of Ireland. From the ocean west of the British Isles one class of storms passes southeastward over the Bay of Biscay and another to the north of Scotland. An average of 1.4 storm per month traverses the ocean from coast to coast in April, and the average velocity of north Atlantic storms for that month is about 20 statute miles per hour.

In April, 1892, three storms, low areas I, II, and IV, traversed the ocean and reached the Bay of Biscay, numbers I and II having advanced from the Pacific Ocean and number IV from the Gulf of Mexico. The month opened with a storm of moderate energy east of the Grand Banks. This storm moved slowly eastward to a position west of the British Isles by the 4th, passed thence southward and was central west of the Bay of Biscay on the 5th, after which it apparently moved eastward. High pressure continued off the Atlantic coast of the United States until the night of the 3d, when low area I moved eastward over the Gulf of Saint Lawrence. This low area was central off the east coast of Newfoundland the morning of the 4th, and moved thence to mid-ocean as a storm of considerable energy by the 5th, thence to the vicinity of the Azores by the 6th, and to the Bay of Biscay and the Spanish Peninsula by the 8th, attended by gales of marked strength. On the 6th low area II moved south of east over the Gulf of Saint Lawrence and reached mid-ocean by the 8th, with pressure about 29.20 (742), where it remained nearly stationary until the 10th, apparently losing energy, and passed thence to the Bay of Biscay.

On the 8th low area IV moved off the middle Atlantic coast attended by fresh to strong gales, remained over New England and the Canadian Maritime Provinces from the 8th to 10th, with hard gales west of the Grand Banks, passed north of Newfoundland by the morning of the 11th, to mid-ocean by the 12th, and reached the Bay of Biscay and the Spanish Peninsula on the 13th. On the 13th a storm moved eastward from the Gulf of Saint Lawrence, reached mid-ocean by the 15th, and disappeared north of the region of observation. On the 18th an offshoot of low area VII appeared off the New Jersey coast, passed eastward to a position south of the Grand Banks by the 19th, thence north of the Grand Banks by the 20th, and disappeared north of the region of observation by the 21st. During the last decade of the month high pressure and generally settled weather prevailed over the ocean.

OCEAN FOG.

The limits of fog belts west of the 40th meridian, as reported by shipmasters, are shown on Chart I by dotted shading. East of the 55th meridian fog was reported on 12 dates; between the 55th and 65th meridians on 9 dates; and west of the 65th meridian on 6 dates. Compared with the corresponding month of the last 4 years the dates of occurrence of fog east of the 55th meridian numbered 3 less than the average; between the 55th and 65th meridians 1 less than the average; and west of the 65th meridian 4 less than the average. The occurrence of fog along the steamship tracks west of the 40th meridian and at stations of the Weather Bureau along the middle Atlantic and New England coasts generally attended the approach or passage of general storms.

OCEAN ICE.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for April during the last 10 years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
	° ′	° ′		° ′	° ′
April, 1883	40 49	52 06	April, 1883	48 00	43 00
April, 1884	41 26	48 46	April, 1884	45 25	43 34
April, 1885	41 40	49 50	April, 1885	44 10	39 41
April, 1886	40 51	46 39	April, 1886	*47 43	30 11
April, 1887	40 02	50 04	April, 1887	48 00	38 18
April, 1888	41 33	50 00	April, 1888	47 40	49 00
April, 1889	43 57	50 20	April, 1889	47 16	43 11
April, 1890	40 00	49 40	April, 1890	47 26	35 42
April, 1891	40 01	48 24	April, 1891	45 33	43 32
April, 1892	42 46	49 37	April, 1892	48 58	44 27
Mean	41 18	49 33	Mean	47 01	41 04

* Isolated iceberg.

The limits of the region within which icebergs or field ice were reported for April, 1892, are shown on Chart I by ruled shading.

The southernmost ice reported, an iceberg observed on the 29th, in the position given, was about 1½° north of the average southern limit, and the easternmost ice reported, several icebergs noted on the 21st in the position given in the table, was more than 3° west of the average eastern limit of ice for April.

Compared with the preceding month there was a marked increase in the quantity of ice reported. Icebergs and field ice were encountered along the east edge of the Banks of Newfoundland throughout the month, and along the southeast Newfoundland coast on the 2d and 13th. On the 21st a large ice field was reported about 80 miles east of Cape Canso, Nova Scotia. On the 24th a schooner en route from Saint Pierre to Sydney, C. B. I., was sunk by heavy ice.

