

## GENERAL SCIENCE

# STS Winners' Research

**Final 40 competitors for the Westinghouse Science Scholarships will demonstrate their independent scientific projects in Washington. They vie for \$11,000 in scholarships.**

► **FORTY HIGH** school seniors, possibly tomorrow's leaders in the world of science, will meet in Washington on March 1, 1956, for five days during which they will take part in the Science Talent Institute. (See SNL, Feb. 4, p. 69.)

They will bring with them exhibits demonstrating their scientific projects which helped win them a place among the top 40 in the country-wide competition.

They will compete for \$11,000 in Westinghouse Science Scholarships. Here are descriptions of a few of the projects that helped win them the trip:

## Iron and Nickel Alloys

► **PUZZLED** by an unexpected drop in the electric current of an induction furnace, a senior student in the Eugene High School, Eugene, Ore., embarked on an ambitious research problem.

The student is 17-year-old Daniel Ch'en, son of Prof. and Mrs. S. Y. Ch'en of the University of Oregon. The research program helped Daniel become a finalist in the Fifteenth Science Talent Search.

Seeking expert help in his study of metals in the electric furnace, Daniel learned he had found the phenomenon of the Curie point. At this point iron and nickel change their magnetic quality.

He noted that these points for the two metals differ by more than 400 degrees Centigrade, and made a series of alloys of the two metals. To his surprise, the mixture containing between 70% and 80% iron was found to have a Curie point far out of line with other alloys of the metals.

Daniel is proceeding with his research, and devising an improved type of induction furnace to melt new alloys. He plans to go to the California Institute of Technology, then combine teaching with research in nuclear physics.

## Unusual Telescope Lens

► **PATIENT PERSISTENCE** has enabled Dennis Lee Johnson, 17-year-old senior student at Phillips Exeter Academy, Exeter, N. H., to construct an astronomical camera with which he can photograph an unusually large field of stars.

Using the newest development in telescope lens design, Dennis ground both the large mirror and also the special non-spherical lens required for his Schmidt-type camera. Such a design calls for much more work than the usual Newtonian tele-

scope constructed by amateurs.

Dennis is the son of Mr. and Mrs. Wilbur L. Johnson of Canoga Park, Calif.

## Fossil Weeds Studied

► **LOWLY WEEDS** today, known as horsetails or scouring rushes, were lofty forest trees when the coal deposits were formed.

Their fossil remains, called calamites by geologists, interest a 17-year-old senior at the Mason High School, Mason, Mich., who shows exhibits of them in his own museum of natural history.

He has found his specimens in local stone quarries, in formations of the Michigan Coal Basin.

Descriptions of the fossils helped Robert Lynn Carroll, son of Mr. and Mrs. John Carroll, win a trip to Washington as a Science Talent Search contestant.

## Chinese Puzzle Solved

► **A COMBINATION** of interests ranging from the newest in mechanical brains to ancient Chinese puzzle lore gave a girl in the senior class of Bayley Ellard High School, Madison, N. J., the inspiration for a science project in electricity.

The project helped her win a place among the 40 finalists in the Science Talent Search. She is Rosemary Patricia Och, 17, the daughter of Mr. and Mrs. Henry G. Och. Mr. Och is a military development engineer.

Rosemary devised a new wrinkle in mechanical brains, building one operated by electrical relay circuits that can solve the puzzle of removing five rings from a bobbin when the rings are joined together in a complicated way. Quickest solution of the puzzle takes 21 moves. Her machine solves it in less than 20 seconds, without error. A human competitor requires as many minutes, and is apt to make time-consuming mistakes.

## Phosphorescence in Salt

► **STUDIES** of the phosphorescent light given off by ordinary salt and its chemical relatives, known under the general name of alkali halides, formed the research project that helped 18-year-old Dwight Thomas Hoxie of Navarre Rural Station, Wayzata, Minn., to place among winners in the Fifteenth Annual Science Talent Search.

After developing his own methods for timing duration of the phosphorescence, Dwight studied quantum theory to learn how to account for conditions inside the salt crystal producing the light.

