

Solar halos have been observed in the various districts on the following dates: New England, 2d, 9th, 12th, 19th, 20th, 22d, 23d, 28th, 30th; Middle Atlantic states, 14th, 15th, 16th, 19th, 28th; South Atlantic states, 8th, 23d, 27th; East Gulf states, 1st, 21st, 30th; West Gulf states, 21st, 29th; Ohio valley and Tennessee, 6th, 7th, 11th, 17th, 19th, 21st to 23d, 27th to 29th; Lower Lake region, 6th, 11th, 17th, 19th, 23d, 27th, 28th, 30th, 31st; Upper Lake region, 11th, 27th; extreme Northwest, 1st; Upper Mississippi valley, 1st, 5th, 7th, 11th, 20th, 21st; Missouri valley, 26th; Middle Slope, 6th, 18th, 26th, 30th; Northern Plateau, 8th, 14th, 26th, 27th; Southern Plateau, 25th; Middle Pacific coast region, 11th, 17th, 30th.

Mirage.—Indianola, 19th, 20th; New Haven, 28th, 7 a. m.

MISCELLANEOUS PHENOMENA.

Earthquakes.—In the mining district of Taversal, Nottinghamshire, England, August, 1881, violent shock in one of the pits of the Stanton Iron Works Co., having a depth of 1290 feet. The miners were so alarmed at the accompanying noise that they rushed to the mouth of the pit, thinking that an explosion had occurred. In Pear Tree Inn, Fackley, bricks were removed from the chimney; the same thing occurred in a house at Taversal. At the latter village, the station master, while sitting in his house was thrown from his chair by the shock and a quantity of plastering was detached from the ceiling. There was no explosion in the mines or the occurrence of other ordinary circumstances to account for the phenomenon, but the cause as supposed was clearly indicated by the upheaval of the floor of one of the pits, showing that the seat of the disturbance was below the workings of the mine. This observation would appear to refute the general impression that earthquake shocks are seldom if ever felt at any great depth beneath the surface, as in deep mines. Hawaiian Islands, September 13th, 1881, island of Maui visited by very violent shocks. Constantinople, September, 1881, heavy shocks at Gallipoli and Adrianople during latter part of month. Chaugeri, Province of Anatolia, Turkey, September 30th, 1881, heavy shock, 11 persons killed; the grand mosque and many dwellings greatly damaged. The following observations were made on the Island of Ukamok, Alaska Territory, (55° 48' N., 155° 34' W.,) by Mr. Alexander Newlander, who resided there during the year ending June 30th, 1881: "September 28th, 1880, 6 p. m., three very heavy and successive shocks, direction of first shock N. to S., the remaining two from W. to E.; 9 p. m., severe shock from W. to E. 29th, 3 a. m., very heavy shock from W. to E; 1 p. m., extremely heavy shock from W. to E. From the commencement of this phenomenon, September 28th, 1880, until its subsidence October 16th, 1880, there was an uninterrupted trembling motion of the earth interspersed with heavy subterranean rumbling sounds. During a short trip over a portion of the Island on September 29th, deep fissures with a width of from 15 to 20 inches were found to be very numerous. The residence of Mr. Newlander, one story high and substantially built of logs, was situated about 500 yards from shore, on rising ground and about 20 feet above sea-level. During the heavy shocks shelves were wrenched from the walls, a brick stove upset, the flooring twisted out of shape and heavy beef and flour barrels (full) were pitched from one side of the room to the other. Outside of the building no one was able to stand on their feet owing to a violent, jerky and rotary motion of the earth, which continued for at least 20 minutes. The action upon bodies of water is given as follows: Several times at low water the sea rose in a body, travelling inshore about 60 yards when it would subside, immediately followed by a succession of similar waves. The water in the creeks overflowed their banks to the eastward as indicated by the condition of the ground on that side which was dotted by numerous small pools of water, some of which were fully 40 yards distant from the east bank. On the south side of the Island a small shallow creek, across which one could have easily stepped previous to the earthquake, was now widened about six feet; the fresh water was changed to salt water, and the depth so increased, that the bottom was not discernable. After the shocks, heavy breakers were observed on the southwest shore of the Island, where, for the past four years, no such phenomenon has been observed. On the west side of the Island, the tide does not rise as high as before the shocks. The wind during the shocks was invariably from the WNW., and whenever it changed to easterly no shocks were experienced, and the trembling of the earth would diminish considerably." Nickerie, Dutch Guiana, June 20th, 1881, 11 a. m., two successive shocks, one immediately following the other, and each lasting about ten seconds; the second was slightly longer in duration and stronger than the first. The shocks were preceded, accompanied and followed by a dull, rumbling noise, resembling that of distant carriage wheels. The sensations to a person seated in a chair were as if some one was shaking the floor on which the chair stood, by a rapid to and fro movement of the arms. A peculiar feeling of nausea was experienced for about a minute after the shocks. The air was very warm and oppressive, and the barometer stood at 30.21, the thermometer at 86°; sea very calm; slight breeze from the east. Bristol, N. H., October 6th, 1881, heavy shock 1 title after midnight, direction west to east; noise like the rumbling of a heavy train of cars; buildings jarred perceptibly. Kamouraska, Province of Quebec, 5th, severe shock. Concord, N. H., 6th, heavy shock about midnight; at Tilton it jarred houses and rattled dishes. Ashland, N. H., 6th, slight shock about midnight, lasting a few seconds. Virginia City, Nev., 21st, 7 p. m., two shocks, quite heavy, each lasting about two seconds; direction southwest

