

Arkansas.—3d to 6th, 18th, 19th, 20th, 31st.
California.—1st, 2d, 6th, 7th, 8th, 11th, 16th, 18th, 22d, 23d, 26th, 27th, 29th, 30th.
Colorado.—10th, 18th.
Connecticut.—1st, 6th, 9th, 11th, 18th, 23d, 24th, 25th.
Dakota.—1st, 4th, 8th, 10th, 30th, 31st.
District of Columbia.—4th, 5th, 23d, 24th, 30th.
Florida.—14th, 16th, 18th, 24th.
Georgia.—3d.
Idaho.—1st, 2d, 10th, 13th, 15th, 28th.
Illinois.—2d to 5th, 11th, 17th, 25th, 27th.
Indiana.—2d, 17th, 22d.
Iowa.—5th, 7th to 11th, 14th to 17th, 19th, 21st, 22d, 24th to 28th, 30th, 31st.
Kansas.—2d, 5th, 6th, 7th, 16th, 20th, 21st, 22d.
Louisiana.—30th.
Maine.—10th, 23d.
Massachusetts.—6th, 13th, 22d, 23d.
Michigan.—6th, 7th, 8th, 13th, 17th, 18th, 23d, 25th, 27th to 30th.
Minnesota.—5th.
Missouri.—5th, 16th, 18th, 20th, 24th, 28th.
Nebraska.—2d, 3d, 8th, 9th, 10th, 17th, 18th, 21st, 24th, 25th, 31st.
Nevada.—8th, 17th, 22d, 29th.
New Hampshire.—3d, 6th, 9th, 22d, 23d.
New Jersey.—23d.
New York.—3d, 7th, 9th, 11th, 22d, 25th, 28th.
North Carolina.—1st, 3d, 4th, 6th, 16th, 20th, 23d.
Ohio.—2d, 3d, 5th, 6th, 8th to 11th, 21st, 22d, 23d, 25th to 29th, 31st.
Oregon.—8th, 13th, 17th, 28th.
Pennsylvania.—6th, 11th, 17th, 21st, 28th.
Rhode Island.—11th, 24th.
South Carolina.—29th.
Tennessee.—3d, 14th, 23d, 24th, 30th, 31st.
Texas.—2d, 9th, 18th, 28th, 31st.
Utah.—9th, 17th, 23d, 30th, 31st.
Virginia.—4th, 5th, 23d, 24th, 28th, 30th, 31st.
Washington Territory.—3d, 14th.
Wisconsin.—5th, 16th, 17th, 21st, 23d, 27th, 30th.

LUNAR HALOS.

Lunar halos were observed in the various states and territories as follows:

Alabama.—24th, 27th.
Arizona.—3d, 8th, 22d, 23d, 26th, 27th, 29th, 30th.
California.—1st, 2d, 5th, 7th, 8th, 22d, 23d, 24th, 26th, 28th, 29th, 30th.
Colorado.—23d.
Connecticut.—22d, 24th, 25th, 28th.
Dakota.—1st, 23d, 26th, 30th, 31st.
Florida.—24th, 27th, 30th.
Georgia.—27th, 30th.
Idaho.—6th, 28th.
Illinois.—2d, 24th, 26th, 27th, 28th, 30th.
Indiana.—2d, 21st, 22d, 25th, 27th, 29th, 30th.
Iowa.—24th to 29th, 31st.
Kansas.—1st, 22d to 28th.
Kentucky.—22d.
Louisiana.—27th.
Maine.—22d, 23d, 24th, 26th, 29th.
Maryland.—23d.
Massachusetts.—22d, 24th, 25th, 26th.
Michigan.—19th, 23d, 24th, 26th, 27th, 29th, 31st.
Minnesota.—25th, 29th.
Missouri.—22d, 24th.
Montana.—26th.
Nebraska.—1st, 3d, 21st, 22d, 23d, 26th, 27th, 29th.
Nevada.—1st, 22d, 23d, 24th, 29th.
New Hampshire.—3d.
New Jersey.—22d, 24th, 25th, 26th, 28th, 30th.

