

POLAR BANDS.

Polar bands were reported from the following stations:

- Napoleon, Ohio, 15th, 18th.
- Wauseon, Ohio, 1st, 15th.
- Fort Macon, North Carolina, 5th.
- Beverly, New Jersey, 13th.
- Memphis, Tennessee, 7th.
- Archer, Florida, 13th, 26th, 30th.
- Riley, Illinois, 2d, 11th, 18th.
- Salina, Kansas, 9th, 28th.
- Gardiner, Maine, 19th, 25th, 29th.
- Dale Enterprise, Virginia, 4th, 10th, 14th, 29th, 30th.
- Wytheville, Virginia, 10th, 13th, 20th.

SAND STORMS.

- Fort Custer, Montana, 14th, 26th.
- El Paso, Texas, 3d.
- Fort McDowell, Arizona, 11th, 20th.

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-seven stations show 4,669 observations to have been made; of which eight were reported doubtful; of the remainder, 4,661, there were 4,090, or 87.7 per cent., followed by the expected weather.

SUN SPOTS.

Prof. David P. Todd, director of the Lawrence Observatory, Amherst, Massachusetts, furnishes the following record of sun spots for September, 1886:

Date— September, 1886. Standard time.	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, 7 a. m.	1	20†	0	0	0	0	1	20†	
3, 3 p. m.	1	25†	0	0	0	0	2	45†	
4, 4 p. m.	0	0	0	0	0	0	2	45†	
4, 5 p. m.	0	0	0	0	0	0	2	35†	
6, 6 p. m.	0	0	0	0	0	0	2	30†	
7, 9 a. m.	2	4	0	0	1	3	4	40†	
9, 9 a. m.	1	5	0	0	1	5	4	15†	
10, 4 p. m.	1	40†	0	5†	0	15†	5	55†	Broad areas of facule.
11, 5 p. m.	0	2	1	3	0	0	3	35†	
13, 5 p. m.	2	15†	0	0	0	0	5	50†	
17, 5 p. m.	0	0	0	0	0	0	3	40†	Broad areas of facule.
18, 11 a. m.	0	0	0	0	0	0	2	25†	
20, 10 a. m.	0	0	0	15†	0	0	2	10†	
22, 12 m.	1	10†	2	25†	0	0	1	10†	
24, 10 a. m.	0	0	0	0	0	0	0	0	
26, 11 a. m.	0	0	0	0	0	0	0	1	
29, 11 a. m.	1	3	0	0	1	3	1	3	
30, 1 p. m.	0	0	0	0	0	0	1	3	

Facule 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: 2d, 4th, 6th to 11th, 13th, 14th, 15th, 17th, 18th, 20th, 21st, 30th.

WATER-SPOUTS.

The bark "Elida" reports, September 23d, in latitude N. 38° 40', longitude W. 70° 10', passed close to a large water-spout.

Fourth Officer J. Niedermeyer, of the s. s. "Weser," Capt. H. Bruns, commanding, reports having observed a water-spout on the 23d, at 9.45 a. m., in N. 35° 56', W. 57° 2'.

VERIFICATIONS.

INDICATIONS.

The indications for September, 1886, were made by 2d Lieutenant Frank Greene, Signal Corps, U. S. Army, Assistant, and were verified by 2d Lieutenant J. E. Maxfield, Signal Corps, U. S. Army, Assistant.

The detailed comparison of the tri-daily indications for September, 1886, with the telegraphic reports for the succeeding thirty-two hours, shows the general average percentage of verifications to be 73.16. The percentages for the different elements are: Weather, 72.24; wind, 68.66; temperature, 75.44. By states, etc., the percentages are: For Maine, 69.36; New Hampshire, 69.03; Vermont, 65.03; Massachusetts, 66.44;

