

In Lauderdale County, 15 people were killed, 81 injured, and over 100 families were left homeless. The total property loss, closely estimated by the relief committees, was \$155,000. Owing to the unusual backward character of the spring season, the damage to crops was slight.

## NOTES.

It is perhaps worth noting that the apparent north-to-south progress of the incipient tornadic condition from near Bradley to New Deemer, a distance of 50 miles, required nearly exactly the same time as for the Oktibeha County storm to move from Bradley to Aberdeen, a distance of about 45 miles. In other words, when one tornado was passing Aberdeen, the next one to the southward was just becoming a destructive force.

The apparent southward progress of the condition was nearly twice the velocity of the forward movement of the tornadoes, except in the case of the southernmost storm, which developed rather slowly, as the first three had practically spent themselves before the last one was created.

At Mr. J. M. T. Hamilton's place, near Meridian, a drill-press weighing 150 pounds was carried about 150 feet; also a vise, weighing 100 pounds, was carried 150 feet away.

Near Bay Springs an automobile was blown several hundred yards; the spokes were torn from the wheels and tires from the rims. Three of the tires were found still inflated.

An automobile locked in a garage was undamaged, although the garage was blown to splinters.

Half a dozen glass jars of fruit were carried 100 yards by the winds and not damaged.

Legal documents from Bay Springs were found on the mountain, near Meridian, 50 miles from their point of origin.

Several photographs carried by the whirl from Jasper County have been found near Meridian.

The damage done to small towns and settlements lying within the path of the tornadoes was enormous. When the storms encountered heavily timbered sections, the paths of destruction suggest the swaths left by mowing machines. Large trees were snapped and wrung as if they had been limp rags, and the ruins present a spectacle of chaos that only fire could make more complete.

## INTENSE DARKNESS.

At Meridian the cloud layers gradually thickened between 10:15 a. m. and 10:30 a. m., when it was very dark, with occasional flashes of vivid lightning. The darkness between 10:30 and 10:39 a. m. was as intense as would be common for a cloudy moonless night at 9:30 or later, and though lights were on in business houses (but no street lights were in operation), pedestrians could distinguish each other only with great difficulty. There were a great many excited people on the streets, and in many of the office buildings and department stores there was nearly a panic among the employees and others who were hurriedly leaving the buildings. The pall of darkness was so unnatural that it was extremely weird. People riding in automobiles state that steering was difficult even with lights on. At 10:31 a. m. the clouds in the southwestern horizon took on a greenish tinge, and at 10:36 a. m. the darkness was less intense for about three minutes. At 10:39 a. m., the darkness returned, the greenish tint being now of a yellowish green, pulsating in different degrees of intensity. The second period of darkness continued until about 10:55 a. m., and was, perhaps, more intense than the first period. The sky during the darkness was covered by a heavy curtain of clouds of stratus to nimbus structures, hanging nearly to the horizon, which was a narrow ring of light.

## THE TORNADOES OF APRIL 20, 1920, IN ALABAMA.

By P. H. SMYTH, Meteorologist.

[Weather Bureau, Montgomery, Ala., June 3, 1920.]

## METEOROLOGICAL CONDITIONS PRECEDING THE TORNADOES.

The disturbance in the Mississippi Valley (see Fig. 1) was attended in Alabama by southeasterly winds, generally less than 10 miles per hour, except along the coast, where they reached 22 miles per hour. A pronounced wind-shift line extended from southern Louisiana to Chicago, Ill. Morning temperatures were unseasonably high, the 7 a. m. isotherm of 70° F. extending as far inland as Nashville, Tenn., with temperatures as high as 76° F. recorded at Meridian, Miss., and Centerville, Ala., and a temperature of 74° F. at Montgomery, Ala., but somewhat lower temperatures prevailed on all sides of the area comprising these three stations.

Light rains had fallen within 24 hours at 18 stations in Alabama, mostly in northwestern and extreme western counties. Thunderstorms had occurred within 12 hours at Corinth and Vicksburg, Miss., and Birmingham, Ala. The sky over most of the State was overcast with clouds, exceptions being noted at Ozark, Milstead, and Selma, with partly cloudy weather, and Evergreen and Thomasville, with clear skies. At Montgomery the clouds were stratus, completely covering the sky and moving at 7 a. m. from the south; and these clouds continued throughout

the day without breaking, shifting to the southwest late in the afternoon. Relative humidity at Montgomery at 7 a. m. was 80 per cent; at noon, 78 per cent.

## METEOROLOGICAL CONDITIONS FOLLOWING 7 A. M. OF APRIL 20.

The storm that was centered between Memphis and Vicksburg at 7 a. m. of the 20th moved northeastward and was centered on the morning of the 21st over the lower Lake region, with increased intensity. It was attended in its passage by rainfall over nearly all except extreme southern Alabama, heavy rains (ranging from 1.25 inches at Riverton to 3.10 inches at Tuscaloosa) over much of northern Alabama, scattered thunderstorms in some central and northern counties, and the most destructive tornadoes of record for Alabama in the northwestern and north-central portions of the State. The sky remained overcast over nearly all the State during the 20th. Nevertheless, unseasonably high maximum temperatures were reported at most stations, ranging generally above 75° F. and reaching 85° F. or above at four stations, the highest being 87° F. at Auburn. Hail was reported from several points along the paths of the tornadoes, but from no other places in the State on the 20th.

