

cars, preparatory to deserting the city; many were compelled to cling to the debris of buildings for safety until rescued. Genoa, 27th, town flooded to a depth in many places of 13 feet; river filled with dead cattle, hogs and horses, the debris of bridges, buildings, farm-machinery and lumber; several houses completely covered with water on the bottom lands south of the town. *New York*.—Rochester, 20th, Genesee river overflowed; considerable damage to buildings near the Lower Falls; all the bottom lands for several miles under water. *Maryland*.—Baltimore, 9th, very heavy rain, flooding a portion of city, causing considerable damage to property; serious land-slides on B. & P. R. R., wrecking a train. *Texas*.—Pilot Point, 11th, very heavy rains; all streams overflowed; railroad bridge over Elm Creek carried away; roads almost impassable.

High Tides.—New York City, 30th, unusually high tide, causing great damage to property at Rockaway Beach and Coney Island. Little Egg Harbor, N. J., 4th. New London, 1st; 4th, remarkably high; 31st. Bangor, Me., 11th. New Haven, 4th, remarkably high; many of the wharves covered and the meadows of the Quinnipiac valley completely submerged.

Low Tides.—New River, N. C., 23rd.

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. Owing to ice and breakage of instruments, observations are wanting as follows: Alpena, Burlington, Vt., Cleveland, Chicago, Duluth, Grand Haven, Milwaukee, Marquette, San Francisco, 1st to 31st; Punta Bassa, 1st to 6th; Augusta, 18th to 22nd; Sandusky, 1st to 19th, 30th, 31st; Detroit, 1st to 17th, 30th, 31st; Buffalo, 1st to 27th; Toledo, 1st to 23rd.

ATMOSPHERIC ELECTRICITY.

Thunder-storms.—In the various districts they were reported on the following dates: New England, 1st, 2nd, 16th, 20th; Middle Atlantic States, 3rd, 4th, 9th, 12th, 13th, 16th, 19th, 20th, 29th, 30th, 31st; South Atlantic States, 3rd, 18th, 19th, 22nd, 25th, 26th, 29th, 30th; Eastern Gulf States, 3rd, 7th to 9th, 11th, 12th, 13th, 16th to 19th, 21st, 25th, 26th, 29th; Western Gulf States, (excluding Texas,) 7th, 10th to 12th, 14th to 19th, 21st, 25th, 28th, 29th; Texas, 6th to 11th, 15th to 18th, 24th, 25th, 28th, 29th; Ohio valley and Tennessee, 2nd, 3rd, 11th, 12th, 16th, 18th, 19th, 25th, 28th, 29th; Upper Mississippi valley, 2nd, 11th, 14th to 16th, 25th; Lower Missouri valley, 1st, 2nd, 9th, 10th, 14th to 16th, 25th; Arkansas and Indian Territory, 6th, 9th, 10th, 11th, 14th, 15th, 18th, 24th; New Mexico and Arizona, 8th, 9th; Nevada, Carson City, 31st; California, Red Bluff, 9th, 20th, Yosemite valley, 31st; Oregon and Washington Territory, along the valley of the Willamette, 1st, 23rd, 26th. No thunder-storms were reported from the Lake region, the Northwest or Rocky Mountain regions.

