

on the Lower Lakes. Maximum velocities on the 22nd:—Oswego and Rochester, 5:15 p. m., NE., 32 and 30; Cleveland, 5:15 p. m., NW., 42; Sandusky, 6:45 p. m., NW., 42; and, on the 23rd, at Erie, 10:15 a. m., NW., 34, lake very rough.

No. XI—was probably northeast of British Columbia at midnight of the 21st, extending southwestward over Oregon, where the pressure was 0.30 below normal, followed, on the morning of the 22nd, by rising pressure, westerly winds and light rains. 22nd, moved southeastward to the Missouri valley, preceded by southeast winds in the Northwest. 23rd, moved down the Missouri valley, unattended by precipitation, except light snow in rear of the centre as the winds changed to colder northerly; during the day the lowest pressures of the month occurred over the Southwest and thence to Colorado and New Mexico, in which region a secondary centre of depression formed, which will be considered as area No. XII. 24th, the present area moved eastward over the central Mississippi and Ohio valleys, followed by northerly winds and light rains. 25th, moved from the Lower Lake region over New England, with light, but increasing, precipitation. 26th, passed south of Nova Scotia, and heavy rain prevailed for a short time at Halifax and Sydney.

No. XII.—Formed during the 23rd over the high lands in northwestern Texas and New Mexico, where high temperature prevailed during the afternoon. 24th, moved southeastward over Texas, followed by cold northerly winds, with snow in New Mexico and rain in western Texas. 25th, was off the coast of Texas and Louisiana, followed by brisk to high northerly winds, rain or snow in former, and preceded by easterly winds and heavy rain at New Orleans. 26th, moved northward, with southerly winds and heavy rains on the East Gulf coast, and generally rainy weather thence to Tennessee and Virginia. 27th, moved northward to the Lower Lakes, with heavy rains, thence to the Atlantic coast, and heavy snows from Arkansas to Michigan. 28th, passed down the St. Lawrence valley, with heavy rains, thence to the coast of New England and Nova Scotia. Cautionary Signals ordered up at Indianola and Galveston were justified on the 25th: Indianola, 10 a. m., N. 43, and Galveston, 7:45 p. m., NW. 32; on the Atlantic coast from Smithville to Sandy Hook on the 26th, (changed to Cautionary Off-shore on the 27th;) from New York to Eastport on the 27th, (changed to Cautionary Off-shore on the 28th;) and in the Lake region on the afternoon of the 27th were justified except at the stations in northern Michigan. Maximum velocities: on the 27th, at Wilmington, 1:45 p. m., SW. 31; Cape Hatteras, 4:00 p. m., S. 40; Kittyhawk, 4:35 p. m., S. and SW. 44; Barnegat, 8:40 p. m., SE. 40; Sandy Hook, 5:35 p. m., E. 47; New London, 10:20 p. m., SE. 45; Thatcher's Island, 11:00 p. m., SE. 34; Duluth, 11:00 p. m., NW. 34. On the 28th, Cape Lookout, 4:30 a. m., W. 40; Cape May, 3:45 p. m., W. 46; Newport, 10:40 p. m., NW. 32; Wood's Holl, 2:05 a. m., SE. 34; Thatcher's Island, 1:00 a. m., NW. 35; Eastport, 8:25 a. m., SE. 38; Erie, 6:30 a. m., W. 32; Cleveland, 4:10 a. m., NW. 36; Sandusky, 2:35 a. m., W. 37.

No. XIII—was probably north of Montana on the 25th, and passed eastward, over Manitoba, on the 26th, followed by high north winds and light snows in Dakota and Minnesota.

