that this moist air existed as a stratum a little way above the ground, and that it descended to the earth because of the lower temperature in the eclipse area, as compared with the areas in front and rear.

As the moon cuts off the heat of the sun from the earth and its atmosphere quite rapidly during an eclipse and as totality itself lasts only from one to five minutes, the atmospheric changes as to pressure, temperature, moisture, and wind go on so rapidly, even though they be but slight, that we need very sensitive apparatus in order to measure them accurately. The temperature of the dry and wet thermometers follows the corresponding temperature of the air too sluggishly to be of much value in these delicate researches unless the thermometers are thoroughly well ventilated or whirled. Anemometers are notoriously sluggish. In general, we think that the diminution of the vertical convection current due to the cooling of the ground suffices to explain the diminution of the wind, while the subsequent warming of the ground and renewal of convection currents should explain the gusts that followed. The diurnal variation of the wind must, according to the simplest laws of hydrodynamics, produce a corresponding diurnal variation in the barometric pressure.

LANTERN SLIDES FOR LECTURES.

In order to respond to the increasing demand for lantern slides for the use of Weather Bureau officials in their lectures, the Chief of Bureau has ordered that such be prepared and sent to those who are giving lectures that require such illustrations. Many of the teachers and others who receive the MONTHLY WEATHER REVIEW doubtless have seen or perhaps possess such slides, and the committee appointed by the Chief to make the selection would be glad to hear of any that are esteemed as particularly effective or instructive. Those who desire slides on particular subjects or have any suggestions to make relative to the proposed series are invited to submit their views. It will, of course, require some months to complete the execution of this work.

POGONIP.

In the MONTHLY WEATHER REVIEW for 1894, page 76, the Editor has given some account of that mist or fog of frozen vapor that is called by the Indian name pogonip. It is there spoken of as recurring frequently in the southeastern part of White Pine County, Nev.; but the following item from Ainsley's Magazine, as reprinted in the Washington Evening Star of October 27, 1900, gives further interesting information.

This phenomena occurs most frequently in the northern part of Colorado, in Wyoming, and occasionally in Montana.

About two years ago a party of three women and two men were crossing North Park in a wagon in the month of February. The air was bitterly cold, but dry as a bone and motionless. The sun shone with almost startling brilliancy. As the five people drove along over the crisp snow they did not experience the least cold, but really felt most comfortable, and rather enjoyed the trip. Mountain peaks 50 miles away could be seen as distinctly as the pine trees by the roadside.

Suddenly one of the women put her hand up to her face and remarked that something had stung her. Then other members of the party did the same thing, although not a sign of an insect could be seen. All marveled greatly at this. A moment later they noticed that the distant mountains were disappearing behind a cloud of mist. Mist in Colorado in January. Surely there must be some mistake. But there was no mistake, because within ten minutes a gentle wind began to blow, and the air became filled with fine particles of something that scintillated like diamond dust in the sunshine. Still the people drove on until they came to a cabin where a man signaled to them to stop. With his head tied up in a bundle of mufflers, he rushed out and handed the driver a piece of paper, on which was written: "Come into the house quick, or this storm will kill all of you. Don't talk outside here."

Of course no time was lost in getting under cover and putting the horses in the stables. But they were a little late, for in less than an hour the whole party was sick with violent coughs and fever. Before the next morning one of the women died with all the symptoms of pneumonia. The others were violently ill of it, but managed to pull through after long sickness.

"I saw you people driving along the road long before you got to my house, and I knew you did not know what you were driving through," said the man, as soon as the surviving members of the party were able to talk. "That stuff you saw in the air was small particles of ice, frozen so cold that it goes clear down into the lungs without melting. If one were to stay out a few hours without covering his head he would surely die. One winter about eight years ago a whole Indian tribe across the Wyoming line died from its effects. The Indians are more afraid of it than they are of rattlesnakes, and call it the 'white death.'"

THE LONG RECORD OF MR. S. P. DAVIDSON.

Mr. B. L. Waldron, Observer Weather Bureau, Columbus, Ohio, writes that Mr. Samuel P. Davidson, of London, Ohio, has maintained a complete record of temperature and rainfall, frosts, and snowfall since 1852. The whole record was made by himself, and his thermometers have always hung on the same north porch. Mr. Davidson is now eighty-eight years of age—it is to be hoped that the records will be maintained by others for many years to come.

Mr. Waldron has forwarded to the Weather Bureau some newspaper clippings and data compiled from Mr. Davidson's record, and it is to be hoped that the complete manuscript will be deposited for safe keeping in the fire-proof vaults of the Weather Bureau.

