GENERAL SCIENCE

# STS Winners Study Nature

**Physics and chemistry are also represented among the projects of those who will attend the Science Talent Institute as most talented 40 in nation-wide search.**

➤ HIGH-SCHOOL scientists who may be leaders in tomorrow's world of science will meet in Washington, D. C., March 1 through 5 for the Tenth Annual Science Talent Institute. They will bring with them the results of their favorite hobbies and pet projects for an evening of getting acquainted with each other's achievements before an audience of several thousand invited guests.

### Confused Flour Beetle Studied

➤ WHAT makes a confused flour beetle act like a skunk? Finding the answer to that question has been the scientific project of 16-year-old Rhea Mendoza, who goes to Forest Hills High School, Forest Hills, N. Y., and who is among the top 40 in the Tenth Annual Science Talent Search.

The confused flour beetle is called that not because it is especially confused itself but because man confuses this pest with another flour beetle, the rust-red. It gives off a gaseous compound which it secretes from glands.

Miss Mendoza wanted to find out what stimuli make the beetle let go with its smell, whether it ever got used to the stimuli and what effect this gaseous compound had on the larvae of this beetle.

She found that merely prodding the insect caused it to produce the odoriferous compound. Other stimuli, such as heat or electricity, didn't work. In addition, Miss Mendoza discovered that the confused beetle did not get used to the prodding, but continued to give off its smell when prodding was repeated.

Miss Mendoza had read that if larvae were subjected to the gaseous compound, they would grow up deformed. In the course of her experiments with this idea she discovered what she believes to be a new way of subjecting larvae to the gas. Methods described in science textbooks were too complicated for her.

She merely put larvae and adult insects in a closed container and shook it. When the adults were thrown against the sides they emitted the gas and the larvae were bathed in it. Now she is developing the exposed larvae to see what happens.

Miss Mendoza wants to be a research biologist.

### Constructs Cyclotron

➤ A 17-year-old scientist in Kenmore, N. Y. constructed an atom-smashing cyclotron. The young man, Robert E. Simpson, a senior at Kenmore Senior High School, built this complicated research instrument from engineering details found in scientific journals and with the personal advice of the cyclotron's inventor, Dr. Ernest O. Lawrence.

Mr. Simpson wrote Dr. Lawrence, at the University of California, after he had all the engineering details except a half dozen items which were not clear from the technical journals he studied. He sent his plans to Dr. Lawrence with his questions.

The famed physicist answered Mr. Simpson's questions and commented: "Looking your plans over, I certainly want to congratulate you as it seems to me that your plans are very good."

The cyclotron has many parts. The magnet alone consists of more than 3,000 pieces, which Mr. Simpson "stacked" himself, a physically hard and dirty job. There are 16,000 feet of wire in the coils, wound by hand.

The cyclotron will be used at Mr. Simpson's school for teaching and demonstration purposse. Also Mr. Simpson plans to expose fruit flies and other laboratory animals to the gamma rays or radioactive isotopes he produces so that he can continue his research.

Mr. Simpson is an Eagle Scout and wants to become a nuclear physicist.

### Purer Water for Paper

➤ DUPLICATING the water purification process of a paper mill in Cloquet, Minn., and trying to find ways of doing it better was the project of 16-year-old David C. Larson. The mill uses 6,000,000 gallons of water every day from a river which drains a swamp area, and it has to be made pure and color-free before it can be used in manufacturing paper.

Mr. Larson succeeded in repeating, on a small scale, the complicated chemical process by which the paper manufacturers do this. He then went on with other chemical materials to see if he could do it better.

Mr. Larson considered not only the chemical reactions involved, but also the practical aspects of handling such large amounts of water.

The young senior, who ranks number one in his high school class, hopes to be a research chemist.

### Flight of Insects Studied

➤ ANOTHER step toward fulfillment of the dream of man to fly as efficiently as the insects may well have been taken by 17-year-old James J. Cowan III of Maryville, Tenn. Following the example of Leonardo Da Vinci and more modern aeronautical students, he has constructed what he considers to be a new arrangement for observation of the flight of insects.

Mr. Cowan, a senior at Maryville High School, concludes from his study of approximately 50 insects that "if an airplane of reasonable size could be constructed to utilize practically the wing motion of insects, it would be able to hover and fly rapidly, and do both with a low consumption of power—a fact which remains to be accomplished today."

Mr. Cowan, who wants to be an aeronautical engineer, photographed his insects—horse flies, bumble bees and wasps—with a small camera and a triggered strob-flash. The insects were held in position with modeling clay.

With this arrangement, he discovered that the wing paths took the form of a figure eight. In this way, he said, the angle of attack of the wing was in a lifting position at all times.

### Kitchen Becomes Laboratory

➤ COOKING for her family from the time she was nine years old led to top honors for Patricia Cummisford. The 16-year-old Arlington Heights Township High School

***FUR SUBSTITUTE — This shiny imitation wolf pelt is made from nylon. For parkas it has the advantage that it is moisture resistant; frost crystals from the wearer's breath can be easily brushed off. Inspecting the synthetic wolf are Brig. Gen. Fred R. Dent, Jr., chief of the AMC Engineering Division, and Donald B. Huxley, chief of the Aero Medical Laboratory Clothing Branch. The nylon fur will soon replace wolf fur on USAF Arctic clothing.*** ***(See Page 118).***