within, but fully as many fell inward. In one case the four walls bulged outward, and the roof lay within about half way down to the floor of the second story, while not far off roofs had been lifted high into the air and carried a block and a half away before being deposited in an alley.

* * * * * * *

In all, several hundred houses were unroofed or otherwise badly wrecked. The money loss has been estimated at $200,000.

ILLNESS OF PROF. ALFRED J. HENRY.

The students of the daily weather map were quite puzzled on October 7 to find that Professor Garriott had succeeded Professor Henry as forecaster for the month of October. Inquiry revealed the fact that in consequence of a sudden affliction of the eyes Professor Henry had been taken to the University Hospital for treatment for "displacement or falling of the retina of the left eye." We are happy to add that he is improving and that there is good reason to believe that he will return to duty in a month or six weeks.—*C. A.*

NOTES UPON ECONOMICAL SHAPES FOR CUTTING ENVELOPES OF BALLOONS.

Referring to Professor Marvin's article under the above heading in the MONTHLY WEATHER REVIEW for July, 1903, a casual examination of fig. 4, page 315, might lead one to assume that the outline of the end gores of a 15-gore field of the "baseball" type is determined by a circle having for its center the projection of one of the poles p_1, p_2, p_3, p_4, and for its radius half the length of one of the central gores. The point of projection of these poles is at the center of the third gore from the end of the field.

A little consideration will show, however, that such a determination of the outline would not be correct, since the adjacent edges of any two gores must be of equal length, and this length, in degrees of a great circle, is $90° - b$, where

$$\sin b = \sqrt{(\sin 45°)^2 + (\sin 45° \tan a)^2},$$

and a is the distance in degrees from the pole to the point through which the length of any meridian of the gore is to be measured.

The data for the lengths of the edges and central meridians of the gores that fall outside the poles in a 15-gore field is as follows:

(a). Distance from pole.	$90° - b$.	Length of gore in percentage of length of central gore.
°	° ′	
9	44 17	98.4
18	41 58	93.3
27	37 29	83.3
36	29 0.7	64.5
45	0 0	0.0

H. H. K.

CORRIGENDA.

In the MONTHLY WEATHER REVIEW for July, 1903, p. 316, column 2, line 16, make "$\frac{14.007\pi^2R^2}{10}$" read "$14.047\pi R$."

On the same page in fig. 7, for "80° 24′ 10″" read "83° 24′ 10″;" and for "89° 7′ 36″" read "87° 7′ 36″."

THE WEATHER OF THE MONTH.

By Mr. W. B. STOCKMAN, District Forecaster, in charge of Division of Meteorological Records.

PRESSURE.

The distribution of mean atmospheric pressure is graphically shown on Chart IV and the average values and departures from normal are shown in Tables I and VI.

The mean barometric pressure was high over the eastern half of the country and on the north Pacific coast, with the highest reading 30.05 inches in southwestern Washington. The readings were low over the middle and southern Plateau regions, with a minimum mean of 29.72 inches at Yuma.

The mean pressure was above the normal in New England, the eastern parts of Pennsylvania and New York, western Kentucky, southern Tennessee, parts of the Gulf States, lower Missouri and upper Mississippi valleys, parts of the northern and middle slope regions, eastern North Dakota, northwestern part of the upper Lake region, and on the immediate coast of Washington, Oregon, and northern California; elsewhere the mean pressure was below the normal.

The pressure diminished from that of July, 1903, in the Pacific States, the Plateau regions generally, the Gulf and South Atlantic States, central Mississippi Valley, and the Ohio Valley and Tennessee.

TEMPERATURE OF THE AIR.

The distribution of maximum, minimum, and average surface temperatures is graphically shown by the lines on Chart VI.

The mean temperature was above the normal in the middle Plateau and slope regions, generally over the southern half of the country, excepting on the Pacific coast and in portions of southeastern Texas. Over North Carolina, southeastern Tennessee, northwestern Texas, New Mexico, eastern Arizona, north-central Utah, and north-central Colorado the departures averaged between +2.0° and +3.5° per day. As a rule the departures in the region where the temperature was below the mean were more marked than the plus departures, averaging from −2.0° to −6.4° per day from Montana, South Dakota, and Nebraska eastward to the Atlantic Ocean. The greatest deficiencies in temperature were reported from New England, eastern New York, and about western Lake Superior.

