

Icebergs and field ice—Continued.

Date.	Vessel.	Position.		Remarks.
		Lat. N.	Lon. W.	
20	S. S. Washington City	Off Cape Breton coast.		Large quantities of floating ice.
	S. S. Amoor	39 35	46 00	Field ice.
21	S. S. Gothenburg City	46 40	48 00	One large berg.
		46 33	48 24	Do.
		42 57	49 18	Do.
22	S. S. Rotterdam	42 10	49 54	Do.
		42 39	51 15	Do.
	S. S. State of Georgia	42 55	50 05	Do.
23	S. S. Bavarian	42 40	50 30	Two large bergs.
	S. S. Scandinavian	42 41	50 05	One berg.
24	S. S. Aller	42 20	46 21	One large berg.
		42 23	49 36	One medium berg.
	S. S. Indian Prince	42 24	51 06	One large iceberg.
25	S. S. Washington City	Cape Breton coast.		Large fields.
	S. S. Suevia	42 34	50 41	Two bergs.
	S. S. Republic	43 27	48 53	One moderate berg.
	S. S. Aller	42 14	50 35	One medium berg.
28	S. S. Borderer	42 50	51 00	One berg.
	S. S. Sarnia	Off Cape Race		
29	S. S. Grecian	47 24	49 45	One small berg.
30	do	Off Cape Pito		One large berg.
	Bk. Adolph	do		Do.

FOG.

From the following reports it will be seen that fog-banks were encountered in the vicinity of the Banks of Newfoundland on sixteen dates, and in the trans-Atlantic routes to the westward of the sixtieth meridian on nineteen dates. In each of the thirty-four instances in which fog was observed in the vicinity of the Banks, the position of the reporting vessel was included within the eastern quadrants of an area of low barometric pressure. As regards fog observed to the westward of the sixtieth meridian, forty-one reports have been made, by which it is shown that fog was, as a rule, encountered in the western quadrants of areas of low pressure, or within areas of high barometer which succeeded the eastward passage of cyclonic areas.

The following table shows the limits of fog-areas on the north Atlantic Ocean during May, 1887, as reported by shipmasters:

Date.	Vessel.	Entered.			Cleared.		
		Lat. N.	Lon. W.	Time.	Lat. N.	Lon. W.	Time.
1	S. S. Waesland	42 59	41 41		42 51	42 02	
3	S. S. Lessing	42 02	50 20		42 02	50 30	
3	S. S. State of Indiana	41 57	51 34		41 49	53 26	
3-4	S. S. Adriatic	41 45	51 47		41 41	53 56	
3-5	S. S. Baltic	43 12	48 52		42 09	55 47	
4	S. S. State of Indiana	45 56	45 12		42 34	54 11	
4	S. S. Waesland	40 59	64 30		40 57	64 50	
4	S. S. Waesland	40 10	64 22		40 15	66 27	
5	S. S. Lessing	41 40	64 15		40 49	64 36	
5	S. S. Lessing	40 52	65 40		40 59	65 55	
5	S. S. Umbria	43 15	47 02		42 10	50 06	
		42 02	51 00		42 00	51 20	

Limits of fog areas—Continued.