New Mexico.—29th.
New York.—3d, 6th, 22d to 25th, 28th.
North Carolina.—3d, 24th, 26th to 29th, 31st.
Ohio.—2d, 22d, 27th, 28th, 30th.
Oregon.—3d, 28th.
Pennsylvania.—1st, 22d, 25th.
Rhode Island.—4th, 5th, 24th, 30th.
South Carolina.—26th.
Tennessee.—2d, 3d, 24th.
Texas.—21st, 22d, 27th to 31st.
Utah.—1st, 7th.
Vermont.—28th.
Virginia.—1st, 3d, 29th, 30th, 31st.
Wisconsin.—23d, 27th, 28th, 30th, 31st.
Wyoming.—23d, 24th, 27th.

The phases of the moon during March were: last quarter, 8th, 1.48 p. m.; new moon, 16th, 12.31 p. m.; first quarter, 23d, 12.17 p. m.; full moon, 30th, 11.34 a. m.; apogee, 9th, 3.12 p. m.; perigee, 23d, 3.54 p. m.

MIRAGE.

Cedar Keys, Florida, 11th: the mainland and vessels appeared very near and distinct in the east and northeast.

Mackinaw City, Michigan, 8th: a very distinct mirage was observed at 9.30 a. m., the outlines of an island, seven miles east of station, being plainly visible; the phenomenon faded away about 10 a. m. On the 18th the image of islands reflected from the snow was much more distinctly observed than the outlines of the islands themselves, which could be seen beyond. On the 20th a mirage was also observed, and on the 23d a very distinct mirage was seen from 8 a. m. to 10.30 a. m.; it was first observed in the northeast. Islands which are ordinarily below the horizon, at a distance estimated at from eighteen to twenty miles, were distinctly seen, apparently within eight miles of this station. The phenomenon gradually extended to the east and southeast as the sun rose higher in the heavens. People crossing the straits report that the reflection of this shore from lake surface was at first taken for a strip of open water. All islands and coast lines were much elevated, while their reflection from the lake surface was very distinct. Another mirage was observed on the 29th.

Saint Vincent, Minnesota, 28th: a fine mirage was observed during the morning. The "Ridge," eighteen miles distant, and other objects not ordinarily visible, were plainly seen.

The following stations also report mirage:

Webster, Dakota, 7th, 19th, 21st, 22d, 24th, 27th, 28th, 31st
 New London, Connecticut, 18th.
 Sherlock, Kansas, 3d, 16th.
 Salina, Kansas, 5th, 13th, 14th, 19th.
 San Diego, California, 25th.

MISCELLANEOUS PHENOMENA.

DROUGHT.

Swanwick, Perry county, Illinois: at the close of March, many cisterns were dry, necessitating hauling of water for household uses. The continued cold and dry weather has seriously injured the wheat crop.

Cahuenga Valley, Los Angeles county, California, 31st: the past three months have been very warm and dry; at the close of March the crops were suffering and the farmers were cutting their wheat to be used as hay.

Salina, Saline county, Kansas: the cold and dry weather during March seriously injured the wheat crop in this section.

Mattoon, Coles county, Illinois, 31st: the weather was very dry during the whole month; very little rain has fallen in this vicinity during the last seventy-five days.

Ashland, Oregon; at the close of the month the weather was very dry and rain much needed.

The observer at San Diego, California, reported on the 5th that in Spring Valley and vicinity, ten miles east of that place, the wheat crop was much damaged in consequence of drought, no rain having fallen since the early part of January.

EARTHQUAKES.

Lancaster, Lancaster county, Pennsylvania: a heavy rumbling, which is supposed to have been due to an earthquake, was distinctly felt in this city shortly after 8 p. m., on the 8th. Buildings trembled and in some instances plates were shaken from stoves. In several churches the services were interrupted.

The "New York Herald" of March 19th, contained the following: Contocook, New Hampshire, March 18, 1885. A distinct shock of earthquake was felt in this vicinity a few minutes past twelve o'clock to-day.

