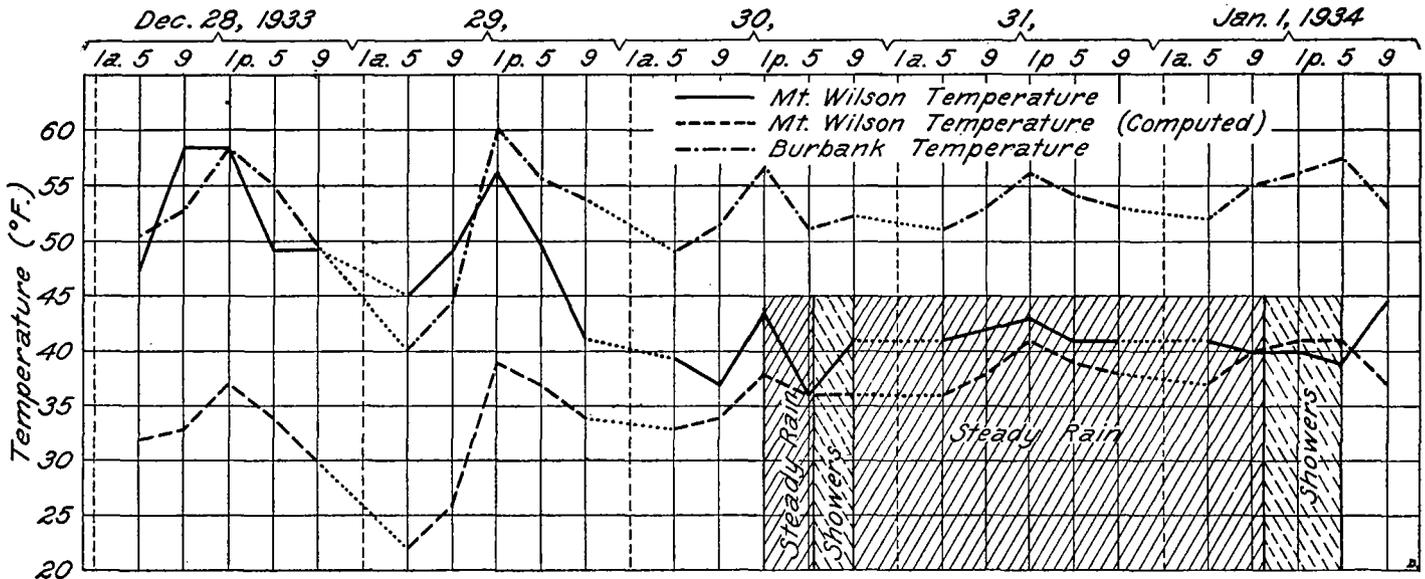


colder air may have already invaded the Los Angeles area below the elevation of Mount Wilson, as rainfall was very heavy during the early morning hours, indicating greater convectivity. This was followed again on the graph by the convergence of the lines indicating steepened lapse rate, characteristic of NPP air, and from 9 a.m. to 5 p.m. the weather was showery with occasional breaks in the overcast. The winds in the meantime were shifting from southeasterly to southwesterly and west. At 9 p.m. the lines of the graph showed rapid divergence

mountains extended into the warm mass and it would appear that Daingerfield's conclusions that topography played an important role in the amount of rainfall for various localities would be justified even under the warm-front conditions.

CONCLUSIONS

Considering the storm from the standpoint of masses of air involved, there appears to have been a warm front



again and as we were coming under the influence of an anticyclone it is possible air warmed by subsidence was causing the higher temperatures.

The angle formed by the line of discontinuity between the cool air mass and the warm mass above is seldom very steep, therefore it is probable that many of the mountains near the coast extended into this warm air mass as well as the higher mountains in which Mount Wilson is located. If this be the case, then orographic influences would be expected in each case where the

established which started rain in the Los Angeles area, a rain soon temporarily halted by the passage of a dying occluded front, which front in turn was again quickly replaced by a new warm front that continued until the last day of the storm when occlusion again took place along the coast with the occluded front passing inland and terminating the storm.

