

end of the whole depression, had advanced eastward to the Atlantic coast of Virginia the conditions that were favorable for its further special development were antagonized by the rapid movement westward toward Newfoundland and Labrador of the high pressure that was then prevailing over Great Britain. On the 20th, noon, the lowest pressure was still central in Virginia and the high pressure over Manitoba was still central in that region, while, on the other hand, pressure had rapidly risen, with northeast winds, over New England and the Maritime Provinces. To this latter feature we must attribute the breaking up of *J*, which had disappeared on the 21st, noon, and also the development of *I*, as above narrated.

K. This appeared as a feeble depression on the 24th, noon, on the middle Atlantic coast, and was identical with No. VIII, U. S. series, having apparently originated in Virginia during the preceding twelve hours. This area moved northeastward, reaching the Bay of Fundy on the 26th, noon; it then passed over the Gulf of St. Lawrence, and on the 29th, noon, was at N. 52°, W. 48°. After this the cyclonic whirl rapidly increased in severity, and it was central as a severe storm on the 30th at N. 48°, W. 25°, while the low pressure that was then over Europe apparently extended westward toward it. On the 31st this storm was central at about N. 48°, W. 29°.

L. This letter is assigned to the extensive depression that prevailed over the Mediterranean on the 17th, while high pressure was reaching south and west over northern Europe and the Atlantic. Numerous local depressions apparently developed over southern Europe on the 16th, 17th, and 18th, while the dividing line, 29.9, between high and low pressure extended rapidly north and west, until, on the 20th and 21st, the low pressure prevailed over all Europe, except Great Britain. From the 22d to the 25th the high pressure on the north gradually extended over Sweden, Germany, and Russia, but by the 26th an extensive whirl and low pressure had developed over central Europe, and so continued during the 27th and 28th, after which it broke up and had disappeared by the 31st.

OCEAN FOG FOR MAY, 1894.

The limits of fog belts for May, 1894, as determined from reports of shipmasters, are shown on Chart I by dotted

shading. More than the usual amount of fog was encountered in this month. Near the Grand Banks of Newfoundland fog was reported on 25 days; between the fifty-fifth and sixty-fifth meridians on 20 days; and west of the sixty-fifth meridian on 22 days. Compared with the corresponding month of the last six years, the dates of occurrence of fog near the Grand Banks numbered 8 more than usual; between the fifty-fifth and sixty-fifth meridians, 7 more than usual; and west of the sixty-fifth meridian, 6 more than usual.

OCEAN ICE IN MAY, 1894.

The following table shows the southern and eastern limits of the regions within which icebergs or field ice were reported in May for each year:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
May, 1883	40 30	47 00	May, 1883	45 40	45 12
May, 1884	41 30	47 30	May, 1884	43 30	44 50
May, 1885	40 50	48 15	May, 1885	42 30	40 10
May, 1886	41 36	51 30	May, 1886	48 55	46 13
May, 1887	39 38	46 00	May, 1887	39 38	46 00
May, 1888	41 00	46 00	May, 1888	41 00	46 00
May, 1889	43 07	55 47	May, 1889	49 46	36 08
May, 1890	40 50	50 28	May, 1890	44 12	36 25
May, 1891	40 49	49 07	May, 1891*	48 00	45 00
May, 1892	42 14	51 20	May, 1892	45 05	41 14
May, 1893	41 05	55 55	May, 1893	47 02	42 16
May, 1894	40 34	48 35	May, 1894	43 31	43 37
Mean	41 12	49 54	Mean	45 02	42 44

* On the 7th three small pieces of ice were reported in N. 49° 03', W. 33° 40'.

The limits of the region within which icebergs or field ice were reported for May, 1894, are shown on Chart I by crosses. The southernmost ice reported, a large berg observed on the 25th in the position given, was about one-half of a degree farther south than the average southern limit of ice for May, and the easternmost ice reported, a medium sized berg, noted on the 1st in the position given in the table, was over one degree east of the average eastern limit of ice for the month. Ice was reported in great quantities over the southern and northern parts of the Banks of Newfoundland. Two bergs each about 3,000 feet long were reported south of the Grand Banks on the 18th.

TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The distribution of the monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart II; the lines are drawn over the high irregular surface of the Rocky Mountain plateau, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

NORMAL TEMPERATURE.

In Table II, for voluntary observers, the mean temperature is given for each station, but in Table I, for the regular stations of the Weather Bureau, both the mean temperatures and the departures from the normal are given for the current month. In the latter table the stations are grouped by geographical districts, for each of which is given the average temperature and departure from the normal; the normal for any district or station may be found by adding the departures to the current average when the latter is below the normal and by subtracting when it is above.

MONTHLY MEAN TEMPERATURE.

For the regular stations of the Weather Bureau the monthly mean temperature is the simple mean of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

During May, 1894, the highest mean temperatures were: Southeastern California, 90; southern Arizona, 88; and southern Texas, 82. The lowest temperatures were: at Canadian stations, 41 at Anticosti Island, and 44 at Sidney and White River; at United States stations: 46.7 at Eastport, 46.6 at Marquette, 47.7 at Sault Ste. Marie, and 48.1 at Tatoosh Island. The temperature averaged 32 at no point within the limits of our daily map, except on the peaks of the mountains.

