0.5°. The highest monthly mean was at Keokuk, the lowest was 56.4° at Postville. The absolute range for the State was 69°, ranging from 93° at Keokuk and Wever on the 9th, to 24° at Sanborn on the 25th, Maquoketa on the 26th and Washta and Webster City on the 27th. Temperatures of 90°, or higher, occurred at about one-third of the stations. The number was least in the northeastern division with only one station reporting 90°, and greatest in the southeastern division; one station reported 90°, or higher on three days. The average number of days with the minimum temperature 32°, or lower, was two and one-half. The greatest number was five at twelve stations; at eight stations the temperature did not reach 32° and included all divisions except the northwestern and west-central.

PRECIPITATION

The average precipitation for the State, derived from the averages of nine divisions of nearly equal area, and based on the records of 118 stations, was 3.08 inches, or 0.59 inch less than the normal. There was a deficiency in all the central and northern divisions and an excess in all southern divisions. All stations in the northwestern, west-central and east-central divisions were deficient and all but one in the north-central division. The stations that reported excesses were mostly in the extreme southern portion, though there were several stations with marked excesses in the central and northeastern divisions and were due mainly to heavy downpours on a single day. The precipitation was well distributed throughout the month but by far the greatest amount occurred during the 2d week and that which occurred during the last half of the month was of little importance. The greatest amount was 9.98 inches at Centerville and the least was 1.04 at Sheldon. The greatest amount occurring in 24 consecutive hours was 5.70 inches at Keosauqua on the 11th-12th.

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
1873	59.1	- 5.2	89	33	2 18	- 1.49	5.40	0 81					
1874	62.8	- 1.5	90	40	6.04	+ 2 37	9.50	4.50					
1875	60.6	- 3.7	92	37	5.02	+ 1 35	9.38	1.33					
1876	60.4	- 3.9	86	38	6.42	+ 2 75	12.60	3.42					
1877	65.4	+ 1.1	96	40	1.95	- 1 72	5 20	0 65					
1878	62.9	- 1.4	92	38	3.13	- 0 54	10.85	0 70					
1879	59.3	- 5.0	90	24	2.70	- 0 97	9.45	0 57					
1880	61.1	- 3.2	90	30	4.18	+ 0 51	11.64	0 10					
1881	64.5	+ 0.2	103	37	7.14	+ 3 47	13.35	2.64					
1882	63.4	- 0.9	97	31	0.87	- 2 80	3.71	0 00					
1883	58.5	- 5.8	93	30	2.04	- 1 63	6.20	0 06					
1884	66.5	+ 2.2	95	30	5.20	+ 1 53	11.00	2.20					
1885	61.7	- 2.6	92	32	3.04	- 0 63	5.59	0 65					
1886	63.0	- 1.3	97	30	4.68	+ 1 01	7.93	0 39					
1887	62.1	- 2.2	98	30	6.17	+ 2 50	12.87	1 40					
1888	59.9	- 4.4	96	26	1.07	- 2 60	3.44	0 10					
1889	60.7	- 3.6	96	23	2.80	- 0 87	7.19	0 70					
1890	59.5	- 4.8	96	23	2.71	- 0 96	4.85	0 30					
1891	67.3	+ 3.0	104	28	1.33	- 2 34	3.60	0 13		4	20	7	3
1892	64.7	+ 0.4	99	29	1.53	- 2 14	4.15	0 16	0	4	16	8	6
1893	64.7	+ 0.4	102	18	2.34	- 1 33	5.49	0 74	0	4	20	6	4
1894	65.1	+ 0.8	100	26	3.57	- 0 10	7.43	0 67	0	8	15	10	5
1895	66.8	+ 2.5	103	22	3.03	- 0 64	7.43	0 85	T.	5	18	8	4
1896	58.5	- 5.8	95	22	4.09	+ 0 42	9.96	1 82	0	10	11	9	10
1897	70.9	+ 6.6	106	26	2.04	- 1 63	5.88	0 00	0	4	23	5	2
1898	65.3	+ 1.0	99	29	2.69	- 0 98	8.45	0 41	0	7	16	9	5
1899	62.5	- 1.8	104	15	0.93	- 2 74	4.32	T.	0	4	16	9	5
1900	64.4	+ 0.1	99	26	4.98	+ 1 31	8.82	2 48	T.	9	15	8	7
1901	63.3	- 1.0	102	26	4.77	+ 1 10	13.62	1 71	0	9	13	9	8
1902	59.1	- 5.2	88	23	4.35	+ 0 68	10.41	1 65	0	9	15	6	9
1903	60.8	- 3.5	94	28	3.81	+ 0 14	8.79	1 42	0	10	14	6	10
1904	64.0	- 0.3	94	30	2.78	- 0 89	8.33	0 99	0	7	13	8	9
1905	65.8	+ 1.5	96	36	3.81	+ 0 14	13.18	0 50	0	8	14	8	8
1906	67.2	+ 2.9	100	27	4.16	+ 0 49	11.10	0 64	0	8	16	8	6
1907	62.8	- 1.5	98	25	2.75	- 0 92	6.06	1 38	0	8	15	9	6
1908	67.9	+ 3.6	98	20	1.20	- 2 45	3.46	0 25	T.	3	21	6	3
1909	62.4	- 1.9	94	30	3.58	- 0 09	7.34	1 39	0	9	14	8	8
1910	63.2	- 1.1	99	30	3.59	- 0 08	7.43	1 18	0	9	14	7	9
1911	65.8	+ 1.5	103	32	5.12	- 1 45	13.78	1 19	T.	10	11	9	10
1912	62.1	- 2.2	104	24	3.98	+ 0 31	10.12	0 28	T.	11	12	8	10
1913	64.5	+ 0.2	107	19	3.31	- 0 36	7.44	0 45	0	9	15	8	7
1914	64.5	+ 0.2	99	30	7.88	+ 4 21	16.24	2 48	0	10	16	7	7
1915	63.7	- 0.6	91	30	6.03	+ 2 36	12.45	2 88	0	11	11	8	11
1916	62.5	- 1.8	91	21	3.89	+ 0 22	9.71	1 45	T.	7	17	8	5
1917	62.6	- 1.7	98	28	2.90	- 0 77	8.68	0 39	0	7	15	7	8
1918	58.6	- 5.7	93	20	1.87	- 1 80	4 62	0 48	T.	6	16	8	6
1919	67.5	+ 3.2	99	33	5.34	+ 1 67	11.82	1 49	0	8	16	6	8
1920	66.5	+ 2.2	98	24	3.30	- 0 37	7.21	0 69	0	8	17	8	5
1921	67.3	+ 3.0	99	31	6.72	+ 3 05	11.95	1 72	0	11	14	8	8
1922	67.1	+ 2.8	103	31	2.03	- 1 64	4.34	0 31	0	6	20	6	4
1923	64.2	- 0.1	92	28	5.79	+ 2 12	12.14	1 88	0	11	14	8	8
1924	59.1	- 5.2	91	25	3.13	- 0 54	5.68	1 01	0	8	16	7	7
1925	69.0	+ 4.7	105	32	5.04	+ 1 37	9.13	1 54	0	9	14	10	6
1926	63.0	- 1.3	92	18	9.76	+ 6 09	18.57	4 75	T.	14	8	7	15
1927	67.4	+ 3.1	101	29	4.56	+ 0 89	11.94	2 02	T.	10	15	8	7
1928	60.5	- 3.8	93	24	3.08	- 0 59	9.98	1 04	0	6	19	7	4

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

Climatological Data for September, 1928

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>Northwest District</i>																				
Akron	Plymouth	1,153	2								1.79	-1.00	0.96	0	8	18	11	1	se.	Orlan C. Moore
Alta	Buena Vista	1,513	37	60.0	-2.7	88	9	29	25	34	2.16	-1.12	0.98	0	5	22	7	1	s.	
Alton	Sioux	1,305	23	59.0	-3.8	90	9	26	27	41	1.07	-1.89	0.65	0	6	10	18	2	nw.	D. E. Hadden W. S. Slagle
Cherokee	Cherokee	1,196	8	59.4	-2.8	90	9	26	27	39	2.11	-1.16	1.09	0	6	21	9	0	s.	
Etherville	Emmet	1,298	33	61.0	-0.7	92	9	30	25	38	1.47	-1.86	0.85	0	6	18	11	1	nw.	J. E. Wirth A. O. Peterson
Hawarden	Sioux	1,182	2								2.14	-0.74	1.06	0	6	17	4	9	nw.	Earl V. Slife
Inwood	Lyon	1,474	24	59.8	-3.3	89	9	26	25†	41	2.16	-0.63	1.51	0	8	22	6	2	nw.	
Lake Park (near)	Dickinson	1,489	15	59.6d	-1.9	88d	9	29d	25†	38d	2.26	-1.35	1.37	0	5	22	6	2	nw.	A. C. Hanson P. M. Lawrence
Le Mars	Plymouth	1,224	32	60.1	-3.6	91	9	28	25†	41	1.85	-1.38	0.88	0	5	22	6	2	n.	
Marathon	Buena Vista	1,390	2								1.37	-0.59	0	6	23	6	1	nw.	Henry Newell E. G. Smith	
Pocahontas	Pocahontas	1,248	24	60.1	-3.4	90	9	29	25†	43	2.91	-0.68	2.01	0	6	22	7	1	s.	F. E. Hronek
Rock Rapids	Lyon	1,349	29	57.8	-3.9	85	8	27	27	43	1.51	-1.08	0.78	0	7	25	2	3	s.	
Sanborn	O'Brien	1,553	14	58.0	-4.8	88	9	24	25	36	1.71	-1.49	1.03	0	7	19	5	6	sw.	Nellie F. Medberry J. W. Dow
Sheldon	O'Brien	1,418	17	59.4	-4.0	88	9	27	27	41	1.04	-2.22	0.58	0	7	21	7	2	s.	
Sioux Center	Sioux	1,426	29	59.2	-3.8	89	9	27	25	40	1.12	-1.83	0.85	0	5	16	6	8	s.	Ross E. Forward J. De Ruyter
Spencer	Clay	1,319	14	60.4	-3.1	91	9	27	25†	42	1.66	-1.66	0.80	0	5	19	9	2	nw.	E. W. Little
Storm Lake	Buena Vista	1,440	39	60.8	-3.2	88	9	30	25	32	1.57	-1.68	0.66	0	7	24	5	1	se.	
Washita	Cherokee	1,157	30	58.4	-5.1	89	9	24	27	46	2.41	-0.98	0.98	0	5	21	6	3	nw.	George H. Fracker H. L. Felter
West Bend	Palo Alto	1,197	35	59.7	-3.7	87	9	27	25	38	1.62	-1.52	0.73	0	6	14	16	0	s.	
Means and extremes				59.5	-3.4	92	9	24	25†	46	1.79	-1.37	2.01	0	6	20	8	2	nw.	Jos. Dorweiler
<i>North Central District</i>																				
Algona	Kossuth	1,213	55	59.6	-3.7	88	10	30	23†	33	1.40	-1.92	1.20	0	3	27	3	0	se.	W. E. Laird
Allison†	Butler	1,060	14	58.1	-5.0	88	6†	30	25	39	2.39	-2.39	1.17	0	5	22	7	1	nw.	
Belmond	Wright	1,181	18	59.4	-4.2	89	9	29	25†	35	2.18	-2.02	1.30	0	4	15	7	8	nw.	E. W. Detra H. F. Luick
Britt	Hancock	1,236	41	59.9	-2.5	89	9	31	25	32	3.36	-0.10	2.50	0	6	17	0	13	sw.	
Charles City	Floyd	1,015	37	58.0	-3.0	87	9	32	26	32	2.01	-1.65	1.03	0	9	18	9	3	se.	E. P. Healy U. S. Weather Bureau
Forest City	Winnebago	1,226	34	59.2	-3.5	89	9	29	23†	35	2.53	-0.80	1.48	0	8	14	11	5	nw.	Dr. M. B. Neil L. H. Davis
Hampton	Franklin	1,145	3								2.44	-0.99	1.24	0	4					
Humboldt	Humboldt	1,095	40	59.2	-5.0	90	9	27	27	39	4.18	+0.91	1.78	0	4	17	11	2	s.	H. C. Snitkey American Beet Sugar Co.
Mason City	Cerro Gordo	1,148	31	59.0	-2.7	92	7†	27	26	44	1.88	-0.93	1.36	0	6	14	12	4	se.	
Northwood	Worth	1,222	32	58.0	-3.0	85	9	34	23†	31	2.81	-0.72	2.10	0	7	12	12	6	nw.	Charles Dwelle
Osage	Mitchell	1,163	34	58.8	-2.4	88	9	32	26†	32	1.76	-1.75	0.72	0	6	11	14	5	nw.	Dr. C. E. Juhl
Means and extremes				58.9	-3.5	92	7†	27	26†	44	2.63	-0.94	2.50	0	6	17	8	5	nw.	
<i>Northeast District</i>																				
Decorah	Winnesiek	872	35	57.4	-4.2	83	8	25	26	40	4.49	+0.38	2.15	0	7	18	7	5	nw.	M. D. Whitney
Dubuque	Dubuque	700	55	59.8	-4.2	82	8	33	26	27	1.27	-2.74	0.47	0	5	16	9	5	s.	
Fayette	Fayette	1,003	40	58.7	-3.6	87	8	27	26	38	3.94	+0.27	2.17	0	6	21	7	2	nw.	U. S. Weather Bureau R. Z. Latimer
Independence	Buchanan	921	64	59.7	-4.2	85	9	32	26†	33	3.73	-0.22	1.56	0	6	24	3	3	se.	
Lansing	Allamakee	632	21								5.23	+1.54	2.35	0	8				se.	Dr. Geo. Boody Mrs. Mary Spinner
New Hampton†	Chickasaw	1,169	31	57.1	-5.3	85	9	27	26	33	5.20	+1.61	2.93	0	6	18	10	2	nw.	D. W. Dawson John T. Ridler
Oelwein	Fayette	1,036	5	59.4	-3.4	87	9†	30	26	32	3.20	-0.59	1.40	0	6	23	2	5	s.	
Postville	Clayton	1,192	29	56.4	-4.4	80	8	30	25	34	3.99	+0.15	2.11	0	5	20	7	3	sw.	F. L. Williams R. B. Slippy
Waterloo	Black Hawk	854	45	60.4	-3.7	90	9	28	27	39	3.10	-0.94	1.17	0	6	23	5	2	se.	
Waverly	Bremer	936	32	59.1	-4.3	88	9	29	27	34	3.08	+0.42	2.17	0	5	24	4	2	nw.	D. H. Murphy
Means and extremes				58.9	-3.9	90	9	25	26	40	3.55	-0.27	2.35	0	6	21	6	3	nw.	
<i>West Central District</i>																				
Audubon (near)	Audubon	1,297	33	60.6	-3.1	89	9	32	26	33	1.29	-2.47	0.89	0	7	20	10	0	s.	George Kibby
Carroll	Carroll	1,265	38	60.6	-3.1	88	9	30	25†	33	3.00	-0.47	1.45	0	8	25	2	3	se.	
Denison	Crawford	1,171	34	61.3	-2.7	89	9	30	25†	41	2.16	-0.96	0.99	0	9	14	12	4	nw.	Mrs. Jos. J. Wolfe V. L. Byers
Guthrie Center	Guthrie	1,077	33	60.9	-3.7	90	9	29	25†	41	1.94	-1.83	1.11	0	5	27	1	2	sw.	
Harlan	Shelby	1,192	29	60.2	-3.6	88	9	27	26	45	1.56	-2.21	0.94	0	7	20	7	3	nw.	H. A. Stafford Walter Bell
Jefferson	Greene	1,052	29	60.2e	-3.4	87e	9	29e	26	38e	3.23	-0.76	1.80	0	6				sw.	W. I. Lyon H. W. Kerr
Little Sioux	Harrison	1,040	23	61.4	-3.9	88	9	27	25	43	1.32	-1.85	0.57	0	8	14	15	1	nw.	
Logan	Harrison	1,120	61	60.6	-5.1	88	9	27	26	42	2.66	-0.50	1.05	0	8	16	14	0	ne.	Amy Ann Stern Mrs. H. E. Colby
Onawa	Monona	1,051	27	60.8	-3.8	90	8	30	26†	42	1.12	-2.39	0.60	0	5	22	6	2	se.	
Rockwell City	Calhoun	1,232	32	60.6	-3.2	89	9	30	23†	41	2.40	-1.65	1.50	0	3	18	12	0	nw.	A. W. McIsaac
Sac City	Sac	1,269	52	60.0	-3.7	91	9	29	27	39	2.81	-0.55	1.16	0	3	21	9	0	s.	F. P. Kessler U. S. Weather Bureau
Sioux City	Woodbury	1,135	39	61.6	-1.8	91	9	31	25	35	2.14	-0.33	0.99	0	6	17	11	2	s.	
Means and extremes				60.7	-3.5	91	9	27	25†	45	2.15	-1.36	1.80	0	6	19	9	2	nw.	
<i>Central District</i>																				
Ames	Story	926	51	61.4	-3.0	89	9	29	26	35	4.27	+0.60	1.90	0	5	25	0	5	sw.	Iowa State College
Baxter	Jasper	998	28	59.8	-4.8	87	9	25	26	35	2.56	-1.41	0.75	0	5	14	13	3	nw.	
Boone (near)	Boone	894	23	60.2	-3.6	89	9	26	26	42	5.18	+1.13	1.74	0	6	17	10	3	n.	Otto Sanderman C. F. Henning
Des Moines	Polk	861	50	62.0	-3.6	89	9	34	26	33	1.87	-1.80	0.55	0	10	18	6	6	s.	
Fort Dodge	Webster	1,114	28	59.4	-4.6	89	9	26	27	40	2.73	-1.65	1.35	0	7	21	6	3	sw.	U. S. Weather Bureau Samuel Sampson
Grinnell	Poweshiek	1,031	34	59.3	-5.6	87	9	27	26	34	2.26	-1.39	0.93	0	6	20	8	2	s.	R. E. Bates M. G. Heiberger
Grundy Center	Grundy	976	37	60.4	-4.2	89	9	32	25†	38	2.66	-1.11	1.36	0	5	24	3	3	nw.	
Iowa Falls	Hardin	1,127	55	59.4	-3.2	90	9	30	25†	34	3.16	-0.64	2.35	0	4	19	7	4	nw.	C. H. Gilbert C. C. Pigman
Marshalltown	Marshall	947	36	61.0	-4.4	90	9	32	25	32	3.11	-1.00	1.06	0	8	20	7	3	s.	
Monroe	Jasper	922	16	60.8	-5.3	88	9	32												

Climatological Data for September, 1928—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
East Central District																				
Belle Plaine	Benton	866	38	60.2	- 4.2	91	9	23	27	38	2.24	- 1.33	1.22	0	6	16	10	4	s.	O. C. Burrows J. T. Wurster Dr. A. P. Bryant U. S. Weather Bureau Rex Shriver
Cedar Rapids	Linn	737	46	58.9	- 5.7	90	9	27	26	38	2.04	- 1.56	0.87	0	7	17	4	9	sw.	
Clinton	Clinton	595	55	61.6	- 3.6	91	9	28	25†	39	1.37	- 2.12	0.88	0	5	19	3	8	s.	
Davenport	Scott	580	57	62.6	- 3.0	88	9	36	25	28	1.93	- 1.65	1.02	0	7	16	9	5	nw.	
Davenport, No. 2	Scott	690	3	61.6		92	9	29	26	38	2.02		1.02	0	6	20	6	4	nw.	
Fairport	Muscatine	567	7	61.6	- 4.4	87	8	32	25	33	1.59	- 2.01	0.91	0	6	21	4	5	s.	
Iowa City	Johnson	733	68	60.7	- 4.1	89	9	29	25	36	1.74	- 2.14	0.78	0	7	19	8	3	nw.	
Le Claire	Scott	576	23								1.57	- 1.84	1.05	0	5					
Maquoketa	Jackson	692	23	58.4	- 4.8	85	9	24	26	40	1.10	- 3.18	0.65	0	4	18	5	7	nw.	
Muscatine	Muscatine	546	67								1.95	- 1.65	1.05	0	7					
Olin	Jones	760	29	59.8	- 3.9	88	9	27	26	40	1.25	- 2.42	0.70	0	3	21	5	4	sw.	
Tipton (near)	Cedar	807	29	59.8	- 5.0	88	9	26	26	39	1.11	- 2.82	0.90	0	4	17	12	1	s.	
Williamsburg	Iowa	770	12	58.4	- 5.2	89	9	25	26	36	1.14	- 2.51	0.69	0	4	24	5	1	nw.	
Means and extremes				60.3	- 4.3	92	9	24	26	40	1.62	- 2.07	1.22	0	6	19	6	5	nw.	
Southwest District																				
Atlantic	Cass	1,164	37	61.2	- 3.8	88	8	30	26	39	2.49	- 0.92	1.04	0	9	17	7	6	nw.	T. H. Whitney Arthur L. Bishop Dr. H. C. Hawley C. A. Smith Carl E. Pollock
Bedford	Taylor	1,200									6.99	+ 2.93	4.09	0	6	24	4	2	s.	
Clarinda	Page	1,009	38	62.4	- 3.9	90	8	30	26	42	7.37	+ 3.90	4.02	0	9	23	7	0	se.	
Corning	Adams	1,150	36	62.3	- 2.1	90	9	27	25†	46	1.45	- 2.47	1.04	0	7	25	4	1	sw.	
Cumberland (near)	Cass	1,225	29								3.88	+ 0.50	1.99	0	6	22	7	1	nw.	
Glenwood	Mills	1,100	30	62.4	- 4.3	90	9	30	26	38	4.25	+ 1.57	2.23	0	9	16	11	3	se.	
Lenox	Taylor	1,250	33	62.2	- 3.5	91	9	31	25	42	6.54	+ 2.33	3.25	0	10	18	8	4	se.	
Oakland	Pottawattamie	1,139	9	62.3	- 2.8	88	13	28	26	43	1.37	- 1.89	0.80	0	4	23	4	3	sw.	
Red Oak (near)	Montgomery	1,030	3								4.37	+ 0.83	1.13	0	9	13	16	1	s.	
Riverton (near)	Fremont	920	2								5.04	+ 1.24	3.52	0	8	20	3	7	s.	
Thurman	Fremont	960	31	62.8	- 4.8	90	8†	29	25	40	6.11	+ 1.85	3.50	0	9	22	5	3	s.	
Omaha, Neb.		1,165	57	63.8	- 3.0	89	15	36	25	35	2.73	- 0.48	2.04	0	6	20	9	1	s.	
Means and extremes				62.5	- 3.5	91	9	27	25†	46	4.38	+ 0.78	4.09	0	8	20	7	3	s.	
South Central District																				
Afton	Union	1,212	34	62.2	- 2.9	91	9	28	26	37	3.21	- 1.17	0.98	0	10	20	6	4	nw.	S. R. Brown O. E. McBride Thomas Wood C. C. Burr J. C. Davis
Albia	Monroe	949	30	61.6	- 3.8	88	9	34	25†	33	4.75	+ 0.69	1.60	0	6	19	4	7	sw.	
Centerville	Appanoose	1,013	23	61.8	- 3.8	88	9	32	26	34	9.98	+ 5.88	3.92	0	9	19	5	6	sw.	
Chariton (near)	Lucas	1,042	33	62.2	- 2.6	90	9	32	26	34	6.52	+ 2.58	2.16	0	5	19	8	3	sw.	
Corydon (near)	Wayne	1,050	35	61.2	- 4.5	87	9	32	25†	31	7.17	+ 3.08	3.48	0	7	20	6	4	nw.	
Creston	Union	1,291	23	60.8	- 3.3	89	9	30	25†	36	3.52	- 0.48	1.37	0	9	17	8	5	s.	
Earlham (near)	Madison	1,126	26	60.7	- 3.9	89	9	25	26	38	1.74	- 1.95	0.67	0	4	26	3	1	se.	
Indianola	Warren	972	37	61.8	- 3.8	90	9	30	26	33	2.50	- 1.23	0.93	0	7	18	11	1	sw.	
Knoxville	Marion	920	33	61.4	- 4.4	89	9	29	26	30	2.63	- 1.51	0.75	0	8	18	7	5	se.	
Lacona	Warren	824	29								2.13	- 2.23	0.80	0	8	19	5	6		
Lamoni	Decatur	1,123	21	61.8	- 2.9	91	9	29	25	32	5.61	+ 1.60	2.39	0	10	20	6	4	se.	
Mount Ayr	Ringgold	1,240	35	62.2	- 3.2	87	9	32	25	32	6.07	+ 2.12	2.42	0	9	22	4	4	s.	
Pella (near)	Marion	850	1								3.37	- 0.80	0.88	0	7	21	6	3	se.	
Tingley	Ringgold	1,275	3	60.7	- 4.1	89	9	30	25	38	6.09	+ 1.95	2.06	0	7	22	6	2	se.	
Winterset	Madison	1,118	37	62.4	- 3.1	90	9	31	25	33	1.51	- 2.24	0.58	0	8	24	5	1	nw.	
Means and extremes				61.6	- 3.6	91	9	25	26	38	4.45	+ 0.42	3.92	0	8	20	6	4	se.	
Southeast District																				
Bonaparte (near)	Van Buren	563	37	61.2	- 4.7	90	9	29	26	33	6.96	+ 2.83	5.10	0	5	21	4	5	w.	B. R. Vale John T. Donnelly Miss Musa Todd R. M. McKenzie U. S. Weather Bureau
Burlington	Des Moines	544	32	63.0	- 4.2	91	9	35	25†	31	4.94	+ 1.02	3.92	0	5	18	8	4	sw.	
Columbus Junction	Louisia	595	27	60.3	- 5.8	90	9	28	26	37	1.81	- 1.85	1.04	0	9	20	10	0	se.	
Fairfield	Jefferson	780	44	60.2	- 5.4	90	9	27	26	38	4.44	+ 0.81	2.98	0	8	20	5	5	nw.	
Keokuk	Lee	614	57	63.1	- 4.4	93	9	35	26	30	4.18	+ 0.34	2.69	0	9	18	5	7	s.	
Keosauqua	Van Buren	644	36	61.8	- 4.0	92	9	31	25†	38	7.38	+ 3.18	5.70	0	9	17	8	5	se.	
Mt. Pleasant	Henry	730	47	61.8	- 4.3	89	9	32	26	31	4.26	+ 0.73	2.97	0	7	14	13	3	se.	
Oskaloosa	Mahaska	835	52	60.5	- 4.4	88	9	29	26	35	4.64	+ 1.24	1.82	0	9	18	6	6	se.	
Ottumwa	Wapello	649	33	61.8	- 4.5	89	9	30	25†	39	3.64	- 0.21	1.95	0	9	19	7	4	se.	
Sigourney (near)	Keokuk	790	32	60.8	- 4.3	89	9	28	26	35	2.61	- 1.08	1.56	0	7	20	3	7	sw.	
Stockport	Van Buren	747	26	60.6	- 4.4	92	9	28	26	37	5.30	+ 1.21	3.52	0	8	21	4	5	s.	
Washington	Washington	757	46	61.8	- 3.4	89	8	29	27	36	2.54	- 0.84	1.65	0	4	17	8	5	sw.	
Wever	Lee	552		61.8		93	9	32	24†	37	5.80		4.90	0	7	21	2	7		
Means and extremes				61.4	- 4.5	93	9	27	26	39	4.50	+ 0.72	5.70	0	7	19	6	5	se.	
State means and extremes				60.5	- 3.8	93	9	24	25†	46	3.08	- 0.59	5.70	0	6	19	7	4	nw.	

Temperature normals are based on the 46-year period July 3, 1875 to July 2, 1921; shorter records corrected to harmonize. Precipitation normals are based on the 50-year period ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1920 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.

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.

Daily Precipitation for September, 1928

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>Northwest District</i>																																				
Akron.....	Big Sioux.....	.10	T.				.01				.02	.10	.96	.48						.02	.10												T.		1.79	
Alta|||.....	Raccoon.....										.10	.36	.66	.98								T.	.06										T.		2.16	
Alton.....	Floyd.....	.05									.03	.10	.65	.12	T.							.12											T.		1.07	
Cherokee.....	Little Sioux.....		T.								.16	.25	.55	1.09							T.	.04	.02										T.		2.11	
Estherville|||.....	Des Moines.....										.15	.02	.85		.35	.05							.05												1.47	
Hawarden.....	Big Sioux.....	.06								.02			.98	.98	.05							.05													2.14	
Inwood|||.....	Big Sioux.....	.01	T.	T.							.02	.03	1.51	.42	.01							.10	.05									.01		2.16		
Lake Park (near).....	Little Sioux.....	.11									.27		1.37	.11	.40																			2.26		
Le Mars.....	Floyd.....	.04	T.						T.	.03	.12	.40	.88	.25	.04							T.	.09												1.85	
Marathon.....	Raccoon.....		T.			.12				.04	.12	.41	T.	.59							T.	T.	.09									T.			1.37	
Pocahontas.....	Des Moines.....						.04				.04	.02	.71	2.01									.09												2.91	
Rock Rapids.....	Big Sioux.....	.06									.01	.01	.78	.42	.03							.16									.05			1.51		
Sanborn.....	Floyd.....	.14									.12	.03	1.03	.13	.03							.23												1.71		
Sheldon.....	Floyd.....	.02	.03								.10	.02	.58	.06	T.							T.	.23										T.		1.04	
Sioux Center.....	Floyd.....	.03									T.	.12	.85	.09	T.							T.	.03											T.	1.12	
Spencer.....	Little Sioux.....	.04					.07				.10		.80		.65																				1.66	
Storm Lake.....	Raccoon.....										.06	.11	.62	.66								.02	.03	.07									T.		1.57	
Washita.....	Little Sioux.....										.16	.60	.61	.98									.06											T.	2.41	
West Bend.....	Des Moines.....		.11				.04				.02	T.	.73		.65							T.	.07											T.	1.62	
<i>North Central District</i>																																				
Algona.....	Des Moines.....						.05															.15													1.40	
Allison.....	Cedar.....									T.	.54		.26	.06	1.17								.36										T.		2.39	
Belmond.....	Iowa.....		T.								.04		.46		1.30							T.	.38										T.		2.18	
Britt.....	Iowa.....	.15	.02								.04		.60		2.50								.05												3.36	
Charles City***.....	Cedar.....	.08								.02	.02	.09	.14	.46	.58								.38	.24									T.		2.01	
Forest City|||.....	Cedar.....	.06	.02	T.			.25				T.	.04	.53		1.48	.02							.13												2.53	
Hampton.....	Cedar.....										.50	.20		1.24									.50												2.44	
Humboldt.....	Des Moines.....		T.	T.			T.				.77		1.78		1.56							T.	.07												4.18	
Mason City.....	Cedar.....	.06				T.					T.	.03	.06		.22		1.36	T.					T.	.15										T.	1.88	
Northwood.....	Cedar.....	.02	.01				T.				T.	.04		.45		2.10	.10						.09										T.	T.	2.81	
Osage.....	Cedar.....	.03										.22		.32	.10	.72								.37											1.76	
<i>Northeast District</i>																																				
Decorah|||.....	Mississippi.....		.05								.19	.82	.61		2.15	.09							.58												4.49	
Dubuque***.....	Mississippi.....	T.	.10	T.							.25		.38	T.	.47								.07										T.	T.	1.27	
Fayette.....	Mississippi.....	.20	.05								1.20		.32	.17	2.00																				3.94	
Independence.....	Wapsipicon.....		.28								1.56	.09	.57	T.	.94								.29												3.73	
Lansing|||.....	Mississippi.....		T.	.05							.74	.81	.12		2.35	.73							.38										.05		5.23	
New Hampton.....	Wapsipicon.....		.09								.65	.70		.23	2.93								.60												5.20	
Oelwein.....	Wapsipicon.....	.10									1.40		.50	.20	.80								.20												3.20	
Postville.....	Mississippi.....		.05								1.40		.27	2.11									.16												3.99	
Waterloo|||.....	Cedar.....	T.	.43								.10	.80	.40		1.17	T.							.20												3.10	
Waverly.....	Cedar.....		.09								.44		.18		2.17								.20												3.08	
<i>West Central District</i>																																				
Audubon (near).....	Nishnabotna.....											.03	.89	.02	.08								.14	.03			.10								1.29	
Carroll|||.....	Raccoon.....		.38									1.45	.71	.07									.04	.25			.07	.03							3.00	
Denison.....	Missouri.....										.23	.08	.99	.02	.42							.03	.17	.06			.16	.03							2.16	
Guthrie Center.....	Raccoon.....										.02	.65		1.11									.03	.13			.13								1.94	
Harlan.....	Nishnabotna.....	.15	.02								T.	.10	.94	T.	T.								.20	.10			.05							T.	1.56	
Jefferson.....	Raccoon.....										1.80	.02	.64		.63		T.						.09				.05								3.23	
Little Sioux.....	Little Sioux.....	.12	.08								.12	.37	.57	.02									.02				.02								1.32	
Logan.....	Missouri.....	.82	.10								.04	.20	1.05	.13								.18	.14											T.	2.66	
Onawa.....	Missouri.....										.18	.14	.60	T.								T.	.14			.06									1.12	
Rockwell City.....	Raccoon.....			T.							1.50		.60		.30								T.												2.40	
Sac City.....	Raccoon.....										.60		1.05	1.16																					2.81	
Sioux City***.....	Missouri.....		T.				T.				.04	.13	.84		.99								T.	.05			.09							T.	2.14	
<i>Central District</i>																																				
Ames.....	Skunk.....		.87									.51		.87		1.90								.12											4.27	
Baxter.....	Skunk.....		.55								.48		.45		.75									.33										T.	2.56	
Boone (near)|||.....	Des Moines.....		1.40									.83	1.03		1.74								.16				T.	.02					T.		5.18	
Des Moines***.....	Des Moines.....	.39	.05								T.	.09	.55		.36								.08	.15			.14								1.87	
Fort Dodge|||.....	Des Moines.....		.01	.01								.52	1.35	.01	.36								T.	.47												2.73
Grinnell.....	Iowa.....		.26									.93	.03	.48		.54								.02											T.	2.26
Grundy Center.....	Cedar.....		.05									.65	.40		1.36									.20											T.	2.66
Iowa Falls|||.....	Iowa.....		T.									.08	.44		2.35									.29											3.16	
Marshalltown|||.....	Iowa.....	.01	.19	.02								.07	1.06	.62		.95								.19										T.	3.11	
Monroe.....	Des Moines.....		.07									.34	.09	.36		.76								.08			.20						.13		2.03	
Perry.....	Raccoon.....		.52								T.	.03	.02																							

