

## GENERAL SCIENCE

# Research of STS Winners

Independent scientific work of high excellence done by final competitors for Westinghouse Science Scholarships coming to Washington for the Science Talent Institute.

➤ **HIGH SCHOOL** scientists who may be leaders in tomorrow's world of science will meet in Washington on Feb. 26 for the five-day Twelfth Annual Science Talent Institute. They will bring with them exhibits they have made demonstrating projects in their particular field of research.

The young scientists who will participate in the Science Talent Institute will compete for \$11,000 in Westinghouse Science Scholarships. The scholarships range in value from the grand prize of \$2,800 to \$100.

## Bird Population Declines

➤ **SURVIVAL OF** the starling and the sparrow at the expense of such birds as the myrtle warbler, the chickadee and the goldfinch may be one result of civilization.

This is the conclusion of 17-year-old Kenneth Jeremy Harte, senior at Scarsdale High School, N. Y., who made a survey of the effects of suburban development on bird population.

By taking bird censuses for two successive years in the months of November and December, when bird migration is at the minimum, in regions where suburban building operations were going on, the young naturalist finds that a marked decrease in bird life results from the construction of houses for man—"the dominant animal."

By planting trees and shrubs and putting out feeding stations, Mr. Harte believes the residents of the suburbs can coax back many of the birds, although some species are too wary ever to return when their natural habitat has been destroyed. When no provision is made for encouraging them, loss of bird life in the neighborhood is immediately noticeable, according to Mr. Harte's count, but he finds that many birds will accept a handout from congenial human neighbors.

## Wind Instruments

➤ **TONES FROM** the flute, the oboe, the clarinet, the bassoon, the trumpet and the French horn recorded their autographs for John Charles Reynolds, 17-year-old senior at the Glenbard Township High School, Glen Ellyn, Ill. He put his oscilloscope through its paces to demonstrate the four main uses of this instrument.

Sounding your A on a musical instrument gives rise to a basic tone plus overtones that determine the tonal color of the instrument. These waves were produced on Mr. Reynolds' oscilloscope, then photographed so that he could compare them.

Other uses of the instrument studied by the young scientist include the demonstration of "beat" patterns when two tones of slightly different frequencies are heard together, determination of frequency and phase relationships of pairs of waves, and timing measurements of sound and its echoes.

Combining his present interest in music with his enthusiasm for electronic devices, Mr. Reynolds expects to go on with his scientific study of sound during his college career. He hopes eventually to become an engineer.

## Turbojet Engine

➤ **BICYCLE WHEEL** hubs and a stove-pipe, along with other more complicated things went into the construction of a turbojet engine by Harry Joseph Cassidy, 18, of the Painted Post High School, Painted Post, N. Y.

The axial-flow turbojet engine is powered by a mixture of air, thrust into the motor by a fan and compressed by stainless steel rotor blades, and propane gas. The mixture, when in combustion, comes out the rear with a powerful thrust. He achieves tem-

peratures of 1500 degrees Fahrenheit in his combustion chamber.