DEPARTURES FROM NORMAL TEMPERATURE FOR MAY, 1894.

As compared with the normal for May the temperatures were decidedly in excess over the Rocky Mountain region and its eastern slopes, as also on the middle Atlantic coast, but were deficient in the central portion of the Lake region, Ohio Valley, and Tennessee, as also in the Pacific States. The

maximum excesses were: 5.4 at Rapid City, 4.2 at Topeka, 3.9 at Huron, 3.8 at Valentine, 3.8 at Hatteras, and 3.6 at Norfolk. The maximum deficits were: 4.0 at Portland, Oreg., 3.4 at Walla Walla, and 3.2 at San Diego.

The departures from normal temperature for the current month, and by districts, are as follows:

Positive departures: New England, 0.6; middle Atlantic States, 1.9; south Atlantic States, 0.7; west Gulf States, 0.6; lower Lake region, 0.2; North Dakota and extreme northwest, 1.3; upper Mississippi valley, 0.8; Missouri Valley, 2.0; northern slope, 2.9; middle slope, 1.5; southern slope (Abilene), 2.1; middle plateau, 1.3; southern plateau, 0.0.

Negative departures: Key West, 1.8; east Gulf, 0.1; Ohio Valley and Tennessee, 1.0; upper Lake region, 0.5; northern plateau, 1.5; north Pacific, 2.0; middle Pacific, 1.8; southern Pacific, 2.3.

The following table shows for certain stations, as reported by voluntary observers, the normal and extreme mean temperatures for this month:

State and station.	(1) Normal for the month of May.	(2) Length of record.	(3) Mean for May, 1894.	(4) Departure from normal.	(5) Extreme monthly means for May.			
					Highest.	Year.	Lowest.	Year.
<i>Arizona.</i>	o	Years	o	o	o		o	
Fort Apache	62.0	22	63.0	+ 1.0	67.6	1881	55.6	1884
Whipple Barracks	60.2	23	59.7	- 0.5	66.6	1876	54.3	1892
<i>Arkansas.</i>								
Keesees Ferry	67.4	12	67.6	+ 0.2	74.4	1886	62.9	1882
<i>California.</i>								
Riverside	65.4	12	62.4	- 3.0	69.0	1885	60.3	1891
<i>Colorado.</i>								
Las Animas	59.6	12	60.8	+ 1.2	65.6	1886	54.1	1892
<i>Florida.</i>								
Merritts Island	75.8	12	76.8	+ 1.0	79.2	1884	70.3	1886
<i>Georgia.</i>								
Forsyth	72.7	20	73.9	+ 1.2	75.8	1880	69.2	1877
<i>Idaho.</i>								
Boise Barracks	58.3	20	59.2	+ 0.9	63.5	1874	53.0	1880
Fort Sherman	54.4	11	.....	.....	57.9	1891	51.5	1882
<i>Indiana.</i>								
Lafayette	60.6	14	60.3	- 0.3	69.4	1881	55.0	1882
<i>Iowa.</i>								
Cresco	56.0	22	58.1	+ 2.1	64.1	1881	49.9	1888
<i>Kansas.</i>								
Eureka Ranch	63.2	11	65.4	+ 2.2	69.5	1887	55.0	1892
Independence	66.1	22	66.6	+ 0.5	72.0	1880	60.8	1872
Salina	65.2	10	65.2	0.0	71.3	1887	58.4	1892
<i>Louisiana.</i>								
Grand Coteau	74.1	11	74.8	+ 0.7	75.7	1884	70.4	1891
<i>Maine.</i>								
Orono	51.7	23	52.4	+ 0.7	55.9	1887	41.8	1884
<i>Maryland.</i>								
Cumberland	61.9	23	63.2	+ 1.3	67.0	1880	57.6	1882
<i>Michigan.</i>								
Kalamazoo	57.4	17	56.5	- 0.9	66.0	1881	41.3	1882
<i>Missouri.</i>								
Bedalia	64.2	11	66.0	+ 1.8	69.5	1887	60.1	1882
<i>Montana.</i>								
Fort Custer	55.0	12	58.0	+ 3.0	58.3	1886	52.2	1888
<i>Nebraska.</i>								
Fort Robinson	56.0	10	59.2	+ 3.2	66.4	1886	48.9	1892
Genoa (near)	59.3	18	63.1	+ 3.8	67.6	1880	52.2	1892
<i>Nevada.</i>								
Browns	65.2	22	.....	.....	71.3	1889	60.5	1873
Carson City	56.6	16	54.1	- 2.5	60.4	1875	51.3	1893
<i>New Hampshire.</i>								
Hanover	54.4	23	55.1	+ 0.7	62.0	1880	50.2	1882
<i>New Mexico.</i>								
Fort Wingate	59.8	22	60.6	+ 0.8	64.9	1875	54.2	1892
<i>New York.</i>								
Cooperstown	54.3	23	54.7	+ 0.4	60.7	1880, 1887	49.7	1882
Plattsburg Barracks	54.7	23	55.6	+ 0.9	60.9	1887	50.3	1882
<i>North Carolina.</i>								
Lenoir	62.7	21	64.4	+ 1.7	67.8	1887	48.0	1881
<i>Oklahoma.</i>								
Fort Reno	67.2	10	68.0	+ 0.8	73.9	1886	64.0	1885
Fort Sill	69.7	22	68.5	- 1.2	75.6	1886	64.7	1885
Fort Supply	65.5	15	66.2	+ 0.7	72.1	1886	58.8	1882
<i>Oregon.</i>								
Bandon	53.7	10	52.5	- 1.2	55.8	1891	50.7	1893
<i>Pennsylvania.</i>								
Dyberry	54.2	21	55.4	+ 1.2	64.1	1880	48.4	1882
Grampian	56.5	23	59.8	+ 3.3	65.1	1887	50.0	1882
Wellsboro	55.1	15	54.2	- 0.9	68.4	1879	50.4	1891
<i>South Carolina.</i>								
Statesburg	70.1	13	71.6	+ 1.5	73.8	1881	65.9	1885
<i>South Dakota.</i>								
Fort Sully	58.2	23	62.4	+ 4.2	68.4	1871	50.6	1892
<i>Texas.</i>								
Austin	74.6	18	78.4	+ 3.8	80.0	1886	72.3	1879
Silver Falls	69.8	8	.....	.....	76.6	1886	65.8	1888
<i>Utah.</i>								
Terrace	61.5	22	62.0	+ 0.5	71.9	1888	50.6	1882