Daily Precipitation, for September, 1928—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>Southwest District</i>																																		
Atlantic	Nishnabotna		.07								T.	.27	1.04		.64							.23	.20			.02		.01	.01					2.49
Bedford	102										1.70	4.09		.64								.12					.34		.10					6.99
Clarinda	Nodaway		.05								2.41	4.02	.05	.35								.05						.37	.03	.04				7.37
Corning	Nodaway		.05								.38	.66		.22							.02								.10					1.45
Lumberland (nr.)	Nodaway		.26								T.	.38	.93		1.99							.19	.13			T.	T.	T.	T.				3.88	
Glenwood	Missouri		.38								.58	.78	1.45	.52								.20	.14				.02	.18					4.25	
Lenox	Missouri										1.35	.63	3.25	.35	.58								.10	.02			.10	.10	.06				6.54	
Oakland	Nishnabotna											.44	.80	.04									.09										1.37	
Red Oak (near)	Nishnabotna		.63								.83	.22	1.13	.73	.51								.18					.04	.10				4.37	
Riverton (near)	Nishnabotna		.11								3.52	.51		.09									.35	.04				.18	.24				5.04	
Thurman	Missouri		.23								3.50	.78	.81	.15								.25	.10				.26		.03				6.11	
Omaha, Neb., ***	Missouri		.48								.02	2.04		.06							.06	.07					T.		T.				2.73	
<i>South Central District</i>																																		
Afton	Grand		.03								.98	.55	.75	.18	.60							.02	.03			T.		.02	.05				3.21	
Albia	Des Moines			.03							1.32	1.60		1.51									.10			T.	.16		T.	.13			4.75	
Centerville	Chariton		T.								.78	3.92	2.63	1.33	1.12										T.	.04		T.	.08	.07	.01		9.98	
Chariton (near)	Chariton		T.								2.16	.90	1.70	.12	1.64										T.				T.				6.52	
Corydon (near)	Chariton		T.								3.48	2.04		.43	1.12											.04	.04		.02				7.17	
Creston	Missouri			T.							.06	1.37	.89	.06	.98							.03	.05	T.		T.		.06	.02		T.		3.52	
Earlham (near)	Des Moines										T.	.31	.67		.49							T.	.27			T.							1.74	
Indianola	Des Moines		.08								.51	.20	.54		.93								.08				.16						2.50	
Knoxville	Des Moines		.09								.50	.18	.60	.25	.75											.20			T.				2.63	
Lacona	Des Moines		.02								.23	.17	.40	.42	.80								.02				.07						2.13	
Lamoni	Grand											.72	2.39	.01	1.80							.02	.01										5.61	
Mount Ayr	Grand										.30	.83	2.42	.55	1.42							.02						.17	.13	.23			6.07	
Pella (near)	Des Moines		.10								T.	.86	.12	.88	.46	.80													T.				3.37	
Tingley	Platte										1.73	.56	1.39	.76	1.30							T.	T.					.15		T.			6.09	
Winterset	Des Moines		T.								.14	.30	.58	.02	.25							T.	.12				.08		.02				1.51	
<i>Southeast District</i>																																		
Bonaparte (near)	Des Moines		T.								T.	.91	5.10	T.	.70										T.		.13		.12				6.96	
Burlington	Mississippi		T.								.42	3.92		.24	T.												.17		.19				4.94	
Columbus Jct.	Iowa		.05								.03	.27	1.04		.30													.01		.04	.05		1.81	
Fairfield	Skunk		.02								.05	.28	2.98	.02	.89												.18		.02				4.44	
Keokuk***	Mississippi		.06								.34	.92	1.96	.14	T.											.02	.06	.15	.53		T.		4.18	
Keosauqua	Des Moines										.30	.96	4.80	T.	.90											.04		.07	.03	.18	.16		7.38	
Mt. Pleasant	Skunk		.02								.02	.46	2.97		.48												.20			.11			4.26	
Oskaloosa	Des Moines		.07								T.	1.82	1.57	.17	.63										.04		.16		.03	T.			4.64	
Ottumwa	Des Moines		.03								.25	.31	1.95	.63	.69											.18		.07	.10				3.64	
Sigourney (near)	Skunk		T.								.19	.13	1.56	.05	.41												.08		.19				2.61	
Stockport	Skunk		.02								.49	.39	3.52	T.	.57											.07		.17		.07			5.30	
Washington	Skunk		T.								T.	.22	1.65		.65														.02				2.54	
Wever	Mississippi										.02	.50	4.90		.07												.16		.08	.07			5.80	

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.
 T. Precipitation is less than .01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE

Stations	Barometric Pressure, Inches (Sea Level)				Relative Humidity, %				Wind				Sunshine				
	Mean	Highest	Date	Lowest	Mean				Total movement	Maximum				% possible			
					7 A. M.	12 Noon	7 P. M.	Lowest		Date	Average hourly velocity	Miles			From	Date	
Chas. City	30.03	30.38	17	29.60	14	87	50	68	31	24	3,872	5.4	19	w.	14	75	+14
Davenport	30.04	30.35	6th	29.65	14	82	48	57	30	27	3,688	5.1	18	s.	14	74	+11
Des Moines	30.02	30.37	17	29.64	12	84	48	55	28	27	4,123	5.7	21	sw.	10	74	+12
Dubuque	30.03	30.35	6	29.60	14	83	51	61	31	24	3,487	4.8	19	se.	12	69	+10
Keokuk	30.06	30.35	6	29.73	12	79	48	57	27	22	3,939	5.5	27	nw.	2	72	+9
Sioux City	30.02	30.40	17	29.50	13	76	44	49	24	29	7,287	10.1	36	w.	11	72	+9
Omaha, Nb.	30.02	30.38	17	29.57	13	74	47	50	22	29	4,634	6.4	33	nw.	11	77	+12
Means and extremes	30.03	30.40	17	29.50	13	81	48	57				6.1		w.	11	73	+11
Normals and records	30.02	30.67	25th	29.20	12	83	64	28th							7th	62	

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

††January 1, 1928, 3-cup anemometers replaced the 4-cup instruments used since the establishment of the Weather Bureau stations. The new instruments will more accurately indicate the true wind movement. The records of the 4-cup instruments were somewhat too high at moderate velocities and considerably too high at the higher velocities. Tables of true velocities corresponding to indicated velocities appear in the January, 1928 Climatological Data. For purposes of comparison the highest velocity of record in the lower line of the table has been converted into a 3-cup velocity.

MISCELLANEOUS PHENOMENA

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

RIVERS

Falling stages prevailed on the Mississippi River till about the middle of the 2d week and thereafter there was a slight rise until the end of the month. The average stages were above normal. On the Missouri there were no important changes except a marked rise occurred about the middle of the 4th week. On all interior rivers the most important changes occurred after the heavy rains at the end of the 2d week. Small streams in the southern and northeastern portions of the State were out of banks and caused considerable local damage.

ERRATA

Report for July, 1928, Page 51. Corydon; mean temperature published 74.2°, should be 74.6°; departure published -0.4°, should be 0.0°.

Daily Maximum and Minimum Temperature for the Month of September, 1928

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.

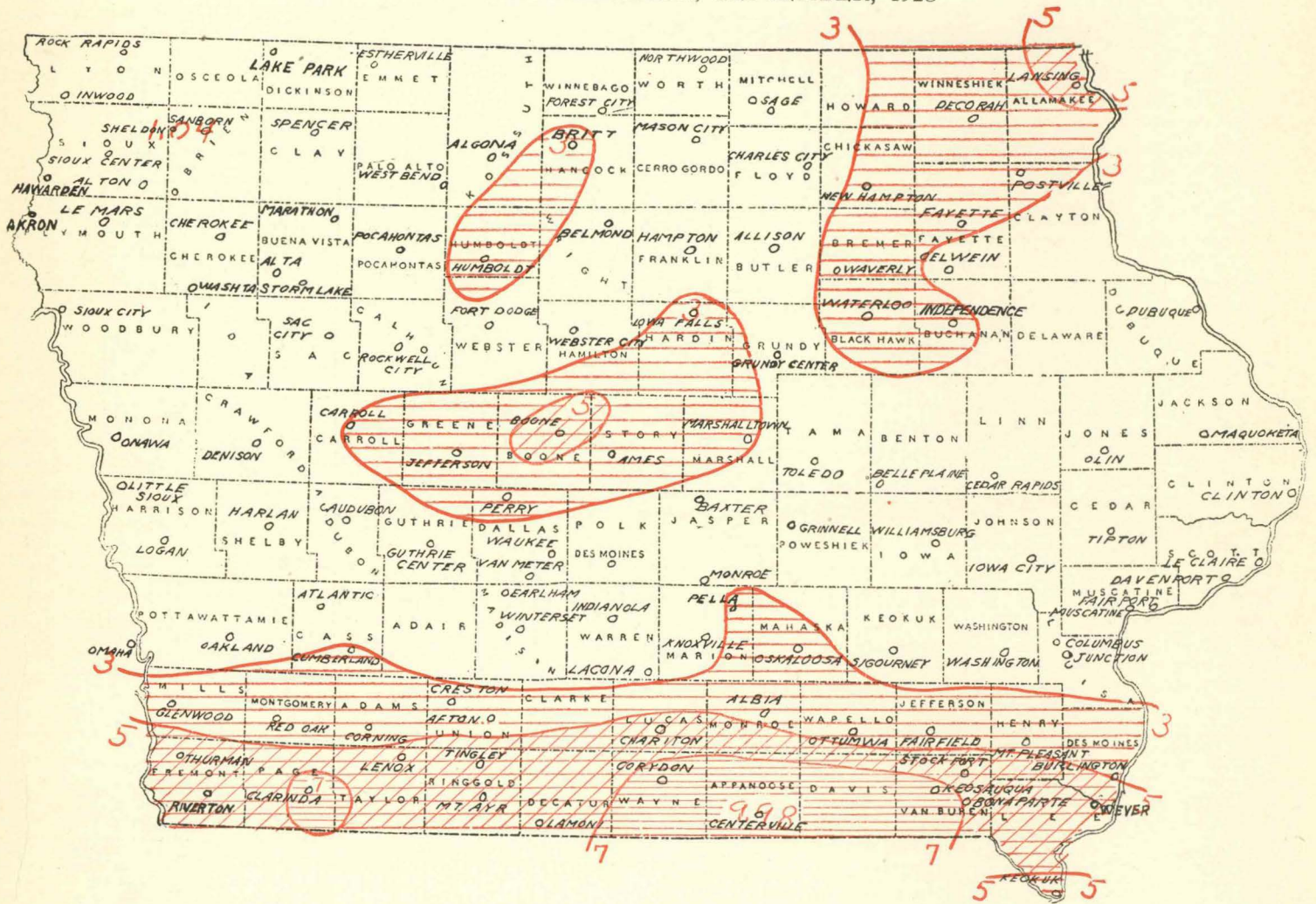
IOWA STORMS, AUGUST, 1928—(Continued from August Issue)

Date	County	Township	Nature of Storm	Time	Storm Moved From	Width of Path Miles	Length of Path Miles	Area of Sq. Miles	Size of Hailstones Inches	Damage	Persons Killed	Persons Injured
20	Black Hawk	East Waterloo, Waterloo	Wind	6:00 p. m.	NW to SE	.....	.....	.....	.....	Considerable to Crops, Bldgs.	.....	.....
20	Bremer	La Fayette, Polk, Sumner and Warren	Wind	6:00 p. m.	SW to NE	.....	.....	.....	.....	Considerable to Crops	.....	2
20	Calhoun	Butler, Garfield, Sherman and Twin Lakes	Tornado	5:00 p. m.	SW to NE	1/4	5 1/2	1 3/8	.....	\$150,000	2	.....
20	Clinton	Liberty and Sharon	Wind	10:00 p. m.	SW to NE	.....	.....	.....	.....	\$10,000	.....	.....
20	Dubuque	Dubuque and Julien	Wind	8:00 p. m.	SW to NE	.....	.....	.....	.....	\$25,000	.....	.....
20	Fayette	Fairfield	Wind	7:00 p. m.	.....	.....	.....	.....	.....	Considerable to Crops	.....	.....
20	Hamilton	Boone, Clear Lake, Hamilton, Independence, Lincoln, Lyon, Marion and Scott	Tornado	6:00 p. m.	SW to NE	1/2	35	17 1/2	.....	\$70,000	1	6
20	Hardin	Concord, Pleasant, Sherman and Tipton	Tornado	6:00 p. m.	SW to NE	1/8	20	2 1/4	.....	\$40,000	.....	.....
20	Howard	Howard Center	Hail	5:00 a. m.	S to N	.....	.....	.....	Hazel Nuts	Slight	.....	.....
20	Linn	Franklin and Linn	Wind and Hail	5:00 a. m.	W to E	1	.....	.....	1/2	Considerable to Crops	.....	.....
20	Linn	Rock	Wind and Hail	2:45 p. m.	W to E	.....	.....	.....	1/2	\$15,000	.....	.....
20	Lyon	Allison, Cleveland, Larchwood, Liberal, Logan, Riverside and Rock	Wind and Hail	3:00 p. m.	W to E	.....	.....	.....	1/2	\$70,000	.....	.....
20	Marshall	Marshall	Wind	6:30 p. m.	SW to NE	.....	.....	.....	.....	Considerable to Crops and Telephone Lines	.....	.....
20	Muscatine	Goshen and Wapsinocoe	Wind	8:30 p. m.	.....	.....	.....	.....	.....	Considerable to Crops, Bldgs.	.....	.....
20	Pocahontas	Dover	Tornado	4:00 p. m.	W to E	1/16	6	3/8	.....	\$15,000	.....	.....
20	Scott	Davenport	Wind	p. m.	.....	.....	.....	.....	.....	Considerable to Trees and Transmission Lines	.....	.....
20	Story	Howard, Nevada, New Albany and Sherman	Tornado	6:00 p. m.	W to E	1/8	10	1 1/4	.....	\$50,000	.....	1
20	Webster	Dayton	Tornado	6:00 p. m.	SW to NE	.....	.....	.....	.....	Considerable to Crops, Bldgs.	.....	.....
20	Worth	Grove, Kensett and Silver Lake	Wind and Hail	5:00 p. m.	SW to NE	.....	.....	.....	.....	Considerable to Crops	.....	.....
22	Cerro Gordo	Falls	Wind and Hail	5:00 p. m.	W to E	.....	.....	.....	.....	Considerable to Crops	.....	.....
22	Floyd	Rock Grove	Hail	10:30 p. m.	NE to SW	.....	.....	.....	Walnuts	\$150,000	.....	.....
22	Hancock	Boone and Magor	Wind and Hail	p. m.	.....	.....	.....	.....	.....	Some to Crops and Bldgs	.....	.....
22	Howard	Howard Center, Jamestown, Oak Dale, and Saratoga	Wind and Hail	7:30 p. m.	SE to NW	.....	.....	.....	1/2	\$70,000	.....	.....
22	Kossuth	Cresco, Irvington, Plum Creek and Union	Wind and Hail	2:00 a. m.	E to W	.....	.....	.....	.....	Some to Crops	.....	.....
22	Mitchell	Jenkins, Liberty, Otranto, St. Ansgar, and Union	Hail	7:00 p. m.	E to W	10	.....	.....	.....	Considerable to Crops	.....	.....
22	Pocahontas	Des Moines and Garfield	Hail	p. m.	SW to NE	.....	.....	.....	.....	Considerable to Crops	.....	.....
22	Worth	Deer Creek, Grove, Hartland and Kensett	Wind and Hail	5:30 p. m.	S to N	.....	.....	.....	1/2	\$20,000	.....	.....
26	Adair	Greenfield, Jackson, Lee and Summerset	Tornado	8:00 p. m.	W to E	.....	.....	.....	.....	Considerable to Buildings	.....	.....
26	Cass	Massena and Victoria	Hail	6:00 p. m.	SW to NE	.....	.....	.....	.....	Considerable to Crops	.....	.....
26	Cass	Edna, Noble and Pleasant	Tornado	7:00 p. m.	SW to NE	.....	.....	.....	.....	\$115,000	.....	.....
26	Mills	Center, Glenwood, Indian Creek, Ingraham, Lyons, Oak, Rawles, Silver Creek and White Cloud	Tornado	5:30 p. m.	SW to NE	.....	.....	.....	.....	\$60,000	.....	.....
26	Montgomery	Lincoln, Pilot Grove, Red Oak and Sherman	Tornado	6:00 p. m.	SW to NE	.....	.....	.....	.....	\$300,000	4	4
26	Pottawattamie	Belknap, Carson, Keg Creek, Macedonia, Silver Creek, Washington	Tornado	5:30 p. m.	SW to NE	.....	.....	.....	.....	\$150,000	.....	4
26	Warren	Jefferson	Hail	10:00 p. m.	SW to NE	.....	.....	.....	Walnuts	Slight	.....	.....

IOWA STORMS, SEPTEMBER, 1928

10	Montgomery	General over the County	Rain	p. m.	.....	.....	.....	.....	.....	Crops and small bridges	.....	.....
10	Page	Pierce	Rain	p. m.	.....	.....	.....	.....	.....	Roads and small bridges	.....	.....
10	Wayne	Wright	Wind and Rain	11:00 p. m.	S to N	.....	.....	.....	.....	Some to crops, small bridges	.....	.....
11	Van Buren	Jackson	Wind and Rain	9:00 p. m.	S to N	.....	.....	.....	.....	Some to crops	.....	.....
13	Allamakee	Lansing	Rain	7:00 p. m.	.....	.....	.....	.....	.....	Some to crops	.....	.....
13	Cass	Union	Wind and Rain	p. m.	S to N	.....	.....	.....	.....	Some to crops	.....	.....
13	Calhoun	Williams	Tornado	6:00 p. m.	SW to NE	1/2	1	1/2	.....	\$15,000	.....	.....
13	Kossuth	Sherman	Wind	8:00 p. m.	S to N	.....	.....	.....	.....	Windmills, small bldgs	.....	.....
13	Monona	Cooper and Maple	Wind	4:00 p. m.	.....	.....	.....	.....	.....	Some to trees, bldgs	.....	.....
13	Pocahontas	Cedar	Tornado	6:00 p. m.	SW to NE	1/2	3	1 1/2	.....	\$25,000	.....	1
13	Sioux	Reading and Washington	Tornado	5:00 p. m.	SW to NE	1/4	6	1 1/2	.....	\$20,000	.....	.....
13	Woodbury	Rock	Tornado	6:00 p. m.	SW to NE	1/8	1	1/8	.....	\$ 7,000	.....	.....
13	Woodbury	General over the County	Rain	10:00 p. m.	.....	.....	.....	.....	.....	Some to crops	.....	.....
14	Bremer	Franklin	Tornado	4:00 a. m.	W to E	1/8	1	3/8	.....	\$20,000	.....	.....
14	Fayette	Oran, Fremont and Banks	Tornado	4:00 a. m.	S to N	1/8	16	2	.....	\$40,000	.....	.....
14	Monroe	Troy	Wind	2:45 a. m.	NW to SE	.....	.....	.....	.....	Crops damaged 5%	.....	.....

TOTAL PRECIPITATION, SEPTEMBER, 1928



SCALE OF SHADES IN INCHES



CLIMATOLOGICA port

IOWA SECTION

In co-operation with

IOWA WEATHER AND CROP BUREAU

CHARLES D. REED, Senior Meteorologist

VOL. XXXIX DES MOINES, IOWA, OCTOBER, 1928 No. 10

GENERAL SUMMARY

October, 1928, was warm and wet. The mean temperature while considerably above the normal was not unusually warm compared with previous Octobers and was more than one degree cooler than last October. The precipitation was more than one inch above normal and not since 1900 has the average precipitation for the State been greater.

Mild weather prevailed during the greater portion of the month, and, except for a day or two, the first twelve days were continuously above normal and the latter part of this period was decidedly above. From the 13th until the 24th fluctuations were numerous with no marked departures, but the last week was cold with the temperature continuously below normal and the average daily deficiency more than 6 degrees. There was very little frost or freezing weather during the first three weeks and that part of the State which escaped frost during September did not experience a killing frost until about the 26th and in the extreme southeast portion until the 29th. High temperatures were general on the 10th but the maxima were generally considerably below the October record. At Charles City the October record was equalled.

There were more cloudy days, more days with measurable precipitation and less sunshine than the average. While precipitation occurred on a large number of days, most of the total occurred during the principal period of the month, 11th-22d. During this period very little favorable weather prevailed. Heavy downpours occurred at a large number of stations, and the number that reported one inch, or more, during a 24-hour period was unusually large. Some damage occurred in towns and cities but none from overflowed streams. Nearly all small streams, usually dry at this season of the year, showed running water at all times during the month.

From an agricultural standpoint the month was mostly unfavorable. The frequent rainfall interfered with the gathering of corn and kept it from drying. Strong winds, particularly on the 10th-11th, blew down a large amount of corn and knocked many ears off in the mud, causing them to mold, rot or sprout. The condition of the fields made machine gathering almost impossible and hand picking slow and difficult. The wet fields also interfered with the gathering of sugar beets and caused the supply on hand to become very low. The absence of freezing weather permitted canning factories to consume the entire supply of pumpkins without any being damaged, apples were generally gathered in good condition, and root crops still in the ground were uninjured.

TEMPERATURE

The mean temperature for the State, derived from the means of nine districts of nearly equal area, and based on the records of 100 stations, was 54.2°, or 2.4° higher than the normal. The excess was general throughout the State and ranges from 1.5° in the northwestern district to 3.1° in the south-central and southeastern districts. The highest monthly mean was 58.5°, at Keokuk, and the lowest was 50.0° at Rock Rapids. The absolute range for the State was 76°, ranging from 93° at Le Mars, Little Sioux and Washta,

on the 10th, Dodge, Sanborn, Webster City and West Bend on the 29th. Temperatures of 90°, or higher, occurred at about one-third of the stations and at all but one station in the northwestern district. This temperature was not reached at a single station in the three eastern districts. Thurman, in the southwestern district, reported the occurrence of 90° on two days. The average number of days with the temperature 32°, or lower, was 6, being greatest in the northwestern district with 8, and least in the south-central district with 4. The greatest number at a single station was 11 at Washta, and the least was a single day at Keokuk.

PRECIPITATION

The average precipitation for the State, derived from the averages of nine districts of nearly equal area, and based on the records of 117 stations, was 3.66 inches, or 1.23 inches more than the normal. The excess was greatest in the southeastern district, where the average was more than double the normal and least in the southwestern where the excess was only 0.02 inch more than the normal. The amounts were above normal at all stations in three districts and all except one in two districts. The greatest monthly amount was 7.38 inches at Little Sioux and the least was 1.48 inches at Red Oak. The greatest amount occurring in 24 consecutive hours, 4.39 inches, was at Denison on the 12th. There was one principal rainy period, extending from the 11th till the beginning of the 4th week. Most of the heavy, general rains occurred on the 12th, 16th and 21st; the other rains were less general and during the passage of one storm the precipitation was confined almost entirely to the southeastern district.

COMPARATIVE DATA FOR THE STATE—OCTOBER

YEAR	Temperature				Precipitation				Number of Days				
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	Days			
										With pre. .01 in. or more	Clear	Partly cloudy	Cloudy
1873.....	46.0	- 5.8	76	15	2.64	+ 0.21	4.80	1.25					
1874.....	51.2	- 0.6	84	25	1.52	- 0.91	2.70	0.65					
1875.....	47.8	- 4.0	77	22	1.36	- 1.07	2.71	0.28					
1876.....	47.0	- 4.8	78	18	1.16	- 1.27	3.31	0.18					
1877.....	49.6	- 2.2	93	28	4.45	+ 2.02	8.08	1.90					
1878.....	48.9	- 2.9	85	10	2.73	+ 0.30	5.52	0.40					
1879.....	58.3	+ 6.5	90	11	2.19	- 0.24	6.28	0.28					
1880.....	47.6	- 4.2	83	13	1.90	- 0.53	6.90	0.25					
1881.....	52.1	+ 0.3	86	26	6.42	+ 3.99	14.03	3.10					
1882.....	54.4	+ 2.6	86	23	3.97	+ 1.54	6.50	0.55					
1883.....	47.2	- 4.6	88	20	3.37	+ 0.94	6.95	0.40					
1884.....	54.2	+ 2.4	86	17	4.20	+ 1.77	9.00	2.00					
1885.....	46.7	- 5.1	80	20	2.62	- 0.19	4.30	0.92					
1886.....	55.0	+ 3.2	88	18	2.51	+ 0.08	8.15	0.43					
1887.....	46.4	- 5.4	86	- 3	1.46	- 0.97	3.41	0.05					
1888.....	47.7	- 4.1	84	22	1.16	- 1.27	2.81	0.10					
1889.....	47.5	- 4.3	94	12	0.58	- 1.85	2.88	0.00					
1890.....	49.2	- 2.6	84	15	3.44	+ 1.01	6.43	1.59					
1891.....	50.0	- 1.8	92	19	2.77	+ 0.34	6.53	0.85		6	18	7	6
1892.....	54.5	+ 2.7	96	14	1.55	- 0.88	2.58	0.00	0.0	4	21	6	4
1893.....	52.4	+ 0.6	94	10	1.28	- 1.15	4.56	0.02	0.0	4	16	9	6
1894.....	51.7	- 0.1	90	20	2.67	+ 0.24	5.25	0.03	0.2	8	14	8	9
1895.....	46.0	- 5.8	88	4	0.47	- 1.96	1.38	0.00	T.	2	19	8	4
1896.....	47.8	- 4.0	88	12	3.13	+ 0.70	5.05	1.51	T.	5	18	6	7
1897.....	56.8	+ 5.0	97	12	1.14	- 1.29	3.30	0.03	0.0	4	17	8	6
1898.....	47.5	- 4.3	88	17	3.56	+ 1.13	5.75	1.27	3.6	8	7	9	15
1899.....	56.7	+ 4.9	95	17	1.73	- 0.70	4.64	0.15	0.0	5	17	8	6
1900.....	59.3	+ 7.5	90	21	3.91	+ 1.48	8.00	1.20	0.0	7	16	7	8
1901.....	54.2	+ 2.4	88	20	1.98	- 0.45	4.23	0.45	T.	6	17	7	7
1902.....	53.5	+ 1.7	83	20	2.54	+ 0.11	6.66	0.28	T.	5	16	8	7
1903.....	52.2	+ 0.4	90	16	1.95	- 0.48	4.50	0.32	0.0	5	19	6	6
1904.....	53.1	+ 1.3	96	16	1.67	- 0.76	4.43	0.14	T.	6	15	8	8
1905.....	49.2	- 2.6	95	16	3.40	+ 0.97	5.36	1.20	1.6	8	16	6	9
1906.....	50.5	- 1.3	87	7	1.96	- 0.47	4.25	0.50	0.1	6	14	7	10
1907.....	50.4	- 1.4	85	10	1.50	- 0.93	3.71	0.30	0.0	5	20	5	6
1908.....	51.1	- 0.7	89	17	3.38	+ 0.95	8.83	0.58	2.6	8	16	6	9
1909.....	49.7	- 2.1	97	10	2.22	- 0.21	4.70	0.48	T.	6	16	6	9
1910.....	55.2	+ 3.4	93	10	0.77	- 1.66	1.73	T.	0.1	4	21	4	6
1911.....	48.7	- 3.1	87	14	3.34	+ 0.91	7.03	0.73	0.6	10	12	8	11
1912.....	52.2	+ 0.4	92	16	2.98	- 0.55	5.77	1.03	T.	6	21	3	7
1913.....	49.2	- 2.6	89	- 2	3.03	+ 0.80	7.29	0.35	1.2	9	15	8	8
1914.....	55.9	+ 4.1	88	14	3.23	+ 0.60	6.64	0.74	T.	9	16	6	9
1915.....	54.4	+ 2.6	86	19	1.31	- 1.12	3.25	T.	T.	5	19	6	6
1916.....	50.9	- 0.9	92	6	2.00	- 0.43	4.33	0.20	2.0	8	16	7	8
1917.....	42.9	- 8.9	85	0	1.41	- 1.02	4.00	0.15	2.2	6	10	11	10
1918.....	55.1	+ 3.3	93	21	3.64	+ 1.21	7.56	1.36	0.8	7	13	7	11
1919.....	50.7	- 1.1	89	8	3.02	+ 0.59	8.65	0.45	T.	10	11	8	12
1920.....	57.7	+ 5.9	90	11	2.13	- 0.30	4.64	0.48	T.	6	19	6	6
1921.....	54.6	+ 2.8	90	21	1.96	- 0.47	3.61	0.21	T.	6	17	8	6
1922.....	56.1	+ 4.3	96	14	1.81	- 0.62	3.98	0.06	T.	5	21	4	6
1923.....	48.5	- 3.3	81	10	1.22	- 1.21	3.67	0.29	1.7	6	18	6	7
1924.....	58.1	+ 6.3	89	21	0.87	- 1.56	2.58	0.03	0.0	4	22	5	4
1925.....	40.2	- 11.6	78	- 15	2.91	+ 0.48	2.70	0.97	4.9	10	8	8	15
1926.....	51.2	- 0.6	91	14	1.53	- 0.90	3.91	0.11	T.	7	13	9	9
1927.....	55.5	+ 3.7	91	24	3.25	+ 0.82	8.51	0.46	T.	7	19	5	7
1928.....	54.2	+ 2.4	93	17	3.66	+ 1.23	7.38	1.48	0.1	8	15	5	11

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



Climatological Data for October, 1928

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
Northwest District																			
Akron	Plymouth	1,153	2															Orlan C. Moore	
Alta	Buena Vista	1,513	37	51.8	+ 1.7	90	10	22	28	37	3.33	+ 1.10	1.24	1.0	6	14	8	D. E. Hadden	
Altón	Sioux	1,305	23	51.4	+ 1.6	92	10	23	29	42	2.06	+ 0.30	1.23	0	6	11	9	W. S. Slagle	
Cherokee	Cherokee	1,196	8	52.4	+ 2.9	92	10	21	29	42	1.67	+ 0.24	0.62	0	5	15	4	J. E. Wirth	
Estherville	Emmet	1,298	33	51.9	+ 2.8	92	10	20	29	41	1.68	+ 0.23	0.85	0	6	18	3	A. O. Peterson	
Hawarden	Sioux	1,181	2															Earl V. Slife	
Inwood	Lyon	1,474	24	50.2	+ 0.4	91	10	21	29	43	4.49	+ 2.58	2.61	T.	6	17	5	A. C. Hanson	
Lake Park (near)	Dickinson	1,489	15															P. M. Lawrence	
Le Mars	Plymouth	1,224	32	52.2	+ 1.1	93	10	23	29	43	2.86	+ 0.80	1.77	0	8	16	4	Henry Newell	
Marathon	Buena Vista	1,300	2															E. G. Smith	
Pocahontas	Pocahontas	1,248	24	52.4	+ 1.7	91	10	21	29	43	3.04	+ 0.31	1.63	0	9	15	7	F. E. Hronek	
Rock Rapids	Lyon	1,319	29	50.0	+ 1.1	91	10	21	30	43	3.58	+ 1.79	2.42	0	6	21	4	Nellie F. Medberry	
Sanborn	O'Brien	1,553	14	50.2	+ 0.8	90	10	17	29	39	2.13	+ 0.28	1.11	0.5	10	14	8	J. W. Dow	
Sheldon	O'Brien	1,418	17	51.0	+ 0.8	92	10	21	29	41	2.92	+ 0.92	1.88	T.	7	16	5	Ross E. Forward	
Sioux Center	Sioux	1,426	29	51.6	+ 1.8	92	10	24	29	39	3.23	+ 1.39	1.78	T.	7	12	6	J. De Ruyter	
Spencer	Clay	1,319	14	51.4	+ 1.2	92	10	18	29	47	1.74	+ 0.18	1.00	0	7	16	6	E. W. Little	
Storm Lake	Buena Vista	1,440	39	53.0	+ 1.8	88	10	22	29	35	3.80	+ 1.76	1.76	0	7	15	3	George H. Fracker	
Washta	Cherokee	1,157	30	51.6	+ 1.1	93	10	20	29	48	2.14	+ 0.03	1.14	0	5	16	2	H. L. Felter	
West Bend	Palo Alto	1,197	35	51.6	+ 1.0	90	10	17	29	41	2.61	+ 0.58	1.00	0	7	15	7	Jos. Dorweiler	
Means and extremes				51.5	+ 1.5	93	10	17	29	48	2.90	+ 0.95	2.72	0.3	7	15	5	11	nw.
North Central District																			
Algona	Kossuth	1,213	55	52.8	+ 1.3	90	10	20	29	37	3.13	+ 0.86	1.35	0	4	19	3	W. E. Laird	
Allison	Butler	1,060	14	51.3	+ 0.6	88	10	18	29	40	3.84	+ 1.57	1.10	0	7	18	3	E. W. Detra	
Beimond	Wright	1,181	18	51.4	+ 0.8	89	10	19	29	46	2.41	+ 0.31	0.93	0	9	13	2	H. F. Luick	
Britt	Hancock	1,236	41	52.4	+ 2.7	91	10	27	30	40	2.78	+ 0.38	1.05	0	7	16	0	E. P. Healy	
Charles City	Floyd	1,015	37	51.1	+ 2.5	87	10	21	29	36	3.33	+ 1.13	1.41	0	8	14	5	U. S. Weather Bureau	
Forest City	Winnebago	1,226	34	52.0	+ 2.9	92	10	19	29	40	3.01	+ 0.58	1.10	0	5	16	6	Dr. M. B. Neil	
Hampton	Franklin	1,145	3															L. H. Davis	
Humboldt	Humboldt	1,095	40			91	10	19	29	45	3.87	+ 1.32	1.37	0	5			H. C. Snitkey	
Mason City	Cerro Gordo	1,148	31	50.9	+ 1.3	87	10	19	29	43	3.17	+ 0.95	1.57	0	6	15	5	American Beet Sugar Co.	
Northwood	Worth	1,222	32	50.1	+ 1.9	85	10	20	29	33	4.42	+ 2.22	2.09	0	7	17	2	Charles Dwelle	
Osage	Mitchell	1,163	34	51.6	+ 2.5	88	10	20	29	40	3.35	+ 0.71	1.03	0	6	13	9	Dr. C. E. Juhl	
Means and extremes				51.5	+ 1.8	92	10	19	29	46	3.36	+ 0.97	2.09	0	6	15	4	12	nw.
Northeast District																			
Decorah	Winneshiek	872	35	52.8	+ 3.7	85	10	20	29	40	3.27	+ 0.45	1.04	0	6	14	6	M. D. Whitney	
Dubuque	Dubuque	700	55	53.8	+ 1.9	85	11	25	30	35	3.46	+ 0.98	0.90	0	12	9	8	U. S. Weather Bureau	
Fayette	Fayette	1,003	40	52.4	+ 2.8	88	10	17	29	44	3.44	+ 0.91	1.08	0	9	17	6	R. Z. Lathimer	
Independence	Buchanan	921	64	55.0	+ 2.9	86	10	23	29	35	3.31	+ 0.79	1.04	0	11	19	1	Dr. Geo. Boody	
Lansing	Allamakee	632	21											10			Mrs. Mary Spinner		
New Hampton	Chickasaw	1,169	31	51.4	+ 1.2	85	10	18	29	37	4.07	+ 1.50	1.50	0	6	12	8	D. W. Dawson	
Oelwein	Fayette	1,036	5	54.0	+ 2.8	85	10	21	29	38	4.00	+ 1.47	1.40	0	6	17	1	John T. Ridler	
Postville (near)	Clayton	1,192	29	50.9	+ 1.6	84	10	19	29	37	3.50	+ 0.82	1.13	0	8	17	7	F. L. Williams	
Waterloo	Black Hawk	854	45	54.2	+ 2.3	89	10	20	30	43	3.38	+ 0.94	1.91	0	7	17	3	R. B. Slippy	
Waverly	Bremer	936	32	52.4	+ 1.3	87	10	19	29	40	3.64	+ 1.04	1.21	0	8	19	5	D. H. Murphy	
Means and extremes				52.8	+ 2.1	88	10	17	29	44	3.67	+ 1.06	1.40	0	8	16	5	10	nw.
West Central District																			
Audubon (near)	Audubon	1,297	33	52.3	+ 1.5	82	10	24	29	33	4.01	+ 1.70	1.60	0	7	16	8	George Kibby	
Carroll	Carroll	1,265	38	53.2	+ 1.6	89	10	23	29	37	4.07	+ 1.49	2.15	0	6	20	4	Vrs. Jos. J. Wolfe	
Denison	Crawford	1,171	24	54.1	+ 2.4	89	10	25	29	38	6.62	+ 4.39	4.39	0	6	12	7	W. L. Byers	
Guthrie Center	Guthrie	1,077	33	54.2	+ 1.7	92	10	24	29	41	3.32	+ 0.66	1.75	0	5	20	1	H. A. Stafford	
Harlan	Shelby	1,192	29	54.4	+ 3.2	89	10	26	29	43	4.15	+ 1.50	1.65	0	8	14	6	Walter Bell	
Jefferson	Greene	1,052	29	54.0	+ 2.6	89	10	24	29	42	3.07	+ 0.53	1.23	0	5	18	3	W. I. Lyon	
Little Sioux	Harrison	1,040	23	53.8	+ 1.6	93	10	26	30	42	7.38	+ 5.33	2.85	0	8	12	11	H. W. Kerr	
Loran	Harrison	1,120	61	54.3	+ 1.1	92	10	26	29	47	3.99	+ 1.61	2.40	0	7	9	17	Amy Ann Stern	
Onawa	Monona	1,051	27	54.3	+ 2.5	92	9	28	29	42	4.62	+ 2.44	2.50	0	5	19	0	Mrs. H. E. Colby	
Rockwell City	Calhoun	1,232	32	53.4	+ 1.6	90	10	21	29	39	4.77	+ 2.18	2.05	0	7	17	4	A. W. McIsaac	
Sac City	Sac	1,269	52	52.5	+ 1.0	90	10	23	29	39	4.32	+ 2.15	2.70	0	5	13	7	F. P. Kessler	
Sioux City	Woodbury	1,135	39	52.6	+ 1.7	92	10	30	29	38	3.55	+ 1.91	2.18	0	8	13	4	U. S. Weather Bureau	
Means and extremes				53.6	+ 1.9	93	10	21	29	47	4.49	+ 2.16	4.39	0	6	15	6	10	nw.
Central District																			
Ames	Story	926	51			89	10	24	29	42	3.27	+ 0.66	1.87	0	7	15	0	Iowa State College	
Baxter	Jasper	998	28	54.0	+ 1.6	89	10	20	29	41	2.62	+ 0.20	1.00	0	8	12	8	Otto Sanderman	
Boone (near)	Boone	894	23	54.0	+ 2.3	90	10	20	29	47	3.19	+ 0.40	1.42	0	7	12	7	C. F. Henning	
Des Moines	Polk	861	50	55.6	+ 2.2	88	10	29	29	36	3.08	+ 0.58	1.71	0	9	12	5	U. S. Weather Bureau	
Fort Dodge	Webster	1,114	28	52.3	+ 1.0	90	10	17	29	47	3.40	+ 0.36	1.58	T.	9	15	5	Samuel Sampson	
Grinnell	Poweshiek	1,031	34	54.6	+ 1.6	88	10	22	29	37	2.69	+ 0.18	1.01	0	11	16	0	R. E. Bates	
Grundy Center	Grundy	976	37	54.1	+ 3.0	88	10	22	29	40	2.52	+ 0.27	0.90	0	8	15	6	M. G. Heiberger	
Iowa Falls	Hardin	1,127	35	52.4	+ 1.7	89	10	21	29	42	4.30	+ 1.84	1.15	0	7	18	2	C. H. Gilbert	
Marshalltown	Marshall	947	36	54.5	+ 1.5	89	10	23	29	39	3.23	+ 0.47	1.13	0	11	15	4	C. C. Pigman	
Monroe	Jasper	922	16											9			J. A. Dibel		
Perry	Dallas	975	27	54.0	+ 1.8	89	10	24	29	45	3.26	+ 0.46	1.19	0	8	16	5	Eugene N. Hastie	
Toledo	Tama	847	34	54.6	+ 1.3	88	10	20	29	43	3.10	+ 0.59	0.95	0	11	14	6	H. P. Giger	
Van Meter	Dallas	872	9											6			Calvin K. Smith		
Waukee	Dallas	1,033	25	55.6	+ 2.8	89	10	22	29	42	3.73	+ 1.57	2.63	0	9	16	7	Samuel F. Foff	
Webster City	Hamilton	1,042	23	52.5	+ 1.1	90	10	17	29	48	3.17	+ 0.69	1.35	0	9	14	5	Frank A. Bonebright	
Means and extremes				54.0	+ 1														