Dwight is the son of Mr. D. T. Hoxie. He is a member of the graduating class in the Mound Consolidated High School at Mound, Minn. His mother is Mrs. Leo G. Barnard. Dwight expects to attend the University of Chicago, where he plans to specialize in nuclear and theoretical physics.

## Sounds From Nowhere

► **REVERSING** the usual technique of recording sounds as wavy lines on photographic film, a science-minded senior in the Los Angeles High School does the opposite.

He first traces wavy lines on film and then produces sounds never heard before. He finds pure tones come from very carefully constructed curves, while other waves are reproduced as noise. The young science student is Peter Roland Rony, 17, son of Mr. and Mrs. George Rony.

Among practical uses for his wave-recording device, Peter sees the possibility of helping deaf people study sound and thus improve their speech.

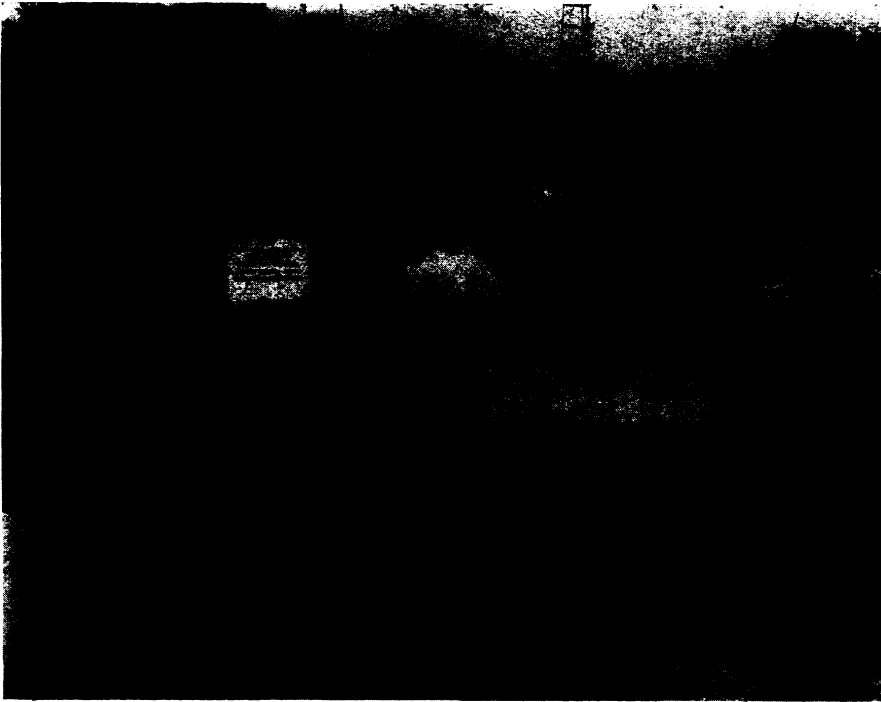
On the lighter side, perhaps to help his father, who is a film director, Peter suggests artificially created sound to represent the speech of the "Martians." Noting that "our gallant space explorers" will be sure to encounter such creatures in future movies, Peter says their producers could edit the sound pattern of a normal human voice by his method of recording "to such a degree that the outer space beings could be endowed with speech that is understandable, yet not human."

## Cancer Research

► **POSSIBILITY** that immunity to cancer might be induced in mice by proper surgical treatment stimulated a high school girl in Brooklyn, N. Y., to try the experiment after reading about similar research performed by adult scientists.

Fifteen-year-old Susan Elizabeth Zimet is a senior at the Midwood High School. Although she has by no means solved the problem, which puzzles more experienced scientists, she has won the respect of her teachers for the competent way she tackles the research. She has also won a place among the 40 contestants for Westinghouse Science Talent Search and will be coming to Washington on March 1 to compete with them for top honors.

Susan, who is the daughter of Mr. and Mrs. Sidney Zimet, hopes to enter Radcliffe College next fall.



**HURRICANE-DAMAGE PROTECTION**—*This wave-testing machine, believed to be the largest in the world, is expected to aid in devising possible methods of protecting coastal areas from hurricane damage. Waves are created by a vertical bulkhead 20 feet high in a concrete tank 635 feet long, 15 feet wide and 20 feet deep, built by the Beach Erosion Board of the Army Corps of Engineers.*

In line with her research project, one of her choices for a career is medicine, but another is engineering. In college she wants to study theoretical and applied physics and take all the mathematics courses available.

