

pressure probably extended from Fort Garry southwestward into Dakota, the lowest temperatures being -37° , or lower, and the winds nearly calm, while to the southward brisk northwest winds prevailed, as has been previously stated. February 1st, 4:35 p. m., the area of highest pressure and calms was confined to the northeastern corner of Dakota; at midnight the area of calms included pretty much all of Minnesota, while the area of highest pressure had moved rapidly southward into Missouri and northern Texas. February 2d, 7:35 a. m., the highest pressure of 30.50 was central in Arkansas; 2d, 4:35 p. m., the highest pressure, 30.40, was central from Tennessee to Ohio; 2d, 11 p. m., the highest pressure, 30.50, was central in Pennsylvania and northern Virginia; 3d, 7:35 a. m., the highest pressure, 30.60, was central off the middle Atlantic coast.

No. II. The cold air on the northern side of low barometer No. III on the morning of the 3d formed a well-defined area of high pressure, which was central in the afternoon in Dakota and at midnight in Nebraska. On the morning of the 4th a pressure of 30.60 is recorded in Missouri, while the area of 30.55 extended thence as a barometric ridge northward to Minnesota and southwestward to Texas. February 4th, 4:35 p. m., the highest pressure, 30.60, was central in southern Illinois; by 11 p. m. an influx of very cold air from Canada gave the area of 30.60 an oval outline, extending from Arkansas to Virginia, thence northward over Upper Canada. February 5th, 7:35 a. m., very remarkable increase in the extent of this area had taken place, the isobar of 30.60 having scarcely changed its position on the west, but having pushed rapidly to the southeast and northeast, the highest pressure was now 30.95 in northern New England; by 4:35 p. m., the isobar of 30.60 had moved decidedly eastward, and the highest pressure, 30.98, was off the New England coast. During the remarkable rise in pressure which had taken place during the preceding 24 hours over the Middle and Eastern States, the temperature remained abnormally low on the summit of Mt. Washington, as compared with stations at sea-level, and the wind continued north and northwest from 80 to 40 miles. February 5th, 11 p. m., the isobar of 30.90 included the middle and east Atlantic coasts, New Brunswick and Nova Scotia, while a higher pressure prevailed to the eastward, as shown by the reports of 30.99 at Halifax, 30.96 to 30.99 on most stations on the east Atlantic coast, and 31.01 at Wood's Hole. It is therefore evident that the pressure in this area of high barometer was the highest on record for that portion of the United States. After this the pressure rapidly diminished.

No. III. This area followed closely in the rear of low barometer No. VI, but passed to the southeastward, and, on the morning of the 12th, reached the Atlantic coast.

No's. IV and V. The flow of cold air from the north in the rear of low barometer No. VII produced a maximum pressure of 30.59 at 4:35 p. m., on the 15th, while the pressure was simultaneously rising both in California and the Northwest. The maximum (30.45) was reached in the latter section on the 16th, at 11 p. m., by which time the pressure had fallen in Oregon to 30.29. The central area of highest pressure was rapidly transferred to the south and east, being, on the 17th, at 11 p. m., over the Gulf States and Tennessee, while a new depression, No. VIII, was developed in Dakota and Manitoba. The barometer continued high during the 18th over the Southern and Atlantic States, the highest pressure extending, at 11 p. m., from Mississippi to Virginia. During the 19th, this area moved slightly eastward, and was joined by a small area of high barometer, No. V., which had moved southeastward over the upper Mississippi in the rear of low barometer No. VIII. The conjoined areas, No's. IV and V, extended, on the 20th, at 11 p. m., from Upper Canada to Virginia, whence they moved slowly southeastward, and were, on the 21st, at 11 p. m., east of New England and New Brunswick.

