

season progressed they have selected pathways of higher latitude; and moreover, their intensity has increased. As these barometric waves have advanced and spread out from the Northwest and West, toward the Alleghanies; the pressure rather increased than diminished. Their front has been distinguished as well by low temperatures, heavy snows and rains, as by high barometer readings; and generally they have given rise to high northerly winds in their front, and high southerly winds in their rear, the atmospheric mass drawing around the crest in the direction of the hands of a clock. The very high pressure of the 27th-30th of November while in the Northwest, by retarding the advance of the storm-centre on its western side, until the pressure over the Rocky Mountains could accumulate, apparently explains the violence of the storm that has since passed over the Lakes. The course of these waves may be discerned on Map No. 2 by the isobaric lines.

TEMPERATURE.

The November temperature has been much lower than usual in New England; and generally lower over the whole country east of the Rocky Mountains. In the Lower Mississippi, the Lower Missouri valleys, and the Gulf States the normal temperature has prevailed. The variation from the normal in the Ohio valley and Tennessee has been very little— $1^{\circ} 2'$ below. The thermometric means will be found on Map No. 2, which gives the isothermal lines. The lowest temperature reported (except from mountain stations) was— 22° at Pembina.

PRECIPITATION.

Map No. 3 gives approximately the rainfall for the different sections this side of the Rocky Mountains. The marginal table on the map explains where there has been abnormal excess or deficiency. The official report from Yankton, Dakota, shows that there has been hardly any appreciable rainfall in that section during the entire month. The greatest precipitation was in Southeastern Massachusetts and near Galveston.

RIVERS.

The Red river was highest above low-water mark on the 25th, when its rise was 13 feet 3 inches. The Missouri reached its highest between the 20th and 27th. The Upper Mississippi on the 28th, when it was five feet above low-water mark at St. Paul, and 8 feet 6 inches at St. Louis. At Cairo, on the 29th, the Mississippi maximum was 14.9 above low-water. At New Orleans, on the 1st, it was 13 feet and 4 inches below high-water mark. The Cumberland, at Nashville, and the Ohio, at Cincinnati, on the 28th, were over twenty feet above low-water.

The lowest fall of the Ohio was on the 12th, when at Cincinnati it was 8 feet; that of the Mississippi on the 19th, at Cairo, 6 feet 6 inches; that of the Red river on the 20th, at Shreveport, 6 feet 3 inches.

PECULIAR PHENOMENA.

The display of auroras in the Lake region does not seem to have been as frequent or as brilliant as usual; nor have the November cyclonic disturbances been as numerous or as marked as usual during the past month. At New York, on the 22d, the peculiar arrangement of cirrus clouds, known as the "Polar Bands," was reported by the Obser-

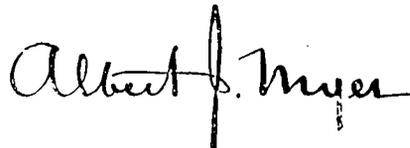
ver; the "Bands" extending from the southwest to the northeast, covering nearly the entire sky and apparently converging at the two points mentioned; and the whole attenuated mass was moving rapidly to the northeastward. On the 29th two "mock suns" were observed, one on either side of the sun, at an altitude of about 5°. At Buffalo, on the 1st, the unusual phenomenon of a vivid flash of "blue light" was observed over the Lake, accompanied by a loud report as of a cannon; supposed by the observer to be a "lightning ball." During the storm of the 17th, the Lake City, Fla., observer reports the electric phenomena very protracted and persistent toward the southeast, showing its connection with the Gulf Stream off the Florida coast. The Nashville observer, on the nights of the 13th and 14th, kept up meteoric observations and saw a number of shooting stars. The Marquette observer, during this month, has conducted an interesting investigation to ascertain what, if any, connection exists between barometric fluctuations and the rise and fall of the water in Lake Superior. The St. Paul observer, on the 3d, reported the "Bands" of fine cirri at 10.30 p. m., extending from west to east, through which the moon appeared surrounded with two rings, showing the prismatic colors very distinctly. The Lexington, Ky., observer reports unusual smokiness in his section—a phenomenon which has largely extended over the Lakes and is a characteristic of the Indian summer.

The first ice at Savannah was formed on the 20th of November. On the 17th the barometer fell .167 of an inch at Leavenworth, and read 29.33, the lowest reading given since last April. The observer at Leavenworth reports first ice floating in the river on the 29th. The enormous rainfall of 6.35 inches in forty-eight hours, on the 24th, was reported by the observer at Shreveport.

STORM-WARNING SIGNALS.

Seventy-seven (77) Cautionary Signals were displayed during the month at ports in the United States and forty-four (44) at Canadian ports. The office has no returns to show how many of the signals displayed at Canadian points were justified. Out of the seventy-seven storm-warnings displayed at United States ports there were four whose justification was doubtful; but the number known to have been *actually justified* was 62. This gives as the percentage of verification 80.51.

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Brig. Gen. (Bvt. Assg'l.) Chief Signal Officer, U. S. A.

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