

and Allegheny City was suspended. On this date the river rose 11 feet at Parkersburgh, W. Va. On the 18th the river reached 31.3 feet at Pittsburgh, after which it fell. In the Allegheny River the water reached 32 feet on the 7th street bridge in the early morning; with the exception of the stage reached February 6, 1884, this was the highest stage ever recorded at that place. Streets in low-lying parts of Parkersburgh and Allegheny City were flooded. On the 20th the river reached 44 feet 10 inches at Parkersburgh, W. Va., at midnight, the highest stage noted in 60 years, save in February, 1884, when 54 feet 2 inches was reached. On the 22d 54.8 feet was reached at Cincinnati, and parts of Cincinnati and Newport, Ky., were flooded. At Louisville, Ky., the river was 1.6 foot above the danger-line. On the 23d the river reached 56 feet at Cincinnati, and many houses were abandoned in submerged districts. Immense damage had been caused, and large areas continued under water along the Ohio River and tributaries. At Louisville the river reached 27.7 feet. On the 25th the river was 57.4 feet and stationary at Cincinnati, and the water had risen 16 feet in 6 days. On the 26th the stage of the water at Louisville was 32.3 feet, and the river was falling at Cincinnati.

The Tennessee River reached a dangerous stage at Chattanooga, Tenn., on the 10th, and was rising rapidly at Knoxville. On the 12th portions of Chattanooga were flooded; the river was 2.5 feet above the danger-line, and considerable of the surrounding country was flooded. On the 14th the river reached 37.55 feet at Chattanooga, and then began to fall. Another rise occurred at Chattanooga from the 22d to 25th. On the 15th the Cumberland River rose above the danger-line at Nashville, Tenn., reaching 41.2 feet. On this date a rise in the Sacramento River flooded a part of Red Bluff, Cal., and caused damage in Butte county. On the 16th about one-half of Johnstown, Pa., was flooded by a rise in the Conemaugh River. On the 17th there was a flood in the west branch of the Susquehanna River. On the 20th the Susquehanna River was 2 feet above the danger-line at Harrisburg, Pa., and had

risen 5 feet during the preceding night, causing much damage. On the 26th floods occurred along the Hudson River and in streams in central and east New York. On the 13th the Mississippi River reached the danger-line, 40 feet, at Cairo, flooding bottom lands. On the 22d the river reached a dangerous stage at Natchez, Miss. On the 23d the Mississippi River was dangerously high from Memphis, Tenn., southward. On the 24th the lower Mississippi was at or near the danger-line at several points. On the 25th the river was 44.3 feet and rising at Cairo. On the 26th the water reached the danger-line, 33 feet, at Memphis, Tenn., and was 1.9 foot above the danger-line at New Orleans, La. At the close of the month the river was 5.5 feet above the danger-line and rising slowly at Cairo; it stood at the danger-line at Memphis, and was 2.2 feet above the danger-line at Vicksburg, Miss.

Tornadoes were reported as follows: Helena, Ark., 9th; damage \$5,000. Troy, Mo., 24th; damage \$2,000. Utica, Ind., about midnight 24-25th; damage \$6,000. Severe local storms were reported at Soapstone Mount, N. C., on the 11th; at Cape Girardeau, Mo., on the 20th; at Sunbury, N. C., on the 22d, damage \$4,000, and one child killed; at Berkeley, Cal., on the 23d; at Newcastle, Ky., on the 24th, damage \$2,000; and at Abilene, Tex., on the 25th. Heavy thunder-storms occurred at Eureka, Cal., on the 16th; at San Antonio, Tex., on the 20th; at West Bend and Manson, Iowa, on the 24th; at Louisville, Ky., the night of the 24-25th; and in southeast Massachusetts on the 28th.