In utilizing such records for the investigation of the question of the secular change of climate one should always remember that thermometers are always changing their zero points, and rain gages are greatly affected by such changes in their surroundings as increase or diminish their exposure to the wind. Even the records of frost will vary with the nature of the soil and the plant and the sheltering influence of the forests.

THE WEATHER OF THE MONTH.

By ALFRED J. HENRY, Professor of Meteorology.

CHARACTERISTICS OF THE WEATHER FOR OCTOBER.

In many respects the weather of the month was typical of summer conditions. The circulation of the air was generally feeble, temperatures were above the seasonal averages and the rainfall was abundant in the majority of districts. A number of areas of low pressure formed in the Plateau region or moved in from the north Pacific, only to dissipate in the upper Mississippi and Missouri valleys. It was eminently a month of inaction on the part of the lows. Two areas of high pressure of marked character moved across the country. The first appeared over the northern Plateau region on the morning of the 6th, moved to the middle Rocky Mountain region by the morning of the 7th and to the Mississippi Valley by

the morning of the 8th. The second appeared north of Montana on the morning of the 15th, moved to the upper Mississippi Valley by the morning of the 16th and to the New England coast during the next twenty-four hours. This extremely rapid movement was doubtless due in part to the sudden development of an area of low pressure over eastern New England on the 16th.

The distinguishing characteristics of the month were (1) the sluggishness of the lows; (2) the persistence of areas of high pressure over New England and the Middle Atlantic States; (3) the high temperatures east of the Rocky Mountains and the prevalence of summer weather types.

PRESSURE.

The distribution of monthly mean pressure is graphically shown on Chart IV, and the numerical values are given in Tables I and X.

As in the last three months, pressure has been above the average over the eastern seaboard. The so-called south Atlantic high for the current month appears over New England with maximum mean monthly values of 30.19 inches at Northfield, Vt., and Albany, N. Y. The persistence of areas of high pressure over New England and the Middle Atlantic States was one of the marked features of the pressure distribution during the month. This entire region was not traversed by a single well-defined area of low pressure during the month. As compared with the preceding month, pressure rose in all regions, save Florida, the upper Mississippi and the Missouri valleys, and the north Pacific coast, the greatest rise being over New England and the central Plateau region.

TEMPERATURE OF THE AIR.

Temperature was markedly above the average in all parts of the country, except the great Valley of California, the north Pacific coast, and the central Plateau region. The greatest positive departures were recorded in the upper Lake region, where the average daily excess of temperature above the normal was as much as 10° and 11° at several stations.

The area over which temperature was above normal extended westward across the Rocky Mountains to about the one hundred and twelfth meridian. During the months of August and September the Rocky Mountains formed the dividing line between regions of positive and negative departures.

The line of freezing temperature did not extend into the South Atlantic or Gulf States. Frosts occurred in the western and northern parts of North Carolina and in the mountainous districts of South Carolina on the 18th.

The distribution of monthly mean surface temperature, as deduced from the records of about 1,000 stations, is shown on Chart VI.

In Canada.—Prof. R. F. Stupart says:

The mean temperature of the month was above average in all parts of the Dominion, except in the mainland of British Columbia, Alberta, and the extreme western portion of Assiniboia. In Ontario the departure from normal ranged between 8° and 12°, an amount which, judging by the Toronto record, has not been exceeded in sixty years. In Quebec and the Maritime Provinces the positive departure from normal was also large, ranging from about 7° in the eastern townships and portions of Nova Scotia to 3° or 4° in the Gaspe Peninsula, Prince Edward Island, and Cape Breton. In Manitoba also, the mean temperature was unusually high, averaging about 6° above normal; but farther west the difference became gradually less, and at Calgary a negative departure of 3° was registered. The monthly range of temperature was large, and particularly so in Ontario, in which province maxima of over 80° were recorded in nearly all localities about the 4th and 6th, and sharp frosts occurred very generally on and about the 16th and 18th. The absolutely highest temperature so far reported was 90°, at Lucknow, Ontario, on the 6th, and the lowest reported was 11°, at Calgary on the 3d.

