



RECORD TORNADO YEAR—Map shows locations of the 133 tornadoes which hit the United States in a six-week period beginning April 29. Only 9 of the 42 days were tornado-free. Weather Bureau statistics show that 1953 may be a record tornado year.

METEOROLOGY

Tornado Predicting

Weather Bureau hopes to develop a more accurate tornado warning service from research project now using many volunteer observers to spot sudden pressure jumps.

► PRESENT TORNADO predicting methods were not good enough to give the residents of Worcester, Mass., any warning, but a new method is being worked out by the Weather Bureau which may one day catch such disasters before they strike.

The Bureau was able to give some warning in Ohio on the day before the Worcester disaster, but it was not able to catch the Flint, Mich., tornado.

Hopes of a more accurate tornado warning service lie in a research project now being carried out by the Bureau in the Midwest. More than 200 people are cooperating with the Bureau, without pay, in this effort to learn more about the cause of tornadoes and how to predict their beginnings and their paths.

Right now the best that the Bureau can do is to warn people in a large area, usually as large as a Midwestern state, that tornadoes might occur. If the research project is successful, the weathermen will be able to make "line" rather than area forecasts. If weather conditions are generally right for a tornado, hour by hour from west to east across the face of a state, they will be able

to give warnings that tornadoes might occur.

The forecast will depend upon the discovery, the measurement and the plotting on a map of sudden large jumps in atmospheric pressure. In an area from Kansas, Oklahoma and Nebraska west to the Continental Divide where a research network has been set up, it has been found that 83% of the tornadoes and 87% of all storms occurred when and where this big pressure jump was measured.

It is believed that this pressure jump is the triggering mechanism which sets off the tornadoes and other storms. Dr. Morris Tepper, Weather Bureau meteorologist in charge of the project, points out that, first there is needed warm, moist air from the Gulf of Mexico, topped with cool, dry air from the Pacific Ocean. Then the warm, moist air has to start rising until it reaches the saturation point. It is the pressure jump that lifts the warm, moist air. In the turbulence which results, the tornado is born.

To discover these pressure jumps, however, an extremely dense network is needed. In the research net, the microbarographs

that measure the air pressure and the citizens who read them are stationed only about 30 miles apart. This is about 15 times more dense than the regular network of weather observing stations.

Dr. Tepper and Dr. Harry Wexler, the bureau's director of Scientific Services, would like to see such a network spread over all the nation east of the Continental Divide. The instruments need not be manned, they explained. They would automatically send in information about any big, quick pressure jump to a central point, perhaps over the regular telephone wires. These reports could be correlated and lines drawn on a map, usually from about north to about south, indicating the line along which the jump is occurring, and how fast it is moving eastward.

Tornadoes occur in all states east of the Continental Divide, Dr. Wexler said. In 1952 only 10 states escaped tornadoes. Although there was none in Massachusetts in 1952, Connecticut and New Hampshire each had one. He recalled a long series of Michigan tornadoes in past years.

"One difference this year," he said, "seems to be that they are hitting more population centers."

The 267 tornadoes so far this year are pretty much of a record, according to Bureau figures. Average is only 149 over a 35-year period. Nevertheless, Weather Bureau men insist that the atom bomb explosions have nothing to do with the tornadoes. They point out that the atom bombs are like firecrackers when compared with the great power required to generate a storm of any kind. The forces that produce the tornadoes started over the Pacific Ocean and the Gulf of Mexico, they say.

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METEOROLOGY

Record Tornado Year In Making for 1953

► A RECORD YEAR for tornadoes is in the making, Weather Bureau statistics indicate. Already the nation has suffered 267 tornadoes, only three less than the total for all of 1952.

Only 9 out of 42 days in the six weeks ending June 9 lacked a tornado. There were 133 in the country in this period.

Between Jan. 1, 1916, and June 9 this year, 6,041 tornadoes occurred in the nation. These killed at least 8,603 people. This year's tornadoes have killed at least 400 people as compared with a total of 230 killed all last year.

Tornadoes have occurred in all states. However, they are rare west of the Continental Divide and in the Appalachian Mountains. They occur quite frequently in the Atlantic coastal lowlands.

The number of tornadoes observed has been generally rising from year to year as the Weather Bureau's reporting service has improved. However, this is only a small factor in the large increase in tornado statistics this year, the Bureau says.

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