ordered late. In ninety-three cases, winds of twenty-five miles or more per hour were reported for which no signals were ordered.

COLD-WAVE SIGNALS.

During the month there were one hundred and forty-nine cold-wave signals displayed. Of these, one hundred and thirty-nine, or 93.29 per cent., were justified.

RAILWAY WEATHER SIGNALS.

Prof. P. H. Mell, jr., director of the "Alabama Weather Service," in the report for December, 1885, states:

The verifications of predictions for the whole area was 88 per cent. for temperature, and 100 per cent. for weather.

The following roads comprise this system: Western of Alabama; South and North; Montgomery and Mobile; Mobile and Girard; Georgia Pacific; East Tennessee, Virginia and Georgia system in Alabama; Memphis and Charleston; Columbus Western; Alabama Great Southern; Atlanta and West Point of Georgia; Northeastern of Georgia; Atlanta and Charlotte Air Line; Western and Atlantic; Georgia; East Tennessee, Virginia and Georgia system in Georgia; and Savannah, Florida and Western.

## ATMOSPHERIC ELECTRICITY.

AURORAS.

Auroral displays occurred during December, as follows:

Fort Totten, Dakota: an auroral arch of 25° altitude and 100° azimuth was observed at 9.20 p. m. of the 1st, the display lasting until 4.30 a. m. of the 2d.

Fort Sully, Dakota: a faint aurora, extending from 180° to 195° azimuth, with an altitude of 5°, was observed from 11.25 p. m. to midnight of the 1st.

Escanaba, Michigan: an auroral display was visible from 9.22 to 10.58 p. m. of the 1st, consisting of a dark segment of 15° altitude, bordered by a bright yellow arch 5° in width.

Mount Washington, New Hampshire: a faint auroral light was observed at 9.30 p. m. of the 1st; it gradually increased in extent until 10.10 p. m., when it reached its maximum of 40° azimuth with an altitude of 4°; streamers of a light green color were seen at intervals.

Bismarck, Dakota: an auroral light of a pale yellow color was observed at 10.45 p. m. of the 1st having an altitude of 5°, and extending from 135° to 225° azimuth; the arch was uniform and well defined; no dark segment was observed.

Manistique, Schoolcraft county, Michigan: a moderate auroral arch was observed from 8.30 to 10 p. m. of the 1st, having an altitude of 10° to 15° and extending from 170° to 215° azimuth.

Saint Vincent, Minnesota: an aurora was observed at 9.30 p. m. of the 1st, consisting of a pale, indistinct arch resting on a dark segment of 25° altitude, and extending from 160° to 250° azimuth.

Burlington, Chittenden county, Vermont: an aurora of a light straw color was observed from 12.30 to 1.30 a. m. of the 6th.

Portland, Maine: an aurora was observed from 9.40 to 11.45 p. m. of the 6th, consisting of an arch 5° in altitude and 85° azimuth; it faded away at 10.20 p. m., and reappeared a few moments later as an irregular arch, with two streamers, of about 30° altitude, having but a slight motion.

Cambridge, Middlesex county, Massachusetts: a low auroral arch, above a dark segment, was observed on the 6th.

Duluth, Minnesota: an auroral light, of a pale white color, having an altitude of 20° and extending from 160° to 230° azimuth, was observed at 8.30 p. m. of the 6th. At 9.45 p. m. the color changed to a light green.

Saint Paul, Minnesota: a faint auroral light, of a whitish color, was observed in the northern horizon on the 6th.

Saint Vincent, Minnesota: an aurora was observed at 7.20 p. m. of the 6th; it consisted of a pale whitish arch about 5° in width, and extending from 160° to 270° azimuth, with an altitude of 30°; the lower edge of the arch was well defined, beneath which a dark segment was plainly visible. The display continued until daylight of the 7th.

Tatoosh Island, Washington Territory: an aurora was observed from 2.15 to 4.00 a. m. of the 7th, consisting of a bluish-white color of 5° altitude, with a few slender beams shooting up to an altitude of 15°; the arch was bounded on the east and west by dense stratus clouds.

Manistique, Schoolcraft county, Michigan: an aurora, hav- a moderate diffused light, was observed at 12.18 a. m. of the 8th, having an altitude varying from 8° to 22° and 160° to 220° azimuth. The display lasted until daylight.

Escanaba, Michigan: an aurora of a pale yellow color was observed at 9.19 p. m. of the 6th; the display was very faint, and disappeared at 11.49 p. m.

Prairie du Chien, Crawford county, Wisconsin: an aurora of a whitish color, low in the sky, and 9° east of the magnetic pole, was observed from 9 to 10 p. m. of the 6th.

Saint Vincent, Minnesota: a faint auroral light was observed in the north at 7.45 p. m. of the 7th, continuing until after midnight.

Fort Totten, Dakota: an auroral display was visible from 9 p. m. of the 8th to 3 a. m. of the 9th, consisting of two arches of 15° and 20°, reaching its maximum intensity at 2 a. m.

Saint Vincent, Minnesota: an aurora, consisting of two parallel arches about 3° apart, and extending from 150° to 260° azimuth, with an altitude of 20°, was observed at 8.15 p. m. of the 8th. The lower arch was well defined, while the upper one was somewhat indistinct. The display continued until the morning of the 9th.

Other auroral displays were observed during the month, as follows:

1st.—Mackinaw City and Traverse City, Michigan; Gardiner and Kent's Hill, Maine; Winnipeg, Manitoba; Sydney, Nova Scotia; Charlottetown, Prince Edward's Island.

2d.—Mackinaw City, Michigan; Winnipeg, Manitoba.

4th.—Winnipeg, Manitoba.

5th.—Embarras, Wisconsin.

6th.—Boston, Massachusetts; Escanaba, Michigan; Moorhead, Albert Lea, and Sherburne, Minnesota; Fort Benton, Montana; Webster and Fort Totten, Dakota; Bancroft, West Union, and Cresco, Iowa; Gardiner, Cornish, and Kent's Hill, Maine; Nashua, New Hampshire; Embarras and Madison, Wisconsin; Winnipeg, Manitoba; Sydney, Nova Scotia; Charlottetown, Prince Edward Island.

7th.—Marquette, Michigan; Moorhead, Minnesota; Independence, Iowa; Gardiner, Kent's Hill, Cornish, and Orono, Maine; Cambridge, Westborough, and Fall River, Massachusetts; Newport, Vermont; Embarras, Wisconsin; Toronto, Ontario; Sydney, Nova Scotia.

8th.—Fort Totten and Webster, Dakota; Orono, Maine; Winnipeg, Manitoba.

9th.—Kent's Hill, Maine.

17th, 26th, 29th.—Winnipeg, Manitoba.

30th.—Lansing, Michigan.

THUNDER-STORMS.

Thunder-storms were reported in the various states and territories, as follows:

*Alabama.*—Mobile and Greensborough, 8th; Montgomery and Birmingham, 9th.

*Arizona.*—Fort Apache and Tucson, 8th; Fort Grant, 7th, 8th; Fort Bowie, 27th.

*Arkansas.*—Little Rock and Lead Hill, 8th.

*Colorado.*—Montrose, 31st.

*Florida.*—Archer, 2d, 9th, 13th, 26th; Sanford, 2d, 10th; Tallahassee, Jacksonville, and Cedar Keys, 9th; Key West, 9th, 14th; Pensacola, 13th.

*Georgia.*—Atlanta and Savannah, 9th.

*Illinois.*—Windsor, 4th, 8th; Cairo, Anna, Bunker Hill, and Collinsville, 8th; Chicago, 9th.

*Indiana.*—Greencastle, Indianapolis, and Terre Haute, 8th.

*Louisiana.*—Point Pleasant and Shreveport, 8th; Grand Coteau, 12th; New Orleans, 13th; Morgan City, 24th.

*Massachusetts.*—Fall River, 19th.

*Mississippi*—Vicksburg, 8th, 9th.

*Missouri.*—Centreville, 9th.

*New Mexico.*—Santa Fé, 27th.

*Table of miscellaneous meteorological data for December, 1885—Signal Service observations.*

