

Cheyenne, Wyoming, 16th.
 Uncompahgre, Colorado, 16th.
 Genoa, Nebraska, 17th.
 Red Bluff, California, 24th.
 Fort Canby, Washington Territory, 27th.

OPTICAL PHENOMENA.

SOLAR HALOS.

Solar halos have been observed in the various states and territories on the following dates:
Arkansas.—Lead Hill, 10th, 13th, 16th, 23d, 28th.
California.—San Francisco, 3d, 7th, 11th, 27th, 31st; Poway, 22d; Cape Mendocino, 30th.
Dakota.—Fort Buford, 9th, 27th; Webster, 12th, 19th, 20th.
Florida.—Key West, 5th, 8th, 14th; Archer, 13th, 30th.
Georgia.—Augusta, 15th, 20th.
Illinois.—Cairo, 11th; Polo, 17th, 18th; Chicago, 30th.
Kansas.—Holton, 7th; Independence, 10th; Yates Centre, 10th.
Maine.—Cornish, 23d; Gardiner, 23d.
Massachusetts.—Provincetown, 23d.
Michigan.—Swartz Creek, 4th; Marquette, 9th; Grand Haven, 24th.
Minnesota.—Northfield, 4th.
Nebraska.—Johnson, 7th.
Nevada.—Carson City, 27th.
New Hampshire.—Grafton, 3d; Mount Washington, 8th, 23d.
New York.—Palermo, 28th.
North Carolina.—Fort Macon, 11th; Cape Lookout, 28th.
Ohio.—Wauseon, 3d, 4th; Toledo, 4th.
Tennessee.—Chattanooga, 4th; Nashville, 28th.
Texas.—Indianola, 21st; Palestine, 23d; Fort Davis, 31st.
Utah.—Salt Lake City 19th.
Vermont.—Lunenburg, 10th, 30th; Strafford, 23d.
Virginia.—Variety Mills, 27th, 28th.
Wisconsin.—Manitowoc, 4th.

LUNAR HALOS.

Lunar halos have been observed in the various states and territories on the following dates:
Alabama.—Auburn, 11th, 15th; Mobile, 15th.
Arizona.—Prescott, 12th; Fort Apache, 21st.
Arkansas.—Lead Hill, 10th; Fort Smith, 10th, 12th.
California.—Los Angeles, 11th, 16th, 21st; San Diego, 20th, 22d.
Colorado.—Uncompahgre, 12th.
Dakota.—Webster, 9th; Fort Bennett, 10th; Fort Meade, 13th.
Florida.—Limona, 12th, 14th.
Georgia.—Augusta, 12th; Atlanta, 18th.
Illinois.—Cairo, 8th, 9th, 10th, 13th, 17th, 18th; Chicago, 10th, 17th; Polo, 10th; Riley, 10th; Springfield, 10th, 16th.
Indiana.—Wabash, 9th, 17th.
Iowa.—Humboldt, 10th; Dubuque, 16th; Guttenburg, 16th; Manchester, 16th; Monticello, 16th; Indianola, 17th.
Kansas.—Yates Centre, 8th, 10th; Independence, 10th; Fort Scott, 10th, 17th; Clay Centre, 14th.
Kentucky.—Frankfort, 12th; Louisville, 12th.
Maine.—Gardiner, 8th; Eastport, 18th.
Massachusetts.—Boston, 8th; Dudley, 8th.
Michigan.—Alpena, 11th; Port Huron, 12th; Kalamazoo, 16th; Swartz creek, 17th.
Minnesota.—Saint Paul, 12th.
Mississippi.—Vicksburg, 8th.
Missouri.—Curryville, 19th.
Nebraska.—Johnson, 7th.
Nevada.—Carson City, 11th.
New Hampshire.—Mount Washington, 8th.
New Jersey.—Freehold, 8th, 9th, 11th, 16th; Moorestown, 10th, 25th; Barnegat City, 14th, 19th, 20th.
New York.—Menand Station (near Albany), 9th.
North Carolina.—Cape Lookout, 9th, 10th; Fort Macon, 11th.

