adobe houses were destroyed in Socorro and a number washed away in San Marcial.

Reed City, Osceola county, Michigan: a severe thunder-storm pervailed between 4 and 9 p. m. of the 24th. The storm was accompanied by unusually heavy rain which flooded streams and damaged property in this county to the extent of $50,000. The Grand Rapids and Indiana Railroad was badly washed out between Reed City and Crapo. Several mill dams in the Hersey River broke during the night, considerably increasing the volume of water in the stream and causing several wash-outs along the line of the Flint and Pére Marquette Railroad.

HIGH TIDES.

Eastport, Maine, 28th, 29th.
New York City, 28th.
Smithville, North Carolina, 30th.
New River Inlet, North Carolina, 3d, 14th.
Wash Woods, North Carolina, 29th.
Cedar Keys, Florida, 25th.
Galveston, Texas, 24th.
Bainbridge Island, Washington Territory, 28th.

LOW TIDES

New River Inlet, North Carolina, 17th.
Cedar Keys, Florida, 21st.

ATMOSPHERIC ELECTRICITY.

AURORAS.

Tatoosh Island, Washington, Territory: a white auroral light was seen at 9.10 p. m. of the 9th. The aurora increased in brightness and at 9.40 p. m. it had changed in color from white to a bright yellow and extended from 30° west to 40° east of the magnetic meridian, altitude 15°. Shortly after 10 p. m. numerous well defined streamers appeared. The display continued visible until dawn of the 10th.

Escanaba, Michigan: an auroral light was visible from 1 a. m. until dawn of the 10th; it was again visible at 11 p. m. in the form of several long streamers. The light was obscured by clouds at 12.30 a. m. of the 11th.

Duluth, Minnesota: an auroral light was visible at 11.20 p. m. of the 10th; at 11.30 p. m. beams were quite numerous. The light was obscured by clouds at 1.45 a. m. of the 11th.

Mackinaw City, Michigan: an auroral light was seen at 7.50 p. m. of the 20th; azimuth, 90°; altitude, 20°; color, very light pink.

Eastport, Maine: an auroral arch of about 10° altitude was visible from 7.45 to 10.10 p. m. of the 20th. A faint auroral light was seen from 7.30 p. m. of the 21st until after midnight. An indistinct auroral arch of a dull white color was visible from 11 p. m. of the 29th until 1 a. m. of the 30th.

Alpena, Michigan: a faint auroral light was seen on the northern horizon at 9 p. m. of the 20th; it disappeared at 11.38 p. m.

Fort Buford, Dakota: an arch of auroral light, was seen on the 29th at 10.15 p. m., extending 15° on each side of the north point of the horizon. The light was visible until after midnight.

Saint Vincent, Minnesota: at 10.25 p. m. of the 30th a white auroral light was seen in the north, rising to an altitude of about 20° and having an azimuth of 90°. The display was not active but remained as first observed until after midnight.

Mackinaw City, Michigan: at 10 p. m. of the 30th an auroral light could be seen through breaks in the clouds. The sky began to clear at 10.30 p. m., showing the light to be of a gray color; altitude 20°; azimuth 75°.

Auroras were also observed during the month, as follows:

8th.—Cambridge, Massachusetts.
9th.—Vevay, Indiana.
10th.—Windsor, Illinois; Vevay, Indiana; Bancroft, Iowa; Poplar River, Montana.
11th.—Bethlehem, Pennsylvania.
13th.—Fort Totten, Dakota.
14th.—Wellsborough, Pennsylvania.
15th.—Windsor, Illinois.
17th.—Vevay, Indiana; Duluth, Minnesota.
19th.—Pekin, Illinois.
20th.—Cornish and Orono, Maine; Blue Hill Observatory, Cambridge, and Milton, Massachusetts; Escanaba and Traverse City, Michigan; Nashua, New Hampshire; Embarras, Wisconsin.
21st.—Fort Totten, Dakota; Cambridge, Massachusetts.
22d.—Pekin, Illinois.
23d.—Pekin, Illinois.
27th.—Kalamazoo, Michigan.
29th.—Gardiner and Orono, Maine; Cambridge, Massachusetts; Poplar River, Montana.
30th.—Fort Totten and Webster, Dakota; Bancroft, Iowa; Gardiner and Cornish, Maine; Berlin Mills, New Hampshire; Oswego, North Volney, and Syracuse, New York.

THUNDER-STORMS OF SEPTEMBER, 1886.

[By Jr. Prof. H. A. HAZEN.]

The total number of reports during September were, as follows: voluntary observers, 450; Signal Service, 181; special thunder-storm observers, 1,079; making a total of 1,710. The days of greatest frequency were, 10th, 92; 19th, 174; 18th, 108; 19th, 176; 22d, 133, and 23d, 130; and of least, 1st, 10; 4th, 22; 6th, 23; 14th, 11; 20th, 18; 25th, 17; 29th, 14; and 30th, 0. The day of greatest number was the 19th, and, contrary to the usual law, most of these storms occurred not far from 7 a. m. The conditions of pressure, temperature, and wind-direction are exhibited on chart number viii. The figures printed very near the centre of each state indicate the number of storms reported in each case. As the number of stations in Ohio is much greater than in other states, the number of storms has been divided by ten in that state.

CHART OF ELECTROMETER READINGS.

[Prepared under the direction of Prof. T. C. MENDENHALL, Assistant.]

Observations have been made during the month of September at the six stations supplied with the necessary apparatus.

At Washington City, the highest indication was given on the afternoon of September 3d, during prevalence of haze. The lowest indication was given on the afternoon of the 26th, during cloudy, windy weather when the barometer was falling rapidly; this is the only date of negative electricity during the month, although there are several dates of very low positive. Rain occurred on the 8th at 11 a. m., during early morning of the 9th, and on the 15th during the 9 a. m. and 1 p. m. observations. All of these dates show at the time of rain much lower values than the average.

On September 7th, during the afternoon, a set of observations was made at the top of the Washington Monument. The wind was light, from the east, the sky nearly covered with cumuli clouds. The values obtained were very steady in character and rather below the average. It was noticed, however, that on grounding the needle, a spark could be obtained, although the potential indicated was less than 300 volts. On several other occasions when sparks have been given in this way the potential indications were very much greater. On several clear days the lowest values of the potential, at which sparks could be obtained, exceeded 700 volts. About 3 p. m. on this date, September 6th, the cumulus clouds disappeared and the sky remained generally clear, excepting a few cirro-stratus clouds and a light haze. This change did not affect the character or value of the indications to any marked extent.

The first diagram of chart vi represents a set of observations made simultaneously at the top of the Washington Monument and at the Instrument Room of the Signal Office on September 21, 1886. The difference in elevation of the two places is about four hundred and fifty feet. It was a bright day, the wind from the northwest, and a trifle hazy. The values obtained at the Monument were much less than might have been expected from the character of the day. On September 26th observations were again made at the Monument, and, as before, the potential values were quite low; the values at the Signal