| Stations. | Elevation above sea-level. | Atmospheric pressure (in inches and hundredths). Mean actual barometer. | Departure from normal. | Mean reduced barometer. | Extremes. Highest barometer | Date. | Lowest barometer | Date. | Monthly range of barometer. | Temperature of the air (in degrees Fahrenheit). Monthly mean. | Departure from normal. | Extremes. Max. | Date. | Mean max. | Min. | Date. | Mean min. | Monthly range. | Daily ranges. Greatest. | Date. | Least. | Date. | Mean rel. humidity. | Mean dew-point. | Precipitation. | Departure from normal. | Winds. Total movement. | Prevailing direction. | Maximum velocity. Miles p. h. | Direction. | Date. | No. of rainy days. | No. of cloudy days. | No. of fair days. | No. of clear days. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *New England.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eastport | 61 | 29.80 | —.12 | 29.87 | 30.68 | 12 | 28.92 | 5 | 1.76 | 27.8 | + 2.7 | 52.9 | 10 | 34.4 | 7.4 | 8 | 18.8 | 45.5 | 31.2 | 5 | 6.0 | 2 | 76.9 | 21.5 | 5.90 | + 2.06 | 10,005 | nw. | 43 | n. | 26 | 16 | 15 | 13 | 3 |
| Portland | 99 | 29.81 | —.10 | 29.92 | 30.68 | 12 | 28.97 | 5 | 1.71 | 27.2 | — 2.3 | 55.3 | 10 | 34.6 | 6.6 | 8 | 19.6 | 48.7 | 30.6 | 9 | 5.4 | 17 | 76.8 | 20.7 | 2.94 | — 0.20 | 6,549 | w. | 36 | w. | 7 | 16 | 10 | 14 | 7 |
| Mount Washington | 6,279 | 23.37 | ..... | 30.00 | 30.60 | 12 | 29.25 | 5 | 1.35 | 10.1 | + 1.0 | 41.8 | 10 | 18.8 | —16.1 | 7 | 1.5 | 57.9 | 34.5 | 8 | 5.7 | 2 | 95.0 | 9.0 | 4.83 | — 0.57 | 30,010 | nw. | 96 | sw. | 9 | 22 | 4 | 18 | 9 |
| Boston | 125 | 29.80 | —.12 | 29.94 | 30.70 | 12 | 29.09 | 5 | 1.61 | 32.8 | + 2.8 | 61.5 | 9 | 40.7 | 11.8 | 27 | 24.6 | 49.7 | 31.6 | 9 | 6.9 | 17 | 67.0 | 22.8 | 2.09 | — 1.54 | 10,856 | w. | 48 | w. | 7 | 14 | 12 | 11 | 8 |
| Block Island | 27 | 29.93 | ..... | 29.96 | 30.71 | 12 | 29.13 | 5 | 1.58 | 36.7 | + 0.6 | 57.4 | 9 | 43.4 | 17.4 | 8 | 30.7 | 40.0 | 31.5 | 8 | 4.9 | 12 | 80.5 | 31.3 | 4.68 | + 0.07 | 15,601 | nw. | 60 | ne. | 26 | 15 | 11 | 16 | 4 |
| Narragansett Pier | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 35.0 | ..... | 58.0 | 10 | 43.5 | 11.0 | 8 | 25.5 | 47.0 | ..... | ..... | ..... | ..... | ..... | ..... | 2.25 | — 1.86 | ..... | ..... | ..... | ..... | ..... | ..... | 15 | ..... | ..... |
| New Haven | 107 | 29.87 | ..... | 29.98 | 30.71 | 12 | 29.14 | 5 | 1.57 | 33.3 | + 2.2 | 56.4 | 10 | 41.5 | 10.3 | 8 | 25.2 | 46.1 | 27.1 | 9 | 6.0 | 1 | 68.8 | 23.8 | 3.31 | — 0.30 | 7,380 | w. | 31 | w. | 7 | 10 | 12 | 15 | 4 |
| New London | 47 | 29.94 | ..... | 29.98 | 30.73 | 12 | 29.16 | 5 | 1.57 | 35.0 | ..... | 58.8 | 10 | 42.0 | 14.4 | 8 | 27.9 | 44.4 | 24.6 | 13 | 5.0 | 1 | 72.0 | 26.7 | 3.92 | ..... | 6,573 | nw. | 45 | se. | 13 | 13 | 10 | 12 | 9 |
| *Middle Atlantic States.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Albany | 83 | 29.92 | —.09 | 30.01 | 30.74 | 12 | 29.13 | 5 | 1.61 | 30.2 | + 1.7 | 57.5 | 10 | 38.0 | 9.2 | 27 | 23.5 | 48.3 | 28.9 | 9 | 4.4 | 31 | 74.7 | 23.0 | 1.51 | — 1.24 | 6,559 | s. | 28 | w. | 7 | 13 | 18 | 11 | 2 |
| New York City | 164 | 29.83 | —.10 | 30.00 | 30.72 | 12 | 29.19 | 5 | 1.53 | 36.0 | + 2.9 | 60.1 | 10 | 44.4 | 14.1 | 8 | 29.4 | 46.0 | 25.8 | 5 | 6.5 | 1 | 69.0 | 26.5 | 2.69 | — 0.52 | 9,794 | nw. | 50 | w. | 7 | 7 | 3 | 21 | 7 |
| Philadelphia | 117 | 29.91 | —.10 | 30.03 | 30.76 | 12 | 29.26 | 5 | 1.50 | 36.7 | + 2.3 | 60.1 | 9 | 44.6 | 14.8 | 7 | 29.5 | 45.3 | 29.8 | 13 | 5.0 | 1 | 68.3 | 26.7 | 2.87 | + 0.27 | 9,129 | nw. | 37 | nw. | 5 | 7 | 6 | 17 | 8 |
| Atlantic City | 13 | 30.00 | —.10 | 30.00 | 30.71 | 12 | 29.25 | 5 | 1.46 | 36.9 | + 1.2 | 53.3 | 9 | 44.8 | 12.5 | 8 | 28.6 | 40.8 | 35.0 | 8 | 4.8 | 1 | 81.8 | 31.6 | 4.29 | — 0.07 | 7,766 | w. | 40 | n. | 26 | 9 | 5 | 17 | 9 |
| Barnegat City | 22 | 30.00 | — 08 | 30.01 | 30.73 | 12 | 29.24 | 5 | 1.49 | 38.0 | + 2.9 | 56.0 | 9 | 45.5 | 14.1 | 12 | 31.0 | 41.9 | 32.6 | 8 | 4.0 | 1 | 80.0 | 32.3 | 0.61 | — 3.96 | 13,188 | nw. | 52 | nw. | 7 | 9 | 9 | 12 | 10 |
| Cape May | 27 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Little Egg Harbor | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 38.2 | ..... | 54.0 | 9 | 46.7 | 14.0 | 7 | 30.0 | 40.0 | ..... | ..... | ..... | ..... | ..... | ..... | 3.36 | — 0.45 | ..... | ..... | ..... | ..... | ..... | ..... | 9 | ..... | ..... |
| Sandy Hook | 28 | 29.98 | —.10 | 30.00 | 30.72 | 12 | 29.21 | 5 | 1.51 | 37.0 | + 2.0 | 60.1 | 9 | 44.4 | 16.1 | 8 | 31.2 | 44.0 | 24.1 | 9 | 5.5 | 18 | 76.0 | 3.0 | 4.33 | + 0.45 | 16,063 | nw. | 55 | nw. | 5 | 9 | 6 | 18 | 7 |
| Cape Henlopen | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 33.1 | ..... | 62.1 | 12 | 42.5 | 17.0 | 7 | 23.8 | 45.1 | ..... | ..... | ..... | ..... | ..... | ..... | 3.79 | + 1.23 | ..... | ..... | ..... | ..... | ..... | ..... | 8 | ..... | ..... |
| Baltimore | 45 | 30.01 | —.10 | 30.05 | 30.79 | 12 | 29.34 | 5 | 1.45 | 37.6 | + 0.6 | 64.4 | 22 | 45.9 | 14.7 | 7 | 31.0 | 49.7 | 31.3 | 21 | 6.5 | 1 | 61.8 | 24.9 | 2.49 | — 0.68 | 5,047 | nw. | 26 | nw. | 5 | 6 | 8 | 19 | 4 |
| Ocean City | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 35.2 | ..... | 60.1 | 9 | 48.3 | 14.9 | 8 | 32.1 | 45.2 | ..... | ..... | ..... | ..... | ..... | ..... | 4.40 | + 0.71 | ..... | ..... | ..... | ..... | ..... | ..... | 13 | ..... | ..... |
| Washington City | 106 | 29.96 | —.08 | 30.06 | 30.80 | 12 | 29.29 | 5 | 1.52 | 37.5 | + 1.9 | 63.9 | 22 | 45.8 | 13.9 | 7 | 30.4 | 50.0 | 31.8 | 21 | 4.1 | 1 | 69.1 | 27.6 | 2.67 | — 0.37 | 5,244 | nw. | 28 | nw. | 5 | 6 | 3 | 19 | 9 |
| Cape Henry | 16 | 30.05 | —.08 | 30.05 | 30.74 | 12 | 29.33 | 5 | 1.40 | 43.4 | — 0.1 | 67.0 | 9 | 51.4 | 21.9 | 8 | 34.4 | 45.1 | 32.1 | 8 | 4.3 | 26 | 74.2 | 35.3 | 3.49 | — 0.90 | 12,078 | sw. | 53 | n. | 26 | 6 | 7 | 8 | 16 |
| Chincoteague | 8 | 30.04 | —.08 | 30.04 | 30.75 | 12 | 29.30 | 5 | 1.44 | 40.4 | + 1.5 | 64.5 | 9 | 48.9 | 17.8 | 8 | 32.9 | 46.7 | 32.6 | 8 | 7.4 | 2 | 73.1 | 32.0 | 4.16 | + 0.09 | 11,881 | nw. | 54 | n. | 26 | 6 | 5 | 14 | 12 |
| Lynchburg | 652 | 29.38 | —.05 | 30.09 | 30.74 | 12 | 29.42 | 5 | 1.33 | 39.6 | + 0.9 | 65.5 | 22 | 49.4 | 15.7 | 8 | 31.2 | 49.8 | 30.3 | 18 | 4.8 | 1 | 66.2 | 28.3 | 3.16 | — 0.75 | 3,524 | nw. | 23 | w. | 19 | 9 | 7 | 10 | 14 |
| Norfolk | 30 | 30.05 | —.07 | 30.06 | 30.70 | 12 | 29.35 | 5 | 1.35 | 43.2 | + 0.8 | 68.8 | 9 | 52.1 | 22.3 | 7 | 34.3 | 46.5 | 30.2 | 8 | 5.9 | 1 | 69.6 | 33.1 | 3.94 | + 0.10 | 6,065 | n. | 32 | n. | 26 | 9 | 5 | 11 | 15 |
| *South Atlantic States.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Charlotte | 808 | 29.26 | —.02 | 30.12 | 30.69 | 12 | 29.50 | 5 | 1.19 | 42.8 | — 0.2 | 66.2 | 22 | 52.8 | 20.1 | 27 | 32.1 | 46.1 | 33.2 | 21 | 8.9 | 2 | 62.2 | 29.1 | 4.71 | — 0.54 | 4,572 | sw. | 28 | nw. | 5 | 11 | 6 | 12 | 13 |
