

WIND.

The prevailing winds for July, 1895, viz, those that were recorded most frequently at Weather Bureau stations, are shown in Table I.

The resultant winds, as deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table IX. These latter resultants are also shown graphically on Chart II, in connection with the isobars based on the same system of simultaneous observation; the small figure attached to each arrow shows the number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a wind of average velocity; these figures (or the ratio between them and the total number of observations in this month) indicate the extent to which winds from different directions counter-balanced each other.

HIGH WINDS.

Maximum wind velocities of 50 miles or more per hour were reported at regular stations of the Weather Bureau as follows (maximum velocities are averages for five minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Bismarck, N. Dak.....	4	52	s.	Little Rock, Ark.....	31	60	nw.
Chicago, Ill.....	18	60	w.	Memphis, Tenn.....	31	54	w.
Davenport, Iowa.....	7	60	w.	Sandusky, Ohio.....	31	50	nw.
Havre, Mont.....	15	50	nw.	Winnemucca, Nev.....	31	60	sw.
Huron, S. Dak.....	14	56	w.				

ATMOSPHERIC ELECTRICITY.

The statistics relative to auroras and thunderstorms are given in Table X, 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.

The dates on which reports of thunderstorms for the whole country were most numerous were: 20th, 259; 21st, 244; and 27th, 205.

Thunderstorm reports were most numerous in Missouri,

301; Florida, 266; Illinois, 251; and Colorado, 220. Thunderstorm days were most frequent in Kentucky and Florida, 31; Colorado, Mississippi, and Missouri, 28; Alabama and North Carolina, 25.

Severe thunderstorms are especially mentioned under "Local Storms."

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, from the 2d to the 10th, inclusive. On the remaining twenty-two days of this month 57 reports were received, or an average of about 3 per day. The dates on which the reported number especially exceeded this average were: 12th, 6; 22d, 7.

Auroras were not reported anywhere by a large percentage of observers, but the largest percentages were: North Dakota, 22 per cent; Montana, 12.

Auroras were most frequent in: Ohio, on nine days; Massachusetts, seven; North Dakota, six.

CANADIAN THUNDERSTORMS AND AURORAS.

The dates of thunderstorms were as follows: Sydney, 11, 12; Quebec, 21, 28; Saugeen, 12; Winnepeg, 5, 13, 19, 26, 29; Minnedosa, 2, 22.

The dates of auroras were as follows: Grindstone, 19; Halifax, 16; Yarmouth, 26; Saint Andrews, 25, 26; Charlottetown, 23; Father Point, 18, 22; Quebec, 13, 22; Rockliffe, 7, 8, 12; Toronto, 7, 12, 16, 21, 25; White River, 7; Port Stanley, 12, 15, 19-21; Parry Sound, 15, 25; Port Arthur, 7, 11; Winnepeg, 5, 25; Minnedosa, 5, 6, 26; Qu'Appelle, 4, 6, 9, 10, 25, 26, 27; Medicine Hat, 2-5, 15, 19, 30, 31; Swift Current, 1, 4, 15, 23, 25; Calgary, 8; Prince, Albert, 3, 4, 5, 26; Battleford, 3, 4, 5, 14, 26, 31.

METEOROLOGY AND MAGNETISM.

For general remarks relative to this subject see page 7 of the REVIEW for January, 1895.

The comparison of the air temperature with magnetic horizontal force is shown in detail on Chart V, and the special features of the July curves are as follows:

There are no corrections for amplitude or slope. For reduction to a zero base line the temperature variations are corrected by +5 and the magnetic force by +1. The pressures are plotted as for April and the succeeding months.

STATE WEATHER SERVICES.

These extracts in regard to general weather conditions are taken from the monthly reports of the State weather services. Snowfall and rain are expressed in inches.

Alabama.—The mean temperature was 79.6°, or 4.3° less than normal. The highest temperature, 102°, occurred at Goodwater on the 17th, and the lowest, 56°, at Oneonta on the 26th. The average total precipitation was 4.94; the greatest amount, 9.23, was reported at Citronelle, and the least, 1.65, at Newbern. Thunderstorms were quite frequent.

Alaska.—Not yet organized.

Arizona.—Not received.

