

TORNADO AT NASHVILLE, TENN., ON MARCH 14, 1933

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About 7:30 p.m. of Tuesday, March 14, 1933, Nashville was visited by a rather severe tornado, undoubtedly the worst storm in its history and certainly the most damaging. The day had been warm, the maximum temperature reaching 80° at 3 p.m. It was as high as 76° as late as 6:30 p.m. At that time a thunderstorm was approaching from the southwest, five tenths of cumulonimbus clouds being observed and the first thunder heard at 6:45 p.m.

An extensive area of low pressure, with two centers, occupied the Eastern States at 7 a.m. of the 14th (central standard time). This was a fairly good type of V-shaped depression, with a decided southwest-northeast trend. One center was over the Great Lakes and the other over western Arkansas and southern Missouri, the lowest pressure in the latter area being 29.56 inches at Fort Smith, Ark. At 4 p.m. the southern portion of the depression was long and narrow, extending from Memphis Tenn., to Columbus, Ohio, being wedged in between high pressure areas in the southeast and in the northwest. At the p.m. observation the trough extended from Nashville, Tenn., to Parkersburg, W.Va., both points registering the same pressure, 29.62 inches. There probably was slightly lower pressure at the Lexington, Ky., station, where it is indicated on the Washington weather map that the center was located at 7 p.m. The tornado struck Nashville 45 minutes after the above barometer reading was made. It therefore occurred in the southeast quadrant of the depression, and somewhat ahead of the wind-shift line at the surface.

The wind direction had been southwest most of the afternoon, becoming south-southwest at 6 p.m. and south at 6:50 p.m. Here it remained until 7:18 p.m., when the approaching thunderstorm brought the usual shift to an easterly direction (in this case, southeast). For about 10 minutes the wind blew from the southeast. Suddenly at 7:28 p.m. the wind veered from southeast to southwest, remaining so for 1 minute, and at 7:30 p.m. it was blowing from the west. The wind velocity at 7:20 p.m. was at the rate of 15 miles per hour; the velocity increased to 27 miles per hour at 7:26 p.m., 47 miles per hour at 7:27 p.m., and 65 miles per hour at 7:28 p.m. This was the extreme velocity at the station. For the 5-minute period beginning at 7:26 p.m. the average velocity was 50 miles per hour. During the minute of blow from the southwest the tornado was passing just north of the station, the right side of the path of destruction being only about 400 feet away. After the passing of the storm the wind direction was west for 15 minutes, northwest for 20 minutes, west-southwest for 15 minutes, and finally northwest for the remainder of the night.

Large hailstones preceded the arrival of the tornado by several minutes and heavy rainfall began with the shift of wind to the west. The temperature dropped from 75° at 7:30 p.m. to 61° at 8 p.m., due to cooling caused by the thunderstorm. The temperature then remained nearly stationary for about 1 hour. From 9 p.m. to 10 p.m. there was a further drop of 10° to 51°. This was the result of the progress eastward of the high-pressure cold-weather area, following the permanent shift of the wind to the northwest. In other words, the thunderstorm and the tornado were running ahead of the cold northwest blast at the surface about 1 hour. The tornado was not coincident with but preceded the real wind shift line by about 1 hour.

As the thunderstorm neared the station the barograph trace was falling with fair speed. About 7:30 p.m. it dropped suddenly 0.12 inch and immediately recovered 0.15 inch. This was during the passing of the tornado. The rise in pressure continued for probably 20 minutes, when there was another slight fall, lasting about 15 to 20 minutes. This second drop in pressure, after the thunderstorm had passed, was just prior to the permanent shift of wind from west-southwest to northwest at which time a steady rise in the barometer began.

Assistant Meteorologist Foster V. Jones, who was on duty at the Weather Bureau office until 7 p.m. and who later observed the approaching storm from his home at Delmas Avenue and Gallatin Pike, about three fourths mile north of the tornado's path, described its appearance as follows: "The tornado cloud was first observed while watching the unusual hail which fell prior to the storm. The cloud approaching from a westerly direction appeared like a huge inverted cone moving rapidly across a light-colored background of rain, looking very much similar to a shadow moving across a motion-picture screen." The usual roar, as of a freight train thundering along at high speed, was attested by many.

The path of the storm across the city was approximately east-northeast. It first appeared in west Nashville in the vicinity of Charlotte Pike and Fifty-first Avenue, about 4 miles from the public square. So far as known, this was the point of origin of the storm. From that vicinity to the public square moderate damage occurred here and there, such as trees broken off and a few walls down. Upon reaching Capitol Hill it caused the breaking of a few windows in the State Capitol Building and then descended upon the buildings on the north and east sides of the public square with terrific fury. The path here was probably not over 200 yards wide but the destruction was great. Some 15 or more brick business houses, ranging from 3 to 5 stories high, were affected. The top stories of some of the buildings on the east side of the square had both the west and the east ends blown out, the main portion of the roof remaining intact. Several on the north side of the square were almost completely demolished. Proceeding thence across Cumberland River the storm widened to about 400 yards and partially wrecked a row of 4-story factory buildings along First Street, and greatly damaged another large brick building, occupied by the National Casket Co., at Second and Woodland Streets. Large sections of brick wall a foot or more in thickness gave way to the pressure. From this point, for a distance of 3 miles it tore through a district of residences, churches, schools, and store houses, the width of the path ranging from 600 to 800 yards.