Climatological Data for October, 1928—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>East Central District</i>																						
Belle Plaine.....	Benton.....	866	38	54.7	+ 2.8	89	10	19	29	41	3.32	+ 0.83	0.96	0	13	11	10	10	n.w.	O. C. Burrows J. T. Wurster Dr. A. P. Bryant U. S. Weather Bureau Rex Shriver		
Cedar Rapids.....	Linn.....	737	46	54.0	+ 2.6	86	10	20	29	44	5.01	+ 2.56	1.48	0	13	14	1	16	16		sw.	
Clinton.....	Clinton.....	595	55	55.0	+ 2.0	87	11	21	29	38	4.47	+ 1.91	1.09	0	11	16	2	13	13		s.	
Davenport.....	Scott.....	580	57	56.5	+ 2.8	85	10	28	29	28	3.44	+ 1.05	0.80	0	13	13	5	13	13		sw.	
Davenport, No. 2.....	Scott.....	690	3	56.4		88	10	23	29	38	4.27		0.96	0	14	16	2	13	13		sw.	
Fairport.....	Muscatine.....	567	7	56.6	+ 2.8	85	4†	23	29	42	4.43	+ 1.94	1.09	0	14	14	4	13	13	n.w.	Bureau of Fisheries Prof. J. F. Reilly Margaret T. Disney John Strodthoff William Molis	
Iowa City.....	Johnson.....	733	68	55.2	+ 2.8	87	10	23	29	38	5.34	+ 2.60	1.46	0	13	15	7	9	11	n.w.		
Le Claire.....	Scott.....	576	28								4.39	+ 1.94	1.04	0	10					sw.		
Maquoketa.....	Jackson.....	692	23	53.2	+ 3.0	85	10†	18	30	44	4.68	+ 1.79	1.06	0	11	14	4	13	13	sw.		
Muscatine.....	Muscatine.....	546	67								4.29	+ 1.64	0.88	0	11					sw.		
Olin.....	Jones.....	760	29	53.7	+ 2.7	86	10	19	29	43	3.94	+ 1.45	1.03	0	8	15	4	12	12	sw.	Mrs. L. Stingley John Kroepfen Dr. F. C. Schadt	
Tipton (near).....	Cedar.....	807	29	55.6	+ 3.2	86	8	22	29	40	4.92	+ 2.51	1.01	0	12	9	10	12	12	w.		
Williamsburg.....	Iowa.....	770	12	53.9	+ 3.2	86	10	20	29	41	4.20	+ 1.75	1.01	0	10	15	6	10	10	sw.		
Means and extremes					55.0	+ 3.0	89	10	18	30	44	4.37	+ 1.83	1.48	0	12	14	5	12	12	sw.	
<i>Southwest District</i>																						
Atlantic.....	Cass.....	1,164	37	54.2	+ 2.0	88	10	26	29	39	2.65	+ 0.05	1.70	0	9	12	5	14	14	sw.	T. H. Whitney Arthur L. Bishop Dr. H. C. Hawley C. A. Smith Carl E. Pollock	
Bedford.....	Taylor.....	1,200									3.48	+ 0.67	1.74	0	9	16	5	10	10	n.w.		
Clarinda.....	Page.....	1,009	38	56.0	+ 2.0	89	8†	27	29	39	3.15	+ 0.51	1.38	0	12	17	8	6	6	n.		
Corning.....	Adams.....	1,150	36	56.6	+ 4.2	89	10	26	25	48	3.34	+ 0.58	1.48	0	8	20	2	9	9	sw.		
Cumberland (near).....	Cass.....	1,225	29								2.90	+ 0.19	1.53	0	9	13	10	8	8	n.w.		
Glenwood.....	Mills.....	1,100	30	55.2	+ 1.6	90	10	28	30	40	2.05	+ 0.63	0.84	0	8	15	7	9	9	se.	George Mogridge J. L. Hurley W. S. Matthews B. R. Bridge Geo. C. Rader	
Lenox.....	Taylor.....	1,250	33	56.2	+ 3.0	90	8†	26	29	45	3.62	+ 0.90	1.73	0	10	12	9	10	10	n.w.		
Oakland.....	Pottawattamie.....	1,139	9	56.4	+ 4.1	91	10	28	29	43	2.27	+ 0.28	1.01	0	6	16	3	12	12	n.w.		
Red Oak (near).....	Montgomery.....	1,030	3								1.48	+ 1.27	0.60	0.2	8	10	15	6	6	s.		
Riverton (near).....	Fremont.....	920	2								2.30	+ 0.42	0.81	0	7	12	5	14	14	s.		
Thurman.....	Fremont.....	960	31	56.0	+ 2.7	91	10	29	25†	43	1.68	+ 1.26	0.62	0	8	13	7	11	11	s.	H. H. Askew U. S. Weather Bureau	
Omaha, Neb.....		1,105	57	56.2	+ 1.9	91	10	32	29	33	3.33	+ 1.16	1.75	0	8	15	6	10	10	n.w.		
Means and extremes					55.8	+ 2.6	91	10	26	25†	48	2.69	+ 0.02	1.75	T.	8	14	7	10	10	n.w.	
<i>South Central District</i>																						
Afton.....	Union.....	1,212	34	56.2	+ 2.9	89	10	25	29	40	3.77	+ 1.19	2.41	0	8	14	9	8	8	sw.	S. R. Brown O. E. McBride Thomas Wood C. C. Burr J. C. Davis	
Albia.....	Monroe.....	949	30	56.8	+ 3.3	88	8†	24	29	34	2.63	+ 0.35	0.73	0	12	12	8	11	11	sw.		
Centerville.....	Appanoose.....	1,013	23	57.9	+ 3.9	88	8	26	29	37	5.47	+ 3.26	1.77	0	11	10	7	14	14	n.w.		
Chariton (near).....	Lucas.....	1,042	33	57.2	+ 4.8	89	8	25	29	38	3.36	+ 1.04	0.83	0	7	13	8	10	10	sw.		
Corydon (near).....	Wayne.....	1,050	35	56.9	+ 3.1	87	8	25	29	37	3.32	+ 0.73	1.23	0	9	11	11	9	9	s.		
Creston.....	Union.....	1,291	23	55.2	+ 2.7	89	8†	25	29	36	4.09	+ 1.31	2.18	0	11	9	8	14	14	n.w.	Mrs. N. Spangler George Phillips Seth F. Shenton W. J. Casey J. B. Alter	
Earlham (near).....	Madison.....	1,126	26	56.7	+ 4.7	90	10	23	29	40	3.50	+ 1.06	1.74	0	6	18	3	10	10	n.w.		
Indianola.....	Warren.....	972	37	56.2	+ 3.0	90	8	25	29	39	2.96	+ 0.60	1.75	0	9	15	10	6	6	sw.		
Knoxville.....	Marion.....	920	33	56.8	+ 3.1	89	8†	23	29	38	2.68	+ 0.37	0.95	0	10	13	3	15	15	se.		
Lacona.....	Warren.....	824	29								2.23	+ 0.48	1.43	0	12	11	11	9	9	n.w.		
Lamoni.....	Decatur.....	1,123	21	56.0	+ 2.5	89	8	25	29	34	4.43	+ 1.50	1.71	0	11	17	7	7	7	n.w.	F. S. Parks E. O. Gleason L. L. Langerak James A. Verploegh H. S. Ely	
Mount Ayr.....	Ringgold.....	1,220	35	55.6	+ 2.0	87	8†	27	29	32	4.02	+ 1.50	1.68	0	9	18	4	9	9	s.		
Pella (near).....	Marion.....	850	1								2.42	+ 0.03	0.79	0	9	15	4	12	12	se.		
Tingley.....	Ringgold.....	1,275	3	54.6	+ 1.5	87	8†	24	29	34	3.50	+ 0.81	2.03	0	7	14	10	7	7	se.		
Winterset.....	Madison.....	1,118	37	56.6	+ 3.0	89	10	23	29	39	3.94	+ 1.57	2.53	0	8	15	8	8	8	n.w.		
Means and extremes					56.4	+ 3.1	90	8†	23	29	40	3.49	+ 0.99	2.53	0	9	14	7	10	10	n.w.	
<i>Southeast District</i>																						
Bonaparte (near).....	Van Buren.....	563	37	56.5	+ 2.8	85	8†	25	29	33	6.13	+ 4.25	1.95	0	11	12	8	11	11	w.	B. R. Vale John T. Donnelly Miss Musa Todd R. M. McKenzie U. S. Weather Bureau	
Burlington.....	Des Moines.....	544	32	57.8	+ 2.9	85	8†	27	29	28	4.68	+ 2.40	1.29	0	10	16	6	9	9	sw.		
Columbus Junction.....	Louisa.....	595	27	56.1	+ 1.8	86	8†	24	29	36	4.05	+ 1.50	0.97	0	12	11	15	5	5	sw.		
Fairfield.....	Jefferson.....	780	44	55.1	+ 2.1	86	10	23	29	35	6.79	+ 4.03	1.93	T.	11	14	3	14	14	n.w.		
Keokuk.....	Lee.....	614	37	58.5	+ 3.1	86	12	31	29	28	5.91	+ 3.65	1.65	0	9	10	8	13	13	s.		
Keosauqua.....	Van Buren.....	644	36																		J. H. Landes J. H. Jericho Roy R. Robinson C. L. Mikesch W. E. Utterback	
Mt. Pleasant.....	Henry.....	730	47	57.0	+ 3.0	87	8†	26	29	36	3.57	+ 1.17	1.45	0	11	13	9	9	9	se.		
Oskaloosa.....	Mahaska.....	835	52	56.1	+ 3.3	88	8	24	29	32	3.10	+ 0.85	0.85	0	12	11	10	10	10	se.		
Ottumwa.....	Wapello.....	649	33	57.0	+ 2.4	89	8	26	29	46	5.51	+ 3.13	1.33	0	12	15	9	7	7	se.		
Sigourney (near).....	Keokuk.....	790	32	56.1	+ 3.1	88	8	24	29	39	3.61	+ 1.36	0.73	0	12	13	3	15	15	se.		
Stockport.....	Van Buren.....	747	26	56.2	+ 3.8	87	10	24	29	38	5.55	+ 3.49	1.29	0	12	14	5	12	12	s.	C. L. Beswick D. D. Sherman H. G. Liddle	
Washington.....	Washington.....	757	46	57.0	+ 3.7	89	10	23	29	35	3.81	+ 1.61	1.54	0	9	12	4	15	15	se.		
Wever.....	Lee.....	552		57.6		87	10	26	29	35	4.63		1.20	0	12	11	5	15	15	sw.		
Means and extremes					56.8	+ 3.1	89	8†	23	29	46	4.78	+ 2.51	1.95	T.	11	13	7	11	11	se.	
State means and extremes					54.2	+ 2.4	93	10	17	29	48	3.66	+ 1.23	4.39	0.1	8	15	5	11	11	n.w.	

Temperature normals are based on the 46-year period July 3, 1875 to July 2, 1921; shorter records corrected to harmonize. Precipitation normals are based on the 50-year period ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1920 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.

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.

Daily Precipitation for October, 1928

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>Northwest District</i>																																	
Akron	Big Sioux											.62	.01	.42		2.36		.05	.01			.01											.35
Alta	Raccoon									.30		.93				1.24	.22	.04															.60
Alton	Floyd			T.								.43		T.		1.23	T.	.08	.06			.04										.22	
Cherokee	Little Sioux	T.										.73		T.		.62	T.	.02	.03			T.										.27	
Estherville	Des Moines											.85		.05		.40	.10	.25					.03										.16
Hawarden	Big Sioux											.39	T.	.44		2.72		.11	.01			T.									T.	.34	
Inwood (near)	Big Sioux				.36							.31		1.03		2.61		.16	T.		T.									T.	.02		
Lake Park (near)	Little Sioux													.27		1.05		.05															**
Le Mars	Floyd		.01									.62	T.	.01		1.77	.02	.07				.10										.26	
Marathon	Raccoon		.02								.86	T.	T.	T.	.10	.70	.42	.07	T.									T.		T.	.91		
Pocahontas	Des Moines	T.										1.63		.03	.02	.58	.55	.04	.03									.03				.13	
Rock Rapids	Big Sioux		.04									.33		.68		2.42		.09				.02									T.	.17	
Sanborn	Floyd											.50	.04	.05	.02	1.11	.02	.08	.05			.09										.17	
Sheldon	Floyd	T.										.57	T.	.17		1.88	T.	.09	.03			.01								T.	.17		
Sioux Center	Floyd				T.							.02	.51	T.	.42	1.78	.21		.08			T.								T.	.21		
Spencer	Little Sioux		.01									.04	.50	.01		1.00		.12				.06										1.74	
Storm Lake	Raccoon											.19	1.45			1.76	.16	.19	.03													.02	
Washta	Little Sioux	T.										.08	1.14		T.	.85	T.	.05				.02										2.14	
West Bend	Des Moines	T.										1.00	.10		T.	.75	.50	.19	.05									T.	T.			T.	
<i>North Central District</i>																																	
Algona	Des Moines											.98			1.35		.50		.30													3.13	
Allison	Cedar			.22							*	.68			T.	.94	1.10	.75	T.									.15				3.84	
Belmond	Iowa	T.		.15								.93		.05	.01	.22	.80	.14	.05			T.						.06				2.41	
Britt	Iowa			.23								1.05			.05	.51	.40	.52	.02													2.78	
Charles City***	Cedar	T.		.11								.71		T.	T.	.97	1.39	.11	.01			.02					T.	.01				3.33	
Forest City	Cedar	T.		.28								.78			1.10	.37	.48	T.														3.01	
Hampton	Cedar											1.37		T.		1.26	1.02											.12				3.87	
Humboldt	Des Moines				.08							1.57		T.	T.	.45	.77	.20	.10								T.				T.	3.17	
Mason City	Cedar	T.		.38								.89		.01		2.09	.55	.45	.05			T.						T.				4.42	
Northwood	Cedar	T.		.33								1.03				1.02	.61	.30	.06													3.35	
Osage	Cedar			.30								.96				1.31	.71	.40														3.68	
<i>Northeast District</i>																																	
Decorah	Mississippi			.05	.37							.55			.76	1.04		.50				T.										3.27	
Dubuque***	Mississippi	T.		.90				.07				.68	T.		.02	.29	.59	.01			.45	.32					.07	.02			.04	3.46	
Fayette	Mississippi			.38				.15				.66			T.	.38	1.08	.09			.03	.65						.02				3.44	
Independence	Wapsipicon			.75								.59	.02		.02	1.16	1.04	.07	.04			.02	.56					.07				3.34	
Lansing|||	Mississippi		.01	.03	1.28			T.				.82			.06	.75	.83	.06				.30					.02					4.16	
New Hampton	Wapsipicon				.28							.80			T.	1.50	1.22	.16	.11														4.07
Oelwein	Wapsipicon				.90							.60				1.40	.40					.60						.10				4.00	
Postville (near)	Mississippi	T.			.70							.72			.10	.26	1.13	.11	.03			.45									3.50		
Waterloo	Cedar	T.			.22							.60			1.91						.02	.50					.08				3.38		
Waverly	Cedar			.57	.11							1.08			.02	1.21		.30	.02									.33				3.64	
<i>West Central District</i>																																	
Audubon (near)	Nishnabotna											T.	1.14	T.		.66	1.60	.01	.30								.15				.15	4.01	
Carroll	Raccoon											2.15	.05		.45	.95	.17				T.						T.				.30	4.07	
Denison	Missouri											4.39			.98	.74	.14											.05				.32	6.62
Guthrie Center	Raccoon											.30	.25		.80	1.75																.22	3.32
Harlan	Nishnabotna	T.										1.65	.10	T.		.60	1.17	.17				.01					.15					.30	4.15
Jefferson	Raccoon											T.	.71			.61	1.23	.22				T.						T.				.30	3.07
Little Sioux	Little Sioux											2.80	2.85	T.		.40	.31	.05				.01					.01					.95	7.38
Logan	Missouri											2.40	.09	.02		.36	.50					.18						.18				.44	3.99
Onawa	Missouri											1.00	2.50		T.	.68	T.	.10														.34	4.62
Rockwell City	Raccoon											2.05		.05		.72	1.20	.25									.20					.30	4.77
Sac City	Raccoon											2.70			.46	.68	.03											T.				.45	4.32
Sioux City***	Missouri	T.										.18	.55	T.	.01	1.32	.86	T.	.03			.02					T.				.58	3.55	
<i>Central District</i>																																	
Ames	Skunk			T.								.63			.22	1.87	.23					.18					.08				.06	3.27	
Baxter	Skunk			.18								.39			T.	.29	1.00	.15									.10	.01				.22	6.62
Boone (near)	Des Moines	T.										.71			.41	1.42	.34					.06					.09				.16	3.19	
Des Moines***	Des Moines	T.		.02								.11	T.	T.	.17	1.71	.01	T.				.53	.01				.20				.32	3.08	
Fort Dodge	Des Moines			.03								1.58			.01	.58	.85	.22									.03	.03				.07	3.40
Grinnell	Iowa	T.		T.	.28							.20	.47		.06	.08	1.01	.03			*	.38				*	.18			T.	.29	2.69	
Grundy Center	Cedar	T.			.15							.64			.40	.15	.90	.08									.10				.10	2.52	
Iowa Falls	Iowa			.20								.89			.99	1.15	.75	.07									.25					4.30	
Marshalltown	Iowa	T.		.40								.45		.06	T.	.21	1.13	.13	T.			.31	.37				.08	.02			.07	3.23	
Monroe	Des Moines	T.		.20								.39	.01		.28	1.19	.17						.48				.68	.06				3.46	
Perry	Raccoon	T.		T.								.53	T.	.02	T.	.28	1.03	.16				.06					.10				.08	2.26	
Toledo	Iowa	T.		.55								.45		T.	.10	.20	.95	.10	.05			T.	.50				.10	.05			.05	3.10	
Van Meter|||	Raccoon							T.				.40			.40	.30	2.35										.10					4.05	
Waukeo	Raccoon											.16	T.	.02	.02	.31	2.63					.35					.19	.02			.03	3.73	
Webster City	Des Moines			.18																													

Daily Precipitation for October, 1928—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	
Southwest District																																	
Atlantic.....	Nishnabotna..											.26	.01		.01	.22	1.70	.04					.05					.05				.31	2.65
Bedford.....	102.....	.03										.25	.15			.39	1.00	.74				.49					.39				.04	3.48	
Clarinda.....	Nodaway.....	.09									.28	.10		.28	.03	1.38	.12				.15	.28				.32	.02			.10	3.15		
Corning.....	Nodaway.....	.02									.28	.08			.21	1.48					.43					.02				.82	3.34		
Lumberland (nr.)	Nodaway.....	.02									.32	.03			.59	1.53	.10			T.		.10				.06				.15	2.90		
Glenwood																																	
Glenwood.....	Missouri.....										.44	.08			.22	.84	.02					.15				.02				.28	2.05		
Lenox.....	Missouri.....	T.									.28	.15	.02	.06	.68	1.73	.08				T.	.45			.14	.03			.04	3.62			
Oakland.....	Nishnabotna..										.83	.03		1.01	.10											.06				.24	2.27		
Red Oak (near)	Nishnabotna..										.28	.12			.14	.60						.14				.02	.04			.14	1.48		
Riverton (near)	Nishnabotna..	.02									T.	.17			.44	.81						.24				.14				.48	2.30		
Thurman																																	
Thurman.....	Missouri.....	.08									.20	.18			.31	.62	.02					.10				T.	T.			.17	1.68		
Omaha, Neb., ***	Missouri.....	T.									.62	1.13	.05	T.	.30	.12	.49	T.			T.				.01				.61	3.33			
South Central District																																	
Afton.....	Grand.....										.15	.10			.32	2.41	.03					.10	.35			.31					3.77		
Albia.....	Des Moines.....	T.			.32				.08		.15	.14		.10	.05	.73	.01					.08	.69		.08	.20					2.63		
Centerville.....	Chariton.....	.01		T.	T.	.09			T.		.01	1.77	T.	.66	.07	1.10	.01				.15	.54			.26	.81					5.47		
Chariton (near)	Chariton.....										.48	.28	T.	.19	.65	.83					T.	.38			T.	T.					3.36		
Corydon (near)	Chariton.....				.23	.55	T.				.59	.11		.11	.14	1.23						.04	.62			.25					3.32		
Creston																																	
Creston.....	Missouri.....	T.									.52	.07	T.	.02	.60	2.18		.01				.33	.20			.02	.04		T.	.10	4.09		
Earlham (near)	Des Moines.....	T.									.39	T.			T.	.21	1.74	.40							.16						T.	3.50	
Indianola.....	Des Moines.....				.13						.45	.03			.10	1.75	.06					.04	.32			.08	T.				2.96		
Knoxville.....	Des Moines.....				.63						.04	.20		.05	.23	.95	.04					.04	.46			.04					2.68		
Lacona.....	Des Moines.....				.08	.02					.02	.08		.05	.10	1.43	.02					.14	.01			.10	.18				2.23		
Lamoni																																	
Lamoni.....	Grand.....				.23						.30	.38		.04	.37	1.71						.70	.14			.42	.11			.03	4.43		
Mount Ayr.....	Grand.....	.03			.05						.49	.26	.35		.28	1.68						.62			.35					4.02			
Pella (near)	Des Moines.....	T.			.61						.07	.21		.05	.18	.79	T.					.37	.08			.06					2.42		
Tingley.....	Platte.....	T.			T.						.30	.23	T.	T.	.37	2.03						.12	.18			.27					3.50		
Winterset.....	Des Moines.....	T.			.09						.15	.02			.48	2.53	.05					T.	.57			.05					T.	3.94	
Southeast District																																	
Bonaparte (near)	Des Moines.....	T.			.06	.04		T.	1.05				.08		.92	.08	1.95					.55	.84			.19	.37				6.13		
Burlington.....	Mississippi.....				.76	.07					.39	T.			.56	.30	.22					1.29	.56			.07	.55				4.68		
Columbus Jct.	Iowa.....					.30			.01		.68	.15		.55	.42	.75	.03					.28	.70			.13	.05				4.05		
Fairfield.....	Skunk.....	T.			1.09				1.93		.14	.45		.80	.17	.67						.35	.73			.13	.03		T.		6.79		
Keokuk**	Mississippi.....	T.			1.65				.70		T.	.37		1.33	.01	.11	T.					.28	.51			.95	T.				5.91		
Keosauqua																																	
Keosauqua.....	Des Moines.....																																
Mt. Pleasant.....	Skunk.....	T.			.02				.15		.13	.03		.43	.23	.78						.78	.67			.13	.22				3.57		
Oskaloosa.....	Des Moines.....	T.			.35				.31		.15	.56		.12	.03	.85	.04	T.				.14	.45			.06	.04				3.10		
Ottumwa.....	Des Moines.....				.11	.24			1.32		.38	.70		.30	.15	1.33						.02	.71			.10	.15				5.51		
St. Ignace (near)	Skunk.....	T.			T.	.36			.73		.18	.12		.72	.04	.55	.02					.15	.63			.06	.05				3.61		
Stockport																																	
Stockport (near)	Skunk.....				.46	.01			1.29		.06	.12		.86	.20	1.02						.15	.70			.23	.42				5.55		
Washington.....	Skunk.....	T.			.10	.36			T.		.05	.47			.12	1.54	T.					.24	.92			.01					3.81		
Wever.....	Mississippi.....	.07			.64				.16		.09	.07		.65	.40	.12						1.20	.58			.33	.32				4.63		

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.
 T. Precipitation is less than .01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE

Stations	Barometric Pressure, Inches (Sea Level)				Relative Humidity, %				Wind				Sunshine						
	Mean	Highest	Date	Lowest	Mean		Lowest	Date	Total movement	Average hourly velocity	Maximum		% possible departure from normal	Date					
					7 A. M.	12 Noon					Miles	From							
															7 P. M.	Date			
Chas. City	30.05	30.61	29	29.46	4	86	58	72	24	6	4,217	5.7	23	sw.	10	56	—	1	
Davenport	30.05	30.60	29	29.53	4	81	58	66	23	7	4,454	6.0	23	w.	4	58	—	3	
Des Moines	30.04	30.61	29	29.42	4	80	55	62	16	6	4,758	6.4	35	sw.	10	56	—	7	
Dubuque	30.05	30.60	29	29.43	4	83	57	65	28	7	4,134	5.6	28	sw.	4	45	—	10	
Keokuk	30.07	30.59	29	29.61	4	79	55	64	24	9	4,546	6.1	25	sw.	4	54	—	7	
Sioux City	30.05	30.69	29	29.44	4	74	55	57	20	2†	7,966	10.7	44	sw.	10	52	—	10	
Omaha, Nb.	30.04	30.66	29	29.45	4	75	54	56	20	6	5,172	7.0	28	n.w.	21	54	—	8	
Means and extremes	30.05	30.69	29	29.42	4	80	56	63		6		6.8			10				6
Normals and records..	30.03	31st	20th	81	62	6th								16th	60				
	*30.69	1913	\$28.96	1876	¶16	1928						‡49	sw.	1880					

*Davenport and Sioux City, 29th, 1928 †Des Moines ‡Omaha ‡Local mean time †And other dates.

‡January 1, 1928, 3-cup anemometers replaced the 4-cup instruments used since the establishment of the Weather Bureau stations. The new instruments will more accurately indicate the true wind movement. The records of the 4-cup instruments were somewhat too high at moderate velocities and considerably too high at the higher velocities. Tables of true velocities corresponding to indicated velocities appear in the January, 1928 Climatological Data. For purposes of comparison the highest velocity of record in the lower line of the table has been converted into a 3-cup velocity.

RIVERS

Unusually high stages prevailed on the Mississippi River for this season of the year. There was a gradual decline during most of the first half of the month and a gradual rise thereafter, except in the extreme upper portion where a fall had started at the end of the month. On the Missouri River moderate stages prevailed with very little fluctuation in the upper portion of the stream; at Sioux City the extreme stages occurred within a period of three days and amounted to less than one foot; during most of the time the stages were nearly stationary. Over the southern portion of the stream the fluctuations were more pronounced but occurred mostly in the first half of the month; during the last half the changes were slight. On the interior streams moderate stages prevailed with no marked rises except during the middle of the third week.

MISCELLANEOUS PHENOMENA

Aurora: 24th, 25th.
 Fog: 14th, 18th, 22d, 26th, 27th, 30th.
 Frost: 2d, 22d, 24th, 25th, 26th, 27th, 28th, 29th.
 Hail: 4th.
 Halos (lunar and solar): 28th, 29th, 31st.
 Thunderstorms: 4th, 5th, 8th, 11th, 12th, 14th, 15th, 16th, 17th, 18th, 21st.
 Tornadoes: 4th.

ERRATA

Report for August, 1928. Page 58. Ames, partly cloudy days should be 0 and cloudy days, 6; Rockwell City, greatest 24 hour precipitation should be 1.10 inches. Page 59. Davenport, No. 2, prevailing wind direction should be S. W. Report for September, 1928. Page 69. The lowest reduced pressure at Omaha should be 29.55.