No. VI. This area followed closely in the rear of depression No. IX, which, as before stated, extended, on the 21st, as a trough from Texas to the Upper Lakes. The high pressure appeared at 4:35 p. m., of the 21st, to extend from Manitoba to Kansas and Missouri; its southern portion, however, moving rapidly southeastward, was, on the 22d, at 4:35 p. m., in Texas, while the northern portion continued stationary with rising pressure, and was, on the 23d, 7:35 a. m., central in Minnesota, with a maximum pressure of 30.85; moving southeastward it was, at 4:35 p. m., central in the upper Mississippi valley with a pressure of 30.60; and, at 11 p. m., central at Cairo, pressure 30.50. During the 24th it moved southeastward, and disappeared on the 25th off the South Atlantic coast.

No. VII. The rising barometer in the rear of depression No. X extended from the Upper Lakes and Northwest southward to the Gulf during the 28th and morning of the 29th, and seems to have been hindered in its progress eastward by the presence of a very remarkable depression (No. XI) on the California coast.

TEMPERATURE OF THE AIR.

The general distribution of the temperature of the air is shown by the isothermal lines upon Chart No. II. The average temperature has been above its normal value, except for stations in the extreme northern part of Minnesota and the St. Lawrence valley. A tendency has been apparent during the month to the formation of an area of cold northeast winds at our northern stations, simultaneously with the prevalence of warm southerly winds at stations south of the Lake region; the dividing belt passing generally eastward from Iowa to New York and Pennsylvania.

Maximum Temperatures.—Northern stations. At Pembina, 32° ; St. Paul, 46° ; Pike's Peak, 29° ; Mount Washington, 34° ; Escanaba, 39° ; Eastport, 45° ; Breckenridge, 34° . Southern stations: Jacksonville, Fla., 83° ; Key West, 85° ; Savannah, 80° ; Brownsville, Texas, 83° .

Minimum Temperatures.—The minimum temperatures have been for northern stations. Yankton, -18° ; St. Paul, -22° ; Pike's Peak, -17° ; Pembina, -48° ; Omaha, -19° ; Alpena, -11° ; Burlington, Vt., -12° ; Breckenridge, -28° ; Duluth, -28° ; Eastport, -20° ; Escanaba, -12° ; Fort Sully, -28° ; Marquette, -16° ; Milwaukee, -10° ; North Platte, -14° ; Malone, -16° ; Mount Washington, -42° , and for southern stations, Galveston, 35° ; Indianola, 33° ; Jacksonville, 36° ; New Orleans, 36° ; St. Marks, 30° ; Brownsville, Texas, 42° ; Key West, 63° .

Ranges of Temperature.—The least ranges of temperature have been: San Francisco, 26° ; Key West, 22° ; Galveston, 39° and Cape May, 22° .

Frosts destructive to vegetation and to the premature buds, are reported from Ohio, North Carolina, 24th; Virginia, 10th, and subsequently.

PRECIPITATION.

Amount of Rain and Snow.—Chart No. III shows the general distribution of precipitation for the month, and that there has been in general an excess over the Lake region, New England and Canada, as also in Louisiana, and a deficiency in the remaining Gulf States, Tennessee, Ohio valley and the South Atlantic States. Snowfall is reported from 13 to 18 inches in Conn.; 5 or 6 in Ind., Ill., Iowa and Ken.; 23 to 29 in Maine; 11 to 22 in Mass.; 2 to 10 in Minn.; 4 to 7 in Neb.; 25 to 35 in N. H.; 7 to 48 in N. Y.; $1\frac{1}{2}$ at Weldon, N. C.; 5 to 8 in Ohio; 6 to 13 in Penn.; 22 in Utah; 20 to 38 in Vt.; 2 to 4 in Va.; 10 in W. V.; 8 to 19 in Wis.

Rainy days.—The number of days on which rain or snow fell during February, averaged from 14 to 16 on the middle and east Atlantic coasts; from 16 to 20 in the Lake region; from 8 to 12 in the upper Mississippi and Ohio valleys; from 8 to 10 in the Southern States, except 16 in southern Louisiana. From 2 to 5 rainy days are reported from the plains of Kansas and Nebraska.