Departures from normal temperature—Continued.

State and station.	(1) Normal for the month of May.	(2) Length of record.	(3) Mean for May, 1894.	(4) Departure from normal.	(5) Extreme monthly means for May.			
					Highest.	Year.	Lowest.	Year.
<i>Vermont.</i>	o	Years	o	o	o		o	
Strafford	55.1	21	54.4	- 0.7	63.0	1887	48.2	1892
<i>Virginia.</i>								
Dale Enterprise	63.8	14	63.2	- 0.6	72.0	1887	59.5	1893
<i>Washington.</i>								
Fort Townsend	53.7	22	51.0	- 2.7	57.0	1889	50.2	1880, 1893
<i>West Virginia.</i>								
Parkersburg .....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Wisconsin.</i>								
Madison	56.2	23	57.4	+ 1.2	65.3	1881	51.5	1883
<i>Wyoming.</i>								
Fort Washakie	51.6	11	58.6	+ 7.0	59.2	1886	47.6	1892

YEARS OF HIGHEST MEAN TEMPERATURE FOR MAY.

The mean temperature for May, 1894, was the highest on record at regular Weather Bureau stations, as shown in the following table, which also gives the highest previous record:

Stations.	May, 1894.		Highest previous.	
	Mean temperature.	Departure from normal.	Temperature.	Year.
Topeka, Kans	65.6	+ 4.2	63.0	1889
Kansas City, Mo	64.9	+ 0.4	63.6	1892
Palestine, Tex	74.4	+ 2.4	73.8	1886
Hatteras, N. C.	70.3	+ 3.8	69.1	1887

YEARS OF LOWEST MEAN TEMPERATURE FOR MAY.

The mean temperature for May, 1894, was the lowest on record at regular Weather Bureau stations, as shown in the following table:

Stations.	May, 1894.		Lowest previous.	
	Mean temperature.	Departure from normal.	Temperature.	Year.
Neah Bay, Wash.	50.7	- 2.7	51.4	1893
Eureka, Cal	51.0	- 2.5	51.4	1893
Los Angeles, Cal.	60.2	- 3.0	61.6	1891
San Diego, Cal.	58.6	- 3.2	60.0	1873

MAXIMUM TEMPERATURE.

The maximum temperatures of the month at regular stations of the Weather Bureau are given in Table I, from which it appears that the highest maxima were: Yuma, 102; Tucson, 100; El Paso, 96; Abilene, 99; Columbia, S. C., 95; Cape Henry, 95. The lowest maxima were: Eastport, 75; Sault Ste. Marie, 75; Escanaba, 73; Marquette, 76; Tatoosh Island and Eureka, 63; Neah Bay, 70; San Diego and San Francisco, 72.

YEARS OF HIGHEST MAXIMUM TEMPERATURE FOR MAY.

The maximum temperature for May was the highest on record at regular Weather Bureau stations, as shown in the following table:

Stations.	May, 1894.		Highest previous.	
	Maximum.	Excess above previous record.	Temperature.	Year.
Port Angeles, Wash.	81.0	+ 7.0	74.0	1888
Rapid City, S. Dak.	91.0	+ 1.0	90.0	*
Huron, S. Dak.	96.0	0.0	96.0	1886
Valentine, Nebr.	95.0	0.0	95.0	1886
North Platte, Nebr.	94.0	0.0	94.0	1880
Kansas City, Mo	90.0	+ 3.0	87.0	1890
Topeka, Kans	89.0	0.0	89.0	1889
Palestine, Tex	92.0	0.0	92.0	*

* Frequently.

