

done the work. The phenomenon swept on across the country out of sight."

Passing within half a mile of Waxhaw, the storm did no damage there, but seems to have been at its greatest intensity $2\frac{1}{2}$ miles northeast of that place, in what is called the Howie Gold Mine district.

Here the home of B. P. Hancock was completely destroyed, and one of the children, Ella Hancock, seriously injured by flying timbers. The other members of the family sustained minor injuries. Two tenant houses in this vicinity were wrecked, one of which was occupied by Raymond Paxton and his family. That no one was injured is probably due to Mr. Paxton's precaution in taking his family to a deep road ditch, in which they lay flat.

At the Howie mine a negro cabin was demolished, the occupants having taken refuge in an old mine shaft. The old mill house was blown down on five mules, one of which was killed and others injured. A yearling heifer was also killed. Large oak trees were twisted and torn out by the roots, the tramway from the shaft to the mill house was wrecked, and roofs and chimneys of other buildings were blown off.

From the Howie mine the tornado continued north-eastward for about 4 miles through a sparsely settled district, apparently coming to an end near Wesley's Chapel, which is 8 miles southwest of the place where the April tornado began.

The following descriptions of weather conditions attending the movement of this tornado have been received:

From Lewis L. King, postmaster at Waxhaw, N. C.:

"I saw the tornado that passed this town on Sunday, June 20, 1920, from beginning to end. It was a typical summer day, warm, with thunder clouds passing over. A heavy thunder cloud had passed to the north of us, going northeast, a few minutes before the black funnel-shaped cloud appeared, but there was just a light rain in the cloud that passed before the tornado and not much rain in the tornado cloud. There was a mighty roar, somewhat like the roar of a train, and some people actually mistook the noise for a passing train and did not see the tornado. I would say that the path of the storm was not over 200 feet. There was no thunder in the tornado cloud. This was a genuine twister, which suddenly dipped down and was exactly in the shape of a funnel."

From B. P. Hancock, living $2\frac{1}{2}$ miles northeast of Waxhaw, whose home was completely demolished:

"The forenoon was very hot, with a few showers. About 1:30 a small cloud formed in the southwest, moving southeast, and about 20 minutes later another small cloud formed in the northwest, moving toward the northeast, from which thunder was heard three times. After the third thunder it seemed to move back to the southwest, forming into a body like a thunderhead and an awl at the same time. At times it fell to the earth and then rose back up again, and soon formed into a funnel shape, broad at the top and narrow at the bottom. This descended down again and it began to roar and move from the southwest to the northeast. It was dark in the storm as night, but there was no thunder, rain, or hail; there seemed to be a lot of heat inside it."

It is interesting to note that both of these accounts describe the weather as "warm" and "very hot," whereas in Charlotte it was rather cool in the forenoon, the temperature ranging from 62 to 65 up to 11 a. m., when it began to rise, reaching a maximum of 78 at 4 p. m. Cool weather prevailed generally throughout the State, the maxima in the central district ranging from 65 at Winston-Salem to 80 at Albemarle. Monroe, about 10 miles east of the tornado path, had the highest maximum, viz, 83. The heat area mentioned in the above accounts was, therefore, purely local.

There was a thunderstorm in Charlotte from 5:05 p. m. to 6:22 p. m., and frequent showers occurred during the day, the total amount being 1.11 inches. One of these

showers occurred from 1:05 p. m. to 1:50 p. m.; amount, 0.31 inch.

Monroe reported a rainfall of 0.62 for the day.—G. S. Lindgren, Weather Bureau Office, Charlotte, N. C.

TORNADO IN SOUTHEASTERN WYOMING, JUNE 24, 1920.

The Weather Bureau official at Cheyenne, Wyo., has reported the occurrence of a small tornado, accompanied by a severe hailstorm in southeastern Wyoming on the afternoon of June 24. As far as can be learned, the damage was very slight. The tornado swept a path about 200 feet wide and about 12 miles long in the vicinity of Hillsdale and Burns. A few houses, barns, and fences were destroyed, but there was very little damage to stock and no deaths were reported.

The hailstones were unusually large and destructive. Several newspapers contain accounts of hail "as large as good-sized lemons," "medium-sized hen's eggs," English walnuts, and one report from Burns said the hailstones were about 7 inches in circumference. The force of the hail was sufficient to dent the steel roof of railway coaches and did considerable damage to tin roofs. On the whole, however, the storm was not severe, although in appearance it was said by some former residents of the Missouri valley to be a "regular, old-time Missouri twister."—C. L. M.

COLD SHORE WATER OWING TO OFF-SHORE WINDS.

By CHARLES F. BROOKS, Meteorologist.

[Weather Bureau, Washington, D. C., July 28, 1920.]

Reports of unusually cold surf bathing along the New Jersey coast late in July, 1920, led me to examine the wind records of Sandy Hook and Atlantic City. Although there had just been a decidedly cool spell, with northerly winds, and although the spring and early summer averaged 2° or 3° F. below normal in eastern New Jersey, it did not appear that these influences would be sufficient to make the coldness of the water worthy of remark. An unusual amount of off-shore wind, however, would easily account for cold water, because such winds would have driven the warmed surface water out to sea, and cold water from below would have replaced it.

In June, 1920, the off-shore winds—SW., W., NW., and N.—at Sandy Hook blew a total of 4,778 miles, as compared with 2,260 in 1919, and 5,148 in 1918. It is noteworthy that these winds in June, 1920, comprised 54 per cent of all the wind of that month, and that this is not only markedly greater than the 26 per cent of off-shore winds in June, 1919, but also exceeds the off-shore winds of June, 1918, which were 49 per cent of the total—less than half, in spite of the large amount, June, 1918, being unusually windy.

At Atlantic City the average (1914–1920) frequency of off-shore winds, SW., W., NW., and N., at the 8 a. m. and 8 p. m. observations in June is 28, i. e., 47 per cent. In June, 1920, however, the number was 38, or 63 per cent of the total. In July the average frequency of off-shore winds is 34 (31 for 28 days), or 57 per cent, while in the first 28 days in July, 1920, the number of off-shore wind occurrences was 37, or 66 per cent. Thus, in June and most of July this year the off-shore winds have been 27 per cent more frequent than the average of the last seven years, and have occurred about two-thirds of