Date.	Vessel.	Entered.			Cleared.		
		Lat. N.	Lon. W.	Time.	Lat. N.	Lon. W.	Time.
5	S. S. Waesland	40 28	69 23		40 28	69 39	
7-8	S. S. Elder	41 23	65 15		40 38	Hook.	
8	S. S. New Orleans	Lower Bay, N. Y.			40 10	65 44	
8	S. S. Elyan	39 55	67 57		40 10	65 44	ship.
8-9-10	S. S. Aurania	Sandy Hook			40 10	65 44	
8-9	S. S. Denmark	Daily fog continued off New York.			40 24	66 31	
9	S. S. British Princess	39 12	69 41		39 23	66 14	
9	S. S. Britannic	40 53	42 31		46 30	43 45	
10-11	S. S. City of Augusta	40 50	74 09		37 50	75 00	
10-11	S. S. British Princess	40 46	48 44		40 51	48 22	
14 16	S. S. Washington City	45 56	50 29		46 09	58 00	
15	S. S. Gleniffer	44 40	45 30	9 a. m. to 3 p. m.			
16-17	do	44 00	47 30		42 36	51 40	
16-17	S. S. LaBretagne	43 45	45 45		42 18	50 20	
16-17	S. S. Schiodan	44 50	43 30		42 10	50 05	
16-20	S. S. Washington City	46 09	59 00		42 10	50 05	
16-17	S. S. Celtic	44 52	55 11	9:35 p. m.	42 35	50 33	4:45 p. m.
16-17	S. S. Rhinco	44 50	47 10		39 58	47 40	
16-17	S. S. Pavoia	42 27	46 45	4:55 p. m.	41 55	48 47	6:19 a. m.
16-17	S. S. British King	44 00	39 50		43 34	40 55	
16-23	S. S. Toledo	46 58	41 12		39 20	74 10	
17	S. S. Denmark	40 25	67 44		40 23	65 27	
17-19	S. S. Santiago	41 35	63 00		Boston		
17	S. S. Elder	41 39	50 08		42 38	47 41	
17	S. S. Saale	42 40	47 15		42 20	50 00	
17	S. S. Benalder	40 20	67 50		40 20	65 00	
17	S. S. Rhinco	44 10	41 65		43 10	43 28	
17	S. S. British King	42 42	43 00		43 00	43 15	
17-18	S. S. Weser	39 20	66 14	5:35 a. m.	47 40	74 03	9 a. m.
17-19	S. S. Wyoming	40 28	73 00	8 p. m.	41 10	63 00	8 a. m.
18	S. S. Letimbro	37 41	72 45		38 30	73 06	
18	S. S. City of Montreal	41 00	65 10		Fire Is.		
18	Schr. C. B. Church	43 20	70 03		42 35	70 15	
19	S. S. Trave	40 30	70 31		40 76	64 40	
19	S. S. Edith Godden	38 26	74 18		38 57	74 15	
19	S. S. Gleniffer	41 20	61 00		40 55	65 00	
19-20	S. S. Schiodan	41 40	61 36		41 00	66 14	
19-20	S. S. Rhinco	40 20	63 00		40 25	66 30	
19-20	S. S. Celtic	41 11	63 15	8:10 a. m.	40 44	66 56	7:20 a. m.
19-20	S. S. Marengo	40 28	64 56	8 p. m.	40 35	60 50	7:30 a. m.
20	S. S. Rhinco	41 30	58 28		41 28	58 44	
20	S. S. City of Augusta	39 00	75 00		36 30	75 20	
21	S. S. Rhinco	41 17	62 48		41 17	63 30	
21-22	S. S. British King	39 15	70 30		10° W. of 5° lat.	hom light-ship.	
22-23	S. S. Gleniffer	39 50	69 50		39 30	72 10	
22	S. S. Rhinco	40 30	72 39		Sandy Hook.		
22-23	S. S. Albero	38 59	72 38		40 07	73 25	
23	Schr. C. B. Church	39 41	71 53		39 40	74 10	
23	S. S. Rotterdam	40 28	71 39		40 28	71 25	
24	do	40 28	71 00		40 34	64 00	
24-26	S. S. Arctic	41 43	54 54		44 11	44 29	At inter-val.
25	S. S. La Bourgogne	40 51	69 33		Montauk.		
25	S. S. Rotterdam	40 51	69 09		40 26	72 56	
25	S. S. Suevia	42 00	53 13		42 17	53 30	
25-27	S. S. Aurania	44 00	46 00		42 30	52 00	
26-27	S. S. British Prince	41 43	46 55		41 02	48 18	
27-28	S. S. Suevia	41 12	61 45		40 50	70 00	
28	S. S. Westernland	41 30	46 47		40 50	48 37	
28	S. S. Vaderland	41 30	46 04		40 25	48 54	
28-30	S. S. Canada	42 53	40 15		41 02	48 30	
29	S. S. Gallieo	40 34	66 42		40 32	68 13	
29	S. S. Aurania	41 12	63 43		41 00	66 12	
29	S. S. Polynesia	40 30	44 09		41 19	44 44	
30	do	40 38	46 33		40 31	47 15	
30-31	S. S. Emu	45 05	41 59		42 13	51 02	
30-31	S. S. British Princess	43 47	41 19		43 24	42 09	

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

The distribution of mean temperature over the United States and Canada for May, 1887, is exhibited on chart ii by the dotted isothermal lines. In the table of miscellaneous data are given the monthly mean temperatures, with the departures from the normal, for the various stations of the Signal Service, and in the figures opposite the names of the geographical districts in the column for mean temperature, precipitation, and departures from the normal, show respectively the averages for the several districts. The normal for any district may be found by adding the departure to the current mean for the district when the departure is below the normal, and subtracting when above. On chart iv the departures from the normal are illustrated by lines connecting stations of normal or equal abnormal values.

In northern California, western Montana, New Mexico, along the immediate Gulf coast, and on the south Atlantic coast

below Charleston, S. C., including the Florida Peninsula, the month of May, 1887, was slightly colder than the average, the most marked deficiency in the mean temperature occurring at Key West, Fla. With the exception of the comparatively small areas above mentioned, the month was warmer than the average throughout the United States. For the entire country north of the thirty-fifth parallel, the excess in the mean temperature amounted to 2°, or more, with the exception of the Pacific coast, northern New England, and the Maritime Provinces of Canada; to the northward of the parallel mentioned the departures increase to 6°, or more, over portions of the Lake region, Saint Lawrence, upper Mississippi, and lower Missouri valleys, while the area over which the excess amounts to 4° embraces all territory from Dakota and Nebraska eastward to Maine.

RANGES OF TEMPERATURE.

The monthly, and the greatest and least daily, ranges of

temperature, are given in the table of miscellaneous meteorological data.