No. XIV.—During the 28th the pressure fell below the normal over the Western Plateau, and on the 29th in New Mexico, while high-pressure area No. IX was over Montana; light snows fell during these days from Idaho to Colorado and New Mexico; five inches of snow was reported at Summit, Rio Grande county, Colorado. During latter part of the 29th the lowest pressure was central over the high lands of western Texas. 30th, moved eastward to Arkansas, preceded by a heavy NE. snow-storm in the Lower Missouri valley, and followed by brisk to high northerly winds in Texas. Cautionary Off-shore Signals were ordered at Indianola and Galveston. Maximum velocity at Indianola, NW. 32. This area afterwards developed into quite a severe storm, and will be considered in the December REVIEW.

INTERNATIONAL METEOROLOGY.

On chart No. IV are shown the partial tracks of hurricanes occurring over the Oceans as follows: *Atlantic*.—No. I. as given in the September REVIEW; No. II, September 14th to 17th; No. III, September 24th to October 3rd, and No. IV, September 29th to October 8th, that were treated of in the October REVIEW as one storm, but Mr. Jahncke, of St. Thomas, considered them as two, whose paths crossed each other. No. V, October 9th to 20th, probably reached the British Isles. No. VI, October 14th to 19th, the track of which is nearly identical with that of No. V, but about five days later. No. VII, October 21st to 29rd, was treated of in the October REVIEW. *Pacific*.—No. I, September 12th; No. II, September 15th to 19th; No. III, September 19th; No. IV, October 7th to 9th; No. VI, October 17th to 19th. Additional reports of storms are to hand. *South Atlantic Ocean*.—September 8th, 31° 19' S., 31° 00' E; September 25th to October 1, storm lasting six days off the coast of Brazil; October 3rd, heavy at Caracas, Venezuela.

TEMPERATURE OF THE AIR.

The isothermal lines on chart No. II illustrate the general distribution of the temperature of the air for the month. The mean temperature for Punta Rasa should be 69°.6 instead of 74°, as given on the chart. By reference to the table on the left-side of the chart, it will be seen that the temperature has been considerably above the normal over the interior of the continent, the largest deviation from the normal (+13°.7) occurring in the Upper Missouri valley. Along the Pacific, Gulf and South Atlantic coasts it has ranged about, or slightly above, normal, and in the Middle States and New England about 3° above.

Minimum and Maximum Temperatures, respectively:—Maine—Mechanics' Falls, 15°, and 50°; Portland, 22°, 56°; Eastport, 17°, 54. *New Hampshire*—Dunbarton, 13°, 52°; Mt. Washington, —10°, 37°. *Vermont*