Table of miscellaneous meteorological data for September, 1886—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 clear days.	No. of fair days.
New England.																																			
Eastport	61	30.03	+.08	30.10	30.55	4	29.60	12	0.95	54.9	− 0.7	76.7	7	61.7	36.8	22	48.1	39.9	20.1	7	3.7	10	78.7	47.7	2.73	− 0.91	5,379	s.	24	s.	20	14	9	11	10
Portland	99	30.00	+.07	30.10	30.50	3	29.60	12	0.90	58.2	− 2.4	83.9	8	67.2	38.6	22	50.4	45.3	25.2	6	6.2	28	78.1	50.6	5.56	+ 2.70	5,260	nw.	28	sw.	14	15	8	10	12
Mount Washington	6,279	23.91	.....	30.11	30.64	3	29.46	12	1.18	40.2	− 0.3	61.0	6	47.6	11.4	22	33.9	50.2	25.5	29	7.1	24	86.4	35.7	8.52	− 0.10	25,060	w.	100	w.	19	16	4	12	14
Boston	125	29.99	+.06	30.12	30.49	3	29.70	12	0.80	62.7	+ 0.5	84.9	7	70.7	41.0	22	55.5	43.9	26.1	26	4.0	23	74.6	53.3	2.73	− 0.25	7,680	w.	32	w.	20	10	9	11	10
Block Island	27	30.09	.....	30.11	30.43	3	29.68	12	0.76	64.8	+ 0.7	77.7	11	69.9	50.2	21	59.9	27.5	15.7	11	5.2	30	86.5	60.4	2.90	− 0.20	8,897	sw.	34	nw.	20	10	6	16	8
Narragansett Pier	.....	.....	.....	.....	.....	.....	.....	.....	.....	63.7	.....	82.0	11	71.3	37.0	21	56.1	45.0	.....	.....	.....	.....	.....	.....	3.01	.....	.....	.....	.....	.....	.....	14	.....	.....	.....
New Haven	107	30.01	.....	30.12	30.44	4	29.68	12	0.76	63.2	− 0.9	80.4	8	72.6	40.1	21	55.2	40.3	26.5	14	8.6	9	78.6	55.8	2.35	− 1.33	4,548	s.	18	n.	20	12	9	14	7
New London	47	30.07	+.04	30.11	30.46	3	29.67	12	0.79	64.6	+ 1.3	79.1	11	71.4	43.3	21	57.3	35.8	27.0	20	6.2	9	79.8	57.6	3.69	+ 0.44	4,647	n.	24	s.	19	8	7	18	5
Edgartown	.....	.....	.....	.....	.....	.....	.....	.....	.....	67.0	.....	80.2	11	70.5	56.1	2	63.5	24.1	.....	.....	.....	.....	.....	.....	2.09	.....	.....	.....	.....	.....	.....	5	.....	.....	.....
Mid. Atlantic States.																																			
Albany	83	30.04	.....	30.12	30.49	4	29.68	12	0.81	63.4	+ 0.3	89.0	17	73.7	40.3	22	53.6	48.7	33.5	3	8.6	23	69.9	52.3	2.51	− 0.85	3,800	s.	26	s.	19	11	7	14	9
New York City	168	29.96	+.06	30.13	30.44	3	29.71	12	0.73	67.1	+ 1.6	85.9	28	74.9	50.5	21	61.1	35.4	18.9	24	4.2	9	74.5	58.0	1.79	− 1.66	4,633	s.	27	sw.	26	7	7	17	6
Philadelphia	117	30.02	+.06	30.13	30.43	3	29.71	12	0.72	69.2	+ 2.5	90.6	17	79.3	51.2	22	60.8	39.4	26.1	17	11.6	9	69.8	57.7	1.20	− 2.12	5,980	s.	38	sw.	26	9	8	10	11
Atlantic City	13	30.10	+.04	30.10	30.39	3	29.73	12	0.66	68.5	+ 1.4	85.6	11	75.4	49.8	21	62.8	35.8	23.2	21	6.9	18	81.6	62.0	0.89	− 2.45	6,460	e.	22	s.	12	9	4	14	12
Sandy Hook	28	30.09	+.04	30.11	30.42	3	29.69	12	0.73	68.6	+ 1.6	86.6	28	74.7	53.9	21	63.0	32.7	17.8	28	3.6	9	81.1	62.3	1.06	− 3.30	10,037	s.	40	nw.	20	8	3	19	8
Baltimore	45	30.09	+.05	30.12	30.42	3	29.70	12	0.72	69.6	+ 1.6	90.8	28	78.5	50.1	21	61.7	40.7	25.1	29	5.1	15	70.5	58.7	1.90	− 1.95	3,442	s.	21	sw.	26	8	5	19	6
Ocean City	.....	.....	.....	.....	.....	.....	.....	.....	.....	70.3	.....	82.0	11	75.1	51.5	20	65.8	30.5	.....	.....	.....	.....	.....	.....	2.58	.....	.....	.....	.....	.....	.....	3	.....	.....	.....
Washington City	106	30.03	+.05	30.13	30.42	3	29.72	12	0.70	69.3	+ 1.5	91.2	28	78.5	47.0	21	60.2	44.2	25.4	29	6.2	15	73.7	59.7	1.79	− 2.19	3,364	ne.	21	nw.	12	8	5	20	5
Cape Henry	16	30.11	+.05	30.11	30.35	2	29.78	12	0.57	72.0	0.0	89.0	28	77.0	58.6	22	67.7	30.4	20.8	23	2.5	5	78.6	64.5	4.98	− 0.01	9,612	ne.	38	n.	13	6	7	9	14
Chincoteague	8	30.12	+.05	30.11	30.37	2	29.71	12	0.66	71.0	+ 1.0	85.1	11	76.3	57.2	29	65.1	27.9	18.3	29	7.6	18	79.7	64.1	1.03	− 1.57	7,129	ne.	31	nw.	29	7	5	15	10
Lynchburg	652	29.46	+.06	30.13	30.40	2	29.76	12	0.65	69.5	+ 0.8	90.7	10	80.3	50.0	14	60.5	40.7	28.9	12	4.9	15	83.4	63.7	1.74	− 1.58	1,761	ne.	12	nw.	13	9	8	11	11
Norfolk	30	30.11	+.06	30.12	30.35	2	29.78	12	0.58	71.6	+ 0.7	89.4	28	79.1	59.9	21	66.1	29.5	22.2	23	5.6	8	78.1	63.5	4.63	− 0.14	4,254	ne.	21	n.	20	8	6	13	11
South Atlantic States.																																			
Charlotte	808	29.39	+.06	30.12	30.35	2	29.80	12	0.55	72.4	− 1.4	90.8	11	82.5	53.3	3	62.2	37.5	27.1	28	11.6	8	84.3	67.0	0.68	− 2.58	3,262	ne.	20	sw.	12	7	8	13	9
Fort Macon	11	30.11	+.05	30.09	30.28	2	29.84	12	0.44	74.8	+ 0.3	84.5	18	80.0	63.4	30	70.2	21.1	14.4	29	5.7	21	83.8	69.4	1.70	− 5.55	9,665	ne.	31	n.	4	8	5	13	12
Hatteras	12	30.12	+.06	30.11	30.31	2	29.83	12	0.48	74.6	0.0	83.5	11	79.4	64.0	23	69.6	19.5	16.0	23	6.0	6	80.6	68.2	4.11	− 3.23	5,181	ne.	23	ne.	13	4	4	10	16
Kitty Hawk	9	30.13	+.04	30.12	30.32	2	29.81	12	0.51	72.8	+ 0.4	86.1	27	77.5	66.2	21	70.0	19.9	15.6	27	2.0	3	81.3	66.3	1.92	− 4.03	10,865	ne.	38	ne.	20	4	7	12	11
New River Inlet	.....	.....	.....	.....	.....	.....	.....	.....	.....	74.5	.....	89.0	18	81.5	61.0	3	67.5	28.0	.....	.....	.....	.....	.....	.....	1.09	.....	.....	.....	.....	.....	.....	7	.....	.....	.....