to northeast. Campo, Cal., 2nd. 9 a. m., sharp shock, preceded and accompanied by a heavy rumbling sound and tremulous vibration, which rapidly increased in severity, shaking buildings and causing crockery to rattle; motion was from SE. to NW.; duration 8 to 10 seconds. Carson City, Nev., 21st, 6.41, p. m., two slight shocks; motion from S. to N.

Meteors.—Campo, Cal., 30th, 7 p. m., brilliant. Boise City, Idaho, 4th. Pioche, Nev., 13th, 29th. Florence, Ariz., 12th. Little Rock, 21st, very brilliant, moving from W. to S., trail very broad and resembling that of a rocket, flight lasted about 8 seconds. Mobile, 18th, 2.20 a. m., appeared in the east about 65° above the horizon, and moved rapidly in a northwesterly direction toward the earth; when about 10° above the horizon it burst with a loud report, throwing off a shower of brilliant fragments, each of which left behind it a bright trail; the entire western sky was illumined by the explosion, which left a cloud that remained visible nearly ten minutes. Pensacola, Fla., 17th, 18th. Southington, Conn., 22d. Morrison, Ill., 18th. Charleston, Ill., 26th. New Corydon, Ind., 7th, 8th, 21st, 22d. Vevay, Ind., visible nearly every night; brilliant on 26th. Monticello, Ia., 18th. Woodstock, Md., 15th, 16th, 21st. New Bedford, Mass., 17th, 1 a. m. Thornville, Mich., 26th. Fayette, Miss., 13th to 15th, 17th, 25th, 30th. Oregon, Mo., 19th, 24th, 25th. Atco, N. J., 26th, 27th. Freehold, N. J., 11th, 18th, 20th. Moorestown, N. J., 22nd. Ithaca, N. Y., 16th. Elsworth, N. C., 10th. Westerville, Ohio, 10th. Stateburg, S. C., 9th, 16th, 21st, 27th. Wytheville, Va., 10th. Mr. William J. Fisher at St. Paul, Kodiak Island, reports, December 30th, 1880, 8.30 p. m., “observed very large meteor, at least 7 feet in length and in circumference about the size of an ordinary barrel. Direction of path, ESE. to WSW.; in shape, conical, the pointed end smooth, while the blunt end (which was in front) had a jagged and corrugated appearance. It emitted a very intense light yellowish color, mingled along the jagged end with a bluish tinge: innumerable bright sparks were thrown off during its flight. The velocity with which it travelled seemed to be about equal to the speed attained by a shell fired from a heavy gun at long range, and the accompanying noise was almost identical with that made by the shell during its flight. The meteor descended into the water near Bliski Island, about 50 yards from shore; when it struck a large volume of water was thrown upon the neighboring land.” Winona, Minn., 6th, 8 p. m., very brilliant; exploded like a rocket in a shower of vivid colors and rapidly disappeared.