| Fort Macon | 11 | 30.10 | —.04 | 30.08 | 30.65 | 12 | 29.43 | 5 | 1.22 | 47.0 | — 1.4 | 65.2 | 9 | 53.5 | 25.9 | 27 | 39.3 | 39.3 | 26.5 | 5 | 4.4 | 1 | 85.8 | 42.8 | 5.98 | + 1.60 | 12,580 | sw. | 52 | sw. | 5 | 11 | 6 | 13 | 12 |
| Hatteras | 12 | 30.07 | ..... | 30.06 | 30.66 | 12 | 29.37 | 5 | 1.29 | 47.5 | + 0.2 | 68.5 | 9 | 54.6 | 28.0 | 27 | 40.8 | 40.5 | 29.0 | 8 | 7.1 | 9 | 77.9 | 40.5 | 6.23 | — 0.19 | 10,940 | w. | 48 | n. | 26 | 12 | 10 | 7 | 4 |
| Kitty Hawk | 9 | 30.08 | —.06 | 30.07 | 30.71 | 12 | 29.39 | 5 | 1.32 | 45.4 | + 0.3 | 67.7 | 9 | 53.1 | 25.3 | 27 | 37.3 | 42.4 | 28.3 | 9 | 7.4 | 24 | 70.5 | 35.0 | 6.59 | + 1.35 | 12,851 | w. | 65 | ne. | 26 | 11 | 8 | 11 | 10 |
| Smithville | 34 | 30.08 | —.06 | 30.08 | 30.60 | 12 | 29.47 | 5 | 1.13 | 46.5 | — 1.7 | 65.2 | 24 | 53.4 | 24.0 | 27 | 38.5 | 41.2 | 27.5 | 5 | 4.7 | 7 | 74.0 | 38.1 | 3.51 | 0.00 | 7,085 | w. | 41 | sw. | 5 | 10 | 6 | 12 | 13 |
| Charleston | 52 | 30.10 | .00 | 30.12 | 30.58 | 12 | 29.56 | 5 | 1.02 | 50.4 | — 0.7 | 70.0 | 9 | 58.6 | 28.0 | 27 | 41.3 | 42.0 | 25.5 | 14 | 8.0 | 2 | 68.7 | 39.2 | 6.30 | + 2.68 | 5,480 | w. | 31 | w. | 5 | 10 | 3 | 14 | 14 |
| Augusta | 183 | 29.98 | —.02 | 30.14 | 30.64 | 12 | 29.59 | 5 | 1.05 | 45.0 | — 2.9 | 71.9 | 9 | 59.2 | 23.0 | 27 | 33.6 | 48.9 | 40.7 | 29 | 9.9 | 1 | 68.2 | 32.4 | 2.14 | — 1.80 | 3,101 | w. | 26 | n. | 26 | 5 | 5 | 13 | 13 |
| Savannah | 87 | 30.08 | +.01 | 30.14 | 30.56 | 12 | 29.59 | 5 | 0.96 | 51.1 | — 1.2 | 71.8 | 13 | 61.2 | 30.0 | 27 | 41.5 | 41.8 | 30.7 | 8 | 9.5 | 9 | 67.8 | 39.7 | 5.50 | + 2.08 | 5,905 | nw. | 31 | nw. | 5 | 8 | 5 | 10 | 16 |
| Jacksonville | 43 | 30.14 | +.03 | 30.15 | 30.50 | 21 | 29.74 | 5 | 0.77 | 53.3 | — 2.7 | 76.0 | 9 | 63.2 | 32.2 | 27 | 44.7 | 43.8 | 27.6 | 28 | 11.4 | 26 | 73.7 | 44.1 | 7.76 | + 4.78 | 4,683 | nw. | 33 | w. | 5 | 7 | 4 | 15 | 12 |
| *Florida Peninsula.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cedar Keys | 22 | 30.14 | —.01 | 30.12 | 30.45 | 21 | 29.80 | 5 | 0.65 | 52.8 | — 6.9 | 73.7 | 23 | 60.9 | 31.0 | 15 | 44.9 | 42.7 | 25.7 | 17 | 7.8 | 9 | 83.7 | 47.7 | 3.84 | + 0.62 | 6,264 | nw. | 36 | s. | 9 | 8 | 2 | 17 | 12 |
| Key West | 20 | 30.12 | +.03 | 30.09 | 30.32 | 21 | 29.90 | 25 | 0.42 | 64.7 | — 5.7 | 83.0 | 10 | 69.2 | 50.2 | 27 | 61.1 | 32.8 | 20.3 | 10 | 2.5 | 1 | 82.2 | 58.9 | 1.72 | — 0.11 | 10,938 | ne. | 42 | n. | 10 | 8 | 9 | 11 | 11 |
| Sanford | 25? | 30.16 | ..... | 30.15 | 30.49 | 21 | 29.88 | 5 | 0.61 | 55.6 | — 8.4 | 84.9 | 9 | 66.0 | 32.0 | 28 | 46.6 | 52.9 | 31.1 | 28 | 8.6 | 26 | 73.6 | 46.4 | 1.85 | + 0.52 | 4,739 | n. | 33 | n. | 26 | 7 | 6 | 13 | 12 |
| *Eastern Gulf States.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Atlanta | 1,129 | 28.97 | .00 | 30.17 | 30.57 | 12 | 29.64 | 4 | 0.93 | 42.7 | — 2.6 | 69.0 | 9 | 51.6 | 21.0 | 15 | 34.1 | 48.0 | 27.0 | 5 | 7.8 | 2 | 61.3 | 28.6 | 2.64 | — 3.38 | 8,204 | w. | 36 | w. | 5 | 8 | 3 | 12 | 16 |
| Pensacola | 30 | 30.17 | +.05 | 30.16 | 30.51 | 11 | 29.73 | 9 | 0.78 | 50.5 | — 4.9 | 69.4 | 9 | 59.4 | 28.3 | 15 | 42.1 | 41.1 | 24.1 | 28 | 10.2 | 30 | 70.2 | 39.8 | 4.72 | — 0.64 | 5,430 | nw. | 37 | sw. | 8 | 5 | 4 | 14 | 13 |
| Mobile | 35 | 30.18 | +.06 | 29.18 | 30.54 | 11 | 29.67 | 8 | 0.87 | 49.5 | — 2.6 | 69.4 | 8 | 59.0 | 26.0 | 15 | 40.0 | 43.4 | 29.1 | 6 | 11.3 | 24 | 71.7 | 39.4 | 5.00 | + 0.26 | 6,090 | nw. | 36 | s. | 8 | 4 | 4 | 14 | 13 |
| Montgomery | 219 | 29.96 | +.03 | 30.17 | 30.58 | 11 | 29.67 | 8 | 0.91 | 46.6 | — 2.6 | 70.0 | 24 | 57.2 | 25.0 | 15 | 36.6 | 45.0 | 32.0 | 4 | 10.7 | 14 | 66.4 | 34.6 | 3.13 | — 2.28 | 4,132 | nw. | 32 | s. | 8 | 5 | 8 | 11 | 12 |
| Vicksburg | 209 | 29.98 | +.04 | 29.18 | 30.54 | 11 | 29.45 | 8 | 1.09 | 48.7 | — 1.6 | 73.0 | 8 | 59.5 | 22.5 | 15 | 39.2 | 50.5 | 31.6 | 3 | 9.2 | 1 | 61.7 | 34.6 | 2.86 | — 3.01 | 4,251 | e. | 33 | nw. | 4 | 7 | 5 | 13 | 13 |
| New Orleans | 52 | 30.15 | +.07 | 30.17 | 30.49 | 11 | 29.60 | 8 | 0.89 | 53.1 | — 2.2 | 73.5 | 23 | 61.8 | 30.4 | 15 | 45.0 | 43.1 | 26.1 | 6 | 7.0 | 14 | 77.8 | 45.9 | 4.38 | — 0.68 | 5,813 | n. | 29 | se. | 12 | 8 | 7 | 7 | 17 |
| *Western Gulf States.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shreveport | 227 | 29.94 | +.03 | 30.16 | 30.53 | 22 | 29.38 | 8 | 1.16 | 48.6 | — 0.6 | 73.2 | 4 | 58.7 | 25.4 | 15 | 39.0 | 47.8 | 33.4 | 3 | 9.1 | 24 | 65.5 | 36.1 | 4.11 | — 1.31 | ..... | s. | ..... | ..... | ..... | 6 | 4 | 12 | 15 |
| Fort Smith | 470 | 29.64 | +.03 | 30.14 | 30.51 | 26 | 29.32 | 8 | 1.19 | 41.5 | + 1.1 | 75.2 | 8 | 52.5 | 9.8 | 14 | 31.5 | 65.4 | 43.4 | 8 | 4.4 | 29 | 66.6 | 29.8 | 1.26 | — 2.45 | 4,413 | e. | 32 | n. | 4 | 3 | 7 | 13 | 11 |
| Little Rock | 299 | 29.84 | +.01 | 30.13 | 30.54 | 26 | 29.30 | 8 | 1.24 | 43.0 | — 2.3 | 71.2 | 8 | 52.4 | 19.3 | 15 | 34.5 | 51.9 | 29.9 | 17 | 3.3 | 12 | 66.9 | 31.5 | 3.74 | — 1.43 | 4,176 | e. | 28 | w. | 4 | 6 | 4 | 15 | 12 |
| Galveston | 40 | 30.16 | +.08 | 30.16 | 30.49 | 14 | 29.48 | 8 | 1.02 | 57.6 | + 1.2 | 72.5 | 8 | 63.6 | 34.3 | 14 | 51.2 | 38.2 | 22.1 | 9 | 6.0 | 21 | 78.5 | 50.5 | 2.10 | — 2.80 | 8,517 | se. | 35 | n. | 5 | 4 | 6 | 7 | 18 |
| Indianola | 26 | 30.14 | +.04 | 30.13 | 30.51 | 14 | 29.43 | 8 | 1.08 | 58.5 | + 2.4 | 76.8 | 8 | 65.3 | 31.4 | 14 | 51.7 | 45.4 | 25.8 | 12 | 3.7 | 25 | 79.6 | 51.4 | 1.38 | — 1.84 | 9,734 | e. | 43 | n. | 4 | 3 | 5 | 10 | 17 |
| Palestine | 533 | 29.62 | +.05 | 30.16 | 30.47 | 14 | 29.50 | 8 | 0.97 | 50.6 | — 0.9 | 77.6 | 4 | 61.4 | 23.9 | 14 | 42.1 | 53.7 | 29.8 | 19 | 10.5 | 30 | 71.2 | 40.8 | 3.14 | — 0.54 | 7,367 | nw. | 52 | nw. | 4 | 6 | 8 | 12 | 11 |
| San Antonio | 781 | 29.33 | ..... | 30.13 | 30.45 | 14 | 29.49 | 8 | 0.96 | 54.9 | + 1.1 | 81.3 | 4 | 66.3 | 25.8 | 14 | 43.7 | 55.5 | 34.8 | 4 | 12.3 | 20 | 70.1 | 43.7 | 1.78 | — 0.26 | 6,173 | n. | 39 | n. | 4 | 4 | 9 | 8 | 14 |
| *Rio Grande Valley.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brownsville | 59 | 30.10 | +.06 | 30.11 | 30.49 | 14 | 29.44 | 8 | 1.06 | 62.6 | + 2.2 | 92.9 | 8 | 73.4 | 32.6 | 14 | 53.2 | 60.3 | 33.2 | 2 | 8.6 | 27 | 75.8 | 53.3 | 1.20 | — 1.01 | 5,827 | s. | 30 | s. | 28 | 4 | 6 | 13 | 12 |
| Rio Grande City | 230 | 29.95 | +.05 | 30.11 | 30.52 | 14 | 29.46 | 8 | 1.06 | 61.9 | + 2.6 | 88.3 | 8 | 73.1 | 32.0 | 14 | 52.2 | 56.3 | 34.0 | 6 | 9.0 | 27 | 64.6 | 48.4 | 0.39 | — 0.99 | 4,262 | se. | 31 | sw. | 5 | 5 | 2 | 10 | 19 |
| *Ohio Valley & Tennessee.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chattanooga | 783 | 29.35 | +.01 | 30.19 | 30.60 | 11 | 29.59 | 4 | 1.01 | 40.8 | — 2.8 | 64.6 | 4 | 51.5 | 20.7 | 15 | 31.8 | 43.9 | 34.7 | 21 | 5.1 | 2 | 67.1 | 28.9 | 3.41 | — 2.59 | 5,004 | sw. | 38 | sw. | 5 | 6 | 9 | 9 | 13 |