Smithville	34	30.07	+.04	30.08	30.26	2	29.84	12	0.42	75.3	+ 0.8	86.1	15	81.1	57.3	30	67.1	28.8	19.2	4	8.1	13	82.9	69.4	0.52	− 5.99	6,336	ne.	24	ne.	6	8	5	12	13
Wash Woods	.....	.....	.....	.....	.....	.....	.....	.....	.....	73.6	.....	87.0	28	79.9	61.0	22	67.2	26.0	.....	.....	.....	.....	.....	.....	2.02	.....	.....	.....	.....	.....	.....	4	.....	.....	.....
Wilmington	52	30.06	+.04	30.09	30.28	2	29.84	29	0.44	74.9	+ 1.5	91.2	11	84.8	58.3	30	66.7	32.9	24.6	29	9.3	13	78.5	67.1	1.34	− 6.30	3,930	ne.	20	e.	6	7	4	14	12
Charleston ‡	52	30.06	+.06	30.08	30.25	2	29.83	29	0.42	76.3	0.0	87.8	10	83.3	60.5	30	70.5	27.3	18.5	4	8.4	9	82.5	70.1	3.03	− 3.51	4,771	e.	24	e.	6	10	4	16	8
Augusta	183	29.94	+.04	30.10	30.30	3	29.87	29	0.43	74.7	− 0.1	94.6	12	87.0	60.1	3	66.8	34.5	29.6	24	5.9	21	81.7	68.0	0.65	− 3.25	2,831	ne.	17	sw.	12	3	3	17	10
Savannah	87	30.02	+.05	30.08	30.24	2	29.84	29	0.40	77.2	+ 1.4	92.7	12	83.9	63.6	4	71.0	29.1	18.4	4	8.0	8	82.6	71.1	1.64	− 4.05	4,592	e.	23	e.	6	13	4	12	14
Jacksonville	43	30.04	+.05	30.06	30.19	25	29.86	30	0.32	78.6	+ 0.8	92.0	14	85.4	66.0	28	73.5	26.0	19.3	28	4.4	3	82.1	72.2	4.91	− 3.07	3,670	ne.	24	e.	18	14	7	15	8
Florida Peninsula.																																			
Cedar Keys	22	30.06	+.05	30.04	30.16	26	29.91	30	0.25	79.4	− 0.2	91.4	16	86.6	69.4	27	73.1	22.0	19.3	24	6.5	10	78.9	72.0	1.38	− 4.18	6,646	ne.	27	ne.	2	9	8	17	5
Key West	20	29.98	+.02	29.96	30.08	10	29.80	18	0.28	82.5	− 0.4	96.9	11	89.2	70.5	3	77.1	26.4	18.6	3	5.0	26	75.3	73.5	7.10	+ 0.59	7,144	e.	32	e.	17	13	7	18	5
Sanford	25	30.00	.....	29.99	30.11	25	29.82	30	0.30	79.3	+ 1.2	92.4	13	87.0	65.5	29	73.7	26.9	24.7	29	7.1	7	80.1	72.0	5.01	− 0.99	5,446	ne.	26	n.	4	15	4	12	14
Eastern Gulf States.																																			
Atlanta	1,129	28.97	+.05	30.11	30.30	3	29.91	14	0.39	72.9	+ 1.6	90.0	11	82.8	53.0	30	64.9	37.0	23.4	30	7.4	21	74.8	63.7	0.53	− 2.74	5,983	e.	22	nw.	12	4	2	14	14
Pensacola	30	30.02	+.02	30.01	30.14	3	29.90	9	0.24	79.1	+ 1.7	89.4	18	85.8	59.7	30	73.6	29.7	24.2	30	6.1	26	77.6	71.1	1.29	− 5.24	5,586	e.	24	e.	8	10	3	17	10
Mobile	35	30.03	+.04	30.03	30.14	3	29.92	14	0.23	77.6	− 0.8	91.7	17	86.3	54.7	30	71.4	37.0	23.5	30	4.6	19	75.2	68.3	2.69	− 2.62	4,983	n.	21	e.	9	7	0	18	12
Montgomery	219	29.86	+.04	30.06	30.23	3	29.89	14	0.34	77.3	+ 1.8	91.6	17	87.2	53.9	30	69.8	37.7	25.2	30	9.5	10	69.9	65.8	1.12	− 1.81	3,893	e.	20	e.	21	4	4	15	11
Vicksburg	222	29.83	+.01	30.03	30.18	29	29.83	14	0.35	76.7	+ 1.7	92.3	9	87.1	53.4	30	69.1	38.9	25.4	1	9.1	13	77.5	68.2	5.13	+ 0.65	3,925	se.	20	sw.	15	9	6	13	11
New Orleans	52	29.99	+.01	30.01	30.10	2	29.90	9	0.20	77.9	− 0.1	92.0	12	85.3	61.8	30	72.7	30.2	18.0	16	5.2	25	81.0	70.8	4.09	− 0.83	5,524	ne.	27	ne.	18	13	5	16	9
Western Gulf States.																																			
Shreveport	227	29.80	−.01	30.00	30.22	29	29.80	15	0.41	76.9	+ 2.0	97.0	10	88.6	54.9	29	69.2	42.1	30.5	3	7.0	24	77.9	68.5	4.98	+ 0.59	3,329	se.	18	n.	28	10	4	12	14
Fort Smith	470	29.52	−.02	29.96	30.22	29	29.68	25	0.54	73.8	+ 1.6	97.9	10	85.9	49.3	29	65.4	48.6	31.2	10	7.5	24	75.4	64.2	4.22	+ 0.08	3,161	e.	17	sw.	16	7	10	9	11
Little Rock	288	29.72	+.01	30.00	30.21	29	29.76	15	0.46	73.9	+ 1.5	93.5	10	84.0	52.9	29	66.0	40.6	24.2	3	10.1	24	78.5	65.9	6.24	+ 3.24	3,362	se.	28	sw.	11	10	5	13	12
Galveston	40	29.97	+.01	29.97	30.11	29	29.77	24	0.34	80.1	+ 0.5	89.3	18	85.2	61.2	30	73.9	28.1	19.1	15	7.7	26	79.4	72.9	13.31	+ 5.74	8,947	e.	34	se.	24	17	8	13	9
Palestine	533	29.48	−.01	30.00	30.24	29	29.73	24	0.51	76.3	+ 0.7	95.5	10	86.8	55.3	29	68.8	40.2	26.9	1	2.2	24	74.2	66.0	7.12	+ 3.90	6,058	s.	32	se.	24	9	9	10	11
San Antonio	781	29.18	.00	29.94	30.16	28	29.68	24	0.48	77.1	− 0.4	91.8	9	85.9	53.7	30	70.0	38.1	21.8	1	6.3	23	82.5	70.7	4.12	− 0.42	6,104	n.	24	ne.	20	15	8	15	7
Rio Grande Valley.																																			
Brownsville	57	29.88	−.02	29.89	30.06	29	29.15	22	0.91	77.9	− 1.7	90.5	2	85.3	62.7	30	72.9	27.8	17.4	2	3.8	21	90.6	74.7	30.57	+24.95	5,595	s.	68	e.	22	20	6	17	7
Rio Grande City	230	29.75	−.01	29.94	30.17	29	29.74	23	0.42	79.5	− 2.1	98.2	3	89.9	63.3	29	73.7	34.8	23.5	3	2.0	22	81.0	72.2	8.21	+ 4.91	3,749	se.	15	s.	10	16	11	15	4
Ohio Val. & Tenn.																																			
Chattanooga	783	29.32	+.05	30.11	30.30	3	29.88	12	0.42	71.0	+ 0.7	91.3	17	82.3	48.4	30	62.5	42.9	26.7	30	8.6	14	76.7	62.5	1.11	+ 3.02	2,816	ne.	17	nw.	28	8	8	11	11
Knoxville	980	29.12	+.04	30.13	30.33	2	29.88	30	0.45	71.1	+ 2.6	90.1	18	81.7	52.0	30	60.9	38.1	29.9	24	6.6	14	77.2	62.8	1.88	− 0.99	2,545	ne.	20	ne.	28	6	7	11	12
Memphis *	320	29.74	+.02	30.05	30.23	29	29.82	15	0.40	73.4	+ 1.9	91.0	10	83.6	53.4	29	66.0	37.6	27.6	22	6.0	13	74.9	64.2	6.20	+ 3.14	4,157	se.	36	sw.	11	9	4	11	14