Acknowledgments are due to L. H. Dangerfield and members of the Weather Bureau Airport Station at Burbank for their helpful suggestions and criticisms.

THE NEW ORLEANS, LA., TORNADO OF MARCH 26, 1934

By GRADY NORTON

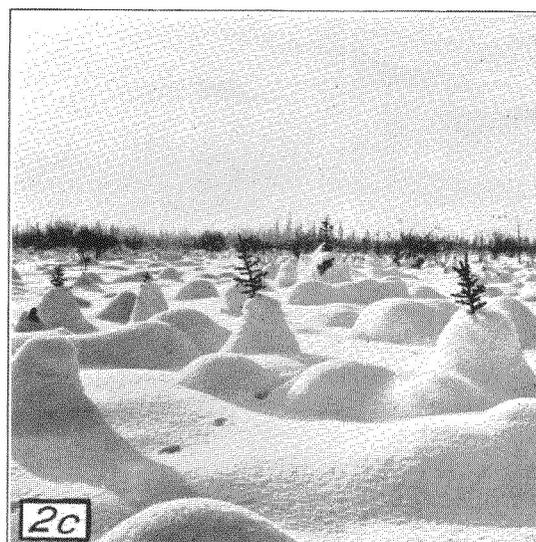
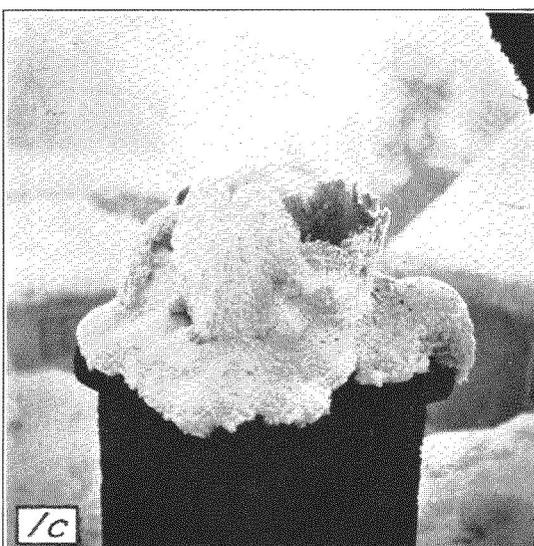
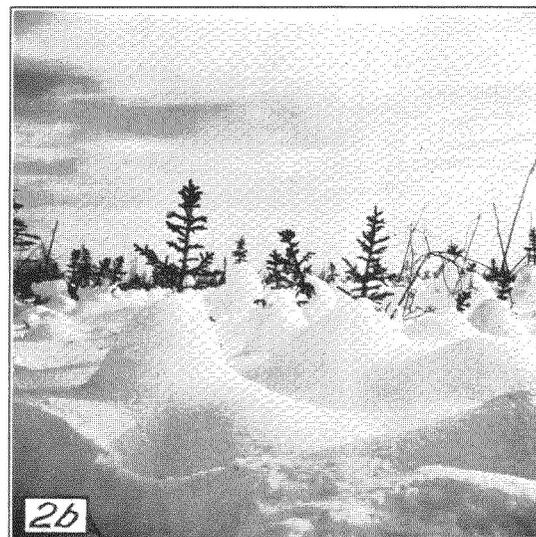
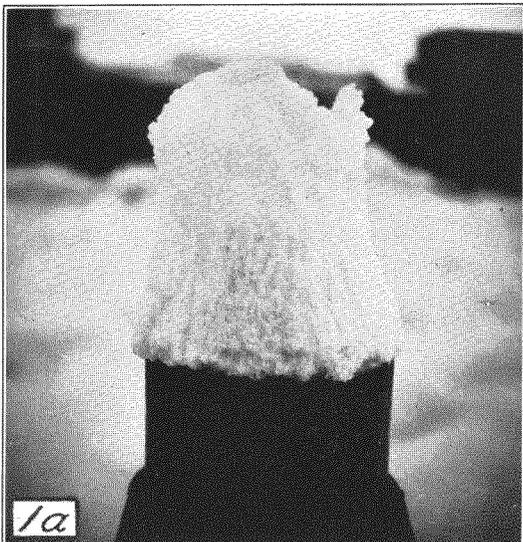
[Weather Bureau Office, New Orleans, La., Mar. 29, 1934]

