

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 purposes. 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 con-

siders 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 strobe-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).

senior of Arlington Heights, Ill., took over the kitchen duties when her mother died seven years ago.

She soon became interested in the changes undergone by various kinds of food in the cooking processes and she began to figure them out chemically.

In one series of experiments, Miss Cummisford studied the actions of various kinds of leavening agents, yeast, baking soda and baking powder. She found that a double action type of baking powder, starch and baking soda with an acid constituent consisting of a combination sulfate-phosphate, was quite satisfactory for cooking because only a portion of the carbon dioxide was liberated at room temperature. Thus, cookies could be stored in the refrigerator before baking.

She is also studying sugar and starch cookery, egg cookery, and colloidal dispersions (foams and emulsions).

Miss Cummisford plans to continue study in the field of science as related to food and perhaps some day, she says, "I will be a scientist working in one of the many laboratories throughout the world—working for the betterment of mankind."

For Better TV Reception

► EXPERIMENTS which point the way to better television reception have been per-

formed by 17-year-old Dana R. Spencer, a potential physicist.

A senior at the Arlington Senior High School, Arlington, Mass., Mr. Spencer thought of applying the theory of diffraction—the bending of light, sound and water waves around obstacles—to the electromagnetic waves used in radio and television.

Television waves travel in a straight line and therefore cannot go through a hill. However, if there is diffraction in television waves, Mr. Spencer figured, like the diffraction in light waves, some advantage might be taken of this fact in improving television reception.

Mr. Spencer first experimented with light waves. He set up a pinpoint light source, focused it on a screen, placed an obstacle in its way and photographed the result. The diffraction could be clearly seen and measured in the photographs.

The young scientist then transferred his experiments to the roof of his house. He used about 20 feet of wire netting as his obstacle and then took a series of readings of the strength of the signal of a local television station.

Mr. Spencer concluded that more experiments with several extraneous factors better controlled needed to be done before his theory about television wave diffraction could be either proved or disproved.

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GENERAL SCIENCE

Draft Control Planned

Two organizations being set up to handle deferment of college students and scientists. One is advisory committee for Selective Service, other in manpower office.

► A RACE is on between Selective Service Director Lewis B. Hershey and Mobilization Director Charles E. Wilson's new manpower policy committee for control of draftable college students and scientists.

The manpower committee's new director, President Arthur S. Flemming of Ohio Wesleyan University, is still an innocent bystander, but it will probably be one of the first problems he has to take up.

General Hershey is preparing to set up an advisory committee to Selective Service which would plan now for the selection of the 75,000 students to be deferred to enter college next fall. This committee would also advise General Hershey on deferring young scientists in vital industries.

At the same time, the National Security Resources Board's manpower office is preparing an executive order creating a National Scientific Personnel Board under Dr. Flemming. This board would have the same duties General Hershey wants his committee to perform.

The new draft bill, recently reported out by the Senate Preparedness Subcommittee, calls for a five-man Presidential Commission to select those who would be per-

mitted to go to college on a competitive basis.

The idea of the National Scientific Personnel Board comes from the so-called Thomas report, written by a committee headed by Executive Vice-President Charles Allen Thomas of the Monsanto Chemical Company. It is expected that the Thomas Committee—the Scientific Manpower Advisory Committee—will move from N.S.R.B. to the new Flemming manpower office as soon as it is operating.

All hands are agreed that, if any deferments for college training are to be made under the new draft law, plans for an orderly selection of the students should be made as soon as possible.

The proposed law provides, in addition to a method of selection, that the Presidential Commission shall consist of three men from one political party and two from the other, that the students shall wear distinguishing insignia, and that financial assistance shall be given to those students who could not otherwise afford to go to college.

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TECHNOLOGY

Artificial Fur Made For Soldiers' Clothes

► ARTIFICIAL fur, suitable for use in Arctic clothing of men in the armed services, is in experimental use at the Wright-Patterson Air Force Base. Two types are in use. One is to replace wolf fur, the other is a substitute for mouton from sheep. Both are inexpensive.

The principal use of these furs in the Air Force is in trimming and lining parka hoods, flight jackets and caps for Arctic operations. Strips of wolf fur, used because its long, smooth-fibered guard hairs enable frost formed by breathing to be easily knocked off, is a satisfactory material. But wolf fur is no longer available in sufficient quantities.

The new synthetic wolf fur, still in an experimental stage, is made of nylon fiber on a backing of knit cotton coated with rubber. As nylon is a poor conductor of heat, the parka wearer's face stays warm. As it does not absorb moisture readily, frost is easy to brush off.

Since sheep are scarce too, the Air Force is experimenting with synthetic mouton made from a blend of two synthetic textile fibers, Dynel and Vicara. Like artificial wolf fur, this synthetic mouton will prove much cheaper than the real material. It will be used for collar trimming on flight jackets and hoods.

Both products rival their natural counterparts in luster, softness, quality and wearability. They are easy to work with and, unlike natural furs which must be sewed together, can be cut in any desired shape or form. These synthetic furs are made by the George W. Borg Corporation, Delavan, Wis.

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INVENTION

Television Viewers May Receive Scents

► TELEVISION viewers will receive "appropriate scents" along with the picture and sound by means of a system which brought Emery I. Stern, Jackson Heights, N. Y., patent 2,540,144.

The device will "automatically release predetermined scents at predetermined phases of the action," he states. The odors will not come through the air from the transmitter station but will be released from containers at the receiver by light signals accompanying the radio waves.

Substances to provide various odors are added to a harmless gas and put in containers at the television receivers. The light signals sent from the broadcast station will be of different frequencies, each frequency attuned to release the gas and odor from a particular container. The pressure of the gas will disperse the scent through the room.

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