MINIMUM TEMPERATURE.

The lowest temperatures recorded at regular stations of the Weather Bureau were: St. Vincent, 28; Havre, 28; Marquette and Escanaba, 29; Sault Ste. Marie, Alpena, Northfield, and Olympia, 30. Highest minima were: Key West, 66; Corpus Christi, 63; Galveston, 62; Port Eads, 60; Hatteras, 59; San Diego, 55; and Yuma, 50.

YEARS OF LOWEST MINIMUM TEMPERATURE FOR MAY.

The minimum temperatures for May were the lowest on record at regular Weather Bureau stations as shown in the following table:

Stations.	May, 1894.		Lowest previous.	
	Minimum.	Deficit below previous record.	Temperature.	Year.
Neah Bay, Wash.....	33.0	0.0	33.0	1890
Fort Canby, Wash.....	38.0	0.0	38.0	1887
Jupiter, Fla.....	55.0	- 1.0	56.0	*
Titusville, Fla.....	49.0	- 4.0	53.0	1889
Jacksonville, Fla.....	46.0	- 2.0	48.0	1877
Savannah, Ga.....	44.0	- 4.0	48.0	1877
Charleston, S. C.....	45.0	- 2.0	47.0	1876
Columbia, S. C.....	40.0	- 1.0	41.0	1891
Augusta, Ga.....	41.0	- 1.0	42.0	*
Atlanta, Ga.....	39.0	- 1.0	40.0	*
Chattanooga, Tenn.....	40.0	0.0	40.0	*
Knoxville, Tenn.....	34.0	- 2.0	36.0	1889
Lexington, Ky.....	32.0	- 2.0	34.0	1888
Cincinnati, Ohio.....	35.0	0.0	35.0	1883
Portland, Oreg.....	32.0	- 1.0	33.0	1878
Carson City, Nev.....	22.0	- 2.0	24.0	1892
Fresno, Cal.....	40.0	- 1.0	41.0	1892
San Francisco, Cal.....	45.0	0.0	45.0	*
San Diego, Cal.....	45.0	0.0	45.0	1883
Fort Smith, Ark.....	40.0	0.0	40.0	1889

* Frequently.

DAILY AND MONTHLY RANGES OF TEMPERATURE.

Greatest daily ranges.—Huron, 50; St. Vincent, 44; Laramie, 49; Pueblo, 47; Idaho Falls, 46.

Smallest daily ranges.—Hatteras, 16; Key West, 15; Port Eads, 17; Galveston, 13; Corpus Christi, 15; Tatoosh Island, 13.

Largest monthly ranges.—Idaho Falls, Laramie, North Platte, and Sioux City, 61; Olympia, 62; Huron and Moorhead, 63.

Smallest monthly ranges.—Tatoosh Island, 27; Eureka and San Diego, 27; San Francisco, 28; Galveston and Port Eads, 26; Hatteras, 21; Key West, 20; Corpus Christi, 25.

DIURNAL PERIODICITY.

The regular diurnal period in temperature is shown by the hourly means given in Table V for all stations having self-registers.

LIMITS OF FREEZING TEMPERATURE.

The region within which the air has had a freezing temperature at some time during the month is bounded by the minimum isotherm of 32°. This line, so far as can be judged from our charts, passed from central Maine westward to central Michigan and thence northwest along the northern boundary of Wisconsin and westward to central North Dakota; it then passed southward, taking in the whole of the mountainous part of Colorado, northern Utah, Idaho, and the western portions of Oregon and Washington. The line of minimum 40° passed from Cape Cod eastward to northern Pennsylvania, southward to northern Georgia, and thence northwest to Saint Louis, thence west-southwest to central New Mexico and northwest to California.

ACCUMULATED TEMPERATURES.

From January 1 to the end of the current month the average temperature for each geographical district was above or below the normal by an amount that is given in the last column of the following table. The accumulated departures from normal temperatures, as given in the second column, may be used

for comparison with the departures of current conditions of vegetation from the normal conditions.

Districts.	Positive departures.		Districts.	Negative departures.	
	Acc.	Average.		Acc.	Average.
New England.....	0	0	Southern plateau.....	- 9.4	- 1.9
Middle Atlantic.....	+ 6.7	+ 1.3	Middle plateau.....	- 4.9	- 1.0
South Atlantic.....	+ 11.2	+ 2.2	Northern plateau.....	- 2.9	- 0.6
Key West.....	+ 8.4	+ 1.7	Northern Pacific.....	- 8.2	- 1.6
East Gulf.....	+ 1.2	+ 0.2	Middle Pacific.....	- 9.9	- 2.0
West Gulf.....	+ 3.7	+ 0.7	Southern Pacific.....	- 12.8	- 2.6
Ohio Valley and Tennessee.....	+ 4.5	+ 0.9			
Lower Lake.....	+ 8.6	+ 1.7			
Upper Lake.....	+ 14.7	+ 2.9			
North Dakota (Ex. N.W.).....	+ 16.5	+ 3.3			
Upper Mississippi.....	+ 11.1	+ 2.2			
Missouri Valley.....	+ 13.0	+ 2.6			
Northern slope.....	+ 11.2	+ 2.2			
Middle slope.....	+ 1.4	+ 0.3			
Southern slope (Abilene).....	+ 4.3	+ 0.9			
	+ 5.8	+ 1.2			

PERIODS OF HIGH TEMPERATURE.

