

THE WEATHER ELEMENTS.

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PRESSURE AND WINDS.

Cyclonic and anticyclonic activity assumed the slowing-up process usual to the last spring month, and pressure variations were moderate, in the main. Despite this, however, the month as a whole presented some unusual aspects. Notable among these were the late and, in some localities, heavy snows about the 8th and 9th, over most central and northern districts from the Mississippi Valley eastward, being heavier in some places than at any time during the past winter, and severe cold and frost that immediately followed over portions of the same territory.

The movement of the cyclones across the country was likewise out of the ordinary, the paths assuming positions somewhat farther south than usual, resulting in unprecedented precipitation over portions of the Southeastern States, where May is frequently a comparatively dry month, and a decided lack of moisture over many north-central districts.

The principal cyclones attended by important precipitation, were as follows: From the 8th to 11th, when a storm of wide extent moved from the Great Lakes to the St. Lawrence Valley and New England, accompanied by widespread precipitation, mostly light, however, except in portions of the Atlantic coast region. This storm was notable for the extensive falls of snow which, in portions of the Ohio Valley and Great Lakes region, ranged up to 10 inches or more, with drifts from 2 to 4 feet in depth. (See pp. 260-262.) In many sections the falls were the greatest ever known so late in spring, while in others it was the first occurrence ever reported in May. Immediately following this, another storm developing in Kansas moved eastward during the 11th to 13th, attended by heavy rains in portions of the Ohio and middle Mississippi Valleys, and by lighter falls over adjacent regions.

The most widespread storm of the month, and probably the one giving the heaviest precipitation over extensive areas, moved from southern New Mexico to New England, from the 14th to 17th. This storm gave important rains over nearly all sections from the Rocky Mountains eastward, with heavy falls in much of the Mississippi Valley and Southeastern States and portions of the Southern Plains.

The latter part of the month had few well-developed cyclones, but pressure was frequently low over the Gulf States, and local thunderstorms, often accompanied by heavy rains, were of almost daily occurrence over many of the central and southern portions of the country from the Great Plains eastward.

The most important anticyclone of the month immediately followed the general storm of the 8th to 11th, and during its progress southeastward over the central valleys, about the 9th to 13th, was attended by severe frosts and temperatures frequently lower than ever before recorded so late in the season.

During the last decade of the month anticyclonic conditions prevailed almost continuously over the northern districts from the Great Lakes eastward.

For the month as a whole the pressure averages were above normal from the middle and northern Plains to the Great Lakes, and also in the far Northwest. Elsewhere they were below normal, and distinctly so over the Gulf and South Atlantic States.

Compared with the preceding month the pressure was lower in all districts save from the Great Lakes eastward and along the North Pacific coast. This distribution is not materially different from normal, save that the area of excess over the northeastern districts is materially greater than may usually be expected. On the other hand, the deficiency over the southern districts is distinctly larger than usual.

As the pressure distribution in the main lacked sharp gradients over extensive areas, there was a general absence of severe cyclonic winds. Local thunderstorms with attendant high winds were numerous, and tornadic winds of more or less severity occurred over limited areas, description of which will be found at the end of this section and elsewhere in the REVIEW.

The prevailing wind directions, shown on Chart VI, indicate widely divergent directions in near-by areas, as may usually be expected at this period of the year.

TEMPERATURE.

The first week of the month was mainly warm, although over the far western States the 1st and 2d were in many instances the coolest days of the month. The averages for the period were above normal over most northern and central districts from the Rocky Mountains eastward and also to westward of those mountains. In the Gulf and South Atlantic States and over the middle and Southern Plains the averages were usually slightly below normal. At the beginning of the second week, however, hopes of continued and much desired warmth, which had already been long delayed, were shattered by an anticyclone moving into the upper Missouri Valley and overspreading the districts to the southward and eastward. During the following few days a return to almost winter conditions existed over large areas in the central valleys and eastern districts. Snow varying in depth up to 10 inches or more occurred over portions of the Ohio Valley, Great Lakes and eastern districts; freezing weather extended over much of the northern half of the country from the Rocky Mountains eastward, many stations reporting the lowest temperatures ever observed so late in the season, and frost was observed as far south as the central portions of the Gulf States.

Despite the severity of the cold, so late in the season, no great damage appears to have resulted, due mainly to the generally backward state of vegetation.

The average temperature for the week ending May 15th was below normal over all parts of the country from the western slopes of the Rocky Mountains to the Atlantic coast, save along the immediate Rio Grande Valley. Over the interior and northern districts the averages were from 6° to 9° below normal. In the far western districts the week continued moderately warm.

