

pencil lead, and of a very bright violet, color were observed. It was impossible to touch the flames as they vanished, or escaped to other points on the wire. The cups of the anemometer, which were rapidly revolving, appeared as a ring of fire; the wind vane and other objects were also tipped with light. On approaching the light, the hands and face of the observer were similarly affected, but no heat was felt. The phenomenon was preceded by lightning and thunder and was accompanied by a dense driving snow. It disappeared at 8.55 p. m., simultaneously with the cessation of the snow. A similar display also occurred on the 9th.

West Las Animas, Colorado, 12th: The observer reports that the points of the wind vane were tipped with flame and the anemometer cups revolved in a circle of light.

ATMOSPHERIC ELECTRICITY INTERFERING WITH TELEGRAPHIC COMMUNICATION.

Coleman City, Texas, 13th; Fort McKavett, Texas, 8th, 19th.

OPTICAL PHENOMENA.

SOLAR HALOS.

Solar halos have been observed in the various districts on the following dates:

New England: 5th, 6th, 7th, 10th, 13th, 14th, 17th, 19th, 21st to 24th, 26th, 28th to 30th.

Middle Atlantic states: 7th, 8th, 14th, 19th, 30th.

South Atlantic states: 7th to 10th.

East Gulf states: 4th to 6th, 13th, 21st, 27th, 28th.

Ohio valley: 1st, 2d, 8th, 10th, 11th, 14th to 18th, 20th, 21st, 23d, 30th.

Tennessee: 16th, 18th.

Lower lake region: 6th, 7th, 9th to 12th, 14th, 16th, 17th, 20th, 24th, 26th to 28th.

Upper lake region: 5th, 10th, 20th, 22d, 28th.

Upper Mississippi valley: 1st, 3d, 6th, 8th, 11th, 14th, to 17th, 21st, 27th.

Middle Pacific coast region: 7th, 8th, 13th, 22d, 23d, 26th, 27th, 30th.

Solar halos were also reported from the following stations not included in the districts named above:

- Saint Vincent, Minnesota, 13th.
- Olivet, Dakota, 27th.
- Huron, Dakota, 1st, 2d.
- Fort Keogh, Montana, 7th.
- Yates Centre, Kansas, 1st, 2d, 3d, 6th, 18th, 19th, 24th.
- Palestine, Texas, 13th, 26th.
- Indianola, Texas, 1st.
- Santa Fé, New Mexico, 4th.
- Yuma, Arizona, 7th.
- Salt Lake City, Utah, 1st, 4th, 7th.
- Mission, Idaho, 7th.
- Umatilla, Oregon, 21st.
- Albany, Oregon, 16th, 28th.
- Roseburg, Oregon, 26th.
- San Diego, California, 14th.

LUNAR HALOS.

Lunar halos have been observed in the various districts on the following dates:

New England: 25th.

Middle Atlantic states: 1st, 3d, 14th, 21st, 23d, 25th, 28th, 29th.

South Atlantic states: 23d, 25th, 28th, 29th.

Florida peninsula: 1st, 2d, 27th.

East Gulf states: 1st, 3d, 21st, 22d, 25th, 27th, 28th, 29th.

West Gulf states: 2d, 20th, 22d to 30th.

Ohio valley and Tennessee: 3d, 24th, 26th to 30th.

Lower lake region: 7th, 12th, 23d, 25th; 26th, 27th, 29th.

Lunar halos were also reported from the following stations not included in the districts named above: Moorhead, Minnesota, 30th; Olivet, Dakota, 26th; Alexandria, Dakota, 1st;

Dodge City, Kansas, 23d, 24th; Yates Centre, Kansas, 25th; Umatilla, Oregon, 29th; Olympia, Washington territory, 28th.

MIRAGE.

Nantasket Beach, Massachusetts, 24th; Barnegat, New Jersey, 24th, 25th; Indianola, 1st, 2d, 3d, 5th; Alexandria, Dakota, 5th.

MISCELLANEOUS PHENOMENA.

SUNSETS.