Arkansas.—The temperature was generally below the average, except during the period from the 15th to the 20th, when it averaged 2° above. The period of greatest deficiency occurred from the 9th to the 12th, when it averaged about 8° below. The lowest temperatures occurred generally on the 9th and 10th. The average total precipitation was 7.29, or 3.26 greater than usual, and is the greatest average rainfall for thirteen years. The largest total rainfall, 16.74, was reported at Winslow, and the smallest, 1.34, at Elon. It was heaviest over the west and northwest parts of the States and lightest in the east and southeast. Thunderstorms were reported on nearly every day. On the 7th storms were reported at the greatest number of stations. Hail was reported at Keesees Ferry on the 7th and at Camden on the 20th.

California.—The mean temperature was 72.8°, about 0.3° below normal. The highest temperature, 121°, was reported at Volcano Springs on the 16th, and the lowest, 29°, at Boca on the 4th. The average total

precipitation was but 0.04 greater than the normal. Frost was reported at Bodie on the 1st, 4th, 6th, 12th, 26th, 29th, and 30th.

Colorado.—The month was characterized by many cool and rainy days, and was 3.5° cooler than the average. The deficiency of heat was general, many stations reporting the mean temperature from 1° to 3° lower than previously recorded. The average total precipitation was 1.55 above the normal. A slight deficiency occurred over Logan County and over limited areas in Washington, Summit, and Eagle counties; but in other sections decidedly more than the usual amount of rain fell, the excess being greatest over the southeastern counties, where from 2.00 to 5.00 more than the normal was recorded.

Connecticut.—(See New England.)

Delaware.—(See Maryland.)

District of Columbia.—(See Maryland.)

Florida.—The mean temperature was 81.1°, or 1.5° below the average. The highest temperature, 100°, was reported at Earnestville, on the 1st, and the lowest, 61°, at Green Cove Springs and Manatee, on the 10th. The precipitation, 7.16, was in excess of the normal by only 0.32. Decidedly the heaviest rains occurred over the northern and northwestern districts, and the least, in the southern sections.

Georgia.—The average temperature was about 2° below the normal. Although the average rainfall for the month varied but little from the normal the total amount received at stations in the same part of the State and in some cases in the same county was unusually variable. The greatest rainfall appears to have been in the extreme southwestern part of the State and over districts bordering on the coast.

Idaho.—The month opened with clear and unusually warm weather in all sections of the State. Showers were general on the 3d, 4th, and 5th, followed by a long period of dry weather, broken in only a few places by thunderstorms, accompanied by showers, which were poorly distributed and too light to be of benefit to crops. Light rains were reported over a large portion of the State from the 28th to 31st. Frosts occurred in portions of the southern section on the 6th, 7th, 8th, 10th, and 20th; the first two dates were the coolest days of the month; the warmest, the 23d and 24th.

Illinois.—The month was marked by many sudden and severe storms and heavy falls of rain over limited areas. The 7th, 14th, 17th to 20th, 26-27th, were all marked by exceedingly high gales and heavy thunderstorms with tornado tendencies. Much damage was done to property and growing crops, especially in the northern half of the State, and several lives were lost.

Indiana.—The daily mean temperature was below the normal the greater part of the month in all portions, the deficiency for the State being 1°. Excess in temperature existed in the northern, central, and southern portions; the greatest excess was in the latter section. The average precipitation for the State was 0.18 above normal.

Indian Territory.—(See *Oklahoma*.)

Iowa.—The month was slightly cooler than the average, with less than the usual precipitation. The highest temperature was 104°, at Neola, Belle Plaine, and Sidney, on the 16th; and the lowest, 35°, at Logan, on the 9th. The average precipitation was 3.40, or 0.90 below normal. The distribution was remarkably unequal. The greatest amount was 10.10, at Iowa City, and the least, 0.45, at Neola. In some sections there were excessive downpours on single days.

Kansas.—The mean temperature was 74.9°, or 2.8° below the normal. The mean did not reach normal at any station. The greatest deficiency was 6.7° in the southern part of Trego County. The average rainfall was 5.58, or an excess of 1.92. The rainfall was generally heavy in the western division, the heaviest, 7.27, occurring in Morton, and the least, 0.31, in Stafford. The largest rainfall in the State was 12.31, at Morton. Hail was reported on the 7th, 19th, 28th, and 29th; and thunderstorms on 16 dates.

