

disappear in the central portion of the country between the Rockies and the Mississippi Valley. Highs III, IV, V, IX, and X are in this category. Nos. I, II, VI, VII, and VIII reached the Atlantic. Highs II, IV, VIII, and X came from the Pacific Coast; III, VII, and IX from north of Montana, and I, V, and VI began in the central portion of the country. The general motion of the highs that crossed the country has been along the latitude of 35°, the temperature departures have been, in general, below the normal. This would seem to indicate that a tendency to higher temperature from southerly winds has been more than overcome by a radiation to clear skies.

LOWS.

Most of the storms of the month have been first seen to the north of Montana. Their paths have been along northerly latitudes, and they have disappeared in the Lake Region or else in the Gulf of St. Lawrence. The West India hurricane of October 9th to 17th was IV on Chart I. Its ocean path has been mapped by the Hydrographic Office. From the 13th to 16th this storm remained almost stationary off the middle Atlantic Coast. The highest winds were reported as follows: Cape Henry, 60 miles, p. m. of 10th and 11th. Block Island, 68, p. m., 11th; 73, a. m., 12th; 80, p. m., 12th. Boston, 52, p. m., 12th.

At 8 p. m. of 28th a storm was central off the north Pacific Coast and this marked a break in the rather uniform dry weather which had prevailed previously. During the preceding twenty-eight days rain (mostly light and sporadic) had occurred on only six days. During the nineteen days following, up to November 16, rain (oftentimes very heavy) fell on all but two of the days. The remarks by Mr. B. S. Pague, the official at Portland, Oreg., relative to this occurrence, are published on a later page of this REVIEW.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I.....	1, a. m.	45	90	5, p. m.	51	68	Miles.	Days.	Miles.	Miles.
II.....	2, a. m.	42	125	13, a. m.	49	83	1,130	4.5	251	10.5
III.....	8, p. m.	41	118	11, a. m.	49	83	4,320	11.0	384	16.0
IV.....	11, a. m.	41	126	14, a. m.	40	96	1,880	2.5	753	31.4
V.....	14, a. m.	43	111	17, a. m.	51	105	1,890	3.0	630	26.2
VI.....	17, a. m.	41	101	21, a. m.	46	58	910	3.0	304	12.7
VII.....	19, a. m.	43	109	23, a. m.	38	82	2,830	4.0	705	28.4
VIII.....	20, p. m.	45	137	27, a. m.	39	73	2,540	4.0	626	26.1
IX.....	27, a. m.	32	106	29, p. m.	51	102	4,630	6.5	714	27.2
X.....	29, p. m.	37	125	31, p. m.	33	102	1,840	2.5	294	11.0
Sums.....							22,530	44.0	5,244	
Mean of 10 paths.....									524	21.0
Mean of 44 days.....									512	21.3
Low areas.										
I.....	2, a. m.	53	116	5, a. m.	47	87	2,060	3.0	687	28.6
II.....	5, p. m.	38	91	8, p. m.	50	62	1,690	3.0	563	23.5
III.....	8, a. m.	42	113	12, a. m.	36	85	1,990	4.0	498	20.7
IV.....	9, a. m.	27	77	17, a. m.	51	84	2,900	8.0	363	15.1
V.....	9, p. m.	54	119	11, p. m.	53	105	1,600	2.0	303	12.6
VI.....	13, p. m.	54	107	15, p. m.	46	78	1,460	2.0	732	30.5
VII.....	17, p. m.	51	117	22, a. m.	51	66	2,830	4.5	629	26.2
VIII.....	22, a. m.	47	90	25, a. m.	48	62	1,550	3.0	516	25.1
IX.....	23, p. m.	30	98	29, p. m.	34	96				
X.....	26, a. m.	44	120	31, p. m.	48	87	2,980	5.5	541	22.5
Sums.....							18,060	35.0	4,832	
Mean of 9 paths.....									537	24.4
Mean of 35 days.....									516	21.5

TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The mean temperature is given for each station in Table II, for voluntary observers. Both the mean temperatures and

the departures from the normal are given in Table I for the regular stations of the Weather Bureau.

The monthly mean temperatures published in Table I, for the regular stations of the Weather Bureau, are the simple means of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The regular diurnal period in temperature is shown by the hourly means given in Table V for 29 stations selected out of 82 that maintain continuous thermograph records.