A small tornado passed through the eastern portion of New Orleans at about 8:05 to 8:10 a.m., central standard time, March 26, 1934, over a path approximately 4 miles long and from 100 to 200 feet wide. Fifteen persons were injured but none killed. Sixty houses were destroyed, or virtually so, and about 50 others damaged in varying degrees. Telephone and electric wires and poles were torn down and much other damage of a minor nature done. A conservative estimate of the property loss is \$150,000.

The storm moved slightly east of north, and was first noted as it crossed the Mississippi River near the wharves of the Standard Fruit Co. The port officials of this company observed it as a roll of very black cloud moving low over the river with a very strong wind on its right side. However, no appreciable damage occurred on the river front. The first evidence of real damage was noted near the intersection of St. Claude and Almonaster Avenue, where roofs of buildings were injured. From this point

the storm moved out Almonaster Avenue, with varying degrees of damage, to the junction of Franklin Avenue, and thence diagonally across the triangle of blocks between Franklin and Almonaster Avenues along Eads and Deer Streets to the railroad tracks, where the last major damage occurred to the property of a city pumping station located near the intersection of Industry and Deer Streets. Slight damage occurred at intervals from this point to the Gentilly Road, but none of consequence beyond it.

The greatest destruction occurred along a path 100 feet wide, with lesser damage 50 feet farther out on either side, from the junction of Franklin and Almonaster Avenues along Eads and Deer Streets for a distance of 10 blocks. This is a residential section having mostly small, lightly constructed frame houses virtually every one of which near the center of the path was completely wrecked, while those near the edges of the path were extensively



Rime caps.

Snow cocks.

damaged. It was in this section that all the injuries occurred.

Farther on the city pumping station was considerably damaged, and beyond that practically nothing hurt as the course was then over unimproved property.

One or more persons who witnessed the storm reported that they saw a funnel-shaped cloud attending the vortex.

The extent and character of the wreckage leaves no doubt of the tornadic character of the storm, but the path was so narrow that the wreckage left showed only occasional evidence of the whirling motion of the air. Much of the damage indicated that the vortex was barely touching the earth, and that roofs were lifted or houses picked up and carried along in the direction of the storm movement and left scattered in confusion.

At the city office of the Weather Bureau about 2 or 3 miles southwest of where the storm struck, no special observation of the clouds was made near that time, but a thunderstorm attended by heavy rainfall and very thick dark clouds was in progress, the rain having begun at 7:50 a.m., or 15 minutes before the tornado occurred. The winds were not strong, the extreme gust being only about 22 miles per hour, but a well-defined shift from southeast to southwest and west occurred during the progress of the thunderstorm. Mr. C. E. Mahaffey, in charge of the Airport Station at Menefee Airport, about 3 to 4 miles east of the storm path, observed the thunderstorm cloud over the city at the time of his 8 a.m. observation, and describes it as being black in color and presenting the appearance of a squall-line front, but with a decided greenish cast underneath the black roll of the advancing squall. He did not observe the vortex cloud, but stated that it might have been obscured by falling rain. He stated that he turned on the wind velocity indicator and it registered a velocity of 60 miles per hour from the southeast at 8:05 a.m. as the storm approached from the west and southwest. The tornado was in progress at this time approximately 4 miles northwest of his station. This will indicate the violence of the rush of air inward and upward toward the vortex, which is

much stronger than the usual uprush in front of a thunder-squall in this section.

