

ingly, southwest warnings were issued for Lake Superior and northern Lake Michigan, and on the following morning the warnings were extended to include the remainder of the Great Lakes. The center of the storm passed eastward just to the north of the Lakes on the 20th, with gradually decreasing energy. Within the period covered by the warnings strong winds occurred rather generally, with verifying velocities at about one-half the stations.

The next disturbance to call for warnings was central on the morning of the 23d, over Ohio. At that time but little energy was evident, but the pressure in and near the center of the storm was decreasing rapidly. Small-craft warnings were advised for Lakes Erie and Ontario. Noon special observations, however, indicated a marked increase in intensity, Erie, Pa., reporting a wind velocity of 48 miles an hour from the southeast, and a 2-hour pressure fall of 0.14 of an inch. Therefore, southeast storm warnings were substituted for the small-craft warnings on Lake Ontario and on Lake Erie from Erie, Pa., eastward. The warnings were lowered a few hours later, however, the night reports indicating that the disturbance was losing energy. No verifying velocities other than that referred to in the foregoing were reported.

On the morning of the 25th a disturbance from the Northwest was central in northern Minnesota with increasing strength. Small-craft warnings were then issued for Lake Superior and northern Lake Michigan, but at 2 p. m. northwest storm warnings were substituted. At night the warnings were extended over the remainder of the Lakes, southwest warnings being displayed on the Lower Lakes. The storm continued its eastward movement, but it lost energy after the morning of the 26th. Generally speaking, the warnings were verified on the Upper Lakes, but on the Lower Lakes only fresh to strong winds occurred.

Another disturbance from the Northwest was central over northern Manitoba on the morning of the 28th and it appeared to call for southwest warnings on Lake Superior and the northern portions of Lakes Michigan and Huron. Accordingly, these were issued. The warning was verified in part, moderate gales being reported from central Lake Superior.

The final storm warning for the month was issued on the 29th for a disturbance that had moved up the Mississippi Valley from the Gulf of Mexico to a position central on the morning of that date near Memphis, Tenn., and with a marked increase in intensity. At 2 p. m. northeast warnings were issued for Lake Michigan, and southeast warnings for Lake Huron. At night the warnings were extended over the Lower Lakes, southeast warnings being displayed. This storm moved north-northeastward from Memphis. As it reached the Lake Region the disturbance decreased in intensity, but it caused gales over portions of Lake Erie on the night of the 29th-30th.

Cold-wave warnings.—Coldwave warnings were issued as follows: On the 20th, for North Dakota, northern Minnesota, northern and eastern upper Michigan, and extreme northern lower Michigan; on the 25th, for North Dakota and northwestern Minnesota; and on the 30th, for Montana, Wyoming, the Dakotas, and northern Minnesota. For the most part these warnings were verified but, as indicated in the first part of this report, the cold was not severe.

Frost warnings.—Frost warnings were issued on a number of dates until the 21st for southeastern Kansas. The frosts that occurred were apparently of little economic importance.

Stock warnings.—Warnings for stock interests were issued on the last day of the month for the Dakotas, western Nebraska, Montana, and Wyoming in connection with the expected occurrence of snow and much colder weather in those States. In general, ensuing conditions were as predicted; however, little or no snow fell in South Dakota and western Nebraska.

Forecasts for the benefit of beekeepers in this district were begun on a small scale. The necessary arrangements were not completed until near the middle of the month and only one special forecast was issued. It is understood that plans are under way to extend this forecast service to the entire country where it is not already in operation. The work is being carried out by the American Honey Producers' League with headquarters at Madison, Wis. The particular information desired by those in the Chicago district is a forecast in November of a day or two with a temperature of 50° or higher and clear weather, followed by cloudy and colder.—C. A. Donnel.

NEW ORLEANS FORECAST DISTRICT.

Moderate weather conditions prevailed over this district during the month. Frost or freezing warnings were issued for interior portions of the district on the 3d, 4th, 5th, 6th, 7th, 15th, 16th, 17th, 19th, 21st, and 26th. Livestock warnings on the 27th were issued for snow for Oklahoma and the northern portion of west Texas, and Amarillo, Tex., reported 9.0 inches of snow on the ground on the 28th.

Small-craft warnings were displayed on the Texas coast on the 1st, 2d, 26th, 27th, and 28th, and northeast storm warnings for the Galveston section on the 28th, all of which were justified. No storm occurred without warning.—I. M. Cline.

DENVER FORECAST DISTRICT.

During the greater part of the month, areas of high pressure occupied the middle portion of the Rocky Mountain region, with frequent Lows of considerable intensity passing across western Canada and the upper Missouri Valley and occasional disturbances moving eastward along the southwestern border. A storm of marked intensity that appeared over southern California on the 9th moved rapidly northeastward during the 10th and 11th and was attended by general precipitation in all portions of the district except eastern Colorado, with occasional excessive downpours in Arizona on the 10th.

A moderate cold wave, without warning, occurred in southeastern and extreme eastern Colorado on the 26th, due to the passage of an area of relatively high pressure across that portion of the State. Local cold waves, also without warning, occurred at Pueblo on the 21st and 28th.

Frost warnings were issued as follows: 2d, southern New Mexico and southeastern Arizona; 3d, southern New Mexico, heavy to killing northwestern Utah; 4th, heavy northern Utah; 5th and 6th, south-central and