Ohio.—Columbus, 11th; Cincinnati, 12th; Wauseon, 18th.
Oregon.—Portland, 15th.
Pennsylvania.—Fallsington, 11th; Chambersburg, 30th.
Tennessee.—Milan, 12th; Memphis, 13th.
Texas.—Galveston, 3d, 7th, 17th; Indianola, 4th to 8th, 10th, 11th, 12th, 15th, 16th, 18th; Fort Stockton, 10th, 15th, 16th.
Utah.—Salt Lake City, 18th, 19th, 25th.
Vermont.—Strafford, 10th.
Virginia.—Norfolk, 10th; Wytheville, 10th; Johnstown, 12th, 13th.
Washington Territory.—Spokane Falls, 9th; Fort Canby, 10th, 23d; Dayton, 11th, 12th.
Wisconsin.—Franklin, 8th; Grand Haven, 10th; Milwaukee, 14th; Beloit, 14th, 16th; La Crosse, 16th.

MIRAGE.

Indianola, Texas, 20th, 25th, 30th.

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 fifty-two stations show 4,610 observations to have been made, of which twenty-one were reported doubtful; of the remainder, 4,589, there were 3,852, or 83.9 per cent., followed by the expected weather.

SUN SPOTS.

The following record of sun spots for the month of October, 1883, has been forwarded by Professor D. P. Todd, Director of the Lawrence observatory, Amherst, Massachusetts:

Date— Oct., 1883.	No. of new		Disappeared by solar rotation.		Reappeared by solar rotation.		Total No. visible.		Remarks.
	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	
1, 4 p. m.	2	2					2	2	
3, 10 a. m.	1	3	0	0			3	5	
4, 9 a. m.	0	4	1	1	0	0	2	8	
4, 12 m.	2	6	0	0	1	2	4	13	
6, 3 p. m.	1	1	0	0	1	1	5	14	
7, 4 p. m.	2	15	0	0	1	5	7	30	Also veiled spots.
8, 10 a. m.	0	0	1	1	0	0	0	30	
9, 3 p. m.	1	15	0	0	1	1	7	45	
10, 12 m.	0	20	0	0	0	0	7	70	
11, 11 a. m.	1	15	0	0	0	0	8	85	Two of spots quite large.
13, 12 m.	1	10			1	10	5	65	
14, 2 p. m.	0	5	0	0	0	5	5	70	
15, 10 a. m.	2	10	0	5	0	0	7	75	
16, 3 p. m.	0	0	1	5	0	0	6	70	
17, 12 m.	0	0	0	10	0	0	6	60	
18, 4 p. m.	0	0	2	25	0	0	4	30	
22, 5 p. m.	1	2					3	15	
28, 10 a. m.							7	50	
30, 2 p. m.	0	0	2	15	0	0	5	35	
31, 3 p. m.	1	2	0	0	1	2	6	35	

Faculae were seen at the time of every observation. 1 Approximated.

Mr. William Dawson, of Spiceland, Indiana, observed sun-spots during October as follows:
 1st.—Two groups, four spots, three of which were near the east edge; all prominent; air very poor.
 7th.—Seven groups, sixty-five spots; a large oblong spot near east edge; a row of groups across the sun.
 8th.—Seven groups, seventy-one spots; much faculae.
 9th.—Six groups, one hundred and thirty-five spots; many of the latter were large. Eighty-eight spots were counted with 50 eye-piece.
 13th.—Six groups, seventy (?) spots, observed with 50 eye-piece through cloud.
 14th.—Six groups, ninety spots, observed with 50 eye-piece. Two large groups were near the west side, and one near the east edge.
 15th.—Six groups, one hundred and fifty spots, observed with 100 eye-piece. There were sixty-five spots in one group near the west edge.
 19th.—One spot was distinctly seen through cloud without the telescope.