—Woodstock, 12°, 54°; Burlington, 21°, 52°. *Massachusetts*—Westborough, 17°, 60°; Boston, 22°, 61°; Springfield, 22°, 66°. *Rhode Island*—Newport, 26°, 57°. *Connecticut*—Colebrook, 17°, 56°; New Haven, 24°, 61°. *New York*—Schroon Lake, 10°, 56°; Nile, 13°, 54°; Plattsburg Bks., 18°, 48°; New York City, 28°, 59°; Buffalo, 24°, 54°. *New Jersey*—Linden, 18°, 54°; Acton, 26°, 64°; Trenton, 28°, 60°. *Pennsylvania*—Franklin, 16°, 52°; Brownsville, 26°, 68°; Philadelphia, 36°, 64°; Pittsburgh, 21°, 58°. *Delaware*—Dover, 31°; 61°. *Maryland*—Woodstock, 21°, 69°; St. Ingoes, 40°, 75°; Baltimore, 33°, 69°. *District of Columbia*—Washington, 27°, 56°. *Virginia*—Snowville, 22°, 68°; Johnstown, 35°, 72°; Lynchburg, 30°, 68°. *West Virginia*—Morgantown, 25°; 59°. *North Carolina*—Franklin, 20°, 68°. Weldon, 30°, 76°. *South Carolina*—Aiken, 33°, 74°; Charleston, 37°, 75°. *Georgia*—Gainesville, 30°, 73°; McPherson Bks., 29°, 74°; Augusta, 33°, 77°. *Florida*—Camp Barrancas, 31°, 86°; Key West, 63°, 85°; Milton, 30°, 76°. *Alabama*—Mobile, 36°, 81°; Montgomery, 33°, 77°. *Mississippi*—Fayette, 31°, 78°. *Louisiana*—Point Pleasant, 36°, 79°; New Orleans, 41°, 76°; Shreveport, 34°, 81°. *Texas*—Fort Davis, 17°, 76°; Fredericksburg, 20°, 78°; Uvalde, 28°, 86°. *Ohio*—Bellevue, 19°, 63°; Columbus, 24°, 63°; Toledo, 26°, 60°. *Kentucky*—Danville, 21°; 69°; Louisville, 30°, 72°; Bowling Green, 26°, 74°. *Tennessee*—Clarksville, 23°, 71°; Nashville, 28°, 71°; Knoxville, 54°, 69°. *Arkansas*—Mt. Ida, 21°, 80°; Judsonia, 33°, 74°. *Michigan*—Litchfield, 17°, 54°; Marquette, 18°, 59°; Detroit, 14°, 53°. *Indiana*—Spiceland, 19°, 64°; St. Meinrad, 32°, 72°; Indianapolis, 25°, 65°. *Illinois*—Mt. Sterling, 13°, 69°; Anna, 30°, 75°; Cairo, 30°, 71°; Chicago, 31°, 57°. *Missouri*—Wet Glaze, 16°, 85°; Pierce City, 19°, 81°. *Kansas*—Fort Hays, 6°, 76°; Dodge City, 13°, 74°; Leavenworth, 25°, 71°; Independence, 22°, 83°. *Wisconsin*—Neillsville, 8°, 60°; Embarras, 16°, 56°; Madison, 24°, 58°. *Iowa*—Vail, 12°, 70°; Logan, 14°, 72°; Des Moines, 21°, 69°. *Nebraska*—Sidney Bks., 7°, 81°; North Platte, 17°, 75°; Omaha, 18°, 71°. *Indian Territory*—Fort Sill, 17°, 81°; Fort Gibson, 22°, 78°. *Minnesota*—Breckenridge, 3°, 59°; St. Anthony, 10°, 63°; Duluth, 13°, 53°. *Dakota*—Pembina, 2°, 51°; Yankton, 15°, 73°; Bismarck, 19°, 58°. *Colorado*—Fort Garland, 0°, 60°; Pike's Peak, —15°, 33°; Denver 11°, 73°; Colorado Springs, 5°, 66°. *Wyoming Territory*—Fort Fetterman, 1°, 72°; Cheyenne, 2°, 67°; Fort Fred. Steele, 3°, 67°. *Utah*—Salt Lake City, 22°, 68°. *Nevada*—Winnemucca, 9°, 66°; Pioche, 17°, 67°. *California*—Visalia, 29°, 76°; Sacramento, 34°, 72°; San Francisco, 47°, 68°; Los Angeles, 37°, 81°; Red Bluff, 34°, 77°. *New Mexico*—Santa Fe, 12°, 77°; Fort Union, 2°, 72°. *Idaho*—Boise City, 18°, 70°. *Montana*—Virginia City, 11°, 59°.

Ranges of Temperatures.—The monthly ranges will appear from an examination of the maxima and minima just given. Greatest daily ranges vary in New England, from 19° at Portland to 29° at New Haven; Mount Washington, 23°; Middle Atlantic States, 20° at Albany to 31° at Lynchburg; South Atlantic States, 20° at Cape Lookout and Charleston to 32° at Wilmington; Gulf States, 12° at Key West to 34° at Corsicana, and 35° at St. Marks; Ohio valley and Tennessee, 22° at Louisville to 35° at Knoxville; Lower Lakes, 16° at Erie to 27° at Toledo; Upper Lakes, 20° at Port Huron to 30° at Marquette; Upper Mississippi valley, 22° at La Crosse to 33° at St. Louis; Missouri valley, 30° at Omaha to 44° at Yankton; Eastern slope of Rocky Mountains, 35° at Deadwood, Dak., and 31° at Dennison, Tex., to 49° at North Platte and Fort Stockton; Rocky Mountain stations, 26° at Virginia City to 48° at Fort Craig; 22° on summit of Pike's Peak; Western Plateau, 28° at Pioche to 43° at Winnemucca; California, 15° at San Francisco to 56° at Campo.