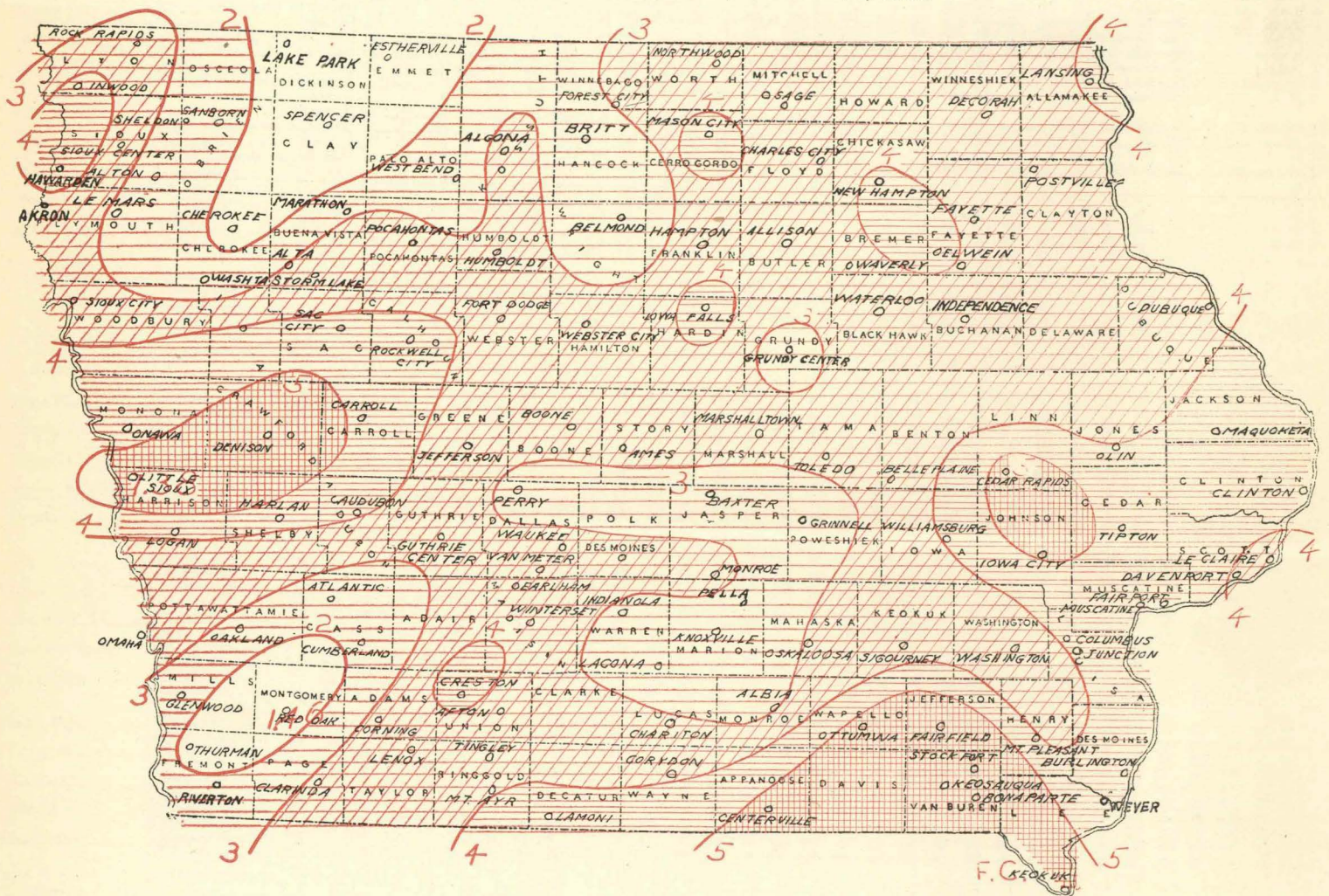
Daily Maximum and Minimum Temperature for the Month of October, 1928

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	
<i>Northern Division</i>																																	
Algona.....	(Maximum.....	71	72	78	75	70	72	73	78	75	90	84	79	47	60	75	69	52	58	54	61	66	51	61	60	54	50	53	44	41	47	46	63.4
	(Minimum.....	50	35	50	57	38	41	40	53	68	60	68	44	39	45	58	45	44	42	40	32	40	34	36	35	30	35	39	28	20	24	36	42.1
Alta.....	(Maximum.....	70	76	82	78	76	78	81	82	90	84	62	44	39	61	78	65	49	50	50	70	60	55	60	55	47	51	39	40	49	45	45	63.0
	(Minimum.....	46	40	50	49	39	47	44	53	47	65	60	38	37	41	58	48	41	42	36	35	40	29	37	31	32	31	28	22	29	29	32	40.7
Alton.....	(Maximum.....	67	75	80	80	74	71	76	80	82	92	85	67	41	60	74	70	50	51	46	68	56	50	59	59	53	50	52	39	39	47	45	62.6
	(Minimum.....	50	33	50	50	37	45	42	50	42	68	67	39	37	41	59	50	45	40	38	33	41	28	32	33	26	30	29	30	23	24	33	40.3
Belmond.....	(Maximum.....	66	74	80	75	71	69	78	79	76	89	86	77	48	61	73	66	53	47	47	69	67	52	61	58	56	49	54	41	42	48	41	63.4
	(Minimum.....	48	29	44	53	38	44	33	33	41	59	68	44	41	44	58	52	45	44	39	31	42	32	33	34	29	26	33	26	19	20	36	39.3
Charles City.....	(Maximum.....	61	70	78	72	66	70	70	75	67	87	85	72	51	60	71	70	50	55	49	66	67	50	60	57	53	49	54	40	46	44	61.5	
	(Minimum.....	39	34	43	50	42	41	37	54	46	54	66	46	44	47	56	50	47	42	38	35	41	38	35	37	31	30	32	27	21	22	37	40.7
Decorah.....	(Maximum.....	65	70	78	75	73	72	69	76	69	85	84	77	75	74	68	72	64	54	50	63	69	56	60	56	53	47	54	40	40	47	48	61.0
	(Minimum.....	46	30	40	60	40	48	32	49	44	47	64	53	50	45	53	63	53	52	40	43	45	30	35	33	30	25	35	28	20	23	32	41.5
Dubuque.....	(Maximum.....	63	71	79	81	67	72	71	80	69	84	85	73	53	66	70	76	61	54	51	61	63	51	60	58	53	51	49	42	40	44	45	62.7
	(Minimum.....	50	41	44	58	48	48	41	57	53	55	68	53	48	49	57	61	49	45	44	40	49	37	36	40	37	31	38	31	26	25	36	45.0
Forest City.....	(Maximum.....	72	74	80	74	70	72	73	78	72	92	88	80	48	59	74	70	53	58	52	68	66	53	62	60	56	50	51	46	43	49	48	64.3
	(Minimum.....	42	34	45	53	37	49	39	52	45	55	63	43	39	44	48	50	43	42	39	32	42	31	31	31	30	38	27	19	22	35	39.8	
Independence.....	(Maximum.....	68	70	78	78	79	76	71	81	76	86	85	83	63	64	72	74	64	54	65	67	64	60	59	57	50	53	53	40	41	43	42	66.2
	(Minimum.....	51	36	45	60	44	51	41	50	50	53	63	61	45	46	55	64	49	46	41	36	47	40	33	37	32	30	40	31	23	23	32	43.7
Inwood.....	(Maximum.....	69	78	80	74	73	74	75	83	83	91	82	58	45	57	79	58	52	50	46	63	56	53	60	55	56	54	41	40	41	40	62.2	
	(Minimum.....	44	38	48	47	37	44	50	44	40	65	51	36	36	43	57	47	42	37	33	33	37	25	35	30	24	30	27	26	21	21	32	38.1
Lake Park.....	(Maximum.....	68	76	81	75	74	73	76	76	81	.....	.....	65	61	75	65	51	48	45	.....	.....	.....	.....	.....	58	53	52	52	39	42	42	43	.....
	(Minimum.....	42	37	47	48	36	49	41	42	46	.....	.....	37	43	58	47	42	37	.....	.....	.....	.....	.....	32	38	28	35	32	28	18	22	29	.....
Mason City.....	(Maximum.....	65	72	77	71	67	69	70	76	68	87	85	76	49	58	71	66	52	56	47	65	65	49	60	57	53	49	52	39	40	46	46	61.4
	(Minimum.....	46	29	41	53	39	48	39	52	42	55	70	44	41	48	57	50	45	42	40	33	42	32	33	35	30	26	37	28	19	19	37	40.4
New Hampton.....	(Maximum.....	63	69	77	70	71	71	69	76	69	85	83	76	53	59	69	70	60	56	50	66	68	54	61	57	55	48	54	42	41	41	44	62.2
	(Minimum.....	47	32	43	60	39	50	36	52	42	52	65	47	42	42	55	56	46	43	39	33	45	37	32	33	29	28	32	29	18	20	32	40.5
Northwood.....	(Maximum.....	65	69	76	71	65	68	69	75	66	85	84	74	50	60	73	65	50	53	49	63	64	48	58	56	52	48	46	40	39	45	41	60.2
	(Minimum.....	41	36	44	52	40	46	38	51	44	53	64	44	43	40	54	50	45	42	42	33	40	33	33	35	32	29	38	29	20	22	26	40.0
Pocahontas.....	(Maximum.....	68	76	81	80	75	75	76	80	80	91	88	79	45	62	77	60	52	55	50	71	64	53	61	60	56	47	57	44	40	47	40	64.2
	(Minimum.....	50	33	41	54	37	48	46	50	42	50	70	41	39	44	57	50	45	41	36	32	40	30	35	33	30	31	31	27	21	24	37	40.5
Postville.....	(Maximum.....	64	68	76	75	64	69	68	75	66	84	84	73	51	60	68	72	59	52	48	64	67	58	54	57	51	54	40	38	44	43	61.3	
	(Minimum.....	47	33	40	60	42	47	37	54	47	47	65	50	43	42	57	43	46	45	40	35	35	42	32	32	25	38	26	19	20	34	40.5	
Rock Rapids.....	(Maximum.....	74	74	78	78	72	70	75	80	79	91	87	66	46	57	73	60	51	50	45	64	60	51	59	57	53	53	51	40	39	40	41	61.8
	(Minimum.....	49	33	50	50	35	41	32	45	38	60	64	36	36	44	56	49	43	39	37	32	39	25	34	30	26	27	28	27	22	21	33	38.1
<i>Central Division</i>																																	
Belle Plaine.....	(Maximum.....	69	73	79	78	74	79	77	88	79	89	87	76	56	67	76	79	63	57	49	68	76	58	65	64	58	53	57	44	45	49	46	67.0
	(Minimum.....	51	32	41	61	42	52	37	53	43	56	64	55	46	50	56	61	51	47	39	33	46	37	32	34	28	27	41	26	19	22	33	42.4
Boone.....	(Maximum.....	67	75	80	82	75	79	76	83	81	90	87	77	50	64	75	77	59	60	50	72	73	55	65	63	59	45	59	48	45	51	44	66.6
	(Minimum.....	48	29	38	62	38	50	29	54	40	62	67	48	44	49	59	59	48	46	40	31	46	36	30	31	25	26	41	27	20	23	39	41.5
Carroll.....	(Maximum.....	71	74	80	81	73	75	74	81	82	89	84	74	46	64	76	70	52	57	52	69	64	52	61	61	56	45	55	46	42	46	42	64.3
	(Minimum.....	55	37	46	55	39	56	41	50	47	65	88	42	34	43	58	51	43	47	37	36	40	31	37	35	30	32	37	28	23	28	36	42.1
Cedar Rapids.....	(Maximum.....	69	74	79	82	72	77	74	82	75	86	85	74	59	68	75	77	63	57	49	65	69	58	62	60	57	50	51	45	44	46	45	65.5
	(Minimum.....	51	30	39	63	44	47	35	50	48	56	63	58	47	49	56	62	51	45	41	32	45	37	30	35	30	25	41	30	20	21	32	42.5
Davenport.....	(Maximum.....	63	75	78	83	71	79	76	84	77	85	84	77	58	79	57	72	78	66														

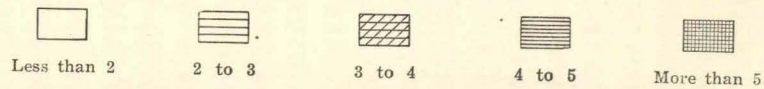
IOWA STORMS, OCTOBER, 1928

Date	County	Township	Nature of Storm	Time	Storm Moved From	Width of Path Miles	Length of Path Miles	Area of Sq. Miles	Size of Hailstones Inches	Damage	Persons Killed	Persons Injured
4	Cedar	Center and Fairfield	Wind	8:00 p. m.						\$500 to bldgs. ; some to crops		
4	Cedar	Massillon and Springfield	Tornado	8:00 p. m.	SW to NE	1/4	1	1/4		\$4,000		
4	Clinton	Bloomfield, Liberty, Lincoln and Spring Rock	Wind	8:00 p. m.	SW to NE					\$3,000 to small bldgs. ; considerable to trees		
4	Iowa	Troy	Wind	7:10 p. m.	SW to NE					\$2,000		
4	Johnson	Oxford	Wind	7:30 p. m.						Some to bldgs.		
4	Jones	Greenfield, Hale, Madison and Rome	Wind	p. m.						Some to trees and bldgs.		
4	Keokuk	Prairie	Tornado	6:30 p. m.	S to N					Consid. to small bldgs.		
4	Lee	Jackson	Wind	5:00 p. m.	S to N					\$100		
4	Linn	Bertram, College, Cedar and Fairfax	Wind	7:30 p. m.						Some to small bldgs. and trees		
4	Lucas	English and Pleasant	Wind	8:00 p. m.						Consid. to small bldgs.		
4	Lucas	Washington	Wind	5:45 p. m.						Slight		
4	Mahaska	Garfield, Lincoln and Spring Creek	Tornado	6:15 p. m.	SW to NE				Small	Some to small bldgs. and trees		
4	Marion	Dallas and Washington	Wind	8:00 p. m.						\$5,000		
4	Monroe	Union	Wind	6:30 p. m.						Some to small bldgs. and trees		
4	Poweshiek	Deep River	Tornado	6:30 p. m.	S to N					Consid. to small bldgs.		

TOTAL PRECIPITATION, OCTOBER, 1928



SCALE OF SHADES IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In co-operation with

IOWA WEATHER AND CROP BUREAU

CHARLES D. REED, Senior Meteorologist

VOL. XXXIX DES MOINES, IOWA, NOVEMBER, 1928 No. 11

GENERAL SUMMARY

The month opened and closed with the temperature below normal but values above normal prevailed during about two-thirds of the month. The mean temperature for the State averaged 2.1° above the normal and the excess was unusually uniform in all districts. The departures were more pronounced in the western portion of the State. During the first four days the average daily deficiency in the extreme western portion of the State was 12°, while in the extreme eastern portion it was less than 2°. The positive departures also were greater over the western portion but the contrast was not so marked. There were no unusually warm days and the general excess was mainly due to high minima.

There was a decided excess in precipitation for the State but there was a deficiency in most of the northwestern district and a single station in the west-central district, all stations reporting a deficiency being in a single area. Since July, excepting September, when there was a slight deficiency in precipitation, all months have shown a material excess in precipitation and there is now a marked accumulated excess in precipitation in a large portion of the State, amounting in places to more than 25 per cent. There were four snowstorms but none were general throughout the State. The first, occurring on the 1st and 2d, was general over most of the western and central portions and heavy over most of the northwestern district, and throughout this district practically no snow fell during the rest of the month; the storms of the 9th and 17th were mostly light except some locally heavy falls occurred on the 17th in the central and northeastern districts. The storm occurring on the 29th-30th was one of the heaviest November storms of record, amounting to 14 inches at several stations. As this storm was accompanied by very little wind there was little drifting but the fall was so heavy in localities that traffic was temporarily blocked and the weight broke wires and damaged trees to some extent. The storm of the 17th was the most damaging as it was in the form of sleet in portions of the State, the worst condition being in the central, east-central and northeastern districts. Many telephone and telegraph wires were broken, hundreds of poles snapped off, and many fruit and shade trees damaged. In the extreme southern portion of the State this storm was in the form of heavy rainfall, which caused many small streams to overflow with considerable damage.

One of the most unusual features in connection with the month's weather was the development of a series of tornadoes on the afternoon of the 14th. The principal one showed a well defined path from the vicinity of Vinton, Benton County, northeastward to Manchester, Delaware County. There was a great deal of damage in this area. On the same afternoon a number of tornadoes were reported from Floyd and Howard counties and unverified reports from Worth, Mitchell and Chickasaw counties. As far as can be ascertained, this is the latest date that a tornado ever occurred in Iowa.

Farm work was badly hampered by the weather. The

snow at the beginning of the month interrupted corn husking for several days in the western and central portions, and broke down a large amount. The subsequent rainy weather caused further delay where the progress has been least. Husking has been difficult the entire season due first to the large amount broken down, and later to the continual wet weather that prevented the use of machines, and in some parts of the State it was impossible for wagons to be drawn through the wet bottom lands. There has been a great amount of corn wasted in gathering this year, and there is some corn in the mud that cannot be salvaged even by hogs. Plowing was possible in the northwest district and well drained lands in the other districts, but in most of the State the soil was too wet. All water courses had running water and the stages were high for the season; water in wells is the highest in years and the soil is thoroughly saturated. The generally mild weather permitted building operations and paving to be carried on with very little interruption, but the wet weather kept dirt roads in poor condition almost the entire month. Stock generally was in good condition and continued on pastures or stalk fields with very little protection.

F. L. D.

COMARATIVE DATA FOR THE STATE—NOVEMBER

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
1873	36.2	-0.4	64	-4	0.72	-0.83	2.78	0.00					
1874	32.9	-3.7	74	-6	2.21	+0.66	4.79	1.05					
1875	30.1	-6.5	60	-16	0.19	-1.36	0.63	0.00					
1876	31.3	-5.3	68	-6	1.70	+0.15	3.50	0.16					
1877	33.3	-3.3	82	-10	1.86	+0.31	3.84	0.12					
1878	39.7	+3.1	72	12	0.63	-0.92	2.69	0.00					
1879	36.3	-0.3	75	4	4.08	+2.53	7.90	0.20					
1880	25.3	-11.3	68	-12	1.29	-0.26	3.30	0.05					
1881	34.4	-2.2	65	-1	2.01	+0.46	3.97	0.60					
1882	37.5	+0.9	76	4	1.71	+0.16	7.15	0.30					
1883	36.8	+0.2	70	-3	1.44	-0.11	4.17	0.00					
1884	35.6	-1.0	68	-15	0.79	-0.76	1.90	0.00					
1885	36.4	-0.2	67	14	0.69	-0.86	2.60	0.10					
1886	32.1	-4.5	75	-4	1.49	-0.06	5.18	0.30					
1887	35.1	-1.5	78	-26	0.85	-0.70	4.10	0.10					
1888	37.1	+0.5	82	0	1.56	+0.01	6.00	0.00					
1889	33.0	-3.6	68	-9	1.44	-0.11	4.90	0.05					
1890	38.9	+2.3	73	-2	1.31	-0.24	3.55	0.50					
1891	30.5	-6.1	84	-24	1.70	+0.15	3.64	0.66		7	10	8	12
1892	33.3	-3.3	70	-3	1.10	-0.45	3.16	0.05	1.8	4	11	8	11
1893	34.0	-2.6	86	-13	1.17	-0.38	2.56	0.05	4.6	4	16	8	6
1894	32.7	-3.9	72	-5	0.92	-0.63	2.42	T.	0.4	4	9	11	10
1895	34.3	-2.3	86	-12	1.51	-0.04	3.01	0.45	4.9	6	9	8	13
1896	29.6	-7.0	82	-15	1.83	+0.28	4.51	0.16	2.9	6	9	8	13
1897	34.3	-2.3	81	-19	0.66	-0.89	2.24	T.	1.2	5	12	8	10
1898	32.2	-4.4	78	-17	1.50	-0.05	3.61	0.35	8.7	6	14	8	8
1899	43.9	+7.3	86	8	1.20	-0.35	2.97	0.13	0.5	5	12	8	10
1900	35.5	-3.1	79	-6	1.06	-0.49	3.35	T.	3.7	6	12	7	11
1901	35.8	-0.8	77	-2	0.86	-0.69	2.30	0.20	2.6	3	18	6	6
1902	41.2	+4.6	79	4	2.13	+0.58	4.19	0.16	1.8	7	9	7	14
1903	34.2	-2.4	76	-5	0.52	-1.03	1.74	T.	1.1	3	13	8	9
1904	41.0	+4.4	80	4	0.15	-1.40	0.50	0.00	0.5	1	20	6	4
1905	38.4	+1.8	70	-12	2.84	+1.29	5.30	0.90	0.6	5	16	7	7
1906	35.4	-1.2	76	-5	2.03	+0.48	3.86	0.35	4.4	8	9	7	14
1907	36.7	+0.1	68	-4	1.03	-0.52	2.27	0.05	0.9	4	17	6	7
1908	39.3	+2.7	80	5	1.56	+0.01	3.31	0.21	1.4	5	14	7	9
1909	42.4	+5.8	84	-3	5.39	+3.84	1.48	0.07	6.8	10	10	7	13
1909	33.4	-3.2	76	-5	0.34	-1.21	1.03	T.	0.7	3	13	9	8
1910	29.9	-6.7	77	-8	1.42	-0.13	4.99	0.11	1.6	6	11	8	11
1911	40.1	+3.5	79	6	0.98	-0.57	2.38	0.00	T.	2	18	8	4
1912	44.1	+7.5	78	10	1.18	-0.37	3.49	0.20	0.4	6	11	7	12
1913	41.0	+4.4	80	-4	0.22	-1.33	0.95	0.00	T.	2	19	6	5
1914	40.2	+3.6	83	-5	1.94	+0.39	4.86	0.30	1.2	6	11	10	9
1915	37.3	+0.7	80	-8	1.61	+0.06	3.65	0.05	3.6	5	16	6	8
1916	40.7	+4.1	77	3	0.28	-1.27	1.02	T.	1.4	3	14	6	10
1917	39.9	+3.3	76	0	2.11	+0.56	5.10	0.70	4.4	7	13	5	12
1918	33.6	-3.0	68	-12	3.40	+1.85	6.22	1.97	6.3	8	11	7	12
1919	35.4	-1.2	71	5	2.18	+0.63	4.45	0.73	1.2	8	10	5	15
1920	33.6	-3.0	70	-5	0.58	-0.97	1.61	T.	3.4	5	10	5	15
1921	42.2	+5.6	74	11	3.54	+1.99	5.28	1.96	0.3	9	11	6	13
1922	40.1	+3.5	72	9	0.58	-0.97	1.84	0.00	1.2	3	16	6	8
1923	38.9	+2.3	82	0	0.58	-0.97	1.55	T.	0.4	4	15	7	8
1924	36.1	-0.5	68	-6	0.71	-0.84	2.30	0.10	4.0	4	15	6	9
1925	32.6	-4.0	71	-3	2.10	+0.55	3.88	0.68	4.2	7	8	7	15
1926	37.7	+1.1	81	0	0.87	-0.68	3.61	T.	0.6	5	7	6	17
1927	38.7	+2.1	70	8	3.83	+2.28	6.83	0.77	6.9	9	13	4	13

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



Climatological Data for November, 1928

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>Northwest District</i>																			
Akron	Plymouth	1,153	2							0.89	- 0.25	0.52	5.0	4	10	12	8	w.	Orlan C. Moore D. E. Hadden W. S. Slagle J. E. Wirth A. O. Peterson
Alta	Buena Vista	1,513	37	35.6	+ 1.7	60	14	12	25	2.58	+ 1.16	0.95	8.0	5	11	8	11	n.w.	
Alton	Sioux	1,305	23	35.4	+ 1.8	60	13†	12	25	0.87	- 0.50	0.50	5.0	3	10	8	12	n.w.	
Cherokee	Cherokee	1,196	8	36.4	+ 3.3	61	13	12	25	1.83	+ 0.32	0.69	6.0	5	12	9	9	s.	
Estherville	Emmet	1,298	33	36.5	+ 2.5	60	13†	12	25	1.45	+ 0.14	0.70	3.0	4	10	15	5	n.w.	
<i>Means and extremes</i>																			
				35.8	+ 2.0	63	13	8	3†	38	1.44	+ 0.14	1.44	4.9	5	13	7	10	n.
<i>North Central District</i>																			
Algona	Kossuth	1,224	55	36.6	+ 2.0	60	14	12	25	2.64	+ 1.28	0.90		7	17	4	9	n.w.	W. E. Laird E. W. Detra H. F. Luick E. P. Healy U. S. Weather Bureau
Allison	Butler	1,060	14	35.8	+ 1.3	61	11	12	25	2.98	+ 1.63	0.80	6.5	8	12	7	11	n.	
Belmond	Wright	1,181	18	36.2	+ 2.0	61	11†	10	25	3.63	+ 1.98	1.40	10.5	10	12	3	15	sw.	
Britt	Hancock	1,236	41	37.2	+ 3.7	60	11	12	25	3.28	+ 1.83	1.95	7.0	12	5	3	22	n.w.	
Charles City	Floyd	1,015	37	36.3	+ 3.3	60	11	16	25	3.47	+ 1.95	0.82	2.4	8	13	2	15	n.w.	
<i>Means and extremes</i>																			
				36.1	+ 2.3	63	14	10	25	39	2.79	+ 1.23	1.95	7.4	9	12	4	14	n.w.
<i>Northeast District</i>																			
Decorah	Winneshiek	872	35	36.6	+ 1.9	60	5	9	26	2.68	+ 0.84	0.65	4.0	10	10	3	17	n.w.	M. D. Whitney U. S. Weather Bureau R. Z. Latimer Dr. Geo. Boody Mrs. Mary Spinner
Dubuque	Dubuque	700	55	39.2	+ 2.2	64	15	17	25	4.88	+ 3.18	1.54	4.5	12	8	5	17	n.w.	
Fayette	Fayette	1,003	40	37.6	+ 3.5	62	11†	15	25	5.16	+ 3.44	1.20	13.5	9	11	3	16	n.w.	
Independence	Buchanan	956	64	39.4	+ 2.9	68	15	21	26	5.10	+ 3.66	1.07	11.0	11	10	3	17	sw.	
Lansing	Allamakee	632	21							2.98	+ 1.03	0.56	8.0	10				sw.	
<i>Means and extremes</i>																			
				37.7	+ 2.4	64	15	9	26	37	4.53	+ 2.85	1.80	8.0	10	11	4	15	n.w.
<i>West Central District</i>																			
Audubon (near)	Audubon	1,297	33	37.5	+ 2.7	65	15	11	25	4.05	+ 2.72	1.20	18.0	10	15	5	10	n.w.	George Kibby Mrs. Jos. J. Wolfe V. L. Byers H. A. Stafford Walter Bell
Carroll	Carroll	1,265	38	37.6	+ 1.5	62	14	13	25	2.39	+ 1.07	0.95	5.5	8	18	3	9	n.w.	
Denison	Crawford	1,171	34	37.5	+ 1.9	61	14	12	25	1.36	+ 0.01	0.81	4.5	7	9	9	12	n.w.	
Guthrie Center	Guthrie	1,077	33															n.w.	
Harlan	Shelby	1,192	29	37.7	+ 1.9	62	14†	12	25	3.35	+ 1.89	1.08	11.5	9	14	3	13	n.w.	
<i>Means and extremes</i>																			
				37.7	+ 1.9	62	14†	12	25	31	3.35	+ 1.89	1.08	11.5	9	14	3	13	n.w.
Jefferson	Greene	1,052	29	39.0	+ 2.8	64	11†	14	25	3.52	+ 1.59	1.03	10.0	7	16	3	11	sw.	W. I. Lyon H. W. Kerr Amy Ann Stern Mrs. H. E. Colby A. W. McIsaac
Little Sioux	Harrison	1,040	23	39.1	+ 2.6	64	11	10	25	2.24	+ 0.67	1.36	5.0	6	14	5	11	n.w.	
Logan	Harrison	1,120	61	39.6	+ 2.3	63	14†	15	31	2.33	+ 0.93	1.07	11.0	6	14	10	6	n.w.	
Onawa	Monona	1,051	27	38.1	+ 2.3	63	13	13	25	1.68	+ 0.30	1.06	5.0	5	17	3	10	s.	
Rockwell City	Calhoun	1,232	32	37.2	+ 1.5	62	14	13	25	2.08	+ 0.38	0.90	9.0	7	12	8	10	n.w.	
<i>Means and extremes</i>																			
				38.0	+ 2.0	65	15	10	25	33	2.21	+ 0.78	1.36	8.1	7	14	6	10	n.w.
<i>Central District</i>																			
Ames	Story	926	51	40.2	+ 4.3	67	11	16	25	4.21	+ 2.93	1.20	12.0	10	15	0	15	n.w.	Iowa State College Otto Sanderman C. F. Henning U. S. Weather Bureau Samuel Sampson
Baxter	Jasper	998	28	38.7	+ 1.5	66	15	12	25	4.14	+ 2.71	0.90	8.6	10	9	8	13	sw.	
Boone (near)	Boone	894	23	39.1	+ 2.5	66	15	15	25	4.54	+ 3.17	1.17	15.0	10	11	6	13	n.	
Des Moines	Polk	861	50	40.4	+ 2.0	67	15	17	25	4.62	+ 3.19	1.20	8.4	10	11	5	14	n.w.	
Fort Dodge	Webster	1,114	28	37.6	+ 2.3	62	11†	13	25	2.97	+ 1.39	1.03	2.5	9	16	3	11	sw.	
<i>Means and extremes</i>																			
				38.8	+ 1.9	67	11†	12	25	36	4.06	+ 2.55	1.59	10.4	10	13	4	13	n.w.
Grinnell	Poweshiek	1,031	34	38.8	+ 1.1	66	15	13	25	2.93	+ 1.24	0.55	5.0	13	14	0	16	n.w.	R. E. Bates M. G. Heiberger C. H. Gilbert C. C. Pigman J. A. Dibel
Grundy Center	Grundy	976	37	38.1	+ 1.8	63	15	14	25	4.95	+ 3.51	1.25	19.0	9	8	6	16	n.	
Iowa Falls	Hardin	1,127	35	37.2	+ 1.9	62	15	14	25	3.89	+ 2.29	0.80	13.0	8	13	5	12	n.w.	
Marshalltown	Marshall	947	36	38.8	+ 1.4	66	15	14	25	5.30	+ 3.78	1.39	12.7	12	13	3	14	n.w.	
Monroe	Jasper	922	16	39.8	+ 0.8	67	15	14	25	3.03	+ 1.53	1.16	6.5	9	15	2	13	w.	
<i>Means and extremes</i>																			
				38.8	+ 1.9	67	15	14	25	35	3.03	+ 1.53	1.16	6.5	9	15	2	13	w.
Perry	Dallas	975	27	38.6	+ 1.6	65	15	15	25	3.22	+ 1.70	1.59	15.0	9	16	3	11	sw.	Eugene N. Hastie H. P. Giger Calvin K. Smith Samuel F. Foft Frank A. Bonebright
Toledo	Tama	847	34	39.0	+ 1.1	66	15	14	25	4.75	+ 3.15	0.95	8.0	12	13	3	14	s.	
Van Meter	Dallas	872	9							5.35		1.00	13.0	11				sw.	
Wauke	Dallas	1,033	25	40.0	+ 2.9	66	14	13	25	4.01	+ 2.44	1.30	10.9	9	14	6	10	sw.	
Webster City	Hamilton	1,042	23	37.0	+ 1.4	65	15	13	25	2.96	+ 1.35	0.83	6.5	8	16	3	11	n.w.	
<i>Means and extremes</i>																			
				38.8	+ 1.9	67	15	13	25	36	4.06	+ 2.55	1.59	10.4	10	13	4	13	n.w.

Climatological Data for November, 1928—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		
East Central District																						
Belle Plaine	Benton	866	38	39.4	+ 2.4	68	15	13	25	35	4.83	+ 3.14	1.18	10.7	14	7	8	15	n.w.	O. C. Burrows J. T. Wurster Dr. A. P. Bryant U. S. Weather Bureau Rex Shriver		
Cedar Rapids	Linn	737	46	39.2	+ 2.8	63	11	17	25	33	4.71	+ 3.06	1.76	2.0	9	11	1	18	n.			
Clinton	Clinton	595	55	40.8	+ 2.9	69	15	16	25	30	4.74	+ 2.85	2.03	0.6	11	11	2	17	n.w.			
Davenport	Scott	580	57	41.4	+ 2.4	67	15	17	25	26	4.29	+ 2.47	2.37	0.6	13	9	4	17	sw.			
Davenport, No. 2	Scott	690	3	41.5		70	15	16	25	31	4.50		2.18	0.2	12	12	2	16	n.w.			
Fairport	Muscatine	567	7	41.6	+ 2.4	61	15	15	25	29	3.72	+ 1.72	2.00	T.	13	11	1	18	s.		Bureau of Fisheries Prof. J. F. Reilly Margaret T. Disney John Strothoff William Molis	
Iowa City	Johnson	733	68	40.4	+ 2.8	68	15	17	25	31	4.27	+ 2.10	2.08	0.5	11	11	6	13	n.w.			
Le Claire	Scott	576	28																			
Maquoketa (near)	Jackson	692	23	39.0	+ 3.2	66	15	14	25	31	4.88	+ 3.30	1.75	1.0	11	12	1	17	n.w.			
Muscatine	Muscatine	546	67																			
Olin	Jones	760	29	39.6	+ 3.3	65	15	16	25	30	4.54	+ 2.92	2.25	6.5	9	12	3	15	n.w.	Mrs. L. Stingley John Kroepfen Dr. F. C. Schadt		
Tipton (near)	Cedar	807	29	40.4	+ 3.0	65	15	15	25	33	5.34	+ 3.47	1.96		11	9	6	15	n.w.			
Williamsburg	Iowa	770	12	39.1	+ 2.6	66	15	15	25	38	4.42	+ 2.72	1.83	1.6	12	11	8	11	n.w.			
Means and extremes						40.2	+ 2.9	70	15	13	25	38	4.57	+ 2.73	2.37	2.4	11	10	4	16	n.w.	
Southwest District																						
Atlantic	Cass	1,164	37	38.8	+ 1.3	64	15	12	25	29	4.81	+ 3.51	1.20	20.5	12	10	5	15	sw.	T. H. Whitney Arthur L. Bishop Dr. H. C. Hawley C. A. Smith Carl E. Pollock		
Bedford	Taylor	1,200									5.69	+ 4.12	1.77	10.7	8	15	4	11	n.w.			
Clarinda	Page	1,009	38	40.6	+ 0.9	68	15	13	25	37	5.16	+ 3.64	1.24	9.0	14	18	7	5	n.w.			
Corning	Adams	1,150	36			67	14	11	25	38	4.02	+ 2.55	0.85	13.5	9	17	2	11	sw.			
Cumberland (near)	Cass	1,225	29								4.75	+ 3.66	1.09	18.0	9	15	2	13	sw.			
Glenwood	Mills	1,100	30	40.7	+ 2.1	64	15	14	25	28	5.74	+ 4.59	1.74	10.0	9	14	5	11	n.w.			
Lenox	Taylor	1,250	33	39.5	+ 1.3	65	11†	13	25	36	4.81	+ 3.34	1.27	14.5	10	16	3	11	n.w.			
Oakland	Pottawattamie	1,139	9	40.6	+ 3.1	69	15	12	25	33	4.55	+ 3.30	1.05	11.0	7	15	1	14	n.w.			
Red Oak (near)	Montgomery	1,030	3								4.95	+ 3.53	1.86	9.0	8	2	21	7	sw.			
Riverton (near)	Fremont	920	2								4.44	+ 2.95	1.38	4.9	9	13	2	15	n.			
Thurman	Fremont	960	31	41.2	+ 2.8	66	14†	14	25	33	4.70	+ 2.85	1.69	4.5	7	15	3	12	n.	H. H. Askew U. S. Weather Bureau		
Omaha, Neb.		1,105	57	40.6	+ 2.1	65	15	18	25	25	2.87	+ 1.80	0.86	15.8	8	12	9	9	n.w.			
Means and extremes						40.3	+ 2.1	69	15	11	25	38	4.71	+ 3.32	1.86	11.8	9	14	5	11	n.w.	
South Central District																						
Afton	Union	1,212	34	40.1	+ 1.6	67	15	15	25	31	5.99	+ 4.56	1.47	17.0	12	14	4	12	sw.	S. R. Brown O. E. McBride Thomas Wood C. C. Burr J. C. Davis		
Albia	Monroe	949	30	40.8	+ 2.6	69	15	16	25	31	5.01	+ 3.45	2.18	0.4	10	14	2	14	sw.			
Centerville	Appanoose	1,013	23	41.4	+ 1.9	70	15	16	25	31	5.96	+ 4.52	2.54	0.7	12	12	3	15	n.w.			
Chariton (near)	Lucas	1,042	33	40.9	+ 2.2	67	15	15	25	34	3.66	+ 2.20	1.12	2.0	7	14	3	13	sw.			
Corydon (near)	Wayne	1,050	35	41.0	+ 2.2	65	14	16	25	28	5.63	+ 4.13	2.48	0.5	10	14	3	13	n.w.			
Creston	Union	1,291	23	39.2	+ 1.0	65	14†	14	25	34	4.80	+ 3.08	1.09	13.0	12	14	4	12	s.			
Earlham (near)	Madison	1,126	26	38.8	+ 1.6	66	15	14	25	30	4.91	+ 3.25	1.50	22.5	9	16	1	13	sw.			
Indianola	Warren	972	37	40.2	+ 1.9	68	15	15	25	32	3.66	+ 2.09	1.32	7.0	9	15	4	11	n.w.			
Knoxville	Marion	920	33	40.6	+ 1.8	68	15	17	25	33	4.60	+ 3.04	1.70	4.0	12	13	2	15	n.w.			
Lacona	Warren	824	29								4.63	+ 2.95	1.10	6.0	13	12	5	13	n.w.			
Lamoni	Decatur	1,123	21	40.4	+ 1.7	69	15	13	25	33	5.92	+ 3.48	1.63	4.6	12	15	3	12	n.w.	Mrs. N. Spangler George Phillips Seth F. Shenton W. J. Casey J. B. Alter		
Mount Ayr	Ringgold	1,220	35	40.6	+ 1.8	65	14	14	25	33	6.83	+ 5.29	1.94	10.5	8	17	3	10	n.			
Pella (near)	Marion	850	1																			
Tingley	Ringgold	1,275	3	38.8	+ 0.4	65	14†	12	25	33	5.48	+ 4.01	1.17	6.5	9	15	4	11	sw.			
Winterset	Madison	1,118	37	40.5	+ 2.1	67	15	14	25	29	5.23	+ 3.76	1.53	20.0	11	15	3	12	ne.			
Means and extremes						40.3	+ 1.8	70	15	12	25	34	5.16	+ 3.62	2.54	8.2	10	14	3		13	n.w.
Southeast District																						
Bonaparte (near)	Van Buren	563	37	40.8	+ 1.2	66	15	17	25	31	5.03	+ 3.23	2.30	1.0	9	13	3	14	n.w.		B. R. Vale John T. Donnelly Miss Musa Todd R. M. McKenzie U. S. Weather Bureau	
Burlington	Des Moines	544	32	42.0	+ 0.9	65	15	19	25	26	5.86	+ 4.00	2.61	T.	13	13	2	15	n.w.			
Columbus Junction	Louisa	595	27	41.1	+ 1.5	67	15	15	25	31	4.62	+ 2.88	2.32	0.2	12	10	7	13	sw.			
Fairfield	Jefferson	780	44	40.4	+ 1.9	67	15	16	25	33	4.48	+ 2.32	1.88	0.3	13	14	0	16	n.			
Keokuk	Lee	614	57	42.9	+ 1.8	69	15	20	25	26	5.18	+ 3.24	3.18	0.3	10	10	4	16	s.			
Keosauqua	Van Buren	644	36	41.5	+ 2.5	68	15	19	25	33	5.68	+ 4.07	2.14	0.5	11	12	4	14	se.			
Mt. Pleasant	Henry	730	47	42.0	+ 2.3	69	15	17	25	31	4.74	+ 2.93	2.05	T.	9	11	5	14	n.w.			
Oskaloosa	Mahaska	835	52	40.0	+ 1.5	67	15	13	25†	33	4.95	+ 3.35	1.98	5.0	13	11	5	14	n.w.			
Ottumwa	Wapello	649	33	41.9	+ 1.7	69	15	18	26	33	4.32	+ 2.94	1.89	0.5	9	13	3	14	n.w.			
Sigourney (near)	Keokuk	790	32	39.8	+ 1.6	68	15	16	25	31	3.99	+ 2.34	1.42	0.2	9	12	4	14	n.w.			
Stockport (near)	Van Buren	747	26	40.9	+ 2.5	69	15	17	25†	32	5.15	+ 3.51	1.68	1.5	15	15	1	14	s.	C. L. Beswick D. D. Sherman H. G. Liddle		
Washington	Washington	757	46	41.2	+ 2.5	70	15	15	25	34	5.18	+ 3.51	2.12	T.	9	11	5	14	ne.			
Wever	Lee	552		41.0		64	11	23	23†	29	6.02		3.28	0	13	13	1	16	n.			
Means and extremes						41.2	+ 1.8	70	15	13	25†	34	5.02	+ 3.28	3.28	0.7	11	12	3	15	n.w.	
State means and extremes						38.7	+ 2.1	70	15	8	3†	39	3.83	+ 2.28	3.28	6.9	9	13	4	13	n.w.	

