

ings, or being blown from their foothold; but one was so terrified that he committed suicide. About 50 other persons were badly injured and two were struck by lightning. The damages amount to a total estimated loss of \$1,000,000, of which \$500,000 was principally sustained by a few large manufacturing establishments, twelve churches and seventeen schoolhouses, nearly all of which were located in the southeast or the southwest sections of the city. The railway and telephone lines operating in these sections were also heavy losers by injuries to their property. The northeast and northwest sections of the city suffered only small losses through damage to property, but even in these sections some roofs of buildings were injured and windows broken, and at A, fig. 1, "every telephone and trolley post on the west side of the street for 8 blocks was either blown down or badly damaged."

Reports received by the local newspapers showed that on the day of this storm considerable damage was done by thunderstorms in the adjacent county (Lorraine) on the west and at places in the belt of counties extending thence northeast to Ashtabula County. At Elyria, according to a report, "Windows were blown in and outbuildings and sheds wrecked." At Medina, "Trees in the public square were uprooted, telegraph poles were blown down and roofs and chimneys wrecked." At Ashtabula, "One house was turned completely upside down and demolished. The roof of the Lyceum Theater was carried over residences and shot through North Park, trees being stripped in its path;" also, "A house was blown from its foundation, barns and small buildings all over the city were unroofed and completely razed." In Plymouth, Ashtabula County, "A man who sought shelter in a horse shed during a thunderstorm was killed by the collapse of a church near by, and another man who had sought shelter in the same shed was knocked senseless, and one of his arms was broken."

It seems probable that if the hours of occurrence of these disturbances, and others on the same day in northern Ohio, could be learned the facts might show that the Cleveland storm originated in one of the counties of northwestern Ohio and traveled thence through this city into Ashtabula County. However, it would probably be impossible to trace the connection between these local storms, owing to the lack of reliable observations of time, barometric readings, and other essential data.

It is believed that the Cleveland storm should properly be classed as an exceptionally severe local storm, but not as a tornado. So far as can be learned, no one saw the funnel-shaped tornado cloud when this storm was advancing or after it had passed. There were but few flashes of lightning. Objects, such as trees or poles that had been overturned by the wind, were found to lie in a direction from southwest to northeast, or west to east, and in the majority of cases they lay toward the east. In a few instances heavy roofing of tin or other material had been carried from one roof to another 100 to 200 feet distant, and they were carried from west to east. In the grove near the Euclid Club, where about 100 trees, large and small, were found uprooted and blown over within an area not larger than four acres, the trunks lay as if overturned by a southwest or west wind. Near the same club house an iron flagstaff, 4 inches in diameter, had been blown nearly prostrate in a northeastward direction, the wind having bent the iron near the base of the staff. Among all the hundreds of houses where panes of window glass were broken out, there seems to have been no breaking by outward expansion of the air, though there were windows fronting east that had their glass broken and forced outward, this effect being probably due to the west squall having reached them through open doors or windows in the rear of the house. So far as can be learned no chickens were stripped of their feathers, nor were any trees stripped of their bark. For these

reasons, and notwithstanding the great destructive force that the wind attained at many places within a zone of 1 to 2 miles in width and 6 miles long within the city and its outskirts, it seems proper to assume that the storm was not a tornado.

TORNADO IN ALABAMA.

By E. C. HORTON, Assistant Observer. Dated: Montgomery, Ala., May 21, 1909.

I have the honor to submit the following report of a tornado that occurred in the northern part of Alabama near midday of April 30, 1909.

The storm began about 7 miles southeast of Moulton, Lawrence County, and moved in a northeasterly direction to about $1\frac{1}{2}$ miles north of Danville, Morgan County, where it seems to have disappeared.

The storm track varied from 100 yards to a half mile in width. The tornado was well defined, having the characteristic funnel-shaped cloud, with the usual destructive effects. At Madison it seems to have been represented by a severe hailstorm. Only one person was killed, but about eighteen were more or less injured. Seven dwellings were demolished, their value being estimated at \$4,000. The damage to timber and other property was also great, and the loss in livestock was considerable. It would probably be conservative to place the entire property loss at not less than \$15,000.

TORNADOES IN ARKANSAS.

[Extract from the Monthly Climatological Summary, Arkansas Section, March, 1909.]

February, 1909.

At 8 a. m., seventy-fifth meridian time, February 5, 1909, a low of large geographic extent and great intensity extended from the Lake region to Texas, the center of the storm being over Davenport, Iowa, with a pressure of 29.24 inches. At that hour Arkansas was in the southeast quadrant of the storm and the weather, which was abnormally warm, damp, and blustery, with thunderstorms at many places, was favorable for the development of tornadoes.

Between 8 and 9:30 o'clock in the morning tornadoes passed over Hamburg, Ashley County, and Stuttgart, Arkansas County. At Hamburg there was no loss of life and no one was injured, but two brick buildings were damaged, the loss in buildings and merchandise being estimated at \$6,000. The tornado that passed over Stuttgart killed two persons and injured several others, and two residences and six barns were destroyed. At Little Rock, Pulaski County, a thunderstorm, accompanied by rain, hail, and high wind, prevailed from 7:02 to 9:30 a. m., a maximum velocity of 52 miles per hour from the northwest being recorded at 7:12 a. m. No damage resulted in the city from this storm.

During the early morning of February 23, 1909, a destructive tornado passed over portions of Lonoke, Prairie, Woodruff, Jackson, and Poinsett counties. The weather map of February 22 showed a storm of great intensity central over Colorado, while a secondary disturbance overlaid southwestern Texas. These storms, following their usual paths, had moved during the next 24 hours to western Missouri and central Arkansas, respectively.

In Arkansas the weather was cloudy, the temperature much above the normal, and the barometer falling rapidly. The conditions were generally favorable for the development of tornadoes. The storm appeared at Little Rock about 11:30 p. m. of the 22d in the form of a heavy thunderstorm, although the wind was comparatively light. Moving northeastward, it first assumed the proportions of a tornado at McCreanor, Lonoke County, about 2 a. m. of the 23d, where the damage was about \$500 in property and 1 person was injured. About 8 miles southeast of Hickory Plains, Prairie County, the storm caused a loss of \$5,000, killed 1 person, and injured 20. The storm passed southeast of Augusta, Woodruff County, about 3