Kentucky.—The month was slightly cooler than normal, and over the greater portion of the State there was an excess of rainfall which, with its accompanying clouds, reduced the amount of sunshine considerably below the average. The general character of the weather was exceptionally favorable to vegetation of all kinds, except in certain western counties, where heavy rains had a rather baneful effect. The average amount of rainfall, 5.75, exceeded that for any July since the State Weather Service was organized. The distribution of rain, however, was not uniform, the western, central, and mountain districts receiving an excess, while the counties north of Fayette and Clark received less than the average.

Louisiana.—The temperature averaged normal in the northern half of the State and was less than a degree warmer than usual over the southern half, the average for the State was but 0.4° above the normal. In the northern portion the nights averaged a degree warmer than usual and the days a degree cooler; in the southern portion both the days and nights were slightly warmer than usual. The rainfall for the State averaged 6.80, an excess of a third of an inch; it was slightly above the normal in both the north and south sections, but more noticeably so in the latter. Thunderstorms were reported from one or more stations on every day of the month.

Maine.—(See *New England*.)

Maryland.—The mean temperature was 71.4°, or 4.4° below the normal; the highest temperature, 102°, reported at Western Port on the 20th, and the lowest, 32°, at Deer Park on the 31st. The average rainfall was 3.29, or 0.96 below normal. The largest amount, 7.68, was recorded at Cherryfields, and the smallest, 0.81, at St. Charles College. Thunderstorms were reported at one or more stations on the 4th, 5th, 8th, 9th, 15th, 16th, 17th, 19th, 20th, 21st, 22d, 23d, 25th, 27th, 28th, and 31st.

Massachusetts.—(See *New England*.)

Michigan.—The mean temperature for the State was 67.8°, or 2.6° below the normal; for the Upper Peninsula it was 2.2°; northern counties, 3.9°; central counties, 3.0°, and southern counties, 1.9° below. The temperature was deficient on twenty-one days, in excess on eight days, and normal on two days. At a few scattered localities in the interior portion of the Lower Peninsula frosts were reported on the 31st, but very little damage was done. The average precipitation was 1.81 below normal. It was below the usual amount in the Upper Peninsula, 2.05; northern counties, 2.15; central counties, 1.76, and southern counties, 1.55. Over the central and southern counties there was practically no precipitation during the first fourteen days, while the rain that fell during the remainder of the month was so light and poorly distributed and came to such a parched soil that it was insufficient to supply the needs of vegetation. Over the Upper Peninsula and northern counties of the Lower Peninsula the rainfall was somewhat better distributed throughout the month; while the average was considerably less than that over the central and southern counties, it seems to have been more beneficial to vegetation, owing to its more even distribution.

Minnesota.—The month averaged 2.7° cooler than usual. The deficiency was quite uniform in all sections. There was but one hot spell,

which occurred on the 4th, 5th, and 6th. On the 8th, 9th, and 10th a marked cool spell prevailed, when nearly all minimum temperatures for the month were recorded, and in a few exposed places light frosts occurred. Other cool spells occurred between the 17th and 22d and on the last two days of the month. This latter spell was also attended with light frosts that did no harm. The rainfall averaged 0.40 in excess of the usual quantity. The counties contiguous to the Minnesota River had a slight deficiency; elsewhere the moisture was ample.

Mississippi.—The month was cooler than usual by half a degree, with a mean temperature of 80.8°. The highest temperature, 105°, was reported at Columbus on the 14th, and the lowest, 58°, at French Camp on the 26th. The average precipitation was 4.66, or an excess of 0.82. An excess fell over the southern and north-central districts, with nearly a normal fall elsewhere. The largest amount, 12.29, was recorded at Magnolia, and the smallest, 1.69, at Columbus. Reports from 10 voluntary stations show thunderstorms to have occurred at one or more stations on every day except the 26th. Hail was reported at Woodville on the 18th.

Missouri.—The month averaged cooler than usual in all sections; the mean for the State was 74.3°, or 2.8° below the normal. In the northwest and southwest sections the average daily deficiency amounted to 3.5°, and in the remaining sections it ranged from 2.2° to 2.5°. Except at a few stations in the west-central and northwest portions of the State the precipitation was decidedly in excess of the normal. In the northeast section the excess amounted to 4.21; in the southeast section 2.91; in the central section, 2.77, and in the northwest section, 1.49. Over the greater portion of the State the total rainfall exceeded 6.00, and over considerable areas in the northeast, central, west-central, and southern portions it exceeded 8.00. The average total amount was 6.89, being 2.98 above the normal. Hail was reported at one or more stations on the 14th, 18th, 28th, and 29th, and thunderstorms on the 4th, 5th, 7th, 8th, 14th, 17th to 21st, and 26th to 29th.