The maximum temperatures of May usually occurred about the middle of the month, except in Washington, Oregon, and Idaho, where they occurred at the end of the month, and in northern New York and New England, where they occurred at the beginning of the month. The dates of occurrence of the monthly maxima were the 13th, 14th, and 15th, in North Dakota, South Dakota, Nebraska, Colorado, Kansas, Iowa, Minnesota, western Illinois, and Wisconsin. On the 16th an area of high temperature had advanced southward over Missouri and eastward over Indiana and Lake Michigan. By the 17th this area of highest temperature had advanced southeast over Ohio, Kentucky, Tennessee, the south Atlantic, and northern portion of the Gulf States. This was the most decided and extensive southeasterly movement of high temperatures during the month, but all other areas of high temperatures pursued a similar course.

AREAS OF 20° RISE IN TWENTY-FOUR HOURS.

The daily weather charts show by heavy dotted lines the regions over which the temperature has risen 20° in the preceding twenty-four hours. The occurrence of such rapid rises becomes less frequent as we approach the midsummer season, and the following is a list of these areas, with their diameters, in miles:

- (A) 10th, p. m., 600 by 200, Wyoming, Montana, and Saskatchewan.
- (B) 10th, p. m., 100 by 100, western New York and Lake Erie.
- (C) 11th, p. m., 100 by 100, southeast Colorado.
- (D) 31st, p. m., 100 by 300, Minnesota and Wisconsin.

PERIODS OF LOW TEMPERATURE.

The lowest temperatures of the month occurred principally between the 18th and 22d over the eastern slope of the Rocky Mountains, the Mississippi Valley, and the Atlantic States. The minimum temperatures in California and Oregon occurred on the 16th, in connection with the extensive high area that was then central off the coast of Oregon. Two days after this the highest pressure was central in Manitoba and Saskatchewan, and as it moved southeastward brought the lowest pressure of the month to the Mississippi Valley and the south Atlantic States. The minimum temperatures occurred on the 19th in southern Wisconsin, Iowa, Missouri, Illinois, Arkansas, Kansas, Nebraska, and Oklahoma; on the 20th in Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina, Tennessee, Kentucky, and Ohio; on the 21st in North Carolina and Virginia; 22d, in Connecticut and Massachusetts.

AREAS OF 20° FALL IN TWENTY-FOUR HOURS.

A fall of temperature of 20°, or more, in twenty-four hours is not called a cold wave by the Weather Bureau unless the tem-

perature falls below 40°, and is, therefore, likely to cause a frost injurious to vegetation, but all falls of 20° are indicated on the Daily Weather Map by inclosing the areas within which they occur by heavy dotted lines, and the following list enumerates these regions for the month of May:

(A) 3d, a. m., 200 by 100, northern New York; 3d, p. m., 300 by 200, New England and Nova Scotia.

(B) 10th, a. m., 100 by 100 in South Dakota.

(C) 10th, p. m., 500 by 200 in central Texas.

(D) 11th, p. m., 200 by 100 in western New York and Lake Erie.

(E) 13th, p. m., 400 by 200 in Minnesota and Wisconsin.

(F) 14th, p. m., 100 by 100 in Nevada.

(G) 15th, p. m., 100 by 100 in Utah.

(H) 16th, p. m., 300 by 200, in South Dakota.

(I) 17th, p. m., 300 by 200 in the Missouri Valley. 18th, a. m., 300 by 300 in Iowa and Illinois; 18th, p. m., 1,100 by 400 in Arkansas, Missouri, Illinois, Tennessee, Kentucky, Indiana, Ohio, Michigan, and Lake Huron. 19th, a. m., 1,000 by 300 in Alabama, Tennessee, Kentucky, Ohio, Lake Erie, and western New York; 19th, p. m., 600 by 200 in West Virginia, western Kentucky, western Tennessee, and northern Georgia. 20th, a. m., 400 by 200 in South Carolina, Georgia, and Florida.

(J) 20th, p. m., 500 by — in Manitoba. 26th, p. m., 400 by 200 in Minnesota and Wisconsin. 27th, p. m., 100 by 100 in southern Wisconsin and northern Illinois, also 200 by 100 in Michigan and Lake Huron. 28th, a. m., 400 by 500, lakes Huron, Erie, and Ontario; 28th, p. m., 400 by 200, New York and Pennsylvania.

(K) 31st, p. m., 200 by 200 in Texas.

DESTRUCTIVE FROSTS.

Destructive frosts were reported on the following dates at the localities mentioned in the respective States:

2d.—Nevada: Carson City.

