

WEATHER IN THE UNITED STATES

GENERAL CONDITIONS

The weather of the month was that appropriate to a normal July; temperature was close to normal in practically all parts of the country; precipitation was irregularly distributed, some areas receiving more than the normal, others less. There were very few destructive storms.—*A. J. H.*

CYCLONES AND ANTICYCLONES

Twelve low-pressure and eleven high-pressure areas were plotted during the month. None of the LOWS became important as storms, and there were no indications of hurricanes in adjacent Atlantic waters. The majority of the HIGHS came from the Canadian interior, but were mostly weak.—*W. P. Day.*

THE WEATHER ELEMENTS

By P. C. DAY, in Charge of Division

PRESSURE AND WINDS

The general distribution of the atmospheric pressure was not unusual for a midsummer month, though anticyclonic conditions were somewhat more pronounced than cyclonic.

In general there were no cyclones that pursued definite courses over extended distances, nor did they cover large areas, though numerous storms of small area prevailed locally in most districts from the Rocky Mountains eastward, and rains were frequent in the Northeastern and Southeastern States, in portions of the Ohio Valley and near-by areas, and in the central Rocky Mountain region.

At the beginning of the month a cyclone of slight importance as to extent of depression and area involved was passing eastward over the Dakotas and Minnesota, attended by generally light precipitation, but its influence appears to have extended far to the southward and heavy rains occurred over much of the central Plains, and some rain fell as far south as Texas and Louisiana. This cyclone quickly disappeared but considerable precipitation resulted therefrom during the 2d over the Great Lakes. On the 3d a barometric depression immediately off the southern New England coast caused local precipitation in that area, and thunderstorms were reported over a considerable area from eastern Texas to the Ohio Valley and southern Appalachian region. On the 5th and 6th low pressure moving from the northern Rocky Mountains toward Lake Superior caused some local heavy rains in near-by areas on those days and its continued eastward movement on the 7th and 8th was attended by rather extensive precipitation from the lower Ohio Valley northeastward to New England, and along the entire Atlantic coast southward to Georgia, continuing locally over the Southeastern States for several days thereafter.

Thunderstorm conditions existed over the middle Plains and to the northeastward on the 12th to 14th, and like conditions prevailed locally over wide areas in the eastern half of the country near the middle of the month, continuing locally along the Atlantic coast until the end of the second decade.

Moderately low pressure over the lower Lakes on the 22d caused general rains from the middle Mississippi Valley northeastward over the Lake region, and thunderstorms were again reported over the Southeastern States.

By the 23d the low pressure had advanced slightly to the eastward and generally rainy conditions existed over the entire Appalachian region, extending later to all Atlantic coast districts.

The latter part of the month had no important cyclonic developments though precipitation of the thunderstorm type occurred over widely scattered areas, becoming somewhat general during the last three days over the interior parts of the country and thence northeastward to New England.

In the far West precipitation was light, as usual, and occurred mainly on the first few days or about the middle of the last decade. In Arizona and adjoining areas the usual summer showers occurred rather frequently in some districts, particularly in the highlands, but in other localities dry conditions existed.

Anticyclones of considerable importance covered the more northern sections on several occasions. That central over the northern Rocky Mountains on the first and moving eastward over the Northern States to the Great Lakes by the 4th and thence southeast to the middle Atlantic coast by the 6th, was probably the most important, as it was attended by the lowest temperatures of the month over extensive areas. Several other anticyclones crossed the country at intervals but they were not important as to their effect upon the general weather conditions.

The average sea-level pressure was above normal over all parts of the United States and also in Canada as far north as observations are obtainable at present, though the excesses were mainly small save in the Rocky Mountain region.

Compared with the preceding month the pressure was higher in all districts of both the United States and Canada, save from the lower Lakes and northern drainage area of the Ohio eastward to near the Atlantic coast. The excesses were considerable over the Rocky Mountain and adjacent areas.

The general distribution of pressure favored southerly winds over the central and southern portions east of the Rocky Mountains and over the Atlantic Coast States as far north as New England, though in the latter area they were frequently southwest and occasionally from the west. Along the northern border from the Rocky Mountains to the upper Lakes they were mainly from northerly points, and similar winds prevailed generally along the Pacific coast.