The third week continued cool over nearly all interior and northern districts, but freezing weather was confined to the extreme northern border and to the more elevated portions of the western Great Plains and mountain districts. The latter portion of the month was mainly without important temperature changes, but it continued mostly cooler than normal over the central valleys and eastern districts until near the end when the highest temperatures of the month were reported from many portions of these areas. This period was mainly warmer than normal in the Rocky Mountain districts and over the Northern States between the mountains and the Great Lakes, the averages for the period ranging from

6° to 12° per day above normal over much of this area. West of the Rockies the temperatures during the latter part of the month were mainly below normal, with occasional freezing at the higher elevations.

Considering the month as a whole, the average temperatures did not depart greatly from the normal, despite the apparently continuous cold over most central and eastern districts. The coldest sections, compared with the normal, were mainly from the middle Plains eastward to the southern Appalachian Mountains, and in the region of the Lower Lakes, where the monthly means ranged from 2° to 4° below the normal. Over Texas and thence westward to the Pacific, and generally in the Mountain and Plateau districts, the average temperature for the month was slightly above normal.

The main warm periods of the month were near the end of the first decade from the Great Plains westward; about the early part of the third decade over portions of the Gulf States; and generally during the latter part of that decade over most central and northern districts from the Rocky Mountains eastward.

The lowest temperatures of the month were on the 1st and 2d in the far Southwest, and over the greater part of the remaining area of the country from about the 8th to 10th. In California, however, some of the lowest temperatures occurred on the last day of the month.

PRECIPITATION.

May was a month of scanty rainfall, in comparison with what is expected, over far more than half the country, but the southeastern portion had a marked excess. In Georgia and Florida, and westward to extreme eastern Texas, also in most of Arkansas and Tennessee, there was far more than the average quantity for May, the second half of the month being particularly rainy. Many stations received three times the normal rainfall, and a few as much as four times the normal. At Titusville, Fla., almost 20 inches fell during the month, and at Beaumont, Tex., 20.58 inches; of this latter total, almost exactly two-thirds (13.54 inches) fell within about three hours, during the forenoon of the 18th, resulting in floods and great damage (see pp. 263-264). On the whole, these rains in the southeastern districts were detrimental, but in Florida the dry condition that had prevailed so many months was thoroughly relieved.

Other parts of the country where there was more than the normal precipitation were southern Michigan, the lower Ohio Valley, the Great Plains from southern Oklahoma to southern South Dakota and eastern Wyoming, and some areas in the far Northwest.

In the western portions of Oklahoma and Kansas the May rains were of vast benefit in relieving the long-continued dryness; though in a few portions the falls were so excessive as to cause damaging floods.

From the northeastern part of South Carolina northward and northeastward there was a marked deficiency, especially near the coast from Chesapeake Bay to Cape Cod. A considerable number of stations here, with normal May falls of from 2½ to 4 inches, had this May less than an inch. Fortunately, the closing days of April had given abundant rainfall over most of this area, and as temperatures were low there was little harm from the dryness.

Upper Michigan, Wisconsin, Minnesota, nearly all parts of the Dakotas and Iowa, and the northern and western portions of Missouri received considerably less than the normal May precipitation, while the central Plateau region, the far Southwest, and nearly all portions of Texas had but a small part of the normal. Southern California had practically no rains, and, in spite of some showery days in the northern part of that State, hardly any stations had as much as their monthly normals.

SNOWFALL.

There was not much new snow in the western mountains during May, but the old snow seems to have melted no faster than usual at this season, and the prospects for summer stream-flow are, on the whole, fairly good.

East of the Rocky Mountains the most notable snow-storm of the month came about the 8th and 9th, especially affecting lower Michigan and Ohio, and the nearest portions of Wisconsin and Indiana, also considerable parts of West Virginia. The falls were remarkable for the time of year, and generally in the southern portion of the area affected, from Illinois to Virginia, it was the latest snowfall of record. At Lansing, Mich., the snowfall within 24 hours on the 8th and 9th was 11.5 inches.

RELATIVE HUMIDITY.

The percentage of this element of the weather was mainly deficient over the central and northern districts, due to a general lack of precipitation, despite the prevalence of cool weather which ordinarily tends to its increase. In the Southeastern States the percentages were mainly above normal due to the highly saturated condition resulting from frequent rains, and similar conditions prevailed, but to a less extent in the middle Plains. Elsewhere the relative humidity was mainly less than normal.