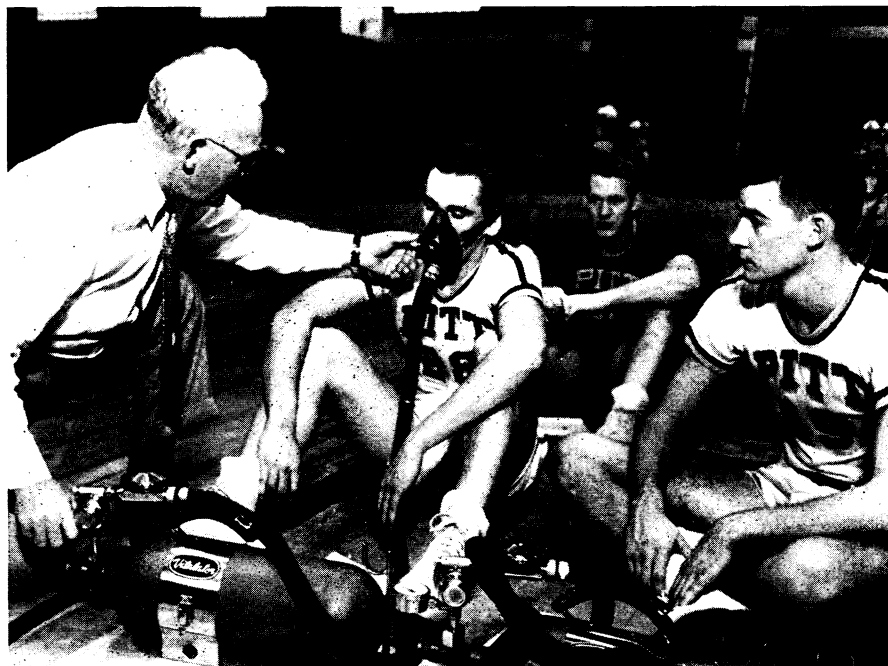
Construction of the engine was marked by at least two failures, from both of which Mr. Cassidy learned lessons. He analyzed what was wrong and either reconstructed parts or provided a different fuel. At one point he added a water cooling and lubricating system to keep the bearings in the bicycle wheel hubs from burning. Combustion chambers were made of ceramic entirely from his own design by a glass works.

## Rhinoceros Bones Found

➤ **BONES OF** a small rhinoceros from the banks of the John Day river in Oregon were discovered by Jack Albert Wolfe, 16, a high school senior of Portland, Ore.

Mr. Wolfe has already begun as a hobby the researches in paleontology which he hopes to make his life's work. During last summer's vacation from the Franklin High School, Portland, he joined a party with similar interests on a camping trip to the Clarno Formation in the north central part of the state. In addition to his finds of the scarce remains of the prehistoric rhinoceros, Mr. Wolfe collected and described specimens of the 50 species of plants found at this site.

By correspondence with scientists in other parts of the country and in England, Mr. Wolfe has attempted to give a more exact date to the time at which these fossilized plants grew. He has attempted to relate the early rhinoceros to others of its kind, whose bones occur in the Rocky Mountains and in China.



**OXYGEN DURING REST PERIODS**—Tests at the University of Pittsburgh have shown that oxygen given to athletes during rest periods helps them to recover more quickly from fatigue. (See p. 119.)

## Measure Radioactivity

► EXPERIMENTS WITH photographic methods of measuring radioactivity in uranium ores and in minerals of unknown composition formed the scientific project of 17-year-old Virgil Everett Barnes, Jr., senior at Austin High School, Tex.

Grinding up his rock samples, the young scientist used them, along with samples of known radioactivity obtained from the Atomic Energy Commission, to make exposures on special photographic emulsions made for nuclear studies. He rigged a toy motor to stir the developing solution during the seven hours necessary to develop these scientific pictures of the radioactive rays given off by the rocks.

Improvements in handling the powdered rock samples suggested themselves to Mr. Barnes in the course of his experiments, and he is now carrying on his plans for better chemical separation of the radioactive material from the ores. He expects to continue his college research in pure physics.

## Mouse Bone Formation

► THE FORMATION of bones in unborn mice was studied by Robert Avery Shore, 16, who began his study of mice embryos at the Jackson Memorial Laboratory in Bar Harbor, Me., during summer vacation from Midwood High School, Brooklyn, N. Y.

In order to carry out his study, he had to devise special techniques for a Caesarean operation so he could deliver the premature mice while keeping the mothers alive for other studies. This specialized operation, he says, was completely of his own devising.

He divided the embryos into two groups for the study of the two successive processes of bone formation. These are, first, the formation of cartilage, and then, from the cartilage, the formation of the mouse skeleton.

He now has two parallel series of embryos representing the two stages from the age of 14 and one-half days after conception to birth. It was possible for him to observe the different rates of development of bone in different parts of the body.

## Radio Background Noise

► ELIMINATION OF background noise in very high frequency radio receivers was the aim of 18-year-old Dennis Richard Clark, University High School senior, Los Angeles.

One of the limiting factors in very high frequency receiving equipment, he points out, is the noise produced by the first one or two tubes of the receiver.