## THE TORNADOES—GENERAL SUMMARY.

Information at hand shows two tornadoes to have struck in Alabama, one crossing the Alabama-Mississippi line into Marion County, 5 miles northwest of Detroit, Lamar County, and the other reported first in northeastern Fayette County. Moving northeastward in nearly parallel tracks about 40 miles apart they cut swaths ranging from 100 yards to nearly a mile wide for a combined distance of about 180 miles through the whole or parts of 10 counties in Alabama. Estimates based on all available information place the number killed at not less than 89 persons, the number injured at about 500, and the property damage done at approximately \$2,000,000 in Alabama alone. In some cases the injured were not expected to survive and in some counties, notably Winston, information could not be obtained from outlying districts and the death list may exceed the above estimate. For the amount of destruction these tornadoes exceed any of record in this State. The funnel-shaped cloud was observed by several reporters in the case of both tornadoes; both were observed to be counterclockwise in circulation, moved at an average rate of about 40 miles per hour, were attended at points along their paths by thunder and some hail, and were probably of about equal intensity. Heavy rains followed the tornadoes at several places in the vicinity of their tracks but in no cases preceded them, nor is there a record of heavy rain during the passage of either tornado. The feats and freaks of the storms were almost unbelievable. Houses were obliterated, forests in the centers of the paths of the tornadoes were literally swept clean, and objects in some instances were carried a distance of 75 miles. Slight earthquakes were felt just previous to the passage of one of the storms. Casings were stripped from the wheels of an automobile during the passage of this storm, showing the rapid and extreme decline in pressure. All along the paths of both storms observers noted the extreme density of the clouds; many state that it was the darkest midday in many years and one report is that chickens went to roost. Details of each storm are given in full below:

## THE MARION COUNTY TORNADO.

This tornado, so called from the name of the county in which the greatest damage in Alabama was done, crossed the State line from Mississippi into extreme southwestern Marion County about 9 a. m. Moving exactly northeastward, it cut across the northwestern corner of Marion County, entering Franklin County near Hodges. Continuing in the same direction it crossed Franklin County, just touching Colbert County at the extreme southeastern corner near Mehama, from whence it whirled into northwestern Lawrence County, to be last heard from at about 11 a. m. in Alabama near the Tennessee River, northeast of Town Creek. It is not known whether the storm crossed the Tennessee River and Limestone County into Tennessee, but certainly no great damage was done farther to the northeast of northwestern Lawrence County in Alabama.

The destruction was terrific. Forty-four persons were killed or died from injuries sustained, about 315 were injured, some of them very seriously, and enormous damage was done to property. In Marion County alone 20 persons were killed and between 100 and 200 injured, while the property damage was conservatively estimated at \$500,000. In Franklin County at least 19 were killed and perhaps 100 injured and property loss equal to or

greater than that in Marion County was sustained. Four were killed and 15 or more injured in Colbert County, and 1 was killed and 8 or 10 injured in Lawrence County.

The width of the path of great destruction ranged from about 200 yards to eight-tenths of a mile and may have been wider in places, with one newspaper report placing the width at a mile and a half. The average width was probably close to one-half mile, making this storm considerably larger than usual.

It was this tornado that blew the casings off the wheels of an automobile and probably occasioned the earth tremors as mentioned in the general summary above, and it was this storm also that carried an insurance policy from Marion County to the vicinity of Killen, Lauderdale County, a distance through the air of about 75 miles. One observer near Hamilton reported that on the ground in front of the tornado cloud he saw what looked like a fire.

Detailed reports from various sections along the path of this tornado are given below:

*Detroit, Lamar County.*—Postmaster's report: Storm entered State about 5 miles northwest of Detroit; went in northeast direction through Marion County. No hail was observed, but thunder and heavy rain. Time of storm, 9 a. m.; it came from the southwest and went toward the northeast. The funnel-shaped cloud was observed. Trees on the north side of the storm's path lay to the south; in the center, twisted; on the south side of the path, to the north. The path of great destruction was fully one-half mile wide. His estimate of destruction for Marion County made on April 26, 1920, was as follows: Number killed, estimated at 20; injured, 100; property damage, not including crops, \$150,000. \* \* \*

*Bexar, Marion County.*—Postmaster's report: Storm occurred 2½ miles south of Bexar, about 9.30 a. m.; it came from the southwest and went toward the northwest. The funnel-shaped cloud was observed. Trees on the north side of the path lay toward the southeast; in the center, toward the east; on the south side of the path, toward the northwest; width of path of great destruction, one-half mile; property loss in vicinity of Bexar, not including crops, about \$75,000. Number killed in vicinity of Bexar, 9; injured, 19. \* \* \* No hail; about one-half inch rainfall; shocking thunder; peculiar clouds, consisting of upright layers of black and yellow, revolving from west around south, to east, to north, to west.

*Hamilton, Marion County.*—Postmaster Charles E. Mitchell's report: Storm occurred on route 4 and route 2 from Hamilton at 10 a. m. Beginning near the southwest corner of the county, it extended in a northeast direction, entering Franklin County. It came from the southwest and went toward the northeast. The funnel-shaped cloud was observed. Trees on the north side of the path pointed to the south; in center, both ways; on south side, to north. The path was about 0.8 mile wide. Damage for Marion County estimated as follows: Buildings, \$100,000; household effects, \$50,000; live stock, \$50,000; farm implements, \$50,000; all other property, \$100,000; timber, \$100,000; feed-stuff, \$50,000; total, \$500,000. Number killed in Marion County, 20; injured, 200. No thunder; no hail. \* \* \* Mr. Mitchell's report was dated April 26, 1920.

Extracts from *Marion County News*, Hamilton, Ala., April 21, 1920: \* \* \*

"Everything went like leaves when the wind came," said Ben Crane, operator of a sawmill. "There first appeared something that looked like a fog, and the wind soon came roaring like a train. Not a building was left. We had 20,000 or 25,000 feet of lumber stacked; now it is scattered and blown away." Crane's mules were blown 100 feet from the barn, but were uninjured.

Volunteers are cutting new roads. \* \* \* Twenty physicians from near-by towns are in Hamilton.

Guy Cantrell says: "I was in a room by myself. I started to go across the hall, where other members of our family were. As I entered the hall I saw the stairs blow out. I was carried into the yard. A feather bed blew by me. I thought it would keep the sticks from hurting me, so I wrapped up in it, trying to keep it under me. I came out with small bruises."