The Norwegian brig "Coulant," which arrived at Philadelphia on April 10th, reports having experienced a severe earthquake shock on March 22d, when in latitude N. 13° 22', longitude W. 45° 30'.

The following reports relate to the earthquake which occurred in California on the 30th:

San Raphael, Marin county: at 11.30 p. m., there occurred three perceptible earthquake shocks lasting about twelve seconds; the vibration was apparently from southeast; the disturbance was sufficient to stop clocks; no damage resulted.

San José, Santa Clara county: a slight shock of earthquake occurred here at 11.35 p. m.; the motion was from east to west.

Salinas, Monterey county: at 11.45 p. m. two distinct shocks of earthquake, occurring in quick succession, were felt at this place; the vibration was apparently from north to south; the shocks were sufficiently severe to awaken persons from sleep.

The Signal Service observer at San Francisco reports the following:

A very light earthquake shock was felt in this city at 2.56 a. m. (75th meridian time), the vibration being apparently from east to west. The shock was quite generally felt in this vicinity. At Hollister several shocks were reported to have been felt during the night of the 30-31st. At Fall Brook, San Diego county, a slight earthquake was reported to have occurred at about 3 a. m. on the 31st.

METEORS.

The "Chico (California) Chronicle," of March 7th, contains a report of a remarkable meteor which struck the earth about six miles east of Chico during the night of the 5-6th. The report referred to states that the meteor lighted up the country for miles, and was accompanied by a noise like thunder. On the 6th a party numbering several persons instituted a search for the aerolite, which was found among the foot hills east of Chico. The meteoric body is reported as having a length a few inches over thirty feet, and a diameter of about two feet; it was of a slate color and of pyramidal shape; its weight is estimated at several tons. The meteor, in falling, struck upon a lava formation, which prevented it from going into the earth. After striking the lava bed it glanced about two hundred feet, leaving a furrow two feet deep for that distance. The body was found to be composed of a very hard substance, which resisted heavy blows made with a sledge-hammer without having the least scratch made upon it.

Dr. A. Fouch, voluntary observer at College City, Colusa county, California, has forwarded the following report of a meteor which was probably identical with that above referred to: "On March 5th, at about 10 p. m., when on my way to Berlin (a village five miles north of College City) I observed a meteor almost directly overhead. Its course was to the northwest, and when at an altitude of about 45° it exploded into several parts, which scattered in all directions; the report at its explosion was distinctly heard. The light produced by the meteor was as brilliant as that of an electric light and made it possible to have seen a needle on the ground." College City is situated about fifty miles southwest from Chico.

Alpena, Michigan, 10th, a large and very bright meteor was observed at 10.09 p. m.; its course was from west to east, moving very rapidly and leaving a trail of about 30° in length. When the meteor was within 50° of the horizon it exploded, leaving a very brilliant trail, which remained visible about fifty seconds.

Burlington, Vermont: the most brilliant meteor seen in this section for many years, was observed in the northwestern sky at 9 p. m. on the 21st; its brightness illuminated the heavens in all directions. When near the earth a large fragment fell from the main body which remained intact, and passed beneath the horizon.

San Francisco, California: on the 28th at 10.4 p. m. a large meteor was observed moving in a southeasterly direction and leaving a short train.

Meteors were also observed at the following places:

Fort Thomas, Arizona, 10th.

Lead Hill, Arkansas, 1st, 18th.

Cedar Rapids, Iowa, 22d.

Allison, Kansas, 3d, 5th, 6th, 8th, 9th, 10th, 13th, 14th, 15th, 17th, 27th.

Sterling, Kansas, 17th.

Sherlock, Kansas, 21st.

Richmond, Kentucky, 5th.

Rowe, Massachusetts, 6th.

Madison, Nebraska, 12th.

Tiffin, Ohio, 11th.

Pittsburg, Pennsylvania, 22d.

MIGRATION OF BIRDS.

Geese flying southward.—Elk Falls, Kansas, 1st; Independence, Kansas, 6th; Grand Haven, Michigan, 29th; Fort Custer, Montana, 15th.