Nashville	549	29.52	+.04	30.08	30.26	3	29.86	14	0.40	71.1	+ 0.5	90.2	10	82.2	45.0	30	61.1	45.2	29.9	22	12.3	26	75.9	61.9	3.68	+ 0.19	3,374	e.	20	s.	25	5	4	12	14
Louisville	551	29.52	+.04	30.09	30.30	2	29.86	27	0.43	69.8	+ 0.8	90.8	24	81.2	43.8	30	60.1	47.0	28.3	30	10.3	26	70.2	58.3	1.63	− 1.35	3,745	s.	26	nw.	28	8	6	12	12
Greencastle	897	29.15	.....	30.08	30.33	18	29.78	30	0.55	66.2	.....	86.3	9	75.3	43.7	30	58.9	42.6	25.8	30	7.7	27	75.9	57.7	5.36	.....	3,224	se.	28	w.	16	11	5	13	12
Indianapolis	766	29.28	+.04	30.08	30.34	18	29.77	30	0.58	66.6	+ 0.9	90.2	9	77.9	43.3	30	56.9	46.9	30.5	30	9.8	27	70.3	55.5	3.43	+ 0.77	3,320	s.	22	s.	16	10	5	18	7
Cincinnati	628	29.45	+.04	30.10	30.36	18	29.82	27	0.54	68.4	+ 0.3	88.0	9	79.0	44.4	30	59.3	43.6	27.3	24	9.9	27	76.1	59.8	1.30	− 1.02	4,279	se.	32	sw.	23	8	5	13	12
Columbus	812	29.24	+.03	30.09	30.39	18	29.80	30	0.59	65.7	− 0.2	88.8	9	77.1	40.5	29	54.6	48.3	33.9	3	7.4	23	73.1	55.9	3.61	+ 1.09	4,359	s.	29	w.	19	10	2	18	10
Pittsburg	766	29.29	+.02	30.09	30.38	2	29.75	30	0.64	67.2	+ 2.3	92.1	10	79.1	47.5	30	58.3	44.6	29.7	25	5.8	26	77.6	59.3	2.86	+ 0.27	3,916	s.	22	sw.	27	12	3	13	14
Lower lake region.																																			
Buffalo	690	29.34	+.02	30.08	30.42	2	29.71	30	0.70	62.7	+ 0.7	83.1	6	71.4	44.4	22	55.0	38.7	31.2	3	9.1	26	73.1	53.2	5.98	+ 2.82	7,263	w.	44	sw.	19	15	6	12	12
Oswego	335	29.71	+.04	30.08	30.45	3	29.65	10	0.80	60.4	− 1.8	87.6	10	68.6	39.6	22	52.7	48.0	25.4	22	8.2	20	75.0	51.8	4.30	+ 1.74	7,034	s.	32	w.	19	15	9	11	10
Rochester	621	29.42	+.03	30.08	30.44	2	29.57	30	0.87	61.3	− 0.6	89.8	10	72.3	41.9	21	52.9	47.9	29.8	2	9.5	23	77.7	53.5	2.90	+ 0.57	7,170	sw.	34	nw.	19	13	10	14	6
Erie	681	29.35	+.02	30.07	30.40	2	29.71	27	0.69	64.2	+ 0.3	87.0	7	75.9	44.2	22	54.8	42.8	35.3	7	12.3	1	69.1	53.3	3.26	− 0.99	6,879	sw.	30	nw.	12	8	3	17	10
Cleveland	690	29.34	+.01	30.07	30.39	2	29.69	30	0.70	64.8	+ 1.2	87.3	25	74.2	42.2	30	56.2	45.1	26.8	30	6.2	17	69.5	53.8	4.04	+ 0.27	6,461	se.	32	w.	16	9	4	14	12
Sandusky	638	29.41	+.03	30.08	30.40	18	29.68	30	0.73	65.3	0.0	87.8	25	75.3	43.6	30	57.4	44.2	27.8	13	8.2	17	72.9	55.6	3.83	+ 0.52	7,715	sw.	46	nw.	30	11	5	14	11
Toledo	651	29.39	+.04	30.08	30.40	18	29.66	30	0.75	63.7	.....	88.0	8	74.3	40.0	30	55.3	48.0	30.6	30	9.8	23	72.9	53.8	6.17	+ 3.74	4,710	sw.	26	w.	19	16	5	19	6
Detroit	662	29.36	+.01	30.06	30.37	2	29.64	30	0.73	64.8	+ 2.1	85.3	8	72.8	42.9	30	57.6	42.4	23.9	30	8.3	23	75.7	56.5	4.20	+ 1.60	6,034	sw.	30	n.	19	13	7	13	10
Upper lake region.																																			
Green Bay	616	29.33	.....	30.00	30.33	18	29.66	29	0.67	58.9	.....	89.7	6	67.9	35.0	13	50.5	54.7	31.9	29	5.3	18	79.7	51.8	3.58	.....	4,577	s.	.....	.....	.....	16	9	18	3
Alpena	609	29.36	+.01	30.02	30.35	3	29.57	30	0.77	56.0	− 0.9	85.2	7	65.0	32.8	21	47.8	52.4	27.2	1	0.5	3	83.9	50.5	5.31	+ 0.72	6,533	w.	26	w.	10	17	10	13	7
Escanaba	608	29.32	−.01	29.98	30.34	18	29.53	29	0.80	55.0	− 1.4	75.6	7	62.4	33.2	30	47.2	42.4	28.0	13	6.0	22	82.5	49.3	4.06	− 0.15	5,328	sw.	26	sw.	29	15	9	16	5
Grand Haven	620	29.36	.00	30.02	30.36	18	29.63	30	0.72	61.6	+ 0.7	82.0	3	68.8	39.8	30	54.9	42.2	27.1	15	7.0	11	74.0	52.5	4.81	+ 0.84	8,265	s.	41	w.	12	14	11	15	4
Mackinaw City	605	29.32	−.05	29.98	30.30	2	29.59	30	0.72	57.2	0.0	86.7	6	65.5	30.0	21	50.6	50.7	24.1	16	6.0	9	75.0	42.8	3.84	+ 2.03	7,465	sw.	28	w.	12	17	9	15	6
Marquette	672	29.23	−.03	29.96	30.30	18	29.42	29	0.88	55.1	− 1.5	89.5	6	65.3	32.7	30	47.1	56.8	29.3	15	9.9	12	77.1	47.6	1.94	− 3.01	7,093	w.	30	s.	15	13	14	11	5
Port Huron	633	29.38	+.03	30.06	30.39	2	29.64	30	0.74	61.4	+ 0.4	89.5	8	72.2	38.3	13	52.3	51.2	26.5	2	8.9	9	77.5	53.6	4.73	+ 2.29	5,737	s.	40	sw.	16	12	7	15	8
Chicago	661	29.34	+.01	30.03	30.32	18	29.71	30	0.62	66.1	+ 2.1	86.3	7	73.4	41.0	30	58.7	44.7	27.2	13	9.0	26	71.3	55.8	6.93	+ 4.14	5,543	se.	22	nw.	18	13	5	14	11
Milwaukee	697	29.27	−.01	30.01	30.31	18	29.61	30	0.71	60.7	− 0.2	84.2	4	69.6	38.0	29	53.0	46.2	27.9	11	7.1	22	73.8	51.4	2.38	− 0.75	7,556	s.	39	sw.	11	12	8	17	5
Duluth	672	29.20	−.03	29.94	30.29	18	29.56	15	0.73	50.6	− 5.5	77.9	6	60.2	30.1	30	44.4	47.8	30.6	1	5.0	23	76.3	42.2	6.05	+ 1.62	4,607	ne.	30	nw.	29	15	5	18	7
Extreme northwest.																																			
Moorhead	923	28.90	−.05	29.91	30.30	20	29.26	14	1.04	54.2	− 1.4	90.1	4	67.5	22.7	18	41.6	67.4	42.3	14	12.8	3	69.1	43.2	1.31	− 1.32	7,499	nw.	50	s.	14	.....	.....	.....	.....
Saint Vincent	804	29.02	−.05	29.91	30.35	20	29.38	14	0.97	50.4	− 2.1	83.6	4	63.6	24.0	20	38.3	59.6	44.3	1	12.1	30	85.2	45.9	3.20	+ 1.25	6,838	nw.	39	nw.	29	8	7	12	11
Bismarck	1,694	28.12	−.01	29.94	30.26	18	29.45	14	0.82	54.3	− 1.6	91.8	5	69.0	21.7	18	43.0	70.1