Temperature normals are based on the 46-year period July 3, 1875 to July 2, 1921; shorter records corrected to harmonize. Precipitation normals are based on the 50-year period ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1920 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.
 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.

TEMPERATURE

The mean temperature for the State, derived from the means of nine districts of nearly equal area, and based on the records of 103 stations, was 38.7°, or 2.1° higher than the normal. The excess was general throughout the State and more uniform than usual. The range by districts was 0.6°, being greatest in the northeastern district, where the excess was 2.4°, and least in the southeastern and south-central districts, where it was 1.8°. The highest monthly mean was 42.9° at Keokuk, and the lowest was 34.5° at Inwood and Rock Rapids. The absolute range for the State was 62°, ranging

from 70°, at Centerville, Davenport, No. 2 and Washington on the 15th, to 8° at Inwood on the 3d and 25th and Sanborn on the 25th. The absolute range for the month was the least since 1885. The average number of days on which the maximum temperature did not go higher than 32° was 2 and the greatest number was 3 in the north-central district, and least in the southwestern and south-central districts where the total number for this entire area was only 4. The average number of days on which the temperature was 32°, or lower, was 20, the greatest average being 23 in the north-central district and least in the southeastern district with an average of 14; for individual stations the extreme range was from 28 days at Estherville to 9 at Davenport and Keokuk.

Daily Precipitation for November, 1928

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>Northwest District</i>																																						
Akron	Big Sioux	.52	.09				.18								.10																			0.89				
Alta	Raccoon	.95	.40				.84								.27		.12																	2.58				
Alton	Floyd	.50					.22								.15						T.													0.87				
Cherokee	Little Sioux	.69	.08				.50								.49		.07	T.			T.													1.83				
Estherville	Des Moines	.45					.70				.10				.20																			1.45				
Hawarden	Big Sioux	.55	.02				.15								.17																			0.89				
Inwood (near)	Big Sioux	.42	T.				.26								.21																			0.89				
Lake Park (near)	Little Sioux	.36					.21			T.					.20																			0.77				
Le Mars	Floyd	1.44	.20				.34				T.				.07																			2.05				
Marathon	Raccoon	.47	.12				.67	T.	T.	T.			.02		.06	.04	T.	T.	T.									T.	T.				1.44					
Pocahontas	Des Moines	.67	.35				.55		.05	T.					.12	.16	.02	.04														.01		1.97				
Rock Rapids	Big Sioux	.42					.26								.16																			0.84				
Sanborn	Floyd	.45					.48								.15	.03																		1.11				
Sheldon	Floyd	.50	T.				.37			T.					.13	T.																		1.00				
Sioux Center	Floyd	.50					.21								.12																			0.85				
Spencer	Little Sioux	.30	.20				.60		.01						.12																			1.23				
Storm Lake	Raccoon	.99	.40				.63								.19		.01	.07																2.29				
Washta	Little Sioux	1.25	.20				.53								.10		.12																	2.20				
West Bend	Des Moines	.85	.20				.88		.11						.11		.04	T.														.08		2.27				
<i>North Central District</i>																																						
Algona	Des Moines	.90	.89				.39		.18						.09			.10													.09			2.64				
Allison	Cedar	.50	.80	T.			.46		.15						.10		.33	.39			T.											.25		2.98				
Belmond	Iowa	.57	.57				1.40		.13	.13					.10		.21	.45														.05		3.63				
Britt	Iowa	.20	.20	.30			1.95	.10	.08						.10	.08	.06	.19																3.28				
Charles City***	Cedar	.63	.69				.66		.13						.04		.82	.49			.01	T.	T.											3.47				
Forest City	Cedar	.55	.40	.08			.80		.08						.10	.02	T.	.14	.02	.12	T.	.04												2.35				
Hampton	Cedar	* 1.20					.20	.07	.15						.06		.83	.31			T.											.34		3.16				
Humboldt	Des Moines	.96	.26				.81		T.						.18		.19	.12			T.													2.52				
Mason City	Cedar	.52	.42	.08			.74		.15						.13		.15	.23			T.													2.42				
Northwood	Cedar	.65	.40				.80		.13	T.					.13		.04	.10	.05															2.30				
Osage	Cedar	.32	.20	.10			.74		.09	.02					.04		.27	.17	.03															1.98				
<i>Northeast District</i>																																						
Decorah	Mississippi	.52	.28	.03			.65		.09						.03		.63	.33														.02	T.	.10	2.68			
Dubuque***	Mississippi	.64	.60				.67		.05	T.					.15	.14	.65	1.16			T.		.01	T.	T.						.02	T.	.28	.51	4.88			
Fayette	Mississippi	.52	1.03	.18			.75		.11						.04		.41	1.20																.92	5.16			
Independence	Wapsipinicon	.56	1.07	.26			.82		.11						.13	.12	.41	1.51																1.00	5.10			
Lansing|||	Mississippi	T.	.55	.09			.45	.23	.07						.06		.27	.26	.56															.44	2.98			
New Hampton	Wapsipinicon	.70	1.40	.40			.80		.40						.40		.60	1.80																.10	6.60			
Oelwein	Wapsipinicon	.40	.27				.78		.06						.04		.35	.42																.70	3.02			
Postville (near)	Mississippi	.80	1.50	.60			.75		.10						.02		.75	.90																.90	6.32			
Waterloo	Cedar	.80	1.50	.60			.75		.10						.02		.75	.90																.90	6.32			
Waverly	Cedar	.33	1.04	.12			.56		.10	.03					.05		.28	.52	.28															.70	4.04			
<i>West Central District</i>																																						
Audubon (near)	Nishnabotna	1.20	.40	.20	T.		.07		.11						.15		.69	.12																	4.05			
Carroll	Raccoon	.95	.62				.05		.08						.03		.10	.36																.20	2.39			
Denison	Missouri	.81	.10				.13								.13		.12	.05																.02	1.36			
Guthrie Center	Raccoon																																					
Harlan	Nishnabotna	1.08	.25				.09		.06						.20		.52	.30																	.15	.70	3.35	
Jefferson	Raccoon	1.03	.46	T.			.10		.14						T.		.47	.42	T.																.90	3.52		
Little Sioux	Little Sioux	1.36	.50				.10								.08		.18	.02																		2.24		
Logan	Missouri	1.07	.48				T.								.03		.20	.06																	.49	2.33		
Onawa	Missouri	1.06	.30				.10								T.		.20	.02																		1.68		
Rockwell City	Raccoon	.90	.60				.08		.05						.20		.10	.15																		2.08		
Sac City	Raccoon	.67	.20				.32								.15		.14	.10																		1.58		
Sioux City***	Missouri	.64	.03				.08	.12		T.					.01		T.																			0.88		
<i>Central District</i>																																						
Ames	Skunk	1.04	.50	.14			.24		.11						.07		.31	.60																		4.21		
Baxter	Skunk	.80	.45	.15			T.		.08						.18		.75	.90	.08																.05	.70	4.14	
Boone (near)	Des Moines	.99	.80	.05			.23		.12						.22		.18	.75			.03														T.	1.17	4.54	
Des Moines***	Des Moines	1.03	.98				.07		.10						.07		.44	.87	T.		.01	T.													.94	T.	4.62	
Fort Dodge	Des Moines	1.03	.55	.18			.31		.11						.16	.30	.08	.25																			2.97	
Grinnell	Iowa	.30	.36	.34			.25		.10	.05					.22		.18	.55																	.06	.20	.24	2.93
Grundy Center	Cedar	.25	1.25	.30			.65		.25						.20		.45	.60																		1.00	4.95	
Iowa Falls	Iowa	.75	.65				.35		.30						.24		.25	.55																		.80	3.89	
Marshalltown	Iowa	1.02	1.39	.02			.26		.10	.03					.12		.62	.92																		.67	5.30	
Monroe	Des Moines	.64	T.				.06		.09						.12		.24	1.16	T.	T.	T.														.58	3.03		
Perry	Raccoon	.58	.25				.01		.16						.13																							

Daily Precipitation for November, 1928—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		
Southwest District																																		
Atlantic	Nishnabotna	1.01	.45	.03				.05		.07					.20		.99	.65		.15								T.	.01	.70	.50		4.81	
Bedford	102	.84	1.40							.10					.18		.44	1.77										T.		.45	.51		5.69	
Clarinda	Nodaway	1.24	.72	.14				.03		.12					.32		.49	1.01		.07	.02							.07	.03	.20	.70		5.16	
Corning	Nodaway	.48	.42	.70				.05		.10					.27		.50	.65													.85		4.02	
Cumberland (nr.)	Nodaway	.75	.61	T.				.01		.08					.21		1.09	.75			T.							T.		.35	.90		4.75	
Glenwood	Missouri	1.74	.44							.02					.22		.92	1.32												.60	.42		5.74	
Lenox	Missouri	1.08	.85							.10					.15		.37	1.27										.02	.02	.10	.85		4.81	
Oakland	Nishnabotna	1.05	.64												.38		.91	.42												.75	.40		4.55	
Red Oak (near)	Nishnabotna	1.86	.43							.14					.43		.86	.84												.25	.14		4.95	
Riverton (near)	Nishnabotna	1.38	.89							T.					.18		.91				T.							.13	.01	.46	.36		4.44	
Thurman	Missouri	1.69	.47							T.					.41		1.00	.44										T.	T.	.50	.19		4.70	
Omaha, Neb., ***	Missouri	.68	.49							T.					.23		.08	.26	.21		T.							T.	T.	.86			2.87	
South Central District																																		
Afton	Grand	1.32	1.47							.02					.05		.40	1.25			.01							.03	.04	.34	.90		5.99	
Albia	Des Moines	.42	.91	.03						.01					.27		.45	2.18		T.	T.									.06	.54		5.01	
Centerville	Chariton	.92	.45	.05						.02					.19		1.16	2.54		T.	T.							.03	.04	.41	.02		5.96	
Chariton (near)	Chariton	.50	.58							T.					.20		.30	1.12		T.	T.									T.	.74		3.66	
Corydon (near)	Chariton	.56	1.00							.02					.25		.60	2.48			.02							T.	*	.58		5.03		
Creston	Missouri	.98	.89							T.	T.				.08		.45	1.09		T.	T.							.05	.02	.72	.37		4.80	
Earlham (near)	Des Moines	1.04	.60	.05						T.					.25		.44	.62		T.	T.							T.	T.	.10	1.40		4.91	
Indianola	Des Moines	.74	1.32	T.						T.					.13		.39	.13		T.	T.							.06	.24	.58		3.66		
Knoxville	Des Moines	.40	.87	.10						.05					.22		.27	1.70			.04							.03	T.	.15	.70		4.60	
Lacna	Des Moines	.45	1.10	.28						.03					.28		.60	.92			.10							.05	.03	.40	.30		4.63	
Lamoni	Grand	.98	1.06							.02					.11		.79	1.63		.01	.01								.01	.85	.22		5.92	
Mount Ayr	Grand	1.14	1.02							.12					.12		.39	1.94											T.	1.55	.55		6.83	
Pella (near)	Des Moines																																	
Tingley	Platte	1.17	.91							T.					.17		1.10	.80		T.									.04	T.	.21	.91		5.18
Winterset	Des Moines	1.01	1.53							.02					.10		.62	.65										.15	.03	.12	.70		5.23	
Southeast District																																		
Bonaparte (near)	Des Moines	.35	.76	.02						T.					.17		1.10	2.30			.10	T.									.17		5.03	
Burlington	Mississippi	.52	.69	.05						.12					.38		1.06	2.61		T.	.06	.03						T.	.02	.03	.26		5.86	
Columbus Jct.	Iowa	.31	.50	.03						.04					.23		.64	2.32		T.	.07	.02						.02	T.		.37		4.62	
Fairfield	Skunk	.23	.58	.03						.03					.16		1.12	1.88		.01	.08								.02	.20		4.48		
Keokuk***	Mississippi	.45	.49	T.						.05					.39		2.57	1.01		T.	.03	T.						.04		.14	T.		5.18	
Keosauqua	Des Moines	.35	.55	.59						.02					.12		1.30	2.14			.09									.41		5.68		
Mt. Pleasant	Skunk	.38	.58	.04						.04					.36		.94	2.05			.07	T.								.28		4.74		
Oskaloosa	Des Moines	.36	1.05	.05						.06					.52		.25	1.98		.02	.04								T.	T.	.07	.46		4.95
Ottumwa	Des Moines	.38	.60	.03						T.					.12		.70	1.89		T.	T.								T.	T.	.02	.50		4.32
Sigourney (near)	Skunk	.30	.95	.05						.02					.18		.38	1.42			T.								T.	T.	.60		3.99	
Stockport (near)	Skunk	.42	.62	.04						.04					.09		1.68	1.54		.08	.15	.03							.07	T.	.12	.16		5.15
Washington	Skunk	.63	.67							.06					.08		1.08	2.12		T.	T.								.01		.50		5.18	
Wever	Mississippi	.55	.68	.11						.05					.34	.24	.45	3.28		.02	.01							T.		.10	.17		6.02	

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.

T. Precipitation is less than .01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE

PRECIPITATION

Stations	Barometric Pressure, Inches (Sea Level)				Relative Humidity, %				Wind				Sunshine				
	Mean	Highest	Date	Lowest	Mean				Total movement	Average hourly velocity		% possible Departure from normal					
					7 A. M.	12 Noon	7 P. M.	Lowest		Miles	From			Date			
Chas. City	30.10	30.70	25	29.42	14	84	72	80	30	6	4,942	6.9	27	sw.	14	41	-6
Davenport	30.08	30.65	25	29.53	17	80	66	72	30	4	5,258	7.3	26	s.	14	44	-6
Des Moines	30.09	30.73	25	29.49	14	84	69	72	38	26	5,317	7.4	37	sw.	14	52	-11
Dubuque	30.07	30.65	25	29.60	17	80	66	73	35	6†	5,058	7.0	24	nw.	21	35	-11
Keokuk	30.11	30.71	25	29.57	17	80	63	72	31	25	5,479	7.6	31	s.	14	46	-5
Sioux City	30.12	30.78	25	29.28	14	82	69	70	39	21	8,303	11.5	45	sw.	14	52	-1
Omaha, Nb.	30.11	30.78	25	29.40	14	79	65	65	36	21	6,089	8.5	28	n.	17	54	-1
Means and extremes	30.10					81	67	72				8.0				46	-5
Normals and records	30.07		2d	28th	81		72		6th				45	sw.	14		
		*30.96	1896	§29.03	1918				¶16	1916			||51	sw.	1919		

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

††January 1, 1928, 3-cup anemometers replaced the 4-cup instruments used since the establishment of the Weather Bureau stations. The new instruments will more accurately indicate the true wind movement. The records of the 4-cup instruments were somewhat too high at moderate velocities and considerably too high at the higher velocities. Tables of true velocities corresponding to indicated velocities appear in the January, 1928 Climatological Data. For purposes of comparison the highest velocity of record in the lower line of the table has been converted into a 3-cup velocity.

The average precipitation for the State, derived from the averages of nine districts of nearly equal area, and based on the records of 115 stations was 3.83 inches, or 2.28 inches more than the normal. The excess was greatest in the south-central district and least in the northwestern district, where it amounted to only 0.14 inch. The excess was less than one inch in the west-central district but throughout the rest of the State it was pronounced. The total in the three southern districts was more than three times the November normal. The greatest monthly amount was 6.83 inches at Mount Ayr and the least was 0.77 inch as Lake Park. The greatest amount occurring in 24 consecutive hours was 3.28 inches at Wever on the 17th. There were three rainy periods, occurring on the 1st, 7th and 14th, that covered the entire State but the storms that produced the heaviest rains missed the northern and much of the western portions. The average rainfall for the State was the greatest since 1909 and only one other time since 1873 has a greater average amount been recorded in November.

MISCELLANEOUS PHENOMENA

Fog: 7th, 9th, 10th, 12th, 15th, 16th, 27th, 28th, 29th.

Hail: 14th.

Halos (lunar and solar): 8th, 13th, 15th, 20th, 23d, 26th.

Haze: 28th, 29th.

Sleet: 2d, 3d, 17th, 20th, 21st, 27th, 28th, 29th, 30th.

Thunderstorms: 1st, 2d, 14th, 15th, 16th.

Tornado: 14th.

Daily Maximum and Minimum Temperature for the Month of November, 1928

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
<i>Northern Division</i>																																
Algona.....	(Maximum.....	43	32	49	50	50	55	50	43	37	51	58	48	56	60	54	43	53	36	35	34	48	40	50	43	32	46	41	38	28	40	44.4
	(Minimum.....	30	26	20	25	22	30	40	26	32	36	30	26	35	50	39	35	34	31	24	26	32	27	25	25	12	21	33	27	23	23	28.8
Alta.....	(Maximum.....	33	31	37	43	46	52	48	44	43	55	57	49	59	60	56	39	34	33	37	35	49	40	50	37	33	46	37	36	25	44	42.9
	(Minimum.....	27	23	18	20	34	28	35	29	35	34	38	27	40	47	37	34	31	27	26	24	34	26	16	12	21	30	25	23	22	28.3	
Alton.....	(Maximum.....	34	31	32	38	43	49	50	44	42	50	57	49	60	60	50	43	36	35	38	38	49	42	50	40	31	45	40	37	26	41	42.7
	(Minimum.....	28	24	18	15	30	27	42	27	36	35	32	25	40	47	36	35	30	28	25	34	26	23	20	12	22	30	25	23	18	28.1	
Belmond.....	(Maximum.....	42	33	38	44	53	58	49	44	47	37	54	61	45	55	60	41	43	37	35	32	48	38	51	39	33	46	38	35	30	37	43.6
	(Minimum.....	32	29	21	17	35	30	37	28	29	36	34	29	34	48	40	36	32	26	24	26	32	23	23	22	10	20	33	27	22	28.7	
Charles City.....	(Maximum.....	41	35	41	47	56	58	48	40	36	52	60	45	53	60	57	42	37	34	33	32	46	35	49	36	29	46	35	37	31	29	42.7
	(Minimum.....	32	31	25	23	33	32	35	30	29	35	35	32	35	48	40	37	32	29	25	27	31	25	25	20	16	22	32	29	29	29.9	
Decorah.....	(Maximum.....	43	47	47	51	60	57	48	50	36	44	59	39	51	57	58	43	37	34	33	33	48	39	48	39	37	46	38	39	33	34	44.3
	(Minimum.....	32	32	28	23	33	30	35	29	30	33	34	32	33	47	39	37	32	31	25	25	28	25	22	26	15	9	21	29	29	22	28.9
Dubuque.....	(Maximum.....	44	41	51	54	60	59	52	43	38	42	59	47	53	59	64	49	39	38	36	32	47	38	50	39	30	46	39	40	38	33	45.3
	(Minimum.....	39	39	32	29	38	35	40	34	34	35	37	34	34	47	49	39	34	32	31	28	31	27	25	21	17	25	33	36	33	26	33.1
Forest City.....	(Maximum.....	45	35	33	45	52	57	47	48	41	52	61	48	52	57	58	43	40	35	34	33	49	44	53	45	39	47	49	40	30	33	44.8
	(Minimum.....	30	27	18	16	30	27	40	27	28	32	33	28	32	43	37	35	32	29	28	25	30	28	22	25	13	17	30	25	22	20	27.6
Independence.....	(Maximum.....	45	43	48	52	61	60	55	45	41	50	61	59	54	59	68	62	44	35	35	34	47	45	31	49	35	46	43	39	40	34	47.3
	(Minimum.....	32	34	36	26	33	32	41	31	30	35	34	33	31	44	44	40	32	32	29	28	26	31	23	28	23	21	29	33	31	22	31.5
Inwood.....	(Maximum.....	33	32	33	42	41	51	51	53	39	57	58	48	59	58	49	38	38	37	40	39	49	42	42	34	32	44	45	31	25	41	42.7
	(Minimum.....	27	23	8	16	26	28	35	23	36	38	34	23	39	44	33	32	30	28	22	24	34	24	26	17	8	20	29	24	21	17	26.3
Lake Park.....	(Maximum.....	38	32	39	45	49	57	50	50	42	52	56	46	58	57	50	44	38	36	35	34	48	39	52	38	35	43	41	38	25	43	43.7
	(Minimum.....	27	22	16	20	31	28	35	25	32	34	33	25	38	38	35	33	30	27	25	23	23	20	10	21	29	33	21	18	28	26.3	
Mason City.....	(Maximum.....	41	33	37	42	52	56	47	42	34	52	59	15	54	63	55	40	36	34	32	32	46	39	49	37	30	46	37	36	32	31	42.3
	(Minimum.....																															
New Hampton.....	(Maximum.....	32	29	19	17	34	31	38	28	27	33	33	30	32	49	38	35	32	31	24	26	31	26	23	23	13	20	33	28	27	22	28.8
	(Minimum.....	38	32	37	39	48	57	49	44	37	47	58	43	52	59	56	41	36	34	34	31	46	35	49	34	32	45	39	35	32	29	41.6
Northwood.....	(Maximum.....	26	28	20	20	27	31	37	32	30	25	36	30	30	48	39	34	32	30	25	26	27	22	25	22	13	20	31	30	25	21	28.1
	(Minimum.....	37	32	40	45	52	57	50	45	41	53	60	48	58	62	57	45	35	35	38	35	50	40	53	38	35	50	39	37	27	46	44.7
Pocahontas.....	(Maximum.....	30	25	23	22	32	29	37	27	33	36	32	26	37	37	32	35	32	28	25	27	27	27	23	23	13	20	32	27	23	23	28.0
	(Minimum.....																															
Postville.....	(Maximum.....	37	37	48	51	58	59	42	40	34	43	60	50	50	57	59	41	37	33	32	31	42	34	47	34	30	44	35	36	32	26	42.0
	(Minimum.....	32	32	28	25	32	30	36	31	31	34	35	32	34	47	39	35	32	29	24	25	28	21	22	20	14	22	31	30	22	29.1	
Rock Rapids.....	(Maximum.....	37	33	34	39	45	50	45	42	48	56	47	59	59	49	49	43	37	35	37	37	48	44	51	43	31	43	43	32	26	41	42.8
	(Minimum.....	27	22	13	16	25	26	29	25	35	34	27	22	39	47	33	33	30	29	25	24	33	26	25	23	10	20	27	24	20	17	26.2
<i>Central Division</i>																																
Belle Plaine.....	(Maximum.....	44	42	50	58	63	63	63	42	38	56	65	51	56	59	68	61	43	37	38	33	50	41	51	45	33	48	37	40	37	34	48.2
	(Minimum.....	38	33	30	21	34	28	41	26	28	36	37	29	34	47	42	42	32	33	29	27	29	25	20	28	13	17	32	32	31	25	30.6
Boone.....	(Maximum.....	42	36	44	55	61	60	53	47	40	58	63	54	58	65	66	52	39	36	37	35	52	45	55	42	35	49	42	41	34	32	47.6
	(Minimum.....	36	32	30	20	34	26	44	28	31	29	31	27	36	51	38	39	33	33	27	28	33	30	19	29	15	17	35	33	29	24	30.6
Carroll.....	(Maximum.....	39	33	36	48	54	57	52	46	43	53	60	52	60	62	61	49	36	33	37	35	51	42	51	44	33	46	39	37	35	41	45.5
	(Minimum.....	31	26	25	23	37	29	41	28	34	28	40	28	37	44	40	34	30	31	26	25	32	28	26	26	13	22	32	31	25	23	29.8
Cedar Rapids.....	(Maximum.....	44	43	51	51	61	61	53	43	40	49	63	50	55	58	60	56	45	37	38	34	48	42	53	40	31	47	47	41	39	37	46.9
	(Minimum.....	39	39	33	23	34	30	39	30	30	31	36	30	28	46	45	44	34	34	31	28	28	27	20	28	17	18	30	35	29	25	31.4
Davenport.....	(Maximum.....	47	46	54	55	59	60	55	44	40	46	61	49	55	62	67	61	45	40	39	33	49	40	50	41	31	46	39	42	40	39	47.8
	(Minimum.....	41	41	35	29	39	38	40	34	37	37	40	35	37	49	51	45	37	35	31	30	32	30	28	24	17	24	35	36	36	38	35.0
Des Moines.....	(Maximum.....	43	38	45	52	61	60	56	46	40	58	65	49	59	66																	

IOWA STORMS, NOVEMBER, 1928

Date	County	Township	Nature of Storm	Time	Storm Moved From	Width of Path Miles	Length of Path Miles	Area of Sq. Miles	Size of Hailstones Inches	Damage	Persons Killed	Persons Injured
14	Benton	Benton, Canton, Eden	Tornado	4:30 p. m.	SW to NE	$\frac{1}{8}$	10	$1\frac{1}{4}$	Small	\$50,000		7
14	Buchanan	Newton	Tornado	5:00 p. m.	SW to NE				Small	\$30,000		
14	Delaware	Adams, Coffins Grove, Delaware and Prairie	Tornado	5:15 p. m.	SW to NE	$\frac{1}{4}$	20	5	Small	\$70,000	1	2
14	Howard	Chester	Tornado	5:30 p. m.	SW to NE				Small	\$3,000		
14	Linn	Grant, Spring Grove and Washington	Tornado	4:50 p. m.	SW to NE	$\frac{1}{8}$	3	$\frac{3}{8}$	Small	\$50,000		
14	Floyd	Rock Grove	Tornado	4:00 p. m.	SW to NE				Chestnuts	\$2,000		

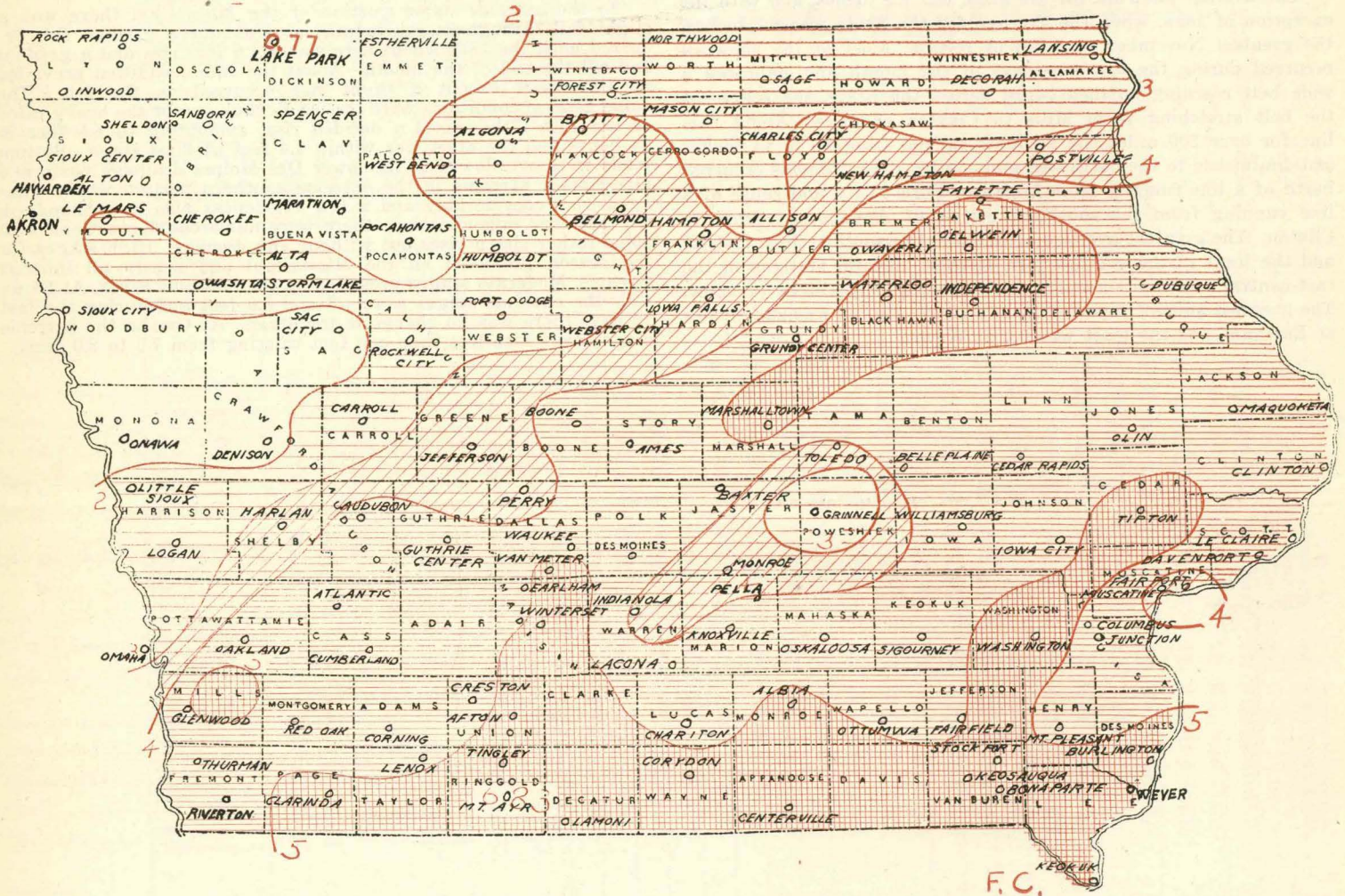
SNOWFALL

The average snowfall for the State was 6.9 inches, and with the exception of 1898, when the average for the State was 8.7 inches, the greatest November snowfall of record. Most of the snowfall occurred during the last two days of the month and embraced a wide belt reaching northeastward across the State, the center of the belt stretching from Mills to Clayton counties. Along this line for over 200 miles the amounts ranged from 10 to 14 inches and diminished to the northwest and southeast where none occurred north of a line running from Logan to Forest City and south of a line running from the southeast corner of Appanoose county to Clinton. The greatest average occurred in the southwestern district and the least in the southeastern district. Several stations in the east-central and southern districts reported only traces of snow. The greatest amount reported from a single station was 22.5 inches at Earlham, and the least was 0.0 at Wever.

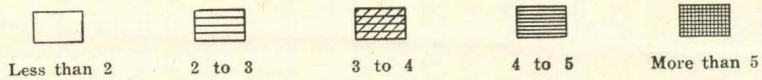
RIVERS

In the extreme upper portion of the Mississippi there was a slight fall throughout the month; at Dubuque a gradual fall occurred until the 18th when there was a 1.0 foot rise and a gradual fall till the end of the month. About the same condition prevailed at Davenport except a slight rise occurred on the 6th. The same general conditions were true at Keokuk except the heavy rains of the 16th-17th caused a decided rise, amounting to 5.5 feet in 24 hours and the crest was within 1.4 feet of flood stage. Bottom lands were overflowed in the lower Des Moines drainage basin and along other streams in the extreme southern portion which damaged corn considerably and a few residences also were damaged. On the other minor streams there were numerous fluctuations with some rather sharp rises but without any damage. High stages for the season prevailed on the Mississippi and nearly all interior streams. Moderate stages prevailed on the Missouri River. At Sioux City the extreme stages were 4.6 and 5.0 feet and during the last 10 days there was no change in the stage. At Omaha the extreme stages were also less than one foot ranging from 7.3 to 8.0 feet.

TOTAL PRECIPITATION, NOVEMBER, 1928



SCALE OF SHADES IN INCHES



CLIMATOLOGICAL DATA.

IOWA SECTION

In co-operation with

IOWA WEATHER AND CROP BUREAU

CHARLES D. REED, Senior Meteorologist

VOL. XXXIX DES MOINES, IOWA, DECEMBER, 1928 No. 12

GENERAL SUMMARY

Mild winter weather prevailed during the greater part of December, 1928. The mean temperature was 4.6° above normal and 10.0° warmer than last December. Also, it was the first time since 1923 that December has been warmer than normal. The first ten days were mostly rather cold, with an average daily deficiency of 6°. Zero weather was general over nearly all the State on the 5th, the lowest temperatures as a rule being in the central district where the snow cover was greatest. During the rest of the month the temperature was continuously above normal, except for a short period extending from the 19th to 21st. The mild weather that set in during the second week, in connection with the general heavy rain of the 13th, removed all frost from the ground and left the soil in a thoroughly saturated condition. This situation produced the worst possible condition as to mud. Dirt roads in all portions of the State were impassable to automobiles, graveled roads were badly cut up and unpaved streets in cities could not be used for about one week. A great many automobiles were temporarily abandoned where stranded. The situation was relieved by freezing weather that set in on the 19th, but all roads froze rough and, until worn down, travel was difficult. There was still considerable corn to gather in the eastern and southern portions of the state and this work had to be suspended on account of the soft condition of the fields.