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

Many of the voluntary stations do not have standard thermometers or shelters.

The distribution of mean temperature over the United States and Canada for April, 1892, is exhibited on Chart II by dotted isotherms. In the table of miscellaneous meteorological data the monthly mean temperature and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the average 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. The monthly mean temperature for regular stations of the Weather Bureau represents the mean of the maximum and minimum temperatures.

The mean temperature was highest in the Colorado Desert, California, in the lower Rio Grande valley, and over extreme southern Florida, where it was above 75. The mean readings were above 60 in South Carolina, Georgia, the Gulf States, western and southern Arizona, and a great part of southern California, and were above 50 south of a line traced from the southern New Jersey coast to north-central Kansas, thence to south-central New Mexico, thence west-northwest over Arizona and along the Sierra Nevada Mountain range to north-central California, and thence to the California coast north of San Francisco. The mean temperature was lowest on the north shore of Lake Superior and at elevated stations in central Colorado, where it was below 30. The mean values were below 35 in the lower Saint Lawrence valley and from Upper Michigan over northern Wisconsin, northern Minnesota, and northern North Dakota, and were below 40 north of a line traced from southeastern Maine to eastern Montana, thence southward to south-central Colorado, and thence to extreme northwestern Montana.

DEPARTURES FROM NORMAL TEMPERATURE.

The mean temperature was generally below the normal, except in central and eastern Texas, over the Florida Peninsula, over the east part of the Lake region, and in southeastern New York, New England, and the Canadian Maritime Provinces. The most marked departure below the normal temper-

ature occurred from the middle and north Pacific coasts to the Dakotas, where it was 4 to 6, and the greatest excess in temperature was noted in New Brunswick, Nova Scotia, and southeastern Texas, where it exceeded 4.

DEVIATIONS FROM NORMAL TEMPERATURE.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for April for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for April, 1892; (4) the departure of the current month from the normal; (5) and the extreme monthly mean for April during the period of observation and the years of occurrence:

