

## SAN FRANCISCO FORECAST DISTRICT.†

[California and Nevada.]

The month was unusually dry. A drought that began early in March continued until the beginning of the third decade of April. With the exception of some showers at the close of March it was one of the longest spring dry spells experienced for many years in California. No frost nor storm warnings were issued.—*A. G. McAdie, Professor and District Forecaster.*

## PORTLAND, OREG., FORECAST DISTRICT.†

[Oregon, Washington, and Idaho.]

The month was warmer than usual and precipitation was deficient. Two storms of note crossed the district, one on the 17th and the other on the 24th. Warnings for these storms were timely and no casualties of consequence are known to have occurred. Frosts were frequent and all important frosts were forecast sufficiently in advance for the warnings to be of benefit.—*E. A. Beals, District Forecaster.*

## RIVERS AND FLOODS.

The rivers of the northern portion of the country showed, as a rule, very little departure from their usual gage readings. The breaking of a dam on the upper Missouri River, 15 miles north of Helena, Mont., caused considerable local damage and for a time threatened serious loss, but the removal of obstructions and a dam by dynamite relieved the situation and the water subsided without serious damage, excepting the loss of two lives, one of which occurred when the dam was blown up.

During the last of March and the first of April excessive rains fell over the mountains of West Virginia and Kentucky, causing rapid and destructive rises of all the southern tributaries of the Ohio River below Parkersburg, W. Va. These, flowing into the already well-filled Ohio, caused a rapid rise of that stream, and flood stages were past at all points from Point Pleasant, W. Va., to Cairo, Ill.; the flood stage being exceeded at Cincinnati by 5.9 feet and at Cairo by 0.3 of a foot. This was the fourth and also the greatest flood this year. It also is of interest to note that, when the Ohio fell below the

\* Morning forecasts made at district center; night forecasts made at Washington, D. C.

† Morning and night forecasts made at district center.

former flood stage of 40 feet at Cairo, Ill., on the 22d, with the exception of four days, the water had been above this mark since February 18.

Very little damage has been reported, except the loss of growing crops, owing to the timely and accurate warnings that were issued.

Heavy rains also fell over the lower portion of the Mississippi Valley, and as a result all the tributaries of the lower Mississippi River were high and several times exceeded the flood mark and overflowed the bottoms, causing some loss to live stock and to early planting, especially along the Red, Arkansas, and White rivers. These floods, combined with the heavy rains and the passage of the flood waters of the Ohio River, caused the Mississippi River to exceed flood stages throughout its length from the Ohio River to the mouth, in fact, the mean stages of the river below Memphis, Tenn., to New Orleans, La., for the month, were above the flood mark, and at several places the lowest reading for the month was above the flood line. Ample and timely warnings were issued for this high water by all the districts and very little damage has been reported. The breaking of one or two levees was reported, and by quick work the crevass was closed before much damage had occurred.

The rivers of the South Atlantic States did not exceed flood-stage mark during the month, altho some high water was reported.

The Trinity, Brazos, and Colorado rivers of Texas were all in flood, caused by the heavy rains during the last of the month, and considerable damage was done, especially along their upper portions, where the water rose higher than it has for several years.

The rivers of the Pacific coast were, as a rule, quiet, and were highest during the last days of the month.

The highest and lowest water, mean stage, and monthly range at 214 river stations are given in Table IV. Hydrographs for typical points on seven principal rivers are shown on Chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*Hermann E. Hobbs.*

## SPECIAL ARTICLES, NOTES, AND EXTRACTS.

## CHINOOK WINDS IN EASTERN COLORADO DURING DECEMBER, 1907.

By L. H. DAINGERFIELD, Local Forecaster. Dated Pueblo, Colo., April 22, 1908.

The following text, with the accompanying daily maps and thermograms, see Charts IX and X, illustrates the chinook conditions prevailing over eastern Colorado during the closing week of December, 1907. Mountain time is used in both the text and the diagrams.

*December 22.*—Unusually well-developed chinook conditions prevailed over eastern Colorado during the closing week of December, 1907. During this week the pressure was relatively high almost continuously from the region where the Continental Divide crosses Colorado and New Mexico to California. A series of storms moved with great regularity from British Columbia southeastward over Montana and the Dakotas, eastward across the Lake region, and down the St. Lawrence Valley to the coast. Such was the condition on the morning of December 22, 1907, when a great indraft of air was being drawn eastward from over the mountains as is evidenced by the brisk westerly wind which prevailed at Pueblo at intervals between 1 p. m. of the 22d and 5 a. m. of the 23d, the maximum being 37 miles per hour from the west at 10:49 p. m. A glance at the accompanying thermograph trace will show a harmonious temperature response to the strong draft from over the mountains.

*December 23.*—The forenoon of December 23 shows a continuation of the foehn conditions of the preceding day, being augmented, as is frequently the case, by a small secondary depression over eastern Colorado. The temperature on this date exhibits remarkable variation between 1 and 9 a. m., during which time Pueblo was undoubtedly under the influence of the local depression. In Colorado the moderate precipitation on the western slope of the mountains possibly influenced the eastern slope temperature to some extent.

*December 24.*—A well-developed storm covered the Dakotas and eastern Montana on the morning of December 24, and the pressure remained moderately high over the Southwest and also over the California coast. Brisk to high westerly to northwesterly winds resulted at Pueblo between 10 a. m. and 6 p. m., reaching the velocity of a gale at 12:45 p. m., when a movement of 45 miles per hour from the northwest was recorded. This strong indraft from over the range of mountains was attended locally by a maximum temperature of 63° which coincided in time with that of the occurrence of the maximum wind velocity.

*December 25.*—A high-pressure area developed over the eastern slope by the morning of December 25 which destroyed the persistent chinook condition, but another depression had appeared over British Columbia.

*December 26.*—The British Columbia disturbance was central