## Oil Traps in Rocks

➤ A STUDY of how geologic structure can form a trap for migrating underground oil has helped a Shelby High School senior, Shelby, Mont., place among winners of the Fifteenth Annual Science Talent Search.

Leroy Edward Hood, 17-year-old son of Mr. and Mrs. Thomas E. Hood, made the geology study as part of a summer trip with geologists in the Beartooth Mountains last summer.

## New Kind of Cheese

➤ ALTHOUGH she lives in a state noted for cheese making, Ida Louise Riendl, 17, senior in Columbus High School, Marshfield, Wis., had never been inside a cheese factory until interest in bacteriology led her to build kitchen-size working models of cheese-making equipment.

Her bacteria studies are self-directed, and her interests have led her to collect an extensive library on the subject. This project has helped Ida Louise, daughter of Mr. and Mrs. Aloys Riendl, place among the 40 finalists.

Seven kinds of commercial cheese have been made successfully by Ida Louise in her project, cultivating the proper kinds of molds and bacteria to give the recognized qualities of flavor and texture.

She then developed a new variety that she describes as "a soft cheese with the characteristic green, somewhat mottled streaks of commercial mold cheese, but with a pronounced sweetened flavor entirely different from other cheese of its kind."

## TV Interference

➤ IN AREAS where TV "noise" blurs the picture, an automatic device that smooths black flecks or "snow" into a medium gray closer to the scene's background would be welcomed by the viewer.

A high school boy in Tahoe City, Calif., thought so, and has set about designing a gadget to give TV watchers this boon.

The boy is 17-year-old Gary Bertel Anderson, son of Mr. Bertel A. Anderson, a building contractor, and Mrs. Anderson. He will graduate this year from the Tahoe Truckee High School.

Gary's idea for improving television reception was submitted as his research report, part of the requirements for completing his entry in the Science Talent Search. In his device, voltage detector circuits find the values of the video signal immediately preceding and following the

"noise" signal that another noise detecting circuit has spotted and eliminated. It averages them and inserts this average in place of the unwanted disturbance.

"Since the wave segment forming circuits cannot gain enough information to construct an exact duplicate of the original wave which was displaced by the noise," Gary explained, "it constructs a wave which is an average of those immediately preceding and following the noise pulse."

## Student's War Game

➤ A WAR GAME that, unlike chess, takes advantage of the terrain over which the armies must proceed as in modern mechanized warfare, has been devised by a 16-year-old senior at Forest Hills High School, Forest Hills, N. Y.

The mathematics of games led to the development of this pastime by Martin Gary Groder, son of Mr. and Mrs. William Groder of Flushing, N. Y.

Development of the game, which offers players a choice of 12 kinds of countryside, built up of colored plastic, to fight over, started with a board on which globules of mercury were used as playing pieces. They were later replaced by more conventional counters. Gains and losses are scored by principles of modern logistics.

## Ear Bones of Fish

➤ FOSSIL EAR BONES of fish found in rocks in America and England, and recent ones saved by cooperative British fishmongers, gave a teen-age University High School scientist in Minneapolis, Minn., his subject for research.

When he learned that paired bones in the head of fish not only tell the kind of fish but give a record of the fish's age, John Howland Campbell, son of Dr. and Mrs. Berry Campbell, began his collection. Dr. Campbell is professor of anatomy at the University of Minnesota.

Photographs 17-year-old John took with polarized light show the growth rings, somewhat like the rings in the trunk of a tree, which are added yearly to the tiny ear bones. These he dissected from unusual fish heads market men saved for him two years ago, when he was spending a year in London.

He collected 250 pairs of otoliths, as the fish ear bones are called, and identified 17 different species. Fossil otoliths he found in England and in America form another part of his collection.

Wishing to take photographs to show the delicate structure of the tiny bones, John devised a way to make light shine through but not around the specimens, by making a polarized light background out of a pair of 3-D movie glasses.

The young scientist also worked out a formula correlating sizes of the otoliths with length of the fish heads from snout to gill. Since he had only the heads, he needed such a check on the size.