Frost has been quite general over the northern sections of the country, and the following items will show its occurrence in some of the southern states: Houston, Fla., injuring vegetation, 1st; Quitman, Ga., first frost, 1st; in southern Texas and lower Rio Grand valley, the first frost of season occurred on the 27th; at Milton, Fla., first frost, 28th.

Ice.—Santa Fe, N. M., 17th, $\frac{1}{2}$ inch; 25th, creeks frozen; Albuquerque, N. M., 18th, 24th, (25th and 26th, $\frac{1}{2}$ in.) 27th to 30th; Denison, Tex., 27th; Mobile, Ala., 1st, 2nd; Dubuque, Ia., 26th; Cleveland, Ohio, 24th; Cincinnati, 1st, 29th; Louisville, Ky., 1st, 29th; Nashville, 29th; Smithville and Wilmington, N. C., 1st; Atlanta, Ga., 1st; Lynchburg, 1st; Atlantic City, N. J., 5th; Baltimore, 4th; Philadelphia, 5th, 9th; Ft. Whipple, Va., 30th; Newport, R. I., 4th, 5th; New London, 4th, 15th, 16th, 27th; Boston, 4th; Forsyth, Ga., 1st; Thomasville, Ga., 29th; Creswell, Kan., 1st to 3rd; Independence, Kan., 3rd, 12th, 13th, 25th to 29th; Pt. Pleasant, La., 28th; Gardiner, Me., 7th; Somerset, Mass., 4th; Springfield, Mass., 2nd, 3rd, $\frac{1}{10}$, 4th, $\frac{1}{2}$ in., 5th, $\frac{3}{4}$ in.; Rowe, Mass., 28th; Oregon, Mo., 8th, 13th, 25th to 29th; Auburn, N. H., 4th, 5th; Freehold, N. J., 9th, $\frac{1}{4}$ in., 14th, 15th, $\frac{1}{4}$ in.; Sacramento, Cal., 28th to 30th; Boise City, Idaho, 7th, 10th to 13th, 23rd to 29th; Princeton, Cal., 1st; Catawissa, Pa., 1st, 2nd, 5th, 6th, 8th, 9th, 14th to 16th, 26th, 29th, 30th; West Charlotte, Vt., 4th, 5th; Dover Mines, Va., 4th, 5th, 8th, 10th, 15th, 29th, 30th; Wytheville, Va., 14th, ice on pond, 24th, thin ice all over pond.

Ground Frozen as follows: North Volney, N. Y., 5th; Starkey, N. Y., 9th; Fayetteville, N. C., 1st; Catawissa, Pa., 2nd, 5th, 9th, 15th, 30th; Fallington, Pa., 2nd, 4th, 5th, 9th; Ringtown, Pa., 4th, one inch; Woodstock, Vt., 4th to 9th, three inches; West Charlotte, Vt., 4th, 5th, 14th to 16th; Broad Oak, Va., 4th, 30th; Wautoma, Wis., 30th, two inches.

PRECIPITATION.

On chart No. III is illustrated the general distribution of the precipitation of rain and snow for the month. On the left side is a table giving the average precipitation for November, which shows a decided excess on the East Gulf coast, over New England and in the St. Lawrence valley. The greatest deficiencies occur in the Pacific coast States, and from the Lower Missouri valley to the Upper Lakes.

Special Heavy Rains.—15th, Fort Barrancas, Fla., 3.29 in.; 17th, Auburn, N. H.; 3.25 in.; Indianola, Tex., 3.16 in.; 17th and 18th, Contoocookville, N. H., 2.75 in.; New Orleans, 2.38 in.; New Bedford, Mass.,