

Iowa, 20th, frozen over. *Des Moines*—Boonsboro', 19th, frozen over. *Spring River*—Empire City, Kans., 18th, closed with ice,—31st, ice 14 inches thick, "hardest frozen ever known." *Rock River*—Rockford, Ills., 7th, 8th and 18th, frozen over,—13th and 15th, partly frozen; Sterling, 6th and 7th, frozen over. *Ohio*—Pittsburgh, 25th, both rivers frozen over. Cincinnati, 19th, canal frozen over; 20th, ice four inches thick; 24th, river full of floating ice, impeding navigation; 25th to 31st, all southern packets laid up, ferries stopped. Louisville, 25th, canal frozen; 26th, navigation closed; 30th, river full of floating ice. Cairo, 25th to 31st, floating ice. *Licking River*—Cincinnati, 23d, frozen over; 30th, ice 8 inches thick. *Monongahela*—Morgantown, 26th, river frozen $\frac{1}{2}$ inch thick; 27th, ice two in. thick; 28th to 31st, ice 3 in. thick. Pittsburgh, 23d, floating ice; 25th, frozen over. *Alleghany*—Pittsburgh, 19th and 21st, floating ice; 25th, frozen over. *New River*—Wytheville, Va., 25th, river and Barret's mill dam frozen over. *James River*—Dover Mines, Va., 27th and 28th, frozen over; 29th, ice moving; 26th to 31st, canal frozen and navigation suspended. *Potomac*—Washington, 26th and 28th, river frozen. *Susquehanna*—*North Branch*—Catawissa, 25th, frozen over; navigation closed on the 11th, owing to damages caused by high water. *Delaware*—Trenton, 8th, canal frozen over, first time this season; 14th, river frozen over. Philadelphia, 19th, ice forming; 20th to 25th, floating ice. *Hudson*—Albany, 11th, floating ice, 23rd, frozen over, navigation closed; Ardenia, 27th, navigation closed; West Point, 25th, frozen over; Wappinger's Falls, 24th, floating ice, 28th, navigation closed, 31st, ice 9 inches thick. New York, 26th, much floating ice in rivers. *Long Island Sound*—Flushing Creek, 23rd, navigation closed, 27th, ice 6 inches thick. *Thames River*—New London, 27th, frozen over. *Penobscot River*—Bangor, Me., 7th, ice forming, 8th, frozen over. *Lake Superior*—Duluth, 23rd, ice in inner harbor $\frac{1}{2}$ inch thick, lake free during rest of month; Ashland, 15th, Long Island bay closed by ice; Marquette, 20th and 29th, ice in harbor. *Lake Michigan*—Escanaba, 16th, ice around docks, 29th, bay frozen over; Embarrass, Wis., 1st, rivers closed; Manitowoc, 7th, rivers closed; Chicago, 16th, navigation closed, 24th, river frozen over, people crossing. *Monono Lake*, Wisconsin.—7th, bay frozen over, 16th, lake frozen over. *Mendota Lake*, Wisconsin.—22nd, frozen over, 31st, ice 16 to 25 inches thick. *Geneva Lake*, Wisconsin.—26th, frozen over, horses and ice-boats on ice. *Lake Huron*—Port Huron, 15th, navigation closed, 24th, ice-floes in St. Clair river. *Lake Erie*—Toledo, 20th, river frozen over; Sandusky, 14th, ice along docks, 18th, bay entirely frozen over; Cleveland, 15th, navigation closed, 16th, first ice in river, 17th, first ice on lake, 18th, canal frozen over, 20th, river frozen over. Buffalo, 7th, navigation closed, 28th, lake frozen as far as visible with glass. *Niagara River*—Ft. Niagara, 24th to 31st, river half to nearly full of floating ice. *Lake Ontario*—Rochester, 1st, lake navigation closed; 7th, navigation closed on Erie canal; Oswego, 1st, navigation closed; Madison Barracks, 27th, bay frozen over. *Otsego Lake*, N. Y.—31st, partially frozen over. *Lake Massabesic*, N. H.—17th, frozen over. *Lake Winnepiseogee*, N. H.—27th, closed by ice. *Cape Lookout*, N. C.—28th, sound frozen nearly half a mile out. *Cape May*—24th, ice in Egg Harbor.

