

Water Spouts.—Punta Rasa, Fla., 5th, 4.30 p. m., a large water spout formed over the Gulf, apparently at a distance of about 8 miles from station. In appearance it resembled a long, crooked, leaden-colored pipe or hose, extending upward from a base of whirling spray to a mass of cumulo-stratus clouds. It remained nearly stationary, the trunk at times being bent and swayed about by the wind. The phenomenon was visible for about five minutes.

Drought.—Los Angeles, Cal., 24th, farmers apprehend drought; rainy season very backward and the usual water-supply very low. Weldon, N. C., 31st, wells have not yet recovered from the effects of the late drought.

Low Tides.—Life-saving Station, No. 6, N. C., 31st, during almost the entire month, the tide in the Sound has been so low that navigation was seriously affected; this unusual state of the tide was probably due to numerous northerly gales.

High Tides.—New Westminster, B. C., 23rd, very high, flats flooded. Port Eads, La., 19th.

TEMPERATURE OF WATER.

The temperature of water, as observed in rivers and harbors at Signal Service stations, with the average depth at which observations were taken, is given in the table on the left hand side of chart No. III. Observations made at Chincoteague and Portland, Me., came too late for publication.

ATMOSPHERIC ELECTRICITY.

Auroras.—The auroral displays during the month of December, 1881, were quite numerous, but none of them are characterized as unusually brilliant. The display of the 18th at Augusta, Ga., is perhaps the most remarkable, owing to its extreme southern latitude. The observer at that station reports the first appearance of the aurora as occurring at 7 p. m., in the northwest horizon; color, faint rose of a diffuse light, with an altitude of 15° and an azimuth of 40°; disappeared at 7.10 p. m. At 10.41 p. m. it reappeared, lasting about 15 minutes, but the color had apparently changed to a pale yellow. The following are general displays of considerable extent: The display of the 8th was witnessed from Eastport, Me., westward to Fort Buford, Dak., the following intervening stations reporting. Eastport, 6.30 to 9 p. m.; Cornish, Me., 6 to 8 p. m.; Gardiner, Me., 6.30 to 9 p. m.; Orono, Me., 7 p. m.; Dexter, Me., 6.30 to 8 p. m.; Newport, Vt., 7 p. m.; Williamstown, Mass., 7 to 9 p. m.; Fall River, Mass., 7 p. m.; New Corydon, Ind., during the night, with streamers reaching an altitude of 20°; Marquette, 6.30 to 7 p. m.; Franklin, Wis., 7 p. m.; Duluth, 6.30 to 7.45 p. m.; Northfield, Minn., 7 p. m.; Morrison, Ill., 7 p. m.; St. Vincent, Minn., 6.30 to 7.30 p. m.; Fort Buford, Dak., 10.30 p. m. The display of the 9th and 10th was probably a continuation of the 8th, as at several stations it was observed throughout the night. Portland, Me., 10th, 7 to 9 p. m.; Cornish, Me., 10th, 7 p. m.; Gardiner, Me., 10th, 7 to 9 p. m.; Harvard College, Cambridge, Mass., 10th, 6 p. m.; Williamstown, Mass., 10th, 9 p. m.; Fall River, 10th, 7 p. m.; Newport, Vt., 10th, 7 p. m.; Woodstock, Vt., 10th, 7 p. m.; Southington, Conn., 9th, 8 p. m., with streamers; New Corydon, Ind., 9th, during the night; Lansing, Mich., 10th, 7 p. m.; Fort Stevenson, Dak., 10th, 7.30 to 10.30 p. m.; Bismarck, 9th, 8 p. m. The most general display of the month was that of the 23d, the line of observation reaching from New Brunswick westward to Idaho; the following intervening stations reporting: Gardiner, Me., visible about midnight; Mt. Washington, 7.22 to 11 p. m.; Williamstown, Mass., 9 p. m.; Southington, Conn., 10.30 p. m.; Ardenia, N. Y., 8 p. m.; Waterburg, N. Y., 9 p. m.; Wellsboro, Pa., 8.30 p. m.; Washington, D. C., 8.15 to 9 p. m.; Rochester, 6.45 to 11.55 p. m.; Buffalo, 7 to 10 p. m.; Erie, 6.50 to 7.20 p. m.; Jacksonburg, O., 7 p. m.; Bellefontaine, O., 6.30 to 7.40 p. m.; North Lewisburg, O., 8 p. m.; Ruggles, O., 8 to 9 p. m.; Lansing, Mich., 7 p. m.; Litchfield, Mich., 8 p. m.; Thornville, Mich., 7 p. m.; Detroit, 10 p. m., to morning of 24th; Alpena, 5.30 p. m., to morning of 24th; Grand Haven, 7 to 10 p. m.; Escanaba, 6 to 11 p. m.; Marquette, 6.35 to 10.30 p. m.; Northfield, Minn., 8 p. m.; Duluth, 6.30 to 9.30 p. m., Beloit, Wis., 7.30 p. m. Manitowoc, Wis., 8 p. m.; Franklin, Wis., 8 p. m., very brilliant; St. Paul, 8 p. m.; Riley, Ill., 7 to 10.30 p. m.; Cresco, Ia., 7 to 9 p. m.; Fort Madison, Ia., 7.30 p. m.; Guttenburg, Ia., 7 to 9 p. m.; Monticello, Ia., 8 p. m.; Muscatine, Ia., 9 p. m.; Dana, Ia., 8.30 p. m.; Clear Creek, Neb., 8.30 p. m.; Morrilton, Dak., 7 p. m.; St. Vincent, Minn., 6 p. m. to midnight; Fort Bennett, Dak., 8.30 p. m.; Bismarck, 6 p. m. to morning of 24th; Ft. Stevenson, Dak., 8 p. m. to morning of 24th; Ft. Assinaboine, Mont., 6 p. m. to morning of 24th. Throughout the Northwest this display appeared to commence on the 20th and 21st, as follows: Ft. Assinaboine, Mont., 20th, 9 p. m. to morning of 21st; 22d, 7 p. m. to morning of 23d; Ft. Stevenson, Dak., 22d 9 p. m. to morning of 23d; St. Vincent, Minn., 7 p. m. to morning of 23d. The display of the 24th and 25th was probably a continuation of the 23d. Eastport, 24th, 7.40 p. m., to midnight; Gardiner, Me., 24th, 8 to 10 p. m.; Harvard College, Cambridge, Mass., 25th, 10.30 p. m.; Dyberry, Pa., 24th, 9 p. m.; Oswego, 24th, 10.45 to 11.50 p. m.; Rochester, 9 to 11.45 p. m.; Buffalo, 10.45 to 11.10 p. m.; Grand Haven, 24th, 8 p. m. to morning of 25th; Alpena, 24th, 7.30 to 11.15 p. m.; Northport, Mich., 24th, 10.25 p. m.; Escanaba, 24th, 8 to 11.30 p. m.; Marquette, 24th, 10.30 to 11.30 p. m.; Cresco, Ia., 24th, 10 p. m.; Monticello, Ia., 24th, 10.30 p. m.; Northfield, Minn., 24th, 10 p. m.; Fort Snelling, Minn., 25th, 8 p.,