In the extreme northwest, and over the central and northern Rocky Mountain districts, the monthly ranges were generally from 60° to 70°, the greatest, 79°.1, occurring at Winnemucca, Nev. The lower Ohio and central Mississippi valleys, and along the Atlantic and Gulf coasts, are the regions over which the monthly ranges were least, being generally below 40°. At Tatoosh Island, Wash., and San Diego, Cal., the monthly ranges were 32°.6 and 31°.5, respectively, all other Pacific stations reporting ranges of 40°, or more.

The following are some of the greatest and least monthly ranges at Signal Service stations:

Greatest.		Least.	
Winnemucca, Nev.....	79.1	Key West, Fla.....	16.6
Fort Klamath, Oregon.....	75.0	Pensacola, Fla.....	27.4
Asiland, Oregon.....	74.0	New Orleans, La.....	28.8
Fort Bidwell, Cal.....	72.6	Galveston, Tex.....	29.8
Lake View, Oregon.....	72.5	San Diego, Cal.....	31.5
Boise City, Idaho.....	71.2	Atlanta, Ga.....	31.6
Saint Vincent, Minn.....	71.2	Mobile, Ala.....	32.1

The greatest daily ranges of temperature during the month were 40°, or more, over the plateau districts, eastern Rocky Mountain slope, and in Wisconsin, Minnesota, and Dakota, occurring generally from the 3d to 5th, 9th, 17th, and 18th. Over the central and eastern portions of the country the greatest daily ranges occurred on the 1st, 2d, 4th to 6th, 9th, 10th, and from the 15th to 20th, and they generally exceeded 30°, except at the Atlantic coast stations south of New England, where they were from 20° to 30°; they were also from 20° to 30° in the Southern States.

The least daily ranges exceeded 10° over the region from the lower Ohio valley southward to the Gulf, and in all districts to the west of the one hundredth meridian, except along the immediate coast of the Pacific and over portions of the northern plateau and northern slope. In southern Florida, and at stations on the Atlantic coast north of Virginia, the least daily ranges were less than 5°.

The following are some of the most marked departures from the normal temperature at Signal Service stations:

Above normal.		Below normal.	
Buffalo, N. Y.....	5.6	Key West, Fla.....	2.5
Parry Sound, Ontario.....	8.2	Brownsville, Tex.....	1.9
Marquette, Mich.....	7.8	Savannah, Ga.....	1.5
Dubuque, Iowa.....	7.6	Jacksonville, Fla.....	1.4
Huron, Dak.....	7.1	San Francisco, Cal.....	1.2
Montreal, Quebec.....	7.0	Cedar Keys, Fla.....	1.1
Kingston, Ontario.....	6.7	Sanford, Fla.....	1.1

The Signal Service observer at San Francisco, Cal., reports, relative to the unusually high temperature at that place on the 28th, as follows:

The temperature (maximum, 96°.9, at 3.30 p. m.) to-day is the highest recorded in this city since the opening of the station in 1871, and is 1°.7 higher than that of June 6, 1883. The records kept in this city by the late Henry Gibbon, sr., since 1850, show only two instances where the temperature exceeded that of to-day, viz., September 10th and 11, 1852, when the mercury reached 97°.0 and 98°.0 on the two days respectively, when the "air was as a 'sirocco,' causing the woodwork of houses to cackle audibly and the plaster to break on the wooden walls."

DEVIATIONS FROM NORMAL TEMPERATURES.

In the table below are given, for certain stations, as reported by voluntary observers, the normal temperatures of May for a series of years, the mean temperature for May, 1887, and the departures from the normal:

Station.	County.	Normal temperature for May.	Number of years.	Mean temperature for May, 1887.	Departure.
Lead Hill.....	Boone.....	67.7	5	70.7	+ 3.0
Sacramento.....	Sacramento.....	64.4	21	63.0	- 1.4

Deviations from normal temperatures—Continued.