Montana.—The temperature was about 1° below the normal, the average being 65°; the highest daily was 108°, at Musselshell on the 3d, and the lowest 31°, at Fort Logan on the 10th and 20th. Frost was reported at Havre on the 15th and at Fort Logan on the 10th. The precipitation was about 0.54 below the normal, the average for the State being 1.08. The largest amount was 2.56, at Fort Benton, and the smallest, 0.08, at Musselshell.

Nebraska.—The average temperature was normal; the rainfall was quite deficient over the State, as a whole, being heaviest along the southern border, but very light over the northern half. The highest temperature was 110°, at North Platte on the 10th, and the lowest, 36°, at Creighton on the 9th. The average precipitation was 1.73, or 1.78 below the normal. Rainfall was heaviest in the southwest section, where it averaged 3.61, and lightest in the northwest section, where the average was but 0.94; the largest amount, 5.80, was recorded at Haiger, and the smallest, 0.00, at Albion.

Nevada.—The mean temperature was 70.2°, 1° below the normal. The greatest deficiency was 6°, at Halleck, and the least 1°, at Stoffel and Palmetto. The greatest excess was 4°, at Downeyville and Sunnyside; the least, 1°, at Candelaria and Tybo. The highest temperature, 112°, was registered at St. Thomas on the 10th and several other days; the lowest, 28°, occurred at Stoffel on the 18th. Probably the most remarkable temperature record was that of St. Thomas, with a monthly mean maximum of 104.2°. The average precipitation, 0.05, was 0.43 less than normal. The deficiency was general all over the State, with the exception of Winnemucca, which reported an excess of 0.10. Light frosts were reported at Cranes Ranch on the 6th, 17th, and 26th, and at Wells on the 5th, 6th, and 17th.

New England.—The average temperature was 67.1°, or 2.5° below the normal. The highest temperature was 98°, at Somerset, Mass., on the 21st, and the lowest 34°, at West Milan, N. H., on the 29th. There were light frosts at West Milan, N. H., on the 11th and 20th, and at Royalston, Mass., on the 11th. The average precipitation was 3.96, or 0.29 above the normal. There was a deficiency in rainfall in the northern and northwestern half of New England and an excess in the south-east. The number of thunderstorms in the north was much less than is usual for the month. Hail was reported on the 6th, 12th, 13th, 14th, 25th, 27th, and 30th. That of the 13th is reported to have done considerable damage in Connecticut.

New Hampshire.—(See *New England*.)

New Jersey.—The mean temperature was 70.9°, or 3.6° below the normal. The maximum temperature was 99°, at Vineland, on the 21st, and the minimum, 41°, at Charlotteburg, on the 12th and 15th. The average precipitation, 4.26, was 0.06 below the normal. The largest amount, 7.73, was recorded at Tomis River, and the smallest, 1.53, at Bridgeton. Thunderstorms were quite frequent. Hail was reported on the 13th, 16th, and 27th.

New Mexico.—The month was on the average cooler than usual, and remarkable for very heavy rainfall in some localities, where it averaged considerably above the normal. The warmest days were generally the 6th to 8th, 16th, 17th, and 26th, and the coolest, the 11th to 13th inclusive. The average precipitation was 4.39; the largest amount was 11.51, at Albert, and the least, 0.54, at Aztec. Thunderstorms were of almost daily occurrence. Hail was reported by a few stations. A heavy shower on the 21st at Silver City caused damage to buildings

and other property. At Socorro, on the 30th, a severe shower caused a flood, resulting in heavy damage to property and the loss of nine lives.

New York.—The month was cooler than usual, deficiencies in temperature occurring at all stations. The average temperature was 3.2° below the normal. The highest temperature was 98°, at South Kortright on the 20th, and the lowest, 36°, also at South Kortright on the 12th. Light frosts occurred in some highland valleys of the western and central sections on the 1st, 10th, and 11th. The precipitation was unevenly distributed over the State, but conformed in a general way to the normal. The average precipitation was 3.12. The heaviest general rainfall, exceeding 4.00, occurred over the coast region and in restricted portions of the northern highlands and the east-central counties; the least was less than 2.00, in the extreme west, and south of the central lakes. There were no severe general storms, but destructive wind and hail were reported from southeastern stations on the 12th and 13th.