The average temperature for the several geographic districts and the departures from normal values are shown in the following table:

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	10	55.0	+ 4.7	+12.7	+ 1.8
Middle Atlantic	12	61.4	+ 5.6	+18.9	+ 1.9
South Atlantic	10	69.0	+ 5.0	+ 9.6	+ 1.0
Florida Peninsula	7	76.6	+ 3.6	+ 0.4	0.0
East Gulf	7	71.6	+ 4.8	+ 2.4	+ 0.2
West Gulf	7	71.0	+ 3.9	+10.7	+ 1.1
Ohio Valley and Tennessee	12	64.8	+ 8.1	+16.7	+ 1.7
Lower Lake	8	60.2	+ 8.9	+15.6	+ 1.6
Upper Lake	9	56.7	+ 9.8	+23.0	+ 2.3
North Dakota	8	48.9	+ 5.4	+40.2	+ 4.0
Upper Mississippi Valley	11	61.5	+ 8.8	+23.5	+ 2.4
Missouri Valley	10	59.4	+ 6.9	+30.0	+ 3.0
Northern Slope	7	49.4	+ 3.3	+33.1	+ 3.3
Middle Slope	6	60.0	+ 4.8	+22.4	+ 2.2
Southern Slope	6	63.8	+ 2.6	+ 9.5	+ 1.0
Southern Plateau	15	57.1	— 0.1	+ 4.3	+ 0.4
Middle Plateau	9	48.9	— 0.5	+13.6	+ 1.4
Northern Plateau	10	46.3	— 0.5	+21.5	+ 2.2
North Pacific	9	50.6	— 0.9	+11.3	+ 1.1
Middle Pacific	5	57.6	— 0.8	+ 7.0	+ 0.7
South Pacific	4	63.2	— 0.3	+ 7.0	+ 0.7

PRECIPITATION.

The month was one of more than the average rainfall, except in the Middle Atlantic States, the Lake region, northern Plateau and the southern Plateau.

The rainfall was especially heavy in the upper Mississippi Valley, in Florida and on the Gulf coast, in the mountain regions of the Carolinas, eastern Maine, and from northeastern Texas northward to South Dakota.

As has been remarked upon previous occasions, the persistence of areas of high prsssure over the middle and south Atlantic coasts is usually attended by scant rains in the Lake region, Ohio Valley, and the Middle and South Atlantic States. The area of diminished rainfall for October, 1900, extended from North Carolina westward to the Mississippi, thence northward to eastern Iowa, northeastward to eastern Lake Superior, and thence southeastward to the coast of Massachusetts.

Traces of snow fell in northern New England and quite generally throughout the Rocky Mountain region from northern New Mexico to the British Possessions. The maximum amount recorded at any one station was 17 inches in southwestern Montana.

HAIL

The following are the dates on which hail fell in the respective States:

California, 3. Colorado, 26, 29. Georgia, 4. Idaho, 5, 17, 22, 28, 31. Illinois, 7, 31. Indiana, 15. Indian Territory, 21, 28, 30. Iowa, 28. Kansas, 21. Minnesota, 3, 4, 5, 6. Mississippi, 11, 21, 22. Missouri, 1, 7, 31. Nebraska, 1, 3, 15, 26, 27, 28, 29, 30. Nevada, 5, 19. New Mexico, 1, 17, 20, 27, 30. New York, 8, 16, 18, 19. Oklahoma, 20. Oregon, 2, 3, 5, 12, 18, 19, 23, 25, 28, 29, 31. Pennsylvania, 18, 30. Utah, 5, 29. Washington, 1, 5, 21, 22, 23, 25, 26. West Virginia, 10. Wisconsin, 3, 5, 15, 17.

SLEET.

The following are the dates on which sleet fell in the respective States:

California, 3, 4, 27, 28. Michigan, 16. Montana, 20, 22, 27, 30. Utah, 6, 23, 24, 29. Washington, 26, 28, 30. Wyoming, 23, 24, 28.

Average precipitation and departure from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1
		Inches.		*Inches.*	*Inches.*
New England	10	3.94	100	0.0	— 2.5
Middle Atlantic	12	2.25	69	—1.0	— 7.4
South Atlantic	10	3.88	100	0.0	— 8.3
Florida Peninsula	7	6.26	124	+1.2	+ 2.9
East Gulf	7	4.95	174	+2.1	+ 9.8
West Gulf	7	3.84	135	+1.0	+ 3.8
Ohio Valley and Tennessee	12	2.65	100	0.0	— 7.6
Lower Lake	8	2.48	80	—0.6	— 2.0
Upper Lake	9	2.26	74	—0.8	— 2.3
North Dakota	8	1.85	148	+0.6	+ 2.2
Upper Mississippi Valley	11	4.30	163	+1.7	+ 1.3
Missouri Valley	10	3.05	174	+1.3	+ 3.1
Northern Slope	7	0.51	63	—0.3	— 1.1
Middle Slope	6	2.18	158	+0.8	+ 1.5
Southern Slope	6	3.02	150	+1.0	+ 8.9
Southern Plateau	15	0.64	76	—0.2	— 1.2
Middle Plateau	9	1.00	111	+0.1	— 3.1
Northern Plateau	10	2.41	184	+1.1	— 1.1
North Pacific	9	6.77	139	+1.9	+ 0.2
Middle Pacific	5	3.26	196	+1.6	— 3.0
South Pacific	4	0.70	100	0.0	— 4.3