| Knoxville | 980 | 29.12 | —.01 | 30.18 | 30.61 | 11 | 29.49 | 4 | 1.12 | 39.6 | + 0.5 | 68.2 | 9 | 49.8 | 19.3 | 27 | 30.9 | 48.9 | 34.7 | 5 | 5.7 | 1 | 71.5 | 29.9 | 4.45 | — 0.03 | 4,986 | w. | 33 | w. | 4 | 12 | 9 | 16 | 6 |
| Memphis | 321 | 29.79 | —.02 | 30.12 | 30.55 | 11 | 29.57 | 8 | 1.17 | 42.6 | + 0.3 | 68.0 | 8 | 51.8 | 18.5 | 14 | 34.7 | 49.5 | 27.0 | 8 | 5.8 | 23 | 64.6 | 30.4 | 2.92 | — 1.15 | 4,545 | w. | 22 | sw. | 4 | 7 | 6 | 15 | 10 |
| Nashville | 549 | 29.56 | .00 | 30.15 | 30.62 | 11 | 29.46 | 4 | 1.16 | 40.3 | — 0.8 | 63.9 | 4 | 49.0 | 18.5 | 15 | 32.1 | 45.4 | 34.6 | 21 | 5.3 | 1 | 71.0 | 31.1 | 2.90 | — 0.94 | 5,635 | nw. | 36 | nw. | 5 | 7 | 6 | 20 | 6 |
| Louisville | 551 | 29.53 | —.02 | 30.12 | 30.64 | 11 | 29.36 | 4 | 1.27 | 41.0 | + 3.3 | 66.9 | 4 | 49.5 | 9.4 | 7 | 33.4 | 57.5 | 32.2 | 8 | 8.4 | 30 | 71.8 | 31.9 | 2.84 | — 1.68 | 7,100 | sw. | 38 | w. | 4 | 14 | 9 | 12 | 10 |
| Greencastle | 885 | 29.12 | ..... | 30.11 | 30.63 | 11 | 29.33 | 4 | 1.30 | 32.3 | ..... | 54.8 | 4 | 39.9 | — 2.1 | 7 | 25.0 | 56.9 | 36.5 | 8 | 4.3 | 28 | 77.3 | 25.7 | 3.88 | ..... | 7,235 | sw. | 29 | w. | 9 | 13 | 11 | 14 | 6 |
| Indianapolis | 766 | 29.26 | —.03 | 30.11 | 30.66 | 11 | 29.29 | 9 | 1.37 | 32.0 | — 0.5 | 56.3 | 22 | 39.8 | 2.1 | 7 | 24.6 | 58.4 | 33.7 | 8 | 4.2 | 10 | 76.0 | 24.8 | 2.45 | — 1.07 | 5,205 | sw. | 28 | sw. | 4 | 14 | 11 | 11 | 6 |
| Cincinnati | 628 | 29.43 | —.03 | 30.12 | 30.67 | 11 | 29.30 | 4 | 1.37 | 35.0 | — 1.6 | 60.0 | 22 | 43.0 | 3.3 | 7 | 27.6 | 56.7 | 36.8 | 8 | 5.0 | 25 | 72.8 | 26.5 | 1.82 | — 2.16 | 7,243 | sw. | 40 | w. | 4 | 13 | 12 | 9 | 10 |
| Columbus | 805 | 29.20 | —.04 | 30.11 | 30.70 | 12 | 29.28 | 4 | 1.42 | 32.5 | + 0.3 | 60.2 | 9 | 40.1 | 0.9 | 7 | 24.7 | 59.3 | 36.2 | 8 | 3.6 | 10 | 78.1 | 26.3 | 1.85 | — 1.95 | 6,572 | sw. | 36 | nw. | 5 | 14 | 13 | 4 | 4 |
| Pittsburg | 766 | 29.21 | —.07 | 30.06 | 30.70 | 12 | 29.20 | 4 | 1.50 | 35.7 | + 2.6 | 72.8 | 9 | 43.6 | 6.2 | 7 | 28.9 | 66.6 | 32.3 | 9 | 4.3 | 29 | 71.8 | 27.0 | 1.64 | — 1.37 | 6,013 | sw. | 28 | sw. | 5 | 16 | 19 | 8 | 4 |
| *Lower lake region.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Buffalo | 690 | 29.22 | —.06 | 30.00 | 30.72 | 12 | 29.16 | 5 | 1.56 | 30.0 | + 0.8 | 61.5 | 9 | 37.8 | 5.3 | 7 | 24.4 | 56.2 | 27.5 | 9 | 4.0 | 29 | 85.4 | 26.1 | 4.51 | + 1.11 | 11,215 | w. | 48 | sw. | 5 | 19 | 23 | 6 | 2 |
| Oswego | 335 | 29.60 | —.09 | 29.97 | 30.71 | 12 | 29.13 | 5 | 1.58 | 28.9 | — 0.9 | 55.0 | 9 | 36.6 | 6.7 | 8 | 21.9 | 48.3 | 32.5 | 24 | 7.2 | 4 | 78.9 | 23.1 | 3.87 | + 0.21 | 10,750 | s. | 39 | nw. | 7 | 16 | 23 | 7 | 1 |
| Rochester | 621 | 29.29 | —.10 | 30.00 | 30.74 | 12 | 29.16 | 5 | 1.58 | 29.3 | + 1.3 | 58.7 | 9 | 38.3 | 4.2 | 8 | 23.1 | 54.5 | 27.8 | 8 | 6.1 | 4 | 84.7 | 25.2 | 2.25 | — 0.80 | 9,436 | w. | 36 | w. | 21 | 18 | 21 | 10 | 0 |
| Erie | 681 | 29.26 | —.07 | 30.03 | 30.71 | 12 | 29.15 | 4 | 1.56 | 31.4 | — 1.2 | 65.2 | 9 | 41.5 | 3.2 | 8 | 24.5 | 62.0 | 38.6 | 8 | 8.2 | 20 | 78.2 | 25.2 | 3.19 | — 0.25 | 10,640 | sw. | 44 | w. | 6 | 22 | 20 | 11 | 0 |
| Cleveland | 690 | 29.27 | —.07 | 30.05 | 30.71 | 12 | 29.22 | 4 | 1.49 | 31.5 | + 1.6 | 61.4 | 9 | 38.9 | 2.7 | 8 | 25.2 | 58.7 | 38.7 | 8 | 5.3 | 25 | 80.3 | 25.9 | 1.68 | — 1.08 | 9,715 | w. | 38 | w. | 6 | 15 | 10 | 15 | 0 |
| Sandusky | 639 | 29.35 | —.05 | 30.07 | 30.72 | 12 | 29.23 | 4 | 1.50 | 31.6 | — 0.8 | 58.9 | 9 | 38.4 | 0.5 | 7 | 24.0 | 58.4 | 38.2 | 8 | 4.5 | 26 | 75.2 | 24.4 | 1.77 | — 1.14 | 11,349 | sw. | 56 | nw. | 5 | 12 | 17 | 12 | 2 |
| Toledo | 651 | 29.33 | —.04 | 30.06 | 30.71 | 12 | 29.18 | 4 | 1.52 | 30.2 | — 0.5 | 55.3 | 9 | 37.0 | — 2.5 | 7 | 23.0 | 57.8 | 26.0 | 8 | 5.5 | 11 | 77.0 | 23.7 | 2.89 | + 0.40 | 6,382 | w. | 36 | nw. | 5 | 12 | 14 | 14 | 3 |
| Detroit | 661 | 29.29 | —.06 | 30.04 | 30.70 | 26 | 29.20 | 4 | 1.50 | 32.9 | + 4.2 | 54.8 | 9 | 39.8 | 0.7 | 7 | 26.5 | 54.1 | 25.5 | 8 | 4.5 | 2 | 80.9 | 27.6 | 2.30 | — 0.50 | 8,763 | w. | 39 | w. | 9 | 7 | 20 | 9 | 2 |
| *Upper lake region.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alpena | 609 | 29.27 | —.07 | 29.98 | 30.70 | 25 | 29.18 | 9 | 1.52 | 24.3 | + 0.8 | 46.2 | 23 | 30.3 | — 4.7 | 7 | 18.5 | 50.9 | 25.0 | 26 | 4.0 | 29 | 85.3 | 20.6 | 3.12 | + 0.79 | 7,589 | w. | 36 | w. | 19 | 20 | 23 | 6 | 2 |
| Escanaba | 608 | 29.30 | —.04 | 30.02 | 30.68 | 25 | 29.35 | 9 | 1.33 | 22.8 | + 2.2 | 42.6 | 23 | 28.6 | —10.1 | 7 | 17.1 | 52.7 | 22.3 | 8 | 2.7 | 24 | 81.4 | 17.9 | 3.37 | + 1.65 | 7,058 | sw. | 35 | nw. | 19 | 20 | 17 | 13 | 1 |
| Grand Haven | 620 | 29.31 | —.00 | 30.01 | 30.68 | 26 | 29.17 | 9 | 1.51 | 28.5 | — 0.7 | 48.0 | 2 | 34.2 | 1.9 | 6 | 23.4 | 46.1 | 21.4 | 8 | 3.2 | 28 | 84.2 | 24.3 | 3.39 | + 0.82 | 10,313 | nw. | 50 | nw. | 18 | 18 | 21 | 10 | 0 |
| Mackinaw City | 605 | 29.26 | —.08 | 29.96 | 30.67 | 26 | 29.26 | 9 | 1.40 | 27.1 | + 1.6 | 46.0 | 23 | 31.5 | 1.5 | 6 | 21.0 | 44.5 | 24.6 | 23 | 2.8 | 28 | 76.1 | 20.6 | 1.73 | — 3.48 | 9,221 | nw. | 37 | ne. | 9 | 19 | 22 | 9 | 0 |
| Marquette | 672 | 29.20 | —.07 | 29.99 | 30.67 | 25 | 29.46 | 6 | 1.20 | 23.4 | + 1.3 | 48.1 | 23 | 32.4 | — 8.2 | 7 | 17.2 | 56.3 | 32.0 | 7 | 7.0 | 24 | 84.5 | 19.3 | 1.87 | — 0.23 | 7,945 | w. | 35 | w. | 18 | 16 | 20 | 11 | 0 |
| Port Huron | 633 | 29.29 | —.06 | 30.01 | 30.69 | 12 | 29.19 | 4 | 1.50 | 27.8 | + 0.9 | 49.2 | 23 | 34.1 | — 2.5 | 7 | 21.8 | 51.7 | 34.2 | 8 | 3.2 | 25 | 82.8 | 23.3 | 2.53 | + 0.11 | 8,058 | sw. | 39 | sw. | 5 | 21 | 21 | 8 | 2 |
| Chicago | 661 | 29.31 | —.05 | 30.06 | 30.60 | 26 | 29.18 | 9 | 1.48 | 31.1 | — 2.3 | 50.3 | 23 | 38.9 | — 2.9 | 7 | 24.7 | 53.2 | 30.5 | 6 | 5.5 | 31 | 81.2 | 25.9 | 3.35 | + 1.13 | 6,700 | sw. | 26 | nw. | 5 | 15 | 8 | 15 | 8 |
| Milwaukee | 697 | 29.22 | —.08 | 30.02 | 30.62 | 25 | 29.17 | 9 | 1.45 | 26.3 | — 1.9 | 47.1 | 22 | 32.4 | —11.0 | 7 | 20.1 | 58.1 | 25.1 | 8 | 5.1 | 30 | 85.3 | 22.4 | 2.71 | + 0.88 | 9,051 | w. | 44 | n. | 4 | 15 | 10 | 16 | 3 |
| Duluth | 672 | 29.27 | —.05 | 30.07 | 30.64 | 25 | 29.55 | 22 | 1.09 | 19.2 | + 2.9 | 43.9 | 22 | 27.5 | —20.5 | 7 | 11.9 | 64.4 | 26.2 | 23 | 5.7 | 10 | 77.4 | 13.2 | 0.54 | — 0.84 | 5,327 | nw. | 38 | n. | 4 | 13 | 9 | 17 | 5 |
| *Extreme northwest.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Moorhead | 923 | 28.99 | —.07 | 30.11 | 30.59 | 24 | 29.44 | 3 | 1.15 | 15.3 | + 5.6 | 42.8 | 2 | 25.3 | —20.2 | 7 | 4.3 | 63.0 | 35.5 | 4 | 9.5 | 27 | 90.2 | 12.9 | 0.32 | — 0.63 | 8,720 | s. | 50 | s. | 26 | 8 | 10 | 15 | 6 |
| Saint Vincent | 804 | 29.12 | —.08 | 30.12 | 30.66 | 24 | 29.60 | 22 | 1.06 | 11.6 | + 7.1 | 39.4 | 26 | 21.7 | —20.7 | 6 | — 0.2 | 60.1 | 39.1 | 25 | 9.0 | 1 | 83.4 | 7.4 | 0.54 | — 0.02 | 6,784 | s. | 41 | s. | 26 | 11 | 6 | 15 | 10 |
| Bismarck | 1,694 | 28.15 | —.08 | 30.17 | 30.60 | 24 | 29.65 | 3 | 0.95 | 23.2 | + 9.9 | 53.0 | 1 | 34.7 | —