Banks Fowler: "I live on the west side of the creek. I saw the cloud and watched it come up the bottom. I could hear the cracking and snapping with the roaring. It looked like a fire on the ground in front of the wind."

Shingles were driven into sound oak trees.

J. P. Sanderson said: "There seemed to be two puffs of wind; one carried things toward the west. In about a quarter of a minute everything came back. I tried to keep my family down on the floor. One of my boys blew out of the house; then blew back. There was a part

of the floor of my house left—the part we were on. Even the sills were blown from under the room we were in."

A Ford car belonging to Edgar Byrd was blown a quarter of a mile over a field. \* \* \* A conservative estimate by tax officials makes \$500,000 the damage done to property. \* \* \* Damage to timber will be at least \$200,000, probably more. A strip 1½ miles wide by 25 miles long was swept clean. People who had seen many storm paths say this is the worst they have ever seen. \* \* \* A house 2 miles west of Barnesville was demolished and a letter addressed to the owner was found four miles north of Russellville.

Extract from the *Sylacauga Advance*, Sylacauga, Ala., April 23, 1920: The shotgun wound sustained by Mr. Will M. Baker, the young farmer living near Hackleburg, Marion County, when a shotgun hanging on the wall was discharged as it fell from the force of the tornado \* \* \* proved fatal.

Extract from the *Marion County News*, Hamilton, Ala., April 28, 1920: In Marion County it was found by the Red Cross survey that 100 homes were hurt by the storm—87 of them entirely demolished. From these homes 500 men, women, and children are now being cared for.

A friend sends us a blank used in this county by justices of the peace. He says it had drifted to J. N. Chafin's farm, 10 miles northeast of Russellville, on Fox Trap Creek. He also says Mr. Brooks found some clothing and pieces of timber in Hill's Beat, Franklin County.

*Guin, Marion County.*—Mr. Mack Pearce, cotton region observer's report: Storm occurred on the western side of Marion County about 9 a. m. It came from the northwest and went toward the northeast. The funnel-shaped cloud was observed. Trees in the center and on the south side of the storm's path lay in all directions. Thunder but no hail. Mr. Pearce's report is for Marion County, and is not dated. Reference to Form No. 1005—Met'l. from Guin shows for April 20: Maximum temperature, 76°; minimum, 71°; temperature at 7 a. m., 72°; precipitation for 24 hours ending 7 a. m., 0.15 inch; wind direction at 7 a. m., south; state of weather at 7 a. m., cloudy; prevailing wind direction for the day, south; character of the day, cloudy.

*Hodges, Franklin County.*—Postmaster's report: Storm occurred about 3 miles south of Hodges at the nearest point about 10 a. m.; it came from the southwest and went toward the northeast. The funnel-shaped cloud was observed. Trees on either side of the path were pulled to the center and the ones in the center fell in different directions. Width of path at point of great destruction about one-fourth mile. Very little hail fell; there was thunder and a heavy rain. Clouds were yellow in places and very black.

*Phil Campbell, Franklin County.*—Postmaster's report: Storm occurred 8 miles west of I Hill (Campbell about 10.30 a. m.; it came from the southwest and went toward the northeast. The funnel-shaped cloud was observed. Trees on the northwest side of the path lay toward the south; in the center, toward the northwest; on the southeast side, toward the north. The path was from one-fourth to one-half mile wide at points of great destruction. At least \$25,000 damage was done; this is very close and not at all exaggerated. Three were killed; 40, injured. Fifteen homes entirely blown away and several others damaged, and a great many barns and outhouses destroyed. This is only in the territory west of Phil Campbell between Big Bear and Little Bear Creeks, a strip one-fourth to one-half mile wide and about 5 miles long. No hail; thunder and heavy rain. Clouds were very dark; it resembled twilight.

*Spruce Pine, Franklin County.*—Postmaster W. H. Wade's report: Storm occurred 1 mile north of Spruce Pine between 9 and 10 a. m.; it came from the southwest and went toward the northeast. The funnel-shaped cloud was observed. Trees on the north and south sides of the path pointed to the center; in the center they lay in every direction. Width of path at points of great destruction, about 200 yards. Damage, except to crops, about \$6,000; this for about 6 miles of the path traveled through this section. One negro child was killed; seven persons were injured. I am only making a report of what we call the Spruce Pine territory, a strip about 6 miles long come southwest of Spruce Pine northeast of Spruce Pine. Everything in center of cyclone was swept clean. A little hail fell; there was thunder, heavy rain, and peculiar clouds.

*Waco, Franklin County.*—Mr. J. E. Franks's report: The storm occurred at Waco about 10 a. m.; it came from the southwest and went toward the southeast. The funnel-shaped cloud was observed. Trees along the path were crossed up in every direction. The path was about 200 yards wide. Lots of houses torn to pieces and stock killed. Twelve were killed; 25 injured. There was a little hail; the hailstones were about the size of medium sized marbles. Thunder; continued slow all day. Little rain all the morning; heavy rain in the afternoon. Dark as midnight.

*Waco.*—Mr. John Landers' report: Storm occurred at Waco at 10 a. m.; it came from the southwest and went toward the northeast. The funnel-shaped cloud was observed. Trees on the north side of the storm's path lay toward the southeast; in the center, nearly straight;

on the south side, north. The path of great destruction was a quarter of a mile wide. About \$20,000 damage was done. Ten were killed; about 40 injured. \* \* \* There was hail in the tornado; hailstones about the size of an egg. Very heavy thunder. In about half an hour after storm both rain and hail fell.

