

ence of the low to the eastern side, first appeared on the morning map of the 17th. By the morning of the 18th a well-defined system of circulating winds around a central area of low pressure appeared in Iowa and moved eastward passing off the coast of New Brunswick on the night of the 19th.

IX.—The origin of low area No. IX is given as eastern Wyoming. There is no evidence, however, that it was not an offshoot of a low pressure area on the Pacific coast which followed No. VIII. This storm developed as it approached the Great Lakes, and gave the first severe stormwinds of the month. It decreased in severity after passing the Lakes and passed beyond the region of observation as a very moderate disturbance.

X.—This appeared on the morning of the 23d as an ill-defined area of low pressure over central Texas. It developed very slightly and remained almost stationary during the next thirty-six hours, but the morning map of the 25th showed a rapid movement and an increase in intensity. By the morning of the 26th pressure had fallen to 29.04 at Saugeen, and the storm had moved 1,500 miles in thirty-six hours; in its further course it gradually diminished and passed down the St. Lawrence Valley as a storm of moderate energy.

XI.—This belongs to that class of storms that occasionally pass from the Pacific along the southern border of the United States and up the Atlantic coast. On the morning of the 27th an extensive ridge of high pressure extended from eastern Tennessee to western Montana. Pressure was lowest on the south California coast. Rain was falling in Arizona and rain and snow in Texas. Twelve hours later the precipitation area covered the greater part of New Mexico, Texas, and Louisiana; the south California low had deepened slightly, and the ridge of high pressure had advanced to the southward, doubtless causing the extensive precipitation of rain and snow in Texas and New Mexico. By the morning of the 28th the ridge of high pressure had broken into two parts, one central over the middle plateau, the other over the Ohio Valley. The southern California low had lost energy and an independent storm center appeared in the central Gulf. The temperature throughout the Lower Mississippi Valley and the Gulf States was below the normal for the season, and extensive snows prevailed from Kansas and Oklahoma eastward to central Tennessee. The low drifted eastward rapidly and passed up the Atlantic coast, giving rain on the immediate coast and heavy snow in the interior.

XII.—This appeared in Alberta on the evening of the 27th, and passed rapidly southeastward until reaching the Lake region. Here, as sometimes happens, the rate of movement was much reduced, and the storm occupied the Lake region for about thirty-six hours.

XIII.—This appeared in the Saskatchewan Valley on the evening of the 29th as an ill-defined depression, and at no

time in its course did it develop stormwinds or extensive precipitation.

XIV.—This appeared off the west Florida coast on the evening of the 29th. It remained almost stationary over the Florida Peninsula until the evening of the 31st, giving heavy rains on the coast as far north as New Jersey.

MOVEMENT OF CENTERS.

The following table shows the date and location of the center at the beginning and ending of each area of high or low pressure that has appeared on the U. S. Weather Maps during the month, together with the average daily and hourly velocities. The monthly averages will differ according as we consider each path as a distinct unit, or give equal weight to each day of observation; in the first case the monthly average is taken by paths, in the latter case by days.