There were no severe storms during the month, and only very light scattered precipitation after the 13th. The snow fall was unusually light and drifted very little. With the exception of 1922, the average for the State was the least in December since 1913. The ground was practically bare of snow after the 13th over the entire State. The ground was snow covered for an average of 7 days, ranging from 15 days at a few stations in the northwestern district to none at a few stations in the northeastern district. During the cold weather at the beginning of the month, most all streams froze and the ice was rather thick. The mild weather following the first cold period caused a break up in nearly all streams and for an extended period the streams were free of ice, a condition that rarely occurs after once frozen over.

Conditions were unusually favorable for building operations. Stock began the winter under conditions that were favorable, and there was very little sickness among farm animals.

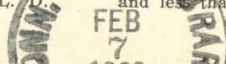
TEMPERATURE

The mean temperature for the State, derived from the means of nine districts of nearly equal area, and based on the records of 102 stations, was 28.7°, or 4.6° higher than the normal. The excess was general throughout the State. The excess was greatest in the northwestern district, amounting to 6.8°, and least in the southeastern district where it was 3.5°, making the departure range by districts 3.3°. The highest monthly mean was 33.4° at Ottumwa, and the lowest was 24.6° at Postville. The absolute range for the State was 72°, from 57° at Sioux City on the 27th to -15° at Perry on the 5th. The average number of days on which the maximum temperature did not exceed 32° was, 8. The greatest number occurred in the north-central district with an average of 11 and the least occurred in the southwestern district with an average of 5; the average number of days that the minimum was 32°, or lower was 26, ranging from 28 in the north-central to 25 in the east-central, south-central and southeastern districts; the average number of days of zero weather was 1. The average was 2 in the three northern and central districts; only three stations in the southwestern district reported zero, or lower. The greatest number was 5 at two stations and at one or more stations in all districts zero was not reached.

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
1873	22.6	-1.5	65	-10	2.51	+1.37	8.56	0.60					
1874	24.0	-0.1	60	-18	0.84	-0.30	3.22	0.10					
1875	30.0	+5.9	68	-18	2.06	+0.92	4.73	0.73					
1876	11.9	-12.2	56	-28	0.24	-0.90	1.40	0.00					
1877	36.8	+12.7	65	-11	2.18	+1.04	3.90	1.00					
1878	17.2	-6.9	52	-17	0.77	-0.37	2.78	0.10					
1879	16.1	-8.0	58	-35	1.40	+0.26	3.31	0.20					
1880	16.1	-8.0	55	-25	0.85	-0.29	2.50	0.06					
1881	33.8	+9.7	60	-10	1.24	+0.10	4.67	0.10					
1882	21.0	-3.1	54	-23	1.57	+0.43	3.50	0.48					
1883	24.8	+0.7	62	-21	1.03	+0.11	2.75	0.00					
1884	16.2	-7.9	59	-30	2.15	+1.01	4.42	0.70					
1885	24.6	+0.5	55	-22	1.45	+0.31	3.73	0.40					
1886	14.4	-9.7	55	-32	0.80	-0.34	1.64	0.10					
1887	20.3	-3.8	57	-25	2.17	+1.03	5.85	0.60					
1888	28.6	+4.5	66	-6	1.46	+0.32	2.90	0.25					
1889	35.8	+11.7	69	-2	1.06	-0.08	3.20	0.00					
1890	28.5	+4.4	68	-18	0.58	-0.56	2.72	0.00					
1891	32.3	+8.2	72	-14	2.41	+1.27	4.50	1.21					
1892	18.9	-5.2	68	-29	1.65	+0.51	3.04	0.20	10.9	6	14	9	8
1893	22.0	-2.1	70	-21	1.31	+0.17	2.80	0.46	7.6	7	10	9	12
1894	30.1	+6.0	73	-17	0.95	+0.19	1.75	0.25	1.3	3	15	6	10
1895	25.4	+1.3	63	-16	1.63	+0.49	5.74	0.00	4.1	5	11	9	11
1896	30.8	+6.7	70	-10	0.65	+0.49	1.79	T.	1.6	4	10	8	13
1897	18.0	-6.1	60	-25	1.65	+0.51	3.22	0.61	15.9	6	11	7	13
1898	18.1	-6.0	60	-25	0.48	-0.66	1.70	T.	3.9	3	15	8	8
1899	22.6	-1.5	75	-19	1.61	+0.47	4.28	0.10	4.3	5	12	9	10
1900	26.9	+2.8	63	-10	0.45	-0.69	2.70	T.	2.4	4	13	6	12
1901	20.5	-3.6	64	-31	0.93	-0.21	2.75	0.05	5.4	6	10	9	12
1902	20.1	-4.0	59	-20	2.23	+1.09	5.51	0.67	12.9	8	9	6	16
1903	19.6	-4.5	58	-27	0.41	-0.73	1.96	T.	3.7	4	11	9	11
1904	23.4	-0.7	67	-19	1.44	+0.30	3.68	0.06	12.3	5	12	7	12
1905	27.0	+2.9	62	-11	0.52	-0.62	1.69	T.	4.2	3	19	6	6
1906	25.7	+1.6	65	-9	1.43	+0.29	2.81	0.37	1.4	6	11	7	13
1907	28.8	+4.7	62	-9	1.00	-0.14	2.28	0.05	4.7	5	10	7	14
1908	27.2	+3.1	67	-17	0.57	-0.57	2.07	0.05	3.8	3	15	8	8
1909	15.1	-9.0	60	-26	2.18	+1.04	6.10	0.89	13.7	11	10	5	16
1910	23.4	+0.7	57	-14	0.37	-0.77	1.39	0.01	3.0	3	15	7	9
1911	27.9	+3.8	60	-24	2.37	+1.43	4.43	0.62	12.6	7	13	6	12
1912	29.2	+5.1	64	-13	0.74	-0.40	1.75	0.10	1.1	3	18	7	6
1913	32.0	+7.9	65	-13	1.02	-0.12	4.73	0.00	1.3	4	15	5	11
1914	15.7	-8.4	63	-31	1.30	+0.16	2.24	0.57	11.1	9	10	6	15
1915	25.0	+0.9	56	-10	0.69	-0.45	1.70	T.	4.6	5	11	8	12
1916	13.7	-5.4	67	-25	1.04	-0.10	2.00	0.35	6.7	6	15	8	8
1917	14.5	-9.6	62	-40	0.56	-0.58	1.70	0.14	6.7	6	10	9	12
1918	32.7	+8.6	68	-7	1.30	+0.16	3.30	0.37	5.1	8	9	8	14
1919	15.0	-9.1	52	-36	0.54	+0.60	1.55	0.08	5.8	4	11	7	13
1920	26.4	+2.3	65	-26	1.16	+0.02	2.42	0.26	7.4	5	10	8	13
1921	28.2	+4.1	69	-22	1.02	-0.12	3.72	T.	2.9	4	14	9	8
1922	24.0	-0.1	65	-25	0.37	-0.77	0.97	T.	2.2	3	16	7	8
1923	33.5	+9.4	68	-21	0.76	+0.38	2.22	T.	4.4	4	14	6	11
1924	15.4	-8.7	62	-33	1.79	+0.65	2.93	0.90	8.1	8	12	6	13
1925	21.0	-3.1	64	-25	1.30	+0.16	3.52	0.30	10.6	5	12	8	11
1926	21.9	-2.2	58	-21	1.06	-0.08	2.42	0.28	5.7	4	10	7	14
1927	18.7	-5.4	59	-22	1.04	-0.10	2.60	0.23	4.4	5	13	8	10
1928	28.7	+4.6	57	-15	0.89	-0.25	1.98	0.12	2.3	5	12	7	12

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



Climatological Data for December, 1928

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>Northwest District</i>																				
Akron.....	Plymouth.....	1,153	2																Orlan C. Moore	
Alta.....	Buena Vista.....	1,513	37	28.4	+ 7.0	50	27	- 1	5	29	0.58	- 0.33	0.30	2.5	6	13	8	10	D. E. Hadden	
Alton.....	Sioux.....	1,305	23	27.0	+ 6.2	49	27	-13	5	38	0.78	- 0.02	0.70	7.2	5	10	11	10	W. S. Slagle	
Cherokee.....	Cherokee.....	1,196	8	27.8	+ 7.3	50	27	- 3	5	32	0.42	- 0.40	0.22	3.7	7	12	8	11	J. E. Wirth	
Estherville.....	Emmet.....	1,298	33	27.0	+ 6.7	46	15	- 5	5	29	0.85	+ 0.14	0.60	7.0	3	10	15	6	A. O. Peterson	
<i>Hawarden</i>																				
Hawarden.....	Sioux.....	1,181	2																Earl V. Slife	
Inwood (near).....	Lyon.....	1,474	24	27.0	+ 7.6	52	27	-12	5	35	0.32	- 0.34	0.29	3.2	3	16	5	10	A. C. Hanson	
Lake Park (near).....	Dickinson.....	1,489	15	25.7	+ 6.2	48	12†	-14	5	45	0.86	+ 0.23	0.80	6.7	4	14	7	10	P. M. Lawrence	
Le Mars.....	Plymouth.....	1,224	32	28.9	+ 6.5	52	27	- 8	5	37	0.66	- 0.21	0.50	4.5	7	13	8	10	Henry Newell	
Marathon.....	Buena Vista.....	1,390	2																E. G. Smith	
<i>Pocahontas</i>																				
Pocahontas.....	Pocahontas.....	1,248	24	28.4	+ 6.7	50	27	- 2	5	36	0.68	- 0.24	0.38	1.5	6	12	6	13	F. E. Hronek	
Rock Rapids.....	Lyon.....	1,349	29	27.1	+ 7.4	49	27	- 8	5	33	0.38	- 0.25	0.14	2.0	5	15	5	11	Nellie F. Medberry	
Sanborn.....	O'Brien.....	1,553	14	26.5	+ 7.1	48	27	- 9	5	33	0.48	- 0.37	0.40	4.0	3	14	7	10	J. W. Dow	
Sheldon.....	O'Brien.....	1,418	17	26.9	+ 6.5	50	27	-11	5	37	0.63	- 0.19	0.38	5.6	9	14	9	8	Ross E. Forward	
Sioux Center.....	Sioux.....	1,426	29	30.1				- 5	5		0.20	- 0.68	0.20	2.0	1	7	14	10	F. C. Aue	
<i>Spencer</i>																				
Spencer.....	Clay.....	1,319	14	27.6	+ 6.9	50	27	- 8	5	33	0.60	- 0.25	0.25	5.5	5	12	9	10	E. W. Little	
Storm Lake.....	Buena Vista.....	1,440	39	28.8	+ 6.3	49	27	- 2	5	28	0.29	- 0.53	0.25	2.2	3	15	7	9	L. B. Florey	
Washta.....	Cherokee.....	1,157	30	28.5	+ 6.4	51	27	-10	5	39	0.50	- 0.33	0.20	3.0	3	14	5	12	H. L. Felter	
West Bend.....	Palo Alto.....	1,197	35	28.0	+ 6.9	50	27	- 5	5	31	0.40	- 0.76	0.16	1.7	5	13	10	8	Jos. Dorweiler	
<i>Means and extremes</i>																				
				27.6	+ 6.8	52	27	-14	5	45	0.48	- 0.33	0.80	3.6	5	13	8	10	nw.	
<i>North Central District</i>																				
<i>Algona</i>																				
Algona.....	Kossuth.....	1,224	55	27.6	+ 6.1	48	27	- 3	5	28	0.48	- 0.47	0.16	2.0	4	21	2	8	nw.	W. E. Laird
Allison.....	Butler.....	1,060	14	25.6	+ 4.2	45	16†	- 1	5†	26	1.20	+ 0.26	0.85	6.0	3	15	8	8	s.	E. W. Detra
Belmond.....	Wright.....	1,181	18	27.0	+ 6.1	48	1†	- 3	5	33	0.72	- 0.61	0.47	0.5	4	7	8	16	sw.	H. F. Luick
Britt.....	Hancock.....	1,236	41	27.2	+ 6.7	47	2†	- 6	5	32	0.52	- 0.28	0.40	1.0	3	9	7	15	nw.	E. P. Healy
Charles City.....	Floyd.....	1,015	37	26.3	+ 5.9	46	11	- 1	20	24	1.13	- 0.13	0.63	†	3	8	6	17	nw.	U. S. Weather Bureau
<i>Forest City</i>																				
Forest City.....	Winnebago.....	1,226	34	25.4	+ 4.1	48	1	- 8	5	34	0.64	- 0.24	0.35	4.0	5	10	5	16	nw.	Dr. M. B. Neil
Hampton.....	Franklin.....	1,145	3								0.78	- 0.47	0.62	0.5	3				s.	L. H. Davis
Humboldt.....	Humboldt.....	1,095	40	29.2	+ 6.6	52	1	0	5	32	0.44	- 0.42	0.26	0.5	2	13	6	12	nw.	H. C. Snitkey
Mason City.....	Cerro Gordo.....	1,148	31	26.2	+ 5.3	45	27	- 2	5†	30	1.01	+ 0.13	0.49	2.5	5	6	8	17	nw.	American Beet Sugar Co.
Northwood.....	Worth.....	1,222	32	25.2	+ 5.5	46	27	- 6	5	29	1.35	+ 0.12	0.70	6.2	4	12	8	11	nw.	Charles Dwelle
<i>Osage</i>																				
Osage.....	Mitchell.....	1,163	34	25.8	+ 5.8	45	11	- 2	5	34	0.57	- 0.65	0.49	0.5	3	8	10	13	nw.	Dr. C. E. Juhl
<i>Means and extremes</i>																				
				26.6	+ 5.7	52	1	- 8	5	34	0.80	- 0.25	0.85	2.2	4	11	7	13	nw.	
<i>Northeast District</i>																				
<i>Decorah</i>																				
Decorah.....	Winneshiek.....	872	35	26.2	+ 4.0	44	11†	- 6	21	30	1.18	- 0.10	0.60	†	3	9	5	17	nw.	M. D. Whitney
Dubuque.....	Dubuque.....	700	55	29.1	+ 4.4	50	11	- 1	21	26	1.10	- 0.34	0.81	0.9	4	6	11	14	s.	U. S. Weather Bureau
Fayette.....	Fayette.....	1,003	40	27.0	+ 5.6	49	11	- 4	8	31	1.19	- 0.22	0.62	0.2	3	9	9	13	sw.	R. Z. Latimer
Independence.....	Buchanan.....	956	64	27.1	+ 3.5	44	25†	- 1	5	29	1.13	- 0.18	0.40	0.8	5	11	3	17	sw.	Dr. Geo. Boody
Lansing.....	Allamakee.....	632	21																sw.	Mrs. Mary Spinner
<i>New Hampton</i>																				
New Hampton†.....	Chickasaw.....	1,169	31	26.0	+ 5.2	45	11	- 3	5	26									s.	D. W. Dawson
Oelwein.....	Fayette.....	1,036	5	27.3	+ 4.3	43	16†	0	5	25									sw.	John T. Ridler
Postville (near).....	Clayton.....	1,192	29	24.6	+ 3.7	43	16†	- 7	21	29	0.94	- 0.42	0.53	3.5	4	11	9	11	nw.	F. L. Williams
Waterloo.....	Black Hawk.....	854	45	26.6	+ 3.1	46	16	- 3	5	31	1.15	- 0.05	0.65	0.5	5	14	6	11	nw.	R. B. Slippy
Waverly.....	Bremer.....	936	32	26.4	+ 3.2	44	11†	0	5	27	0.68	- 0.50	0.36		3	15	10	6	nw.	D. H. Murphy
<i>Means and extremes</i>																				
				26.8	+ 4.2	50	11	- 7	21	31	1.05	- 0.20	0.81	1.0	4	11	7	13	sw.	
<i>West Central District</i>																				
<i>Audubon (near)</i>																				
Audubon (near).....	Audubon.....	1,297	33	27.5	+ 4.7	50	27	- 2	5	31	0.91	- 0.08	0.52	2.0	5	14	7	10	s.	George Kibby
Carroll.....	Carroll.....	1,265	38	28.4	+ 4.6	54	16	1	5	27	0.88	- 0.10	0.30	2.5	5	23	0	8	nw.	Mrs. Jos. J. Wolfe
Denison.....	Crawford.....	1,171	34	28.8	+ 5.0	48	24†	1	5	29	0.47	- 0.40	0.27	4.0	5	8	13	10	sw.	V. L. Byers
Guthrie Center.....	Guthrie.....	1,077	33																sw.	H. A. Stafford
Harlan.....	Shelby.....	1,192	29	27.6	+ 4.0	51	27	- 6	5	33	0.60	- 0.40	0.45	1.5	3	15	5	11	sw.	Walter Bell
<i>Jefferson</i>																				
Jefferson.....	Greene.....	1,052	29	28.2	+ 4.6	53	27	- 6	5	38	0.65	- 0.42	0.60	0.5	2	13	6	12	nw.	W. I. Lyon
Little Sioux.....	Harrison.....	1,040	23	29.9	+ 5.9	55	27	- 2	5	35	0.91	+ 0.03	0.48	4.5	9	9	14	8	nw.	H. W. Kerr
Logan.....	Harrison.....	1,120	61	29.0	+ 3.6	52	27	- 2	5	30	0.41	- 0.72	0.20	3.0	4	3	19	9	w.	Amy Ann Stern
Onawa.....	Monona.....	1,051	27	30.6	+ 6.7	53	27	0	5	33	0.20	- 0.90	0.20	2.0	1	13	6	12	nw.	Mrs. H. E. Colby
Rockwell City.....	Calhoun.....	1,232	32																nw.	A. W. McIsaac
<i>Sac City</i>																				
Sac City.....	Sac.....	1,269	52	29.1	+ 6.6	50	27	2	5	30	0.53	- 0.59	0.30	2.0	4	11	9	11	nw.	F. P. Kessler
Sioux City.....	Woodbury.....	1,135	39	29.9	+ 6.8	57	27	6	5	31	0.14	- 0.72	0.12	1.5	3	10	10	11	nw.	U. S. Weather Bureau
<i>Means and extremes</i>																				
				28.9	+ 5.3	57	27	- 6	5	38	0.57	- 0.44	0.60	2.4	4	12	9	10	nw.	
<i>Central District</i>																				
<i>Ames</i>																				
Ames.....	Story.....	926	51	28.4	+ 4.6	49	27	- 6	5	34	1.14	+ 0.08	0.98	2.0	2	18	1	12	nw.	Iowa State College
Baxter.....	Jasper.....	998	28	28.5	+ 4.1	49	16†	- 6	5	36	0.93	- 0.02	0.63	2.0	5	10	8	13	nw.	Otto Sanderman
Boone (near).....	Boone.....	894	23	27.8	+ 3.8	51	27	- 9	5	39	0.70	- 0.19	0.59	0.5	3	12	10	9	sw.	C. F. Henning
Des Moines.....	Polk.....	861	50	29.8	+ 3.8	50	27	0	5	32	1.03	- 0.19	0.76	1.6	5	9	7	15	sw.	U. S. Weather Bureau
Fort Dodge.....	Webster.....	1,114	28	28.6	+ 6.3	49	27	3	5	28	1.00	+ 0.17	0.67		5	12	7	12	nw.	Samuel Sampson
<i>Grinnell</i>																				
Grinnell.....	Poweshiek.....	1,031	34	28.6	+ 3.4	52	11	1	8	31	0.76	- 0.41	0.42	1.8	4	13	0	18	nw.	R. E. Bates
Grundy Center.....	Grundy.....	976	37	27.1	+ 3.2	47	16†	- 4	5	30	0.80	- 0.36	0.70	1.0	2	8	11	12	nw.	M. G. Heiberger
Iowa Falls.....	Hardin.....	1,127	35	26.9	+ 4.4	46	11†	- 3												

Climatological Data for December, 1928—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>East Central District</i>																				
Belle Plaine	Benton	866	38	28.6	+ 4.4	50	11	- 3	5	33	0.88	- 0.47	0.45	1.5	5	12	10	9	se.	O. C. Burrows
Cedar Rapids	Linn	737	46	28.7	+ 4.7	50	11	0	22	28	0.99	- 0.32	0.70	1.2	6	12	4	15	sw.	J. T. Wurster
Clinton	Clinton	595	55	30.4	+ 4.1	55	11	2	5	32	1.69	- 0.09	1.13	1.9	8	11	8	12	s.	Dr. A. P. Bryant
Davenport	Scott	580	57	31.3	+ 4.2	53	11	5	5	22	1.64	+ 0.16	0.94	2.6	10	11	7	13	s.	U. S. Weather Bureau
Davenport, No. 2	Scott	690	3	30.9		55	11	0	22	28	1.68		0.98	1.7	9	15	3	13	sw.	Rex Shriver
Fairport	Muscatine	567	7	31.0	+ 3.8	51	11	0	5	29	1.22	- 0.34	0.62	2.4	6	16	1	14	s.	Bureau of Fisheries
Iowa City	Johnson	733	68	29.4	+ 3.6	50	11	0	5	28	1.12	- 0.49	0.72	1.0	6	15	5	11	s.	Prof. J. F. Reilly
Le Claire	Scott	576	28																	Margaret T. Disney
Maquoketa (near)	Jackson	692	23	28.2	+ 4.2	51	11	- 1	21	30	0.95	- 0.36	0.80	0.7	3	12	8	11	sw.	John Strothoff
Muscatine	Muscatine	516	67								1.19	- 0.77		2.0						William Molis
Olin	Jones	760	29	29.0	+ 4.1	51	11	- 1	22	30	1.25	- 0.10	0.60	1.5	5	15	4	12	sw.	Mrs. L. Stingley
Tipton (near)	Cedar	807	29	28.8	+ 3.2	50	14	- 5	22	32	1.20	- 0.28	0.53	4.0	5	11	5	15	s.	John Kroepfen
Williamsburg	Iowa	770	12	29.0	+ 4.6	51	11	- 3	5	32	1.10	- 0.15	0.66	2.2	4	22	4	5	se.	Dr. F. C. Schadt
Means and extremes				29.6	+ 4.2	55	11	- 5	22	33	1.25	- 0.24	1.13	1.9	6	14	5	12	s.	
<i>Southwest District</i>																				
Atlantic	Cass	1,164	37	27.8	+ 2.1	50	15†	- 7	5	36	1.45	+ 0.33	0.55	6.5	8	10	4	17	nw.	T. H. Whitney
Bedford	Taylor	1,200									0.37	+ 0.61	0.37	T.	1	12	2	17	nw.	Arthur L. Bishop
Clarinda	Page	1,009	38	30.0	+ 3.1	54	27	4	5	35	0.77	- 0.33	0.55	0	4	7	19	5	s.	Dr. H. C. Hawley
Corning	Adams	1,150	36	30.2	+ 5.0	53	16	- 2	8	36	0.47	- 0.77	0.42	0.5	2	20	6	5	sw.	C. A. Smith
Cumberland (near)	Cass	1,225	29								0.86	- 0.07	0.53	3.0	5	12	5	14	sw.	Carl E. Pollock
Glenwood	Mills	1,100	30	30.3	+ 3.5	54	27	4	5†	28	0.50	- 0.17	0.40	1.0	2	15	7	9	nw.	George Mogridge
Lenox	Taylor	1,250	33	29.6	+ 4.0	50	27	3	5	32	0.61	- 0.37	0.42	1.7	5	13	6	12	nw.	J. L. Hurley
Oakland	Pottawattamie	1,139	9	29.1	+ 3.9	54	27	- 2	5	36	0.55	- 0.41	0.30	3.5	3	15	4	12	sw.	W. S. Matthews
Red Oak (near)	Montgomery	1,030	3								1.05	0.00	0.73	T.	4	8	16	7	sw.	B. R. Bridge
Riverton (near)	Fremont	920	2								0.44	- 0.64	0.31	0.1	3	10	5	16	s.	Geo. C. Rader
Thurman	Fremont	960	31	31.5	+ 4.1	55	27	5	5	32	0.44	- 0.87	0.26	T.	3	14	4	13	n.	H. H. Askew
Omaha, Neb.		1,105	57	31.3	+ 4.9	55	27	9	5	26	0.40	- 0.53	0.25	1.4	5	12	7	12	nw.	U. S. Weather Bureau
Means and extremes				30.0	+ 3.8	55	27	- 7	5	36	0.66	- 0.37	0.73	1.5	4	12	7	12	nw.	
<i>South Central District</i>																				
Afton	Union	1,212	34	29.4	+ 3.2	50	27	0	5	35	0.81	- 0.35	0.52	4.0	6	12	6	13	sw.	S. R. Brown
Albia	Monroe	949	30	30.8	+ 4.6	51	11	- 1	5	32	1.00	- 0.07	0.42	1.8	5	13	5	12	sw.	O. E. McBride
Centerville	Appanoose	1,013	23	31.0	+ 3.3	48	11†	- 2	5	32	1.25	+ 0.15	0.88	3.0	7	11	5	13	nw.	Thomas Wood
Chariton (near)	Lucas	1,042	33	30.2	+ 3.8	49	27	- 3	5	33	0.62	- 0.54	0.26	3.0	3	12	6	13	sw.	C. C. Burr
Corydon (near)	Wayne	1,050	35	30.3	+ 3.5	48	16†	- 2	5	31	0.98	- 0.31	0.76	3.0	4	12	3	16	nw.	J. C. Davis
Creston	Union	1,291	23	27.8	+ 2.8	50	27	- 5	5	40	0.58	- 0.48	0.30	1.0	5	13	6	12	s.	Mrs. N. Spangler
Earlham (near)	Madison	1,126	26	28.4	+ 3.9	50	27	- 6	8	37	0.78	- 0.41	0.64	1.0	3	17	2	12	sw.	George Phillips
Indianola	Warren	972	37	30.0	+ 4.4	52	27	- 3	5	37	0.58	- 0.74	0.30	3.0	3	13	9	9	nw.	Seth F. Shenton
Knoxville	Marion	920	33	30.2	+ 4.3	50	11†	- 3	5	36	0.98	- 0.34	0.63	2.5	3	15	6	10	nw.	W. J. Casey
Lacona	Warren	824	29								1.65	+ 0.03	1.28	3.0	6	10	12	9	nw.	J. B. Alter
Lamoni	Decatur	1,123	21	30.2	+ 4.2	51	27	1	5	32	0.60	- 0.58	0.37	2.5	6	13	5	13	nw.	F. S. Parks
Mount Ayr	Ringgold	1,220	35	31.0	+ 4.5	50	15†	3	5	31	0.47	- 0.76	0.35	4.3	3	16	4	11	s.	E. O. Gleason
Tingley	Ringgold	1,275	3	28.8	- 2.8	52	16	- 1	5	34	0.51	- 0.63	0.23	1.8	4	12	5	14	nw.	James A. Verploegh
Winterset	Madison	1,118	37	30.0	+ 4.2	50	27	2	5	31	1.12	- 0.07	0.85	2.5	4	15	4	12	nw.	H. S. Ely
Means and extremes				29.9	+ 3.9	52	16†	- 6	8	40	0.85	- 0.35	1.28	2.6	4	13	6	12	nw.	
<i>Southeast District</i>																				
Bonaparte (near)	Van Buren	563	37	30.8	+ 3.0	49	2	- 3	5	32	1.10	- 0.16	0.63	2.9	5	15	5	11	sw.	B. R. Vale
Burlington	Des Moines	544	32	32.0	+ 2.6	51	2	3	5	23	1.69	+ 0.09	0.69	4.0	8	11	9	11	sw.	John T. Donnelly
Columbus Junction	Louisa	595	27	29.6	+ 1.8	49	26	- 2	5	29	1.27	- 0.05	0.68	3.4	10	12	9	10	nw.	Miss Musa Todd
Fairfield	Jefferson	780	44	29.7	+ 3.3	50	2	- 2	5	32	1.58	- 0.04	0.75	4.0	5	13	5	13	n.	R. M. McKenzie
Keokuk	Lee	614	57	33.0	+ 3.4	52	26	5	5	25	1.85	+ 0.40	0.83	2.3	6	12	5	14	s.	U. S. Weather Bureau
Keosauqua	Van Buren	644	36	30.9	+ 3.2	49	2†	- 4	5	35	1.51	+ 0.13	0.66	5.5	6	10	9	12	se.	J. H. Landes
Mt. Pleasant	Henry	730	47	31.8	+ 3.7	51	2	0	5	30	0.97	- 0.40	0.37	3.0	7	13	7	11	sw.	J. H. Jericho
Oskaloosa	Mahaska	835	52	30.4	+ 4.4	50	11	- 3	5	35	1.18	+ 0.01	0.56	4.2	6	13	9	9	nw.	Roy R. Robinson
Ottumwa	Wapello	649	33	33.4	+ 5.7	53	15	2	5	29	1.39	+ 0.13	0.67	2.9	5	14	10	7	nw.	C. L. Mikesh
Sigourney (near)	Keokuk	790	32	30.8	+ 4.1	50	11	- 4	5	33	1.00	- 0.23	0.46	3.2	4	14	5	12	nw.	W. E. Utterback
Stockport (near)	Van Buren	747	26	30.0	+ 3.2	49	2	- 9	5	38	1.51	+ 0.24	0.50	5.0	8	15	4	12	s.	C. L. Beswick
Washington	Washington	757	46	29.6	+ 3.0	49	2†	- 2	5	36	1.68	+ 0.36	1.20	3.0	7	9	7	15	nw.	D. D. Sherman
Wever	Lee	552		32.0		52	2	- 2	5	31	1.98		0.57	2.2	7	9	2	26		H. G. Liddle
Means and extremes				31.1	+ 3.5	53	15	- 9	5	38	1.44	+ 0.09	1.20	3.5	6	12	7	12	nw.	
State means and extremes				28.7	+ 4.6	57	27	- 15	5	45	0.89	- 0.25	1.28	2.3	5	12	7	12	nw.	

Temperature normals are based on the 46-year period July 3, 1875 to July 2, 1921; shorter records corrected to harmonize. Precipitation normals are based on the 50-year period ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1920 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.

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.

MISCELLANEOUS PHENOMENA

Aurora: 19th.

Fog: 1st, 2d, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 24th, 25th, 28th.

Haze: 30th.

Halos (lunar and solar): 1st, 20th, 21st, 25th, 28th, 30th.

Sleet: 16th, 26th, 27th, 28th, 29th.

Thunderstorms: 2d.

PRECIPITATION

The average precipitation for the State, derived from the average of nine districts of nearly equal area, and based on the records of 112 stations, was 0.89 inch, or 0.25 inch less than the normal. There was a deficiency in all districts, except the southeast. The greatest deficiency occurred in the west-central district where it was 0.44 inch. The greatest monthly total was 1.98 inches at Wever and the least was 0.12 at Akron. The greatest amount occurring in 24 consecutive hours was 1.28 inches at Lacona on the 13th. The heaviest amounts occurred generally on the 13th, mostly in the form of rain.

Daily Precipitation for December, 1928—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					
Southwest District																																					
Atlantic	Nishnabotna		.25	.05	.10						.15		.55								.20			.10			.05								1.45		
Bedford	102										.10		.37	T.	T.									T.	T.		T.								0.37		
Clarinda	Nodaway											.10	.55	.04													.08								0.77		
Corning	Nodaway		.05										.42																						0.47		
Cumberland (nr.)	Nodaway		.10	.10	.11							T.	.02	.53						T.		T.		T.											0.86		
Glenwood	Missouri		.10									T.	.40						T.					T.											0.50		
Lenox	102		T.		.10							.42	T.						T.			T.			.05	.02	.02									0.61	
Oakland	Nishnabotna		.30										.20											.05												0.55	
Red Oak (near)	Nishnabotna		T.	T.								.10	.14	.73						T.							.08								1.05		
Riverton (near)	Nishnabotna		.01		T.							.12	.31							T.				T.											0.41		
Thurman	Missouri		.10		T.							.08	T.	.26	T.					T.				T.											0.44		
Omaha, Neb., ***	Missouri		.10		.01							.02	T.	.25	T.					T.			T.												0.40		
South Central District																																					
Afton	Grand		.02		.22								.02							.52		T.		.05			.01									0.84	
Albia	Des Moines		.16	T.	.18								.42	.23						.01		T.	T.				T.								1.00		
Centerville	Chariton		.07	.04	.19								.88	.03	.02	T.				T.		T.	T.				.02	T.							1.25		
Chariton (near)	Chariton				.14								.26	.22																						0.62	
Corydon (near)	Chariton		.01		.20								.76														.01									0.98	
Creston	Missouri		.04		.12								T.	.30	T.	T.	T.	T.			T.		.02		.10			T.								0.58	
Earlham (near)	Des Moines		T.	T.								T.	.64	.04										.10				T.								0.78	
Indianola	Des Moines		.06	T.	.30								.22	T.																						0.58	
Knoxville	Des Moines				.25								T.	.63	.10	T.				T.																0.98	
Lacona	Des Moines		.02	.03	.30								1.28	.01														.01								1.65	
Lamoni	Grand				.15								.37	.04	.02								T.	.01	.01											0.60	
Mount Ayr	Grand				.06								.35												.06			T.								0.47	
Tingley	Platte		T.		.23								T.	.18	.05						T.				.05											0.51	
Winterset	Des Moines		.02		.20								T.	.85	.05									T.												1.12	
Southeast District																																					
Bonaparte (near)	Des Moines		T.		.29								.63	.03					.11	.04		T.														1.10	
Burlington	Mississippi		.02	.04	.23								.69	.06					.35	.27	T.															1.69	
Columbus Jet	Iowa		.01	.08	.20								.68	.17					.04			T.														1.27	
Fairfield	Skunk		.15		.40								T.	.75	.25	T.								.02	.01											1.58	
Keokuk***	Mississippi		.10		.20								T.	.55		T.	.69	.14				T.	T.													1.85	
Keosauqua	Des Moines				.40								.66	.05					.27	.08		T.														1.50	
Mt. Pleasant	Skunk		.02	.06	.08								.37	.24					.14																		0.97
Oskaloosa	Des Moines			.07	.40								T.	.56	.12	.02	T.	T.	T.	T.	T.	T.	T.				.01								1.18		
Ottumwa	Des Moines		.04	.08	.25								.67	.35																						1.39	
Sigourney (near)	Skunk		T.		.29								T.	.46	.23						T.	T.	T.		.02											1.00	
Stockport (near)	Skunk		.09		.50								.55	.03					.17	.07																1.51	
Washington	Skunk		.06		.20								1.20	.08					.02	T.					.10											1.68	
Wever	Mississippi			.14	.22								.57	.24					.31	.39			T.													1.98	

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.

