

storm, preceded by roaring noise, some time before any agitation of the air, took place at the point of observation. As the storm approached a little island in the Chesapeake Bay, fifteen miles distant from where it was first seen, it is reported to have occasioned a small water-spout. On the 26th, in the same county, a severe storm, with lightning, was observed. At Fort Wayne, Ind., on the 29th, at 11 a. m., there was a local storm, with great darkness, frequent flashes of lightning and heavy thunder, followed by rain. Forty miles north of Fort Wayne, the same storm took the form of a tornado, striking Goshen and the surrounding country, demolishing a large barn and blowing out-buildings completely away. At 12 o'clock of that night, it struck Angola, Ind., blowing the engine-house of the Fort Wayne, Jackson & Saginaw Railroad to the ground, and also inflicting much other damage. A severe thunder-storm visited Boston on the morning of the 27th, having passed over Springfield, Mass., on the previous evening. The wind subsequently rose to forty-two miles an hour in Boston harbor. A gale, accompanied by heavy rain, swept over Louisville at 11 p. m., of the 29th. At Vicksburg, on the 29th, at 11:45 p. m., a violent storm of wind, rain and hail struck the city from the northwest, the wind-velocity reaching sixty miles an hour. This same storm, on the 29th, passed over Memphis at 9:30 p. m., with vivid lightning and heavy thunder and rain. It also passed over St. Louis, same day, at an earlier hour, about 4:43 p. m., with intense zig-zag lightning, followed by a wind blowing fifty miles an hour and half an inch of rain, and inflicting much damage on buildings. Its effect was felt at Shreveport, La., at 8:50 p. m., of the 29th, in a thunder-shower; and, at New Orleans, at 4:05 a. m., of the 30th, in a heavy shower of rain, with brisk winds, thunder and lightning. The local storms of the 29th and 30th, were evidently due to the cold northwest winds, descending the Mississippi valley, and following behind the storm-centre No. IX.

TEMPERATURE OF THE AIR.

The isothermal lines on Chart No. II show the mean distribution of temperature for October. From the tabular exhibit in the lower left-hand corner of this chart, it is seen that the October temperature has with very remarkable uniformity been below the usual average, in all sections of the country east of the Rocky mountains. This early and unusual cold weather has been most marked in the South Atlantic States and the Upper Lake region, and also in the St. Lawrence valley. This low mean temperature in the South Atlantic States, may perhaps be explained by the presence of the mean high barometer in the lower Mississippi valley, which is seen on Chart No. II. In the lower Missouri valley the temperature has most nearly conformed to the normal. On the Pacific coast the temperature has been nearly three degrees higher than usual.

The following maximum temperatures were reported: Dodge City, Kansas, 88°; Indianola, Texas, 89°; Shreveport, La., 85°; Galveston, Texas, 84°; Breckenridge, Minn., 84°. Among the minimum temperatures, are—Breckenridge, 13°; Cheyenne, 11°; Pike's Peak, —5°; Colorado Springs, 18°; Yankton, 18°; North Platte, 18°; Bismarck, D. T., 21°. The greatest ranges are at Yankton, 69°; Colorado Springs, 64°; Breckenridge, 71°.

Frosts were observed at Huntsville, Ala., on the 12th, 30th and 31st; Jackson, Miss., 13th and 14th; Wilsonville, Ala., 13th and 14th, and killing frost on the 16th; Mt. Ida, Ark., and Forsyth, Ga., 2d, and killing frost at the latter place on the 17th; Atlanta, Ga., 13th; Gainesville, Ga., killing frost on the 3d; Fayette, Miss., 19th, 20th, 21th and 31st; Las Vegas, New Mexico, 15; Weldon, N. C., 3d, 13th and 18th; Attaway Hill, N. C., 3d, 13th and 17th; Greenville, S. C., 13th, 19th and 20th; Aiken, S. C., 13th; Spartanburg, S. C., 2d, 3d and 13th; Edgefield C. H., 13th and 17th; Powhatan Hill and Lynch-

burg, Va., first killing frost on the 13th; Purdy, Tenn., 2d; Norfolk, 17th; Jacksonville, Fla., 28th; Montgomery, 8th, 12th and 17th; Nashville, 12th and 13th; Memphis, 12th, 16th, 19th, 20th, 21st and 31st; Augusta, Ga., 17.