Station.	County.	Normal temperature for May.	Number of years.	Mean temperature for May, 1887.	Departure.
<i>Connecticut.</i>					
Middletown.....	Middlesex.....	57.1	29	61.2	+ 4.1
New Haven.....	New Haven.....	57.4	101	60.5	+ 3.1
Thompson.....	Windham.....	56.5	30	60.1	+ 3.6
Waterbury.....	New Haven.....	58.0	12	61.2	+ 3.2
<i>Dakota.</i>					
Webster.....	Day.....	57.1	5	61.2	+ 4.1
<i>Illinois.</i>					
Mattoon.....	Coles.....	62.7	7	66.0	+ 3.3
Peoria.....	Peoria.....	64.5	32	71.1	+ 6.6
Riley.....	McHenry.....	56.6	26	62.9	+ 6.3
Sycamore.....	De Kalb.....	58.6	7	63.5	+ 4.9
<i>Indiana.</i>					
Lafayette.....	Tippecanoe.....	62.2	8	65.5	+ 3.3
Logansport.....	Cass.....	64.0	33	69.0	+ 5.0
Vevay.....	Switzerland.....	65.4	21	68.6	+ 3.2
<i>Iowa.</i>					
Clinton.....	Clinton.....	59.9	9	66.6	+ 6.7
Creco.....	Howard.....	58.0	10	59.0	+ 1.0
Monticello.....	Jones.....	59.8	34	65.1	+ 5.3
Muscatoine.....	Muscatoine.....	59.8	49	65.0	+ 5.2
<i>Kansas.</i>					
Independence.....	Montgomery.....	66.5	16	68.8	+ 2.3
Lawrence.....	Douglas.....	65.3	19	67.9	+ 2.6
Wellington.....	Sumner.....	65.1	9	69.1	+ 4.0
Yates Centre.....	Woodson.....	64.0	7	67.6	+ 3.6
<i>Maine.</i>					
Belfast.....	Waldo.....	52.1	28	55.3	+ 3.2
Cornish.....	York.....	55.2	30	58.6	+ 3.4
Gardiner.....	Kennebec.....	53.5	51	55.7	+ 2.2
Orono.....	Penobscot.....	52.5	19	55.9	+ 3.4
<i>Maryland.</i>					
Cumberland.....	Alleghany.....	61.9	15	65.8	+ 3.9
Falleton.....	Harford.....	60.7	16	64.6	+ 3.9
New Midway.....	Frederick.....	64.9	6	70.9	+ 6.0
<i>Massachusetts.</i>					
Amherst.....	Hampshire.....	56.9	50	63.8	+ 6.9
Cambridge.....	Middlesex.....	56.1	65	60.0	+ 3.9
Fitchburg.....	Worcester.....	55.3	31	60.0	+ 4.7
New Bedford.....	Bristol.....	54.7	75	57.5	+ 2.8
Somerset.....	Bristol.....	58.2	17	62.0	+ 3.8
Springfield.....	Hampden.....	59.2	20	64.3	+ 5.1
Taunton.....	Bristol.....	58.6	16	58.7	+ 0.1
Williamstown.....	Berkshire.....	56.7	30	61.2	+ 4.5
<i>Nevada.</i>					
Carson City.....	Ormsby.....	57.3	8	58.7	+ 1.4
<i>New Brunswick.</i>					
Saint John.....	Saint John.....	47.1	27	48.3	+ 1.2
<i>New Hampshire.</i>					
Concord.....	Merrimac.....	57.0	19	61.4	+ 4.4
Hanover.....	Grafton.....	55.7	23	59.6	+ 3.9
<i>New Jersey.</i>					
Dover.....	Morris.....	57.4	5	61.7	+ 4.3
South Orange.....	Essex.....	60.4	17	60.4	0.0
<i>New York.</i>					
Factoryville.....	Tioga.....	57.4	5	65.8	+ 8.4
North Volney.....	Oswego.....	55.3	20	61.8	+ 6.5
Palermo.....	Oswego.....	53.9	34	60.2	+ 6.3
<i>Ohio.</i>					
Wauseon.....	Fulton.....	58.8	17	63.2	+ 4.4
<i>Pennsylvania.</i>					
Dyberry.....	Wayne.....	55.0	21	61.3	+ 6.3
<i>South Carolina.</i>					
Stateburg.....	Sumter.....	70.2	7	70.9	+ 0.7
<i>Texas.</i>					
New Ulm.....	Austin.....	74.5	15	75.1	+ 0.6
<i>Vermont.</i>					
Lunenburg.....	Essex.....	52.5	38	59.4	+ 6.9
Newport.....	Orleans.....	56.3	13	61.6	+ 5.3
Stratford.....	Orange.....	56.6	13	63.0	+ 6.4
<i>Virginia.</i>					
Bird's Nest.....	Northampton.....	67.0	19	68.8	+ 1.8
Dale Enterprise.....	Rockingham.....	62.7	7	72.0	+ 9.3
Variety Mills.....	Neleon.....	63.6	10	66.4	+ 2.8
Wytheville.....	Wythe.....	61.1	24	65.3	+ 4.2
<i>West Virginia.</i>					
Helvetia.....	Randolph.....	53.1	10	63.2	+ 5.1

* From the "Bulletin of the New England Meteorological Society."

In connection with this subject, the following notes are furnished by voluntary observers:

Arkansas.—Lead Hill, Boone Co.: the mean temperature for the spring of 1887 is 62°.0, which is 3°.1 above the mean of the past five years.

Illinois.—Peoria, Peoria Co.: the mean temperature of May, 1887, is 71°.1; this is the highest mean, with one exception, viz., 71°.4 in 1881, that is shown by the record of thirty-two years' observations.

Riley, McHenry Co.: during the last twenty-six years the mean temperature for May, 1887, 62°.9, has been exceeded in but three instances, viz., in 1870, 1880, and 1881. The mean temperature of the spring of 1887, 46°.2, is 2°.6 above the mean for the same period; only the years 1863, 1870, 1871, 1878, and 1880 were warmer.