He conducted experiments with several specialized tube types and circuits to see how well they would perform under actual conditions. The noise was measured with each of the experimental circuits.

The young electronics expert discovered ways of modifying the circuit so as to achieve the least noise possible with his

equipment. He also found that antenna noise is a considerable factor which has to be taken into account.

He concluded that the choice of tubes is seemingly more important than the circuits in which they are used. The tubes, he said, should be triodes because they have low inherent noise. Mr. Clark's low noise receiving equipment, he said, will be used in further experiments with distant stations.

## Soil Analyzed

► ANALYZING THE soil in a farming township in Indiana with the hope of getting better yields was the project accomplished by a 16-year-old girl who came here recently from Germany.

She is Barbara Erika Hopf, University High School, Bloomington, Ind., who states: "Living in southern Bavaria, Germany, for a good part of my life, I have been used to the conservation and extreme patience taken by the mountain farmer with his little plot of poor, rocky ground. Yet many hill farmers of southern Indiana, planting corn year after year, get discouraged with poor yields, let their soil erode and finally abandon their farms."

She believes that there should be a better understanding of the material Indiana farmers work with: the soil. She took soil samples, chosen according to vegetative covering and topographic location. About 125 samples were collected and analyzed. Miss Hopf was able to map the concentration and location of organic matter, of calcium and other factors.

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## MEDICINE

# Worst of Flu Over

► THE WORST is over so far as the current influenza epidemic is concerned, even though latest reports (Jan. 31-Feb. 7) show an increase in 'flu-pneumonia deaths.

Some communities, particularly on the Pacific Coast and in New England, may have localized outbreaks for a short time to come, but that is all that can be seen from reports—and lack of them—to the U. S. Public Health Service.

The first hint that the epidemic was coming (see SNL, Jan. 17, p. 35) came from reports of outbreaks two and three weeks earlier in Army installations. Now the Army, Navy and Air Force all report that influenza is declining in nearly all military establishments.

The epidemic among civilians seems to be following the same course, with perhaps a two-week lag. Reports from six state health officers, South Carolina, Arkansas, Colorado, Louisiana, Montana and Kansas, state either that the disease has reached its peak or that no increase in cases has occurred.

Considered equally significant is the dearth of reports from middle western

## METEOROLOGY

# Inversion Blankets North Pacific Ocean

► INVERSION, THE blanket of warm air aloft that causes Los Angeles' famous smog, also extends over much of the eastern North Pacific Ocean and influences the weather as far west as Hawaii.

Dr. Morris Neiburger, University of California at Los Angeles meteorologist, has just completed analysis of all available upper air meteorological data for the area, including that gathered in recent Scripps Institution of Oceanography cruises.

The study, which was supported by the Office of Naval Research, has shown how the height and intensity of the layer determine weather typical of particular regions in the large area.

A layer in which the temperature increases with height is called an inversion because it was regarded as a reversal of the normal condition. However, over subtropical oceans the inversion is normal, particularly during the summer season when it is present every day.

Along the coast the inversion is low, with only a shallow layer of cool, moist air below, thus causing fog or low stratus clouds.

The inversion becomes progressively higher farther west. Clouds of greater vertical extent (cumulus) occur, and still farther west become thick enough for occasional showers. The occurrence and intensity of rain in the Hawaiian Islands is partly dependent upon the inversion being raised above its normal position there.

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states. The assumption is that no reports mean the disease is no longer a problem and the epidemic is waning.

The part played by influenza vaccine in checking the epidemic is hard to determine. It is unlikely to have accounted for the decline of cases in military establishments since vaccination of service personnel in this country was largely limited to those at ports of embarkation.

Vaccination of civilians by private physicians probably was not done in time to have much effect. It takes the vaccine at least two weeks to give immunity and the epidemic developed so rapidly that it is doubtful whether many persons got any vaccine two weeks before the 'flu hit their communities.

Hope of preventing influenza completely by vaccination, enthusiastically suggested in some quarters, would depend on everyone getting vaccinated every year, because the protection from the vaccine lasts only about a year. It seems unlikely that an entire population would keep on being vaccinated every year to avoid the chance of an attack.

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