Table of miscellaneous meteorological data for September, 1886—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. h.	Direction.	Date.	No. of rainy days.	No. of cloudy days.	No. of fair days.	No. of clear days.
Upper Miss. Valley.																																			
Saint Paul	831	29.06	—.02	29.95	30.27	20	29.50	15	0.78	58.1	— 0.7	88.1	6	69.2	33.0	30	48.8	55.1	33.7	14	5.6	18	75.4	49.4	3.69	+ 0.33	5,393	e.	32	w.	16	12	10	17	3
La Crosse	725	29.24	+.03	30.01	30.32	18	29.60	15	0.73	61.8	+ 0.3	90.5	6	70.7	36.4	30	54.5	54.1	28.4	14	5.7	18	79.6	55.0	3.21	— 1.88	5,783	s.	32	nw.	30	11	7	19	4
Davenport	615	29.36	.00	30.01	30.29	20	29.68	15	0.61	65.4	+ 1.2	89.5	6	75.5	37.6	30	57.0	51.9	28.8	13	5.5	1	67.8	53.4	2.43	— 0.92	5,520	s.	34	nw.	18	14	9	14	7
Des Moines	849	29.10	—.02	29.98	30.30	20	29.58	15	0.72	65.1	+ 1.3	93.2	6	70.4	35.7	30	57.0	54.5	30.4	29	7.6	8	75.3	50.3	7.93	+ 4.54	4,120	sw.	24	w.	16	17	9	16	5
Dubuque	665	29.30	.....	30.00	30.28	20	29.65	15	0.63	63.6	+ 1.0	91.9	6	74.2	35.2	30	54.4	56.7	32.6	29	10.5	8	71.1	53.0	3.10	— 1.77	3,846	s.	20	w.	11	13	7	15	8
Keokuk	618	29.36	+.01	30.01	30.31	20	29.69	15	0.62	68.2	+ 2.0	92.1	7	77.8	42.1	30	59.9	50.0	25.1	22	3.6	2	70.4	57.2	3.95	+ 0.30	6,331	s.	32	se.	1	12	5	13	12
Cairo	359	29.71	+.02	30.07	30.24	20	29.86	15	0.38	70.8	+ 1.2	88.5	19	79.7	50.8	30	63.4	37.7	26.8	22	5.9	26	74.6	61.3	2.52	— 0.20	4,409	s.	30	n.	30	9	7	12	11
Springfield	644	29.39	+.02	30.06	30.33	20	29.71	16	0.62	68.2	+ 2.1	89.6	9	77.3	44.6	30	58.8	45.0	28.2	13	7.4	25	71.5	57.9	7.24	+ 3.81	5,404	s.	24	s.	25	8	5	15	10
Saint Louis	571	29.45	+.01	30.04	30.29	20	29.72	16	0.57	72.1	+ 3.9	91.5	9	80.4	47.0	30	64.0	44.5	26.9	22	8.7	25	61.2	57.1	9.60	+ 0.39	7,842	s.	40	w.	16	11	4	16	10
Missouri Valley.																																			
Lamar	1,028	28.99	.....	30.05	30.32	20	29.70	15	0.62	69.9	.....	91.3	7	81.9	42.5	30	60.3	48.8	28.6	29	11.3	24	71.9	58.9	5.96	.....	6,471	s.	28	sw.	16	9	5	13	12
Leavenworth	842	29.11	—.02	29.98	30.27	20	29.60	15	0.67	70.5	+ 3.4	96.8	7	83.4	40.9	30	61.0	55.9	39.0	18	11.7	25	66.8	57.5	2.75	— 0.80	5,436	s.	22	nw.	16	7	5	13	12
Omaha	1,113	28.83	—.01	30.00	30.30	19	29.57	15	0.73	65.3	+ 3.1	92.7	22	77.9	39.9	30	55.8	52.8	34.0	29	10.1	25	69.7	53.8	4.45	+ 1.89	5,534	s.	24	nw.	16	19	7	10	7
Valentine	2,603	27.28	.....	29.95	30.32	28	29.46	14	0.86	59.6	.....	93.4	23	74.0	34.7	28	47.1	58.7	46.3	21	8.6	1	56.6	41.0	1.18	.....	8,551	nw.	42	nw.	9	7	4	11	15
Huron	1,307	28.55	—.02	29.94	30.31	8	29.39	14	0.91	58.7	+ 2.5	91.9	23	73.8	27.9	30	46.2	67.0	44.0	14	11.6	11	63.7	44.1	1.59	— 0.32	5,955	nw.	34	se.	14	10	5	15	10
Yankton	1,234	28.63	—.04	29.93	30.26	17	29.43	14	0.82	61.9	+ 0.6	91.7	23	74.4	33.9	30	52.3	57.8	38.6	29	7.0	18	70.6	50.6	3.45	+ 0.56	6,184	s.	32	s.	15	11	6	10	14
Northern slope.																																			
Fort Assinaboine	2,690	27.16	+.02	29.98	30.29	7	29.50	25	0.78	53.4	— 0.5	84.6	1	66.6	31.5	6	41.6	53.1	42.2	1	10.4	16	56.7	36.8	1.47	+ 0.18	7,645	sw.	41	w.	23	5	9	11	10
Fort Benton	2,661	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Custer*	3,040	26.84	+.02	29.97	30.34	28	29.50	25	0.84	56.0	— 1.6	89.0	3	72.7	30.0	29	40.9	59.0	50.4	22	11.5	16	60.7	40.2	0.66	— 0.08	4,715	n.	31	n.	14	6	5	9	15
Fort Maginnis	4,340	25.58	.....	29.97	30.30	28	29.50	14	0.80	51.0	— 1.1	82.9	2	64.8	27.1	6	40.1	55.8	34.7	6	11.4	26	56.0	34.4	1.17	+ 0.48	7,192	nw.	46	nw.	25	5	3	14	13
Fort Shaw	3,550	26.36	.....	29.98	30.35	27	29.50	25	0.85	52.8	— 0.2	82.4	13	68.4	32.3	6	41.4	50.1	41.5	13	10.7	16	61.0	38.5	1.10	— 0.42	2,195	w.	30	ne.	6	5	4	11	15
Helena	4,069	25.86	+.02	29.98	30.37	28	29.59	25	0.78	52.9	— 3.0	81.8	1	65.7	31.4	5	42.0	50.4	34.0	1	8.8	3	56.0	36.0	2.40	+ 0.89	5,342	sw.	30	sw.	26	7	6	9	15
Poplar River	2,030	27.82	.....	29.93	30.29	30	29.46	14	0.83	53.1	.....	85.6	1	69.9	17.0	30	36.3	68.6	49.5	21	18.1	17	66.6	40.9	0.21	— 0.44	7,196	w.	48	w.	9	4	1	19	10
Deadwood	4,600	25.41	+.02	30.03	30.39	28	29.60	23	0.79	53.7	+ 0.1	83.2	23	65.3	35.3	17	44.6	47.9	32.0	21	10.0	27	64.7	41.2	1.06	+ 0.25	1,610	sw.	18	s.	23	5	2	9	19
Cheyenne	6,105	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Platte	2,841	27.07	—.01	29.97	30.38	28	29.52	15	0.86	61.6	— 0.2	91.0	22	74.6	58.0	16	50.4	33.0	43.4	22	7.4	7	66.2	48.2	1.22	— 0.13	5,826	n.	32	s.	5	3	1	9	20
Middle slope.																																			
Denver	5,294	24.77	—.01	29.92	30.44	28	29.45	15	0.99	60.4	— 0.7	85.7	21	75.1	29.0	28	45.6	56.7	14.5	29	10.1	7	52.8	39.6	0.98	+ 0.06	4,658	s.	36	n.	24	4	1	11	18
Pike's Peak	14,134	17.96	.....	29.96	30.27	26	29.62	15	0.65	32.6	+ 0.5	44.0	19	40.5	21.0	27	27.5	23.0	23.1	9	7.6	11	78.1	26.4	0.71	— 1.15	11,672	w.	64	w.	17	6	0	10	20
West Las Animas	3,899	26.05	—.01	29.90	30.41	28	29.47	15	0.93	64.7	— 0.3	93.8	18	82.4	33.1	28	50.8	60.7	45.7	18	13.1	27	61.8	48.7	1.23	+ 0.63	4,158	s.	36	n.	27	4	4	10	16
Concordia	1,384	28.53	.....	29.96	30.34	28	29.49	15	0.84	68.7	.....	93.3	22	81.0	39.4	29	57.9	53.9	38.2	29	9.7	25	68.0	57.1	3.89	.....	6,218	s.	29	n.	27	9	4	9	17
Dodge City	2,523	27.42	—.01	30.00	30.44	28	29.57	15	0.87	67.6	+ 0.5	90.5	3	80.2	38.0	28	56.9	52.5	37.5	18	8.3	11	76.3	58.6	2.33	+ 1.04	7,554	s.	35	s.	24	4	7	9	14
Fort Reno	.....	.....	.....	.....	.....	.....	.....	.....	.....	75.1	.....	99.8	20	88.4	40.3	29	61.7	59.5	.....	.....	.....	.....	.....	.....	1.27	— 2.08	.....	.....	.....	.....	.....	9	.....	.....	.....
Fort Supply	.....	.....	.....	.....	.....	.....	.....	.....	.....	75.4	.....	94.3	3	85.7	41.2	28	65.0	53.1	.....	.....	.....	.....	.....	.....	0.86	— 1.96	.....	.....	.....	.....	.....	5	.....	.....	.....
Fort Elliott	2,700	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Southern slope.																																			
Fort Sill	1,200	28.78	.00	29.99	30.35	28	29.62	15	0.73	76.0	+ 3.2	94.3	10	86.5	50.1	29	67.0	44.2	28.4	10	7.0	12	63.3	61.0	2.62	— 0.11	7,465	s.	34	nw.	19	7	4	11	15
Abilene	1,745	28.22	.....	29.98	30.33	28	29.67	15	0.65	74.3	.....	91.2	9	84.1	50.9	30	66.7	40.3	24.6	15	6.9	24	70.9	63.0	4.17	.....	5,433	s.	26	sw.	16	7	6	11	13
Fort Davis	4,928	25.23	—.04	29.95	30.33	28	29.75	24	0.59	68.4	+ 1.2	91.0	3	82.2	39.5	29	58.9	51.5	33.5	15	9.5	29	62.7	52.8	5.33	+ 3.25	3,930	ne.	22	ne.	28	9	1	16	13
Fort Stanton	6,150	24.05	.....	29.90	30.25	28	29.67	15	0.58	57.4	.....	79.9	1	71.3	31.4	29	47.7	48.5	30.7	17	9.4	5	75.6	48.8	4.29	.....	3,045	w.	26	s.	1	9	8	4	18
Southern plateau.																																			
El Paso†	3,764	26.28	+.01	29.94	30.28	28	29.76	24	0.52	71.9	— 0.6	97.6	1	85.4	43.3	30	62.1	54.3	36.3	30	12.2	4	67.8	59.8	1.16	+ 0.04	2,202	e.	24	e.	3	6	1	13	6
Lava	.....	.....	.....	.....	.....	.....	.....	.....	.....	67.1	.....	92.0	1	80.0	41.0	23	54.2	51.0	.....	.....	.....	.....	.....	.....	5.67	.....	.....	.....	.....	.....	13	.....	.....	.....	.....
Santa Fé	7,026	23.37	+.04	30.01	30.32	28	29.75	15	0.57	57.4	— 1.7	75.2	19	69.4	38.0	29	48.5	37.2	29.4	30	8.8	12	62.0	43.0	4.02	+ 2.72	3,847	e.	21	s.	20	10	5	6	19
Fort Apache	5,026	25.07	+.01	29.96	30.16	29	29.76	24	0.40	64.0	+ 0.6	88.9	19	80.9	41.7	27	50.6	47.2	41.7	17	16.8	9	64.5	50.1	3.16	+ 1.58	4,342	e.	32	ne.	8	8	1	15	14