Indiana.—Lafayette, Tippecanoe Co.: the highest mean temperature for May during the past eight years, 69°.4, occurred in 1881, the lowest mean temperature, 55°.1, in 1882; the highest maximum temperature for the same period, 94°.0, occurred in 1881, and the lowest minimum temperature, 32°.0, in 1880.

Logansport, Cass Co.: during the last thirty-three years the highest maxi-

imum temperature for May, 99°.0, occurred in 1881; the lowest minimum temperature, 28°.0, in 1876 and 1878.

Vevay, Switzerland Co.: comparisons of temperature for the month of May, 1887, with the May means of the past twenty-one years; the maximum temperature, 90°.0, on the 20th, is 8°.4 above the mean maximum; the minimum temperature, 48°.0, on the 27th, is 6°.5 above the mean minimum; the range of temperature, 42°.0, is 3°.1 below the average range.

Iowa.—Monticello, Jones Co.: during the past thirty-four years the highest mean temperature for May, 67°.8, occurred in 1870, the lowest mean temperature, 52°.1, in 1860; the highest maximum temperature for the same period, 95°.0, occurred in 1856, the lowest minimum temperature, 25°.0, in 1885.

Kansas.—Independence, Montgomery Co.: the mean temperature for the spring of 1887, 59°.0, is 2°.8 above the average for the last sixteen years.

Wellington, Sumner Co.: during the last nine years the highest mean temperature, 71°.2, occurred in 1880, the lowest mean temperature, 58°.2, in 1882; the highest temperature for the same period, 97°.0, occurred in 1879, the lowest temperature, 82°.0, in 1885.

Yates Centre, Woodson Co.: the mean temperature for May, 1887, 67°.6, is, with one exception, 68°.9 in 1886, the warmest May during the last eight years.

Maine.—Cornish, York Co.: during the last thirty years the warmest May occurred in 1879, mean temperature, 59°.0; the coldest occurred in 1861, mean temperature, 49°.2.

Gardiner, Kennebec Co.: the maximum temperature for May, 1887, is 88°.0; only twice in fifty-one years has the maximum temperature been higher, viz., 89°.0 in 1840, and 90°.0 in 1863.

Maryland.—Cumberland, Alleghany Co.: temperature table for May of the last fifteen years:

Year.	Highest.	Lowest.	Mean.	Year.	Highest.	Lowest.	Mean.
1873	83.0	44.0	61.0	1882	78.0	36.0	57.5
1874	89.0	42.0	62.0	1883	84.0	42.0	62.5
1875	85.0	41.0	63.0	1884	85.0	40.0	61.0
1876	82.0	36.0	62.0	1885	82.0	40.0	60.0
1877	86.0	38.0	59.5	1886	80.0	40.0	62.0
1878	82.0	42.0	59.0	1887	91.0	50.0	65.8
1879	88.0	34.0	62.0				
1880	90.0	40.0	67.0	Average	85.0	42.3	61.9
1881	89.0	40.0	65.0				

Fallston, Harford Co.: the mean temperature for May, 1887, 64°.6, is the highest May mean, with one exception, viz., 67°.5 in 1880, that has occurred during the last sixteen years; the lowest mean temperature in that time was 55°.4, in 1882.

New Jersey.—South Orange, Essex Co.: the mean temperature for the season just closed, 47°.7, is 0°.3 above the average for the last seventeen years.

New York.—North Volney, Oswego Co.: during the past twenty years the highest mean temperature for May, 62°.4, occurred in 1880; the lowest mean temperature, 50°.2, in 1882.

Palermo, Oswego Co.: during the past thirty-four years the highest mean temperature for May, 60°.7, occurred in 1880; the lowest mean temperature, 47°.5, in 1867. The mean temperature of the spring of 1887, 46°.6, is 3°.7 above the average for the same period.

Ohio.—Wauseon, Fulton Co.: the mean temperature for May, 1887, 63°.2, is 4°.4 above the average for the last seventeen years, and is the warmest May since 1881; the lowest mean, 52°.2, occurred in 1882. The mean temperature of the spring of 1887, 47°.0, is 1°.2 above the average for the same period; the extreme temperatures for May are 103°.2 in 1874, and 21°.0 in 1885.

Pennsylvania.—Dyberry, Wayne Co.: during the past twenty-one years the highest mean temperature for May, 64°.1, occurred in 1880; the lowest mean temperature, 48°.4, in 1882.

South Carolina.—Stateburg, Sumter Co.: during the last seven years the highest mean temperature for May, 73°.8, occurred in 1881, and the lowest mean temperature, 65°.9, in 1885.

Texas.—New Ulm, Austin Co.: the highest mean temperature during the last fifteen years, 77°.4, occurred in 1879, the lowest mean temperature, 72°.0, in 1885; the highest maximum temperature in that time, 98°.0, occurred in 1874, the lowest minimum, 46°.0, in 1876. The mean temperature for the spring of 1887 (March, April, and May), 69°.4, is 0°.8 above the average for the same number of years; the highest mean temperature for the spring in that time, 72°.0, occurred in 1878; the lowest mean temperature, 60°.4, in 1885.