Annual Fog Wave of 1881, at New Westminster, B. C., concerning which the following remarks are of interest: Exceedingly heavy rains prevailed from the 16th to the 20th of October, clearing away all the snow of the past winter, except small quantities in the crevices of the mountains. Calm weather now set in, and local fogs began to form along the river, as usual at this time of the year. These fogs lifted each day before 12 m., disclosing a cloudless sky, until the 23d, when the fog remained all day, not lifting before 9 p. m. On the morning of the 24th the fog was very thick along the river, but cleared at noon, with cloudless sky and SSW. wind. On the 25th the fog did not lift until noon, when a little cirro-cumulus, in streaks, could be seen stretching from east to west, with a slight movement from the east. Quite warm at 1 a. m.; temperature, 52°. At 2 p. m. a heavy bank of clouds rose up in the south, with a band of cirrus on its upper edge; barometer falling rapidly. This bank gradually ascended, and at 3.45 p. m. obscured the sun; it now rolled rapidly inland, causing the thermometer to fall some 8° almost instantly, and throwing out an advanced guard of the main body of the fog, distant about one mile to the west. Following this condition, the fog gradually thickened, and at 5 p. m. the barometer read 29.708, falling; temperature, 43°, wind, SSW. The following observations were taken during the 25th: 9 a. m., 29.799, 37°, NE; 3 p. m., 29.748, 47°, SW.; 3.45 p. m., 29.723, 45°, SSW.; 4.10 p. m., 29.718, 44°, SSW.; 5 p. m., 29.703, 43°, SSW.; 9 p. m., 29.683, 42°, calm.

Migration of Birds.—*Geese flying south:* Cheyenne, Wyo., 8th; Deadwood, Dak., 12th; North Platte, Neb., 9th; Ft. Supply, Ind. T., 12th, 13th, in large numbers; Grierson Springs, Tex., 11th, 18th; Stockton, Tex., 1st, 11th, 18th; Coleman, Tex., 12th; Huron, Dak., 4th, 7th, 8th, 20th; Yankton, 8th, 12th, 30th; St. Louis, 16th; Davenport, 15th, 16th, 17th, 30th; Springfield, Ill., 14th; Cairo, 5th, 6th, 23rd, 26th, 27th; St. Paul, 14th; Little Rock, 5th, 24th; Ft. Gibson, 5th, 13th; Indianola, 14th; Milwaukee, 26th; Morgantown, 14th, 18th; Augusta, Ga., 20th; Macon, N. C., 16th; Riley, Ill., 9th; Peoria, Ill., 15th; Ft. Wayne, Ind., 16th; Independence, Kan., 9th; Monticello, Iowa, 12th, 13th; Fall River, Mass., 11th; Northport, Mich., 3rd, 4th; Oregon, Mo., 3rd, 13th; Clear Creek, Neb., 8th, 12th, 30th; Franklin, Pa., 2nd; West Chester, Pa., 7th, 8th; Ashwood, Tenn., 5th; Johnsonstown, Va., 14th; Embarras, Wis., 4th, 10th; Clay Centre, Kan., in unusually large numbers. Wood's Holl, Mass., flying west, 12th. *Ducks flying south:* Stockton, Tex., 11th, 18th; Grierson Springs, Tex., 18th; St. Paul, 25th, 30th; Little Rock, 5th, 24th; Ft. Gibson, 5th, 13th; Indianola, 14th; Augusta, Ga., 2nd, 4th; Macon, N. C., 16th; Swanwick, Ill., 14th; Northport, Mich., 3rd, 4th; Clear Creek, Neb., 6th, 19th, 24th. *Pigeons flying south:* Little Rock, 5th, 24th; Ft. Gibson, 10th.

Insects.—*Cotton Worm:*—Franklin, Ark., 30th, many fields of cotton entirely stripped of leaves; cotton crop damaged about 70 per cent. Ashwood, Tenn., 15th, appeared in myriads and in a few days devoured all the leaves; after destroying the cotton, the worms attacked the wheat crop, doing a vast amount of damage; one farmer lost 100 acres, every blade being eaten to the ground. Clarksville, Tex., 20th, after the rains of the first part of month, the cotton worm

inflicted great damage upon cotton, wheat and grass. *Hessian Fly*.—Ruggles, Ohio, 30th, early wheat severely injured.

Prairie and Forest Fires.—Ft. Stevenson, Dak., 3d, 10th; Salt Lake City, 7th, in mountains; North Platte, Neb., 1st; Ft. Keogh, Mont., 10th; Ft. Buford, Dak., 10th; Moorehead, Minn., 18th to 20th, 22d, 26th; St. Vincent, Minn., 23d; Ft. Stevenson, Dak., 30th; Huron, Dak., 1st, 9th to 11th, 16th, 17th, 19th, 20th, 24th, 27th, 30th, 31st; Yankton, Dak., 18th to 20th, 24th to 26th, 31st; Mason, Tex., 17th.