The characteristics of the sky as indicative of fair or foul weather for the succeeding twenty-four hours have been observed at all Signal Service stations. Reports from one hundred and eighty-six stations show 5,534 observations to have been made, of which twenty-five were reported doubtful; of the remainder, 5,509, there were 4,420, or 82.2 per cent., 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— June, 1882.	No. of new		Disappear'd by solar rotation.		Reappear'd by solar rotation.		Total No. visible.		REMARKS.
	Gr'ps	Spots	Gr'p	Spots	Gr'ps	Spots	Gr'ps	Spots	
1, 3 p. m.	0	0	0	0	0	0	2	2	
2, 4 p. m.	2	5	0	0	1	3	4	7	
3, 5 p. m.	0	2	0	0	0	0	3	8	
5, 2 p. m.	0	2	0	0	0	0	2	6	
6, 2 p. m.	1	1	1	1	0	0	2	6	
3 p. m.	0	0	0	0	0	0	2	6	
7, 7 p. m.	0	0	0	1	0	0	0	5	
8, 2 p. m.	2	6	0	0	1	4	4	11	
8, 4 p. m.	0	8	0	0	0	8	4	19	
10, 3 p. m.	0	10†	2	3	0	8	2	23†	
13, 2 p. m.	1	7	-----	-----	1	2	2	33†	
15, 7 p. m.	0	5	0	0	0	0	2	40†	
16, 1 p. m.	0	10	0	0	0	0	2	50†	
18, 6 p. m.	1	5	0	0	1	5	2	55†	
18, 2 p. m.	0	0	0	0	0	0	3	55†	
21, 4 p. m.	0	0	1	10†	0	0	2	45†	
22, 12 m.	1	5	0	10	1	5	3	40†	
23, 3 p. m.	0	0	0	5	0	0	3	35†	
24, 3 p. m.	1	5	1	15†	1	5	3	25†	
26, 2 p. m.	2	10	0	0	1	5	5	35†	
27, 3 p. m.	1	5	0	5	0	0	6	35†	
29, 3 p. m.	1	5	1	5	1	5	6	35†	
30, 4 p. m.	1	5	0	0	1	5	7	40†	

†Approximated. Faculae were seen at the time of every observation.

Mr. H. D. Govey, at North Lewisburg, Ohio, reports sun spots were observed on all clear days during the month. They were least numerous on the 8th, largest on the 14th, and most numerous on the 30th.

Mr. David Trowbridge, at Waterburg, New York, reports: 2d, two groups, two spots; one faint group has disappeared. 6th, one group, one spot. 7th, one group, one spot. 8th, one group, one spot, hazy atmosphere. 9th, one group, two spots; the group observed on 8th has disappeared and a new group appeared by rotation; faculae in west and east. 11th, two groups, seven spots; the new group observed on the 9th is extensive; a new group has arisen near the middle of the disk; faculae numerous. 12th, one group, four spots; the new group observed on the 11th has disappeared. 13th, two groups, six spots; the group of the 12th appears to have separated into two. 14th, two groups, thirteen spots; the large group has twelve spots; a new group has appeared by rotation; faculae in the east. 18th, two groups, seven spots; faculae in the west. 20th, two groups, ten spots; the large group has disappeared by rotation and a new one has appeared. 21st, two groups, six spots; same as observed on 20th. 22d, two groups, four spots; the spots are fading out. 23d, three groups, five spots; one new group has appeared by rotation. 24th, two groups, three spots; one of the groups observed on the 22d has disappeared; faculae in the east; 26th, one group, one spot; one of the groups observed on the 24th appears to have faded out. 27th, four groups, eight spots; one group has appeared by rotation; faculae in the east; 28th, four groups, twelve spots; faculae. 29th, five groups, eight spots; one new group of nine spots has appeared by rotation.

METEORS.

Grand Haven, 20th: At 9.35 p. m., a brilliant meteor, apparently about three feet in diameter, resembling a huge ball of fire, was observed in the northern sky, at an altitude of about 45°. It pursued a northeasterly course and disappeared at a point about 20° east of north. During its passage, which was of about fifteen seconds duration, a hissing noise was distinctly heard; a light was produced, sufficiently brilliant to enable persons to read fine print.

Yates Centre, Kansas, 17th: Between 11 p. m. and midnight, a large meteor was observed, passing from a south-westerly to a northwesterly point, in a horizontal path about 30° above the horizon. It produced a light sufficiently bright to cast well-defined shadows, and left behind it a long fan-shaped trail, of pale red color, which remained visible for several seconds. Before disappearing it burst into numerous fragments.