Vermont.—Strafford, Orange Co.: the mean temperature for May, 1887, 63°.0, is the highest observed during the last thirteen years; the lowest mean temperature for the same period, 50°.5, occurred in 1882.

Virginia.—Variety Mills, Nelson Co.: during ten years past the highest mean temperature, 68°.0, occurred in 1880; the lowest mean temperature, 62°.0, in 1877.

West Virginia.—Helvetia, Randolph Co.: the mean temperature for May, 1887, 63°.2, is the highest, with one exception, viz., in 1880 (which shows a similar average), that is shown by the record of ten years' observations; the lowest mean temperature in that time, 53°.4, occurred in 1877.

Table of comparative maximum and minimum temperatures for May.

State or Territory.	Station.	For 1887.		Since establishment of station.			
		Max.	Min.	Max.	Year.	Min.	Year.
Alabama	Mobile	91.7	56.4	98.0	1878	47.3	1883
Do	Montgomery	92.1	60.0	98.0	1875	44.0	1883
Arizona	Yuma	103.5	44.5	110.0	1885	48.9	1884
Do	Fort Grant	89.1	77.8	94.1	1885	37.0	1882
Arkansas	Fort Smith	91.8	50.0	97.9	1886	41.5	1885
Do	Little Rock	89.0	52.0	93.2	1886	43.8	1885
California	Los Angeles	92.0	44.5	100.0	1883	39.5	1883
Do	San Francisco	96.9	45.6	86.0	1883	45.0	1876, 1879, 1880, 1882
Colorado	Denver	89.4	30.9	92.0	1874	27.0	1873
Do	Pike's Peak	44.3	-1.8	47.0	1880	8.0	1875
Connecticut	New Haven	85.6	41.7	89.0	1880	30.5	1882
Dakota	Bismarck	90.6	25.7	92.0	1886	21.0	1875
Do	Deadwood	80.2	30.9	86.0	1886	17.3	1885
District of Columbia	Washington City	88.7	50.2	96.0	1880	33.5	1876
Florida	Cedar Keys	86.7	57.0	91.0	1880	50.0	1883
Do	Pensacola	89.5	62.1	93.0	1881	45.6	1883
Georgia	Augusta	93.9	45.9	100.0	1878	42.0	1877
Idaho	Boise City	97.3	26.1	91.2	1886	26.4	1886
Illinois	Springfield	86.0	48.3	88.0	1881	33.9	1883
Do	Chicago	85.7	42.3	89.0	1874	27.0	1875
Indiana	Indianapolis	89.0	49.0	89.0	1881, 1874	31.0	1877
Indian Territory	Fort Sill	93.0	41.5	103.5	1886	42.0	1885
Iowa	Des Moines	93.4	39.0	93.6	1886	27.8	1885
Do	Davenport	90.0	44.2	90.0	1874	29.0	1875
Kansas	Lodge City	95.0	35.3	98.0	1879, 1880	32.0	1884
Do	Leavenworth	89.6	45.0	94.0	1874	31.0	1875
Kentucky	Louisville	90.3	53.9	93.0	1881	36.0	1875, 1876
Louisiana	New Orleans	90.9	62.1	92.0	1877	56.0	1871, 1877
Do	Shreveport	98.9	52.9	101.2	1886	47.0	1876, 1877
Maine	Eastport	74.0	36.5	80.0	1877	29.0	1882
Do	Portland	86.8	41.0	94.0	1880	34.0	1876
Maryland	Baltimore	86.7	51.2	95.0	1881	34.0	1876
Massachusetts	Boston	89.3	44.7	97.0	1880	31.0	1882
Michigan	Grand Haven	84.0	42.1	86.0	1877	28.0	1885
Do	Marquette	87.9	32.8	92.0	1879	22.0	1875
Minnesota	Saint Vincent	96.0	24.8	85.1	1884	21.0	1882
Do	Moorhead	95.5	25.1	88.0	1881	21.4	1885
Mississippi	Vicksburg	90.6	58.1	95.0	1877, 1874	46.0	1877
Missouri	Saint Louis	89.0	51.1	93.0	1874	32.0	1875
Montana	Fort Assinaboine	91.9	28.6	94.7	1886	18.2	1885
Do	Helena	88.1	30.7	88.8	1886	21.9	1885
Nebraska	North Platte	92.7	30.6	94.0	1880	28.0	1885
Do	Omaha	93.0	39.2	92.9	1886	28.0	1875
Nevada	Winnemucca	95.9	16.8	88.1	1886	19.5	1885
New Hampshire	Mount Washington	62.0	15.5	62.0	1879, 1880	1.4	1885
New Jersey	Atlantic City	73.3	46.7	80.0	1877, 80, '81	33.0	1876, 1880
New Mexico	Santa Fe	81.0	24.0	89.0	1872	24.0	1880
New York	Rochester	86.1	39.7	90.0	1879	28.0	1880
Do	Oswego	86.9	42.8	94.0	1879	27.6	1885
North Carolina	Charlotte	90.9	50.4	94.4	1881	40.5	1883
Do	Hatteras	78.2	55.3	88.0	1881	47.0	1882
Ohio	Columbus	89.6	49.5	92.0	1881	34.0	1883
Do	Toledo	90.9	46.4	95.0	1871	30.0	1876
Oregon	Portland	99.0	34.2	94.0	1885	33.0	1878
Do	Roseburg	102.0	31.7	89.2	1886	30.5	1886
Pennsylvania	Erie	86.0	43.2	91.0	1879	30.0	1885
Do	Philadelphia	87.9	48.7	96.0	1880	36.0	1880
Rhode Island	Block Island	77.4	43.8	78.3	1881	36.0	1882
South Carolina	Charleston	88.8	55.1	94.0	1878, 1886	47.0	1876
Tennessee	Chattanooga	90.0	52.8	93.0	1879	41.0	1879
Do	Memphis	90.5	54.0	96.0	1879	41.0	1883
Texas	Brownsville	91.4	56.2	99.0	1877	49.0	1877
Do	El Paso	97.0	41.0	105.1	1886	39.5	1884
Utah	Salt Lake City	93.3	30.7	92.5	1886	31.9	1886
Virginia	Lynchburg	94.1	47.0	94.0	1877	37.0	1876
Do	Norfolk	92.0	49.5	98.0	1880	38.0	1876
Washington Ter.	Olympia	88.8	31.5	87.7	1885	30.0	1882, 1886
Do	Spokane Falls	94.9	30.0	88.8	1884	29.0	1881
Wisconsin	La Crosse	91.3	40.4	96.0	1874	29.0	1875
Do	Milwaukee	80.1	41.7	90.0	1874	25.0	1875
Wyoming	Cheyenne	84.0	23.8	88.0	1874	21.5	1886