State and station.	(1) Normal for the month of April.	(2) Length of record.	(3) Mean for April, 1892.	(4) Departure from normal.	(5) Extreme monthly mean for April.			
					Highest.	Year.	Lowest.	Year.
Arizona.	°	Years	°	°	°		°	
Fort Apache	52.6	20	50.1	− 2.5	59.5	1879	47.5	1884
Fort Mohave	70.8	21	69.8	− 1.0	77.1	1881	62.2	1891
Whipple Barracks	51.3	20	50.0	− 1.3	61.8	1876	45.4	1884
Arkansas.								
Lead Hill	61.9	10	.....	.....	65.3	1888	56.7	1884
California.								
Fort Bidwell	47.4	21	40.8	− 6.6	55.9	1881	40.5	1872
Riverside	60.5	10	59.8	− 0.7	63.8	1885	57.8	1891
Colorado.								
Las Animas	51.4	10	49.1	− 2.3	56.7	1888	46.2	1884
Florida.								
Merritts Island	71.6	10	73.7	+ 2.1	75.4	1883	67.0	1886
Georgia.								
Forsyth	65.1	18	66.0	+ 0.9	68.8	1888	61.0	1875
Idaho.								
Boise Barracks	50.3	18	46.1	− 4.2	56.5	1888	44.2	1883
Fort Sherman	46.4	8	45.0	− 1.4	50.9	1889	41.8	1882
Illinois.								
Centralia	55.8	13	49.0	− 6.8	60.5	1888	49.0	1892
Indiana.								
La Fayette	50.6	12	50.0	− 0.6	53.9	1886	45.4	1881
Indian Territory.								
Fort Supply	56.8	13	56.6	− 0.2	61.6	1888	50.0	1874
Iowa.								
Cresco	43.4	20	41.9	− 1.5	47.3	1878	37.5	1874
Kansas.								
Eureka Ranch	55.3	9	49.8	− 5.5	58.6	1888	49.8	1892
Independence	57.6	20	56.6	− 1.0	61.7	1878	48.3	1874
Salina	55.9	9	52.2	− 3.7	60.1	1889	49.6	1884
Louisiana.								
Grand Coteau	69.5	9	69.8	+ 0.3	70.9	1885	68.0	1891
Maine.								
Orono	39.9	22	42.8	+ 2.9	45.1	1889	33.3	1874
Maryland.								
Cumberland	49.0	33	49.3	+ 0.3	57.6	1881	42.2	1859
Michigan.								
Kalamazoo	47.1	15	46.7	− 0.4	52.9	1878	42.0	1881
Missouri.								
Sedalia	57.1	9	53.4	− 3.7	61.5	1888	52.7	1885
Montana.								
Fort Custer	46.3	11	.....	.....	50.6	1889	42.1	1880
Nebraska.								
Fort Robinson	47.9	8	41.8	− 6.1	52.8	1888	41.6	1884
Genoa (near)	49.2	16	46.0	− 3.2	53.0	1890	42.2	1881
Nevada.								
Browns	55.3	21	54.0	− 1.3	63.4	1888	46.8	1883
Carson City	48.8	15	45.5	− 3.3	56.1	1881	43.1	1880
New Hampshire.								
Hanover	41.3	57	42.3	+ 1.0	46.9	1887	33.7	1874
New Mexico.								
Deming	63.4	10	68.0	+ 4.6	69.6	1885	57.1	1882
Fort Wingate	49.2	21	45.6	− 3.6	57.3	1881	39.2	1874
New York.								
Cooperstown	40.9	38	41.2	+ 0.3	51.6	1878	33.6	1874
Plattsburgh Barracks	41.4	21	40.9	− 0.5	47.9	1878	33.6	1874
North Carolina.								
Lenoir	55.8	19	54.1	− 1.7	60.0	1887	42.6	1885
Oklahoma.								
Fort Reno	60.5	9	.....	.....	64.3	1889	55.8	1884
Fort Sill	61.6	20	62.4	+ 0.8	65.5	1880	53.7	1874
Oregon.								
Bandon	49.6	8	46.6	− 3.0	52.5	1889	45.3	1886
Eola	49.5	21	51.1	+ 1.6	54.8	1875	43.2	1872
Pennsylvania.								
Dyberry	42.2	26	42.4	+ 0.2	49.7	1878	35.0	1874
Grampian Hills	43.4	27	44.3	+ 0.9	52.2	1878	29.0	1875
Wellsborough	43.9	13	41.0	− 2.9	52.2	1886	40.1	1881
South Carolina.								
Statesburgh	62.4	11	60.6	− 1.8	64.6	1882	60.1	1884
South Dakota.								
Fort Sully	47.0	20	43.8	− 3.2	55.5	1887	39.2	1875
Texas.								
Austin	70.8	19	69.6	− 1.2	73.2	1888	63.1	1874
Silver Falls	61.4	6	63.1	+ 1.7	63.3	1888	59.4	1886
Utah.								
Terrace	52.9	19	50.6	− 2.3	62.5	1888	45.4	1882
Vermont.								
Strafford	40.8	19	41.0	+ 0.2	48.3	1886	34.9	1874
Virginia.								
Dale Enterprise	53.9	12	51.7	− 2.2	59.1	1886	51.6	1882

Deviations from normal temperature—Continued.

State and station.	(1) Normal for the month of April.	(2) Length of record.	(3) Mean for April, 1892.	(4) Departure from normal.	(5) Extreme monthly mean for April.			
					Highest.	Year.	Lowest.	Year.
Washington.	°	Years	°	°	°		°	
Fort Townsend	48.8	18	45.8	− 3.0	52.4	1889	45.8	1892
West Virginia.								
Parkersburgh	54.2	11	51.6	− 2.6	64.1	1882	43.0	1885
Wisconsin.								
Embarrass	44.4	21	41.1	− 3.3	54.9	1879	34.7	1874
Madison	44.6	24	43.1	− 1.5	52.5	1878	37.4	1874
Wyoming.								
Fort Washakie	43.1	9	39.0	− 4.1	46.6	1889	38.6	1888

YEARS OF HIGHEST MEAN TEMPERATURE FOR APRIL.

At Eastport, Me., Boston, Mass., and Abilene and San Antonio, Tex., the mean temperature for the current month was the highest ever reported for April by 0.6, 0.4, 0.2, and 2.4, respectively. The highest mean temperature for April was noted from the north Pacific coast to North Dakota in 1889; from Oregon and California over the plateau region to Kansas and Nebraska in 1888; and from the middle and upper Mississippi valleys over the Ohio Valley, the Lake region, and New England, save along the coast, in 1878.

YEARS OF LOWEST MEAN TEMPERATURE FOR APRIL.