m.; St. Vincent, Minn., 25th, 8 to 10.30 p. m.; Olivet, Dak., 24th, 10 p. m.; Fort Stevenson, Dak., 6 to 8 p. m.; Fort Sully, Dak., 25th, about 9 p. m.; Fort Assinnaboine, Mont., 24th, 6 p. m. to morning of the 25th; Helena, Mont., 24th, 8 p. m. The following were local displays: Eastport, 11th, 11 p. m. to midnight; Harvard College, Cambridge, Mass., 5th, 10 to 11 p. m.; New Corydon, Ind., 7th, visible for a short time after sunset; Ft. Wayne, Ind., 20th, 9 p. m.; Port Huron, 4th, 9 to 10.12 p. m.; Clear Creek, Neb., 17th, 8 p. m.; Duluth, 14th, 8 to 10.40 p. m.; St. Vincent, 12th, 7 p. m. to midnight; Fort Stevenson, Dak., 11th 10.30 p. m. to morning of 12th; Fort Assinnaboine, Mont., 11th, 7 to 10.30 p. m.; 12th, 6 to 9.30 p. m.; Northfield, Minn., 14th, 9 p. m.

Thunder-storms.—They were reported in the various States and Territories as follows: Alabama, on the 13th, 14th, 28th; Arizona, 17th; Arkansas, 13th; Florida, 5th, 13th, 14th, 20th, 28th, 29th; Georgia, 4th, 29th; Illinois, 12th, 13th, 28th; Indiana, 1st, 12th, 13th, 14th, 19th; Indian Territory, 12th, 13th; Iowa, 1st, 7th, 12th, 13th, 20th, 27th; Kansas, 10th, 12th, 18th; Kentucky, 14th; Louisiana, 13th, 14th, 20th, 28th; Michigan, 12th, 20th; Mississippi, 3rd, 13th, 14th, 28th; Missouri, 2nd, 10th, 12th, 13th, 19th to 22nd; North Carolina, 29th, 30th; Tennessee, 13th, 28th; Texas, 13th, 19th; Virginia, 22nd, 29th.

Zodiacal Light.—St. Vincent, Minn., 13th; Springfield, Ill., 15th; Nashville, Tenn., 15th to 18th; Kittyhawk, N. C., 17th; New Corydon, Ind., 8th, 9th, 10th, 15th to 19th, 23rd, 24th, 25th, 28th; Monticello, Ia., 31st; Cambridge, Mass., 8th, 10th, 11th, 15th, 16th, 18th, 19th, 21st; Somerset, Mass., 9th, 10th, 15th to 21st; Northport, Mich., 8th, 23rd; Clear Creek, Neb., 14th, 16th, 22d, 23d; Atco, N. J., 17th; Dyberry, Pa., 24th; Wytheville, Va., 17th.