The barometers at the city office and airport station were but little affected. At the city office a very slight dip of probably 0.02 inch was noted on the barograph trace, followed by the usual rise characteristic of thunderstorms.

Other storms which have caused damage in appreciable amounts in New Orleans during the past 35 years were:

October 5, 1906.—A well-defined tornado of small size occurred in which 3 persons were killed and 21 injured. Damage, \$300,000.

October 23, 1913.—Severe thunderstorm; a few persons injured. Damage, \$10,000.

April 7, 1916.—Probably a tornado. Fifteen buildings damaged. Two persons killed and four others injured. (In Gentilly section.) No money estimate of damage.

May 2, 1923.—Severe thunderstorm. Several injured; many houses damaged, but no money estimate of damage. (Milenburg, West End, and Lake Shore.)

May 19, 1923.—Incipient tornado. No one injured. Damage \$25,000, principally in vicinity of Jahnecke Dry Docks, where buildings were damaged.

July 24, 1924.—Doubtful, probably small tornado. River boat *Climax* was capsized; steel sheds at Jackson Avenue and River were stripped of corrugated iron sides. Damage \$29,225; no deaths or injuries.

April 17, 1924.—Windsquall of almost tornadic force above Carrollton Avenue and between Oleander Street and Metairie Cemetery and in Jefferson Parish. Damage, \$100,000. Fifty persons injured. Numerous houses moved from their foundations and several wrecked. Terrific hailstorm, with stones 2 to 3 inches in diameter; 3 inches deep on ground in places.

February 22, 1926.—Severe local storm, uncertain as to tornado, occurred in vicinity of Salcedo and Bienville Streets. Several persons injured; damage, \$13,000.

May 16, 1930.—Severe local storm, near Royal and Piety Streets. Warehouse and other small houses damaged. No injuries.

RIME CAPS AND SNOW COCKS

Mr. R. L. Frost, Senior Observer, Weather Bureau office at Fairbanks, Alaska, has kindly sent to the Central Office a number of winter pictures. A few of these are here reproduced because of their general interest.

Figure 1*a* is the top of a ventilator pipe that had become capped with rime—granular ice incident to the solidification on contact of undercooled water droplets. The droplets in this case resulted from the chilling of the exit air to far below its dew point on mixing with the excessively cold (-50° F., or more) outer air.

Figures 1*b* and 1*c* are two views of a chimney top similarly capped with rime, as occurs at this low tem-

perature whatever the fuel used for heating. The fuel itself, if wood, as in the present case, oil or gas, adds a considerable amount of moisture to the chimney air which must increase the rate of growth of the cap. However, as the chimney also is a ventilator it caps, as stated, at excessively low temperatures, whether water is a product of the combustion of the fuel or not.

Figures 2*a*, 2*b*, and 2*c* are several views of snow cocks formed, each, of dry snow piled by shifting winds around a small isolated tree. Similar sand cocks, of like origin though seldom so beautifully symmetrical, often are seen in arid regions.—*Editor.*

SLEET AND ICE STORM IN TENNESSEE ON MARCH 19, 1934

By R. M. WILLIAMSON

[Weather Bureau office, Nashville, Tenn., Apr. 6, 1934]

A sleet and ice storm of unusual intensity occurred over central Tennessee on Monday, March 19, 1934. This was a feature of a rather strong cyclone centered about Atlanta, Ga., at 8 a.m. (eastern standard time) of the 19th, which moved east-northeastward and caused general precipitation along the wind-shift line and for some distance westward. An all-night sprinkle turned to rain and sleet at Nashville, Tenn., at 5 a.m. of the

19th. This combination continued until 3:30 p.m., and the rain until 6:30 p.m. The total amount of precipitation on the 19th was 1.27 inches. The temperature ranged from 31° at 2 a.m. to 27° at 2 p.m. and 32° at 8 p.m. (eastern standard time). The prevailing wind was north to 10 a.m. and northwest thereafter. The maximum wind velocity was 18 miles per hour from the northwest at 3:03 p.m.