Movement of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I.....	1, a. m.	35	85	3, a. m.	43	68	Miles.	Days.	Miles.	Miles.
II.....	2, a. m.	52	113	5, a. m.	44	61	1,100	2.0	550	23.9
III.....	6, a. m.	54	112	10, p. m.	47	58	2,900	3.0	967	40.3
IV.....	8, a. m.	54	104	9, p. m.	46	76	3,500	4.5	778	32.4
IVa.....	8, a. m.	39	114	12, p. m.	39	112	1,500	1.5	1,000	41.7
V.....	10, a. m.	55	108	13, p. m.	51	87	.....	.....	.....	.....
VI.....	13, p. m.	47	123	18, p. m.	32	78	1,400	3.0	497	19.5
VII.....	18, a. m.	39	101	20, p. m.	32	78	3,200	5.0	640	26.7
VIII.....	22, a. m.	55	87	23, p. m.	44	98	2,400	2.5	960	40.0
VIIIa.....	25, a. m.	42	74	26, a. m.	46	60	2,400	1.5	1,600	66.7
IX.....	26, a. m.	55	119	28, p. m.	39	70	900	1.0	900	37.5
IXa.....	28, a. m.	44	117	31, a. m.	45	114	3,200	2.5	1,280	53.8
X.....	30, a. m.	33	99	31, p. m.	45	97	1,900	1.5	1,267	52.8
XI.....	31, a. m.	49	113	31, p. m.	46	101	600	0.5	.....	.....
Sums.....							25,000	28.5	10,409	.....
Mean of 11 paths.....							.....	.....	946	39.4
Mean of 28.5 days.....							.....	.....	877	36.5
Low areas.										
I.....	1, a. m.	43	69	1, p. m.	48	63	600	0.5	.....	.....
II.....	1, p. m.	50	97	5, a. m.	47	58	2,200	3.5	629	26.2
III.....	2, a. m.	29	93	3, a. m.	33	75	1,000	1.0	1,000	41.7
IV.....	2, a. m.	49	130	5, p. m.	45	125	700	3.5	100	4.2
IVa.....	5, a. m.	45	104	7, p. m.	49	62	2,500	2.5	1,000	41.7
V.....	7, p. m.	27	95	14, a. m.	46	77	3,900	6.5	600	25.0
VI.....	10, a. m.	50	126	17, a. m.	47	58	3,200	7.0	429	17.9
VII.....	15, a. m.	26	96	16, p. m.	42	61	2,300	1.5	1,533	63.9
VIII.....	14, p. m.	44	127	18, a. m.	47	122	800	3.5	114	4.8
VIIIa.....	17, p. m.	37	101	19, a. m.	40	72	1,900	1.5	1,200	50.0
IX.....	19, p. m.	43	107	23, a. m.	45	60	2,700	3.5	771	32.1
X.....	23, a. m.	28	98	27, a. m.	51	61	3,000	4.0	750	31.2
XI.....	27, a. m.	34	118	28, a. m.	31	116	350	1.0	350	14.6
XII.....	27, p. m.	54	111	30, p. m.	50	65	2,400	3.0	800	33.3
XIII.....	29, p. m.	51	113	31, p. m.	47	85	1,500	2.0	750	31.2
XIV.....	29, p. m.	29	84	31, a. m.	31	76	450	1.5	300	14.5
Sums.....							29,400	46.0	10,326	.....
Mean of 15 paths.....							.....	.....	688	28.7
Mean of 46 days.....							.....	.....	639	26.6

NORTH ATLANTIC METEOROLOGY.

[Pressure in inches and millimeters; wind force by Beaufort scale.]

NORMAL CONDITIONS.

The normal barometric pressure for January over the North Atlantic Ocean, as deduced from international simultaneous meteorological observations taken at Greenwich noon and not reduced to standard gravity, is highest, 30.20 (767), in a small area between the Azores and the Windward Islands; it is lowest, 29.50 (749), in a region between Greenland, Iceland, and Spitzbergen. As compared with December the normal pressure for January rises about 0.05 in the region southwest of the Azores, but falls in the extreme North Atlantic.

OCEAN FOG.

The limits of fog belts west of the fortieth meridian, as reported by navigators, are shown on Chart I by dotted shading. Near the Grand Banks of Newfoundland fog was reported on 20 dates; between the fifty-fifth and sixty-fifth meridian on 6 dates; and west of the sixty-fifth meridian on 3 dates. Compared with the corresponding month of the last seven years the dates of occurrence of fog east of the fifty-fifth meridian numbered 13 more than the average; between the fifty-fifth and sixty-fifth meridians 3 less than the average; and west of the sixty-fifth meridian, 3 less than the average.

OCEAN ICE.

The positions of icebergs reported for the current month are shown on Chart I by crosses. On the 2d ice was observed in N. 45° 34', W. 50° 35'. On the 11th, in N. 47° 40', W. 49° 58', a large berg was noted. On the 13th heavy ice was encountered near St. Johns, N. F. On the 23d, a berg 100 feet high and 300 feet long, was reported in N. 48° 16', W. 50° 39'.

From January, 1882 to 1888, inclusive, arctic ice in small quantities was reported east of Newfoundland, but in no case was it sighted south of the forty-third parallel. In 1889 and

1892 no ice was reported. In 1890 vast fields of ice and enormous icebergs were encountered over and near the Grand Banks, north of the forty-third parallel. In 1891, on the 28th, 3 large icebergs were observed in N. 46° 30', W. 52° 46', and on the 31st patches of soft ice were encountered in N. 45° 50', W. 59° 20'. In 1893, on the 5th, a large berg was noted in N. 47° 35', W. 48° 34'; on the 8th, a long, low berg was observed in N. 48° 10', W. 47° 26'; on the 18th, a berg was noted in N. 48°, W. 46°. In 1894 more ice was reported during January than in any corresponding month for the past 12 years.