*Table of miscellaneous meteorological data for December, 1885—Signal Service observations*—Continued.

| Stations. | Elevation above sea-level. | Atmospheric pressure (in inches and hundredths). Mean actual barometer. | Departure from normal. | Mean reduced barometer. | Extremes. Highest barometer | Date. | Lowest barometer | Date. | Monthly range of barometer. | Temperature of the air (in degrees Fahrenheit). Monthly mean. | Departure from normal. | Extremes. Max. | Date. | Mean max | Min. | Date. | Mean min. | Monthly range. | Daily ranges. Greatest. | Date. | Least. | Date. | Mean rel. humidity. | Mean dew-point. | Precipitation. | Departure from normal. | Winds. Total movement. | Prevailing direction. | Maximum velocity. Miles p.hr | Direction. | Date. | No. of rainy days. | No. of cloudy days. | No. of fair days. | No. of clear days. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Upper Mississippi Valley.*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Saint Paul | 831 | 29.12 | —.03 | 30.09 | 30.65 | 25 | 29.39 | 4 | 1.26 | 21.1 | + 2.5 | 51.6 | 22 | 28.8 | — 7.9 | 7 | 13.2 | 69.5 | 33.3 | 6 | 3.3 | 27 | 81.4 | 16.0 | 0.64 | — 0.69 | 3,503 | w. | 25 | nw. | 4 | 6 | 7 | 15 | 9 |
| La Crosse | 725 | 29.24 | —.05 | 30.06 | 30.62 | 25 | 29.33 | 4 | 1.29 | 26.3 | + 3.8 | 53.0 | 22 | 33.3 | — 9.5 | 7 | 19.8 | 62.5 | 29.6 | 6 | 3.8 | 29 | 75.4 | 19.5 | 1.97 | + 0.69 | 6,313 | s. | 40 | n. | 4 | 10 | 11 | 12 | 8 |
| Davenport | 615 | 29.40 | —.04 | 30.10 | 30.63 | 11 | 29.32 | 4 | 1.30 | 25.6 | — 1.8 | 50.1 | 23 | 33.0 | — 6.9 | 14 | 18.2 | 57.0 | 25.8 | 18 | 4.5 | 31 | 79.0 | 19.7 | 1.95 | + 0.26 | 5,154 | sw. | 28 | w. | 4 | 13 | 7 | 17 | 7 |
| Des Moines | 849 | 29.16 | —.04 | 30.10 | 30.57 | 25 | 29.51 | 4 | 1.07 | 28.4 | + 4.8 | 55.9 | 22 | 35.7 | — 3.0 | 14 | 20.6 | 58.9 | 31.2 | 4 | 4.2 | 29 | 78.2 | 22.4 | 1.96 | + 0.42 | 3,706 | n. | 30 | n. | 11 | 11 | 10 | 15 | 6 |
| Dubuque | 665 | 29.33 | ..... | 30.08 | 30.62 | 11 | 29.30 | 4 | 1.32 | 25.0 | — 0.4 | 51.5 | 23 | 32.3 | — 9.0 | 7 | 17.2 | 60.5 | 37.2 | 20 | 3.8 | 1 | 79.8 | 19.4 | 3.14 | + 1.34 | 3,169 | nw. | 22 | nw. | 24 | 10 | 13 | 12 | 6 |
| Keokuk | 618 | 29.41 | —.03 | 30.11 | 30.60 | 25 | 29.37 | 4 | 1.23 | 28.7 | + 0.1 | 55.4 | 22 | 36.7 | — 5.2 | 14 | 19.9 | 60.6 | 34.3 | 15 | 4.6 | 28 | 79.8 | 22.9 | 1.96 | — 0.29 | 6,448 | nw. | 38 | nw. | 4 | 13 | 6 | 15 | 10 |
| Cairo | 359 | 29.76 | —.02 | 30.14 | 30.62 | 11 | 29.40 | 8 | 1.22 | 39.0 | + 0.8 | 62.7 | 23 | 46.6 | 14.4 | 7 | 30.4 | 48.3 | 36.3 | 8 | 3.6 | 26 | 65.8 | 27.5 | 3.01 | — 0.72 | 6,674 | s. | 40 | w. | 9 | 8 | 7 | 14 | 10 |
| Springfield | 644 | 29.39 | —.04 | 30.09 | 30.60 | 11 | 29.35 | 8 | 1.24 | 35.6 | + 3.9 | 58.0 | 21 | 44.0 | 6.0 | 14 | 28.1 | 52.8 | 32.7 | 15 | 7.8 | 1 | 69.9 | 26.5 | 2.52 | — 0.86 | 7,335 | s. | 34 | nw. | 4 | 10 | 9 | 15 | 7 |
| Saint Louis | 571 | 29.50 | —.02 | 30.13 | 30.60 | 11 | 29.36 | 8 | 1.24 | 38.9 | + 4.7 | 64.9 | 29 | 47.8 | 6.0 | 14 | 30.3 | 58.9 | 29.8 | 15 | 5.1 | 28 | 69.4 | 29.2 | 2.03 | — 0.42 | 9,955 | s. | 60 | nw. | 4 | 9 | 8 | 12 | 11 |
| ***Missouri Valley.*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lamar | 1,028 | 29.03 | ..... | 30.16 | 30.54 | 11 | 29.40 | 8 | 1.14 | 36.3 | ..... | 63.6 | 23 | 46.1 | — 4.3 | 14 | 26.4 | 67.9 | 38.2 | 4 | 6.9 | 12 | 72.0 | 26.8 | 0.91 | ..... | 8,290 | s. | 48 | nw. | 4 | 8 | 7 | 12 | 12 |
| Leavenworth | 842 | 29.21 | —.02 | 30.16 | 30.56 | 11 | 29.58 | 8 | 0.98 | 32.8 | + 2.6 | 57.2 | 22 | 41.2 | 2.0 | 11 | 24.3 | 55.2 | 28.0 | 4 | 7.5 | 12 | 75.0 | 25.5 | 0.97 | — 0.75 | 4,383 | s. | 38 | nw. | 4 | 6 | 7 | 15 | 9 |
| Omaha | 1,113 | 28.91 | —.03 | 30.16 | 30.60 | 19 | 29.62 | 3 | 0.99 | 28.6 | + 4.0 | 60.0 | 22 | 37.3 | — 4.4 | 13 | 20.6 | 64.4 | 30.8 | 2 | 4.6 | 7 | 80.7 | 23.2 | 1.17 | + 0.17 | 6,030 | nw. | 50 | nw. | 4 | 6 | 6 | 15 | 10 |
| Valentine | 2,603 | 27.28 | ..... | 30.16 | 30.58 | 11 | 29.67 | 7 | 0.91 | 28.8 | ..... | 67.7 | 2 | 43.2 | — 9.5 | 12 | 16.9 | 77.2 | 51.3 | 14 | 12.5 | 6 | 67.3 | 18.1 | 0.15 | ..... | 8,999 | nw. | 72 | nw, | 4 | 3 | 7 | 20 | 4 |
| Fort Sully | ..... | 28.30 | ..... | ..... | ..... | ... | ..... | ... | 0.95 | 26.5 | ..... | 61.0 | 2 | 40.5 | — 8.4 | 12 | 15.2 | 69.4 | 50.1 | 14 | 13.4 | 6 | 80.0 | 20.9 | 0.14 | — 0.36 | 6,582 | nw. | 58 | n. | 4 | 7 | 6 | 21 | 4 |
| Huron | 1,307 | 28.62 | —.06 | 30.16 | 30.64 | 11 | 29.54 | 3 | 1.10 | 23.6 | + 5.8 | 53.3 | 4 | 34.4 | —11.1 | 12 | 15.0 | 64.4 | 44.5 | 4 | 7.4 | 16 | 68.5 | 14.7 | 0.10 | — 0.28 | 5,884 | nw. | 39 | nw. | 4 | 2 | 7 | 13 | 11 |
| Yankton | 1,228 | 28.73 | — 07 | 30.16 | 30.62 | 11 | 29.60 | 3 | 1.02 | 27.2 | + 6.8 | 58.8 | 20 | 37.6 | —10.1 | 12 | 17.6 | 68.9 | 40.4 | 14 | 6.6 | 8 | 84.0 | 22.8 | 0.07 | — 0.69 | 5,477 | nw. | 44 | nw. | 4 | 2 | 4 | 18 | 9 |
| ***Northern slope.*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fort Assinaboine | 2,720 | 27.10 | —.07 | 30.15 | 30.64 | 4 | 29.72 | 7 | 0.93 | 33.0 | +16.1 | 67.9 | 2 | 43.8 | — 6.4 | 11 | 21.0 | 74.3 | 42.8 | 13 | 12.5 | 8 | 58.8 | 19.6 | 0.41 | — 0.39 | 10,134 | sw. | 48 | sw. | 1 | 2 | 9 | 15 | 7 |
| Fort Benton | 2,681 | 27.17 | ..... | 30.17 | 30.65 | 4 | 29.78 | 25 | 0.87 | 35.6 | +15.7 | 73.3 | 20 | 47.6 | 0.9 | 11 | 24.8 | 72.4 | 42.0 | 27 | 5.5 | 8 | 69.9 | 26.0 | 0.38 | — 0.28 | 3,011 | sw. | 57 | sw. | 3 | 6 | 16 | 13 | 2 |
| Fort Maginnis | 4,340 | 25 46 | ..... | 30.09 | 30.47 | 4 | 29.67 | 7 | 0.80 | 33.7 | +13.6 | 64.8 | 1 | 41.7 | — 3.6 | 11 | 25.1 | 68.4 | 37.7 | 3 | 5.1 | 8 | 58.7 | 20.5 | 0.94 | + 0.19 | 11,074 | w. | 36 | w. | 2 | 10 | 11 | 16 | 4 |
| Fort Shaw † | 3,550 | 26.30 | ..... | 30.14 | 30.62 | 4 | 29.77 | 30 | 0.85 | 36.1 | +14.6 | †60.5 | 25 | †45.2 | — 6.0 | 11 | 28.6 | 66.5 | 39.7 | 13 | 9.4 | 21 | 58.4 | 28.1 | 0.17 | — 0.77 | 10,176 | w. | 56 | w. | 3 | 4 | 3 | 23 | 5 |
| Helena | 4,044 | 25.81 | —.02 | 30.14 | 30.57 | 4 | 29.75 | 7 | 0.82 | 31.1 | +10.7 | 56.8 | 3 | 39.3 | 3.2 | 12 | 23.8 | 53.6 | 29.6 | 3 | 7.9 | 1 | 67.3 | 21.4 | 0.21 | — 1.41 | 4,524 | sw. | 36 | w. | 3 | 9 | 5 | 19 | 7 |
| Poplar River | 2,030 | 27.82 | ..... | 30.20 | 30.66 | 4 | 29.68 | 7 | 0.98 | 19.5 | ..... | 61.0 | 1 | 31.6 | —15.1 | 12 | 8.9 | 76.1 | 40.2 | 12 | 10.8 | 6 | 75.8 | 13.0 | 0.41 | + 0.13 | 4,024 | w. | 56 | nw. | 3 | 8 | 14 | 12 | 5 |
| Deadwood | 4,600 | 25. 2 | +.02 | 30.31 | 30.62 | 19 | 29.88 | 7 | 0.75 | 33.3 | +11.8 | 58.2 | 22 | 41.7 | — 2.0 | 10 | 24.3 | 60.2 | 31.0 | 14 | 8.7 | 27 | 67.7 | 23.1 | 1.18 | — 0.37 | 1,661 | sw. | 30 | w. | 26 | 11 | 5 | 10 | 16 |
| Cheyenne | 6,105 | 23.96 | +.03 | 30.25 | 30.57 | 2 | 29.75 | 7 | 0.82 | 33.3 | + 6.4 | 64.2 | 2 | 44.4 | —11.8 | 11 | 21.7 | 76.0 | 39.9 | 4 | 9.7 | 9 | 64.7 | 21.7 | 0.16 | — 0.05 | 10,495 | nw. | 52 | nw. | 22 | 4 | 0 | 19 | 12 |