The total length of the path across the city was about 8 miles, but the storm's track can be traced through Davidson County, Wilson County, and into Smith County, a total distance of about 40 miles. Mr. Jones followed the course of the storm for several miles east of the city, and has the following to say regarding its path:

Taking a map of the city of Nashville and considering the greatest destruction as the center of the path it is found that the tornado was traveling easterly at an angle ranging from 20° to 30° north of east in the city proper, but describing a very slight arc to the south as it advanced beyond the city limits and across Davidson County into Wilson County. It crossed the Davidson County line near Tulip Grove, thence moved eastward through Lebanon to the Smith County line, apparently spending itself within Smith County.

The width of the path is very irregular, varying from one city block near the center of Nashville to slightly over a mile at a point 8 miles east of the city, then narrowing to only a hundred yards or so within a very short distance. At Lebanon the path was about 200 yards wide. The wider the path, the less destruction, in all cases. At the widest point the destruction was confined largely to the topping of trees, although some buildings near the center of the area exploded due to the decrease in pressure.

It was decided that only one tornado occurred in the counties named; and that it was a true funnel type tornado cloud, traveling in an easterly direction approximately 35 miles an hour, pulsating earthward with the apex swinging perpendicularly across the path.

Evidences of tornadic action were so plain and so numerous that no one questioned the true nature of the storm. A 2- by 4-inch timber was driven endwise into the east slope of the roof of the writer's home, clearly the result of a counterclockwise wind blowing into a vortex. At many places in the beautifully wooded portions of East Nashville uprooted trees along the outer edges of the whirl, of which there were hundreds, lay practically at right angles to the direction of the storm's path and toward the center. Hundreds of buildings showed the explosive effect of the storm—roofs lifted and walls blown outward. Many of these were completely demolished. Frame structures succumbed to the fury of the storm more readily than brick and stone, but the latter were by no means spared. Wreckage of many large brick buildings occurred and the damage was great. Notable among such examples were the brick buildings on the square and those just across the river, already referred to, the new East Nashville High School, where the roof of the large gymnasium was lifted off, and the new Bailey High School, which was more than half wrecked. It was observed that walls or roofs inclosing large rooms almost invariably gave way first under the unusual pressure, such pressure exerting full force against the outer inclosures instead of being divided by inside partitions. Numbers of persons in the storm area experienced difficulty in hearing and suffered discomfort in their ears for several days after the storm, due to the suddenly reduced pressure.

The tornado killed 11 persons in Nashville and injured scores of others. The small loss of life was one of its remarkable features, considering the fact that it traversed an area occupied by about 10,000 persons. The property damage included 1,400 homes, of which 1,100 were frame structures and 300 brick or stone; also 16 churches, 36

stores, 5 factories, 4 schools, 1 library, and 1 lodge hall. Some of the best residences of East Nashville were among the damaged list. The property loss within the city, exclusive of trees, automobiles, and other personal property, was estimated at \$1,450,000, and in the suburbs \$150,000. Loss of personal property is estimated at \$400,000. This tornado killed four persons in Lebanon and caused property damage of about \$125,000. Its total loss of life was 15 persons and the total property loss probably \$2,200,000.

The writer, who was near the center of the storm's path on Eastland Avenue, fortunately (for him) did not attempt to observe the storm's approach, for a look out a rear door or window might have cost him his life. During the terrifying half minute when walls, roofs, chimneys, garages, and trees were crashing only a few yards away and his own house was quivering under the pressure and was partially demolished, he and his family were in the front of the house and were unharmed, in spite of a feeling of intense expectancy. Numbers of his neighbors, however, were less fortunate. Some were crushed in the wreckage and others were blown out with the walls, landing in adjoining yards. If it were possible to keep doors and windows open during such a blow, relieving somewhat the inside pressure, the walls and roof of a building might not suffer, but the contents, including the occupants themselves, would be sucked into the open and made targets for flying debris.

Many interesting and freakish things occurred, the following being observed by the writer:

A corn stalk was found driven endwise through a piece of weather boarding.

A 2- by 4-inch timber plunged through a panel door without causing the slightest splitting or splintering. The timber fit the opening perfectly.

A 1- by 6-inch plank was forced through the trunk of a sturdy young tree, splitting the tree in half.

A high-tension tower was bent to the ground in a tangled mass without breaking loose from its concrete moorings.

It is not believed that this tornado was as violent as many that have occurred in other States, nor even in Tennessee for that matter, else the loss of life and property would have been much greater. Its significance lies in the fact that it pierced the heart of one of our large cities.

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C. FITZHUGH TALMAN, in Charge of Library

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