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

Average temperatures and departures from 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	8	62.4	− 4.4	+ 4.4	+ 0.6
Middle Atlantic	12	70.9	− 2.4	+ 7.8	+ 1.0
South Atlantic	10	79.6	+ 1.7	+ 4.7	+ 0.6
Florida Peninsula*	8	82.9	+ 1.5	+ 6.0	+ 0.8
East Gulf	9	81.0	+ 1.5	− 6.7	− 0.8
West Gulf	7	80.9	+ 0.3	−10.2	− 1.3
Ohio Valley and Tennessee	11	75.4	+ 0.5	+ 3.2	+ 0.4
Lower Lake	8	66.8	− 2.6	+ 7.7	+ 1.0
Upper Lake	10	63.0	− 3.0	+10.9	+ 1.4
North Dakota*	8	63.9	− 2.5	+ 2.0	+ 0.2
Upper Mississippi Valley	11	71.0	− 1.7	+ 5.0	+ 0.6
Missouri Valley	11	71.8	− 1.2	+ 1.9	+ 0.2
Northern Slope	7	67.5	− 0.3	− 1.1	− 0.1
Middle Slope	6	75.5	+ 0.9	− 4.9	− 0.6
Southern Slope*	6	80.3	+ 1.6	− 9.0	− 1.1
Southern Plateau*	13	77.4	+ 0.7	−11.3	− 1.4
Middle Plateau*	8	69.9	− 0.4	−20.6	− 2.6
Northern Plateau*	12	67.4	− 0.4	+ 1.7	+ 0.2
North Pacific	7	60.8	− 0.6	− 3.5	− 0.4
Middle Pacific	5	63.4	− 1.3	− 8.6	− 1.1
South Pacific	4	70.9	− 0.6	− 5.5	− 0.7

* Regular Weather Bureau and selected voluntary stations.

In Canada.—Prof. R. F. Stupart says:

The temperature was below the average throughout the Dominion from the Pacific to the Atlantic oceans. The largest negative departures, amounting to from 3° to 6°, were recorded in Ontario and Quebec. In the Maritime Provinces they were from 3° to 4° below, British Columbia and the Northwest Territories from 2° to 4° below, and in Manitoba, Lake Superior, and the northern portions of Ontario from 1° to 2° below.

By geographic districts the temperature was above the normal in the South Atlantic and Gulf States, Florida Peninsula, Ohio Valley and Tennessee, and the middle and southern slope and southern Plateau regions; and below normal in the remaining districts. Generally the minus departures were quite marked.

The isotherm of 80° of mean temperature is located slightly to the northward of its position in August, 1902, while the isotherm of 70° is located somewhat to the southward of its August, 1902, position, with its southward trend over the slope regions about the same position.

Maximum temperatures of 100°, or higher, were reported from portions of the Carolinas, Georgia, Texas, Indian Territory, Kansas, New Mexico, Arizona, California, Nevada, Utah, Colorado, South Dakota, Montana, Idaho, Washington, and Oregon; and 110°, or higher, from western Arizona, extreme southern Nevada, and southeastern California.

Minimum temperatures of 32°, or lower, occurred in north-central Colorado and south-central and western Wyoming.

PRECIPITATION.

The distribution of total monthly precipitation is shown on Chart III.

Excepting in New England, the precipitation was in excess in the northern part of the country generally, in the Missouri and central Mississippi valleys, and parts of the South Atlantic and Gulf States, the most marked departures occurring in the lower Missouri Valley, southeastern North Carolina, and west-central Wisconsin, where they ranged from +4.0 inches to +9.2 inches.

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	8	3.40	87	−0.5	+0.4
Middle Atlantic	12	5.97	131	+1.4	+1.7
South Atlantic	10	7.45	116	+1.0	+0.8
Florida Peninsula*	8	6.20	89	−0.8	+4.6
East Gulf	9	4.36	80	−1.1	−0.5
West Gulf	7	2.99	83	−0.6	+2.3
Ohio Valley and Tennessee	11	2.80	80	−0.7	−3.0
Lower Lake	8	4.56	154	+1.6	+3.3
Upper Lake	10	4.60	153	+1.6	+0.9
North Dakota*	8	4.94	106	+0.3	−3.3
Upper Mississippi Valley	11	4.93	163	+1.9	+0.4
Missouri Valley	11	6.14	202	+3.1	+3.3
Northern Slope	7	1.85	148	+0.6	+0.6
Middle Slope	6	2.73	112	+0.3	+0.7
Southern Slope*	6	3.05	130	+0.7	−1.3
Southern Plateau*	13	1.08	78	−0.3	0.0
Middle Plateau*	8	0.11	22	−0.4	−0.4
Northern Plateau*	12	1.10	220	+0.6	−3.0
North Pacific	7	0.88	100	0.0	−6.7
Middle Pacific	5	0.10	100	0.0	−3.7
South Pacific	4	T.	100	0.0	+0.4

*Regular Weather Bureau and selected voluntary stations.