POLAR BANDS.

Springfield, Massachusetts, 14th.
Punta Rassa, 5th.
Nashville, 4th.
New Corydon, Indiana, 1st, 2d, 12th, 14th to 20th, 23d, 26th.
Guttenburg, Iowa, 9th, 13th.
Gardiner, Maine, 9th, 24th.
Freehold, New Jersey, 6th, 11th, 29th.
Vineland, New Jersey, 8th, 13th.
Woodstock, Vermont, 13th.
Wytheville, Virginia, 2d, 7th, 18th.

EARTHQUAKES.

San Francisco, 27th: At 5.32 a. m., two severe shocks of earthquake, each of about ten seconds duration, were experienced. The interval between the shocks was about four seconds. No serious damage resulted, but crockery, glassware, etc., were broken. Reports from points along the coast between Petaluma and Hollister and as far east as Stockton, state that this shock was the severest that has occurred since the remarkable earthquake of 1868. It was most severe along the immediate coast, and decreased in severity eastward, it being reported as a slight shock at Stockton. At San José, the walls of a number of buildings were reported to have been badly cracked. At Santa Cruz mountains, chimneys were overturned and windows were broken. In this city, the shock was unexpected, as such phenomena generally occur on warm, sultry days, while on this occasion the weather was cool and damp.

ZODIACAL LIGHT.

Nashville, 4th, 6th, 10th, 12th, 14th, 16th; Monticello, Iowa, 5th, 6th, 12th; Cambridge, Massachusetts, zodiacal light suspected, 5th, 9th, 12th.

PRAIRIE AND FOREST FIRES.

Fort McKavett, Texas, 29th.

DROUGHT.

Shreveport, 30th: No rain has fallen since the 10th; crops are very much in need of rain. Westborough, Massachusetts, 30th; Month very dry; season backward. Clarksville, Texas, 30th: The corn and cotton crops are suffering for rain. College station, Texas, 30th: Rain much needed in this locality.

WATER-SPOUTS.

Port Hope, Michigan, 18th. Shortly before 2 p. m., a tornado-like cloud was observed passing over this section, about half a mile south of this village. After passing out over the lake, other clouds of ominous blackness were seen moving with great rapidity toward one point, and the water in the lake was thrown up in places and dashed into the finest spray. As the clouds met, a large black cone formed, projecting downward toward the water, which was boiling and seething with great fury. A few minutes later, the water and clouds met, forming a perfect water spout. The water ascended the spout with great rapidity, causing foam and spray to fill the air on every side. The phenomenon lasted about ten minutes.

Steamship "Colorado," off the coast of North Carolina, on the 5th, observed a large water spout.

INSECTS.

Toledo, Ohio, 7th: Farmers report the appearance of a species of worm on wheat, causing considerable damage to the tender stalks.

Winnemucca, 29th: Black beetles and grasshoppers have caused great damage in this vicinity.

Sandy Springs, Maryland: From 16th to 24th, the army worm appeared in great numbers; no serious damage has been done.

Springfield, Missouri, 5th: The army worm has been observed in this section during the past week, in considerable numbers, but no serious damage has been done.

Leavenworth, Kansas, 13th: Reports from Republican county, state that the chinch bug has done considerable damage to grain.

SAND STORMS.

Coleman City, Texas, 19th, 20th; Santa Fé, 12th, 15th, 27th; Tucson, 9th; Yuma, 8th, 9th; Fort Verde, Arizona, 15th; Camp Thomas, Arizona, 1st to 6th, 10th, 11th, 12th, 15th, 28th; Umatilla, Oregon, 4th, 6th, 11th, 16th, 17th, 18th, 20th, 21st, 25th; West Las Animas, Colorado, 29th, violent dust storm from northwest.

ERRATA.

In the May REVIEW, on page 2, under "Barometric Ranges," the paragraph giving ranges at Eagle Rock and Umatilla should read northern plateau, and not southern plateau.

On page 9, under the heading "Deviations from Mean Temperature," in paragraphs giving mean temperature for Indiana, should read Illinois, and for Illinois, should read Indiana.

PUBLISHED BY ORDER OF THE SECRETARY OF WAR :

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Chief Signal Officer, U. S. A.

Copy furnished for

Entered at the Post Office, Washington, D. C., as Second-Class Matter.

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