

## GENERAL SCIENCE

# Winners' Science Projects

Studies of seven of the 40 top winners in the Science Talent Search show interests in the biology and chemistry of the sea, genetics and the composition of planets.

► TWO 17-YEAR-OLD scientists have gone far beyond the usual interest in the sea. They have concentrated their interests on different seas and different aspects of the seas. Their interests have won them spots in the coveted group of 40 winners in the Science Talent Search, conducted by SCIENCE SERVICE.

Joan Simpson, a North Quincy High School senior who lives in Squantum, Mass., has followed an interest in diatoms, one-celled algae, which are found in the sea. Industry has found uses for diatomaceous earth deposits for such things as insulating materials, backing for furnace walls, and as an absorbent in the manufacture of explosives; but Joan was more interested in biological aspects.

She found that marine life feeding near the bottom of Quincy Bay was quite likely to have diatoms in their diets. Knowing that diatoms are important to our enjoyment of shrimp, flounder or swordfish, Joan now is attempting to explore possibilities of mass culture of diatoms for fish hatcheries.

Joan is well on her way to becoming a marine biologist. She plans to study biology at Radcliffe, specializing in marine biology in graduate school.

## Measures Radioactive Wastes

Meanwhile, on the West Coast, Peter Kauffman of Ballard High School in Seattle has been concerned with measuring radioactive wastes in sea water in an effort to safeguard marine life.

Chromium-51, a radioactive element, reaches the sea from river water used to cool nuclear reactors. The necessity of monitoring the concentrations of chromium-51 led Peter to develop a method of utilizing insoluble chromate salts, particularly barium chromate, to oxidize the chromium-51.

So far, by using varying volumes of sea water test samples with chromium-51 added, Peter has obtained nearly 100% recovery of the chromium-51 from the sea water.

Peter plans to teach college chemistry after studying at Princeton.

Joan and Peter will have the opportunity of discussing their work with 38 other student winners when they go to Washington to attend the Science Talent Institute, Feb. 27 through March 4. The winners will compete for \$34,250 in Westinghouse Science Scholarships and Awards.

Inherited characteristics primarily concern Bernice Chang, 17, of Honolulu; Bruce Leslie, 15, of Brooklyn, and Arthur Shapiro, 17, of Philadelphia.

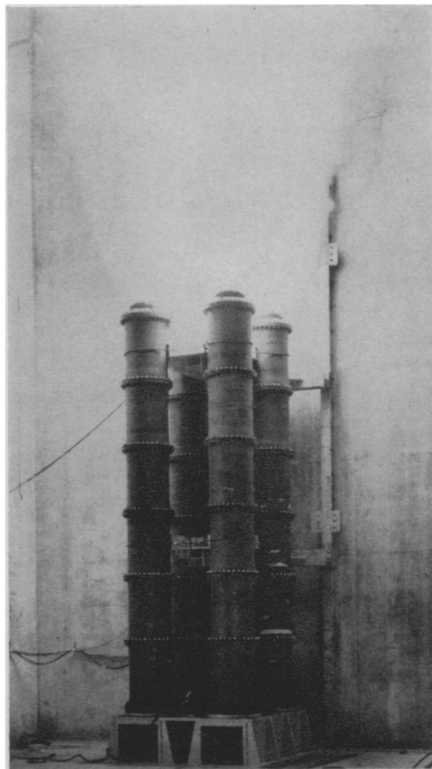
Prior research had shown that the ability to taste phenylthiourea, or PTC, might be inherited, and was modified by sex, age

and ethnic background, and that three out of ten Caucasoids do not taste PTC.

What better place to test these findings than Hawaii, a ready-made laboratory of ethnic backgrounds! Bernice administered taste tests to more than 700 students and found that sex and ethnic background were not significant variables in the ability to taste PTC, and that the percentage of non-tasters generally assigned to Caucasoids is too high.

Bernice plans to study genetics at either the University of Hawaii or the University of California, Berkeley.

Bruce Leslie, the youngest of the 40 Science Talent Search Winners, is studying the structure of a gene. He employed a small bacterial virus (coliphage T2), and used a method described as mapping to define details of its hereditary material.



United Technology Center

**SOLID CLUSTER FIRING**—In the first successful U.S. test firing of a cluster of segmented propellant booster rockets carried out by the United Technology Center for the U.S. Air Force, these four six-segment "barrels" of solid rocket motors produced 140,000 pounds of thrust for 14 seconds.

In this method, defects in genetic material of the virus are used as a tool to determine the physical length of the gene, and to split the gene into two functional units.

As might be expected, Bruce plans a microbiology career after studying at Columbia or Harvard.

The great variations of color and pattern in sulphur butterflies led Arthur Shapiro to study the genetic and environmental influences responsible for this variation.

He established that part of the variation is caused by exposure of the immature insects to cold, but that most of the interesting varieties are due to inheritance through a great variety of genetic situations.

Arthur plans to study at the University of Pennsylvania, beginning with liberal arts and later concentrating on biology.

## Observes Atmosphere of Jupiter

Two 18-year-old high school seniors, Richard Lee Falwell of Bethesda, Md., who attends Phillips Exeter Academy in Exeter, N.H., and Gary Wegner of Bothell High School, Bothell, Wash., have been awarded trips to the nation's capital as a result of their interest in astronomy.

Richard studied the shadings, belts and clouds he saw in the atmospheres of Jupiter and Saturn through a telescope of his own making. He found the most active of these markings were the clouds, which were constantly changing in color, intensity, shape and position. He found the clouds had different life-spans on different parts of the planets and the cooler clouds last longer.

Richard has been observing the planets since 1958, and has made more than 500 pages of sketches of his observations.

Gary says "the planets hold the secrets of their origin. It remains for us to find them." This he has attempted to do in the past six years with various telescopes, by studying the markings of the planets for possible clues to their formation. Gary says two common forces appear important in determining the evolution of a planet. These are tidal distortion by other bodies and the amount of internal heat generated from contraction.

Gary has reached no overall conclusion, but has established definite trends he believes will eventually play an important part in deciphering the secrets of the solar system's origin.

Both Richard and Gary plan astronomy careers. Richard plans to study at Harvard while Gary will enter either California Institute of Technology or the University of Washington.

Richard was a National Science Fair-International first award winner and Gary's science teacher considers that Gary is one of the authorities on planetary observations in the Pacific Northwest.

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