Extract from the *Florence Times*, Florence, Ala., April 30, 1920: Waco, the Government quarry in Franklin County, \* \* \* was completely demolished by the cyclone Tuesday. Parts of the houses, half of the garage, and other parts of the debris were picked up in the streets of Russellville, 8 miles northwest of Waco, and parts of windows, doors, and even chairs and an old washstand were found in the hamlet of Littleville, 11 miles north of Waco, after the storm had passed. Stock was also picked up miles away. \* \* \* A meager report stated that six were killed and the settlement of Waco destroyed. Later reports increased the number, verifying six killed in one family alone a mile from the quarry. According to reports the home section was all but wiped out. A carload of stone was whipped about like a feather, and trees, one especially large oak, were twisted from the roots as if they had been bits of wire. The half of an immense boulder was found in Littleville, Colbert County, and several doors and window frames were seen in the little hamlet. One mule was picked up later in the day in the village with parts of the plow still dragging behind him. The animal was badly cut and bruised. Dr. Meriwether, of the United States Public Health Service, states that only two buildings are left in Waco—the superintendent's building and the office building—and both these are badly damaged; also that 12 quarrymen were hurt, \* \* \* that others a few miles from the quarry were killed and still others injured. The hamlet of Waco is no more; that is, so far as the house section is concerned. It was right in the path of the storm which came up the valley, razing everything in its wake.

\* \* \* The cyclone is said to have been the worst that has ever visited this section. It apparently traveled at right angles to the Southern tracks, and dipped in two places, being deviated in its path by a small tract of completely inundated land. Just between the two points or dips the portion of the country was practically unharmed—this was near Town Creek—and several cows in a near-by pasture were unharmed. \* \* \* At Russellville and Littleville, on the side of the mountain, a slight shock or tremor of the earth was felt just previous to the storm, and a few minutes later a similar shock was felt in portions of the Wilson Dam Reservation and at United States Nitrate Plant No. 2. About the same time the lights went out, and the atmosphere seemed to be surcharged with electricity. One man, a stranger, was killed at Waco.

*Newburg, Franklin County.*—Postmaster F. S. Roe's report: The storm occurred 3½ miles west of Newburg about 9.30 a. m. It came from the southwest and went toward the northeast. The funnel-shaped cloud was observed. Trees on the north side of the path pointed toward the southeast; in the center, toward the northeast; on the south side, to the northwest. Width of path of great destruction, from 200 to 400 yards. There were 12 dwellings, barns, and outbuildings completely destroyed in 6 miles of Newburg. Ten were killed—nine in one family, a mother and eight children. Number of injured unknown. \* \* \* Several more were killed north of here. There was hail, thunder, heavy rain after the storm, and very peculiar dark yellow clouds. Everything in the path of the storm was completely swept away; can not estimate damage; oldest people here never have seen anything like it.

From the *Tuscaloosa, Ala., News*, April 29, 1920: Reports from Gov. Kilby's office place the number killed in Franklin County at 19; number injured, 92. Fifty-seven homes in Franklin County were destroyed and 44 badly damaged.

The *Colbert County Reporter*, April 29, 1920, corroborates this statement.

*Mehama, Colbert County.*—Extract from the *Sheffield Standard*, Sheffield, Ala., April 23, 1920: In this county, Mehama, a small settlement south of Leighton, was practically wiped out. Here there were three deaths and many casualties. Trul Blanton, his wife, and one child were killed, and a score or more injured. Houses were destroyed and much live stock killed. \* \* \* A freak of the cyclone was the destruction of a Ford automobile. The car was blown some distance and the casings stripped from the wheels. Near Town Creek one death was reported. Two were badly injured. The path of the storm extended from southwest to northeast.

From the *Tuscaloosa News*, Tuscaloosa, Ala., April 23, 1920: Report from Gov. Kilby's office \* \* \* states number killed in Colbert County as 5; number injured, 15 or more.

From the *Sheffield Standard*, April 23, 1920: High winds in this city. Sheffield escaped any serious injury from the tornado. However, the residents were given a scare, as the clouds, winds, and heavy rains were such as to cause alarm. Lights were necessary in downtown offices and stores; for more than half an hour the electrical storm raged. The downpour of rain was almost equal to a cloudburst. Tuesday evening about 6 p. m. the strongest blow came, accompanied by terrific rain. \* \* \* The strong wind caught the automobile of

Rev. Wm. R. Riggle, a five-passenger touring car, and blew it off the high bluff.

*Town Creek, Lawrence County.*—Report of Rev. S. V. Blythe: Storm occurred 1 mile southeast of Town Creek at 11 a. m. It came from the southwest and went toward the northeast. The funnel-shaped cloud was observed. Trees on the north side of the storm's path pointed south; in the center, north; on the south side, north and east. Trees and houses were blown down and scattered. Almost every house in its path blown to pieces. Some stock killed; 1 person killed; 8 or 10 injured. No hail; very loud and constant thunder; 2 or 3 inches of rainfall. Much corn and hay destroyed and meat. Report dated April 25, 1920.

Extract from the *Florence Times*, Florence, Ala., April 23, 1920: On Tuesday 1.72 inches of rain fell from 11:45 a. m. to 1:15 p. m., with the wind in at times variable directions and of great velocity. Also 0.74 inch fell in 45 minutes from 6 p. m. to 6:45 p. m. Electrical effects also reported. The wind in the evening was from the east almost constantly, and was of such velocity as to do great damage to young fruit trees. No serious damage was reported in any part of Lauderdale County. The heavy flow of water washed out part of the road from Florence to the nitrate plant, and a section of the newly built gunwale fore road a short distance beyond Locust Street was washed out to a depth of probably 10 feet. Greatest damage was done 30 to 50 miles south and west of here.

#### BLOWS POLICY 75 MILES.

As illustrating the powerful force of the tornado that passed over Alabama last week, it may be related that an insurance policy from a home in Marion County was blown into Lauderdale, it having been seen and recovered as it fell by Mr. Sam Ezell on Route 1 from Killen. The policy was on the life of Joel Clarence Ford in favor of his mother. The distance traveled in the air was about 75 miles.