Navigation was resumed on the lower Connecticut River on the 11th. The Hudson River was open from Newburgh to New York City on the 25th. At Iowa and upper Illinois ports the Mississippi River opened and closed at intervals during the month. On the 9th auroras were observed in Indiana, Iowa, Minnesota, South Dakota, and Wisconsin; on the 11th in Illinois, South Dakota, Wisconsin, Michigan, Massachusetts, New Hampshire, and Maine; on the 12th in Maine, Massachusetts, Michigan, and Montana; and on the 14th in Illinois, Michigan, Massachusetts, New Hampshire, and Maine.

⊙ ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for February, 1891, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on Chart II by isobars. The departure of the mean pressure for February, 1891, obtained from observations taken twice daily at the hours named, from that determined from hourly observations, varied at the stations named below, as follows:

Station.	Departure.	Station.	Departure.
New Orleans, La.....	+ .001	Pittsburgh, Pa.....	+ .014
Memphis, Tenn.....	+ .002	Washington City.....	+ .015
Eastport, Me.....	+ .002	Lynchburg, Va.....	+ .015
Saint Louis, Mo.....	+ .003	Saint Paul, Minn.....	- .001
Duluth, Minn.....	+ .005	Moorhead, Minn.....	- .002
Albany, N. Y.....	+ .006	Bismarck, N. Dak.....	- .002
Nashville, Tenn.....	+ .007	Omaha, Nebr.....	- .003
Key West, Fla.....	+ .008	Galveston, Tex.....	- .006
Cleveland, Ohio.....	+ .008	Santa Fe, N. Mex.....	- .005
Wilmington, N. C.....	+ .008	Salt Lake City, Utah.....	- .010
Chicago, Ill.....	+ .009	Abilene, Tex.....	- .011
Atlanta, Ga.....	+ .009	Fort Assiniboine, Mont.....	- .012
New York City.....	+ .010	Portland, Oregon.....	- .014
Boston, Mass.....	+ .012	San Francisco, Cal.....	- .016
Jacksonville, Fla.....	+ .013	El Paso, Tex.....	- .016

The mean pressure was highest along the south Atlantic coast, where it was above 30.15, and it was above 30.10 in the British Possessions north of east Montana. The mean pressure was lowest in west Washington, where it was below 29.85, and it was below 29.95 in a small area which extended over the east-central part of the middle plateau region, over the west part of the middle plateau region, and on the Pacific coast north of the 40th parallel. On the Pacific coast north of the 34th parallel, in the plateau region, except over the

southeast part, generally over the upper lake region, and in the lower Saint Lawrence valley, New Brunswick, and east Nova Scotia the mean pressure was below 30.00.

On the Pacific coast north of the 34th parallel and over the west parts of the middle and northern plateau regions the mean pressure was the lowest reported for February since 1878, and during the storm of the 22-23d the barometer readings were the lowest ever reported for February at a number of stations on the middle and south Pacific coasts.

A comparison of the pressure chart for February, 1891, with that of the preceding month shows that there was a general decrease in mean pressure, except along the Atlantic coast north of Georgia and in the British Possessions north of Montana and North Dakota. The greatest decrease in mean pressure occurred over north-central Nevada, where it was more than .40, and the decrease was more than .20 over the middle and northern plateau regions and on the middle and north Pacific coasts. At stations on the immediate middle Atlantic, south New England, and Nova Scotia coasts, and in the British Possessions north of Montana the increase in mean pressure was more than .05. The remarkable decrease in mean pressure over the middle and northern plateau regions and on the middle and north Pacific coasts was largely due to the exceptionally low barometer which attended the storm of the 21st-24th.

The mean pressure was below the normal over the entire country, save at a number of stations on the immediate Atlantic coast north of Georgia, where it was slightly above the normal. The most marked departure below the normal was noted on the north Pacific coast, where it exceeded .20, and

the mean pressure was more than .10 below the normal on the middle Pacific coast, over the middle and northern plateau regions, and on the northeast slope of the Rocky Mountains.

The monthly barometric ranges at regular stations of the Signal Service are shown in the table of Signal Service data on the last two pages of the REVIEW.