Fort Bowie	.....	.....	.....	.....	.....	.....	.....	.....	.....	69.1	.....	84.5	20	78.6	47.2	28	59.6	37.3	.....	.....	.....	.....	.....	.....	1.26	.....	.....	.....	.....	.....	.....	4	.....	.....	.....
Fort Grant	4,910	25.23	.....	29.93	30.16	29	29.81	24	0.36	69.4	— 1.8	87.0	17	80.5	52.3	29	60.6	34.7	28.0	30	13.4	10	51.9	48.4	3.49	+ 2.26	5,335	n.	40	e.	28	10	2	9	19
Fort McDowell	.....	.....	.....	.....	.....	.....	.....	.....	.....	84.6	.....	108.0	19	100.5	58.5	26	64.7	49.5	.....	.....	.....	.....	.....	.....	trace	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Fort Thomas	2,710	27.18	.....	29.85	30.13	29	29.68	24	0.45	72.6	— 0.5	96.2	18	87.6	48.1	27	60.2	48.1	41.2	17	11.9	9	58.7	54.4	1.18	+ 0.63	2,628	s.	19	sw.	28	6	1	7	22
Fort Verde	.....	.....	.....	.....	.....	.....	.....	.....	.....	72.4	— 0.9	92.0	28	85.9	57.0	28	59.0	35.0	.....	.....	.....	.....	.....	.....	0.20	— 0.95	.....	.....	.....	.....	.....	3	.....	.....	.....
Maricopa	.....	.....	.....	.....	.....	.....	.....	.....	.....	84.6	.....	106.3	18	100.0	53.1	27	69.1	53.2	.....	.....	.....	.....	.....	.....	0.06	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Phœnix	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.45	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Prescott	5,389	24.76	—.01	29.93	30.10	29	29.73	24	0.27	64.3	+ 1.1	86.0	18	80.3	43.0	28	50.4	43.0	39.2	28	20.3	1	51.9	44.1	0.46	— 0.68	3,576	sw.	26	sw.	1	4	0	4	26
San Carlos	.....	.....	.....	.....	.....	.....	.....	.....	.....	77.1	.....	100.8	19	91.9	51.7	28	62.2	49.1	.....	.....	.....	.....	.....	.....	0.87	+ 0.11	.....	.....	.....	.....	.....	3	.....	.....	.....
Willcox	.....	.....	.....	.....	.....	.....	.....	.....	.....	65.4	.....	99.0	1	89.1	41.0	26	51.7	58.0	.....	.....	.....	.....	.....	.....	1.68	.....	.....	.....	.....	.....	.....	7	.....	.....	.....
Yuma	141	29.63	—.03	29.74	29.88	29	29.60	23	0.28	84.2	— 4.7	104.5	19	98.7	62.0	28	70.7	42.5	35.6	28	20.8	1	49.0	60.5	0.00	— 0.08	2,969	ne.	19	s.	4	0	0	0	30
Middle plateau.																																			
Fort Bidwell	4,615	25.44	.....	30.04	30.28	8	29.82	22	0.45	60.2	.....	87.6	12	75.5	31.8	24	42.9	55.8	40.9	12	21.1	4	36.4	31.2	0.00	.....	3,159	n.	18	sw.	26	0	0	3	27
Winnemucca	4,358	25.64	+.03	29.96	30.28	27	29.69	12	0.59	59.8	— 0.5	90.7	12	79.7	27.0	25	39.9	63.7	50.4	17	25.3	26	22.4	17.7	0.00	— 0.35	4,735	ne.	27	ne.	30	0	1	2	27
Frisco	6,406	23.76	.....	29.83	30.19	28	29.56	23	0.64	62.9	.....	82.2	17	72.8	38.7	28	54.0	43.5	28.6	28	12.7	23	33.5	32.1	0.11	.....	6,783	n.	32	s.	4	1	0	4	26
Salt Lake City	4,348	25.66	+.03	29.95	30.33	28	29.58	4	0.74	62.3	— 1.9	87.7	22	75.6	37.5	28	50.1	50.2	39.8	17	14.9	20	60.7	47.9	1.88	+ 0.99	3,734	nw.	22	e.	5	2	1	7	22
Montrose	5,780	24.34	.....	29.91	30.27	28	29.64	15	0.62	59.7	.....	83.2	18	75.7	31.1	28	46.0	52.1	39.4	28	9.2	1	50.0	38.1	1.06	.....	4,394	se.	32	e.	6	5	1	8	21
Fort Bridger	6,643	23.57	.....	30.01	30.47	28	29.69	23	0.78	51.2	.....	78.1	21	68.0	15.0	28	36.1	63.1	47.1	28	13.2	2	55.7	33.3	0.06	.....	6,666	sw.	39	nw.	26	2	0	8	22
Northern plateau.																																			
Boisé City	2,750	27.19	.....	30.01	30.37	27	29.71	22	0.66	59.1	— 0.9	88.3	20	75.8	27.9	27	42.3	60.4	41.5	19	12.5	21	44.3	34.5	trace	— 0.09	2,399	nw.	21	nw.	16	0	1	3	26
Cœur d'Alene	.....	.....	.....	.....	.....	.....	.....	.....	.....	56.5	.....	84.0	13	71.5	29.0	28	41.5	55.0	.....	.....	.....	.....	.....	.....	1.61	+ 0.62	.....	.....	.....	.....	.....	4	.....	.....	.....
Ashland	.....	.....	.....	.....	.....	.....	.....	.....	.....	63.1	.....	98.0	10	80.6	35.0	27	45.6	63.0	.....	.....	.....	.....	.....	.....	0.00	.....	.....	.....	.....	.....	.....	0	.....	.....	.....
Fort Klamath	.....	.....	.....	.....	.....	.....	.....	.....	.....	50.4	.....	86.0	11	73.0	18.0	24	27.9	68.0	.....	.....	.....	.....	.....	.....	0.00	.....	.....	.....	.....	.....	.....	0	.....	.....	.....
Lakeview	.....	.....	.....	.....	.....	.....	.....	.....	.....	58.9	.....	87.5	12	75.9	28.0	5	41.9	59.5	.....	.....	.....	.....	.....	.....	0.00	.....	.....	.....	.....	.....	.....	0	.....	.....	.....
Linkville	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Spokane	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spokane Falls	1,909	27.97	+.02	29.99	30.42	27	29.65	14	0.77	57.7	+ 2.0	83.2	13	71.6	31.0	27	44.3	52.2	37.6	13	9.6	4	63.6	44.3	1.00	— 0.34	3,141	w.	32	w.	25	6	1	8	21
N. Pac. coast region.																																			
Fort Canby	179	29.80	+.02	30.00	30.30	26	29.67	22	0.63	58.3	.....	85.0	11	64.1	48.7	26	53.9	36.3	22.5	12	3.3	2	83.1	52.5	3.14	.....	7,335	s.	42	s.	22	10	8	8	14
Neah Bay	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Olympia	36	30.02	+.02	30.04	30.37	27	29.72	23	0.65	56.9	+ 1.0	82.6	11	69.2	35.2	27	46.7	47.4	39.8	29	8.4	2	81.9	51.2	3.17	+ 0.10	2,507	n.	18	w.	25	6	6	8	16
Port Angeles	14	30.01	.....	30.03	30.41	29	29.69	24	0.72	52.1	.....	74.3	11	61.4	34.0	27	44.7	40.3	25.8	12	6.3	1	90.0	49.0	1.68	.....	2,789	s.	16	w.	25	9	7	6	17
Pysht	.....	.....	.....	.....	.....	.....	.....	.....	.....	52.9	.....	75.0	11	61.4	34.0	6	44.4	41.0	.....	.....	.....	.....	.....	.....	4.17	.....	.....	.....	.....	.....	.....	8	.....	.....	.....
Tatoosh Island	86	29.92	+.07	30.02	30.37	27	29.66	22	0.71	53.7	.....	68.4	12	59.0	44.8	17	49.7	23.6	19.2	12	3.9	24	90.2	50.8	5.54	.....	7,982	sw.	46	e.	29	11	6	13	11
Astoria	.....	.....	.....	.....	.....	.....	.....	.....	.....	60.1	.....	84.0	11	66.4	47.0	26	53.8	37.0	.....	.....	.....	.....	.....	.....	4.33	.....	.....	.....	.....	.....	13	.....	.....	.....	.....
Portland	80	29.93	.00	30.02	30.28	26	29.82	23	0.46	62.3	+ 1.7	93.0	11	74.6	43.5	24	52.3	49.5	33.9	20	9.0	2	70.7	51.4	1.19	— 0.68	4,011	nw.	24	e.	28	7	6	8	16
Roseburg	523	29.48	.00	30.04	30.22	26	29.85	11	0.37	61.4	+ 0.8	95.5	11	77.1	35.3	27	46.9	60.2	47.9	10	11.8	1	64.6	47.9	0.33	— 0.59	2,264	w.	18	n.	26	3	1	9	20
Walla Walla	1,018	28.93	.....	30.01	30.41	27	29.73	25	0.68	64.0	.....	91.1	12	77.9	38.0	27	52.8	53.1	35.9	7	12.0	25	39.8	37.3	0.00	.....	4,574	sw.	36	sw.	25	2	0	8	22
Sitka	63	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mid. Pac. coast reg.																																			
Cape Mendocino	637	29.31	+.01	29.98	30.01	3	29.84	10	0.26	57.2	— 0.1	85.4	9	64.0	47.4	19	52.8	38.0	25.9	9	6.3	18	79.9	50.3	0.15	— 0.94	11,360	n.	45	n.	20	0	1	12	17
Red Bluff	342	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sacramento	64	29.82	—.02	29.87	30.04	30	29.77	22	0.27	67.9	— 1.3	96.0	9	86.0	49.0	6	55.0	47.0	40.0	21	20.0	5	59.0	51.5	0.00	— 0.30	3,364	s.	26	nw.	5	0	0	0	30
San Francisco	00	29.88	—.01	29.92	30.05	2	29.78	10	0.27	60.5	+ 0.7	93.9	8	71.0	50.1	21	53.8	43.8	35.0	8	7.9	14	75.8	51.6	0.01	— 0.15	6,325	w.	31	w.	1	1	4	12	14
Keeler	3,622	26.28	.....	29.81	29.96	8	29.52	4	0.43	74.1	.....	94.0	17	87.3	53.4	6	62.0	40.6	29.9	19	17.4	30	31.1	39.5	0.00	.....	3,737	e.	29	s.	30	0	0	0	30
S. Pac. coast region.																																			
Los Angeles	339	29.55	+.01	29.88	30.02	29	29.77	21	0.24	65.6	— 2.1	91.3	11	79.9	48.3	30	55.1	43.0	40.1	11	13.8	24	81.6	59.1	0.11	+ 0.10	3,375	w.	16	w.	25	0	0	15	15
San Diego	67	29.84	.00	29.88	30.02	30	29.78	22	0.24	66.6	— 0.2	77.7	11	72.3	60.0	7	62.7	17.7	17.1	11	6.0