From the *Moulton Advertiser*, Moulton, Ala., April 28, 1920: One of the most destructive cyclones which ever struck this county passed over the northwestern corner of Lawrence County last Tuesday morning, striking the county first at Mehama, and traveling in a northeasterly direction. At Mehama four were killed and seven houses were completely demolished and several persons more or less hurt. \* \* \* Property damage, very conservatively estimated, was \$24,000. \* \* \* After leaving Mehama the storm swooped down on Wolf Springs and blew away the house of Mr. Harvey Carpenter and of a Mr. Garrison. A Mrs. Chaney had an arm broken. \* \* \* The storm continued on its way doing minor damage until it struck Town Creek, \* \* \* where it killed Mrs. John M. Roberts, of Wren. East of Russellville, and along a distance of 10 miles, it is known that 16 are dead and about 40 injured.

*Florence, Lauderdale County.*—Extract of record of Special Meteorological Observer Miss O'ella O. Coburn, Form No. 1001-A-Met'l for April: Sea-level pressure at 7 a. m., 29.67 inches; temperature at 7 a. m., 72°; maximum temperature, 76°; minimum temperature, 64°; rain began, D. N.; ended D. N.; rain began 11:45 a. m.; ended, 1:40 p. m.; rain began 6:30 p. m.; ended, 7:15 p. m.; total rainfall to 7 a. m., 0.04 inch; total for showers after 7 a. m., 2.46 inches; marginal note, severe storm. (All data for the 20th.) Wind direction 7 a. m., south; state of weather, cloudy; character of day, cloudy.

*Riverton, Colbert County.*—Extract from Form No. 1009-Met'l, April 20: Maximum temperature, 81°; minimum, 67°; temperature at 7 a. m., 73°; rain began D. N.; ended, D. N.; rain began 11.04 a. m.; ended 3.50 p. m.; total rainfall to 7 a. m., 0.07 inch; after 7 a. m., 1.25 inches; thunder and lightning; wind direction 7 p. m., south; state of weather, cloudy.

*Tuscumbia, Colbert County.*—Extract from Form No. 1005-Met'l, April 20: Maximum temperature, 77°; minimum, 67°; precipitation began and ended D. N.; precipitation began, 9.30 a. m.; ended, D. N.; amount of precipitation to 7 a. m., 0.05 inch; for remainder of day, 2.28 inches, wind direction at 7 a. m., southeast; prevailing for day, southwest; character of weather at 7 a. m., cloudy; for the day, cloudy.

#### THE MADISON COUNTY TORNADO.

This tornado, so called for the county in Alabama from which reports are most complete and where the destruction was notably great, apparently originated in northeastern Fayette County, Ala., as it was here that the first destruction was reported, but it seems highly probable from a backward projection of the line of the storm's path and in the light of available reports from Tuscaloosa and Pickens Counties that the place of origin was in Mississippi, and that this was the same tornado that was reported from Noxubee County, Miss. If so,

it traveled above the ground at such a height and in such a manner that it escaped notice in western Alabama. From northeastern Fayette County the storm traveled northeastward through northwestern Walker County, passing near Pocahontas and Saragossa to the north of Manchester, striking Winston County near Falls City. It continued across southeastern Winston County, devastating Arley and Helicon, passing into northwestern Cullman County, northeast of Helicon, and into Morgan County near Wilhite. It seems to have done very little damage in Morgan County, and probably passed over this county at a considerable height in the air. It is next positively heard from crossing the Tennessee River into Madison County near Green Cove. Cutting diagonally across Madison County, it did terrific damage at Lily Flagg, sections southeast of Huntsville, and between Brownsboro and Gurley, and was lost sight of northeast of Brownsboro about 15 miles south of the Tennessee line. The destruction in Alabama by this tornado was about equal to that by the Marion County tornado referred to above. About 46 persons were killed and approximately 215 injured. Twenty were killed in Winston County, 1 in Cullman, and 25 in Madison. Property damage was probably nearly \$1,000,000; an accurate estimate can not be made from reports at hand. In Madison County the storm did not cling closely to the ground, but struck here and there along its path. Some hail and thunder were reported from points in Madison County, notably south of Huntsville and near Brownsboro, and rainfall was generally light. The funnel-shaped cloud was observed to revolve counterclockwise, and is described as very heavy, black, and rolling like soft-coal smoke. Near Wilhite the cloud was black, with a yellowish tinge. Many farm animals were moved without injury from one farm to another, feathers were blown off chickens, and a pump was pulled out of a well and broken in two parts, the upper part disappearing completely. Details from various places along the path of the storm are given below:

Extract from the *Tuscaloosa News*, Tuscaloosa, Ala., April 20, 1920: Livingston, Ala., was visited by a severe hailstorm, but no damage done.

From the *Tuscaloosa News*, April 21, 1920: Bad storm did not reach this section, but rain did damage. There in Tuscaloosa, when that black cloud was hanging over the city, many people became frightened, and supposed they were going to get a taste of the tornado, but fortunately it passed away without striking us. The black cloud as it appeared in the west looked exceedingly angry. The force of the wind would shoot great waves of cloud above other clouds, and made it look as if we would not escape the fury of the storm. There was darkness in Tuscaloosa for the period of about an hour. Automobiles turned on their headlights when driving through the pelting rain. S. A. O'Quinn picked up a sea bird that had been driven to this city before the fury of the storm. The bird had a long beak and exceedingly long legs, and was found dead in the streets. It became so dark about noon that chickens went to roost. \* \* \* It was the scariest looking cloud that has hung over this city in many a day, some saying that they had never seen it so dark at high noon.