In Canada.—Professor Stupart says:

A phenomenally heavy rainfall occurred in New Brunswick and western Nova Scotia, between the 9th and 12th, when 10 29 inches fell at Grand Manan, 9.49 at Yarmouth, and 8 33 at Fredericton. In eastern Nova Scotia the fall was not so excessive, and from the Bay of Fundy northward over New Brunswick the amount also lessened, and near the Quebec boundary the total fall of the month was only about average. In Quebec and Ontario there was a fairly general deficiency except very locally in some of the higher counties of the Ontario Peninsula and in the Rainy River district. Reports from stations in Alberta and Saskatchewan indicate a fairly pronounced excess of rain, but in Manitoba and Assiniboia a deficiency was general and decided. The few reports as yet received from British Columbia seem to indicate a rainfall differing very little from average. Light local snowfalls occurred in the Northwest Territories early in the month, and flurries were reported from some few stations in Ontario and the Maritime Provinces about the 17th.

SUNSHINE AND CLOUDINESS.

The distribution of sunshine is graphically shown on Chart VII, and the numerical values of average daylight cloudiness, both for individual stations and by geographical districts, appear in Table I.

The averages for the various districts, with departures from the normal, are shown in the table below:

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	6.4	+0.9	Missouri Valley	4.1	+0.2
Middle Atlantic	5.7	+0.9	Northern Slope	4.3	+0.1
South Atlantic	5.2	+1.2	Middle Slope	4.1	+1.0
Florida Peninsula	5.7	+1.0	Southern Slope	4.0	+1.2
East Gulf	5.6	+2.0	Southern Plateau	2.6	+0.6
West Gulf	4.5	+0.9	Middle Plateau	4.4	+1.2
Ohio Valley and Tennessee	4.5	0.0	Northern Plateau	5.9	+0.8
Lower Lake	4.9	—0.9	North Pacific Coast	7.0	+1.1
Upper Lake	5.6	—0.5	Middle Pacific Coast	4.5	+1.3
North Dakota	4.6	—0.5	South Pacific Coast	3.5	+0.5
Upper Mississippi	4.5	+0.1			

WIND.

The maximum wind velocity at each Weather Bureau station for a period of five minutes is given in Table I, which also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Amarillo, Tex	21	58	nw.	Mount Tamalpais, Cal.	22	54	nw.
Do	28	50	n.	Do	28	53	nw.
Buffalo, N. Y	17	54	w.	Do	29	50	nw.
Carson City, Nev	19	58	sw.	New York, N. Y	16	76	nw.
El Paso, Tex	20	53	w	Point Reyes Light, Cal.	23	60	nw.
Havre, Mont	21	54	sw	Portland, Oreg	19	53	s.
Mount Tamalpais, Cal.	2	60	s.	Sioux City, Iowa	6	54	nw.
Do.	11	50	w.	Winnemucca, Nev.	19	56	sw.
Do.	19	55	sw.				

HUMIDITY.

The averages by districts appear in the subjoined table:

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
	%			%	
New England	85	+ 7	Missouri Valley	72	+ 7
Middle Atlantic	83	+ 9	Northern Slope	64	+ 6
South Atlantic	84	+ 7	Middle Slope	64	+ 6
Florida Peninsula	82	+ 2	Southern Slope	72	+10
East Gulf	83	+11	Southern Plateau	40	— 8
West Gulf	79	+ 8	Middle Plateau	47	+ 2
Ohio Valley and Tennessee	76	+ 6	Northern Plateau	66	+ 4
Lower Lake	76	+ 3	North Pacific Coast	82	— 3
Upper Lake	84	+ 7	Middle Pacific Coast	73	+ 2
North Dakota	83	+13	South Pacific Coast	69	0
Upper Mississippi	78	+ 8			

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table VII, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—Reports of 1,533 thunderstorm were received during the current month as against 2,203 in 1899 and 2,563 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 6th, 140; 30th, 129; 28th, 95; 5th, 91.

Reports were most numerous from: Iowa, 145; Minnesota, 125; Wisconsin, 110; Missouri, 106.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, 4th to 12th.

In Canada.—Auroras were reported as follows: Father Point, 25th; Quebec, 24th, 25th; Minnedosa, 25th, 26th; Medicine Hat, 24th; Swift Current, 16th, 20th, 24th; Prince Albert, 24th, 26th.

Thunderstorms were reported as follows: Father Point, 4th; Quebec, 4th; Toronto, 7th, 26th; White River, 4th, 6th; Saugeen, 26th; Port Arthur, 6th; Battleford, 19th; Hamilton, Bermuda, 7th, 9th.