| North Platte | 2,841 | 27.09 | —.03 | 30.23 | 30.58 | 11 | 29.74 | 7 | 0.83 | 32.9 | + 7.8 | 69.0 | 2 | 44.3 | — 6.0 | 12 | 24.2 | 75.0 | 35.6 | 1 | 6.0 | 26 | 78.7 | 26.6 | 0.95 | + 0.20 | 3,682 | w. | 32 | nw. | 4 | 5 | 7 | 10 | 14 |
| Fort Laramie | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 32.6 | ..... | 65.0 | 1 | 47.3 | —18.7 | 12 | 18.0 | 83.7 | ..... | ... | ..... | ... | ..... | ..... | 0.01 | ..... | ..... | ... | ..... | ... | ... | 1 | ... | ... | ... |
| ***Middle slope*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Denver | 5,294 | 24.74 | +.04 | 30.25 | 30.57 | 2 | 29.66 | 7 | 0.91 | 36.2 | + 6.0 | 74.1 | 2 | 48.7 | — 5.6 | 12 | 24.2 | 79.7 | 45.7 | 14 | 8.7 | 31 | 57.1 | 19.8 | 1.08 | + 0.37 | 6,048 | s. | 48 | w. | 22 | 5 | 3 | 12 | 16 |
| Pike's Peak | 14,134 | 17.68 | ..... | 30.33 | 30.80 | 2 | 29.88 | 8 | 0.92 | 8.8 | + 2.7 | 26.4 | 3 | 14.6 | —19.6 | 12 | 3.0 | 46.0 | 27.8 | 14 | 1.5 | 19 | 83.8 | 4.8 | 4.03 | + 2.77 | 19,905 | nw. | 90 | w. | 22 | 9 | 3 | 16 | 12 |
| West Las Animas | 3,899 | 26.07 | +.06 | 30.20 | 30.51 | 21 | 29.54 | 7 | 0.97 | 33.3 | + 6.4 | 76.4 | 3 | 48.9 | — 5.8 | 12 | 21.0 | 82.2 | 49.7 | 3 | 6.8 | 11 | 76.5 | 25.4 | 0.91 | + 0.08 | 4,630 | w. | 34 | n. | 4 | 6 | 5 | 12 | 14 |
| Concordia | 1,384 | 28.59 | ..... | 30.13 | 30.46 | 11 | 29.67 | 8 | 0.79 | 33.4 | ..... | 67.4 | 2 | 43.4 | — 0.3 | 11 | 23.7 | 67.7 | 38.5 | 2 | 6.6 | 28 | 80.1 | 27.3 | 0.43 | ..... | 6,318 | n. | 48 | nw. | 4 | 4 | 10 | 7 | 14 |
| Dodge City | 2,517 | 27.44 | —.01 | 30.20 | 30.50 | 18 | 29.61 | 7 | 0.88 | 30.6 | + 6.0 | 70.0 | 2 | 46.9 | 1.5 | 13 | 27.3 | 68.5 | 36.4 | 2 | 4.7 | 27 | 76.0 | 28.7 | 1.76 | + 1.04 | 7,240 | nw. | 48 | n. | 4 | 7 | 5 | 10 | 16 |
| Fort Reno | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | ..... | ..... | 71.5 | 3 | 53.1 | ..... | ... | ..... | ..... | ..... | ... | ..... | ... | ..... | ..... | 2.05 | — 0.31 | ..... | ..... | ..... | ... | ... | ... | ... | ... | ... |
| Fort Supply | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 39.4 | ..... | 70.0 | 2 | 50.7 | — 3.0 | 13 | 28.2 | 73.0 | ..... | ... | ..... | ... | ..... | ..... | 3.19 | ..... | ..... | ..... | ..... | ... | ... | 12 | ... | ... | ... |
| Fort Elliott | 2,650 | 27.28 | .00 | 30.22 | 30.51 | 4 | 29.51 | 7 | 1.00 | 39.8 | + 6.0 | 77.5 | 3 | 52.2 | — 0.3 | 13 | 28.6 | 77.8 | 40.2 | 3 | 6.0 | 28 | 75.1 | 31.1 | 2.11 | + 1.28 | 8,307 | nw. | 64 | nw. | 4 | 9 | 7 | 10 | 14 |
| ***Southern slope.*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fort Sill | 1,200 | 28.85 | —.02 | 30.15 | 30.44 | 5 | 29.42 | 7 | 1.03 | 43.4 | + 5.0 | 70.5 | 3 | 55.1 | 15.3 | 13 | 34.1 | 55.2 | 31.5 | 17 | 6.6 | 21 | 76.0 | 35.1 | 1.58 | — 0.62 | 7,870 | se. | 53 | n. | 4 | 5 | 6 | 7 | 18 |
| Abilene | 1,745 | 28.30 | ..... | 30.20 | 30.50 | 14 | 29.54 | 7 | 0.97 | 49.4 | ..... | 80.0 | 3 | 62.4 | 14.8 | 13 | 38.6 | 65.2 | 41.1 | 7 | 6.8 | 24 | 70.0 | 38.9 | 0.98 | ..... | 7,033 | s. | 40 | nw. | 8 | 6 | 7 | 6 | 18 |
| Fort Davis | 4,928 | 25.22 | .00 | 30.12 | 30.37 | 2 | 29.65 | 7 | 0.73 | 48.6 | + 4.0 | 74.2 | 23 | 62.8 | 17.3 | 14 | 24.3 | 56.9 | 40.2 | 8 | 12.0 | 29 | 45.2 | 24.6 | 0.24 | — 0.17 | 5,883 | sw. | 36 | n. | 4 | 2 | 0 | 8 | 23 |
| ***Southern plateau.*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| El Paso | 3,764 | 26.34 | +.03 | 30.16 | 30.50 | 2 | 29.66 | 7 | 0.84 | 46.7 | + 0.4 | 72.4 | 6 | 60.8 | 12.5 | 15 | 31.6 | 59.9 | 46.0 | 15 | 15.0 | 12 | 44.4 | 23.0 | 0.37 | — 0.43 | 2,733 | nw. | 23 | w. | 7 | 2 | 4 | 12 | 15 |
| Lava | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 39.4 | ..... | 69.2 | 7 | 55.3 | 9.2 | 10 | 23.8 | 60.0 | ..... | ... | ..... | ... | ..... | ..... | 1.15 | ..... | ..... | ..... | ..... | ... | 3 | ... | ... | ... | ... |
| Santa Fé | 7,026 | 23.28 | +.11 | 30.19 | 30.55 | 2 | 29.65 | 7 | 0.90 | 32.4 | + 2.2 | 57.0 | 3 | 43.2 | — 1.0 | 12 | 22.4 | 58.0 | 28.5 | 10 | 10.0 | 20 | 64.0 | 20.6 | 2.27 | + 1.53 | 5,041 | n. | 27 | n. | 23 | 6 | 2 | 11 | 18 |
| Fort Apache | 5,050 | 25.10 | +.06 | 30.16 | 30.44 | 2 | 29.78 | 7 | 0.66 | 39.6 | + 3.5 | 68.4 | 3 | 57.3 | 13.5 | 9 | 24.1 | 54.9 | 47.0 | 16 | 8.0 | 28 | 66.9 | 28.2 | 1.41 | — 0.85 | 3,313 | ne. | 33 | ne. | 13 | 8 | 5 | 9 | 17 |
| Fort Bowie | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 47.3 | ..... | 74.0 | 6 | 60.8 | 20.0 | 13 | 33.8 | 54.0 | ..... | ... | ..... | ... | ..... | ..... | 1.74 | ..... | ..... | ..... | ..... | ... | 4 | ... | ... | ... | ... |
| Fort Grant | 4,856 | 25.27 | ..... | 30.12 | 30.38 | 2 | 29.74 | 7 | 0.64 | 47.8 | + 2.8 | 69.1 | 4 | 59.3 | 22.1 | 9 | 38.7 | 47.0 | 29.0 | 15 | 11.4 | 29 | 48.5 | 27.6 | 0.81 | — 1.03 | 5,727 | n. | 40 | se. | 25 | 6 | 2 | 8 | 21 |
| Fort McDowell | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 49.6 | ..... | 83.5 | 3 | 67.4 | 16.0 | 13 | 31.9 | 67.5 | ..... | ... | ..... | ... | ..... | ..... | 1.25 | ..... | ..... | ..... | ..... | ... | 3 | ... | ... | ... | ... |
| Fort Thomas | 2,710 | 27.33 | ..... | 30.12 | 30.40 | 2 | 29.67 | 7 | 0.73 | 42.8 | — 0.5 | 71.0 | 27 | 60.7 | 11.8 | 15 | 27.6 | 59.2 | 45.7 | 15 | 11.6 | 28 | 68.2 | 30.5 | 0.71 | — 0.96 | 2,032 | e. | 20 | ne. | 7 | 5 | 3 | 9 | 19 |
| Fort Verde | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 45.8 | + 4.4 | 69.5 | 1 | 59.2 | 19.0 | 12 | 30.5 | 50.5 | ..... | ... | ..... | ... | ..... | ..... | 0.52 | — 1.41 | ..... | ..... | ..... | ... | 3 | ... | ... | ... | ... |
| Maricopa | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 52.1 | ..... | 78.3 | 26 | 65.2 | 23.0 | 13 | 29.0 | 55.3 | ..... | ... | ..... | ... | ..... | ..... | 0.19 | ..... | ..... | ..... | ..... | ... | 4 | ... | ... | ... | ... |
| Phœnix | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 53.5 | + 2.9 | 89.2 | 3 | 74.7 | 20.2 | 14 | 32.3 | 69.0 | ..... | ... | ..... | ... | ..... | ..... | 0.32 | — 0.97 | ..... | ..... | ..... | ... | 3 | ... | ... | ... | ... |
| Prescott | 5,389 | 24.78 | +.05 | 30.18 | 30.47 | 2 | 29.89 | 7 | 0.67 | 38.8 | + 2.1 | 65.5 | 24 | 53.6 | 10.0 | 12 | 26.1 | 55.5 | 41.3 | 14 | 14.1 | 19 | 69.1 | 27.8 | 0.32 | — 1.72 | 2,763 | sw. | 27 | sw. | 7 | 5 | 3 | 8 | 20 |
| San Carlos | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 40.0 | ..... | 69.4 | 1 | 59.2 | 17.0 | 10 | 30.9 | 52.4 | ..... | ... | ..... | ... | ..... | ..... | 0.90 | — 1.38 | ..... | ..... | ..... | ... | 4 | ... | ... | ... | ... |
| Wickenburg | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 53.4 | + 8.3 | 82.0 | 3 | 70.2 | 24.0 | 10 | 36.6 | 58.0 | ..... | ... | ..... | ... | ..... | ..... | 2.25 | + 0.40 | ..... | ..... | ..... | ... | 2 | ... | ... | ... | ... |
| Yuma | 141 | 29.93 | +.06 | 30.05 | 30.35 | 12 | 29.69 | 7 | 0.65 | 57.5 | + 1.8 | 78.1 | 3 | 68.2 | 39.6 | 10 | 48.1 | 38.5 | 26.8 | 17 | 9.7 | 18 | 56.6 | 40.3 | 0.01 | — 0.48 | 4,071 | n. | 32 | w. | 8 | 1 | 4 | 9 | 18 |