*Tuscaloosa, Ala.*—Extract from Form No. 1009-Met'l, April 20: Maximum temperature, 75°; minimum, 72°; temperature at 8 a. m., 75°; rain began D. N.; ended D. N., both on the 19th; rain began 11 a. m.; ended, D. N., both on the 20th; rainfall to 8 a. m., 0.02; after 8 a. m., 3.10; prevailing direction of the wind, south; character of the day, cloudy.

From the *Greene County Democrat*, Eutaw, Ala., April 23, 1920: Tuesday at noon the clouds became so low, heavy, and black that one could scarcely read a newspaper in the open air, and one automobile drove through the streets with lights. The blackest noon we ever saw, followed by a downpour of rain. \* \* \* Tuesday was a stormy day, with winds, floods, lightning, thunder, and rain.

From the *Greensboro Watchman*, Greensboro, Ala., April 22, 1920: Tuesday, the 20th, was the darkest and most threatening day that had been witnessed here in years. The air was heavy and cyclonic, and it was a feeling of great relief to everybody when the rain came without any wind. The storm went to the west and is reported to have done

much damage in portions of Mississippi. The rainfall here was very heavy—2.18 inches. (This paper is edited by Mr. Wm. E. W. Yerby, cotton region weather observer at Greensboro.)

*Greensboro.*—Extract from Form No. 1005—Met'l, April 20, 1920: Maximum temperature, 76°; minimum, 71°; total precipitation to 7 a. m., 0.18 inch; to 7 a. m. of the 21st, 2.18 inches; wind direction, prevailing, south; state of weather at 7 a. m., cloudy; character of the day, cloudy.

*Cochrane, Pickens County.*—Extract from Form No. 1006—Met'l, April 20, 1920: Rain began 10 a. m.; ended 6 p. m.; amount, 0.75 inch; wind direction at 7 a. m., south; state of weather, cloudy.

*Jasper, Ala.*—Extract from the *Mountain Eagle*, April 28, 1920: Winston County among sufferers. Reports are continuing to come in. In the Bennet settlement north of Manchester, the homes of Fred Wilson, Denny Messer, and John Wilson were completely destroyed, and the barns of H. J. Bennet and Wash Lamson were blown away. Some cattle were killed, but fortunately no lives were lost. The Union Hill Church was destroyed. Fences, wires, and trees were blown down. In Winston County, near Arley, the 6-year old son of Garrett Barrens was killed in the storm of last Tuesday, and many houses and barns were blown completely away, and people left without food or shelter. \* \* \* The small town of Helicon in Winston County was completely demolished: \* \* \* not a building was left standing, and neighboring orchards and farms were ruined. \* \* \* No loss of life is reported, and few were injured.

*Cullman, Ala.*—Extract from the *Cullman Democrat*, April 22, 1920: The worst storm in many years visits the county on Tuesday. On Monday dark clouds hung over this section of the county all day, and on Tuesday the same continued, with very little rain. On Tuesday about noon a distinct roar was heard for quite a long time. Many residents interpreted this roar as a cyclone passing at no great distance from Cullman, and it developed they were correct. The storm, which did no great damage in this city, seems to have passed a little to the northwest of Cullman, near Vinemont, going on to Lacon, where two houses were destroyed within sight of the passenger train which stopped there. At Helicon, several miles northwest of Cullman, near the Winston County line, six are reported dead, and much damage done to property. \* \* \* One or two deaths are reported from Wilhite. \* \* \* Telephone linemen going north of here say they learned that a two-story house was blown away, 9 miles up the Old Corn Road, and a Mrs. Lewis, 70 years old, killed by a falling chimney. Around Hanceville many outbuildings had tops blown off, and several chimneys were blown down. The large barn of S. J. Griffin was blown flat. This barn was only a short distance from Los Manning's home, which was not hurt.

*Carbon Hill, Ala.*—Extract from the *Carbon Hill Journal*, April 22, 1920: Although it was very dark and threatening at Carbon Hill, it was hardly considered that conditions were right for a tornado. \* \* \* The rainfall at Carbon Hill was light and of short duration, although it was cloudy the balance of the day.

*Cullman, Ala.*—Extract from the *Cullman County Tribune*, April 22, 1920: In our county considerable damage was done by the cyclone. The twisting winds appear to have struck Cullman County in the western part. The little town of Helicon, just over in Winston County, was almost wiped out, there being only one home left standing. While no one was killed, many were injured, some of them seriously. The storm next struck in this (Cullman) county in the community of Nesmith, where much damage was done, the tornado cutting a path more than a quarter of a mile wide, sweeping everything clean. \* \* \* Two houses were wrecked and many barns were unroofed. The next place visited was near Ebenezer Church, where three barns were unroofed. The next place to suffer was the home of J. W. Collum: his residence was completely demolished, and Mrs. Mary Collum, 83 years old, was crushed to death by a falling chimney. Mr. Collum and his two children were badly injured. T. W. Shannon's barn was blown down and a good mule killed. The storm next struck near Wilhite, where it blew down much timber, demolishing the large barn of G. W. Drake and tearing the porch off the Huffstutler home. Three barns were unroofed and the home of Sim King blown away. It next struck at Cold Springs, where it did considerable damage to smokehouses, barns, and small houses. \* \* \* A dispatch from Jasper dated the 21st says that a cyclone passed over parts of Walker and Winston Counties about noon of the 20th and did considerable damage to property and killed one child near Arley. The storm started in the northern part of Fayette County, and passed through Walker County, touching Pochontas, just this side of Carbon Hill, and blew down a stretch of timber three or four hundred yards wide. It struck the home of Mark Myers near Saragossa, and blew it down, injuring two of his children. It passed on by Falls City, leveling almost every house in its path. At Nathan, near Arley, it killed one person and injured another. Many farmers in the storm lost heavily in the destruction of feed, barns and stock.

