METEOROLOGY

# Slow Hurricane By Seeding

➤ THE ERRATIC COURSE of Hurricane Ginny has accentuated the need for man to learn if these mighty forces of winds can be controlled.

Although Ginny was too near the coast to be tampered with, scientists are deeply involved in experiments of dropping iodide crystals into suitable hurricane storms, trying to decrease the high speeds of the winds.

During the August passage of Beulah, second hurricane of the season, scientists dropped silver iodide crystals near the storm center to change the heat balance in the cloud wall of the hurricane's eye.

This process of sprinkling clouds with crystals is called seeding.

Complete analysis of the two seeding experiments on Aug. 23 and 24 will take several months, stated meteorologists R. H. Simpson of the U.S. Weather Bureau in Washington, D. C., and Dr. J. S. Malkus of the University of California, Los Angeles.

Scientists hope to upset the balance of forces in the hurricane's supercooled water using the reaction of hundreds of pounds of iodide crystals to cause an outward migration of the cloud wall and thus increase the radius at which the inflowing air is ascending. This should decrease the wind speed, the meteorologists reported in Science, 142:498, 1963.

Silver iodide generators were dropped into Beulah from 35,000 feet in a radial path 15 to 35 miles from the storm center. This produced a vertical "sheet" of silver iodide more than 20,000 feet in depth.

Measurements from ten aircraft showed that with seeding, the eye wall appeared to degenerate and reform at an increased radius, and clouds underwent changes. But, the scientists noted that many hurricanes undergo naturally the dynamic changes observed in Beulah, without human interference.

• Science News Letter, 84:292 Nov. 9, 1963

## Questions

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GENERAL SCIENCE—What is the so-called Argus effect? p. 293.

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PSYCHOLOGY—What effect does solitary confinement have on rats? p. 297.

PUBLIC HEALTH—What compound in house paint causes "pink disease?" p. 296.

TECHNOLOGY—How is cereal-zinc xanthate made? p. 292.

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PHYSICS

# Electronic 'Seeing Eye'

**See Front Cover**

➤ SCIENTISTS can now map, in the finest detail, areas no larger than a period, about one-thousandth of a square inch in area, on the surfaces of tiny electronic devices. It is done with an electronic "seeing eye" called a scanning electron microscope at the Westinghouse Research Laboratories at Pittsburgh, Pa.

The basic concept of the scanning electron microscope originated at Cambridge University in England. The Westinghouse instrument is the first successful one in the United States. It was developed by O. C. Wells, T. E. Everhart and R. K. Matta of the Laboratories' information devices department, who are shown (left to right) on this week's front covering examining the instrument.

The resolution of the scanning electron microscope and depth of focus, which give clarity and detail to the picture it produces, are better than can be achieved with the best optical microscope. In addition, the pictures give basic information on the electrical performance of the electronic devices.

Like a conventional electron microscope, the scanning variety "sees" with a beam of electrons. However, instead of taking a single snapshot of an area, the instrument scans the surface by repeatedly sweeping the electron beam across it, building up a picture as it goes. A second beam, moving in unison with the first, displays the picture on a television picture tube similar to that in an ordinary home television receiver.

The scanning electron microscope needs only about 15-millionths of a square inch of area to yield its extremely detailed pictures. Prime use of the Westinghouse instrument has been to study the surface structure (topology) of molecular electronic devices and other microelectronic structures and surfaces.

However, because of its unique construction, this microscope also gives equally detailed pictures of the electric fields on the surface of such devices.

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TECHNOLOGY

## Strong Insulation Boards Made of Cereal Grain

➤ A CEREAL PRODUCT is being added to wood pulp to produce insulation boards that are stronger and lighter than commercial boards.

Scientists have now made an insoluble cereal derivative called zinc xanthate from ground wheat or some other grain.

When this derivative is added to wood pulp, the resulting board can be up to two and a half times as strong as commercial boards of similar density, stated Dr. T. R. Naffziger of the Northern utilization research laboratory, Peoria, Ill., at the Technical Association of the Pulp and Paper Industry meeting.

The cereal-zinc xanthate is made by combining starch, flour, ground wheat or other grain with carbon disulfide and an alkali. The resulting soluble cereal xanthate is reacted with a zinc salt such as zinc chloride to form an insoluble cereal-zinc xanthate.

Both of these reactions are what chemists call cross-linking operations. It is the cross-linking of the soluble xanthate in the presence of pulp that causes high retention of this cereal derivative in the pulp product.

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