Tabulated statement showing principal characteristics of areas of high and low pressure.

Barometer.	First observed.			Last observed.			Duration.	Velocity per hour.	Maximum pressure change and maximum abnormal temperature change in twelve hours and maximum wind velocity.											
	Date.	Lat. N.	Long. W.	Lat. N.	Long. W.	Days.			Miles.	Station.	Rise.	Date.	Station.	Fall.	Date.	Station.	Direction.	Miles per hour.	Date.	
High areas.	o	o	o	o	o															
I.....	1	54	112	48	73	4.0	32	Chatham, N. B.....	.54	4	Dodge City, Kans.....	34	2	Wood's Holl, Mass.....	nw.	48	4			
II.....	7	54	118	46	68	5.0	41	Fort Custer, Mont.....	.66	7	Omaha, Neb.....	35	8	Fort McKinney, Wyo.....	n.	64	7			
III.....	12	54	117	31	73	4.0	30	Helena, Mont.....	.48	12	Fort Assiniboine, Mont.....	24	12	Kitty Hawk, N. C.....	ne.	64	15			
IV.....	14	55	117	47	67	0.0	24	Eastport, Me.....	.56	19	Rapid City, S. Dak.....	40	15	Chicago, Ill.....	sw.	46	18			
V.....	20	55	120	42	65	4.5	30	Anticosti Island, G. S. L.....	.78	23	Fort Buford, N. Dak.....	28	20	Kitty Hawk, N. C.....	nw.	52	22			
VI.....	24	53	116	41	90	4.0	26	Yarmouth, N. S.....	.76	27	Kansas City, Mo.....	45	24	Abilene, Tex.....	n.	52	25			
Mean.....						4.6	30		.63			34					54			
Low areas.																				
I.....	1	43	123	34	94	1.5	52	Chatham, N. B.....	1.00	3	Sydney, C. B. I.....	39	3	Winnemucca, Nev.....	sw.	46	1			
Ia.....	2	44	86	35	57	1.5	44	Louisville, Ky.....	.40	7	Rockliffe, Ont.....	25	7	Block Island, R. I.....	sw.	46	3			
II.....	5	32	104	58	71	3.5	30	Yarmouth, N. S.....	.92	10	Columbus, Ohio.....	21	9	Sioux City, Iowa.....	ne.	56	7			
III.....	5	53	115	26	95	3.0	31	Calgary, N. W. T.....	.52	11	Medicine Hat, N. W. T.....	25	11	Montreal, Quebec.....	ne.	48	8			
IIIa.....	6	40	90	49	66	1.0	30	Father Point, Quebec.....	.72	16	Albany, N. Y.....	31	15	Fort Canby, Wash.....	sw.	48	10			
IV.....	11	55	127	46	108	2.0	48	Chatham, N. B.....	.54	21	Louisville, Ky.....	32	20	Winnemucca, Nev.....	e.	56	11			
V.....	12	48	130	38	106	4.0	18	Sault Ste. Marie, Mich.....	.58	24	La Cross, Wis.....	30	23	Block Island, R. I.....	e.	42	12			
Va.....	14	47	111	50	55	2.0	48	Eastport, Me.....	.28	27	Halifax, N. S.....	8	27	Winnemucca, Nev.....	sw.	60	23			
Vb.....	16	38	95	50	59	2.0	38	Block Island, R. I.....	.30	28	Quebec, Quebec.....	16	28	Sydney, C. B. I.....	sw.	48	27			
VI.....	18	32	118	52	69	4.5	30	Eastport, Me.....	.28	27	Halifax, N. S.....	8	27	Erie, Pa.....	w.	46	27			
VII.....	21	44	130	34	100	0.0	15	Block Island, R. I.....	.30	28	Quebec, Quebec.....	16	28			56				
VIIa.....	24	43	93	59	65	2.0	33													
VIII.....	25	32	85	44	66	1.5	41													
IX.....	27	43	84	46	73	1.0	27													
Mean.....						2.6	34		.59			25					56			

AREAS OF HIGH PRESSURE.

