SECTION III.—FORECASTS AND WARNINGS.

FORECASTS AND WARNINGS, OCTOBER, 1918.

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PRESSURE IN THE NORTH PACIFIC AND ALASKA.

A depression of the barometer passed over Midway Island on the 1st and the barometer was below normal from the 17th to the 23d; at all other times pressure was above normal. Pressure was below normal at Honolulu practically throughout the month. It was also below normal in the Gulf of Mexico and the Caribbean region and indeed along the Gulf coast and the southern border of the United States. In Alaska pressure was below normal in the coastal regions and the Yukon basin from the 3d to the 13th. This period of low pressure was followed by a week of high pressure, which apparently spread inland by way of the Aleutians and Nome to the interior, but not to the southeast coast or to the Canadian northwest. In the United States the fluctuations from the normal pressure may be seen from an inspection of Table 1.

THE WEATHER OF THE MONTH.

As might be inferred from the fact that the majority of lows of the month passed eastward along the northern border, some rather far to the northward, thus causing southerly winds, the month as a whole was a warm one. Killing frost was not experienced in the southern parts of the areas where the average date falls within the last decade of October.

Precipitation was deficient in Atlantic Coast States to the eastward of the Appalachians. The failure of rain east of the latter was one of the characteristics of the month. Heavy rains fell in the west Gulf States on the 26th and in the east Gulf States on the 29th, and there was a week of more or less general rains in the Gulf States in connection with the depression platted as No. VI on Chart III. On the whole it may be said that the month was warm, with about the average precipitation. The detailed figures appear in Table 1.

HIGHS.

Eleven HIGHS have been plotted on Chart II counting as a single HIGH those which appear to have merged in Manitoba or the valley of the Red River of tle North. If we ascribe the origin of these HIGHS to the Canadian northwest the number that originated in that region will total SIX while the remaining five were of the North Pacific origin. The following characteristics stand out clearly:

(1) The HIGHS were the dominating weather control of the month; nevertheless it is to be noted that the temperature was above the normal.

(2) There was more or less merging of North Pacific HIGHS with HIGHS which first appeared over the Canadian northwest. Just prior to merging, the barometer level in the Canadian HIGHS was no greater than in the North Pacific HIGHS, but shortly after merging the barometer level increased.

(3) There was a very well-defined increase in the barometer level in HIGHS as they passed over mountain districts, particularly the Green Mountains of Vermont and the northern Appalachians of West Virginia.

(4) The North Pacific HIGHS which did not merge passed off to the sea over the Atlantic, or dissipated in Southeastern States south of north latitude 40°, while the Canadian HIGHS invariably passed off to the sea northward of 40° north latitude; North Pacific HIGHS on the average were about six days in crossing the continent while the rate of movement of Canadian HIGHS was more rapid, as might be expected.

LOWS.

Thirteen LOWS, classed according to the geographic location of their entrance into or appearance as well defined LOWS within the field of observation, have been plotted on Chart III as follows: Alberta, 7; North Pacific, 2; Middle Rocky Mountain, 2; Southern Rocky Mountain, 1; Gulf of Mexico, 1. Almost without exception these LOWS were featureless and of little intensity. The tendency was almost always toward a diminution of intensity with eastward movement. No. XII of Chart III for a time gave promise of developing into a severe storm in the Lake region on the 27th, but while the barometer in the center fell as low as 29.12 inches on the morning of the 28th, only moderate gales were reported.

The true centers of Alberta LOWS were doubtless at some distance north of the field of observation and this fact may explain the apparent lack of intensity. A characteristic noted in previous months, viz, the tendency for a secondary depression to form in the southerly quadrants of Alberta LOWS, when for any reason the movement of the principal LOW is checked, was again noted in October. Lows Nos. III, XI, and XII–A are examples of secondary depressions that developed to the south or southwest of the principal depression. The barometer was low practically the entire month in the Gulf of Mexico and the Carribbean region. On the morning of the 13th a shallow depression whose previous movement can not be traced with much certailty appeared off the mouth of the Mississippi. This depression was irregular in shape and generally without storm winds but was associated with fairly heavy rainfall in the Gulf States. It persisted nearly a week and finally seems to have passed inland merging with LOW No. VIII on the night of tle 19th–20th. Its approximate path is shown by No. VI, Chart III.

WARNINGS.

Storm warnings were issued for one or more of the Great Lakes on the 1st, 4th, 5th, 12th, 13th, 24th, 26th, 27th, and 28th, and for the east Gulf and Atlantic coast on the 5th, 15th, 18th, 20th, 23d, and 30th.

The warnings of the 5th and 13th on the Great Lakes and of the 20th and 30th on the Atlantic coast were not justified. In general the month was less stormy than the average.