| ***Middle plateau.*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fort Bidwell | ..... | 25.47 | ..... | ..... | ..... | ... | ..... | ... | 0.61 | 35.5 | ..... | 54.1 | 6 | 43.6 | 12.6 | 12 | 28.6 | 41.5 | 24.7 | 13 | 4.7 | 10 | 83.7 | 30.9 | 3.74 | ..... | 3,363 | w. | 27 | w. | 7 | 11 | 9 | 12 | 10 |
| Winnemucca | 4,358 | 25.73 | +.09 | 30.29 | 30.60 | 13 | 30.00 | 21 | 0.60 | 36.9 | + 5.7 | 54.2 | 2 | 45.9 | 16.0 | 12 | 28.1 | 38.2 | 25.6 | 6 | 6.8 | 10 | 69.5 | 27.5 | 1.00 | — 0.27 | 6,155 | sw. | 39 | sw. | 7 | 9 | 4 | 16 | 11 |
| Salt Lake City | 4,348 | 25.74 | +.07 | 30.27 | 30.66 | 2 | 29.77 | 7 | 0.80 | 34.0 | + 1.2 | 57.2 | 25 | 41.1 | 4.6 | 12 | 26.7 | 52.6 | 21.9 | 24 | 6.3 | 3 | 74.7 | 20.6 | 0.92 | — 0.50 | 2,808 | se. | 27 | se. | 25 | 10 | 11 | 11 | 9 |
| Montrose | 5,825 | 24.37 | ..... | 30.39 | 30.76 | 2 | 29.79 | 7 | 0.97 | 27.5 | ..... | 55.5 | 3 | 40.8 | —10.1 | 12 | 17.6 | 65.6 | 38.3 | 16 | 8.4 | 20 | 75.4 | 20.1 | 0.71 | ..... | 3,548 | se. | 34 | sw. | 7 | 11 | 11 | 9 | 11 |
| Fort Bridger* | ..... | 23.50 | ..... | ..... | ..... | ... | ..... | ... | 0.72 | 25.4 | ..... | 48.0 | 5 | 34.8 | — 2.6 | 12 | 14.6 | 50.6 | 37.5 | 20 | 13.0 | 4 | 77.9 | 18.8 | 0.41 | ..... | 6,247 | sw. | 44 | w. | 12 | 7 | 6 | 13 | 9 |
| ***Northern plateau.*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cœur d'Alene | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 34.7 | ..... | 57.0 | 1 | 42.0 | — 1.0 | 11 | 27.4 | 58.0 | ..... | ... | ..... | ... | ..... | ..... | 1.48 | — 1.09 | ..... | ..... | ..... | ... | 7 | ... | ... | ... | ... |
| Lewiston | 785 | 29.31 | ..... | 30.15 | 30.68 | 11 | 29.74 | 25 | 0.94 | 39.8 | + 8.5 | 59.0 | 1 | 46.3 | 16.0 | 31 | 34.0 | 43.0 | 28.1 | 31 | 5.8 | 9 | 81.2 | 34.3 | 2.21 | — 1.07 | 2,624 | ne. | 26 | ne. | 23 | 16 | 12 | 17 | 2 |
| Ashland | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 42.6 | ..... | 60.0 | 1 | 50.0 | 26.0 | 12 | 35.2 | 34.0 | ..... | ... | ..... | ... | ..... | ..... | 3.32 | ..... | ..... | ..... | ..... | ... | 13 | ... | ... | ... | ... |
| Fort Klamath | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 34.2 | ..... | 54.0 | 18 | 39.4 | 16.0 | 13 | 29.2 | 38.0 | ..... | ... | ..... | ... | ..... | ..... | 4.09 | ..... | ..... | ..... | ..... | ... | 15 | ... | ... | ... | ... |
| Linkville | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 35.4 | ..... | 50.0 | 6 | 41.9 | 19.0 | 2 | 28.9 | 31.0 | ..... | ... | ..... | ... | ..... | ..... | 2.35 | ..... | ..... | ..... | ..... | ... | 13 | ... | ... | ... | ... |
| Fort Spokane | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 34.4 | ..... | 52.0 | 17 | 41.4 | 8.7 | 1 | 27.5 | 43.3 | ..... | ... | ..... | ... | ..... | ..... | 0.44 | ..... | ..... | ..... | ..... | ... | 14 | ... | ... | ... | ... |
| Spokane Falls | 1,909 | 27.29 | —.04 | 30.13 | 30.58 | 11 | 29.67 | 25 | 0.91 | 34.8 | + 7.2 | 57.1 | 1 | 42.3 | 13.4 | 11 | 30.1 | 43.7 | 24.1 | 1 | 5.4 | 29 | 86.3 | 31.0 | 1.81 | — 0.56 | 2,686 | n. | 24 | w. | 17 | 19 | 12 | 11 | 8 |
| Walla Walla | ..... | 29.03 | ..... | ..... | ..... | ... | ..... | ... | 1.03 | 41.2 | ..... | 61.8 | 26 | 48.3 | 22.0 | 11 | 35.2 | 39.8 | 20.4 | 3 | 5.6 | 13 | 76.9 | 34.1 | 1.92 | ..... | 3,673 | sw. | 30 | sw. | 17 | 16 | 14 | 15 | 2 |
| ***North Pacific coast region*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fort Canby | 179 | 29.80 | ..... | 30.00 | 30.42 | 11 | 29.47 | 25 | 0.95 | 46.7 | ..... | 55.6 | 2 | 50.2 | 33.0 | 11 | 44.1 | 22.6 | 11.2 | 11 | 3.0 | 24 | 95.0 | 45.3 | 10.56 | ..... | 9,677 | se. | 48 | se. | 16 | 25 | 21 | 8 | 2 |
| Neah Bay | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | ..... | ..... | 58.0 | 1 | ..... | 27.0 | 31 | ..... | ..... | ..... | ... | ..... | ... | ..... | ..... | 13.00 | ..... | ..... | ..... | ..... | ... | ... | 23 | ... | ... | ... |
| Olympia | 36 | 30.01 | +.05 | 30.06 | 30.53 | 11 | 29.58 | 25 | 0.95 | 43.0 | + 3.2 | 64.2 | 3 | 48.8 | 22.7 | 11 | 37.7 | 41.5 | 22.1 | 3 | 3.8 | 18 | 90.4 | 40.3 | 5.72 | — 3.90 | 2,367 | s. | 16 | w. | 7 | 20 | 16 | 11 | 4 |
| Port Angeles | 14 | 30.00 | ..... | 30.02 | 30.50 | 11 | 29.49 | 25 | 1.01 | 40.2 | ..... | 53.4 | 1 | 45.5 | 14.2 | 31 | 30.6 | 39.2 | 24.3 | 31 | 8.8 | 27 | 94.2 | 38.5 | 3.07 | ..... | 2,146 | s. | 24 | w. | 3 | 19 | 13 | 13 | 5 |
| Pysht | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 41.9 | ..... | 54.5 | 1 | 45.9 | 25.0 | 31 | 37.9 | 29.5 | ..... | ... | ..... | ... | ..... | ..... | 7.93 | ..... | ..... | ..... | ..... | ... | 23 | ... | ... | ... | ... |
| Tatoosh Island | 860 | 29.90 | ..... | 30.01 | 30.51 | 11 | 29.49 | 25 | 1.01 | 46.1 | ..... | 57.4 | 20 | 49.7 | 33.2 | 30 | 42.7 | 24.2 | 11.2 | 21 | 3.1 | 7 | 81.0 | 40.4 | 10.14 | ..... | 11,282 | e. | 51 | w. | 30 | 23 | 22 | 9 | 0 |
| Astoria | ..... | ..... | ..... | ..... | ..... | ... | ..... | ... | ..... | 44.8 | ..... | 56.0 | 25 | 49.4 | 30.0 | 12 | 40.3 | 26.0 | ..... | ... | ..... | ... | ..... | ..... | 9.85 | ..... | ..... | ..... | ..... | ... | 24 | ... | ... | ... | ... |
| Portland | 80 | 29.99 | +.04 | 30.08 | 30.49 | 11 | 29.57 | 24 | 0.92 | 43.0 | + 2.2 | 59.2 | 1 | 50.0 | 27.0 | 12 | 37.8 | 32.2 | 20.0 | 13 | 6.9 | 24 | 89.0 | 39.7 | 7.17 | — 1.05 | 2,939 | s. | 23 | s. | 17 | 19 | 12 | 12 | 7 |
| Roseburg ‡ | 523 | 29.53 | +.03 | 30.10 | 30.44 | 11 | 29.58 | 25 | 0.86 | 44.7 | + 3.5 | 61.0 | 17 | 51.3 | 32.5 | 13 | 39.8 | 28.5 | 16.8 | 29 | 5.2 | 11 | 91.4 | 42.2 | 6.52 | + 0.21 | 715 | w. | 12 | e. | 9 | 19 | 14 | 11 | 5 |
| ***Mid. Pacific coast region*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Red Bluff | 332 | 29.81 | +.08 | 30.16 | 30.36 | 12 | 29.77 | 21 | 0.59 | 49.3 | + 2.6 | 68.0 | 1 | 55.3 | 33.0 | 31 | 43.6 | 35.0 | 21.0 | 1 | 5.5 | 15 | 85.5 | 44.4 | 3.86 | — 1.50 | 4,256 | n. | 28 | s. | 25 | 9 | 11 | 7 | 13 |
| Sacramento | 64 | 30.09 | +.05 | 30.14 | 30.35 | 12 | 29.77 | 21 | 0.59 | 49.1 | + 2.5 | 64.7 | 21 | 53.8 | 37.7 | 13 | 45.0 | 27.0 | 16.0 | 9 | 2.8 | 6 | 90.3 | 46.2 | 5.76 | + 1.71 | 4,458 | se. | 25 | nw. | 7 | 10 | 13 | 7 | 11 |
| San Francisco | 60 | 30.08 | +.04 | 30.13 | 30.32 | 12 | 29.71 | 21 | 0.61 | 53.5 | + 1.8 | 67.0 | 1 | 59.4 | 44.0 | 9 | 48.5 | 23.0 | 16.5 | 27 | 7.0 | 17 | 81.0 | 47.5 | 4.99 | + 0.06 | 5,067 | nw. | 24 | sw. | 24 | 10 | 9 | 4 | 18 |
| ***South Pacific coast region*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Los Angeles | 339 | 29.72 | +.02 | 30.08 | 30.29 | 12 | 29.84 | 31 | 0.45 | 57.9 | + 3.2 | 82.0 | 2 | 68.2 | 40.3 | 10 | 48.6 | 41.7 | 28.7 | 5 | 7.3 | 21 | 71.6 | 47.6 | 1.65 | — 2.27 | 4,918 | ne. | 36 | n. | 8 | 4 | 5 | 5 | 21 |
| San Luis Obispo | 270 | 29.79 | ..... | 30.06 | 29.96 | 12 | 29.57 | 21 | 0.39 | 57.7 | ..... | 81.7 | 1 | 66.1 | 35.2 | 14 | 47.3 | 46.5 | 31.0 | 2 | 7.0 | 21 | 76.7 | 47.8 | 3.68 | ..... | 5,204 | n. | 36 | ne. | 11 | 5 | 5 | 7 | 19 |