Six areas of high pressure were observed during the month, all of which reached the Atlantic coast within the limits of the United States. They were first observed in the region north of Montana or British Columbia, and the general direction of their movement was to the south over the Rocky Mountain regions, and thence eastward to the Atlantic, inclining slightly to the north of east after reaching the Mississippi Valley. Only two areas of high passed eastward north of the Lake region, and in each case secondary areas formed within the limits of the United States and united with the principal area while the latter was central over the Saint Lawrence Valley.

The following is a general description of each area of high pressure observed, based upon regular daily telegraphic reports:

I.—This area of high pressure had appeared in the extreme northwest in the latter part of January, and at the opening of the month it covered the Missouri Valley and the regions to the northward, the barometric pressure being greatest at Calgary, N. W. T., where it was 30.84, and the temperature —38°. At Battleford, N. W. T., the temperature was —44°, and at Qu' Appelle, N. W. T., —42°, the pressure being above 30.60. During the movement of this area to the southward it apparently separated, one portion passing to the west of the Rocky Mountains over Idaho, and the other passing eastward over Manitoba, this being the condition observed on the morning of the 2d; but by the morning of the 3d these areas had united, forming a well-defined area of high pressure central over Colorado, from which region it passed directly eastward, covering the entire country east of the Rocky Mountains during the 4th, and the Atlantic coast on the 5th, when it disappeared to the eastward. The cold wave attending this area of high pressure extended from the Lake region to the Gulf of Mexico, the fall in temperature exceeding 30° in twenty-four hours over large areas of the east Gulf and middle Atlantic states and the Ohio Valley. This cold wave was also severe over the Maritime Provinces, where the fall in temperature ranged from 20° to 34° in twenty-four hours on the 5th, and a temperature of —24° occurred at Chatham, N. B., on the morning of the 5th.

II.—Appeared over British Columbia on the 7th and passed eastward toward Manitoba during the 8th, on which date a secondary area formed over the northern plateau region. The

a. m. report of the 9th exhibited two areas of high pressure, one to the northeast of Manitoba, from which apparently a secondary had passed over the Saint Lawrence Valley, and a second area covering the greater portion of the Rocky Mountain regions, the pressure being greatest over Utah. The telegraphic reports received during the night showed a general drift of the mountain area of high pressure to the southeast. It covered the southwest on the morning of the 10th, having been preceded by a dry norther in Texas. After reaching Texas the direction of movement changed to the north of east, and it passed over the eastern portion of the United States during the 11th and 12th, attended by clearing and fair weather, but not unusually low temperature. It was last located as central on the 40th parallel near Martha's Vineyard, Mass.

III.—This area of high pressure was observed north of Montana on the 12th, while on the afternoon of the 11th a second area was forming over the southern plateau region. The high of the north had moved eastward rapidly north of the Lake region, while the southern area was apparently retarded and remained in the central Rocky Mountain region until the afternoon of the 13th, when it had reached the upper Mississippi valley. The following report indicated that these two areas had united north of the lower lake region, forming a barometric condition, the southern half of which covered the eastern half of the United States. After the union of these two areas of high pressure the direction of movement changed to the southward, and the area passed over the middle Atlantic states and off the south Atlantic coast, the barometric pressure decreasing with the southerly movement. On the morning of the 16th it was central near the 30th parallel on the meridian of Washington City.

IV.—Was first observed in Alberta on the morning of the 14th. It passed slowly southeastward over the Rocky Mountain regions, but during this movement it was not well defined and developed but slight energy. After reaching the northern boundary of Wyoming it passed rapidly to the southeast, attended by increasing pressure at the centre, and on the morning of the 18th it covered the country lying between the Alleghany and the Rocky Mountains, the centre being located in southern Iowa, where the northeasterly movement of this area commenced. This area passed over the Lake region on the 19th and over New England and the Maritime Provinces on