Office, however, were also very low, and on the afternoon negative values were given. This occurred during cloudy, threatening weather.

At Boston, Massachusetts, a complete and valuable set of observations were made during the month of September. The greatest value obtained was at 3 p. m. of the 2d, equivalent to 640 volts, on a clear, cool day characterized by high barometric readings. The lowest occurred on the 18th, at 3. p. m., 316 volts on the negative side, just in advance of a thunder-storm, with a second minimum on the 10th at 11 a. m., of 9.6 volts on the negative side, during an interval of no rain in a rainy spell. Negative values were obtained as follows: on 10th, at 11 a. m., rain began at midnight and continued the whole day; on 18th, at 3 p. m., preceding thunder-storm at 3.15 p. m. The values at the 1 and 3 p. m. observations were respectively, positive, 515, negative, 316 volts. On the 25th, at 3 p. m., a feeble negative indication, the weather being threatening.

Rain occurred, in addition to the dates mentioned, on the 16th, previous to earliest observation, from 10.30 a. m. until 3.45 p. m., and on the 17th early in the morning; all day on the 23d and 28th. The rain of the 16th was accompanied by variable, high, positive values, the highest values occurring at those observations preceding the ending of the rain. The rain on the 23d was accompanied by rather low positive indications, although indications as low are noted at times during the clear weather preceding and following. The observations for the month are charted on the second diagram of chart vi.

