

Eighty-eight and seven-tenths per cent. of those ordered for the stations of the Signal Service were justified by the occurrence of dangerous winds within one hundred miles of the signal. The signals at Wilmington and New London were of special value, as they prevented vessels from going to sea immediately preceding the storm of the 20th.

Probabilities.—A critical comparison between the predictions published in the tri-daily probabilities and the subsequent weather reports, shows that on the average, during the month, ninety-four and four-tenths per cent. of the predictions have been well verified.

NAVIGATION.

The condition of the rivers during the month is given in the table on Map No. III, from which it will be seen that the Red river rose slowly but steadily at Shreveport during the greater portion of the month, and recent reports from points above Shreveport show a sufficient depth of water for navigation. The Missouri river was closed throughout the month at Fort Sully and Yankton, and after the 9th at Omaha. The heavy rains which attended the storm No. VIII in the Tennessee, Ohio and Cumberland valleys, caused a considerable rise in these rivers, beginning on the 20th. These freshets had partly subsided before they were reinforced by the still greater rise of the 28th and 29th. No important change occurred in the Mississippi river until the 23d, when the freshets from the Ohio and the Cumberland caused a rise of ten feet at Cairo, the freshet wave reaching Memphis on the 25th, and Vicksburg on the 29th. At St. Paul and La Crosse the river remained closed during the entire month.

Navigation closed at a greater portion of the Lake ports between the 1st and the 10th of the month. The Erie canal was closed on the 5th.

TEMPERATURE OF WATER.

The table on Map No. II, gives the maximum and minimum temperature of water at many of the Signal stations on the lakes, rivers, Gulf and South Atlantic coasts. The range of water temperature in the rivers and lakes located in the central and northern sections of the country is small, as the temperature of water was, comparatively, near the freezing point at the beginning of the month. In the southern rivers, and on the Atlantic and Gulf coasts, the range has been larger, and a comparison of the mean temperature of water with the mean atmospheric temperature, shows that the temperatures of the air and water have differed but little, the air being slightly cooler. The only instance where the water has been colder than the air is at St. Louis, where the winds have been southerly during the greater portion of the month. In the lakes, and on the coast of New England, the mean temperature of the air has been much lower than that of the water, the greatest observed difference being 17 degrees at Eastport, 10 degrees at Portland, 9 degrees at New London, 14 degrees at Duluth, and 11 degrees at Marquette.

ATMOSPHERIC ELECTRICITY.

Thunder and Lightning.—The thunder-storms which have occurred during the month in the southern portion of the country were uniformly in the vicinity of areas of barometric depression. Those accompanied by the most vivid displays of lightning were as follows: At Montgomery, zig-zag lightning on the 3d; at Indianola and Fort Gibson on the 4th; at Charleston on the 7th; at Galveston on the 17th, 19th and 25th; at Cape Hatteras on the 20th; at Corsicana, Texas, on the 28th.

Auroras.—The auroral displays, although not noticeably brilliant, have occurred more frequently during this than during the preceding month. The following are cited as the most interesting: Those of the 1st, 3d, 6th and 15th, at New London; 6th, 15th and 21st, at Keokuk; 3d, 13th, 20th and 21st, at Wood's Hole; 3d at Alpena, Escanaba and Cornish, Me., very brilliant; an auroral arch was visible at Auburn, New Hampshire, and Woodstock, Vt., on the 21st.

OPTICAL PHENOMENA.

Solar Halos.—The only days on which solar halos have not been reported at some one of the regular stations, during the month, are the 3d, 4th, 7th, 8th, 14th, 21st, 28th and 29th. Those most extensively observed were reported on the 5th at New London, Alto Vista, Va., Andover, Mass., Standish, Me., Florida, Mass., Auburn, N. H., Conitocookville, N. H., Cornish, Me. On the 10th at Ephata, Penn., Standish, Me., and Cornish, Me. On the 15th at Point Pleasant, La., and Newburyport, Mass. On the 18th at Tioga, Pa., Point Pleasant, La., and Milton, Mass., (parhelia,) and Wilsonville, Ala. On the 19th at Jacksonville, Tenn., Afton, Iowa, and Hennepin, Iowa.

Lunar Halos.—These have been unusually numerous during the latter portion of the month; those occurring on the 16th, 17th, 18th, 19th, 20th, 22d and 23d, were extensively observed, and are of especial interest when considered in connection with the storm of the 19th and 20th.

Mirage.—Observed on Lake Superior, near Duluth, on the 15th.

MISCELLANEOUS PHENOMENA.

Meteors were observed on the 5th at Andover, Mass., and Afton, Iowa. On the 8th at Williamsport, Penn., Fall River, Mass., Woodstock, Vt., Corning, Mo., and Council Bluffs, Iowa. On the 12th at Milford, Del., Fort Madison, Iowa, Fort Wayne, Indiana, (brilliant,) and Woodstock, Vt. December 2d at Shreveport, La., (brilliant, exploding with blue and yellow light.)

Fires.—Prairie fires were reported to the west of and near to North Platte station on the 3d and 8th, burning towards the north. Forest fires on the 12th, east of Shreveport.

Earthquakes.—Distinct shocks occurred at 10.15 P. M. on the 10th on Long Island, in Westchester and Rockland counties, along the Palisades and Hudson river, N. Y., and in New Jersey. Also on the 12th, between 10 and 11 P. M., a slight shock of earthquake was felt at Garrisons, New York; also at Guadeloupe W. I., at 11.50 A. M., on the 8th

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Albert J. Myer

Brig. Gen. (Bvt. Assg'd.) Chief Signal Officer, U. S. A.

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