The distribution of the observed monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart IV; the lines are drawn over the Rocky Mountain Plateau region, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The highest mean temperatures were: Key West, 79.8; Jupiter, 76.0; Yuma, 75.5; Tampa, 73.2; Port Eads, 72.9; Galveston, 71.4; Corpus Christi, 70.8. The lowest temperatures were: Moorhead, 41.1; Williston, 41.2; Duluth, 41.8; Sault Ste Marie, 41.9; Bismarck, 42.0. Among the Canadian stations the highest were: Sydney and Halifax, 49.2; Yarmouth, 48.6; St. Johns, N. F., 48.2; Charlottetown, 48.0. The lowest were: White River, 31.6; Minnedosa, 34.5; Prince Albert, 34.6; Qu' Appelle, 34.8; Winnipeg, 35.0.

As compared with the normal for October the mean temperature for the current month was in excess at most of the Rocky Mountain and Pacific Coast stations and also the Canadian Maritime Provinces. It was deficient throughout the intermediate country. The greatest excesses were: Red Bluff, 4.2; Salt Lake City, Sidney, and Halifax, 3.2; Winnemucca, 3.1; Yuma, 3.0. The greatest deficits were: Detroit and Pittsburg, 4.7; Sioux City, 4.6; White River, 4.4; Kittyhawk, 4.2; New York and Cleveland, 4.1.

Considered by districts the mean temperatures of the current month show departures from the normal as given in Table I. The greatest positive departures were: Middle Plateau, 2.4; northern Plateau, 1.4. The greatest negative departures were: Middle Atlantic, 3.0; lower Lake, 3.5.

The years of highest and lowest mean temperatures for October are shown in Table I of the REVIEW for October, 1894. The mean temperature for the current month was not the highest on record at any regular station of the Weather Bureau. It was the lowest on record only at Sioux City, 47.1.

The maximum and minimum temperatures of the current month are given in Table I. The highest maxima were: 102, Yuma (18th); 98, San Luis Obispo (2d) and Phoenix (6th); 94, Fresno (2d) and Red Bluff (5th); 92, Palestine (3d). The lowest maxima were: 59, Eastport (16th); 60, Tatoosh Island (frequently); 64, Northfield (30th); 65, Alpena (30th), Sault Ste. Marie and Marquette (4th); 66, Port Angeles (17th). The highest minima were: 71, Key West (16th); 58, Jupiter (16th), Port Eads (frequently), Galveston (8th); 56, Tampa (16th) and Corpus Christi (25th). The lowest minima were: 10, Williston (22) and Lander (29th); 13, Bismarck (20th) and Huron (22d); 15, Moorhead (21st); 16, Miles City (29th); 17, Havre (26th); 18, Pierre (20th); 19, Duluth (24th) and Idaho Falls (10th).

The years of highest maximum and lowest minimum temperatures are given in the last four columns of Table I of the current REVIEW. During the present month the maximum temperatures were the highest on record at: New Orleans, Little Rock, and Topeka, 91; Miles City, 86; Port Angeles, 66. The minimum temperatures were not the lowest on record at any station of the Weather Bureau.

The greatest daily range of temperature and the data for com-

puting the extreme and mean monthly ranges are given for each of the regular Weather Bureau stations in Table I. The largest values of the greatest daily ranges were: St. Luis Obispo, 52; Carson City, 50; Pierre, 49; Winnemucca and North Platte, 48; Idaho Falls, Miles City, and Huron, 47. The smallest values were: Key West, 10; Block Island and Tatoosh Island, 14; Woods Hole, 15; Nantucket, 17; Eastport and Jupiter, 19; Galveston, San Diego, and Astoria, 20.

Among the extreme monthly ranges the largest were: Williston, 72; Pierre, 71; Miles City, 70; Lander and Huron, 69; Havre, 68. The smallest values were: Key West, 17; Tatoosh Island, 18; Astoria, 25; Hatteras, 26; Corpus Christi, San Diego, and Fort Canby, 27.

The accumulated monthly departures from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column for comparison with the departures of current conditions of vegetation from the normal condition.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
Middle Atlantic.....	+ 1.7	+ 0.2	New England.....	- 1.7	- 0.2
South Atlantic.....	+ 3.8	+ 1.0	Florida Peninsula.....	-11.6	- 1.2
East Gulf.....	+ 2.2	+ 0.2			
West Gulf.....	+11.6	+ 1.2			
Ohio Valley and Tenn.....	+ 8.5	+ 0.8			
Lower Lake.....	+ 6.0	+ 0.6			
Upper Lake.....	+18.4	+ 1.8			
North Dakota.....	+ 3.1	+ 0.3			
Upper Mississippi.....	+17.0	+ 1.7			
Missouri Valley.....	+16.5	+ 1.6			
Northern Slope.....	+ 6.4	+ 0.6			
Middle Slope.....	+22.8	+ 2.3			
Abilene (southern Slope).....	+22.8	+ 2.3			
Southern Plateau.....	+ 7.1	+ 0.7			
Middle Plateau.....	+ 3.2	+ 0.3			
Northern Plateau.....	+16.7	+ 1.7			
North Pacific.....	+ 2.2	+ 0.2			
Middle Pacific.....	+ 1.2	+ 0.1			
South Pacific.....	+ 3.8	+ 0.4			

MOISTURE.