Geese flying northward.—Fort Sully, Dakota, 31st; Fort Buford, Dakota, 30th; Webster, Dakota, 27th, 29th, 31st; Lewiston, Idaho, 14th; Edgington, Illinois, 12th, 15th, 27th, 28th, 30th; Fort Reno, Indian Territory, 14th; Guilford, Indiana, 11th; Monticello, Iowa, 30th; Round Grove, Iowa, 4th; Independence, Kansas, 1st, 2d, 30th; Manhattan, Kansas, 3d; Leavenworth, Kansas, 5th; Wellington, Kansas, 10th; Clay Centre, Kansas, 1st, 2d; Yates Centre, Kansas, 1st, 2d, 17th, 25th, 26th; Salina, Kansas, 21st, 23d, 25th; Allison, Kansas, 2d, 3d, 6th, 8th, 9th, 10th, 13th, 16th, 17th, 20th, 21st, 24th, 30th; West Leavenworth, Kansas, 3d, 18th, 24th; Eastport, Maine, 31st; Emmitsburg, Maryland, 1st; Mottville, Michigan, 28th; Detroit, Michigan, 27th; Red Willow and Madison, Nebraska, 4th; De Soto, Nebraska, 2d, 3d; Genoa, Nebraska, 2d, 9th; New River Inlet, North Carolina, 10th; Lakeview, Oregon, 1st; Albany, Oregon, 14th, 18th; Point Judith, Rhode Island, 5th; San Antonio, Texas, 30th; Indianola, Texas, 16th, 27th; Cleburne, Texas, 3d, 18th; Dale Enterprise, Virginia, 6th.

Ducks flying southward.—Kitty Hawk, North Carolina, 24th.

Ducks flying northward.—Bismarek, Dakota, 20th; Fort Sully, Dakota, 31st; Huron, Dakota, 22d; Anna, Illinois, 1st; Edgington, Illinois, 13th, 14th, 16th, 26th, 27th, 30th; Des Moines, Iowa, 12th; Allison, Kansas, 6th; Yates Centre, Kansas, 2d, 3d, 4th, 7th, 13th, 14th, 18th, 19th, 28th; West Leavenworth, Kansas, 10th; Lamar, Missouri, 1st; Genoa, Nebraska, 9th; Palermo, New York, 8th; Mountainville, New York, 5th; Kitty Hawk, North Carolina, 10th; Indianola, Texas, 27th.

Cranes flying northward.—Forsyth, Georgia, 9th; Des Moines, Iowa, 30th.

Brents flying northward.—West Leavenworth, Kansas, 3d, 10th, 25th.

PRAIRIE AND FOREST FIRES.

Sherlock, Kansas, prairie fires were observed southwest from station during the night on the 17th and 19th; also on the 21st, showing an unbroken line, from west to north, probably fifty miles in length.

Yaukton, Dakota, 13th, 16th to 19th, 24th, 25th, 26th, 29th, 30th, 31st.

Burlington, Iowa, 17th, northeast of station; also 19th, 20th, 31st.

Pike's Peak, Colorado, 5th, 11th, and 19th, extensive, about thirty-five miles east and southeast of station, moving eastward; also on 31st, northeast of station, apparently east of Denver.

Fort Reno, Indian Territory, 1st, 2d, 3d, 5th to 9th, 15th to 22d, 29th, 30th.

North Platte, Nebraska, 14th, 15th.

De Soto, Nebraska, 26th, 31st.

Genoa, Nebraska, 30th.

Fort Totten, Dakota, 19th, northwest of station.

Fort Sully, Dakota, 13th, 14th, 31st.

West Las Animas, Colorado, 19th.

Fort Elliott, Texas, 31st.

Moorestown, New Jersey, 25th.

Wilmington, North Carolina, 9th, 11th.

During the night of the 17-18th, a fire occurred in the woods in Suffolk county, Long Island, and burned over an area of three square miles of timber land.

POLAR BANDS.