6th.—Arizona: Wilgus.

8th.—Washington: Ferry.

9th.—Oregon: Portland. Washington: Ferry.

10th.—New York: Washington County. Washington: Seattle.

11th.—Massachusetts: Boston and Mansfield.

12th.—Tennessee: Franklin.

13th.—Massachusetts: Taunton. Tennessee: Franklin.

14th.—Massachusetts: Taunton.

15th.—Connecticut: Greenfield Hill, Norwalk, Storrs. Massachusetts: Amherst, Taunton, East Templeton. New Hampshire: Brookline. New York: Albany, Bedford, Elmira, Kingston, Oswego, Rome, Troy, Utica, Pulaski, Mexico, Medina, Lockport. Vermont: Norwich.

16th.—Nevada: Yerington.

18th.—Illinois: Martinsville, Winnebago. Indiana: Delphi, Jasper, Mauzy. Nebraska: Culbertson. Missouri: Lebanon. Ohio: New Bremen. Wisconsin: Sharon.

19th.—Georgia: Marshallville. Illinois: Louisville, Riley. Indiana: Veedersburg. Iowa: Alta, Amana, College Springs, Cresco, Des Moines, Glenwood, Greenfield, Hampton, Panama, Sioux City, Spirit Lake. Kansas: Allison, Colby, Concordia, Eureka Ranch, Garfield, Ionia, Pleasant Dale, Sedan, Utica, Wamego, Yates Center. Minnesota: Carver, Maple Plain, Milan, Montevideo, Moorhead. Missouri: Carrollton, Hannibal, Lebanon, Oregon, Phillipsburg, Princeton, Springfield. Nebraska: Beaver City, Ericson, Ewing, Glenwood, Hartington, Harvard, North Platte, Omaha, O'Neill, Ravenna, Seward, Valentine. North Carolina: Columbus. Ohio: New Bremen, Ripley. Oklahoma: Oklahoma. South Carolina: Trenton. South Dakota: Huron. West Virginia: Cloverdale. Wisconsin: Fond du Lac, Sharon.

20th.—Georgia: Adairsville. Illinois: Louisville. Iowa: Davenport. Kansas: Coffeyville, Grenola, Independence,

Topeka, Wamego. Kentucky: Greendale. Mississippi: Meridian. Missouri: Arthur, Eight Mile, Grovedale, Hannibal, Oregon, Phillipsburg, Princeton, Sarcoxie. Nebraska: Ericson. North Carolina: Columbus. Ohio: Ripley. South Carolina: Trenton. Texas: Denison. Wisconsin: Fond du Lac.

21st.—Georgia: Adairsville. Kansas: Wamego. Mississippi: Enterprise. Missouri: Arthur.

22d.—Georgia: Adairsville. Massachusetts: Amherst, East Templeton. Missouri: Sarcoxie. Ohio: Pataskala.

26th.—California: Susanville. Georgia: Savannah.

28th.—California: Fall Brook, Julian. Indiana: South Bend. Iowa: Amana, Cresco. Michigan: Berrien Springs, Escanaba, Grand Haven. Wisconsin: Green Bay, Lincoln.

29th.—Michigan: Escanaba. New Mexico: Olio. New York: Angelica, Humphrey. North Carolina: Bailey. Ohio: Green Hill, Pataskala, Paoli. Pennsylvania: Grampan, Pittsburg. Washington: Powellton. West Virginia: Bloomery, Burlington, Tannery.

30th.—New Hampshire: Brookline.

31st.—Iowa: Amana.

TEMPERATURE AS AFFECTING AGRICULTURE.

The following records of agricultural conditions are taken from newspaper summaries and the official reports of the State Weather Services:

Arkansas.—The first half of the month the temperature was highly favorable for all crops, but from the 18th to the 31st, inclusive, it was below the normal. On some lowlands in the extreme northwest portion of the State corn was killed by the frost of the 20th; this damage was not general, but the cool nights were detrimental to all plant growth and particularly so to cotton. No serious damage was done to the cotton plant, except in a few isolated localities where the stands were injured.

Florida.—The growth of crops was checked for a few days by the exceptionally low temperature of the 19th, 20th, and 21st.

Iowa.—The freezing weather on the 19th and 20th checked the advance of all crops and seriously damaged fruit, tender vegetation, and spring grain, in many localities.

Indiana.—The weather conditions the first half of the month were very favorable to all crops; the latter part frosts injured gardens to some extent. Cereals and pastures are generally in good condition.

Kentucky.—The damage to the crops resulting from the unprecedented freezing temperatures of the 20th was not so great as at first supposed.

Louisiana.—The cool weather in the mornings of the 19th and 21st produced light frosts in a few of the interior and northern parishes and had a retarding effect on vegetation.

Michigan.—The average condition of meadows and pasture in the four southern tiers of counties is 89 per cent, an average much below what would ordinarily be expected in a season when weather conditions were as favorable as prevailed in May.