At Columbus, Ohio, negative indications were recorded in the observations taken on the 22d, at 3 p. m., rain commencing at 6.40 p. m., and on the 23d at 1 p. m., very feeble. A thunder-storm occurred during the night of the 23d. On the 27th feeble negative indications were noted during rain.

At Ithaca, New York, a complete and interesting set of observations was recorded. Negative indications occur on August 30th, at the 11 o'clock observation, rain beginning at 2.40 p. m.; on September 12th, at three of the four observations, rain occurring throughout the day; on September 14th, at 9 a. m., rain beginning at 9.05 a. m.; on September 16th, during showery weather, and on September 26th, at 9. a. m., during light rain. Rain occurred upon other dates than those mentioned, as follows: on September 9th, in the evening; on September 17th, late in the afternoon; on the 19th, ending at 9 a. m., and during the nights of the 26th and 27th. Thunder-storms occurred during the night of the 18th, during the afternoon of the 19th, and during the nights of the 22d, 23d, 26th, and 27th.

At New Haven, Connecticut, during the last third of the month negative indications are not noted. Rain occurs but once, at 9.08 a. m., September 23d, and is accompanied by the highest noted positive potential.

OPTICAL PHENOMENA.

SOLAR HALOS.

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

Alabama.—Mobile, 24th.
Colorado.—Montrose, 10th; West Las Animas, 10th, 12th.
Connecticut.—New London, 14th.
Dakota.—Webster, 10th.
Florida.—Archer, 6th, 7th, 17th, 18th; Key West, 7th, 24th.
Georgia.—Savannah, 16th.
Illinois.—Riley, 3d, 7th; Springfield, 6th, 24th; Pekin, 6th, 29th; Charleston, 18th, 21st; Anna, 30th.
Indiana.—Vevay and Jefferson, 1st; Sunman, 13th, 21st, 30th; Greencastle, 18th.
Iowa.—Cedar Rapids, 10th, 28th, 29th.
Kansas.—Yates Centre, 5th, 10th, 13th; Salina, 9th; Wyandotte, 7th, 14th; Westmoreland, 12th.
Kentucky.—Frankfort, 22d; Richmond, 30th.
Maine.—Cornish, 22d.
Massachusetts.—Somerset, 14th; Blue Hill Observatory, 14th, 26th; Milton, 26th.
Michigan.—Port Huron, 4th; Mottville, 15th, 18th; Marquette, 25th.
Minnesota.—Duluth, 18th, 20th; Moorhead, 20th.
Missouri.—Centreville, 24th, 30th.
New Jersey.—Clayton, 2d, 14th, 24th; Sandy Hook, 4th; Dover, 4th, 14th; Moorestown, 14th; Beverly, 29th.
New York.—Factoryville, Palmyra, and North Volney, 4th; Oswego, 4th, 15th, 22d; Buffalo, 10th, 15th; Albany, 22d.
North Carolina.—New River Inlet, 1st, 5th, 12th, 18th; Weldon, 12th.
Ohio.—Wauseon, 1st, 2d, 13th, 14th, 15th, 18th, 23d; Toledo, 18th; Tiffin, 21st.
Oregon.—East Portland, 22d.
Pennsylvania.—Dyberry and Wellsborough, 4th; Grampian Hills, 14th; East Brook, 30th.
South Carolina.—Spartanburg, 11th, 12th.
Tennessee.—Chattanooga, 19th; Nashville, 30th.
Vermont.—Lunenburg, 20th.
Virginia.—Lynchburg, 4th, 11th, 26th; Wytheville, 10th; Dale Enterprise, 8th, 9th, 12th, 13th, 14th, 23d, 29th; Variety Mills, 14th, 25th; Rappahannock, 20th.
Washington Territory.—Port Angeles, 4th.
Wisconsin.—Delavan, 3d.
Wyoming.—Fort Bridger, 1st, 28th.

LUNAR HALOS.

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

Alabama.—Mobile, 8th, 11th, 13th, 19th.
California.—San Diego, 9th.
Colorado.—Pike's Peak, 8th, 12th; Montrose, 10th; West Las Animas, 10th, 12th.
Connecticut.—New Haven, 11th, 13th; New London, 13th.
Delaware.—Cape Henlopen, 16th.
District of Columbia.—Washington City, 11th to 14th.
Florida.—Key West, 6th, 8th, 9th, 10th; Pensacola, 6th, 8th, 11th; Limona, 6th, 9th, 10th, 11th, 14th; Cedar Keys, 6th, 10th, 11th, 12th, 15th, 16th; Alva, 8th; Manatee and Alva, 10th; Sanford, 14th.
Georgia.—Savannah, 7th, 9th; Atlanta, 12th, 13th.
Illinois.—Pekin, 2d, 5th, 6th, 8th; Windsor, 5th; Springfield, 6th, 7th, 8th; Anna, 8th, 10th, 14th; Cairo, 12th; Riley, 16th.
Indiana.—Lafayette, 5th; Fort Wayne, 11th; Jeffersonville and Sunman, 12th; Vevay, 22d.
Iowa.—Independence, 14th.
Kansas.—Salina, 4th, 9th; Yates Centre, 7th, 14th; Wyandotte, 10th, 12th.
Kentucky.—Frankfort, 12th, 13th; Richmond and Louisville, 13th.
Louisiana.—New Orleans, 8th, 12th.
Maine.—Portland, 14th.
Massachusetts.—Somerset, 13th, 14th; Milton and Blue Hill Observatory, 13th, 14th, 15th; Princeton, 14th.
Michigan.—Escanaba, 8th, 21st.
Missouri.—Saint Louis, 9th; Lamar, 12th, 13th.
Nebraska.—De Soto, 5th; Hay Springs, 7th; North Platte, 10th, 11th.
New Jersey.—Beverly, 5th, 6th, 8th, 9th, 13th; Egg Harbor City, 5th, 13th; Atlantic City and Clayton, 13th.
New York.—Oswego, North Volney, and Palermo, 4th; New York City, 5th, 13th, 16th; Ithaca, 11th, 14th; Rochester, 12th; Le Roy, 12th; Setauket, 13th, 14th; Humphrey, 23d.
North Carolina.—Wilmington, 6th, 13th, 15th; New River Inlet, 8th; Charlotte, 13th; Smithville, 14th.
Ohio.—Napoleon, 4th, 9th, 11th; Columbus, 9th, 13th; Wauseon, Toledo, Cleveland, and Elyria, 11th; Cincinnati, 13th; Jacksonborough, 14th.
Rhode Island.—Block Island, 13th.
South Carolina.—Spartanburg, 12th, 13th.
Tennessee.—Milan, 5th; Knoxville and Memphis, 12th.
Texas.—Brownsville, 5th; Rio Grande City, 6th; Galveston, 6th, 11th, 12th; El Paso, 7th; Palestine, 13th.