In Canada.—Professor Stupart says:

The rainfall was below the average over western Quebec, the greater portion of the Maritime Provinces, and from eastern Manitoba to and over the Lake Superior district; elsewhere it was above the average, except locally in northern Saskatchewan, the positive departures being exceptional in many localities. In British Columbia, Barkerville recorded 3.4 inches above the average; in the Northwest Territories, Calgary was 5.3 inches above, Qu'Appelle 3.6 inches above, and Edmonton 2.1 inches above. The Peninsula of Ontario was also remarkable for its heavy rainfall, Stony Creek was 4.8 inches above the average, Port Hope 3.3 inches above, Goderich 2.9 inches above, Georgetown 2.8 inches above, Port Dover 2.7 inches above, and Stratford 2.9 inches above. The largest negative departure was reported from St. John, 2.5 inches, and Sydney came next with 2 inches.

By geographic districts the precipitation was normal in the Pacific districts; below normal in New England, Florida Peninsula, Gulf States, Ohio Valley and Tennessee, and the southern and middle Plateau regions, with generally slight deficiencies. In the remaining districts the precipitation was above the normal, with a marked excess in the Missouri Valley.

Rainfall exceeding 10 inches in amount occurred in the eastern portions of the Carolinas, north-central Florida, the eastern parts of Kansas and Nebraska, and southwestern Iowa.

The only rains reported from California were in the extreme southern and extreme northern portions.

HAIL.

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

Alabama, 1, 29. Arizona, 5, 8, 9, 16, 26. Arkansas, 9. Colorado, 5, 6, 8, 9, 10, 11, 14, 15, 19, 20, 22, 23, 24, 26, 28. Georgia, 31. Idaho, 21. Illinois, 5, 8, 9, 15, 19, 20. Indiana, 3, 19, 25, 29. Iowa, 3, 4, 5, 8, 9, 10, 14, 18, 26, 28. Kansas, 1, 2, 5, 6, 7, 8, 11, 12, 24, 25, 31. Kentucky, 17, 19. Louisiana, 25. Maine, 16, 17, 23. Maryland, 25, 27, 28. Massachusetts, 16. Michigan, 8, 10, 11, 18, 19, 21, 23. Minnesota, 2, 4, 5, 9, 17, 31. Mississippi, 29. Missouri, 5, 8, 10, 12, 13, 26, 27, 28. Montana, 1, 2, 3, 7, 10, 11, 13, 15, 16, 24. Nebraska, 1, 2, 7, 11, 12, 13, 14, 15, 17, 18, 19, 22, 24, 25. New Hampshire, 17. New Jersey, 25. New Mexico, 3, 5, 9. New York, 6, 9, 11, 17, 19, 20, 24, 25, 31. North Carolina, 8, 15, 16, 26, 29, 30. North Dakota, 2, 4, 13, 17, 22, 23, 31. Ohio, 6, 19, 26, 29. Oklahoma, 8, 9. Oregon, 22. Pennsylvania, 6, 11, 19, 25, 30. South Dakota, 4, 5, 7, 18, 21, 23, 26. Tennessee, 6, 10, 17, 19. Texas, 28. Utah, 7, 8, 9, 10, 12, 13, 16, 24, 26. Virginia, 4, 29. Washington, 22. West Virginia, 11, 18, 19. Wisconsin, 5, 8, 23. Wyoming, 2, 5, 8, 9, 10, 20, 23, 24, 26.

HUMIDITY.

The relative humidity was normal in the South Atlantic States, and the southern Plateau and south Pacific regions; slightly below normal in New England, the Florida Peninsula, and the southern Plateau and middle Pacific districts. In the remaining districts it was above normal, markedly so in North Dakota, and the southern slope region, where the excess amounted to + 10 and + 12 per cent, respectively.