Polar bands were reported during the month by the following stations:

Lead Hill, Arkansas, 23d.

Sacramento, California, 8th, 12th.

Montrose, Colorado, 6th, 11th, 20th.

Bismarck, Dakota, 15th.

Indianapolis, Indiana, 17th.

Guttenburg, Iowa, 22d.

Leavenworth, Kansas, 15th.

Maud, Kansas, 2d, 3d, 14th, 20th, 29th, 30th, 31st.

Yates Center, Kansas, 2d, 3d, 18th, 20th.

Portland, Maine, 22d.

Emmitsburg, Maryland, 15th.

Amherst, Massachusetts, 12th, 18th,

Somerset, Massachusetts, 23d.

Moorestown, New Jersey, 21st.

Mountainville, New York, 12th.

Wauseon, Ohio, 5th, 11th, 17th, 20th, 27th.

Point Judith, Rhode Island, 12th, 18th.

Providence, Rhode Island, 12th.

Nashville, Tennessee, 1st.

El Paso, Texas, 7th, 13th, 29th.

Rio Grande City, Texas, 2d, 28th.

Woodstock, Vermont, 22d, 23d, 24th.

Dale Enterprise, Virginia, 4th.

Wytheville, Virginia, 3d, 18th, 31st.

SUN SPOTS.

Professor David P. Todd, director of the Lawrence Observatory, Amherst, Massachusetts, furnishes the following record of sun spots for March, 1885:

Date— Mar., 1885.	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	
2, 12 m.	2	25 ⁺	0	0	0	0	5	90 ⁺	Many of the spots small.
3, 5 p. m.	0	0	0	0	0	0	5	90 ⁺	
4, 10 a. m.	2	5	0	0	2	5	6	140 ⁺	
5, 5 p. m.	0	0	0	0	0	0	6	130 ⁺	
5, 4 p. m.	0	20 ⁺	0	0	0	0	6	150 ⁺	
6, 11 a. m.	0	2	0	0	0	0	6	120 ⁺	
8, 4 p. m.	0	0	0	0	0	0	6	65 ⁺	
8, 5 p. m.	0	0	0	0	0	0	6	60 ⁺	
10, 11 a. m.	2	5	0	0	2	5	6	25 ⁺	
11, 12 m.	1	5	2	5 ⁺	1	3	4	20 ⁺	
12, 3 p. m.	0	0	2	5 ⁺	0	0	4	15 ⁺	
13, 4 p. m.	2	5 ⁺	0	0	1	1	6	20 ⁺	
14, 12 m.	0	0	0	0	0	0	5	15 ⁺	
15, 3 p. m.	0	0	0	0	0	0	5	15 ⁺	
16, 1 p. m.	0	0	1	2	0	0	4	12 ⁺	
18, 11 a. m.	1	2	0	0	1	2	4	15 ⁺	
21, 11 a. m.	1	1	0	0	1	1	2	3	
23, 6 p. m.	0	0	1	2	0	0	0	0	
23, 5 p. m.	0	0	0	0	0	0	0	0	
24, 12 m.	2	3	0	0	0	0	2	3	
25, 5 p. m.	1	9	0	0	1	2	3	12	
25, 4 p. m.	1	12 ⁺	0	0	1	12	4	15 ⁺	
26, 11 a. m.	0	20 ⁺	0	0	0	0	3	40 ⁺	
30, 1 p. m.	0	20 ⁺	0	0	0	0	3	60 ⁺	
31, 12 m.	1	1	0	0	1	1	3	50 ⁺	

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

SUNSETS.

The characteristics of the sky, as indicative of fair or foul weather for the succeeding twenty-four hours, have been ob-

served at all Signal Service stations. Reports from one hundred and sixty-five stations show 5,065 observations to have been made, of which three were reported doubtful; of the remainder, 5,062, there were 4,431, or 87.5 per cent., followed by the expected weather.

SAND STORM.

Fort Thomas, Arizona, 8th.

WATER-SPOUTS.