Auroras.—In general there were no unusually brilliant displays reported, but the element of frequency afforded quite prominently their appearance in the Northwest. The most important manifestation of auroral display was shown on the evening of the 18th by a somewhat remarkable continuity of observation extending throughout the Lake region and reaching in an unbroken line from Halifax, N. S., westward to the northwestern extremity of Montana. This line of observation was not a direct one, but assumed the form of an elliptical curve, the point of intersection with its minor axis coinciding very nearly with the geographical position of Chicago. Less extended but not entirely local displays, were witnessed as follows: 2nd, from stations in western Maine, northern New Hampshire, eastern New York, throughout Dakota, in western Montana and in Oregon and Washington Territory. In respect to the display in the two latter States a more extended notice is desirable. At Umatilla the aurora was visible from 8:50 to 10:20 p. m.; at 9 p. m. a small pale yellow light was visible in the N.N.E., increasing steadily in size until it assumed the form of an arch of about 20°, which occurred about 10 p. m.; thereafter until the close, bright luminous beams or flashes of reddish light shot upward toward the zenith, a distance of 35°. At Dayton, from 10 to 11:15 p. m., azimuth 180° to 205°, altitude 20°. 3rd, from Cape Breton Island, eastern New York, northern Minnesota, Dakota and western Montana. 20th, from southern Iowa northward to British America and westward to Dakota. 31st, from northern Iowa northward to British America and westward to Washington Territory. The following were local displays: Sidney, Cape Breton Island, 9th, p. m. Bangor, Me., 8th, a. m. St. Vincent, Minn., 23rd, 8:30 to 9:40 p. m.; 24th, 7 p. m. to midnight; 26th, 9 p. m. to midnight; 30th, 8 to 9:40 p. m. Spiritwood, Dak., 11th, p. m., 30th, p. m.

Zodiacal Light.—New Corydon, Ind., 22nd, 23rd; Clinton, Ia., 21st, 22nd, 23rd; Monticello, Ia., 20th, 21st, 22nd; Manhattan, Kan., 7th; Yates Center, Kan., 22nd, 23rd, 25th; Harvard College Observatory, Cambridge, Mass., 21st, 25th, 26th, 28th, slightly visible among clouds on the 24th; Somerset, Mass., 24th, 25th, 26th, 27th; Oregon, Mo., 16th, 17th, 25th, 29th, 30th; Bellefontaine, Ohio, 22nd, 27th, Wytheville, Va., 21st; Havana, Cuba, 17th to 19th, 22nd to 25th, 28th, 29th; Rochester, 10th; Nashville, 24th, 27th; New Haven, 25th.

Telegraphic Communication Interfered with by Atmospheric Electricity.—Ft. Grant, Ariz., 8th, peculiar electrical condition of the atmosphere, sufficient motive force to occasionally work instruments on the line between this station and Ft. Verde, although there was no battery attached. The galvanometer was constantly effected with an electro motive force of ordinary intensity which acted in a contrary direction to that usually displayed. Later in the day quantity of force increased, but intensity diminished between the two stations; finally current changed to opposite direction, followed soon after by a fluctuating quantity. La Mesilla, 5th; Jacksboro, Texas, 6th, 9th, 11th; San Antonio, Tex., 24th; Laredo, Tex., 25th, discharges so heavy as to melt brass connections in office.

OPTICAL PHENOMENA.

Solar Halos have been observed in the various districts on the following dates: New England, 6th, 8th, 25th, 29th and 30th; Middle Atlantic States, 3rd, 6th, 8th, 10th, 12th, 15th, 16th, 19th, 21st, 22nd and 29th; South Atlantic States, 7th, 8th, 14th, 15th, 21st and 22nd; Eastern Gulf States, 13th, 25th, 27th, 28th and 30th; Western Gulf States, including Texas, 6th, 7th, 12th, 13th, 14th, 15th, 21st, 23rd and 29th; Ohio valley and Tennessee, 2nd, 7th, 11th, 12th, 14th, 18th, 21st, 23rd, 25th and 28th; Lower Lake region, 7th, 11th, 12th, 29th and 30th; Upper Lake region, 2nd, 7th, 9th, 10th, 11th, 27th and 29th; Upper Mississippi valley, 6th, 7th, 9th to 11th, 14th, 15th, 18th, 28th to 31st; Lower Missouri valley, 1st, 5th, 6th, 17th, 19th, 23rd, 27th to 31st; Rocky Mountain regions, 13th, 14th, 15th, 17th, 27th and 30th; Northern and Middle Plateau regions, 3rd, 4th, 8th, 9th and 25th; California, 2nd, 3rd, 4th, 9th, 18th, 23rd to 30th; Oregon and Washington Territory, 3rd, 10th, 11th, 17th, 20th, 22nd, 24th, 28th to 31st.