* Record for 28 days. † Record for 23 days. ‡ Record for 30 days.

*North Carolina.*—Charlotte, Fort Macon, Raleigh, and Statesville, 9th.
*Ohio.*—Jacksonborough, 8th.
*Oregon.*—Bandon, 4th, 25th.
*South Carolina.*—Stateburg, 2d, 9th; Pacolet and Spartanburg, 9th.
*Tennessee.*—Memphis, 8th; Nashville, 8th, 9th.
*Texas.*—Fort Elliott, 2d, 11th, 30th; New Ulm, Brownsville, and San Antonio, 12th; El Paso, 27th; Galveston, 29th.
*Washington Territory.*—Spokane Falls, 3d; Neah Bay, 17th.

## OPTICAL PHENOMENA.

### SOLAR HALOS.

Solar halos were observed in the various states and territories, as follows:
*Arkansas.*—19th, 20th.
*California.*—3d, 7th, 15th, 16th, 24th.
*Colorado.*—4th, 27th.
*Dakota.*—4th, 8th, 11th, 21st.
*Florida.*—20th, 21st, 22d, 28th.
*Georgia.*—6th, 17th, 28th.
*Illinois.*—2d, 3d, 5th, 7th, 22d, 26th, 27th.
*Indiana.*—18th.
*Iowa.*—2d, 6th, 7th, 9th, 13th, 24th.
*Kansas.*—7th, 9th, 19th, 24th, 31st.
*Louisiana.*—9th, 12th, 20th.
*Maine.*—1st.
*Massachusetts.*—4th.
*Michigan.*—8th, 12th, 13th, 20th, 21st, 26th.
*Minnesota.*—4th, 16th, 21st.
*Missouri.*—19th, 20th.
*Nebraska.*—19th to 24th.
*New Jersey.*—30th.
*New York.*—8th, 16th, 21st.
*Ohio.*—2d, 4th, 12th, 16th, 18th, 27th.
*Oregon.*—10th, 13th.
*Pennsylvania.*—17th.
*South Carolina.*—4th, 17th.
*Texas.*—10th.
*Vermont.*—8th.
*Virginia.*—4th, 10th, 17th, 23d, 30th.
*Washington Territory.*—30th, 31st.
*Wisconsin.*—2d, 3d, 7th, 10th, 14th, 21st.
*Wyoming.*—4th, 16th, 18th, 19th, 24th, 29th, 30th.

### LUNAR HALOS.

Lunar halos were observed in the various states and territories, as follows:
*Alabama.*—17th, 19th, 20th, 22d.
*Arizona.*—15th to 18th, 20th, 21st, 22d, 25th.
*Arkansas.*—16th, 19th, 20th, 23d, 24th.
*California.*—15th, 16th, 17th, 19th, 20th, 24th, 30th.
*Colorado.*—11th, 16th, 18th, 22d.
*Connecticut.*—16th, 24th.
*Dakota.*—12th, 16th, 19th, 21st, 24th, 25th, 26th, 29th.
*Delaware.*—17th.
*Florida.*—1st, 17th to 22d, 24th.
*Georgia.*—17th to 21st.
*Illinois.*—5th, 11th, 15th, 19th, 20th, 22d, 28th.
*Indiana.*—9th, 15th, 17th, 19th to 22d.
*Iowa.*—15th, 23d, 24th.
*Kansas.*—2d, 12th, 15th, 17th to 24th, 26th.
*Kentucky.*—17th, 22d.
*Louisiana.*—15th, 17th, 19th, 20th, 25th.
*Maine.*—17th, 22d, 24th, 25th.
*Maryland.*—15th, 17th, 19th, 24th.
*Massachusetts.*—15th, 16th, 22d, 24th.
*Michigan.*—14th, 16th, 18th to 22d.
*Minnesota.*—12th, 16th, 17th, 19th, 20th, 21st, 27th.
*Missouri.*—19th, 20th, 23d, 26th.
*Montana.*—14th, 16th, 20th, 21st.
*Nebraska.*—12th, 16th, 19th, 21st to 24th.
*Nevada.*—18th, 20th, 22d, 24th.
*New Jersey.*—12th, 17th to 20th, 22d, 24th.
*New Mexico.*—25th.
*New York.*—15th to 18th, 20th, 21st, 24th to 28th.
*North Carolina.*—17th.
*Ohio.*—12th, 15th to 18th, 20th to 23d, 27th.
*Oregon.*—8th, 12th to 15th, 18th, 19th, 21st.
*Pennsylvania.*—12th, 15th, 16th, 17th, 20th, 21st, 24th, 25th.
*Rhode Island.*—24th.
*South Carolina.*—17th, 19th, 21st, 23d.
*Tennessee.*—17th, 18th, 19th, 21st, 22d, 23d, 28th.
*Texas.*—9th, 10th, 15th to 21st, 23d to 26th.
*Utah.*—18th, 21st, 24th.
*Virginia.*—17th, 21st, 23d, 24th, 27th.
*Washington Territory.*—14th, 15th, 20th, 27th.
*West Virginia.*—12th.
*Wisconsin.*—14th, 15th, 16th, 20th.
*Wyoming.*—14th, 17th, 18th, 19th, 21st, 24th.

The phases of the moon during December were: new moon, 6th, 8.10 a. m.; first quarter, 14th, 1.16 p. m.; full moon, 21st, 3.52 p. m.; last quarter, 28th, 7.16 a. m.; apogee, 10th, 4.30 p. m.; perigee, 22d, 8.12 p. m.

### MIRAGE.

Sherlock, Finney county, Kansas: on the mornings of the 17th and 18th Garden City, about five miles distant from this place, and ordinarily invisible, being backed by a range of bluffs, was so plainly brought into view that the town seemed but a mile distant; the whole of each building was plainly seen.

Mirage was also observed at the following places:
Vermillion, Dakota, 15th.
Webster, Dakota, 19th, 21st.
Salina, Kansas, 22d, 24th.
Blue Hill, Massachusetts, 29th.
Marquette, Nebraska, 10th, 11th, 14th, 18th, 19th, 20th.
Harvard, Nebraska, 19th.
Cedar Keys, Florida, 23d, 27th, 28th.
Galveston, Texas, 13th, 14th.
Indianola, Texas, 9th, 18th, 19th.
Saint Vincent, Minnesota, 8th.
Duluth, Minnesota, 15th.
Sherburne, Minnesota, 19th.

## MISCELLANEOUS PHENOMENA.

### SUN SPOTS.

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

| Date—December, 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, 3 p. m. | ..... | ..... | ..... | ..... | ..... | ..... | 1 | 15‡ | |
| 3, 1 p. m. | 0 | 0 | 0 | 5‡ | 0 | 0 | 1 | 10‡ | |
| 6, 11 a. m. | 0 | 0 | ..... | ..... | 0 | 0 | 0 | 0 | |
| 7, 11 a. m. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 8, 10 a. m. | 2 | 4 | 0 | 0 | 0 | 0 | 2 | 4 | |
| 11, 9 a. m. | 2 | 7‡ | ..... | ..... | ..... | ..... | 3 | 10‡ | |
| 12, 3 p. m. | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | |
| 15, 10 a. m. | ..... | ..... | ..... | ..... | ..... | ..... | 2 | 15‡ | |
| 17, 4 p. m. | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 10‡ | |
| 20, 10 a. m. | 1 | 2 | 0 | 0 | ..... | ..... | 4 | 12‡ | |
| 22, 1 p. m. | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 10‡ | |
| 24, 11 a. m. | 4 | 20‡ | ..... | ..... | ..... | ..... | 7 | 30‡ | |
| 25, 4 p. m. | 0 | 0 | 1 | 3 | 0 | 0 | 5 | 20‡ | |
| 29, 1 p. m. | ..... | ..... | ..... | ..... | ..... | ..... | 3 | 50‡ | Spots mostly small. |
| 30, 4 p. m. | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 40‡ | Do. |

Faculæ were seen at the time of every observation. ‡ Approximated.

Mr. H. D. Gowey, of North Lewisburg, Champaign county, Ohio, reports having observed sun spots on the following dates: 4th, 7th, 14th, 16th, 18th, 21st, 25th, 26th.

### 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 sixty stations show 4,923 observations to have been made, of which three were reported doubtful; of the remainder,