T. Precipitation is less than .01 inch rain or melted snow.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE

Stations	Barometric Pressure, Inches (Sea Level)				Relative Humidity, %				Wind				Sunshine				
	Mean	Highest	Date	Lowest	Mean				Total movement	Average hourly velocity	Maximum						
					7 A. M.	12 Noon†	7 P. M.	Lowest			Date	Miles		From	Date		
																% possible	
Chas. City	30.10	30.57	7	29.45	2	90	75	83	49	6	4,655	6.3	21	n.w.	18	39	5
Davenport	30.12	30.54	8	29.51	2	86	70	74	40	20	4,483	6.0	22	s.w.	3	46	3
Des Moines	30.10	30.57	7	29.53	2	88	70	79	35	27	4,478	6.0	23	s.w.	26	48	2
Dubuque	30.10	30.56	8	29.45	2	81	67	77	41	5	4,092	5.5	19	n.	31	35	7
Keokuk	30.12	30.57	8	29.58	2	82	64	75	45	26	4,948	6.7	34	w.	3	45	7
Sioux City	30.11	30.57	7	29.63	2	84	66	72	28	27	7,696	10.3	36	n.w.	2	53	4
Omaha, Nb.	30.12	30.57	7	29.61	2	80	69	69	31	27	5,337	7.2	30	n.w.	31	48	4
Means and extremes	30.11					85	69	76				6.9				45	2
Normals and records	30.12		29th		2	84		77		12th					24th	47	
		*31.09	1917	‡29.00	1920		‡18	1922					*17	n.w.	1907		

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

†† January 1, 1928, 3-cup anemometers replaced the 4-cup instruments used since the establishment of the Weather Bureau stations. The new instruments will more accurately indicate the true wind movement. The records of the 4-cup instruments were somewhat too high at moderate velocities and considerably too high at the higher velocities. Tables of true velocities corresponding to indicated velocities appear in the January, 1928 Climatological Data. For purposes of comparison the highest velocity of record in the lower line of the table has been converted into a 3-cup velocity.

SNOWFALL

The average snowfall for the State was 2.3 inches, or 3.7 inches less than the normal. The average ranged from 3.6 inches in the northwestern district to 1.0 inch in the northeastern. The greatest amount reported from any station was 7.2 inches at Alton and the least was none at Clarinda; Charles City and Decorah reported only traces. This is the first time in 38 years that there has not been measurable snowfall at Charles City in December and the second time in that period that a measurable amount failed to occur during a winter month. The heavy November snowfall remained on the ground until the second week over most of the State when a rainy period occurred. The ground was practically bare the rest of the month over the entire State.

RIVERS

There was considerable fluctuation in all rivers. There was a steady fall on the Mississippi River until the latter part of the 2d week when there was a marked rise due to rather heavy rains and a protracted period of warm weather. The fluctuations during the latter part of the month were due mostly to ice conditions. A serious situation developed in the vicinity of Burlington that threatened lowlands but it finally passed with very little damage. Falling stages prevailed on the Missouri the greater part of the month, being mostly slight but amounting to more than one foot on the 6th. Changing ice conditions produced a rise of two feet at Sioux City on the 20th. Falling stages prevailed on interior streams until after the heavy rains of the 13th when there was a marked rise; during the rest of the month there was a gradual fall.

ERRATA

Report for October, 1928, Page 74; Cherokee; greatest precipitation in 24 hours published 0.62 inch, should be 0.73 inch.

Daily Maximum and Minimum Temperature for the Month of December, 1928

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.....)	45	39	33	20	24	32	26	28	37	41	45	41	39	42	42	44	31	39	31	24	15	36	38	36	45	43	48	42	32	37	31	35.7
	(Minimum.....)	22	30	18	9	-3	10	13	11	15	20	29	35	34	36	36	30	20	18	7	1	5	8	20	24	23	20	24	23	27	20	10	19.5
Alta.....	(Maximum.....)	47	37	29	16	26	36	34	32	41	45	45	41	39	40	44	34	38	27	24	21	38	37	40	45	47	50	42	34	43	30	37.0	
	(Minimum.....)	22	25	15	5	-1	10	10	13	19	23	30	35	33	36	37	29	16	16	5	5	9	9	28	30	26	32	22	27	19	23	2	19.7
Alton.....	(Maximum.....)	44	37	30	15	25	35	30	32	35	38	40	40	39	40	43	30	38	27	26	20	40	35	42	45	45	49	40	32	40	31	35.7	
	(Minimum.....)	18	25	14	0	-13	-2	8	15	10	10	25	35	33	35	37	27	18	16	7	7	12	11	30	29	24	33	21	27	22	24	7	18.2
Belmond.....	(Maximum.....)	48	36	32	20	27	35	30	26	40	42	48	40	39	42	43	45	34	40	30	24	14	33	35	33	46	42	47	41	32	38	30	35.9
	(Minimum.....)	15	27	16	5	-3	9	9	5	13	14	25	35	33	36	36	31	20	18	8	3	3	4	20	27	23	31	21	24	19	18	13	18.1
Charles City.....	(Maximum.....)	26	35	34	17	24	34	22	26	40	41	46	43	40	41	41	42	31	39	22	23	16	29	31	34	44	41	43	40	26	33	29	33.3
	(Minimum.....)	21	24	17	6	3	11	10	9	17	17	27	35	35	38	36	31	18	20	10	1	2	8	19	30	23	31	26	24	18	22	10	19.3
Decorah.....	(Maximum.....)	29	35	36	21	26	29	29	25	36	41	44	44	42	42	40	43	35	38	27	24	11	28	35	34	42	40	39	41	35	32	30	34.0
	(Minimum.....)	24	22	19	6	4	10	0	16	11	23	35	35	38	35	32	19	18	23	0	-6	-2	16	18	28	33	29	24	18	21	20	18.5	
Dubuque.....	(Maximum.....)	32	41	37	24	23	32	28	27	38	45	50	48	43	43	43	46	36	41	29	22	11	25	37	38	44	45	41	44	32	31	35	35.8
	(Minimum.....)	28	30	24	9	7	14	11	8	20	19	28	38	39	40	40	36	20	20	14	1	1	3	23	19	32	34	36	30	23	25	22.4	
Forest City.....	(Maximum.....)	48	36	33	18	26	34	30	27	39	40	46	40	39	40	40	43	33	40	30	22	16	32	32	42	47	42	45	39	32	31	33	35.1
	(Minimum.....)	15	14	13	5	-8	3	7	2	11	16	25	34	32	35	32	29	17	15	4	-3	1	5	15	28	20	27	22	25	17	11	15.6	
Independence.....	(Maximum.....)	33	35	41	33	25	30	31	26	35	40	42	40	42	42	43	39	41	36	14	15	26	33	34	44	44	41	44	44	40	32	33	35.3
	(Minimum.....)	25	21	22	13	-1	6	12	1	14	11	25	34	34	37	37	34	23	19	13	4	1	2	15	15	22	31	23	26	21	22	23	18.9
Inwood.....	(Maximum.....)	41	38	29	15	23	35	29	34	40	44	40	41	39	41	41	39	24	21	21	41	36	45	46	46	46	42	41	40	31	36.1		
	(Minimum.....)	21	24	13	0	-12	5	5	15	11	20	26	34	34	35	35	23	17	16	4	6	10	10	29	24	24	32	21	26	15	23	5	17.8
Lake Park.....	(Maximum.....)	47	38	34	17	20	33	21	28	47	45	40	48	38	38	40	42	30	31	22	22	16	38	35	43	46	42	48	38	31	40	32	35.2
	(Minimum.....)	19	25	15	-3	-11	-3	9	17	18	23	34	33	34	35	28	20	17	4	6	6	27	29	22	31	21	24	19	20	0	16.2		
Mason City.....	(Maximum.....)	38	36	33	18	25	32	27	35	43	42	40	39	41	41	44	35	39	29	18	15	33	34	34	44	41	45	40	32	35	32	34.4	
	(Minimum.....)	20	23	15	5	-2	5	8	4	17	13	25	34	36	36	31	18	18	7	0	-2	7	23	29	25	32	25	22	20	17	15	18.1	
Northwood.....	(Maximum.....)	40	35	35	16	22	30	27	22	33	37	40	39	38	41	39	43	35	38	24	23	15	30	34	32	45	41	46	39	28	35	30	33.3
	(Minimum.....)	20	25	16	5	-6	1	5	2	12	10	22	34	33	36	35	31	17	18	5	-2	0	8	21	26	22	30	26	25	20	21	13	17.1
Pocahontas.....	(Maximum.....)	48	37	32	18	28	35	31	32	48	45	48	42	38	42	44	44	33	41	30	24	30	38	35	39	47	45	50	40	32	42	28	37.6
	(Minimum.....)	22	28	18	8	-2	10	13	10	12	20	26	35	33	36	37	30	21	12	8	4	8	8	25	30	21	30	20	24	20	8	19.2	
Postville.....	(Maximum.....)	26	33	34	19	20	27	25	26	35	40	40	38	38	39	39	43	32	40	28	21	10	26	34	32	42	43	40	39	30	31	34	32.4
	(Minimum.....)	23	23	19	7	0	5	1	0	15	11	24	34	34	36	35	32	11	11	10	-5	-7	-1	12	18	27	30	30	25	18	21	24	16.9
Rock Rapids.....	(Maximum.....)	43	38	31	17	25	35	30	33	40	39	39	40	39	40	40	41	33	37	37	23	23	40	37	43	45	44	49	43	34	39	33	36.5
	(Minimum.....)	17	24	15	0	-8	5	11	15	10	11	23	35	34	35	27	25	20	17	5	3	9	12	28	25	20	31	20	23	20	23	10	17.7
Central Division																																	
Belle Plaine.....	(Maximum.....)	37	42	40	25	30	37	29	29	41	44	50	39	41	41	44	46	36	43	33	25	16	31	36	36	46	46	47	45	37	37	33	37.5
	(Minimum.....)	22	21	23	9	-3	7	12	3	16	15	30	35	36	38	38	36	24	20	14	5	4	3	20	15	24	32	26	22	22	18	19.8	
Boone.....	(Maximum.....)	44	40	37	24	29	35	29	31	40	41	48	40	38	42	46	47	36	42	33	25	21	36	38	34	45	51	43	35	40	34	37.9	
	(Minimum.....)	5	19	20	10	-9	-1	-3	14	6	8	18	35	34	37	39	33	24	19	12	9	6	5	20	29	50	45	23	21	17	14	17.6	
Carroll.....	(Maximum.....)	43	34	30	19	27	35	32	29	41	41	43	41	39	42	47	54	33	41	31	25	23	30	38	36	48	43	49	42	35	42	34	37.0
	(Minimum.....)	21	19	17	9	-1	11	13	9	17	18	29	33	31	35	36	27	22	17	8	8	9	10	17	29	28	32	24	32	20	22	12	19.8
Cedar Rapids.....	(Maximum.....)	35	45	44	25	27	31	30	28	41	44	50	42	43	44	44	45	36	44	35	21	15	27	36	38	45	46	45	46	39	34	35	37.4
	(Minimum.....)	26	28	25	11	2	8	15	5	14	16	22	31	36	40	38	35	23	20	18	7	4	0	18	14	22	31	27	23	22	23	16	20.0
Davenport.....	(Maximum.....)	34	49	35	28	25	36	29	28	38	45	53	47	46	46	45	43	37	43	33	26	13	25	38	42	42	49	42	41	36	33	43	38.0
	(Minimum.....)	28	29	28	11	5	16	13	10	23	24	31	40	40	43	41	37	25	24	20	8	7	6	24	24	26	36	34	35	23	23	29	24.6
Des Moines.....	(Maximum.....)	36	39	30	22	32	36	32	31	38	42	47	44	41	43	49	50	36	44	25	27	20	34	39	36	49	46	50	46	34	38	34	37.7
	(Minimum.....)	17	28	21	7	0	9	11	6	19	15	31	36	37	39</																		

WINTERS AT KEOKUK

By ARTHUR H. CHRISTENSEN

Official in Charge, Weather Bureau Office, Keokuk, Iowa, January 4, 1929

The statement is frequently made that our winters are not as severe as they were 20, or 30, or 50 years ago, and that we don't have as heavy snowfalls as they did "years ago" when "old Dobbin" had to plow through snowdrifts up to his belly to get the family to church on Sunday morning, and when stories were told of snow-drifts 10 to 15 feet deep along the roadside. Probably with many of the story tellers the depth of snow increased with each repetition of the yarn. At any rate, let us see what the figures of the United States Weather Bureau records, as compiled over a period of 35 to 57 years have to say on the subject.

In determining the severity of any particular winter, two primary factors should be considered—temperature and snowfall, with various phases of each factor entering in, in differing degrees of importance.

Considering first the matter of snowfall, our records at Keokuk extend back 42 years to 1886, and in comparing the average winter snowfall for the first half of this period with that of the last half, it is found that the first half averaged 20.6 inches of snow per winter, while the last half averaged only 19.9 inches, a difference of seven tenths of an inch or a decrease of about three per cent.

Records Made Recently

The statement is frequently made that snow does not remain on the ground as long as formerly. Our record of the number of days with snow-covered ground extends back 35 years to 1893, and dividing this record into halves (omitting the middle year to make an equal division) we find that the snow remained on the ground an average of 31 days per winter during the first half and 34 days per winter during the last half of the record, or an increase of about ten per cent. In checking over the total yearly snowfall for the same period we find that this has also increased from 18.9 inches per winter to 21.3 inches or an increase of nearly 13 per cent. Furthermore, the heaviest winter snowfall of the entire record was 58.2 inches in 1925-26, which was about 25 inches heavier than any snowfall during the first half of our record from 1886 to 1907. Also the winters of 1911-12, 1917-18, 1924-25, and 1925-26, all had a greater number of days with snow on the ground than any winter in the first half of that record, from 1893 to 1910. This is certainly strong evidence in disproof of the theory that our snows are not as heavy and do not remain on the ground as long as formerly.

The fact that our 42 year record tends to show a 3 per cent decrease in total annual snowfall, while the 35 year record shows an increase of nearly 13 per cent, indicates that the record is too short to draw any definite conclusions on the trend of yearly amount of snowfall, if there is a trend either way. Apparently there is no reason why snowfall should increase or decrease over a period of years, and considering the fact that our total winter snowfall ranges from as little as 8 inches to as much as 58 inches, it can readily be seen that it would take an extremely long period of years to show any real change in the average winter snowfall.

In the matter of extreme depths of snow on the ground, (whether falling in one storm or the accumulation of several storms) our record extends back to 35 years, and during the first half of that period there were four winters when a depth of more than 10 inches lay on the ground and the same number in the last half of the record. The greatest depth of snow on the ground in the first half of the record was only seven-tenths of an inch greater than in the last half. It appears from the above data that as far as snowfall is concerned winters of recent years are just as severe as they ever were.

Moderating Tendency in Temperature

Let us take next the element of temperature as shown by the average of the three winter months, December, January, and February, for the entire period of record—1871 to 1928. This will show whether the average or mean temperature for the entire winter has a tendency to moderate or not. The temperatures used are those of Keokuk, Iowa, and while they might be representative of other sections as well, they actually show only local conditions. The 57 winters of record were averaged in groups of ten beginning with the winters of 1871 to 1880, making five decades, with 7 years left over at the end of the record. The average for the winters by decades were as follows: first decade 27.9 degrees, second decade 26.9 degrees, third, 27.0 degrees, fourth, 27.5 degrees, fifth 27.5 degrees, and the average for the last 7 winters 29.6 degrees.

It will thus be seen that the first ten winters averaged the highest temperature of any group except the last 7 which were decidedly higher than any other group. It is also evident that if we omit the first decade, the last 47 winters point toward a moderating tendency of average winter temperatures. If only the

first two or three decades were considered the conclusion would have been that winters were growing colder. But taking the entire 57 year record, there is a slight upward trend in mean temperatures.

This is shown clearly when we divide the record into halves and it is found that the mean temperature of the first 28 years is 27.2 degrees, while that of the last 28 years is 28.1 degrees. (Since there was an odd number of years, the 29th year was omitted to make an equal division, and incidentally, the 29th year was exactly normal.)

The normal winter temperature for the three months is 27.7 degrees as determined from the 57 years record. During the first 28 years there were 16 winters below normal in temperatures and only 12 above normal, while in the last 28 years there were only 12 winters below normal and 16 above normal, which also indicates a moderating winter temperature. On the other hand we find both the coldest and warmest winters occurring in the first half of the record.

January Used as Gauge

Probably the severity of a winter might be gauged by the mean temperature of the coldest month, January. In considering the mean temperature of January over the 57 year period we find the average for the first 28 years is 23.7 degrees, while for the last 28 years it was 26.4 (the 29th year was omitted as above). In the matter of normal temperature we find in the first 28 year period 16 Januarys below normal and 12 above normal, while in the last 28 years there were 7 below normal and 21 above normal, which is strongly in support of the moderating tendency of our winters. But in direct contradiction we find that the warmest January of the entire record was in the first half of the period, 1880, and the two coldest Januarys in the 57 years were in the last half of the period, 1912 and 1918, each with a mean temperature of 12 degrees. These were exceptional months, however, and do not necessarily show average conditions.

Another indication of the severity of a winter is the number of days on which extremely low temperature occur. In the 57 winters of record we find that the temperature fell to zero or lower on 489 days, and 283 of these days were in the first 28 year period, or an average of 10 days per winter in the last 28 years the temperature fell to zero or lower on only 198 days or an average of 7 days per winter. (The 29th winter was omitted as above). We find also that the winter with the greatest number of days with zero temperature occurred in the first period of 1884-5 with 34 days. Both periods had two winters in which temperature never reached zero.

Record Made in February

In the matter of extreme low temperatures, the lowest of the entire record, 27 degrees below zero, occurred in the last half of the record, but it also occurred in the month of February, which tends to show that it was an abnormal condition. And we find that there were 7 winters in the first 28 when the temperature fell as low as 20 below zero, while in the last 28 winters only 4 had temperatures of 20 degrees below zero.

In summing up our conclusions on temperatures, there does seem to be a real tendency toward moderation of our extreme winter temperatures, and there must be a definite reason for that tendency. It will be seen from the foregoing data that the tendency toward moderation is less pronounced when we consider mean temperatures for the entire winter, than it is when extreme low temperatures are considered, or temperatures over a shorter period such as the month of January. And undoubtedly the explanation of that is to be found in the reason for the moderation of temperatures.

Cold Waves Responsible

All temperatures in this section which approach zero or fall below zero are, what might be called abnormal, that is, they would not occur here under the average daily and seasonal fluctuations of temperature, and are always produced by a cold wave moving over this section from the colder areas to the north or northwest. If we can then find a cause which has moderated, even to a slight extent, the severity of cold waves, its result would be to show a more marked moderation when extreme temperatures are considered, and a less pronounced moderation when mean temperatures for the entire winter are considered. That is, the moderation would be more apparent on the extremely low temperatures, and this would tend to raise to a lesser extent the mean temperature for the entire winter, and that is exactly what has occurred over the 57 year period.

Civilization An Aid

The theory usually advanced for moderation of winters is the populating and civilizing of the country and undoubtedly therein

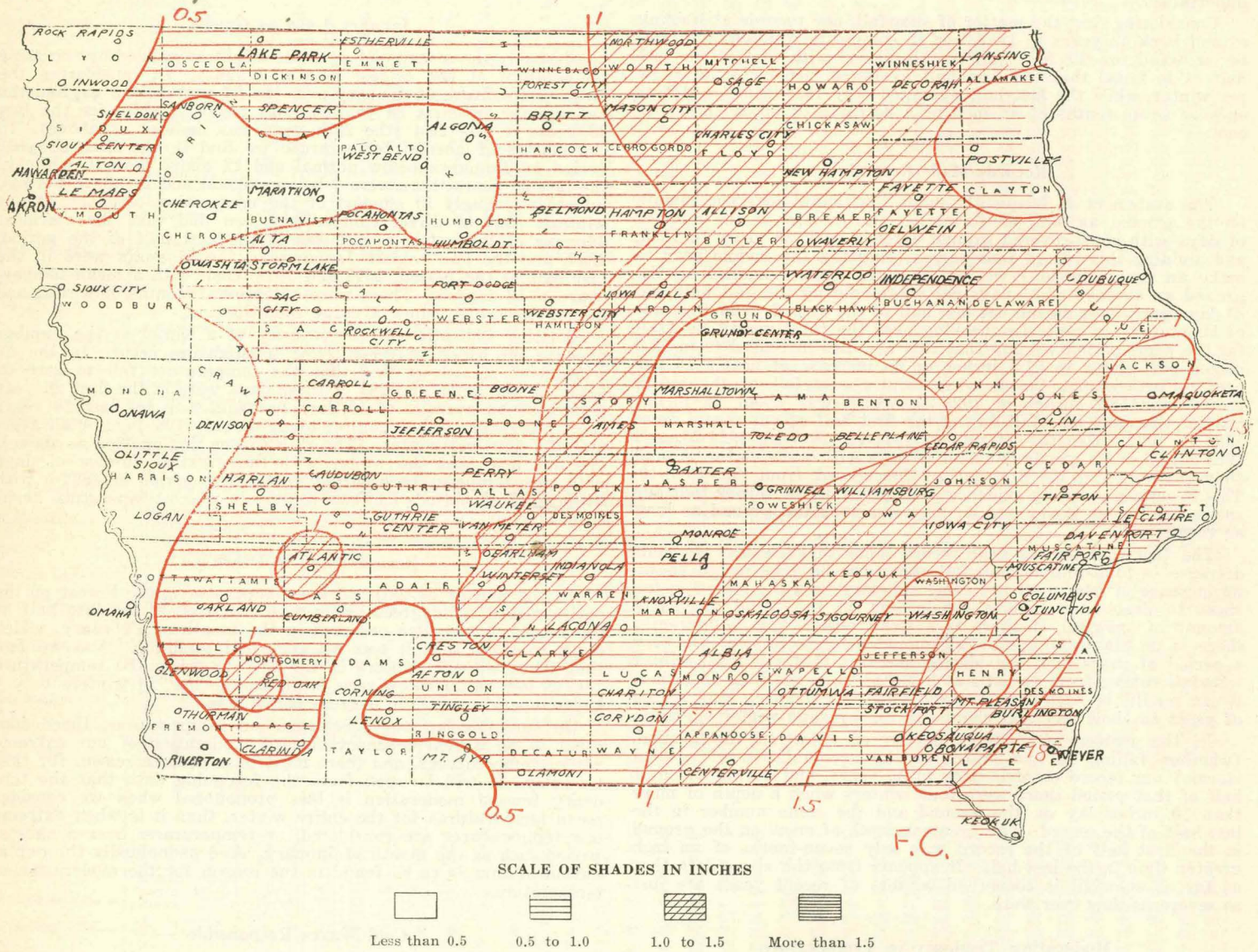
(Continued on next page)

lies the explanation of it. When this record began, Iowa was largely an open prairie and the northwest winds swept, unhampered, across the plains, while in the last half century groves of trees have been planted on almost every farm in the state, and these in the aggregate must offer considerable resistance to the movement of cold air over the state. The theory that the heating of homes has an influence on severe winter temperatures has also been advanced, but it seems that such an effect would be very small, but whatever the influences are their effect has not been

very great and it should not be expected that winter temperatures will continue to moderate to an appreciable extent.

It must not be overlooked that even a 57-year record is not necessarily a true indication of the tendency of the climate, and possibly a record of a hundred years would show an entirely different result. And it should not be assumed that modern winters will not be as severe as they were 50 years ago, for the conditions of any particular winter can not be predicted from the past winters or average winters.

TOTAL PRECIPITATION, DECEMBER, 1928



CLIMATOLOGICAL DATA.

IOWA SECTION

In co-operation with

IOWA WEATHER AND CROP BUREAU

CHARLES D. REED, Senior Meteorologist

VOL. XXXIX DES MOINES, IOWA, ANNUAL, 1928 No. 13

GENERAL SUMMARY

The mean temperature of the year 1928 for the State of Iowa as a whole, was 49.4°, or 1.4° above normal. Most of the excess in temperature accumulated in the colder months of the year, while the deficiencies were mostly in the warmer months, particularly April, June and September. (See Fig. 1). The absence of extremes made the temperatures of the year generally pleasant. The mean temperature of the crop season, May to September inclusive, was 66.8°, which is 0.8° warmer than in 1927, and nearly 1.0° below the normal. The average length of the growing season for the State between the average dates of killing frosts, May 5 to September 25, was about 145 days, and about 10 days less than normal. Ninety per cent of the corn crop escaped frost damage.

Precipitation averaged 35.96 inches or 3.85 inches above the recently revised normal. A relatively dry April and May were favorable for planting, but a steadily accumulating excess of precipitation during June, July and August, made haying and harvest difficult, and except for deficiencies in September and December the excess in precipitation continued to accumulate so that at the end of the year the total precipitation was the greatest for the State as a whole since 1919. (See Fig. 2). Two notable snowstorms, April 5-6 and November 29-30, were mostly responsible for very large annual totals in the southwest portion of the State. The greatest total snowfall of the year, 51 inches, was at Atlantic. The rather heavy rains of the crop season mostly fell at night, so there was more than the normal sunshine, except in June. There were many small, local hailstorms and tornadoes. The hail damage was about 50 per cent greater than 1927.

Crop production was generally good, though winter wheat was badly winter killed and spring grains got off to a poor start. The

yield of corn per acre was slightly above the average, and because of the large acreage, the total crop ranks as the second largest. Rainy or snowy weather between maturity and husking made corn husking difficult. Fields were too soft to haul husking machines and loads through them. The quality of the crop was generally good. Conditions were favorable for fall seeding; wheat, grasses and clover made good progress, and pastures were excellent.

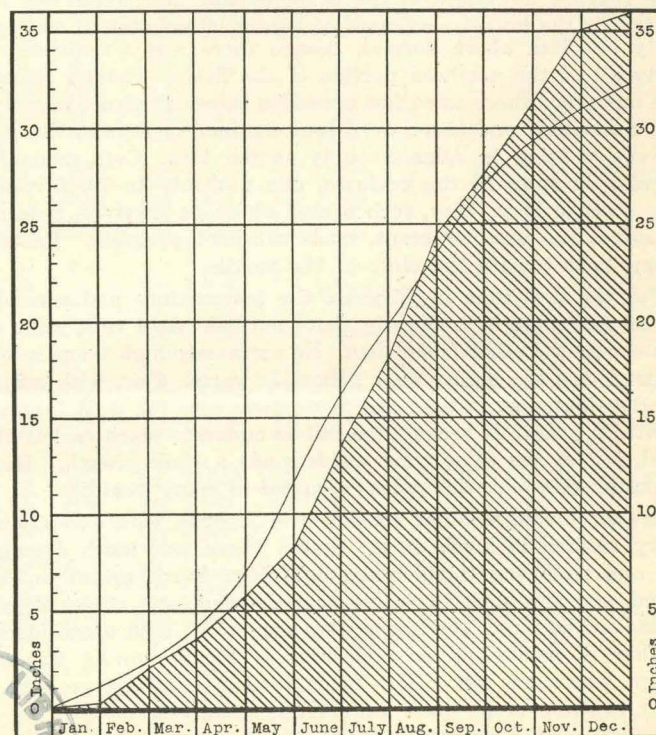
SYNOPSIS BY MONTHS

January was generally mild with unusually high maximum temperatures from the 9th to the 14th which broke records at some stations. It was the driest January in 56 years. The drouth and lack of snow cover, together with alternate freezing and thawing, caused much winter killing of wheat, grasses and clovers. The surface of plowed fields became dusty; and windy days caused dust storms. The roads were excellent.

This was the fifth consecutive mild February. The prevailing drouth was relieved by heavy rains, with some snow, from the 4th to the 8th, which relieved the water shortage, benefited wheat, grasses and clovers and stopped the drifting of the soil. Unfortunately, considerable glaze developed during this storm over a large area in the northwestern portion of the State, and this injured or destroyed a large number of fruit or shade trees and damaged wires. There was very little snow cover, and frost was out of the ground in portions of the State.

Mild weather continued during most of March and there was an unusual cold period about the 5th. During a remarkably warm period from the 20th to the 25th a number of stations in the northwest portion of the State reported the highest March temperature of record, and for the State as a whole it has been 18 years since a higher maximum occurred in March. Plowing was possible early in the month, much seeding of oats was done, but alternate freezing and thawing injured winter wheat and grasses. Vegetation made rapid advance. Fruit buds swelled prematurely and in

AVERAGE PRECIPITATION State of Iowa, Year, 1928



AVERAGE TEMPERATURE DEPARTURE State of Iowa, Year, 1928

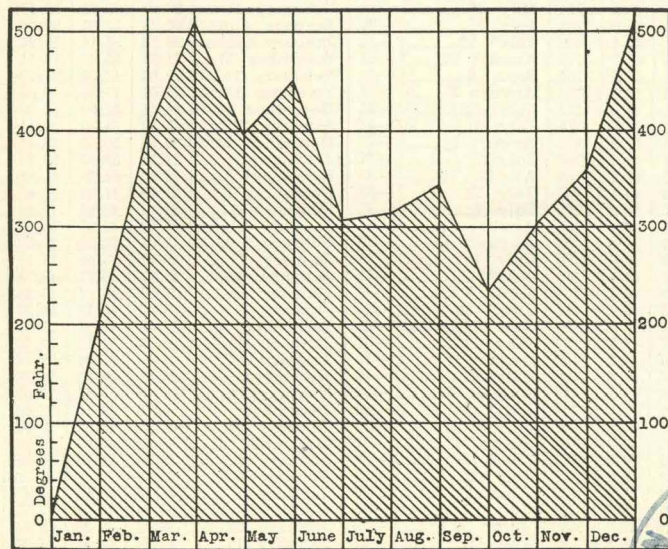


Figure 1.—Line bounding shaded area shows accumulated departure of temperature from normal. Upward slope means temperature above normal; downward, below.

Figure 2.—Line bounding shaded area shows accumulated depth of precipitation in inches. Smooth curve shows normal.

STATE
 FEB 28
 1929
 3

the southern division trees were in full bloom but badly injured by the freeze at the end of the month. Precipitation was generally ample, with rather heavy snowfall on the 28th and 29th in portions of the northern and eastern divisions of the State. A severe local hailstorm occurred on an unusually early date at Bedford on the 24th. Stones the size of walnuts punctured automobile tops.

After the first few warm days in April there was a severe change to colder, and below normal temperatures prevailed the rest of the month. This colder period set in with a severe, slow-moving storm, attended by heavy drifting snow that blocked highways and delayed all classes of traffic over a large portion of the State, with the most serious damage over an area of about 4,000 square miles, centering around Council Bluffs. The loss to overhead wires and poles was stupendous. About 10,000 poles were broken and made unfit for further use, and the only means of communication into this area for some days was by radio. Another severe storm on the 13th-15th gave locally heavy snow. The month was decidedly unfavorable for agriculture. The frequent severe freezes following the exceptionally warm weather near the close of March, caused further damage to winter wheat and grasses, also early seeded oats, some fields of which were killed or failed to germinate. Market gardeners lost practically all early seedings and plantings. However, the cold weather beneficially delayed the opening of such fruit buds as had remained dormant. Plowing and preparation for corn planting made good progress during the last two weeks, but toward the close of the month the soil drifted considerably, dust storms at times obscured the sun, and fine particles of drifting sand cut down many plants.

Above normal temperatures predominated in May though there were many marked fluctuations. The last five days of the month were noticeably cool, with damaging frosts, particularly on the 28th. Large plantings of tomatoes were killed and strawberries damaged somewhat, but the strawberries probably suffered more from the drouth, precipitation being but slightly more than half the normal. Severe storms were lacking, except a tornado on the 2d in Woodbury and Cherokee counties. Ideal farming weather resulted in early preparations for planting, and the bulk of the corn was planted earlier than for several years. The crop came up to an excellent stand, and the soil was sufficiently dry to permit cultivation, so fields were clean. Small grain, pastures and hay, suffered for lack of rain and fruit deteriorated.

In general, June was next to the coolest of record in 56 years, with 26 days out of the month below normal. The highest temperature reached anywhere in the State during the month was 88°, and this is the lowest maximum of record. Precipitation averaged nearly one inch above normal, though there was a deficiency in nearly all of the northern portion of the State. Though showers were numerous there were few excessive rains. Destructive storms were numerous, and there were four distinct tornadoes, the most destructive being in Adams county on the 18th. Corn made fair progress in spite of the coolness, due probably to its favorable early start in May. Hay, such winter wheat as survived, potatoes, and other cool weather crops, made excellent progress. Pastures became rank toward the close of the month.

For the first time in 56 years the temperature and precipitation of July were both slightly above normal. As a rule, when one is in excess the other is deficient. No extremely high temperatures occurred, and the nights were generally warm. This, with rainfall well distributed as to time and place, gave corn the most luxuriant growth in years. It became too tall to cultivate much earlier than usual, but at the same time weeds made a rank growth. Heavy damaging rain and windstorms occurred in many localities.

Warm, humid weather continued in August, with exceptionally heavy rainfall in much of the State. There was much damaging hail and terrifying thunder and lightning. Small grains in shock rotted and sprouted, threshing was delayed, and threshed grain heated in the bins. Tornadoes were numerous, with a considerable number of persons killed and injured. Much plowing was done except where too wet. Corn made further luxuriant growth, and other growing crops made satisfactory progress.