Lunar Halos have been observed in the various districts on the following dates: New England, 5th, 6th, 8th, 9th, 11th, 12th, 15th to 18th; Middle Atlantic States, 3rd, 6th, 8th, 10th, 11th, 14th, 15th, 16th and 26th; South Atlantic States, 6th, 7th, 11th to 15th; Eastern Gulf States, 6th, 7th, 9th, 11th, 12th, 14th and 17th; Western Gulf States, including Texas, 3rd, 4th, 6th to 8th, 11th, 17th and 30th; Ohio valley and Tennessee, 2nd, 6th, 10th, 13th to 17th, 23rd and 27th; Lake region, 7th to 11th, 14th, 15th and 25th; Upper Mississippi valley, 3rd to 7th, 10th to 12th, 14th, 20th and 25th; Lower Missouri valley, 5th to 11th, 13th, 16th and 19th; Rocky Mountain regions, 6th, 8th, 9th, 12th, 14th to 19th; Southern Plateau, 6th, 7th, 8th and 11th; Northern Plateau, 6th, 8th, 10th, 11th and 22nd; California, 7th; Oregon and Washington Territory, 6th, 9th, 10th, 11th, 14th, 15th, 22nd and 24th.

Mirage.—Spiritwood, Dak., 5th, 8th, 19th and 26th; Genoa, Neb., 1st, 2nd, 3rd, 5th, 16th, 19th and 21st; Indianola, 4th and 8th.

MISCELLANEOUS PHENOMENA.

Sun Spots.—The following record of observations, made by Mr. D. P. Todd, Assistant, has been forwarded by Prof. S. Newcomb, U. S. Navy, Superintendent Nautical Almanac Office, Washington, D. C.:

DATE— March, 1881.	No. of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		REMARKS.
	Groups	Spots.	Groups	Spots.	Groups	Spots.	Groups	Spots.	
2. 8 a. m.	1	2	2	2	1	2	3	8	Faculae. Spots probably disappeared by solar rotation.
5 p. m.	0	0	0	0	0	0	3	8	Faculae.
4. 2 p. m.	0	0	1	3	0	0	1	1	Faculae.
5. 8 a. m.	0	0	0	0	0	0	1	1	Faculae.
6. 10 a. m.	0	2	0	0	0	0	1	3	} Faculae.
2 p. m.	0	0	0	0	0	0	1	3	
7. 9 a. m.	1	1	0	0	1	1	2	4	Broad areas of faculae.
9 a. m.	3	8	0	0	2	7	5	12	Broad areas of faculae.
1 p. m.	0	0	0	0	0	0	5	12	Broad areas of faculae.
10. 4 p. m.	0	2†	0	0			5	25†	} Faculae. Many of the spots small.
5 p. m.	0	0	0	0	0	0	5	25†	
11. 9 a. m.	0	10	0	0	0	0	5	45†	} Faculae. Many of the spots small.
11 a. m.	0	0	0	0	0	0	5	45†	
13. 1 p. m.	2	1†					5	30†	Faculae.
14. 8 a. m.	2	20†			1	10†	7	85†	Faculae.
15. 9 a. m.	0	0	0	0	0	0	7	85†	Faculae.
16. 9 a. m.	0	0	0	0	0	0	6	85†	} Faculae. Many of the spots small.
4 p. m.	0	0	0	0	0	0	6	85†	
20. 10 a. m.	1	1					3	10†	Faculae.
21. 3 p. m.	2	5	0	0	0	0	5	45†	Faculae.
22. 10 a. m.	0	15	0	0	0	0	4	60†	} Faculae.
3 p. m.	0	0	0	0	0	0	4	60†	
23. 8 a. m.	0	5	0	5	0	0	4	60†	Faculae.
24. 6 a. m.			1	10	0	0	2	40†	Faculae.
25. 5 p. m.	0	0	0	20†	0	0	2	15	
27. 8 a. m.	1	2	2	15	1	2	1	2	Faculae.
28. 7 a. m.	1	1	0	0	0	0	2	3	Faculae.
30. 12 m.	0	2	0	0	0	0	2	5	Faculae.

† Approximated.

Mr. William Dawson, at Spiceland, Ind., reports: 7th, two groups, three spots, one north of centre, two little spots and faculae at east edge; 9th, five groups, 65 spots; 10th, five groups, 78