Polar Bands.—Prescott, Ariz., 3d, 30th; New Corydon, Ind., 6th, 7th, 19th, 20th, 27th; Gardiner, Me., 1st; Fayette, Miss., 25th; Clear Creek, Neb., 21st; Wytheville, Va., 8th, 22d, 27th, 28th.

Sand Storms.—Umatilla, Or., 3d; Camp Thomas, Ariz., 20th, 23d, 29th.

Sunsets.—The characteristics of the sky at sunset, as indicative of fair or foul weather for the succeeding twenty-four hours, have been observed at all Signal Service stations. Reports from 175 stations show 5,387 observations to have been made, of which 32 were reported doubtful; of the remainder, 5,355, or 86.2 per cent., were followed by the expected weather.

Sun Spots.—The following record of observations has been forwarded by Mr. D. P. Todd, Director of the Lawrence Observatory, Amherst, Mass :

DATE— October, 1881.	No. of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		REMARKS.
	Groups	Spots.	Groups	Spots.	Groups	Spots.	Groups	Spots.	
1, 9 a. m.	0	0	0	0	0	0	5	9	Many of the spots small. Many of the spots small.
3, 4 p. m.	2	25†	1	2	0	0	6	35†	
4, 9 a. m.	0	0	1	5	0	0	5	30†	
5, 2 p. m.	0	0	1	3	0	0	4	20†	
6, 10 a. m.	0	5	0	0	0	5	4	25†	
7, 4 p. m.	0	0	0	0	0	0	3	2†	
8, 3 p. m.	0	0	0	0	0	0	3	20†	
10, 1 p. m.	1	3	0	3	1	3	4	20†	
11, 1 p. m.	0	0	1	2	0	0	3	15	
14, 10 a. m.	1	3	0	0	1	3	4	15	
16, 1 p. m.	2	5	1	3	2	5	4	12	
18, 1 p. m.	1	2	1	2	1	2	4	15	
20, 1 p. m.	0	10†	0	0	0	0	4	25†	Spots probably disappeared by solar rotation. Many of the spots small.
21, 10 a. m.	1	20	0	0	1	2	5	45†	
23, 3 p. m.	0	0	0	0	0	0	5	45†	
25, 2 p. m.	0	0	0	0	4	30†	
27, 11 a. m.	1	3	1	15†	1	3	4	18†	

†Approximated.

Faculae were seen at the time of every observation.

Mr. H. D. Govey, at North Lewisburg, Ohio, reports : Sun spots were observed on every clear day during the month. They were largest and most numerous on the 9th and 21st and least at the close of the month. Mr. David Trowbridge at Waterburg, N. Y., reports as follows: 1st, 4 groups, 5 spots; the new group mentioned Sept. 30th has gone out; 1 new group, 2 spots, has appeared by rotation, and a new one has arisen in the east; faculae. 3d, 5 groups, 9 spots, one group has disappeared by rotation; 3 groups, spots faint, have arisen since the 1st. 4th, 3 groups, 4 spots, 2 groups have gone out. 5th, 4 groups, 6 spots, one new group just appearing by rotation. 6th, 4 groups, same as 5th, 5 spots. 8th, 3 groups, 6 spots, one group has disappeared by rotation, one gone out and one arisen. 9th, 3 groups, same as 8th, ten spots. 11th, 3 groups, 5 spots, one group has disappeared and one appeared by rotation. 14th, 4 groups, 4 spots, a new group has appeared by rotation, faculae in the east. 16th, 4 groups, 6 spots, 2 new groups have appeared by rotation and 2 gone out since the 14th. 20th, 3 groups, 10 spots, several larger. 21st, 3 groups, same as 20th, 7 spots. 22d, 4 groups, 9 spots, one group appears to have broken into two. 23d, 4 groups, same as 22d, 7 spots, cloudiness interfering with observation. 26th, 3 groups, 3 spots; they appear to be the same as some observed on the 23d. 27th, 5 groups, 6 spots one group appeared by rotation and one has arisen; faculae in the east and west. 30th, no spots observed, atmosphere somewhat hazy.

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