High Tides.—Coney Island, 10th, bathing-houses, &c., washed away; Eastport, Me., 23rd, tides very high, overflowing wharves; Newport, R. I., 23rd, unusually high, overflowing wharves in some parts of the city; Wappingers Falls, N. Y., 2nd, 10th to 12th.

Low Tide.—Cape Lookout, N. C., 26th, lowest known tide in sound for fourteen years.

TEMPERATURE OF WATER.

The temperatures of water, as observed in rivers and harbors, with average depth of observations, is given on Chart No. III. At the following stations, observations were discontinued on account of ice, on the dates named: December 15th, at Buffalo; 16th, Escanaba; 18th, Chicago and Cleveland; 19th, Marquette; 20th, Toledo; 22nd, Grand Haven and Detroit; 24th, Sandusky. Observations were resumed at Marquette on the 25th and continued until the 28th; they were interrupted at Cleveland on the 2nd, 4th, 5th, 7th and 10th to 12th by rough water.

ATMOSPHERIC ELECTRICITY.

Thunder-storms.—Gulf Hammock, Fla., 24th, Independence, Kan., 7th; Brookhaven, Miss., 9th; Weldon, N. C., 10th; Aiken, S. C., 26th; Melissa, Tex., 7th; Red Bluff, Cal., 6th; Smithville, N. C., 26th; Cape Lookout, N. C., 2nd.

Auroras.—Bangor, Me., 1st; Boston, 1st; Eastport, Me., 1st, 26th; Pembina, Dak., 23rd, 24th; Cornish, Me., 24th; Gardiner, Me., 16th; Orono, Me., 15th, 16th; Cambridge, Mass., 16th, 19th, 23rd; Fall River, Mass., 16th; Dunbarton, N. H., 19th; Contoocookville, N. H., 16th; Freehold, N. J., 24th; Atco, N. J., 25th; Jacksonburg, Ohio, 27th; Cincinnati, 3rd; North Lewisburg, Ohio, 13th; Brownsville, Pa., 11th to 14th; Woodstock, Vt., 16th; Embarrass, Wis., 1st; Yankton, Dak., 1st; Starkey, N. Y., 16th.

OPTICAL PHENOMENA.

Solar Halos.—1st, Md., N. J., N. Y., Pa. 2d, Nev. 4th, Tex. 6th, Cal., Neb., Kan. 7th, Ill., Ia., Ohio, Tenn. 8th, Cal., Tex., Conn., N. J., N. Y. 9th, Me., Cal. 71th, Tex., Ohio, Nev. 12th, Ia., Neb. 13th, Ind., Ohio. 14th, Ia., Ga., S. C. 16th, Fla., Kan., Ohio, Vt., Nev. 17th, Minn., Fla., Col., Mass., Mo., Neb. 18th, Dak., Kan., Mo., N. H. 19th, Ia., N. Y., Ohio. 20th, Ia., Kan. 21st, Ia., Ohio, Dak. 22d, Ia., Dak. 23d, Ia., Fla., Dak., Kan., Me., Neb., W. Va., Nev. 24th, Ia., Vt., Dak., Kan., Neb. 25th, Ill., Ia., Dak., Kan., Ohio. 26th, Ia., N. Y. 27th, Ia., Ohio. 28th, Ill., Ia., Wis. 29th, R. I., Mass., N. H., N. Y. 30th, Dak., Va. 31st, Ia.