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	81	− 1	Missouri Valley	74	+ 7
Middle Atlantic	81	+ 5	Northern Slope	64	+12
South Atlantic	82	0	Middle Slope	64	+ 5
Florida Peninsula	78	− 2	Southern Slope	61	0
East Gulf	81	+ 1	Southern Plateau	40	− 1
West Gulf	78	+ 3	Middle Plateau	35	+ 2
Ohio Valley and Tennessee	74	+ 2	Northern Plateau	44	+ 1
Lower Lake	75	+ 4	North Pacific	78	+ 1
Upper Lake	78	+ 3	Middle Pacific	66	− 1
North Dakota	74	+10	South Pacific	66	0
Upper Mississippi Valley	76	+ 6			

SUNSHINE AND CLOUDINESS.

The cloudiness was above the average in New England, the Middle Atlantic and east Gulf States, Ohio Valley and Tennessee, Lake region, North Dakota, upper Mississippi, and Missouri valleys, and the north and middle Pacific districts; elsewhere it was below the average, except in the middle slope region, where it was normal.

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

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

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	5.7	+ 0.7	Missouri Valley	4.8	+ 0.7
Middle Atlantic	6.1	+ 1.1	Northern Slope	3.6	— 0.1
South Atlantic	4.9	— 0.3	Middle Slope	3.8	0.0
Florida Peninsula	4.5	— 0.7	Southern Slope	4.3	— 0.5
East Gulf	5.3	+ 0.4	Southern Plateau	3.1	— 0.3
West Gulf	4.0	— 0.4	Middle Plateau	1.6	— 0.6
Ohio Valley and Tennessee	4.6	+ 0.1	Northern Plateau	2.3	— 0.7
Lower Lake	5.5	+ 1.0	North Pacific	6.0	+ 1.9
Upper Lake	6.1	+ 1.3	Middle Pacific	3.3	+ 0.5
North Dakota	5.1	+ 1.2	South Pacific	1.8	— 0.7
Upper Mississippi Valley	5.1	+ 1.0			

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table IV, 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 7174 thunderstorms were received during the current month as against 6524 in 1902 and 8139 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country was most numerous were: 25th, 427; 5th, 388; 9th, 326; 6th, 316.

Reports were most numerous from: Missouri, 525; Nebraska, 404; Iowa, 374; Florida, 323.

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: Thunderstorms were reported at St. John, N. B., 17, 22. St. Johns, N. F., 2. Grand Manan, 22. Yarmouth, 31. Charlottetown, 15, 23. Father Point, 12, 22. Quebec, 11, 16, 17, 19, 22. Montreal, 6, 11, 20. Toronto, 6, 11, 25. White River, 5, 8, 18, 19, 21, 22. Port Stanley, 24, 25, 29. Saugeen, 8, 25. Parry Sound, 11, 21. Port Arthur, 5. Winnipeg, 5, 14, 15, 16, 17, 18, 20. Minnedosa, 3, 17. Qu'Appelle, 4, 17. Medicine Hat, 4, 11, 15, 16, 22. Swift Current, 7, 8, 23. Calgary, 3, 9. Banff, 9. Edmonton, 31. Barkerville, 19. Hamilton, Bermuda, 19, 22, 27.

Auroras were reported from St. John, N. B., Sidney, Grand Manan, Yarmouth, Charlottetown, Port Stanley, Port Arthur, and Edmonton on the 21st; from Quebec on the 21st, 23d, and 26th, and from Swift Current on the 14th and 21st.

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.
Block Island, R. I	5	54	e.	Mount Tamalpais, Cal	21	62	nw.
Do	29	52	e.	Do	22	66	nw.
Buffalo, N. Y	25	58	w.	Do	25	60	nw.
Cairo, Ill	5	60	n.	New York, N. Y	25	56	nw.
Chicago, Ill	5	56	sw.	Point Reyes Light, Cal	2	65	nw.
Do	15	51	se.	Do	5	58	nw.
Cleveland, Ohio	29	54	nw.	Do	20	50	nw.
Jacksonville, Fla	5	55	w.	Do	22	60	nw.
Knoxville, Tenn	10	70	nw.	Do	24	55	nw.
Minneapolis, Minn	5	60	nw.	Do	25	54	nw.
Mount Tamalpais, Cal	2	55	nw.	Do	26	50	nw.
Do	15	60	nw.	Sand Key, Fla	1	52	se.
Do	18	55	nw.	Do	12	62	se.
Do	19	60	nw.	Springfield, Mo	8	67	n.

DESCRIPTION OF TABLES AND CHARTS.

By Mr. W. B. STOCKMAN, Forecast Official, in charge of Division of Meteorological Records.

For description of tables and charts see page 286 of REVIEW for June, 1903.