From the *Mountain Eagle*, Jasper, Ala., April 21, 1920: The storm hit 9 miles northwest of Jasper, and the barn of Myers was blown down

and the house off the pillars, but no one was injured. There were 11 head of horses and three cows in the barn and none of them was injured; how it happened was a miracle. The Union Hill Church, 12 miles north of Jasper, was also blown away, and the property damage in this section was very heavy, but no lives were lost.

*St. Bernard, Cullman County.*—Extract from Form No. 1009—Met'l, April 20, 1920: Maximum temperature, 73° F.; minimum, 64° F.; temperature at 4.15 p. m., 66° F.; rain began a. m.; ended, 3 p. m.; amount, 0.80 inch; prevailing wind direction, southwest; character of the day, cloudy.

*Wilhite, Cullman County.*—Report of Mr. G. W. Drake: The storm occurred at Wilhite station at noon. It came from the southwest and went toward the northeast. The funnel-shaped cloud was observed. Trees on the north side, south side, and in the center of the storm's path pointed to the north. The path was one-fourth mile wide. Property damage, about \$5,000. One killed; three injured. There was hail and thunder; rain after the storm. Clouds were black, yellowish. The storm came to the ground at Wilhite and swept everything clean for about 2 miles, and then rose again and went 6 miles, coming down again at John Gurley's, where it did some harm.

*Vinemont, Cullman County.*—Postmaster's report: The storm did not affect my neighborhood; it was in the territory served by the Lacon post office.

*Falkville, Morgan County.*—Postmaster's report: Storm did not affect this place; it was 4 miles south of here.

*Deatur, Morgan County.*—Extract from Form No. 1005—Met'l, April 20, 1920: Maximum temperature, 75°; minimum temperature, 70°; temperature at 7 a. m., 70°; rain began D. N. of the 19th; ended 3.30 p. m. of the 20th; amount to 7 a. m., 0.03 inch; amount after 7 a. m., 0.16 inch; wind direction at 7 a. m., south; prevailing for day, south; state of weather at 7 a. m., cloudy; character of day, cloudy.

*Lily Flagg, Madison County.*—Report of Mr. J. M. Latham, dated May 1, 1920: The storm occurred 1½ miles south of Lily Flagg at 12.30 p. m.; it came from the southwest and went toward the northeast. The funnel-shaped cloud was observed. Trees on the north side of the path pointed to the south; in the center, to the northeast; on the south side, to the north. The average width of the path of great destruction was 150 yards. Damage, except to crops, \$50,000. Eight were killed; nine injured. \* \* \* No hail; no thunder; heavy rain; very dark, peculiar clouds. We saw the cloud—tornado—coming about 10 miles away. It was a dark, funnel-shaped cloud, whirling toward the northeast, going at a very rapid speed. There was very little noise until it got in a mile of us. It turned in the contrary direction to the movement of the watch. We stood on our porch and watched it about 15 minutes, watching things being whirled away.—*J. M. Latham, per Lillie Latham.*

*Huntsville, Ala.*—Report of postmaster R. L. Okal: The storm occurred 6 miles south of Huntsville at 12.30 p. m.; it came from the southeast and went toward the northeast. The funnel-shaped cloud was observed. Trees on the east side of the storm's path lay toward the west—branches were broken; in the center of the path, scattered and broken; on the west side, toward the east. Width of path of great destruction, about 200 yards. Damage except to crops, estimated at \$35,000. Several substantial country homes were totally obliterated; not a piece of timber left to show where they stood. Twenty-one were killed; injured estimated at 35. There was hail, but very little; hailstones were about the size of filberts. Very little, but heavy thunder; rainfall was light. Clouds were heavy, black, and rolling, like soft coal smoke. I met a Mr. L. W. Baily this morning, who gave a clear description of the cyclone as he saw it from his front porch, as it passed up the cove about three-fourths mile from his home. He said the great, black, whirling cloud first appeared to him coming up from the southeast, small at the bottom and spreading at the top; that as it approached nearer all other clouds in the sky appeared to dash toward it and were swallowed up. It swept rapidly across the cove, moving a little north by northeast as it neared the mountain range, and went over it, leaving a path clear of any standing timber, houses, or fences. In going over the path of the storm the next day he and his sons found cedar trees, with trunks 16 inches through, lying on the upper benches of the mountain, that had been torn up by the roots down in the valley and brought up bodily and deposited among the big timber on top of the range. He also said that he saw quite a number of postholes where the posts had been pulled up and carried off; that the holes were large at the top, as if the posts had been twisted around before coming out of the ground. Numbers of other posts were broken off even with the surface, but not a post was standing in the path. The storm came into Madison County from Morgan County. One citizen of Madison saw the great, black, rolling cloud pass across the river at a distance of several miles, moving east, he said. He saw it spread toward the earth after crossing the river, but did not know of the damage done, until the next day. It struck the earth in Madison about 4 miles east of the Whitesburg Pike, beginning its work of destruction at this point. It was what you might call "a boulder" as it did not cling closely to the ground all the way up through Madison County. If it

had, the loss of life and destruction of property would have been greater still.

*Huntsville, Ala.*—Extract from the *Huntsville Telegram*: \* \* \* Mrs. Newt Flippin suffered the amputation of an arm, which was twisted off by the wind. The wind performed many freak stunts with cattle, moving many animals from one farm to another without injuring them, and blowing the feathers off chickens. Many farm animals were killed, however. The pump at Flippin's home was pulled out of the well and broken into two parts, the upper part not having been seen since the storm. The property damage is estimated at about \$50,000 to houses and barns, and there was very little damage to crops because of the lateness of the season. \* \* \* Practically no one had tornado insurance.

*Owens Cross Roads, Madison County.*—Postmaster's report: The storm occurred at Brownsboro, route No. 1, at 12:30 p. m. It came from the southwest and went toward the northeast. The funnel-shaped cloud was observed. Trees on the north side of the path pointed toward the south; in the center, in all directions; on the south side, to the north; width of path of great destruction, 300 yards. Damage, except to crops, \$2,500. Four killed, 10 injured. \* \* \* No hail; thunder, but no heavy rain; black cloud.