Cool weather predominated during September, except in the second week, and the period, 22d-28th, was one of the coolest in any

SUPPLEMENTAL PRECIPITATION TABLE, YEAR 1928

STATIONS	January	February	March	April	May	June	July	August	September	October	November	December	Annual
<i>Northern Division</i>													
Britt.....	0.11	1.33			1.71	3.93	2.50	11.30	3.36	2.78	3.28	0.52	
Cherokee.....	0.13	1.19		1.01	4.32	2.31	2.41	2.75	2.11	1.67	1.83	0.42	
Fayette.....	0.47	3.10		3.18	2.54	5.11	3.66	9.36	3.94	3.44	5.16	1.19	
Lake Park (near).....	0.43	1.30	1.45	1.17	2.92	5.80	1.16	8.59	2.26		0.77	0.86	
Lansing.....			1.18	1.61	1.85	4.30	5.80	8.06	5.23	4.16	2.98		
New Hampton.....	0.07	2.26		1.68				10.40	5.20	4.07			
Northwood.....			1.05	2.40	3.68	6.03	2.27	11.92	2.81	3.35	2.30	1.35	
Oelwein.....	0.16	1.36	1.66	2.22	2.10	4.25	4.70	9.30	3.20	4.00	6.60		
West Bend.....	0.11	**	**	**	**	**	3.05	6.30	1.62	2.61	2.27	0.40	
<i>Central Division</i>													
Guthrie.....	0.15	2.18	1.22	2.81	2.76	4.51	6.97	7.35	1.94	3.32			
Jefferson.....	0.03	2.51	1.07	2.62	3.39	5.44	3.87		3.23	3.07	3.52	0.65	
LeClaire.....			2.58	4.12	1.32	4.29	5.79	4.86	1.57	4.30			
Maquoketa.....	0.19	1.57		1.78	2.74	5.60	5.57	4.04	1.10	4.68	4.88	0.95	
Onawa.....					3.20	3.62	1.89	3.47	1.12	4.62	1.68	0.20	
Rockwell City.....	T.	2.65	1.11	1.83	2.89		1.45	3.74	2.40	4.77	2.08		
Waukeo.....	0.09				1.93	6.43	4.39	7.56	1.85	3.73	4.01	0.91	
<i>Southern Division</i>													
Bedford.....			1.58	1.96	2.55	7.05	8.34	3.15	6.99	3.48	5.69	0.37	
Corydon.....			2.06	2.18	0.93	8.51	3.42	2.16	7.17	3.32	5.63	0.98	
Oakland.....	0.15	1.52	0.36	1.32	2.60	4.45	4.70		1.37	2.27	4.55	0.55	
Pella.....	0.06	2.37	2.34	2.13	1.67	8.39	4.61	5.20	3.37	2.42			
Wever.....				2.81	1.68	4.54	5.70	4.58	5.80	4.63	6.02	1.98	

**Amounts published in monthly reports deficient on account of slow leak in rain gauge.

COMPARATIVE DATA FOR THE STATE—Annual

Year	Temperature				Precipitation in Inches			
	Mean annual	Highest	Date	Lowest	Annual	Greatest annual	Least annual	Average snowfall
1873	46.1	102	August 31	-38	33.92	41.04	23.34	
1874	47.7	101	July 5	-24	30.76	39.76	25.43	
1875	43.3	97	July 16	-31	35.83	48.42	28.55	
1876	45.9	96	August 24	-28	36.65	53.57	19.92	
1877	48.4	100		-31	35.16	49.82	22.52	
1878	50.0	104		-13	34.53	42.08	20.92	
1879	48.0	102		-35	28.23	46.71	16.49	
1880	47.9	104		-25	30.95	51.10	14.90	
1881	47.5	104		-40	44.16	56.81	34.02	
1882	48.4	98		-23	33.40	50.30	17.71	
1883	44.8	100		-38	34.54	46.15	18.00	
1884	46.0	96		-38	35.59	46.60	23.35	
1885	44.7	102	July 30	-42	32.23	44.89	17.91	
1886	46.4	103	July 13	-34	24.71	35.48	15.55	
1887	46.6	105	July 29	-34	26.31	38.61	12.30	
1888	45.3	110	August 2	-43	31.44	41.17	20.60	
1889	48.0	104	August 30	-28	24.95	37.61	13.66	
1890	47.5	110	July* 13	-27	29.48	45.45	16.54	
1891	47.3	106	August 9	-31	32.90	49.05	23.48	
1892	46.6	104	July 11	-38	36.58	48.77	24.78	34.2
1893	45.7	102	July* 13	-36	36.58	48.77	24.78	34.2
1894	49.7	109	July 26	-37	27.59	33.27	19.19	37.2
1895	47.2	104	May 28	-33	21.94	29.81	15.65	19.2
1896	48.6	104	July 3	-20	26.77	35.25	18.57	26.0
1897	47.8	106	July* 23	-30	37.23	51.60	28.68	22.6
1898	47.7	103	August 20	-25	26.98	36.18	20.21	38.8
1899	47.3	104	Sept. 6	-40	31.34	55.47	19.51	40.3
1900	49.3	103	August 3	-27	28.68	42.06	21.79	23.4
1901	49.0	113	July 22	-31	35.05	47.33	25.05	25.8
1902	47.7	98	July 30	-31	24.41	37.69	16.35	38.5
1903	47.2	101	August 24	-27	43.82	58.80	20.14	28.0
1904	46.3	100	July 17	-32	35.39	50.53	26.41	19.4
1905	47.2	104	August 11	-41	21.94	29.81	19.34	29.2
1906	48.4	102	July 21	-32	36.56	52.26	24.66	38.3
1907	47.4	102	July 5	-31	31.60	44.34	20.63	32.8
1908	49.4	101	August 3	-18	31.61	43.90	19.93	24.0
1909	47.4	103	August* 15	-26	35.09	49.98	24.11	22.7
1910	48.6	108	July 16	-35	40.01	53.48	37.20	49.0
1911	49.5	111	July* 3	-35	19.87	27.99	11.12	23.4
1912	46.3	104	Sept. 8	-47	31.37	46.77	19.74	35.3
1913	49.7	108	July* 16	-25	28.65	33.13	15.25	39.5
1914	49.1	109	July 12	-31	29.95	45.18	20.31	25.4
1915	47.8	99	May 14	-32	31.93	44.11	23.30	27.5
1916	47.2	106	August 4	-34	39.53	51.15	27.29	31.3
1917	44.8	106	July 30	-40	28.90	46.34	22.48	29.5
1918	49.2	113	August 4	-36	27.81	36.00	20.78	32.4
1919	48.6	104	July* 30	-36	32.78	47.53	25.03	33.4
1920	48.2	102	July 23	-26	36.76	48.16	26.88	26.6
1921	52.2	104	July* 11	-22	31.75	44.00	20.95	21.7
1922	50.2	104	June 23	-29	32.03	46.47	20.44	30.7
1923	49.0	102	July* 22	-23	29.98	44.20	19.08	13.5
1924	46.4	100	August* 21	-36	29.50	37.47	21.36	36.3
1925	48.8	105	July* 1	-25	31.39	43.85	19.41	37.2
1926	48.3	109	July* 19	-22	28.24	45.53	13.77	29.2
1927	48.8	102	July 11	-27	33.07	48.36	22.35	27.8
1928	49.4	100	August 1	-20	29.35	47.54	18.75	17.9
Mn	47.7				31.85			29.5

*And other dates.

(Continued on Page 104)

CLIMATOLOGICAL DATA FOR THE YEAR 1928

STATIONS	COUNTIES	Elevation, feet	Length of record, years.	Temperature, in Degrees Fahrenheit					Precipitation, in Inches					Number of Days				Prevailing direction of wind		
				Mean	Highest	Date	Lowest	Date	Length of record, years	Total	Greatest Monthly	Month	Least Monthly	Month	Total snowfall (unmelted)	Precipitation .01 in. or more	Clear		Partly cloudy	Cloudy
<i>Northern Division</i>																				
Akron	Plymouth	1,153						1	26.18	4.66	July	0.01	Jan.	15.7	72	168	132	66	s.	
Algona	Kossuth	1,224	55	47.9	96	Aug. 9	-16	Jan. 2	56	34.55	8.56	Aug.	0.20	Jan.	64	253	46	67	nw.	
Allison	Butler	1,060	16	46.7	91	Aug. 8	-19	Jan. 2	16	34.57	4.80	June	0.35	Jan.	28.0	81	183	101	82	nw.
Alta	Buena Vista	1,513	37	48.0	98	Aug. 9	-14	Jan. 2	37	27.83	4.23	Aug.	0.13	Jan.	35.0	70	179	108	79	nw.
Alton	Sioux	1,305	23	47.3	95	July. 6	-17	Jan. 2	23	25.72	5.12	Aug.	0.08	Jan.	29.7	76	119	167	80	nw.
Beimond	Wright	1,181	18	47.2	94	July 6	-17	Jan. 2	18	37.70	10.03	Aug.	0.13	Jan.	34.0	89	131	78	157	nw.
Britt	Hancock	1,236	41		96	July 9	-18	Jan. 2	41		11.30	Aug.	0.11	Jan.						sw.
Charles City	Floyd	1,015	37	46.7	92	July 6	-17	Jan. 2	42	39.05	12.78	Aug.	0.27	Jan.	20.4	97	161	93	109	nw.
Cherokee	Cherokee	1,196	6		98	Aug. 9	-15	Jan. 2	6		4.32	May	0.13	Jan.						s.
Decorah	Winnebago	872	35	46.6	95	Aug. 8	-16	Jan. 2	42	40.92	12.80	Aug.	0.35	Jan.	26.5	90	171	79	116	nw.
Dubuque	Dubuque	700	55	49.0	92	July 7	-10	Jan. 2	75	31.47	9.38	Aug.	0.20	Jan.	16.3	110	116	110	140	nw.
Estherville	Emmet	1,298	33	47.5	97	Aug. 9	-18	Jan. 2	33	25.15	6.61	Aug.	0.34	Jan.	47.5	76	192	128	46	nw.
Fayette	Fayette	1,003	40		96	Aug. 9	-15	Jan. 2	40		9.36	Aug.	0.47	Jan.						nw.
Forest City	Winnebago	1,226	34	46.8	91	July 27	-20	Jan. 2	34	30.59	8.93	Aug.	0.34	Jan.	38.7	90	156	99	111	nw.
Hampton	Franklin	1,145	4					4		34.45	6.97	Aug.	0.21	Jan.	24.5	75				nw.
Hawarden	Sioux	1,181						2	28.75	6.63	Aug.	T.	Jan.	18.1	72	198	48	120	nw.	
Humboldt	Humboldt	1,095	40	47.5	97	July 26	-17	Jan. 2	43	33.23	8.16	Aug.	0.28	Jan.	23.8	70	165	98	103	nw.
Independence	Buchanan	956	64	48.7	91	Aug. 8	-14	Jan. 2	64	39.01	9.45	Aug.	0.37	Jan.	18.7	87	206	43	117	sw.
Inwood (near)	Lyon	1,474	24	46.8	100	Aug. 1	-18	Jan. 2	24	30.64	7.08	Aug.	0.28	Jan.	26.2	78	231	64	71	nw.
Lake Park (near)	Dickinson	1,489	8		94	Aug. 7	-19	Jan. 2	8					Jan.	25.9					nw.
Lansing	Allamakee	632						21		8.06	Aug.			Jan.						n.
Le Mars	Plymouth	1,224	32	48.6	95	July 6	-14	Jan. 1	40	25.90	4.57	July	0.04	Jan.	23.0	75	227	71	68	n.
Marathon	Buena Vista	1,390						2	26.68	4.87	June	0.16	Jan.	47.3	92	184	66	116	nw.	
Mason City	Cerro Gordo	1,148						31	38.01	12.28	Aug.	0.26	Jan.	31.4	90	146	123	97	nw.	
New Hampton	Chickasaw	1,169	31		92	Aug. 9	-19	Jan. 2	31		10.40	Aug.	0.07	Jan.						nw.
Northwood	Worth	1,222	32		94	July 6		32		11.92	Aug.			Jan.						nw.
Oswego	Fayette	1,036	5	48.0	93	July 6	-14	Jan. 2	5		9.30	Aug.	0.16	Jan.						w.
Osage	Mitchell	1,163	38		97	Aug. 8	-18	Jan. 2	38	33.59	11.25	Aug.	3.32	Jan.	29.0	78	186	67	113	w.
Pocahontas	Pocahontas	1,248	24	47.9	96	Aug. 14	-15	Jan. 2	24	31.53	4.76	June	0.19	Jan.	27.5	96	194	87	85	nw.
Postville (near)	Clayton	1,192	29	45.4	88	Aug. 8	-15	Jan. 2	29	35.86	8.73	Aug.	0.24	Jan.	34.7	87	169	123	74	sw.
Rock Rapids	Lyon	1,349	29	46.2	95	Aug. 1	-18	Jan. 2	29	29.88	7.25	Aug.	0.08	Jan.						nw.
Sanborn	O'Brien	1,553	14	46.2	97	Aug. 9	-20	Jan. 2	14	25.87	8.72	Aug.	T.	Jan.	74	265	48	53	sw.	
Sheldon	O'Brien	1,418	16	47.0	97	Aug. 9	-16	Jan. 2	21	29.14	8.08	Aug.	0.08	Jan.	24.2	74	167	86	113	sw.
Sioux Center	Sioux	1,126	29		96	Aug. 1	-17	Jan. 1	29	32.46	9.96	Aug.	0.20	Dec.	28.8	87	179	116	71	nw.
Spencer	Clay	1,319	14	47.6	99	Aug. 7	-17	Jan. 2	14	27.15	6.04	Aug.	0.17	Jan.	33.6	65	156	78	132	s.
Storm Lake	Buena Vista	1,440	39	48.7	95	Aug. 9	-14	Jan. 2	39	27.38	4.46	Aug.	0.07	Jan.	45.2	76	182	96	88	nw.
Washita	Cherokee	1,157	30	47.4	96	Aug. 9	-12	Jan. 1	30	28.56	5.45	Aug.	0.06	Jan.	26.2	80	212	71	82	se.
Waterloo	Black Hawk	854	45	49.8	95	Aug. 8	-17	Jan. 2	46	41.76	10.06	Aug.	0.15	Jan.	24.5	66	204	76	86	s.
Waverly	Bremer	936	32	47.6	91	Aug. 9	-17	Jan. 2	32	36.33	7.66	Aug.	0.20	Jan.	20.1	91	205	71	90	se.
West Bend	Palo Alto	1,197	35	47.2	97	Aug. 9	-17	Jan. 2	35	22.81	6.30	Aug.	0.11	Jan.	19.1	73	177	119	70	nw.
<i>Central Division</i>																				
Ames	Story	926	51	50.5	95	July 6	-12	Jan. 2	52	35.04	6.38	June	T.	Jan.	18.8	80	218	22	126	nw.
Audubon (near)	Audubon	1,297	33	49.0	94	Aug. 9	-11	Jan. 1	33	34.14	5.25	June	0.06	Jan.	42.9	91	190	117	59	nw.
Baxter	Jasper	998	28	49.3	94	July 6	-14	Jan. 2	28	33.42	6.68	Aug.	0.05	Jan.	19.7	94	98	182	86	nw.
Belle Plaine	Benton	836	38	49.7	95	Aug. 2	-13	Jan. 2	38	40.37	6.46	Aug.	0.17	Jan.	26.1	109	146	129	91	nw.
Boone (near)	Boone	891	23	49.0	96	Aug. 9	-10	Jan. 2	23	39.81	6.92	June	0.02	Jan.	25.5	82	156	100	110	s.
Carroll	Carroll	1,265	38	49.0	95	Aug. 9	-11	Jan. 1	38	32.59	9.43	Aug.	0.09	Jan.	17.5	78	241	52	73	nw.
Cedar Rapids	Linn	737	46	49.0	93	Aug. 8	-13	Jan. 2	46	36.75	5.72	Aug.	0.20	Jan.	14.4	103	153	52	161	nw.
Clinton	Clinton	595	55	50.3	94	Aug. 8	-10	Jan. 2	57	37.89	6.16	Aug.	0.58	Jan.	15.5	112	170	61	135	n.
Davenport	Scott	530	57	51.4	94	July 7	-9	Jan. 2	57	36.49	6.57	Aug.	0.34	Jan.	16.1	115	133	105	128	nw.
Davenport, No. 2	Scott	690	4	51.4	97	July 7	-10	Jan. 2	5	38.24	6.16	Aug.	0.37	Jan.	20.6	115				nw.
Denison	Crawford	1,171	34	49.4	95	Aug. 9	-12	Jan. 1	34	28.92	6.62	Oct.	0.02	Jan.	24.5	78	158	110	98	nw.
Des Moines	Polk	861	50	51.0	95	July 6	-8	Jan. 1	50	40.15	7.75	Aug.	0.11	Jan.	21.0	110	135	94	137	n.
Fairport	Muscatine	567	7	51.2	92	July 6	-11	Jan. 2	7	38.35	6.92	Aug.	0.53	Jan.	103	179	39	148	s.	
Fort Dodge	Webster	1,114	28	47.9	96	Aug. 8	-17	Jan. 2	28	34.77	7.49	Aug.	0.21	Jan.	93	201	61	104	sw.	
Grinnell	Poweshiek	1,031	34	49.2	94	July 6	-12	Jan. 2	34	30.49	6.48	Aug.	0.10	Jan.	17.0	91				nw.
Grundy Center	Grundy	976	37	48.9	95	Aug. 9	-15	Jan. 2	37	36.69	6.95	Aug.	0.21	Jan.	34.0	77	188	78	100	nw.
Guthrie Center	Guthrie	1,077	33		95	Aug. 8	-11	Jan. 1	33		7.35	Aug.	0.15	Jan.						nw.
Harlan	Shelby	1,192	29	49.0	94	Aug. 9	13	Jan. 1	29	30.76	5.45	June	T.	Jan.	21.1	79	192	79	95	nw.
Iowa City	Johnson	733	68	50.2	93	July 6	-11	Jan. 2	68	40.19	6.65	June	0.19	Jan.	8.0	108	168	96	102	nw.
Iowa Falls	Hardin	1,127	35	48.0	95	July 6	-16	Jan. 2	45	40.98	7.26	Aug.	0.29	Jan.	31.8	81	194	72	100	nw.
Jefferson	Greene	1,052	29				-11	Jan. 2	29				0.03	Jan.	28.0					sw.
Le Claire	Scott	576						28		5.79	July			Jan.						sw.
Little Sioux	Harrison	1,040	23	50.6	97	July 6	-12	Jan. 1	23	33.00	7.38	Oct.	0.17	Jan.	26.3	100	140	161	65	nw.
Logan	Harrison	1,120	61	59.4	96	July 6	-11	Jan. 1	61	31.56	5.74	Aug.	0.05	Jan.	79	145	172	49		nw.
Maquoketa (near)	Jackson	692	23		94	Aug. 8	-11	Jan. 2	23		5.60	June	0.19	Jan.						nw.
Marshalltown	Marshall	947	36	49.6	97	July 6	-14	Jan. 2	36	37.75	7.19	Aug.	0.12</							

CLIMATOLOGICAL DATA FOR THE YEAR 1928—Continued

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

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

MONTHLY STATE DATA FOR 1928

Table with columns: MONTH, Barometric Pressure (Mean, Highest, Date, Lowest, Date), Temperature (Mean, Departure from Normal, Highest, Lowest), Relative Humidity (7 a. m., 12 noon, 7 p. m.), Precipitation (Average, Departure from Normal, Greatest, Least, Snowfall), No. of Days (Clear, Partly Cloudy, Cloudy), Sunshine (Pct. of Possible Amt., Departure from Normal), Wind (Average Hourly Velocity, Prevailing Direction).

‡Local mean time. *Normal central time. †And other dates. ‡7 A. M. and 7 P. M., observations only.

MEAN MONTHLY AND ANNUAL TEMPERATURES, WITH DEPARTURES FROM THE NORMAL, FOR 1928

STATIONS	January		February		March		April		May		June		July		August		September		October		November		December		Annual					
	Temp.	Dep.	Temp.	Dep.	Temp.	Dep.	Temp.	Dep.	Temp.	Dep.	Temp.	Dep.	Temp.	Dep.	Temp.	Dep.	Temp.	Dep.	Temp.	Dep.	Temp.	Dep.	Temp.	Dep.	Temp.	Dep.				
<i>Northern Division</i>																														
Algona.....	22.6	+ 7.2	25.6	+ 6.8	36.6	+ 5.1	41.8	- 5.8	62.7	+ 3.5	63.6	- 5.0	74.3	+ 1.3	70.8	+ 0.5	59.6	- 3.7	52.8	+ 2.3	36.6	+ 2.0	27.6	+ 6.1	47.9	+ 1.7				
Allison.....	22.0	+ 6.1	25.4	+ 6.1	35.4	+ 3.3	41.4	- 5.9	60.4	+ 1.7	62.0	- 6.1	71.9	+ 0.9	70.8	+ 0.3	58.1	- 5.0	51.3	+ 0.6	35.8	+ 1.3	25.6	+ 3.3	41.4	+ 0.5				
Alta.....	23.0	+ 7.0	25.2	+ 5.5	37.5	+ 4.5	41.5	- 5.6	62.2	+ 3.6	63.8	- 4.0	74.1	+ 1.7	72.5	+ 2.2	60.0	- 2.7	51.8	+ 1.7	35.6	+ 1.7	28.4	+ 7.0	48.0	+ 1.9				
Alton.....	22.0	+ 6.5	24.5	+ 5.6	36.2	+ 4.2	41.8	- 5.2	61.2	+ 2.6	63.2	- 5.2	73.4	+ 0.1	72.1	+ 1.2	59.0	- 3.8	51.4	+ 1.6	35.4	+ 1.8	27.0	+ 6.2	47.3	+ 1.3				
Belmond.....	22.3	+ 7.6	25.2	+ 6.9	35.7	+ 4.4	41.0	- 5.7	61.2	+ 2.6	63.2	- 5.3	72.6	+ 1.0	71.4	+ 1.6	59.4	- 4.2	51.4	+ 0.8	36.2	+ 2.0	27.0	+ 6.1	47.2	+ 1.3				
Charles City.....	21.0	+ 7.3	25.2	+ 8.1	35.0	+ 4.3	41.1	- 5.3	60.5	+ 3.9	61.4	- 3.7	72.8	+ 0.5	70.1	+ 1.0	58.0	- 3.0	51.1	+ 2.5	36.3	+ 3.3	26.3	+ 5.9	46.7	+ 2.0				
Cherokee.....	23.4	+ 8.2	25.0	+ 5.5		+ 4.7	41.7	- 4.7	60.7	+ 2.7	62.4	- 5.1	72.5	+ 1.4	72.1	+ 2.1	59.4	- 2.8	52.4	+ 2.9	36.4	+ 3.3	27.8	+ 7.3						
Decorah.....	20.6	+ 5.4	24.4	+ 6.6	34.4	+ 3.1	41.6	- 5.7	60.3	+ 1.9	62.7	- 5.3	72.0	+ 2.6	69.9	+ 1.4	57.4	- 4.2	52.8	+ 1.9	39.2	+ 2.2	29.1	+ 4.4	49.0	+ 0.9				
Dubuque.....	23.8	+ 4.7	28.2	+ 6.0	37.4	+ 3.4	44.2	- 4.4	62.4	+ 2.1	64.5	- 4.9	73.6	+ 0.5	71.8	+ 2.1	58.8	- 1.9	59.2	+ 2.8	36.5	+ 2.5	27.0	+ 6.7	47.5	+ 2.7				
Estherville.....	21.1	+ 8.0	24.6	+ 6.7	35.5	+ 3.9	40.0	- 4.1	62.5	+ 5.5	63.7	- 5.1	72.7	+ 2.1	71.7	+ 2.9	61.0	- 0.7	51.9	+ 2.8	36.5	+ 2.5	27.0	+ 6.7	47.5	+ 2.7				
Fayette.....	22.6	+ 7.2	26.8	+ 7.8		+ 4.3	43.0	- 3.9	61.4	+ 3.4	63.8	- 3.5	73.2	+ 1.3	70.4	+ 1.0	58.7	- 3.6	52.4	+ 2.8	37.6	+ 3.5	27.0	+ 5.6						
Forest City.....	21.3	+ 7.0	24.8	+ 6.2	35.2	+ 3.4	40.9	- 5.4	60.8	+ 2.7	62.5	- 5.3	73.0	+ 0.8	70.7	+ 0.5	59.2	- 3.5	52.0	+ 2.9	36.2	+ 2.7	25.4	+ 4.1	46.8	+ 1.3				
Humboldt.....	22.8	+ 6.3	24.6	+ 4.1	36.2	+ 3.0	41.8	- 6.3	61.6	+ 1.6	63.2	- 5.1	73.3	+ 0.8	70.8	+ 1.0	59.2	- 0.7	50.6	+ 0.7	36.9	+ 1.3	29.2	+ 6.6	47.5	+ 0.2				
Independence.....	24.1	+ 7.2	28.0	+ 6.8	37.6	+ 3.5	43.6	- 5.1	62.1	+ 2.5	63.8	- 4.5	72.6	+ 4.4	71.1	+ 0.2	59.7	- 2.9	59.7	+ 2.9	39.4	+ 2.9	27.1	+ 3.5	48.7	+ 1.3				
Inwood.....	24.4	+ 6.4	22.6	+ 4.8	36.2	+ 3.5	40.8	- 5.9	61.2	+ 3.5	63.3	- 4.4	73.2	+ 0.6	72.0	+ 1.5	59.8	- 0.4	50.2	+ 0.4	34.5	+ 4.5	27.0	+ 7.6	46.8	+ 1.4				
Lake Pk. (near).....	19.8	+ 6.5	23.4	+ 5.6	34.4	+ 3.0	38.8	- 6.8	61.5	+ 4.0	62.2	- 5.1	72.4	+ 0.4		+ 1.5	69.6d	- 1.9		+ 1.1	36.6	+ 1.6	28.9	+ 6.5	48.6	+ 1.6				
Le Mars.....	24.4	+ 7.3	26.0	+ 5.1	38.2	+ 4.9	43.7	- 4.1	62.0	+ 3.0	64.4	- 4.2	73.8	+ 0.5	72.5	+ 1.5	60.1	- 3.6	52.2	+ 1.1	36.6	+ 1.6	28.9	+ 6.5	48.6	+ 1.6				
Mason City.....	20.9	+ 6.7	24.6	+ 6.5	34.0	+ 3.1	39.4	- 7.1	59.2	+ 1.2	61.0	- 6.6	71.0	+ 1.4		+ 0.4	58.0	- 2.7	50.9	+ 1.3	35.6	+ 2.1	26.2	+ 5.3						
Northwood.....					34.4	+ 5.2	40.2	- 4.9	60.8	+ 3.6	62.7	- 4.0	71.6	+ 0.4	68.9	+ 0.4	58.0	- 3.0	50.1	+ 1.9	34.8	+ 2.4	25.2	+ 5.5						
Oelwein.....	22.1	+ 5.7	27.2	+ 6.9	36.2	+ 3.2	42.6	- 5.0	61.8	+ 3.1	63.4	- 4.4	72.8	+ 0.6	71.5	+ 1.3	59.4	- 3.4	54.0	+ 2.8	37.9	+ 2.7	27.3	+ 4.3	48.0	+ 1.5				
Osage.....	21.0	+ 7.7	24.5	+ 7.7	34.9	+ 5.0	41.0	- 4.9	60.8	+ 3.0	62.1	- 5.1	72.3	+ 0.4	70.8	+ 2.0	58.8	- 2.4	51.6	+ 3.1	35.8	+ 2.6	25.8	+ 5.8	46.6	+ 2.1				
Pocahontas.....	23.6	+ 7.6	25.4	+ 5.7	36.6	+ 4.3	41.7	- 5.4	61.4	+ 2.6	63.7	- 4.6	73.4	+ 0.7	72.1	+ 1.5	60.1	- 3.4	52.4	+ 1.7	36.4	+ 1.7	28.4	+ 6.7	47.9	+ 1.5				
Postville.....	20.8	+ 5.6	24.7	+ 6.4	33.6	+ 3.0	40.6	- 5.7	58.8	+ 1.4	60.8	- 4.6	69.9	+ 1.6	68.4	+ 0.6	56.4	- 1.6	50.9	+ 1.6	35.6	+ 1.6	24.6	+ 6.7	45.4	+ 0.7				
Rock Rapids.....	20.0	+ 6.5	23.4	+ 5.5	35.5	+ 4.0	40.4	- 5.9	60.8	+ 2.8	62.7	- 5.2	72.2	+ 0.4	70.6	+ 0.9	57.8	- 3.9	50.0	+ 1.1	34.5	+ 1.3	27.1	+ 7.4	46.2	+ 1.1				
Sanborn.....	20.8	+ 6.2	23.6	+ 5.1	35.4	+ 3.8	39.8	- 6.7	60.6	+ 2.5	62.2	- 5.5	72.2	+ 0.6	70.2	+ 0.3	58.0	- 4.8	50.2	+ 0.8	34.6	+ 1.2	26.5	+ 7.1	46.2	+ 0.8				
Sheldon.....	21.4	+ 6.8	24.1	+ 5.6	36.4	+ 4.8	40.8	- 6.2	61.4	+ 3.2	63.2	- 4.3	72.6	+ 0.4	71.1	+ 0.6	59.4	- 4.0	51.0	+ 0.8	35.4	+ 2.2	26.9	+ 6.5	47.0	+ 1.3				
Sioux Center.....	21.0	+ 5.9	23.4	+ 4.7	35.8	+ 4.3	40.8	- 5.7	61.0	+ 3.2	63.1	- 4.4	72.8	+ 0.2	70.3	+ 0.2	59.2	- 3.8	51.6	+ 1.8	35.3	+ 1.8								
Spencer.....	21.6	+ 6.9	24.6	+ 6.1	36.4	+ 4.0	40.8	- 6.2	62.0	+ 3.5	63.6	- 4.9	74.0	+ 0.6	72.6	+ 2.0	60.4	- 3.1	51.4	+ 1.2	36.0	+ 2.4	27.6	+ 6.9	47.6	+ 1.6				
Storm Lake.....	25.0	+ 8.2	26.6	+ 6.2	38.2	+ 5.6	42.2	- 5.2	61.9	+ 2.8	63.6	- 4.7	73.9	+ 0.4	73.1	+ 1.7	60.8	- 1.8	53.0	+ 1.8	37.4	+ 1.9	28.8	+ 6.3	48.7	+ 1.8				
Washita.....	24.0	+ 7.4	25.9	+ 5.1	37.7	+ 4.4	41.8	- 5.7	60.3	+ 2.0	60.8	- 7.3	71.2	+ 1.1	71.3	+ 0.7	58.4	- 5.1	51.6	+ 1.1	36.8	+ 1.8	28.5	+ 6.4	47.4	+ 0.8				
Waterloo.....	23.2	+ 5.8	27.6	+ 6.7	37.4	+ 3.0	43.6	- 5.2	62.8	+ 2.6	65.4	- 4.0	73.7	+ 0.0	72.2	+ 1.0	60.4	- 3.7	54.2	+ 2.3	38.4	+ 1.3	26.6	+ 3.1	48.8	+ 1.2				
Waverly.....	22.2	+ 6.1	26.1	+ 3.2	42.8a	+ 4.8	61.6	- 4.8	61.6	+ 2.6	63.6	- 4.6	73.0	+ 0.5	71.6a	+ 0.7	59.1	- 4.3	52.4	+ 1.3	36.9	+ 1.3	26.4	+ 3.2	47.6	+ 0.9				
West Bend.....	22.2	+ 7.2	24.5	+ 5.3	35.7	+ 3.7	40.0	- 7.4	61.6	+ 2.3	62.8	- 5.6	73.2b	+ 0.0	70.8	+ 0.2	59.7	- 3.7	51.6	+ 1.0	35.8	+ 1.7	28.0	+ 6.9	47.2	+ 1.0				
<i>Central Division</i>																														
Ames.....	26.5	+ 8.0	29.3	+ 6.8	40.4	+ 5.4	45.3	- 3.5	63.6	+ 2.8	66.0	- 3.9	74.5	+ 0.5	73.7	+ 1.9	61.4	- 3.0	56.2	+ 4.5	40.2	+ 4.3	28.4	+ 4.6	50.5	+ 2.4				
Audubon.....	26.3	+ 9.2	27.6	+ 6.1	39.4	+ 5.6	43.8	- 3.8	62.0	+ 2.7	64.2	- 4.1	73.6	+ 0.9	72.8	+ 2.0	60.6	- 3.1	52.3	+ 1.5	37.5	+ 1.7	27.5	+ 4.7	49.0	+ 2.1				
Baxter.....	26.6	+ 6.7	28.6	+ 5.7	39.1	+ 4.1	44.6	- 4.4	62.7	+ 2.2	61.8	- 4.8	73.1	+ 1.1	72.0	+ 0.2	59.8	- 4.8	54.0	+ 1.6	38.7	+ 2.5	27.8	+ 4.1	49.3	+ 0.9				
Belle Plaine.....	25.5	+ 6.7	29.8	+ 6.9	38.6	+ 3.7	45.2	- 4.2	63.0	+ 2.6	64.4	- 4.8	73.6	+ 0.1	73.1	+ 1.6	60.2	- 4.2	54.7	+ 2.8	39.4	+ 2.4	28.6	+ 4.4	49.7	+ 1.5				
Boone.....	25.6	+ 7.7	28.1	+ 4.8	38.3	+ 2.3	44.3	- 4.7	61.5	+ 2.6	63.8	- 5.2	73.4	+ 0.1	72.2	+ 1.3	60.2	- 3.6	54.0	+ 2.3	39.1	+ 2.5	27.8	+ 3.8	49.0	+ 1.0				
Carroll.....	25.6	+ 8.2	27.4	+ 5.5	39.3	+ 3.3	43.5	- 5.0	62.1	+ 2.2	64.0	- 4.4	73.8	+ 0.6	72.0	+ 0.9	60.6	- 3.1	53.2	+ 1.6	37.6	+ 1.5	28.4	+ 4.6	49.0	+ 1.4				
Cedar Rapids.....	24.4	+ 5.5	28.8	+ 6.3	38.0	+ 3.3	44.3	- 4.9	62.0	+ 1.9	64.3	- 4.8	73.2	+ 0.8	72.0	+ 0.2	58.9	- 5.7	54.0	+ 2.6	39.2	+ 1.5	28.7	+ 4.7	49.0	+ 0.9				
Clinton.....	2.50	+ 4.4	30.4	+ 5.8	38.6	+ 2.8	45.8	- 4.0	62.2	+ 1.1	65.6	- 4.8	74.5	+ 0.3	73.9	+ 1.2	61.6	- 3.6	55.0	+ 2.0	40.8	+ 2.9	30.4	+ 4.1	50.3	+ 0.9				
Davenport.....	26.1	+ 4.3	31.0	+ 6.1	40.0	+ 3.9	46.8	- 3.1	64.2	+ 2.9	66.																			

MEAN MONTHLY AND ANNUAL PRECIPITATIONS, WITH DEPARTURES FROM THE NORMAL, FOR 1928

Table with columns for STATIONS, months (January-December), and Annual. Rows are categorized into Northern Division, Central Division, and Southern Division, listing various Iowa cities and their precipitation data for 1928.

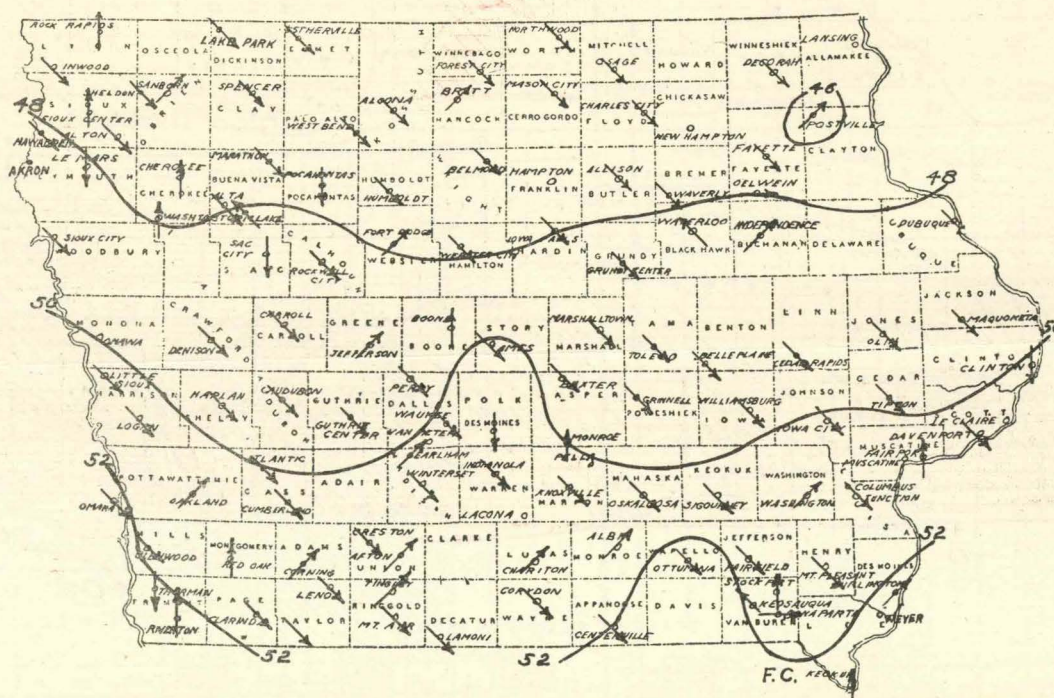
DATES OF KILLING FROST, 1928

Charles City, Davenport, Des Moines, Dubuque, Keokuk, Sioux City, Omaha, and Marshalltown excluded from averages because of city influences

Table with columns for STATIONS, Last in Spring, First in Autumn, Days in Growing Season, and corresponding data for Northwest, West Central, Southwest, North Central, Central, South Central, Northeast, East Central, and Southeast districts.

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

MEAN ISOOTHERMS AND PREVAILING WINDS, YEAR, 1928



STATE LIBRARY OF IOWA



3 1723 02103 4244