FROSTS.

Frosts occurred in the various states and territories during the month as follows:

Arizona.—Fort Apache, 3d, 14th.

California.—Sacramento, 7th, 10th; Nicolaus and Willows, 10th; Oroville, 10th, 11th; Fort Bidwell, 10th to 12th; Eureka, 11th.

Colorado.—Denver, 1st, 3d, 5th; Fort Lewis, 1st to 7th, 11th to 13th, 19th to 21st; Las Animas, 3d; Montrose, 3d, 8th, 13th to 15th, 21st; Pike's Peak, 15th, 28th.

Connecticut.—North Colebrook, 1st; Voluntown, 13th.

Dakota.—Deadwood, 1st; Yankton, 2d to 5th; Parkston, 3d; Webster, 3d, 15th, 17th; Bismarck, 3d, 16th, 17th, 24th; Fort Totten, 3d, 17th.

Iowa.—Bancroft, 3d, 18th; Des Moines, 3d, 8th, 25th; Cresco, 17th; Independence, 18th.

Kansas.—Allison, 1st to 3d; Belleville, 3d.

Louisiana.—Liberty Hill, 4th.

Maine.—Orono, 2d.

Massachusetts.—Taunton, 13th, 14th; Amherst and Westborough, 14th.
Michigan.—Mackinaw City, 4th; Escanaba and Marquette, 4th, 6th; Kalamazoo, 4th, 7th, 27th; Traverse City, 27th; Port Huron, 29th.
Minnesota.—Saint Vincent, 3d, 16th, 17th, 25th; Moorhead, 17th.
Montana.—Poplar River, 8th, 16th; Helena, 14th, 16th, 17th, 21st, 22d; Fort Custer, 17th.
Nebraska.—Tecumseh and North Platte, 3d; Valentine, 3d, 14th, 21st; De Soto, 3d, 18th; Fairbury, 4th.
Nevada.—Carson City, 1st, 2d, 7th, 10th to 14th, 17th, 19th, 23d; Winnemucca, 7th, 11th, 12th. The frost at Carson City on the 1st killed most of the fruit and tender vegetables.
New Hampshire.—Mount Washington, 13th; Nashua, 13th, 14th.
New Jersey.—Clayton, Dover, and Roseland, 14th.
New Mexico.—Fort Stanton, 3d, 5th.
New York.—Penn Yan, 12th, 13th; Albany, 12th to 14th; Oswego, 13th; Palermo, 13th, 14th; Humphrey and North Volney, 14th.
Oregon.—Lakeview, 1st, 2d, 7th, 11th; Linkville, 1st, 7th, 10th to 12th, 20th; Fort Klamath, 1st, 4th, 11th to 13th; Bandon, 2d; Albany and Eola, 11th; Mount Angel, 11th, 12th; East Portland, 11th, 12th, 24th; Ashland, Roseburg, and Portland, 12th.
Pennsylvania.—Wellsborough, 1st, 12th, 14th, 15th; Dyberry, 13th to 15th.
Vermont.—Northfield, 2d, 14th, 15th.
Washington Territory.—Spokane Falls, 7th; Olympia, 9th, 11th, 12th; Port Angeles, 9th, 11th to 13th; Walla Walla, 12th.