At Centralia, Ill., Springfield, Mo., Eureka Ranch, Kans., Valentine, Nebr., Rapid City, S. Dak., Fort Assinaboine, Mont., Spokane, Walla Walla, and Fort Townsend, Wash., Winnemucca, Nev., and Red Bluff, Cal., the current month was the coolest April on record, the greatest departure below the lowest mean previously reported being 3.0 at Fort Assinaboine, Mont. The lowest mean temperature for April was noted generally from the Mississippi River over the Ohio Valley, the Lake region, and the Atlantic coast states north of Virginia in 1874.

MAXIMUM TEMPERATURE.

At Fort Smith, Ark., Dodge City, Kans., and San Antonio, Tex., the maximum temperature was as high as previously reported for April. The highest temperature reported by a regular station of the Weather Bureau in April of preceding years was 105, at Yuma, Ariz., in 1876. The highest temperature reported by a regular station of the Weather Bureau for the current month was 98, at Yuma, Ariz., on the 9th, and the highest temperature reported by a voluntary observer was 106, at Fort Ringgold, Tex. The temperature rose above 100 in the lower Rio Grande, lower Colorado, and lower Gila valleys; it was above 90 at stations in the south Atlantic and Gulf states, on the middle and southeast slopes of the Rocky Mountains, and over the south and west parts of the southern plateau region; and was above 80 south of a line traced from the Virginia coast to eastern Pennsylvania, thence to northern Missouri, thence to southeastern South Dakota, thence to eastern Colorado, thence to southern New Mexico, thence over southern Nevada to the San Joaquin Valley, Cal., and thence southward to the California coast.

The maximum temperature was lowest on the extreme north Pacific coast and in eastern Upper Michigan, where it was 60 or below, and the maximum values were below 70 on the southeast and east New England coasts, at Hatteras, N. C., Buffalo, N. Y., and north of a line traced from northern Lower Michigan to South Dakota, thence southward over the mountains of Colorado, thence to southwestern Wyoming, thence to central Nevada, thence to southeastern Washington, and thence to west-central Washington. The maximum temperature was also below 70 west of this line continued southward inside the coast line to a point south of San Francisco, Cal.

MINIMUM TEMPERATURE.

At Sacramento, Cal., the minimum temperature, 36, noted on the 17th, was the lowest temperature ever reported at that

station for April, and at Olympia, Wash., the minimum, 27, recorded on the 7th, was as low as previously reported for April. The lowest temperature noted for the current month by a regular station of the Weather Bureau was —2, at Saint Vincent, Minn., on the 28th, and temperature below zero was reported at Rocky Mountain stations in the interior of Colorado and in northeastern southern Idaho. The minimum temperature was below 10 in northern North Dakota and northern Minnesota, and at stations in central and western Wyoming, and was below 20 in northern New England, and north of a line traced from east-central Lower Michigan to South Dakota, thence to central New Mexico, and thence to northwestern Washington. The highest minimum temperature was 64 at Key West, Fla., and the minimum values were above 50 over the southern part of the Florida Peninsula and along the immediate Gulf coast west of the mouth of the Mississippi River.

LIMITS OF FREEZING WEATHER.

The southern limit of freezing weather is shown on Chart V by a line traced from the Virginia coast to northern Georgia, thence to southern Illinois, and thence to southern Arizona. The western limit of freezing weather is shown by this line continued from south-central Arizona northwestward along the line of the Sierra Nevada Mountains to southwestern Oregon, thence eastward over the valley of the Columbia River, and thence to extreme northwestern Washington.

RANGES OF TEMPERATURE.

The greatest daily range of temperature is shown in the table of miscellaneous meteorological data. The greatest monthly range of temperature occurred on the middle-eastern slope of the Rocky Mountains and in the lower valley of the Red River of the North, where it exceeded 60. From those districts the monthly ranges decreased eastward to less than 30 on the southeast New England coast, southeastward to less than 20 over extreme southern Florida, southward to less than 30 on the west Gulf coast, and westward to less than 30 at stations on the middle and north Pacific coasts.

TEMPERATURE, JANUARY TO APRIL, INCLUSIVE.