Lunar Halos.—1st, Iowa, Cal., Neb., Md., Mass., R. I., N. Y., Pa., Wis., Dak. 2nd, Ill., Ind., Cal. Nev., N. M., Cal., Kan., Iowa, Ohio, Ky., Nev., Neb., N. J., Wis. 3rd, Cal., Col., Tex., Dak., Ill., Tenn. N. J., R. I., Conn., Mo., Neb., N. Y., Va., Wis. 4th, Cal., Nev., Tex., Minn., Ill., Mass., R. I., Dak., Mo., N. J., N. Y., Ohio, Va. 5th, Ind., Cal., N. M., Iowa, Minn., Tenn., N. J., Conn., Neb. 6th, Cal., Neb., Kan., Miss., Ill., Mass., Conn., Mo., Tex., Va. 7th, Ill., Ind., Iowa, Dak., Wis., Mich., Ohio, W. Va., Mass., Maine, Mo., Va. 8th, Iowa, Cal., Nev., Minn., Mich., N. Y., Mass., Conn., Vt., Dak., Mo., Neb. 9th, Col., Neb., Kan., Me., Utah. 10th, Cal., Col., Iowa, N. J., La. 11th, Iowa, Tex., Minn., Ohio. 12th, Iowa, Minn., Ohio, Conn., Wis. 13th, Ind. 14th, Cal., S. C. 16th, Cal. 17th, Nev., Mo. 18th, N. M. 19th, N. M. 20th, Va. 21st, Neb. 26th, Iowa. 28th, Ill., Iowa. 29th, Ill., Cal., Wis. 30th, Ill., Cal., Nev., Tex., Dak., Wis., Minn., Tenn., N. C. 31st, Ill., Iowa, Neb., Wis., Minn., Ind., Conn., N. J., N. Y., Pa., Va.

Mirage.—Burlington, Vt., 15th, 26th; New London, Conn., 8th, 12th, 17th; McPherson, Bks., Ga., 12th; Princeton, Cal., 15th; New Bedford, Mass., 1st, 13th; Genoa, Neb., 29th to 31st.

Rainbow.—Washington, D. C., 26th, 10:20 a. m., rainbow observed in zenith.

MISCELLANEOUS PHENOMENA.

BOTANICAL.—*Massachusetts*—Somerset, ground open and farmers plowing until the 15th. *Kansas*—Independence, 11th, farmers plowing. *North Carolina*—Fayetteville, 31st, Japonicas budding, violets in bloom. Wilmington, 31st, roses in full bud, one in bloom; geraniums in garden still green. *Utah*—Camp Douglass, grass and clover remained fresh and green until the 7th.

BIRDS.—*Geese*—Winnemucca, Nev., 5th, flying SW.; Des Moines, Ia., St. Louis, 16th, S.; Newport, R. I., 11th, NW.; Somerset, Mass., 23rd, S.; Fall River, Mass., 23rd, S. in large numbers; Corning, Mo., 24th, 26th; Oregon, Mo., 5th, 8th; Clear Creek, Neb., during month; Howard, Neb., 27th, S.; Flushing, N. Y., 8th, N.; Melissa, Tex., 5th, 9th; Riley, Ill., 9th, SE. *Snow-birds*—Monticello, Ia., 19th, 29th; Oregon, Mo., 4th, 8th, 13th, 15th; Contoocookville, N. H., 4th. *Blackbirds*—Oregon, Mo., 8th. *Woodpeckers*—Monticello, Ia., 10th. *Bluejays*—Monticello, Ia., 8th. *Ducks*—Daytona, Fla., 1st, flying S.; Monticello, Ia., 4th, S.; Creswell, Kan., 2nd, 5th, 30th; Oregon, Mo., 4th, 5th; Palermo, N. Y., 5th, S. *Tree Sparrows*—Somerset, Mass., numerous during month. *Owls*—Norfolk, Ohio, hooting 27th.

