DENVER FORECAST DISTRICT.

A marked anticyclonic area appeared over Alberta on the morning of the 2d, and cold-wave warnings were issued for eastern Colorado. The warnings were extended to the portion of New Mexico east of the mountains on the evening of the 2d and were repeated for southeastern New Mexico on the morning of the 3d. The warnings were verified, the fall in temperature in eastern Colorado ranging from 25° to more than 35° and was more than 30° at Roswell, where a temperature of 12° above zero was reported. An area of low pressure developed in Nevada on the 8th. By the morning of the 9th the center of the area had moved southeastward to Flagstaff and moderate cold-wave warnings were issued for northeastern and extreme northern Arizona and extreme southern Utah. Cold waves were confined to the area specified in the warnings.

Cold-wave warnings were issued on the morning of the 10th for extreme southwestern Colorado and northern New Mexico owing to the unusually low temperatures prevailing to the westward, although the low pressure area had decreased in intensity. The warnings were not officially verified.

Warnings of a severe cold wave were issued for eastern Colorado and a moderate cold wave for extreme northeastern New Mexico on the evening of the 12th. The warnings were repeated for eastern Colorado on the morning of the 13th and extended to the region east of the mountains in New Mexico. By the evening of the 13th the barometer in Alberta and parts of eastern Montana was 31 inches, and the warnings were repeated for the same areas. On the morning of the 14th, with a barometer reading of more than 31 inches in eastern Montana and temperatures ranging from 2° to more than 30° below zero in Montana and northern Wyoming, the warnings were continued for south-central Colorado and extended to eastern New Mexico. The warnings of the 12th and 13th for eastern Colorado were verified.—*Frederick W. Brist.*

SAN FRANCISCO FORECAST DISTRICT.

During most of the month high-pressure areas were dominant over eastern Alaska, British Columbia and the northern Rocky Mountain States. No severe storms originating over the ocean succeeded in breaking through this barrier.

Among the conditions little understood was the development of a LOW over Nevada on the morning of the 8th. Twenty-four hours earlier there was a small high-pressure area over Nevada and the fall in pressure amounted to 0.62 of an inch at Reno in 24 hours. One day later (February 9) a low-pressure area similarly developed over Alberta, where at Calgary the fall in pressure amounted to 0.52 of an inch in 24 hours. The development over Nevada caused good rains in southern California; and the one over Alberta after moving westward[1] (a very unusual direction) hovered off the North Pacific coast for a couple of days and then moved southeastward, causing snow in the Northern States and rain in northern California. The forecasting of both of these storms was unusually difficult because of their developing practically right in the district and their eventual movements were very problematical, especially the one forming over Alberta, which during its early history moved westward then south along the coast, then north to Vancouver Island, from where it moved southeastward and eventually reached the St. Lawrence Valley on the 15th; but it lost greatly in energy after crossing the Rocky Mountains. It was this storm when it was central in eastern Oregon on the 12th that caused the heavy blow in the Owens River Valley, upon which a special report has been made by the official in charge of the Independence, Calif., station. The winds were also heavy on that day in Nevada, where the damage is estimated at about $350,000.

Another freak storm appeared off the Washington coast on the morning of the 13th. When the observations were taken at 5 a. m. that morning, no storm was in evidence, but in a very short while snow began falling in western Washington and western Oregon. This proved to be the worst storm of the season in those States. This storm was well defined the next morning, the 14th, and on account of its size and strength there was a strong likelihood of its breaking through the high-pressure barrier to the east; but instead of doing so, it retreated westward and remained in the Gulf of Alaska for five days, when having greatly diminished in energy it moved eastward to Alberta and later advanced to the St. Lawrence Valley.

Heavy frosts occurred frequently in California during the first half of the month and it was necessary to issue warnings on no less than 12 days. Two cold-wave warnings were ordered, only one being verified. Storm warnings were displayed for one or more stations on 9 days, for the most part being verified.—*E. A. Beals.*

RIVERS AND FLOODS.

By H. C. FRANKENFIELD, Meteorologist.

During the closing days of January, 1923, heavy rains fell over the drainage area of the Ohio River and the southern tributaries rose to moderate flood heights during the early days of February. The Ohio River was already in flood in the Evansville (Ind.) district, as was also the upper Green River, and the additional water from above accentuated and prolonged the rises and extended the flood conditions almost to the mouth of the Ohio River, the crest stage at Cairo having been 43.8 feet, 1.2 feet below flood stage, on February 13. The river was in flood from Cloverport, Ky., to Shawneetown, Ill., with crests about 7 feet above flood stage and passed below the flood stage at the latter point on February 15. Green River crests were from 8 to 10 feet above flood stage and it was not until February 21 that the river at Lock No. 2, Rumsey, Ky., fell below the flood stage of 34 feet.

Nearly similar conditions prevailed in the Cumberland and Tennessee Rivers and their tributaries, except that the crest stages were not so much above the flood stage. The usual rise followed in the lower Mississippi River, but without flood stages except at New Madrid, Mo., where the river rose to 34.3 feet, 0.3 foot above flood stage on February 15.

Warnings of these floods were issued promptly and losses were inconsiderable. Along the Cumberland River the reported losses totaled only $4,300. There was no other loss of consequence, and a large amount of livestock, logs, lumber, and crossties was removed from places of danger.

The early rains of the month also caused floods in the smaller southern rivers, beginning with the White River of Arkansas and the Sulphur River of northeast Texas.

The White River flood was quite pronounced, but the

[1] More complete reports might show that the westward movement was more apparent than real.—EDITOR.