For the period January 1 to April 30, 1892, the temperature averaged about normal in the lower lake region, in the upper Mississippi and Missouri valleys, on the middle-eastern and southeastern slopes of the Rocky Mountains, over the southern plateau region, and along the middle and south Pacific coasts. In the extreme northwest the mean temperature averaged about 3, over the northern plateau region about 2, and in New England, the upper lake region, on the northeast slope of the Rocky Mountains, and along the north Pacific coast about 1 above the normal temperature for the period named. In the south Atlantic and east Gulf states, at Key West, Fla., and over the middle plateau region the mean temperature was about 2 deficient, and in the middle Atlantic states, the Ohio Valley and Tennessee, and the west Gulf states the deficiency was about 1.

PERIODS OF HIGH TEMPERATURE.

The highest temperature of the month was noted from North Carolina over the middle Atlantic and New England states and the lower lake region from the 3d to 5th, the maximum temperature rising above 80 on the 3d in Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Alabama, eastern Tennessee, and Kentucky; along the middle and south Pacific coasts and over the west parts of the middle and southern plateau regions from the 6th to 9th; in the south Atlantic states, the interior of the east and west Gulf states, and in western Missouri, eastern Kansas, Oklahoma and Indian territories on the 17th and 18th; on the north Pacific coast on the 20th; in the extreme northwest and over the west part of the upper lake region on the 22d and 23d; over a great part of the upper lake region and in the Ohio and upper Mississippi valleys on the 27th; and in the lower Missouri valley, on the middle-eastern slope of the Rocky Mountains, and over the east part of the middle plateau region on the 29th and 30th.

PERIODS OF LOW TEMPERATURE.

The principal cold wave of the month appeared on the northeast slope of the Rocky Mountains on the 8th, with temperature 16 to 22 below freezing, extended over the Missouri, upper and middle Mississippi, and lower Ohio valleys, and the Lake region on the 9th, and reached the Atlantic and east Gulf coasts on the 10th, attended by the lowest temperature of the month and carrying the line of freezing weather to northern South Carolina, southern Missouri, and Oklahoma Territory. The lowest temperature of the month was noted on the south Pacific coast from the 1st to 3d; on the north Pacific coast and in Texas south of the 30th parallel on the 7th; on the middle Pacific coast on the 17th and 18th; and in north and east parts of the Lake region, New York, and New England on the 24th and 25th.

FROST.

Frost injurious to vegetation was reported as follows: 4th, heavy frost injured vegetation at Eureka, Cal. 5th, frost injured garden vegetables at Dodge City, Kans. 9th, heavy frost caused much damage to early fruit and berries at Oklahoma City, Okla., damaged garden vegetation at Dodge City, Kans., and injured fruit at Burlington, N. C., and Platte River, Mo. 10th, the temperature fell to 30.7 at Knoxville, Tenn., and heavy frost damaged fruit; tender vegetation was killed at Nashville, Tenn.; corn and fruit were injured at Atlanta, Ga.; light frost injured tender vegetation at Columbia, S. C.; and heavy frost damaged early vegetation and fruit at Southport, N. C., and Richmond, Va.; light frost occurred as far south as Charleston, S. C. 11th, heavy frost damaged fruit and vegetables in North Carolina, western Virginia, and north-central Tennessee. 14th, ice and heavy frost formed at Dodge City, Kans.

16th, heavy frost destroyed vegetables in North Carolina, and injured cotton, corn, and vegetation on low ground about Augusta, Ga., and light frost was reported at Charleston, S. C., and Montgomery, Ala. 18th, frost nipped vines south and west of Fresno, Cal. 19th, heavy frost damaged fruit at Olympia, Wash. 21st, heavy frost injured fruit and vegetation about Dodge City, Kans. 26th, frost injured grapevines at La Grange, Cal., and injured grapes and tender vegetation at Lodi, Cal. 28th, a severe cold wave prevailed in the Northwest, the minimum temperature at Fort Assinaboine, Mont., 20, being the lowest noted at that station for the third decade of April. 29th, heavy frost killed tender plants at Fort Madison, Iowa. Frost was reported at stations in the Florida Peninsula between the 28th and 30th parallels on the 4th, 16th, and 25th; along the immediate middle Gulf coast on the 21st, 22d, 24th, and 25th; in central Texas north of the 31st parallel on the 7th; at Tucson, Ariz., on the 1st, 5th, and 6th; and at Los Angeles, Cal., on the 20th and 21st.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for April, 1892, as determined from the reports of about 2,000 stations, is exhibited on Chart III. In the table of miscellaneous meteorological data the total precipitation and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for precipitation and departure 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