

sistency in the results therein shown, may be attributed to a more perfect system of observation in vogue in some of the states. Thus, in New Hampshire the average interval of excessive monthly precipitation is given as two years, while in the adjoining state of Vermont the interval is fifteen years. This discrepancy is doubtless due to the more complete reports from New Hampshire, the observations taken at several points by the Lake Winipiseogee Cotton and Woolen Manufacturing Co. constituting an exceptionally accurate and valuable record extending over many years. Aside from this most marked exception it will be seen that, as a rule, there is a remarkable uniformity shown in the average interval of monthly excessive rainfalls in contiguous states and territories, the interval being smallest in Oregon, where it is only eight months, and only slightly greater in the Gulf States, North Carolina, and Washington, where it averages about one year. Exclusive of Vermont, the greatest average interval of excessive monthly rainfall, fifteen years, is shown for Montana, while in Dakota, Michigan, and Minnesota it is seven and eight years, respectively.

In the column of rainfalls of ten inches, or more, per month, it will be seen that by far the greatest number of excessive monthly rainfalls (482) have been reported in California, where stations are numerous, and that none have been noted in Idaho, Nevada, Utah, and Wyoming, where, while stations are comparatively few and scattered, it is not probable that rain has fallen in amounts to equal or exceed ten inches in a month. Following in order of greater frequency are, Florida with 344, and Georgia, North Carolina, Oregon, and Texas, with more

than 200, while in Arizona, Colorado, Montana, New Mexico, Vermont, and West Virginia, the instances of their reported occurrence are very limited in number.

The greatest number of daily excessive rainfalls, 556, have been reported in Texas, while in Idaho and Nevada none have been noted. In North Carolina, Georgia, and Florida over 300 instances have been reported in which 2.50 inches, or more, of rain have fallen in twenty-four hours, while in Alabama, Illinois, Iowa, Kansas, Louisiana, Maryland, Massachusetts, Mississippi, and Tennessee excessive daily rainfalls have been noted in more than 200 instances. In Arizona, Colorado, Montana, New Mexico, Utah, Vermont, West Virginia, and Wyoming the number of excessive daily rainfalls recorded is less than 20.

Excessive hourly rainfalls have been reported in the greatest number of instances, 168, in Texas, and none have been noted in Idaho, Nevada, Oregon, Utah, and Washington. They have been reported in more than 100 instances in Florida, Iowa, Kansas, and Nebraska, while in Arizona, California, Colorado, Connecticut, District of Columbia, Indian Territory, Kentucky, Maine, Massachusetts, Minnesota, Montana, New Jersey, New Hampshire, New Mexico, Ohio, Rhode Island, Vermont, West Virginia, Wisconsin, and Wyoming, excessive hourly rainfalls have been noted in less than 20 instances.

Over portions of the Rocky Mountain region where monthly rainfalls equalling or exceeding ten inches have not been reported, the largest monthly rainfalls noted in the several states and territories have been published in the tables of excessive precipitation in the REVIEW during 1888.

WINDS.

The prevailing winds during January, 1889, are shown on chart ii by arrows flying with the wind. In the Atlantic coast states north of the thirty-seventh parallel; over a greater portion of the Lake region; in the upper Mississippi, Missouri, and Ohio valleys, and along the south Pacific slope, the winds were mostly westerly. In the south Atlantic and Gulf states, and over the eastern slope and plateau regions of the Rocky Mountains, they were variable. On the north Pacific slope they were from south to east, while along the middle Pacific slope northerly winds were most frequently noted.

HIGH WINDS (in miles per hour).

Maximum velocities of fifty miles, or more, per hour, other than those given in the table of miscellaneous meteorological data, have been reported as follows: Wood's Holl, Mass., 57, s, 9th; 50, nw., 19th; 54, se., 21st. Buffalo, N. Y., 52, sw., 16th and 17th; 52, w., 21st. Block Island, R. I., 54, e., 5th; 54, nw., 10th; 60, se., 21st; 52, e., 27th. Fort Elliott, Tex., 52, nw., 8th. Fort Canby, Wash., 50, se., 3d. Valentine, Nebr., 52, nw., 8th; 54, n., 30th.

LOCAL STORMS.

Descriptions of severe local storms which attended the passage of low area iii are given under the heading "Areas of low pressure," and the following reports refer to disturbances occasioned by the passage of depressions traced on chart i.

5th. Virginia.—Lynchburgh: a severe wind and rain storm occurred during the early morning. It came from the east and did some damage in this city and vicinity. Maximum velocity of wind, thirty-six miles per hour from the east, at about 6 a. m.

Rain continued during the day, 1.26 of an inch being measured at the morning and 0.52 at the evening observation.

6-7th. New York.—New York City: the high northeasterly shifting to westerly winds were very destructive in Brooklyn; six houses in course of erection, and numerous trees and fences in that city were blown down. Watertown: reports show that the sleet storm which prevailed during these dates destroyed thousands of valuable shade, fruit, and forest trees in Jefferson and Saint Lawrence counties. The telegraph and telephone wires were heavily coated with ice and broke under its weight, seriously interrupting communication.

20-21st. Massachusetts.—Boston: heavy snow and high wind prevailed during the night. The wind blew a gale of forty to fifty miles per hour for five hours, and attained a maximum velocity of fifty-four miles per hour at 2 a. m., 21st. The storm was very severe in this vicinity; several lives were lost and considerable damage was caused to shipping.

21st. North Carolina.—Hatteras: storm began from the southwest 2.55 a. m. and ended 3.10 a. m.; maximum velocity of the wind thirty-five miles per hour. The life-saving station at Cape Hatteras reports five men drowned, one barkentine and one three masted schooner sunk, and other vessels disabled on Hatteras shoal during the gale.

WATER-SPOUTS.

"The San Pedro (Cal.) Advocate," of January 19, 1889, states that two water-spouts were observed off San Pedro 15th; one on the east side of the bay near Anaheim Landing, and the other in the vicinity of Catalina Island. They were funnel shaped, the larger end in the cloud, and the smaller end in the water. They moved rapidly and broke before reaching the coast.

INLAND NAVIGATION.

ICE IN RIVERS AND HARBORS.

Albany, N. Y., 23d: the Hudson River froze over for the first time this season this morning.

Buffalo, N. Y.: the lake, open to the 28th, was covered with ice on that date as far as could be seen from this place.

Cleveland, Ohio: a transfer ferry-boat for use at Detroit,