

an area of high pressure, bringing much colder weather progressively over most of the district during the 18th and 19th. In connection with this disturbance stock warnings were issued on the 17th for South Dakota, Nebraska, and Wyoming, and on the 18th for Kansas.

On the morning of the 21st a low pressure area of moderate intensity was centered over southern North Dakota and, during the ensuing 24 hours, moved rapidly eastward, followed by the coldest weather of the present winter thus far. Minima of 40° to 50° below zero were registered on the 22d in Manitoba and Saskatchewan and 30° to 40° below in North Dakota and northern Minnesota, the line of zero temperature reaching southward as far as central Illinois and the northern portions of Kansas and Missouri. This severe cold was preceded by warnings issued on the 21st for most of the district from the Rockies eastward to Lake Michigan and Illinois. Stock advices were also sent to South Dakota.

On the evening of the 27th, as it was apparent that an area of high pressure would soon appear over the northwest, cold-wave warnings were issued for Montana, northern Wyoming, North Dakota, and western South Dakota, these warnings being repeated on the morning of the 28th. During the 28th the high-pressure area developed and moved slowly southward, being blocked in its advance by an immense field of high barometer over Ontario. On the 29th and 30th the warnings were extended eastward to include western Minnesota, Nebraska, eastern Kansas, western Iowa, and northwest Missouri. On the 28th and 31st stock advices were telegraphed to points in the Dakotas, Wyoming, and Nebraska.

Cold-wave warnings were ordered from the evening map of the 31st for eastern and central South Dakota, western Nebraska and extreme southeastern Wyoming.—*E. H. Haines.*

#### NEW ORLEANS FORECAST DISTRICT.

Northwest storm warnings were ordered displayed on the Texas coast at 1 p. m. on the 10th because of an eastward-moving disturbance over the lower Mississippi Valley, which was followed by moderate gales that afternoon and night. Small-craft warnings were displayed on the Louisiana coast. The wind continued strong at Galveston, Tex., throughout the 11th. The area of high pressure in the rear of the disturbance extended well to the southward over the Rio Grande Valley and northeastern Mexico on the morning of the 12th and was attended by gales on the coast of Mexico. "Norther" warnings were issued at 8 p. m. on the 11th for Tampico and Progreso, Mexico.

Small-craft warnings were displayed on the Texas coast on the 16th and were justified.

Northwest storm warnings were ordered displayed from Morgan City, La., to Brownsville, Tex., at 8:20 p. m. on the 18th and were extended over the Louisiana coast east of Morgan City the following morning. The warnings were justified on the Texas coast; but the "norther" lost its force before reaching the Louisiana coast and the warnings were lowered at night on the 19th.

The pressure conditions showed considerable and rapid fluctuations along the middle Gulf coast on the 29th, the fluctuations at New Orleans being most evident in the early part of the night. Small-craft warnings were issued at 9:30 a. m. for the Louisiana coast and the eastern coast of Texas, and northeast storm warnings at 8:30 p. m. on the Louisiana coast east of Morgan City. Mod-

erate easterly gales occurred at New Orleans and fresh to strong easterly gales at Burrwood, La., during the early part of the night. However, the wind diminished greatly by 7 a. m. of the 30th and the warnings were lowered at 9 a. m.

A cold-wave warning was issued for Oklahoma and extreme northwestern Arkansas on the morning of the 4th and was extended in the early afternoon over northeastern Texas, northern Louisiana, and the remainder of Arkansas. The warning was verified in a considerable portion of the area named and the temperature fall was large in all portions.

The temperature fall which overspread the district on the 11th-12th was generally somewhat less than a true cold wave and the warnings issued for much of the northwestern portion of the district on the 10th failed of verification.

During the 18th, 19th, and 20th, a cold wave moved slowly southward over the district to the Texas coast but did not reach the Louisiana coast. Ample warnings were issued well in advance of the cold wave.

A cold-wave warning was issued at night on the 22d for Oklahoma and the Texas Panhandle and was verified. Because of the threatening position of the area of high pressure and a rapid rise in pressure at Oklahoma City, with temperature fall from 30° to 16° between 7 a. m. and 11 a. m., the cold-wave warnings were extended on the 23d over Arkansas, northern Louisiana, and northeastern Texas, but were not generally verified, though sleet occurred with temperatures below freezing.

A cold-wave warning issued on the morning of the 29th for the extreme northwestern portion of the district was justified. Cold-wave warnings were issued for the remainder of the northwestern portion of the district on the morning of the 30th, but the rapid movement of an area of low pressure from the Pacific coast prevented the cold wave from extending farther.

Warnings of frost or freezing temperature were issued on the 1st, 5th, 10th, 11th, 12th, 13th, 16th, 19th, 21st, 24th, 27th, and 28th. Conditions as forecast prevailed in most instances.

Fire-weather warnings were issued for forested areas in Oklahoma and Arkansas on the 2d and conditions occurred as forecast.—*R. A. Dyke.*

#### DENVER FORECAST DISTRICT.

Precipitation in all portions of this district between the 1st and 4th resulted from a storm which moved from the coast of southern California to the middle Mississippi Valley during that period. The disturbance was followed by much colder weather, with temperatures below zero in southwestern Utah. Occasional light snow or rain in southern Arizona, New Mexico, and southeastern Colorado attended a moderate disturbance which advanced from southern California to central Texas from the 7th to the 9th. High pressures prevailed on the middle Plateau from the 7th to the 16th, on which latter date a storm appeared on the north Pacific coast and moved, with increasing intensity, to New Mexico by the 18th, where it remained, slowly filling up, until the 20th, when it advanced to western Texas. Snow fell in Utah and Colorado on the 17th and 18th and in southwestern Colorado and northeastern Arizona on the 19th and 20th, with a cold wave in eastern Colorado on the 18th and in southwestern Utah and most of New Mexico on the 19th. On the last-named date the temperatures were below zero in central and eastern Colorado and western Utah. High