Local high winds were of frequent occurrence from the Great Plains eastward and they occurred in all portions of the month. Some were of tornadic character, the most important of these occurring in eastern Kansas on the 16th, where some 16 lives were lost and large property damage resulted. Considerable damage occurred also from hail which was of rather frequent occurrence in some of the States.

The details of the more important storms appear in the table at the end of this section.

TEMPERATURE

Day to day changes in temperature were mainly unimportant, rarely exceeding 10° to 15° in 24 hours, and at no time did the temperature vary greatly from the normal for the period save on a few dates. The first few days had some of the warmest weather of the month, notably on the 1st when the highest temperatures of the month were recorded in portions of the

Southeast and Great Lakes region, while from the 2d to the 6th the lowest temperatures of the month were recorded over the greater part of the country. At a few points in the Lake region the minimum temperatures on the 4th were the lowest of record for July. The remaining weeks of the month had average temperatures not far from normal, though there was a general tendency to cooler than normal in the middle and northern portions of the central valleys and eastern districts, with general warmth in the South and far West.

For the month the average temperatures were from 1° to 3° lower than the normal over the middle and upper Mississippi Valley and thence westward to the Great Plains and eastward to the Lake region. Along the Atlantic coast and over portions of the Ohio Valley the averages were mainly less than 2° lower than normal, while west of the Rocky Mountains and in portions of the South the averages were mainly about 1° to 2° higher than normal; a few points in the South, notably Corpus Christi, Tex., and Tampa, Fla., had the highest average July temperatures of record, and the greatest number of days with maximum temperatures 90° or higher of record. Corpus Christi had 20 such days while the average is only 2, and Tampa had 26 with an average of only 14. Chart III of this REVIEW presents the variations from the normal for all parts of the country.

In general the periods of severe heat were of short duration, and in most sections the temperatures were pleasantly comfortable during the entire month. The maximum day temperatures were above 100° however, at sometime during the month in practically all the States save those along the northern border from North Dakota to New England. The highest recorded was 125° at Greenland Ranch, Calif., on the 19th, but 118° occurred in Arizona and Nevada, and 112° in Washington, while 106° was reported from Georgia, a record unsurpassed there in July save on two previous occasions.

Minimum temperatures were below freezing at a few points along the northern border and in the mountain districts. The lowest observed was 22° in the high mountains of California, with 23° in Oregon and 24° in Colorado and Wyoming. The lowest temperatures occurred in practically all parts of the country during the first few days, principally from the 3d to 5th, though they were delayed till the 10th and 11th or 24th in some Southeastern States.

PRECIPITATION

The precipitation varied greatly in fairly near-by areas, a condition not unusual in July but rarely to so pronounced an extent in the States having no great topographic variations.

Generally speaking the amounts received at the regular Weather Bureau stations did not depart greatly from the normal, and the country was fairly evenly divided between sections having totals above normal and those with totals below.

There were rather important excesses in central and southern Georgia, also in North Carolina and Virginia, as well as around the lower lakes, in northern Michigan and northern Louisiana, northwestern Arkansas, southwestern Missouri, and central Illinois. On the other hand the precipitation was materially deficient in Iowa and portions of near-by areas, in the middle Gulf States, portions of the lower Mississippi Valley, Maryland and the District of Columbia, along the South Atlantic coast, and in portions of Texas and New Mexico.

Thunderstorms were unusually frequent in portions of the Southeastern States, and in the Great Lakes region and locally in Texas.

SNOWFALL

No snow was reported during the month from any of the observing stations, though it may have occurred in some of the higher northern mountains.

RELATIVE HUMIDITY

On the whole the percentages of relative humidity were below normal, despite the general coolness over a considerable portion of the country and the excess of precipitation in limited areas. Generally speaking the humidity excesses were confined to areas having more than the normal precipitation, though decided variations from this are noted in some sections. In the Mississippi Valley, where precipitation was mainly deficient, the relative humidity was almost universally below normal and there was a general deficiency in the far West and Northwest where the forest-fire hazard was greatly increased thereby, though no serious outbreaks appear to have occurred.