dominance; the only easterly winds on this side of the Rocky mountains, are those due to the influence of the trade-wind belt on the Gulf coast and in Florida. The winds north of latitude 35° north, have nearly all had a westerly tendency.

The total movements of the air in all directions during the month, average as follows: New England and New Jersey coasts, 8,415 miles; interior of New England and Middle States, 4,460; south Atlantic and Gulf coasts, 5,490; interior of the Southern States, 3,012; Lake region, 3,120; Ohio valley and Northwest, 6,277.

TEMPERATURE OF THE WATER.

The table of maximum and minimum temperatures of the water, at the various stations on the sea and Gulf coasts, lakes and rivers, is given on Chart No. II.

NAVIGATION.

The table of highest and lowest water-marks of the principal Western rivers is given on Chart No. III, (lower right-hand corner.) The greatest ranges have been at Shreveport, La.; Memphis, Tenn.; Cairo, Ill.; and Vicksburg, Miss.; at which latter point the range has exceeded twelve feet. At other points the variation of level has been unimportant. At St. Louis, greatest depth was observed on the 1st; least on the 29th and 31st.

VERIFICATION OF "PROBABILITIES" AND CAUTIONARY SIGNALS.

(1) *Probabilities.*—The usual comparison of the Probabilities, item by item, with the weather following, shows that on the average for all districts in the United States, eighty-seven and four-tenths (87.4) of the former have been verified. The percentage of omissions to predict has been 0.8. The percentage of verifications in the different districts, was as follows: For New England, 88.70; Middle States, 89.80; South Atlantic States, 89.30; East Gulf States, 89.30; West Gulf States, 83.90; Lower Lakes, 86.50; Upper Lakes, 87.70; Tennessee and the Ohio valley, 87.60; upper Mississippi valley, 84.80; and the lower Missouri valley, 82.80.

(2) *Cautionary Signals.*—The number of storm-warnings issued to the various seaport and lake stations in the United States and Canada during October, was by far the largest number issued in any one month, since the Signal Service was instituted. The total number for October, 1874, was 86; for July, August and September, 1875, was, respectively, 2, 49 and 154. The total number for the October just passed was 324. Of this number, there were ninety storm-warnings telegraphed for the benefit of Canadian seaports and shipping centres, the results of which this Office has no intelligence. There were two hundred and thirty-four Cautionary Signals ordered for and displayed at United States ports, which were justified by ensuing dangerous winds, as follows: Non-justified, 34; partly justified, 4; fully justified, 196. This gives the percentage of verifications 83.76.

ATMOSPHERIC ELECTRICITY.

(1) *Thunder-Storms.*—These have been, in the main, noted under the head of *Local Storms.*

(2) *Auroras* were few during the month. The chief displays reported were as follows: At Cresco, Iowa, on the 7th; New Orleans, 14th; Gardiner, Me., 7th and 8th; West Waterville, 9th; Fall River, Mass., 7th; Depauville, N. Y., 2d, 10th and 24th; Hector, N. Y., 20th; Fallsington, Pa., 8th; York Sulphur Springs, Pa., 7th; Rocky Run, Wis., 2d; Eastport, Me., 5th, and Escanaba, 6th and 29th.

OPTICAL PHENOMENA.

(1) *Solar Halos* were reported from Wisconsin on the 12th, 16th and 24th; Minnesota, 11th and 12th; Nebraska, 8th, 9th and 24th; Colorado, 14th; Iowa, 8th, 10th, 12th, 13th and 28th; Illinois, 8th and 12th, Indiana, 12th: Ohio, 6th, 7th, 8th, 9th, 12th, 14th, 23d, 24th and 25th; Pennsylvania, 13th, New York; 4th, 13th, 23d, 24th and 28th; Massachusetts, 9th and 14th; New Hampshire, 4th, 13th, 23d, 26th and 28th; Maine, 26th; Tennessee, 21st, 26th and 27th; Memphis, 2d, 9th, 22d and 28th; Alabama, 28th and 29th.

(2) *Lunar Halos* were reported from Colorado on the 11th; Kansas, 9th; Iowa, 8th; Wisconsin, 8th, 9th and 20th; Illinois, 17th, 24th and 25th; Indiana, 12; Michigan, 11th and 13th; Ohio, 12th and 23d; Pennsylvania, 12th and 13th; New York, 9th, 13th and 14th; New Jersey, 7th; Massachusetts, 9th and 14th; New Hampshire, 8th and 9th; Maryland, 13th; Virginia, 3d, 10th, 12th, 13th and 14th; North Carolina, 10th and 22d; Georgia, 14th, 15th and 22d; Tennessee, 11th, 12th to 16th, inclusive; and Alabama on the 9th.

(3) *Mirage.*—New London, 11th, 12th and 14th.