Cloudy days.—The number of cloudy days, (averaging eight-tenths or more of cloudiness,) for the Atlantic States, from Georgia to Maine, varied between 7 and 17, the latter number belonging to Middle Atlantic States and Long Island. From 5 to 11 cloudy days were reported from the region between the Alleghenies and the 100th meridian.

RELATIVE HUMIDITY.

The mean relative humidity for February averages as follows, (not corrected for altitude.) *Dry stations:* Santa Fé, 39; Pike's Peak, 55; Dodge City, 48; Denver, 39; Colorado Springs, 35; Cheyenne, 45. *Damp stations:* Pembina, 92 (?); Albany, 84; Cleveland, 82; Marquette, 80; Mt. Washington, 84.

WINDS.

Wind directions.—The prevailing winds are shown by the arrows upon Chart No. II, from which it will be seen that these have been decidedly northwesterly in all the northern half of the country, southerly in the Southwest, and northeast to southeast on the south Atlantic coast.

Total movements.—The sum total of the movements of the air from all directions, as given by the daily readings of anemometers, have been as follows, in miles. Large movements: Breckenridge, 10,574; Cheyenne, 11,531; Eastport, 10,110; Erie, 11,080; Grand Haven, 10,359; Indianola, 10,501; Kittyhawk, 10,052; Long Branch, 11,629; Manhattan, 10,228; Pike's Peak, 20,908; Sandy Hook, (?); Wood's Hole, 10,143; Thatcher's Island, 13,930. The record from Pike's Peak shows decidedly the largest monthly movement recorded there during the past three years. Small movements: Wytheville, 3,982; Savannah, 3,520; Salt Lake City, 2,460; Nashville, 3,588; Mobile, 3,936; Memphis, 3,561; Lynchburg, 2,832; Augusta, 2,899.

The highest winds.—The maximum winds of the month have been very severe, especially those in connection with the extensive storms of the 1st and 2d and the 15th and 16th. Among these the following are worthy of mention: On February 1st or 2d, Albany, northwest, 70 miles; Stapleton, N. Y., west, 60; Boston, southwest, 50; Barnegat, northwest, 60; Vevay, Ind., northwest, 60; Cape Henry, northwest, 52; Cape May, northwest, 56; Long Branch, northwest, 72; Springfield, Mass., northwest, 60; Lexington, Ky., south, 52; Flushing, 74; New York, northwest, 66; Thatcher's Island, northwest, 70; Newport, west, 80; Washington, northwest, 60 to 72. On other dates maximum winds of 50 miles per hour or more were experienced as follows: Dodge City, 29th, west, 50 miles; Duluth, 26th, northeast, 52; Cape Hatteras, 14th, southwest, 56; Kittyhawk, 22d, north, 60; Mt. Washington, 24th, northwest, 168; Malone, 12th, west, 60; Pike's Peak, 1st, southwest, 72; Port Huron, 19th, south, 50; Sandy Hook, 15th, northwest, 80. As an interesting instance of the power of a strong wind to produce eddies, in which very low pressure exists, it is reported that, on the early morning of the 2d, in Washington, a gust of at least 70 miles velocity, in rushing past an exposed dwelling in the higher part of the city, caused the windows of a small room on the leeward side of the house to burst outwards, a result evidently due simply to the expansion of the confined air, as the room doors were closed, and there was no fire-place or other way of escape.

Local Storms.—Storms of the nature of tornadoes or destructive gusts of wind were reported on the 13th near Friendsville, Ill.; 14th, at Buffalo, N. Y.; 27th, St. Charles, Mo., Princeton and St. Meinrad, Ind.

WATER TEMPERATURES.

The monthly maximum and minimum temperature of the water in rivers and harbors, are given in a table on Chart No. II. Minima of 30° or 32° , were reported from Cleveland, Detroit, Duluth, Grand