North Carolina.—The month was cooler than the average, the mean temperature being 2.6° below the normal. The highest temperature was 99° at several stations from the 18th to 22d; the lowest was 43° at Linville on the 3d and 6th. The amount of rainfall was nearly normal, being deficient only 0.10. The greatest deficiency occurred in the west. The largest amount of rainfall, 9.03, was reported at Southport; the least, 2.32, at Asheville. Moderate thunderstorms occurred on all except 5 days during the month.

North Dakota.—The month was the coolest since the establishment of the State service in 1891, the mean temperature was 66°, or 5.5° cooler than July, 1894. The maximum temperature was 102° at Forman on the 5th, and the minimum, 29°, at Dickinson on the 29th. Heavy showers fell in all parts of the State from the 4th to 8th, after which there was an interval of light scattered showers until the 17th, when medium heavy ones fell in nearly all sections until the 23d, after which there were only light ones at widely separated places. There was a very severe storm at Grafton on the 14th, doing considerable damage and caused the death of a child. The average precipitation was 4.67, or about normal. The largest rainfall was 6.36, at Power, and the smallest, 0.95, at Ashley.

Ohio.—The mean temperature of the southern section was 73.4°; middle section, 70.9°; northern section, 70.1°; and of the State, 71.6°; these are below the averages for sections and State, 0.9°, 1.5°, 1.6°, and 1.2°, respectively. The maximum was 106° at Thurman on the 20th, and the minimum, 34°, at Auburn on the 9th, which is lower than any previous record. The average precipitation was 2.00; that for the southern section, 1.90; middle section, 2.12; and the northern section, 1.97; being below the normal for the State and sections by 1.12, 1.19, 1.16, and 1.03, respectively. Light frosts occurred in low-lying districts on the 4th and 10th; no damage.

Oklahoma.—The mean temperature was 79.2°, or 0.5° below the normal. The maximum temperature was 106° at Ponca on the 29th, and the minimum, 50°, at Pond Creek on the 7th. The average precipitation was 5.58, or 1.76 above the normal. The greatest amount, 11.75, occurred at Kemp, and the least, 1.55, at Ponca.

Oregon.—Both heat and moisture were about normal, the temperature slightly below and the precipitation a trifle above. The greatest departure from the normal temperature was in the eastern section, where it amounted to 2.3°. In the Willamette Valley and the southern portion the temperature was normal. The maximum was 107° at Pendleton on the 23d, and the minimum, 21°, at Burns on the 6th. There was more rain than usual in the Willamette Valley and the coast district, while in the southern and eastern portions there was less, the excess in the coast district amounting to nearly half an inch. The average rainfall was 0.55, or 0.09 above the normal.

Pennsylvania.—The average temperature, 69.1, was 1.9° below the normal for the past seven years. The highest temperature was 102° at (Aqueduct) Logania on the 20th, and the lowest, 34°, at Shinglehouse on the 2d. The average precipitation was 3.24, or 0.97 less than the usual amount. The largest amount was 6.18 at Confluence, and the smallest, 1.16, at Harrisburg. Thunderstorms were frequent. Hail was reported on the 5th, 16th, 20th, 21st, and 27th, and frosts on the 4th, 10th, 11th, 13th, 14th, 30th, and 31st.

Rhode Island.—(See *New England*.)

South Carolina.—The month was much cooler than usual during the first seven days, and about normal or warmer during the remainder of the month. The mean temperature, 79.5°, averaged about normal.

The maximum, 102°, was reported at Gillisonville on the 17th, and the minimum, 54°, at Spartanburg on the 10th. The rainfall averaged 69 per cent of the usual amount and was not well distributed. The average was 4.17, or 1.85 below the normal. The greatest amount, 8.50, was recorded at Georgetown, and the least, 0.73, at Cheraw. Thunderstorms were quite frequent.

