

## METEOROLOGY

# Tornadoes Across U.S.

► THE AREAS where tornadoes are most likely to occur advance northwestward across the country as the year progresses, starting in the eastern Gulf states and reaching Iowa and Kansas in June.

In all the world there is no place more favorable for tornado formation than the relatively flat region lying east of the Rocky Mountains in the United States. The zone of highest frequency for tornadoes follows the seasonal trend of thunderstorms and hail.

Tornado formation requires the presence of layers of air of differing temperature, moisture and wind-flow patterns. Usually drier air rides above a moist layer. This condition occurs in the central part of the U.S., where comparatively dry air from the west or northwest often rides aloft over a moist current moving northward from the Gulf.

When this occurs, there are complicated energy transformations due to evaporation and condensation of moisture, from which come the deadly whirling funnel of the twister.

An individual tornado usually moves from southwest to northeast at speeds averaging 25 to 40 miles an hour. The average width of the path is between 300 and 400

yards for distances of 10 to 40 miles. The wind speeds in a tornado have never been measured directly by instruments exposed in the funnel because the instruments are invariably destroyed by the storm. However, careful studies of tornado damage have resulted in estimates of as high as 500 miles an hour for the wind speed.

Clouds associated with tornado occurrence are dark and heavy. From them the funnel-shaped "elephant's trunk" hangs down, often touching the ground to destroy all objects in its path.

However, the destruction is limited more to property than to people, since the Weather Bureau can often predict the time and general region where tornadoes are likely to form. It cannot predict the exact spot where twisters will strike, but rather specify an area where weather conditions indicate the most violent of all storms is likely to occur.

To help in making such predictions, a huge tornado warning network now blankets most of the U.S. This network is supplemented by observations from citizens who tell the nearest Weather Bureau office when they spot a tornado.

• Science News Letter, 83:191 March 23, 1963

## PUBLIC HEALTH

# Water Radiation Treated

► ATOMIC ENERGY is helping to make our polluted water supply clean and pure.

Ionizing radiation now speeds the sedimentation of waste particles from sewages and reduces the foaming suds caused by detergents in household water.

Throughout the nation today, the pollution of streams and rivers is far from being a sweet or pure problem. The waters of the Ohio River are used almost four times before they flow into the Mississippi. As this same river washes past Cincinnati, one quart in every four has passed through a kitchen sink, bathroom fixture, factory or mine dump. Below Denver, the South Platte at low water is four-fifths polluted from sewage.

Now scientists at Unidynamics of the Universal Match Corporation here are cleaning up sewage water by exposing it to ionizing radiation. By altering the electrical charge of sewage particles, radiation settles the sewage particles faster than usual methods, and removes many that would normally not settle.

The controlled radiant energy, similar to X-rays, flows from a 2,000 curie radioactive isotope, cobalt-60.

Separation of organic waste material from water in the city sewage is particularly complicated because much of this material is in the form of suspensoids—tiny particles of organic matter, such as vegetable oil, that are so small they remain suspended in water for long periods of time. Held apart

from each other by electrical charges on their surfaces, they do not coagulate and sink like larger particles.

When sewage water is treated with the ionizing radiation, this electrical charge is altered and the particles settle without leaving any trace of radioactivity, stated Hal R. Spragg, manager of Unidynamics' Bio-Sciences Laboratories which are under the sponsorship of the division of isotope development of the Atomic Energy Commission.

Today's municipal water plants treat sewage primarily by sedimentation methods that remove only about 40% to 70% of this waste matter. The rest has to be destroyed by chemical or biological methods that are often costly.

Last year, American housewives used more than three billion pounds of detergents. In locations where these detergents cannot be adequately washed away, they sometimes return to the kitchen from the tap, where water foams like beer poured in a glass.

These problem suds are diminished and even eliminated by the irradiation process, scientists found. The radiating energy causes a chemical change, resulting in the molecular decomposition and degradation of the detergent that eliminates the foaming.

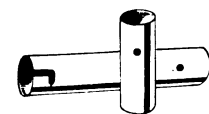
Irradiation could also aid in decreasing or eliminating disease-carrying viruses and bacteria from America's waterways, scientists believe.

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