



**HALO OF ICE**—A cloud of ice crystals was formed within two or three seconds after the upper stages of the second Saturn rocket were exploded as planned, releasing 95 tons of water ballast.

## SPACE

## Successful Saturn Shot

► THE SECOND Saturn C-1 rocket, launched April 25, was deliberately exploded 65 miles high in the atmosphere and released 95 tons of water ballast as an experiment.

The purpose of the experiment, called Project High Water, was to find what effect this large amount of water had at this altitude.

National Aeronautics and Space Administration scientists hope to find the chemical and physical properties of water at that altitude. A cloud of ice crystals was formed from the water and dispersed to a diameter of eight to ten miles.

The shot of the second Saturn C-1 (of a series of ten) was virtually identical to that of the first Saturn, launched Oct. 27, 1961. Both developed 1,300,000 pounds of thrust.

The main purpose of the new flight was to test further the propulsion system of the booster being developed for the manned moon flight effort. The booster, or first stage, was powered by eight H-1 engines each capable of 165,000 pounds of thrust.

The fifth Saturn rocket to be flown, and all thereafter, will have engines capable of producing 188,000 pounds of thrust. This will give the Saturn booster a total thrust of 1,500,000 pounds.

The second Saturn was, like its sister vehicle, SA-1, 162 feet high. It weighed 927,000 pounds at the time of launch, 620,000 pounds of this being propellant burning at more than 5,000 pounds a sec-

ond. The upper stages of the Saturn vehicle were ballasted with the water originally carried to give the weight of "live" rocket stages. The Saturn booster reached a maximum speed of about 3,750 miles per hour before engine cutoff.

Since sound is of considerable concern in large rocket development, a total of 50 measurements of acoustics, vibration and blast were made on the launch. Sound pressure levels measured at the first Saturn test agreed with what had been expected.

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## PALYNOLOGY

### Pollens Rise and Fall By Heating and Cooling

► "WHAT CAUSES ASTHMA or hay fever?"

"Dampness causes mine," a patient answered.

"What do you do for relief?"

"I start a steam kettle going."

This paradox is not as silly as it seems, two pollen experts reported at the International Conference on Palynology in Tucson, Ariz. Heating and cooling of the earth and air cause particles such as pollen and grains to rise or fall with the clouds or haze layers.

This same simple mechanism, called lapse rate, increases or decreases attacks of asthma when the grains fall nearer the earth's surface or are drawn high in the atmosphere

by ballooning air currents.

Drs. Herman A. Heise and Eugenia R. Heise, American College of Allergy and the Aerospace Medical Association, studied the atmosphere by private airplane up to 20,000 feet, counting the pollen grains and mold spores at various levels. The changing distributions of these allergens pointed to the answer behind the remedy.

During warm days, air at the earth's surface surges upward through the cooler air, carrying pollen and causing instability. At night, in clear weather, conditions are reversed. Upward currents cease and the particles settle.

The haze layer actually drifts earthward carrying the particles with it. Conditions affecting fallout are at their worst when the haze layer becomes ground fog.

A steaming kettle will again cause upward, unstable currents which will cause pollen to rise and spread out away from this updraft. The relief is gained on the same principle of lapse rate.

This fallout can be avoided by staying in the warmer city rather than the cooler country, the scientists reported.

Rain effectively removes many of the grains carried aloft, Dr. James E. McDonald of the University of Arizona reported at the same conference.

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## GENERAL SCIENCE

### Million Science Projects Shown in Science Fairs

► A MILLION young science students in America's secondary schools did science projects and showed them in science fairs that culminated in this year's National Science Fair-International held in Seattle, May 2-5.

Each of the finalist exhibits from 208 regional fairs on display in a great hall next to the World's Fair display represented approximately 2,500 projects at the grass-roots level.

In five years the number of science fair projects done in the nation has quadrupled, since the 1957 figure was 250,000. In the same period the number of regional fairs has risen from 122 to 208 and the exhibits at the national event from 231 to 287.

The fair directors in various parts of the nation report attendance figures that show over 3,000,000 parents, students and public saw the science fairs that led up to the display at Seattle. About 1,500,000 people viewed the student projects at the 208 regional fairs, at which approximately 75,000 exhibits competed. In five years the exhibits at the regional fairs have about doubled.

The National Science Fair-International, now 13 years old, had this year United States representation from fairs in 45 states, including Hawaii and Alaska, as well as Puerto Rico, and foreign participation from fairs in Canada, Germany and Japan.

The National Science Fair-International is an activity of SCIENCE SERVICE, Washington, D. C. A Science Fair Council, representative of the cooperating regional science fairs, assists in the management of this youth activity.

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