formations doubtless were responsible for the abnormal course of cyclonic systems that otherwise would have moved in a more nearly normal direction; during the second half of the month the areas of high pressure over the western North Atlantic were found farther south with westward extensions over the continent of North America and as previously stated they were a distinct deterrent to precipitation over eastern United States. On July 31 an unbroken area of high pressure extended from the Spanish coast on the east across the Atlantic and the Continent and still farther west over the Pacific at least to the one hundred and seventieth meridian of west longitude, while the only low pressure on that date was along or near the Arctic Circle in both Europe and America and northeastern Asia. The full story of the drought will not be told until definitive data for the Northern Hemisphere are available. The course of the drought in the United States from month to month is portrayed graphically by the series of 9 small charts of Figure 1.—*A. J. Henry.*

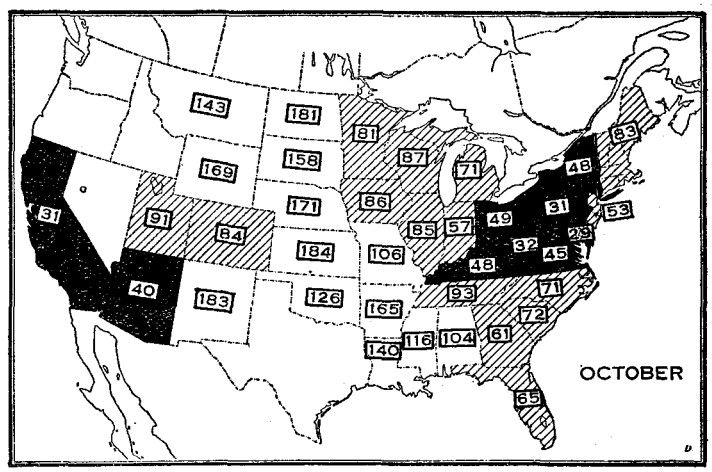

FIGURE 1A.—Per cent of normal precipitation. This chart shows the per cent of normal in all States from which reports have been received. Texas, Washington, Oregon, Nevada, and Idaho not yet available

DROUGHT IN OHIO VALLEY AND WATER SUPPLY

By W. C. DEVEREAUX

[United States Weather Bureau, Cincinnati, Ohio]

The general drought of 1930 in the Ohio Valley began in March or April, and continues at the end of November. The surface run-off practically stopped early in the summer, and the underground water supply diminished rapidly and by the middle of the summer the springs ceased flowing, the creeks and small rivers dried up, and wells failed. These conditions became more acute during August. In September there were fairly good rains over most sections of the valley which revived pastures and restored growing conditions, but there was no run-off to start stream flow or affect the municipal water supply.

The months of October and November (to the 25th) were the driest of the year, thus far, at Cincinnati and probably in most of the Ohio Valley. From 58 stations well distributed over the Ohio Valley and reporting daily to Cincinnati, the average rainfall for October was 1.30 inches and for November 1 to 25 it was 1.37 inches. These amounts are less than one-half of the normal amounts in both months for the area which includes Kentucky, Tennessee, West Virginia, the middle and southern portions of Indiana and Ohio, and extreme western Pennsylvania.

Not only the smaller rivers have been dry all summer, but many of the larger rivers are now dry where artificial pools have not been maintained. In the Kentucky River above Beattyville where the last dam is located there is only a "trickle" of water coming over the bed of the river. This river drains 1,654 square miles and is fed by mountain streams. The United States Engineers find the stream flow to be between 2 and 3 second-feet, estimated as it is impossible to measure it. The same is true of many other rivers in the Ohio Valley.

The municipal water supply has given out in practically all the cities and towns where the water was obtained from unimproved rivers, wells, or springs. At Lexington, Ky., water has been drawn by trainloads for several weeks from the pools in the Kentucky River. At present the construction of a pipe line to the river, a distance of about 25 miles, is being pushed so as to have service in the same by December 1. Even cities like Vanceburg on the Ohio River, but which have depended on wells for their water supply, are now constructing water-supply systems.

Fortunately the Federal Government had completed the 50 dams in the Ohio River before the great drought of 1930. These dams have maintained full pools from Pittsburgh, Pa., to Cairo, Ill., during the entire summer and fall. These dams have formed a series of 50 lakes averaging 10 or more feet deep, from 1,400 to 3,000 feet wide, and extending a distance of 1,000 miles. Many of the larger tributaries such as the Allegheny, Monongahela, Muskingum, Kanawha, Kentucky, etc., have been improved by dams. The water from the pools in these rivers has made it possible for life to exist and business to progress in the Ohio Valley during the driest season of record in the valley.

Principal Hydroelectric Engineer W. S. Winn, of the United States Engineer office, Cincinnati, Ohio, supplies some of the details of low water in Kentucky River and the illustrations presented in the note next below.

LOW WATER IN THE KENTUCKY RIVER, 1930

By W. S. WINN, Principal Hydroelectric Engineer, United States Engineer Office, Cincinnati, Ohio

A statement of low-water conditions on Kentucky River during the current season follows:

I think there is little doubt that the drought of this year has been the worst on record. Early in the summer old citizens of central Kentucky began comparing it with the drought of 1855. For the three months, July to September, inclusive, the rainfall was only 3.23 inches, being 7.27 inches below normal. October and November rainfall was below normal, but data are not yet available.

The effect on navigation has been to lower pools below crests of dams. The pool above Dam No. 8 fell 4 feet below crest of dam. All of the pools above Dam No. 8 have dropped more or less below dam crests. Below Dam No. 8 the pools have been kept full by leakage and operating water discharged from Dix River Dam. However, for the past several months, most of the water from Dix Dam has been leakage since the reservoir had been drawn down 50 feet below normal and the Dix River power plant has been operated very