METEORS.—Cheyenne, Wyo. T'y, 16th, 9 p. m., large meteor moving south to north, elevation 45°. North Platte, Nebr., 26th, 9:50 p. m., small but very brilliant meteor moving from zenith to about 15° above NE. horizon, where it exploded, trail of light smoke vanished almost instantly. Davenport, Iowa, 27th. Toledo, 30th. Morgantown, 30th, 7:10 p. m., remarkably brilliant meteor fell from a point a little west of south, at an altitude of about 60°; color deep blue, changing to white, then golden, then crimson; path nearly perpendicular to the horizon; exploded within 20° of the horizon, remained visible 15 seconds; 7:20 p. m., small meteor in same path, leaving blue trail. Indianapolis, 28th. Savannah, 12th. Fort Whipple, Va., 30th, 7:10 p. m., very brilliant meteor, altitude about 40° above NW. horizon, following a vertical downward course until its disappearance; at about 20° above the horizon there spread out from it a tail resembling that of a comet, of a rich vermilion color; its motion was comparatively slow, remaining visible for about two seconds. Bangor, Me., 1st. Princetown, Cal., 12th, very large meteor, moving from east to west, light equal to half daylight, train visible several seconds. Monticello, Iowa, 12th. Cresco, Iowa, 12th. Woodstock, Md., 5th, 6th, 11th, 12th, 16th, 25th. Rowe, Mass., 22d. Oregon, Mo., 5th, 17th. Freehold, N. J., 2d, 19th. Atco, N. J., 22d. Linden, N. J., 6th. Waterburg, N. Y., 20th. Wappinger's Falls, N. Y., 20th, 25th, 30th. Flushing, N. Y., 29th, 30th. Fayetteville, N. C., 8th, 27th. Westerville, Ohio, 12th, 15th. Jacksonburg, Ohio, 30th. Tioga, Pa., 30th. Fallsington, Pa., 15th. Wytheville, Va., 12th. Yankton, 4th. Castroville, Tex., 6th.

Zodiacal Light.—Savannah, 22nd, 23rd, 25th; Newburg, Vt., 19th; New Corydon, Ind., 6th, 7th, 23rd, 26th, morning, 25th, morning and evening; Monticello, Ia., 28th, evening; Somerset, Mass., 13th, 14th, 16th, 18th to 20th, 22nd, 23rd, 24th, evening; Cambridge, Mass., 14th, 16th, 19th, 23rd, 24th, 25th, evening; suspected 18th, 22nd; Fall River, Mass., 18th, evening; Oregon, Mo., 23rd, 24th, evening; Atco, N. J., 16th to 18th, 20th, 22nd to 24th, evening, 24th, 28th, morning; Waterburg, N. Y., 20th, evening; Bellefontaine, Ohio, 12th; Wytheville, Va., 24th, 25th, 27th; Southington, Conn., 16th, 23rd to 25th; Washington, D. C., 17th, 6 p. m., 18th, 6:30 p. m., 19th, 6 p. m., faint, 20th, 6:15 p. m., extending 90° from the sun, 21st, cloudy, 22nd, 6 p. m., suspected, 22rd, 7:30 p. m., certain, but faint—long and narrow, 23rd, 5:30 a. m., bright, 23rd, 6 p. m., bright—extending 90° from sun, 24th, 6 p. m., bright, sparsely defined—extending 80° from sun, 25th, 6:15 p. m., bright, broad, ill-defined—axis passes south of Venus by several degrees, 26th, cloudy, 27th, 6 p. m., moonlight—dark disk, remarkably bright: 28th, clear—moonlight—dark disk not very bright, 29th, cloudy, haze, 30th, moonlight.

Polar Bands.—Leavenworth, Kan., 16th; Dubuque, Iowa, 29th; Milwaukee, 7th; Savannah, 8th, 19th; Wilmington, N. C., 2nd, New Corydon, Ind., 7th; Taber, Iowa, 29th; Guttenburg, Iowa, 7th, 31st; Danville, Ky., 12th, 13th; Gardiner, Me., 19th, 27th; Plattsmouth, Neb., 6th; Clear Creek, Neb., 1st, 2nd, 3rd, 6th, 7th, 9th, 20th; Auburn, N. H., 1st, 8th; Wytheville, Va., 7th, 8th, 12th, 13th, 18th, 19th, 29th.

Prairie Fires.—Keokuk, Iowa, 5th; New Orleans, La., 18th; Eagle Pass, Tex., 3rd, 17th.

Earthquakes.—San Jose de Costa Rica, October 31st, 9:30 a. m., very feeble shock. November 3d, 5:30 p. m., feeble shock; 8th, 8:15 p. m., feeble shock; 23d, quite strong shock. U. S. Naval Hospital, Yoko.