Frost warnings were issued on various dates mostly for the northern portions of the district.

WARNINGS FROM OTHER DISTRICTS.

Chicago, Ill., forecast district.—The month as a whole throughout the Chicago forecast district was rather mild, with deficient rainfall in the northwest. The rainfall in the middle Missouri Valley thence southward exceeded the normal considerably.

So far as forecasts and special warnings are concerned, the month was uneventful, frost warnings especially being few because of the mild weather. For the most part, damaging frost did not occur until much later than usual.

Frost warnings were issued as follows:

On the 2d for Wisconsin, Iowa, and eastern Minnesota; on the 13th for eastern Wisconsin and northeastern Illinois; on the 24th for Iowa, western Missouri, and southern Nebraska; on the 27th for western Missouri, Kansas, and southeastern Nebraska; on the 29th for Missouri and Kansas; on the 30th for Illinois, Missouri, and Kansas; and on the 31st for Illinois and Missouri.

Warnings for freezing temperatures were issued as follows:

On the 26th for Nebraska and Kansas; and on the 31st for Wisconsin. Moreover, the warnings issued on the 27th were for either frost or freezing temperature.

In almost every instance these warnings for frost and freezing temperature were verified.

Special warnings were issued to the cranberry marshes on October 2, the last of the season, and heavy or killing frost was reported generally throughout the marsh region during the ensuing night. The cranberry harvest was completed by the 3d, except in the northwest portion of the State. There was a local heavy frost at the Mather station on the 2d for which a warning was not issued.

Because of the prolonged drought in the Minnesota forest region, extensive fires developed there so by the 18th a large area was included. In pursuance of a request from Col. L. D. Godfrey, of the Fourth Minneapolis Infantry, who had charge of all fire fighting and relief work in the fire zone, special wind and weather telegrams were sent to him at his headquarters at Moose Lake, from the 19th to the 24th, inclusive. By the latter date the fires had been extinguished because of the general rains and successful work of the fire fighters. Under date of October 24, the official in charge of the United States Weather Bureau office, Minneapolis, Minn., writes as follows:

> Your prompt action in telegraphing the forecasts was much appreciated and the forecasts were of great help to the fire fighters.—
> *H. J. Cox.*

New Orleans, La., forecast district.—The most important feature of the month was a storm area which appeared in the Gulf of Mexico off the Louisiana coast on the 15th and moved slowly northwestward during the 16th and 17th, passing inland off the mouth of the Sabine River on the morning of the 18th. Northeast storm warnings were ordered displayed, New Orleans to Velasco, on the afternoon of the 15th, were extended to Brownsville, Tex., on the morning of the 16th, and were continued at other stations on the Texas coast on the afternoon of that date. Warnings were changed to storm northwest on the Texas coast on the 17th, and were ordered down on the morning of the 18th. Verifying winds occurred at New Orleans and Galveston, and near verifying velocities at other stations, but, as a whole, the disturbance was of moderate intensity.

Storm northwest warnings were ordered displayed from Port Arthur to Corpus Christi, Tex., on the 26th and the warnings were justified.

The first frost of consequence occurred over the interior of the district on the 28th, for which timely warnings had been issued. Warnings were issued on the 30th for frost over the interior of the district, and on the 31st for heavy frost or freezing over the northern portion of the district and frost over the interior of the southern portions; heavy frost with freezing in some localities occurred over the northern portion of the district and frost over the interior of the southern portion by the morning of November 1.—*I. M. Cline.*

Denver, Colo., forecast district.—Warnings of frost or freezing temperature were made for one part or another of the district on the 6th, 11th, 16th, 17th, 18th, 19th, 23d, 25th, and 26th. Warnings of high winds were issued on the 28th. Both wind and frost warnings were generally verified.—*Frederick W. Brist.*

San Francisco, Cal., forecast district.—October, 1918, was comparatively a quiet month in this district, with temperatures above the normal in all sections. From the 28th to the end of the month unseasonably high temperatures prevailed in southern California and along the southern coast of northern California.

Rain was frequent in western Washington and northwestern Oregon, but the daily amounts were not large. In southern Oregon, California, and Nevada, except along the eastern slope of the Sierra Nevada Mountains, the precipitation was very deficient. In Idaho the precipitation was slightly above normal.

Killing frosts occurred in eastern Oregon, Idaho, and Nevada, but it is not believed that they caused material damage.

Storm warnings were ordered on the Washington and northern Oregon coasts on the 4th, 5th, 9th, 10th, and 27th; and small craft warnings from Cape Mendocino north on the 4th; for Marshfield north on the 11th; and on the Washington and Oregon coasts on the 20th, and 22d. There were no storms without warnings and all warnings are believed to have been verified.—*G. H. Willson.*