*Gurley, Madison County.*—Postmaster M. I. Williamson's report: The storm occurred west and north of Gurley at 12:30 p. m. It came from the southwest and went toward the northeast. The funnel-shaped cloud was observed. Trees on the north side of the path pointed to the north; none left in the center; on the south side they pointed to the south. Path of great destruction was 60 yards wide. Damage, except to crops, \$25,000. Nine were killed, 10 injured. \* \* \* The storm did not cut a clean path. It dipped here and there along the path, and went clear over trees in other places. Where it did strike the earth, it swept everything clean.

*Brownsboro, Madison County.*—Postmaster's report: The storm occurred 1 mile east of Brownsboro at 1:15 p. m.; it came from the west and went toward the east. The funnel-shaped cloud was seen. Trees on the north side of the path pointed southward; in the center, eastward; on the south side, northward. Path of great destruction was 100 yards wide. Fifteen houses, 12 barns, and about a thousand dollars' worth of timber totally destroyed. Thirteen killed, 18 injured. A little hail; hailstones small. Thunder very heavy; little rain fell.

*Madison, Madison County.*—Extract from Form No. 1009—Meteorological, April 20: Maximum temperature, 73°; minimum, 67°; temperature at 6 p. m., 68°; rain began at noon; ended, 1 p. m.; amount, 0.38 inch; prevailing wind direction for the day, south; character of the day, cloudy.

*Scottsboro, Jackson County.*—Extract from Form No. 1009—Meteorological, April 20: Maximum temperature, 76°; minimum, 65°; temperature at 5 p. m., 66°; rain ended 1 p. m.; amount, 0.40 inch; prevailing wind direction for the day, southwest; character of day, cloudy.

The following newspaper extracts may be of interest as showing the weather at points off the storms' tracks:

*Greenville, Butler County.*—From the *Greenville Advocate* for April 23: Speaking of the 20th, all day the wind was blowing a gale, and many people feared the storm would reach here.

*Sylvauga, Talladega County.*—From the *Sylvauga Advance*, for April 21: Referring to the 20th, heavy thunder and electrical storm; \* \* \* a smokehouse was damaged by falling trees.

90th meridian time used throughout this report.

Figure 3 shows the location of the storms' paths.

#### IN TENNESSEE.

A tornado occurred on April 20, 1920. On first consideration of the reports received we got the idea that two different tornadoes occurred, but further examination of the reports leads us to believe that it was one tornado striking the ground at intervals.

It first appeared in Wayne County about 9 a. m., passing about 3 miles south of Waynesboro at 9:15 a. m. Its course was from southwest to northeast. We have no reports of tornadic wind effects in Lawrence and Lewis Counties (northeast of Waynesboro), though very heavy rain occurred at Hohenwald, Lewis County, and heavy at Ashwood, Maury County. But there was no tornado in the vicinity of Hohenwald or Ashwood. However, at 10:30 a. m. a tornado struck in the vicinity of Spring Hill, Maury County, and near Burrwood and Thompsons Station, Williamson County, moving north-eastward, in line with the track through Wayne County, made about 1 hour and 15 minutes earlier. It was probably the same tornado.

The map (fig. 3) shows approximately the path of the tornado. Its path was between Burrwood and Spring Hill, about 1 mile east of Burrwood and 3 miles west of Spring Hill. It was traveling directly toward Franklin, about 9 miles northeast of Burrwood, but did not reach Franklin. Apparently, its destructive violence ceased at a point 2 or 3 miles northeast of Burrwood and about 2 miles north of Thompson's Station.

In Wayne County property damage of about \$5,000 was reported, but no lives were lost. In Maury and Williamson Counties the losses were heavier, being estimated at a total of \$20,000. One man was killed and 8 or 10 persons injured near Burrwood, Williamson County.

The rainfall was very heavy in Davidson County, washing away some bridges and causing damages of \$10,000 or more, while in Nashville the streets that were macadamized suffered to the extent, according to estimate, of \$50,000.—*Roscoe Nunn, Nashville.*

#### TORNADO IN UNION COUNTY, N. C., APRIL 12, 1920.

By G. S. LINDGREN, Meteorologist.

[Charlotte, N. C., May 20, 1920.]

The low-pressure area, which gave rise to the tornado of April 12, 1920, in North Carolina, moved from the middle Mississippi Valley to northwestern Pennsylvania between 8 a. m. and 8 p. m. of that date. The general form of the low on the 8 p. m. map was that of a very much elongated ellipse whose major axis extended from the upper St. Lawrence Valley to the east Gulf coast. Thunderstorms with brilliant lightning occurred at Charlotte during the evening hours. There was little wind and about 0.86 inch rainfall. The barometer at that place dropped during the day, reaching a minimum about midnight.

The temperature gradient on the evening map was decidedly steep in the northwest quadrant, the current temperature at Pittsburgh being 60° F., and that at Toledo, 28° F., approximately 200 miles to the northwest.

At about 9 p. m. of the above date a tornado of marked severity formed in the northwestern part of Union

County, 18 miles southeast of Charlotte, which caused the loss of three lives, seriously injured several persons, and inflicted considerable damage to cattle, farmhouses, timber, and orchards, the total loss being estimated at about \$250,000.

Available records indicate that an average of about one tornado per year has occurred in North Carolina, but nearly all of these appear to have been of a light to moderate type. The loss of life or extent of destruction to property attending the passage of previous storms of this character is unknown, but the one under consideration will rank among the severest that have ever visited this section of the country.

The tornado path was about 32 miles long, running northeastward across Union County, extreme northwestern Anson County, and southeastern Stanley County, the last damage reported being 2 miles from the county line. Its width averaged about 150 yards, never being