The quantity of moisture in the atmosphere at any time may be expressed by the weight of the vapor coexisting with the air contained in a cubic foot of space, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-point for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, is given in Table I.

The rate of evaporation from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer; an evaporimeter may be so constructed as to give the quantity of water evaporated from a similar surface during any interval of time. Such an evaporimeter, therefore, would sum up or integrate the effects of those influences that determine the temperature as given by the wet bulb; from this quantity the average humidity of the air during any given interval of time may be deduced.

Measurements of evaporation within the thermometer shelters are difficult to make so as to be intercomparable at temperatures above and below freezing, and they may be replaced by computations based on the wet-bulb temperatures. The absolute amount of evaporation from natural surfaces not protected from wind, rain, sunshine, and radiation, are being made at a few experimental stations and will be discussed in special contributions.

Sensible temperatures.—The sensation of temperature experienced by the human body and ordinarily attributed to the condition of the atmosphere depends not merely on the temperature of the air, but also on its dryness, on the velocity

of the wind, and on the suddenness of atmospheric changes, all combined with the physiological condition of the observer. A satisfactory expression for the relation between atmospheric conditions and nervous sensations has not yet been obtained.

PRECIPITATION.

[In inches and hundredths.]

The distribution of precipitation for the current month, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III. The total precipitation for the current month was heaviest in Nova Scotia, and also from 6 to 8 inches in small isolated regions in Louisiana and Texas and on the coast of Washington. The larger values at regular stations were: Halifax, 15.3; Charlottetown, 10.4; Port Eads, 8.8; Sydney, 7.8; Eastport, 7.1; Quebec, 7.0.

Details as to excessive precipitation are given in Tables XII and XIII.

The years of greatest and least precipitation for October are given in the REVIEW for October, 1890. The precipitation for the current month was the greatest on record at: San Antonio, 6.04; Corpus Christi, 4.12. It was the least on record only at: Rochester, 0.58.

The diurnal variation, as shown by tables of hourly means of the total precipitation, deduced from self-registering gauges kept at the regular stations of the Weather Bureau, is not now tabulated.

The current departures from the normal precipitation are given in Table I, which shows that precipitation was in excess in the Canadian Maritime Provinces, the west Gulf and southern Plateau stations. It was generally deficient elsewhere. The large excesses were: Halifax, 9.6; Charlottetown, 5.9; Port Eads, 5.4; Pensacola and Sydney, 3.5; Quebec, 3.3. The large deficits were: Key West, 3.3; Jupiter, 3.2; Alpena, 3.0; Raleigh and Charleston, 2.8; Charlotte, 2.7.

The average departure for each district is given in Table I. By dividing each current precipitation by its respective normal the following corresponding percentages are obtained (precipitation is in excess when the percentage of the normal exceeds 100):

Above the normal: New England, 105; east Gulf, 151; west Gulf, 156; Missouri Valley, 125; middle Slope, 139; southern Slope (Abilene), 198; southern Plateau, 232; south Pacific, 267.

Below the normal: Middle Atlantic, 54; south Atlantic, 60; Florida Peninsula, 53; Ohio Valley and Tennessee, 60; lower Lake, 45; upper Lake, 73; North Dakota, 77; upper Mississippi, 89; northern Slope, 87; middle Plateau, 51; northern Plateau, 63; north Pacific, 82; middle Pacific, 81.

The total accumulated monthly departures from normal precipitation from January 1 to the end of the current month are given in the second column of the following table; the third column gives the ratio of the current accumulated precipitation to its normal value.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Inches.	Per cent.		Inches.	Per cent.
Lower Lake.....	+ 1.90	106	New England.....	- 2.50	93
North Dakota.....	+ 1.20	107	Middle Atlantic.....	- 4.60	88
Upper Mississippi.....	+ 1.40	105	South Atlantic.....	-11.40	76
Missouri Valley.....	+ 0.70	102	Florida Peninsula.....	- 4.60	90
Northern Slope.....	+ 0.60	104	East Gulf.....	- 6.70	86
Southern Plateau.....	+ 1.50	121	West Gulf.....	- 8.10	78
Middle Plateau.....	+ 2.70	129	Ohio Valley and Tenn.....	- 3.30	92
North Pacific.....	+ 1.70	104	Upper Lakes.....	- 2.10	93
Middle Pacific.....	+ 2.40	111	Middle Slope.....	- 1.60	92
			Abilene (southern Slope).....	- 3.40	85
			Northern Plateau.....	- 1.00	92
			South Pacific.....	- 1.30	85