Rhode Island, 69.95; Connecticut, 67.78; New York, 73.11; Pennsylvania, 71.53; New Jersey, 72.56; Delaware, 70.81; Maryland, 74.44; District of Columbia, 72.81; Virginia, 71.72; North Carolina, 75.08; South Carolina, 76.22; Georgia, 82.11; Florida, 79.19; Alabama, 81.42; Mississippi, 77.77; Louisiana, 78.75; Texas, 76.91; Arkansas, 75.61; Tennessee, 76.19; Kentucky, 72.92; Ohio, 71.92; West Virginia, 70.69; Indiana, 73.47; Illinois, 69.72; Michigan, 71.28; Wisconsin, 63.58; Minnesota, 63.33; Iowa, 62.94; Kansas, 72.06; Nebraska, 62.94; Missouri, 75.42; Colorado, 68.50; east Dakota, 61.42.

There was one omission to predict, out of 9,630, or 0.01 per cent. Of the 9,629 predictions that have been made, eight hundred and one, or 8.32 per cent., are considered to have entirely failed; six hundred and seven-three, or 6.98 per cent., were one-fourth verified; 2,035, or 21.13 per cent., were one-half verified; 1,843, or 19.14 per cent., were three-fourths verified; 4,277, or 44.42 per cent., were fully verified, so far as can be ascertained from the tri-daily reports.

CAUTIONARY SIGNALS.

During September, 1886, one hundred and forty-seven signals of various kinds were ordered, of which number, fifty-two, or 35.31 per cent., were fully justified both as to direction and velocity. Of the above signals, twenty-one were ordered for southwesterly winds; of these, ten, or 47.62 per cent., were justified both as to direction and velocity, and twelve, or 57.14 per cent., were justified as to velocity only. Twenty-three signals were ordered for northwest winds; of these, seven, or 30.44 per cent., were justified both as to direction and velocity. Ninety-eight signals were ordered for winds without regard to direction; of these, thirty-one, or 31.63 per cent., were justified. Five on-shore signals were ordered; of these, four, or 80.00 per cent., were justified.

In twenty-five cases winds occurred which would have justified cautionary signals had they been displayed, and in twenty-eight cases winds occurred which would have justified the display of on-shore signals.

COLD-WAVE SIGNALS.

During September, 1886, twenty-seven cold-wave signals were ordered, of this number the verification of twenty-two was determined; of these, fifteen, or 68.18 per cent., were justified.

RAILWAY WEATHER SIGNALS.

Prof. P. H. Mell, jr., director of the "Alabama Weather Service," in the report for September, 1886, states:

The verification of predictions for the whole area was 91 per cent. for temperature, and 87 per cent. for weather.

The following corporations comprise this system: South and North; Montgomery and Mobile; Mobile and Girard; Georgia Pacific; East Tennessee, Virginia and Georgia system in Alabama; Memphis and Charleston; Columbus and Western; Atlanta and West Point of Georgia; Northeastern of Georgia; Western and Atlantic; East Tennessee, Virginia and Georgia system in Georgia; Montgomery and Eufaula; Pensacola and Selma; Pensacola and Atlantic; the cities of Milledgeville, Georgia, and Talladega, Alabama.

LOCAL WEATHER SIGNALS.

Prof. Goodwin D. Swezey, director of the "Nebraska Weather Service," in the report for September, 1886, makes the percentage of verifications for temperature in the state 83.0, and weather 81.9.

Prof. Winslow Upton, director of the "New England Meteorological Society," in the report for September, 1886, states:

The verification of weather signals at New Haven was 90 per cent. for temperature, 83 for weather; at eight stations reporting at the signal office in Boston, 90 for temperature, 80 for weather. Local sunset predictions at Blue Hill for twenty-four hours from midnight were verified, 80 per cent; prediction at 8 a. m., for sixteen hours 83 per cent; the Signal Service indications had a local verification of 63 per cent.

ERRATA.

In the REVIEW for August, 1886, on page 225, under "Tornado studies," the words "geographical mile," wherever they occur, should read "geographical degree." On page 235, in the table "Summary of report from observers—Earthquake of August 31, 1886," "Hollow (?) Springs, Tennessee, observer, N. F. Bryant," should read "Holly Springs, Mississippi, observer, N. T. Bryant."