Minnesota.—Very favorable weather conditions until the frosts of the 18th, 19th, and 20th, which cut all tender vegetation to the ground; the damage was principally confined to the southern and central portions of the State, and the field crops, with the exception of corn and potatoes, received but little injury. Under the following favorable weather conditions the injured crops, except fruit, made an almost entire recovery, and agricultural prospects were very encouraging until the 28th when the tender plants received another set back from the frost which, although general, was not so damaging as the earlier one. These heavy frosts worked but little injury to the cereals, other than the maize, and their condition, together with pasturage and grass, was upon the whole excellent at the close of the month.

Mississippi.—A cold wave entered the State on the night of the 19th, and since then the weather has remained too cold for all vegetation, cotton especially suffering from cold nights.

Missouri.—The lowest temperatures occurred on the 19th and 20th, and killing frosts were general over the State on those dates, doing considerable damage to tender vegetation.

Nebraska.—The freeze of the 18–19th did great damage to grain crops, fruit, and vegetation generally in many parts of the State. At Ravenna, Buffalo Co., leaves of walnuts, catalpas, ash, and mulberries killed; cherries, strawberries, potatoes, and part of the corn also killed. Sutton, Clay Co.: winter wheat nearly all turned over and planted in corn; oats in poor condition; corn, large area planted and all in good condition; grapes, cherries, apples, potatoes, cabbage, and strawberries killed.

Nevada.—The heavy frost of the 15th and 16th injured fruit prospects to a great extent. The stock ranges are reported to be in good condition and stock better than for years.

New England.—A great deal of fruit was injured in this section by the cold spell of the 14th to 16th, while elsewhere the damage was confined mostly to planted crops. Moderate damage was again done on the 22d,

although many fields were saved by a dense fog. A clipping referring to the frost on the 15th in Vermont states: "In the hill towns the usual peculiarity of such cold waves was observed; the freeze went in streaks, in some cases the apple blossoms were unmistakably frozen, while perhaps only a few rods away the blooms appeared to be uninjured."

North Carolina.—During the first eighteen days of May the temperature was generally above the normal; a cold wave followed on the 20th, preceded by snow in the mountains, which lowered the temperature below 32 at several stations in the western district, with considerable injury to the crops. The remainder of the month was generally cool and unfavorable to the rapid growth of vegetation.

North Dakota.—The temperature was about the average for the month, the frosts were light and no injurious effects have been reported. Generally speaking the outlook for the farmers is good, particularly in the northern and eastern parts.

Oklahoma.—Light frosts occurred throughout the Territory on the mornings of the 19th and 20th, damaging corn, cotton, and tender vegetation slightly on low lands and creek bottoms. Wheat harvest, by the close of the month, had begun in a few fields; grain ripening unusually early. The outlook is favorable for a good average wheat crop; large corn crop; oats short; cotton, potatoes, grass, vegetables, and small fruits excellent.

South Carolina.—From the 1st to the 19th the month was favorable for agricultural interests. After the 19th the conditions were adverse, principally on account of a cool wave that carried the temperature as low or lower than ever before recorded during the latter part of May in this State. Light frosts were noticed on the mornings of the 20th and 21st over the greater part of the State, and vegetation suffered severely, especially the more tender varieties, such as cotton and the various cultivated vines, not so much from the frost as from the prevailing cool nights.

South Dakota.—Frosts sufficiently heavy to kill delicate vines and cut field crops occurred in different portions of the State during the whole month. The most general killing frost over the eastern portion of the State occurred on the 19th.

Tennessee.—A cool wave passed over the State on the 18th, causing light frosts in some of the western counties, but no damage was done to crops aside from temporarily retarding their growth. Covington: Growing crops damaged by unseasonably cold weather. Lynnville: A cold wave struck us on the morning of the 18th and lasted until the end of the month; much damage was done to tender vegetation; nearly all the apples are falling from the trees. Nunnally: The latter portion of the month has been very cold, and vegetation has suffered greatly therefrom.

Texas.—Except for the hail in a few localities the weather was generally favorable for cotton, which was in good condition generally. Maize was blooming or tasseling over the northern portion of the State by the 22d, and the prospects for a good crop continue promising. Early sown oats were beginning to ripen over the southern portions of the State by the 31st.

Washington.—Vegetation made good growth, and, with the exception of the prune and cherry crops, which were injured by frosts in some of the western counties, this year's crops are in a very promising condition in all districts not affected by the inundations.

West Virginia.—Killing frost on the 29th, injurious to tender garden truck. Crops did not make satisfactory growth during the month, the conditions on the average being unfavorable, melons and corn being the most seriously affected.

Wisconsin.—Fond du Lac: The frosts of the 19th and 20th did much damage to strawberries and small fruits, and some injury to early corn and potatoes. Harvey: At the end of the month it was found that fruit was not so badly hurt as at first supposed; small grains looking excellent.

PRECIPITATION.

[In inches and hundredths.]

The distribution of precipitation for the month of May, 1894, as determined by reports from about 2,000 stations, is exhibited on Chart III. The numerical details are also given in Tables I, II, and III; the first of these gives the average departures from the normal for each district, whereas the average departure for each State is given in the chapter on State Weather Services.