Ice was first formed at Fort Wallace, Kan., on the 15th; Fort Wayne, Mich., 12th; Decatur, Ill.; Richmond, Ind.; Rockford, Iowa, 11th; Mt. Desert, Maine; Fallston, Md.; Florida, Mass., 13th; Moorehead, Minn., 1st; Cooperstown, N. Y., 14th; Hillsboro', O., 12th; Cleveland, O., 2d; Fallsington and West Chester, Pa., 13th; Edgefield, S. C., 17th; Purdy, Tenn., and Mt. Solon, Va., 12th; Salem, W. Va., 2d; Embarrass, Wis., 1st; Powhatan Hill, Va., 13th; Newport, R. I., 13th; Keokuk, Iowa, 12th; Indianapolis, 11th and 12th; Milwaukee, 10th and 11th; Nashville, 17th; Detroit, 12th.

PRECIPITATION.

This item is graphically shown on Chart No. III, and numerically by the table in the lower left-hand corner. It will be seen from the data thus furnished that the largest rainfall has been in the Upper Lake region and there only, except in Oregon, has any noteworthy excess of rain been reported for October. Large deficiencies have occurred in the Middle States and in the lower Missouri valley, but elsewhere there has been no very marked departure from the normal. The largest excess in Oregon does not apply to California.

Among the stations at which the smallest rainfall occurred, were—Colorado Springs, Col. Ter., 0.13 inch; North Platte, Neb., 0.14 inch; Cheyenne, W. T. 0.06 inch; Santa Fé, New Mexico, 0.06. Among the largest rainfalls reported, were at Alpena, Mich., 6.55 inches; Eastport, 7.50; Grand Haven, 6.15; Portland, Oregon, 6.73.

Snow—Snow fell at Albany on the 30th and 31st; Portland, Me., Barnegat, N. J., New York City, New Haven, Cleveland and Toledo, 31st; Wytheville, Va., on the 16th and 19th; Oswego, N. Y., 12th and 31st; Erie, Penn., 12th; Escanaba, Mich., 5th and 10th; Chicago, 15th and 18th; Logansport, Ind., 11th; Milwaukee, Wis., 26th; Detroit, Mich., 11th; Rochester, N. Y., 16th and 17th; West Chester, Penn., Philadelphia, 31st; Blooming Grove, Pa., 10th and 31st; Carlisle and Williamsport, Pa., 31st; Salem, Greenbrier county, W. Va., 11th and 16th; Woodlawn, Md., 31st and Asheville, N. C., the 16th.

Hail fell at Detroit on the 29th; Nashville, 30th; Keokuk on 29th; Burlington, Iowa, 29th; Springfield, Mass., on the 26th, and at Rolla, Mo., 29th. (*See Local storms.*)

Rainy days average as follows: For New England, 12; Middle Atlantic States, 9; Southern States, 7; Lake region, 17; Ohio valley and Northwest, 8.

Cloudy days, (other than those on which rain or snow fell,) New England, 5; Middle States, 2; Southern States and Ohio valley, 3; Upper Lake region, 4; Northwest, 5.

RELATIVE HUMIDITY.

The relative humidity for the month, averages as follows in the different districts: New Jersey and New England coasts, 74 per cent.; south Atlantic and Gulf coasts, 72; interior portions of the New England, Middle and Southern States, 66; Lower Lake region, 68; Upper Lake region, 71; Ohio valley and the Northwest, 63. As usual it has been lowest at the Rocky mountain stations, amounting to 48 per cent. at Colorado Springs; 40 at Cheyenne; 33 at Denver and only 24 at Santa Fé.

WINDS.

The prevailing winds of the month will be found indicated by the arrows, flying with the wind, on Chart No. II. Northwesterly and southwesterly winds have the pro-