South Dakota.—The mean temperature, 70.8°, was 0.7° below the normal. The highest temperature was 111° at Cherry Creek on the 4th, and the lowest, 27°, at Forest City on the 10th. The average precipitation was 1.60, or 1.33 below the normal. The largest amount, 3.79, was recorded at Brookings, and the smallest, 0.39, at Rapid City. Thunderstorms were frequent. Some stock was killed by lightning on the 17th in Deuell County and on the 20th in Jerould County. Hail was reported on the 9th, 14th, 18th, 26th, 28th, 29th, and 31st. The hail in a portion of Day County on the 26th was said to be the size of a hen egg.

Tennessee.—The month presented some quite abnormal features, the principal of which were the large monthly rainfall and the low temperatures which prevailed during the first and third decades. The average temperature was 75.9°, or slightly below the normal. The 18th and 26th were the only days on which no precipitation was recorded at any of the stations. The average amount was 6.48, or 2.19 more than normal.

Texas.—The mean temperature was 0.4° below the normal. It was below the normal everywhere except over the southwest portion and extreme western portion of the coast district, where there was an excess ranging from 0.7 to 2.3°. The average precipitation was 0.42 above the normal. It was above the normal over north, central, west, and east Texas, and the eastern portion of the coast district, while over other portions of the State there was a general deficiency ranging from 0.88 to 2.14.

Utah.—The mean temperature was 70°, or about 3° below the normal. The maximum was 110° at Fillmore on the 10th, and the minimum, 33°, at Loa on the 11th. The average precipitation was 0.57; greatest total amount was 2.29 at Grover, and the least, a trace, at Deseret. Thunderstorms were frequent. Hail was reported on the 9th, 10th, 11th, 17th, and 29th. Light frost was reported at Heber on the 1st, 6th, 23d, and 24th, and at Grover on the 12th and 13th.

Vermont.—(See *New England*.)

Virginia.—The month opened with moderate temperatures generally in all sections, but a slow rise prevailed until the 9th, when the temperature declined; it remained moderate until the 14th, when it began to rise and a heated period of ten days followed. From the 24th to the end of the month the temperature remained about normal. The total precipitation was slightly below the normal. It was heaviest in the Blue Ridge counties, and, with few exceptions, lightest in the tidewater counties. Fairly heavy showers occurred on the 1st-2d, 7th, 16th, 23d, 25th, and 31st, and light showers 9th to 14th, 19th to 21st, and 27th to 30th.

Washington.—The chief characteristics during the month were a very uniform temperature slightly below the normal and a rainfall also considerably below the average, with hot dry winds in the eastern section.

West Virginia.—The mean temperature was about 3° below the normal. The month was characterized by extremes of heat and cold. From the 1st until the 16th the temperature was below normal every day but two, the 7th and 8th; from the 18th to the 22d a period of intense heat occurred, followed by cool weather until the close of the month. Light frosts were reported on the 31st from some elevated districts. The rainfall was very nearly normal, but was quite unevenly distributed, the southern section receiving more than the average and the northern section less. Hail was reported at White Sulphur Springs on the 2d and at another station on the 27th.

Wisconsin.—The mean temperature was 68.7°, only 0.2° above the normal. The highest temperature was 100° at Pepin on the 6th, Black River on the 5th and 6th, and Prairie du Chien on the 7th, and the lowest, 33°, at City Point on the 31st. Frosts occurred in the northern portion on the 7th, 8th, 9th, and 31st. The average rainfall was 2.47, or 0.42 below the normal. The extreme southern portion of the State received little or no rain, while over the northern portion the amount received was fully up to the average and well distributed.

Wyoming.—The mean temperature was 64°, being decidedly below the normal. The highest temperature was 101° at Wheatland on the 27th, and the lowest, 28°, at Wise on the 7th. The average amount of precipitation was 2.71, or slightly in excess of the normal.

STUDIES BY FORECAST OFFICIALS.

HIGH AREAS OF THE NORTH PACIFIC COAST IN SEPTEMBER, OCTOBER, AND NOVEMBER.

(By Prof. E. B. GARRIOTT; dated September 13, 1893.)

The high areas of the North Pacific Coast in September, October, and November are associated with low areas which occupy the north-central districts of the United States. Low

areas of this type usually move eastward over, or north of the Great Lakes, and are seldom attended by precipitation south of the Ohio River and the more northern of the Middle Atlantic States (see Charts VI, VII, and VIII). With the eastward movement of a low area from the north-central districts the high area on the North Pacific Coast moves east-