West Virginia.—Middlebrook, 29th.
Wisconsin.—Fond du Lac, 4th, 18th; Embarras, 26th.
Wyoming.—Fort Bridger, 2d, 3d, 5th, 12th, 13th; Cheyenne, 3d.

ICE.

Ice formed in the various parts of the country during May as follows:
California.—Fort Bidwell, 10th to 12th.
Colorado.—Montrose, 14th.
Dakota.—Fort Totten, 3d, 4th.
Nebraska.—Tecumseh, 3d; Fairbury, 4th.

TEMPERATURE OF WATER.

The following table shows the maximum, minimum, and mean water temperature, as observed at the harbors of the several stations; the monthly range of water temperature; the average depth at which the observations were made, and the mean temperature of the air:

Temperature of water for May, 1887.

Station	Temperature at bottom.				Mean temperature of the air at station.	Average depth of water, feet and tenths.
	Max.	Min.	Range.	Monthly mean.		
Cedar Keys, Fla.	78.5	67.9	10.6	75.6	74.9	8.3
Charleston, S. C.	77.1	69.4	7.7	74.7	72.7	36.6
Eastport, Me.	42.9	38.0	4.9	40.3	48.1	13.6
Galveston, Tex.	82.5	73.7	8.8	78.0	75.9	14.4
Key West, Fla.	85.7	77.0	8.7	81.9	77.5	21.1
New London, Conn.	55.7	45.0	10.7	50.6	58.3	11.5
New York City	63.2	47.0	16.2	57.1	62.9	15.2
Pensacola, Fla.	80.6	74.4	6.2	77.2	75.5	17.7
Portland, Me.	51.8	42.6	9.3	47.6	55.7	16.8

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for May, 1887, as determined from the reports of about seven hundred stations, is exhibited on chart iii. In the table of miscellaneous meteorological data are given, for each Signal Service station, the total precipitation, with the departures from the normal. The figures opposite the names of the geographical districts in columns for mean temperature, precipitation, and departures from the normal, show respectively the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal, and subtracting when above.

While over certain areas of comparatively limited extent there has been during May, 1887, precipitation in excess of the average, over much the greater part of the country it was deficient. Especially was this the case in New England, the Lake region, the lower portions of the Ohio and Missouri valleys, the upper and central portions of the Mississippi Valley, and the east Gulf states, in which districts, as a whole, there was not more than 60 per cent. of the average amount of rainfall; that for New England amounting to only about 30 per cent. of the average, and for the other districts named the deficiencies amount to from 25 to 50 per cent. In California there was less than one-half of the average rainfall for May.

The rainfall was in excess of the average in the following districts, viz., over an area extending from eastern Ohio and western Pennsylvania southward to eastern Tennessee; in northern Florida; along the south Atlantic coast from Charleston, S. C., to Wilmington, N. C.; along the west Gulf coast and over a region extending from the lower Mississippi River northwestward to, and including portions of, Kansas, Colorado, and New Mexico; along the northern border of the country from western Lake Superior to Manitoba; over portions of the southern plateau; and from the north Pacific

coast eastward to western Montana. The excess in the districts named is, in general, slight, the only exceptions being northern Florida, the north Pacific coast, eastern Tennessee, and western Pennsylvania, where it was quite marked, the rainfall on the north Pacific coast being about double the average for the month.

The following are some of the most marked departures from the normal precipitation at Signal Service stations:

Above normal.		Below normal.	
	Inches.		Inches.
Astoria, Oregon	4.52	Block Island, R. I.	4.25
Tatoosh Island, Wash.	4.40	Omaha, Nebr.	3.56
Olympia, Wash.	3.13	New Haven, Conn.	3.36
Jacksonville, Fla.	3.05	Springfield, Ill.	3.22
Pittsburg, Pa.	2.95	Yankton, Dak.	3.17
Chattanooga, Tenn.	2.56	Des Moines, Iowa.	3.03
Portland, Oregon	2.33	Escanaba, Mich.	3.02

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows, for certain stations, as reported by voluntary observers, the average precipitation for the month of May for a series of years, the precipitation for May 1887, and the departures from the average:

Station.	County.	Average precipitation for May.	Number of years.	Precipitation for May, 1887.	Departure.
Lead Hill	Arkansas.	Inches.			
	Boone	6.08	5	8.57	+ 2.49
Sacramento	California.				
	Sacramento	0.50	21	trace	- 0.50
Canton	Connecticut.				
	Hartford	4.38	26	0.51	- 3.87
Hartford	Hartford	3.09	16	0.10	- 2.99
Middletown	Middlesex	3.65	29	0.22	- 3.43
Wallingford	New Haven	4.14	30	0.25	- 3.89
Webster	Dakota.				
	Day	6.18	4	1.72	- 4.46