On March 12th, in latitude N. 33° 24', longitude W. 73° 38', Captain W. G. Shackford, of the s. s. "Acapulco" observed a water-spout at 9 a. m.

The brig "Mary Fink," Captain Daniel B. Darrah, in N. 29° 13', W. 79° 17' reports having observed a large water-spout astern of the vessel, moving from southwest to east, and distant about three miles; four large, and several small water-spouts were also observed to the eastward on the same date.

The brig "L. F. Munson," J. H. Smith, master, reports having observed on the 17th, several water-spouts between N. 31° 55', W. 75° 34' and N. 33° 16', W. 74° 57'.

NOTES AND EXTRACTS.

The following extract is from the March, 1885, report of the "Alabama Weather Service," under direction of Prof. P. H. Mell, jr.:

The month of March has been cold and dry with few hard winds, reversing its usual character for heavy rains and violent winds. The temperature was nine degrees below the normal, frosts were frequent and the ground was frozen several times. This cold March following a cold winter has retarded the progress of all vegetation. In north Alabama the wheat crop has been destroyed by the unusual cold; corn was not generally planted until the last week of the month; plum and peach trees were just beginning to bloom at that time, and gardens are reported as fully a month behind. In central Alabama the season is well described by our correspondent at Greensboro:

"Our forests are still bare, although our earliest forest trees generally begin to bud the first week in March. A very few peach trees in the warmest exposures and common plum trees began blooming the second week in March, but most of our peach trees bloomed about the 31st, while only a few pear trees opened their first buds by the 31st. Red maples and early elms began blooming the second week in March. No corn is up and no cotton is planted. This the most backward spring we have had, perhaps, since 1855." In south Alabama the young corn just coming up was seriously injured by the severe cold of the 23d, and a large percentage had to be replanted; truck farmers have lost heavily by the backward season, and all farm work is retarded by the continued cold weather and frequent rains, and it is feared that the corn has been planted so late that it will interfere with the cotton crop, as both will require attention at the same time. The 23d was the coldest day recorded for March since 1873.

The average rainfall was four inches below the normal. There were five rainless days. The rainfall for south Alabama nearly doubled that of the other sections of the state.

There was no rain on the 16th, and all stations report a clear view of the eclipse.

State summary.

Mean temperature, 49°.S; highest temperature, 82° at Eufaula on the 28th; lowest temperature, 14°, at Gadsden on the 23d; range of temperature, 68°; greatest monthly range of temperature, 56° at Gadsden; least monthly range of temperature, 30° at Fayette; mean daily range, 15°.6; greatest daily range of temperature, 42° at Gadsden on the 3d; least daily range of temperature, 0° at Clintonville on the 18th, and Bolling on the 25th, and Carrollton on the 22d.

Mean depth of rainfall, 2.99 inches; mean daily rainfall, 0.096; greatest depth of monthly rainfall, 6.36 inches at Mobile; least depth of monthly rainfall, 1.29 inches at Tuscumbia; greatest daily rainfall, average for the state, 0.76 of an inch, on the 28th; greatest local daily rainfall, 3.05 inches at Clintonville on the 28th.

Days of general rainfall, 1st, 4th, 12th, 21st, 25th, 27th, 28th; average number of days on which rain fell, 9; average number of cloudy days, 11; average number of fair days, 8; average number of clear days, 12; warmest days, 12th, 28th, 31st; coldest day, 23d.

Prevailing direction of wind, northwest.

Snow fell in north Alabama on the 8th to a depth of two inches; it extended as far south as Lafayette; an additional slight fall of snow is reported on the 17th at Mount View, Tuscumbia, Florence, and Centre.

The month was remarkably free from heavy gales. Mobile reports that the greatest force of wind was 26 miles an hour from the west; Montgomery, 23 miles from the northwest; Chattanooga, 22 miles from the northwest. Some stations report strong winds accompanying the thunder-storm of the 28th; and the newspapers state that on that day a small tornado did much damage at Sidney, thirty miles from Mobile.

Thunder-storms were general on the 12th, 27th, and 28th; hail is reported