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.

DIURNAL PERIODICITY.

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

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.

The years of highest and lowest mean temperature for January may be had from Table I of the January, 1894, REVIEW. In this REVIEW the absolute January maximum and minimum temperature for each Weather Bureau station during the entire period of observation is given on the right margin of Table I. It is proposed to give these data for each month in the successive issues of the REVIEW.

Some of the details heretofore published under this section have been omitted to make room for other articles, but the numerical tables contain the information usually given, and its repetition in this text is believed to be unnecessary.

PRECIPITATION.

[In inches and hundredths.]

The distribution of precipitation for the month of January, 1895, as determined by reports from about 2,000 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III; the first of these also gives the average departures from the normal for each district. Unless otherwise stated, the snow or hail is understood to be melted and added to the rainfall.

DIURNAL VARIATION.

Table XII gives the total precipitation for each hour of seventy-fifth meridian time, as deduced from self-registering gauges kept at about 43 regular stations of the Weather Bureau; of these 37 are float gauges and 7 are weighing gauges.

NORMAL PRECIPITATION FOR JANUARY.

The normal precipitation for January is shown on Chart I of the Atlas of Bulletin C, entitled "Rainfall and Snow of the United States, Compiled to the End of 1891, with Annual, Seasonal, Monthly, and other Charts," by Mark W. Harrington, Chief of the Weather Bureau, Washington, 1894. From this chart it appears that the region of greatest rainfall in January is on the north Pacific coast and in the Lower Mississippi Valley, including Tennessee and the mountainous portions of Georgia and North Carolina.

PRECIPITATION FOR CURRENT MONTH.

The precipitation for the current January was heaviest in the extreme northwest corner of Washington and along the Pacific coast as far south as San Francisco. The maxima were: East Clallam, 15.44; Tatoosh Island, 12.50; Neah Bay,

12.44; Pysht 12.07; Fort Canby, 11.52, also at Halifax, 10.12. Other details may be drawn from the charts and tables.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 16. Arizona, 24. Arkansas, 6, 20. California, 15 to 18. Florida, 9, 16. Illinois, 21. Indian Territory, 19. Iowa, 20, 21. Kentucky, 7. Louisiana, 1, 25. Maryland, 12. Michigan, 21. Mississippi, 15, 16. Missouri, 15, 20, 21. Oregon, 11, 13, 17, 21. South Carolina, 2. Tennessee, 7. Texas, 24, 25. Virginia, 12. Washington, 13.

SLEET.

The following are the dates on which sleet fell in the respective States:

Alabama, 2, 8, 9, 10, 28. Arizona, 17. Arkansas, 1, 2, 4, 8, 15, 24, 25, 27, 30. California, 3, 8, 16, 18, 19, 20, 23. Connecticut, 6, 8, 10, 11, 16, 26. Delaware, 8, 15, 25. District of Columbia, 9, 25, 26. Georgia, 2, 3, 28, 29. Idaho, 1, 4, 11, 13, 16. Illinois, 5, 6, 9, 11, 16, 20, 25. Indiana, 5, 6, 10, 25, 26. Indian Territory, 1, 2, 24. Iowa, 4, 5, 6, 18, 21. Kansas, 3, 4, 5, 14, 15, 20, 21, 25, 31. Kentucky, 9, 10, 25, 26. Louisiana, 27 to 30. Maine, 6, 7, 10, 11, 13. Maryland, 5, 6, 8, 9, 10, 12, 16, 18, 24, 25, 26, 28. Massachusetts, 6, 9, 10, 11, 18, 22, 26. Michigan, 5, 7, 18, 20, 21. Minnesota, 5, 17, 18, 20, 21. Mississippi, 1, 3, 8, 9, 14, 27 to 30. Missouri, 3 to 7, 10, 14, 15, 20, 24, 25, 27, 29. Nebraska, 5, 13, 14, 17, 18, 19, 21, 22, 30. Nevada, 4, 5, 6, 12, 13, 16 to 19, 22. New Hampshire, 6, 7, 10, 11, 13, 26. New Jersey, 5 to 10, 13, 15, 16, 18, 19, 21, 22, 25, 26.