NORMAL PRECIPITATION FOR MAY.

The normal precipitation for the month of May is less than 1 in the southern plateau and the southern Pacific regions; it is from 1 to 2 over the middle Pacific, northern, and middle plateau; from 2 to 3 in the North Dakota, northern slope, and north Pacific regions; from 3 to 4 in New England, middle Atlantic, Key West, and Ohio Valley regions; from 4 to 5 in the lower Lake, upper Lake, south Atlantic, east Gulf, and west Gulf regions.

PRECIPITATION FOR CURRENT MONTH.

The total precipitation for May exceeded 6 in the southern slope, or Abilene region, and exceeded 5 in the middle Atlantic and lower Lake region. Areas of 8 to 10 occurred in Arkansas, Michigan, and Pennsylvania.

CURRENT DEPARTURES FROM NORMAL PRECIPITATION.

The precipitation for May was most decidedly in excess of the normal in Pennsylvania, being 6.5 above the average at Philadelphia and still more in the interior of the State. The principal region of excess covered the middle Atlantic and Eastern States, the lower Lake region, Michigan, Ohio, Indiana, and Kentucky, and portions of Wisconsin and Minnesota; a slight excess prevailed in northern California; the principal region of deficit was in the eastern Gulf States, the upper Mississippi and lower Missouri valleys. A maximum deficit of 4.4 occurred at Titusville and an excess of 4.1 at Tampa, on opposite sides of the Florida Peninsula.

The following table shows for certain stations, as reported

by voluntary observers, the normal and extreme total precipitation for this month:

State and station.	(1) Average for the month of May.	(2) Length of record.	(3) Total for May, 1894.	(4) Departure from average.	(5) Extremes for May.			
					Greatest.		Least.	
					Amt.	Year.	Amt.	Year.
<i>Arizona.</i>	<i>Inches.</i>	<i>Years.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>		<i>Inches.</i>	
Fort Apache	0.56	18	0.79	+ 0.23	2.18	1893	0.00	*
Whipple Barracks	0.60	23	0.23	- 0.37	1.82	1877	0.00	*
<i>Arkansas.</i>								
Keesee Ferry	6.09	12	9.41	+ 3.32	10.56	1882	1.97	1891
<i>California.</i>								
Riverside	0.39	13	0.26	- 0.13	1.99	1884	0.00	1886, '93
<i>Colorado.</i>								
Las Animas	1.82	12	1.20	- 0.62	5.06	1882	0.09	1893
<i>Florida.</i>								
Merritt Island	3.88	16	0.74	- 3.14	11.58	1890	0.74	1894
<i>Georgia.</i>								
Forsyth	3.27	20	3.56	+ 0.29	7.31	1890	0.45	1877
<i>Idaho.</i>								
Boise Barracks	1.41	20	2.08	+ 0.67	3.51	1892	0.07	1881
Fort Sherman	1.87	11	.....	.....	3.75	1893	0.66	1884
<i>Indiana.</i>								
Lafayette	4.81	14	5.16	+ 0.35	8.79	1892	1.98	1891
<i>Iowa.</i>								
Cresco	3.47	22	2.63	- 0.84	7.89	1880	0.76	1874
<i>Kansas.</i>								
Independence	4.67	22	3.71	- 0.96	10.64	1892	0.92	1879
Salina	4.10	10	3.02	- 1.08	8.92	1889	0.27	1888
<i>Louisiana.</i>								
Grand Coteau	5.23	11	1.92	- 3.31	14.03	1884	0.21	1889
<i>Maine.</i>								
Orono	3.49	23	3.84	+ 0.35	10.52	1890	1.25	1887
<i>Maryland.</i>								
Cumberland	3.28	22	6.13	+ 2.85	7.13	1890	0.30	1875
<i>Michigan.</i>								
Kalamazoo	4.25	18	8.33	+ 4.08	8.33	1894	1.44	1885
<i>Missouri.</i>								
Sedalia	5.16	15	3.94	- 1.22	10.47	1892	0.97	1879
<i>Montana.</i>								
Fort Custer	2.44	13	1.98	- 0.46	7.29	1893	0.47	1885
<i>Nebraska.</i>								
Fort Robinson	2.92	10	0.79	- 2.13	6.39	1888	0.72	1893
Genoa (near)	4.24	18	1.86	- 2.38	7.80	1877	0.83	1880
<i>Nevada.</i>								
Browns	0.28	22	.....	.....	1.10	1887	0.00	*
Carson City	0.60	16	1.07	+ 0.47	2.80	1891	0.04	1880
<i>New Hampshire.</i>								
Hanover	3.24	23	3.38	+ 0.14	6.26	1892	0.81	1879
<i>New Mexico.</i>								
Fort Wingate	0.52	22	0.02	- 0.50	3.00	1872	0.00	1879
<i>New York.</i>								
Cooperstown	3.67	23	5.29	+ 1.62	8.84	1890	0.36	1879
Plattsburg Barracks	2.58	23	4.14	+ 1.56	5.00	1890	0.18	1879