Telegraphic Communication Interfered with by Atmospheric Electricity.—Brackettville, Texas, 19th.

OPTICAL PHENOMENA.

Lunar halos have been observed in the various districts on the following dates: New England, 1st to 4th, 6th, 8th, 9th, 11th, 13th, 31st; Middle Atlantic States, 1st to 6th, 8th, 9th, 10th, 25th, 26th, 28th, 29th, 31st; South Atlantic States, 1st, 3rd, 4th, 6th, 7th, 24th, 26th, 28th, 31st; Florida Peninsula, 3rd, 7th, 28th; East Gulf States, 1st, 6th, 24th, 31st; West Gulf States, 2nd to 6th, 8th, 9th, 13th, 26th, 31st; Rio Grande Valley, 26th, 29th; Ohio Valley and Tennessee, 1st, 2nd, 5th to 10th, 12th, 14th, 16th, 24th, 28th to 31st; Lower Lake Region, 1st, 2nd, 5th, 8th, 9th, 11th, 20th, 24th, 25th, 29th, 30th; Upper Lake Region, 1st, 2nd, 7th to 9th, 16th, 26th to 30th; Extreme Northwest, 3rd, 10th, 24th, 27th, 28th, 31st; Upper Mississippi Valley, 1st, 2nd, 4th, 7th, 8th, 10th, 16th, 17th, 24th to 31st; Missouri Valley, 1st, 5th, 7th, 19th, 25th to 29th; Northern Slope, 1st, 3rd to 5th, 8th, 9th, 11th, 25th, 26th, 29th, 30th, 31st; Middle Slope, 1st, 2nd, 5th, 10th, 26th, 30th; Southern Slope, 2nd, 3rd, 5th, 6th, 7th, 9th, 12th, 13th, 16th, 17th, 24th, 25th, 26th, 30th; Southern Plateau, 1st, 4th to 7th, 10th, 25th, 26th, 27th, 31st; Middle Plateau, 4th, 7th, 8th, 15th, 20th, 26th, 28th, 31st; Northern Plateau, 3rd, 8th, 10th, 27th to 30th; North Pacific Coast Region, 30th; Middle Pacific Coast Region, 3rd, 21st, 25th, 28th to 31st; South Pacific Coast Region, 1st to 5th, 10th, 27th, 29th, 30th, 31st.

Solar halos have been observed in the various districts on the following dates: New England, 2d, 6th, 9th, 10th, 12th, 20th, 21st; Middle Atlantic States, 2d, 3d, 8th, 11th, 12th, 14th, 19th, 20th, 21st; South Atlantic States, 1st, 2d, 20th, 25th, 26th, 31st; Florida Peninsula, 21st, 24th, 25th; East Gulf States, 24th, 29th; Ohio Valley and Tennessee, 5th, 8th, 9th, 10th, 12th, 16th to 20th, 21st, 28th, 29th, 30th; Lower Lake Region, 2d, 11th, 20th, 29th; Upper Lake Region, 16th, 19th, 27th; Extreme Northwest, 10th, 18th; Upper Mississippi Valley, 1st, 3d, 7th, 8th, 10th, 16th to 19th, 24th to 27th, 29th to 31st; Missouri Valley, 9th, 25th, 26th; Northern Slope, 7th, 26th, 28th, 29th; Middle Slope, 1st, 13th, 17th, 26th, 28th, 30th, 31st; Southern Slope, 13th, 22d; Southern Plateau, 2d, 11th, 25th, 31st; Middle Plateau, 14th, 29th, 31st; Northern Plateau, 8th, 14th, 22d, 28th; Middle Pacific Coast Region, 5th, 8th, 14th, 20th, 21st, 24th, 25th, 28th, 31st; South Pacific Coast Region, 3rd, 4th, 5th, 10th, 21st.

Mirage.—Indianola, 1st, 5th, 16th, 20th to 23d, 26th, 30th; Northport, Mich., 15th, 23d, 26th; Genoa, Neb., 13th, portions of the city of Columbus, 19 miles distant, were distinctly visible.

MISCELLANEOUS PHENOMENA.

Earthquakes.—Eureka, Nev., Dec. 7th, very heavy shock. Kingston, Jamaica, Dec. 26th, 11.45 p. m., slight shock, lasting less than one second. Hawaii, Sandwich Islands, Sept. 30th, 5 a. m., "the most terrible shocks experienced in the past 40 years. The first shock came suddenly with a quick, jerking, terrific crash, as if the foundations of everything about were shivered to pieces; this shock lasted about two minutes with an interval of nearly three minutes, when there followed a second shock similar to the first but not quite equal in terrific violence. Some light tremblings were felt during the remainder of the day and three moderate shocks on the following day. Light shocks continued at intervals to October 3rd inclusive. During this period of earthquake disturbance, from September 30th to October 4th, many buildings were terribly shattered; stone houses were subjected to the greatest injury; many miles of stone wall fencing were