

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 stovepipe, 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

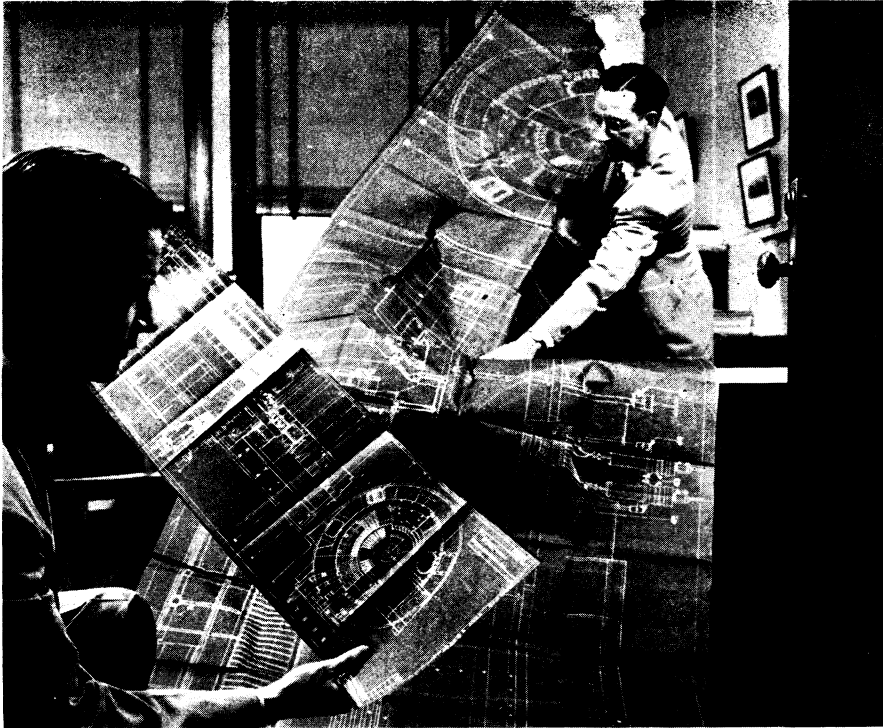
➤ **BONES OF** a small rhinoceros from the banks of the John Day river in Oregon were discovered by Jack Albert Wolfe, 16, a high school senior of Portland, Ore.

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.)



SPACE- AND TIME-SAVER—Although both of these drawings tell the same story, use of streamlined drafting represented in the smaller blueprint is being encouraged.

PHYSICS

Exact Ozone Measurement

► CHANGES IN the amount of ozone in our atmosphere during the past 50 years are now being charted by William Hoover, astrophysicist at the Smithsonian Institution, Washington.

Accurate records of the amount of the sun's visible light received at high points around the globe have been kept for a 50-year period, and scientists are now going back over these old records to find variations in the amount of green and yellow light received.

This will give an accurate measurement of the amount of ozone in the atmosphere, since the ozone layer in the atmosphere stops about three percent of the yellow-green light coming from the sun.

This ozone layer, a sheet of deadly poisonous gas high above the earth, makes possible all life on earth by this absorption. Ozone, a three-atom-molecule oxygen, is the stuff one smells near an electrical discharge of any sort, such as lightning.

The ozone layer occupies a region between about 15 and 30 miles above the earth's surface. If this deadly gas were brought down to the surface at room temperature, it would make a sheet only about one-tenth of an inch thick.

A rip in this tissue-thin sheet, however, would have deadly consequences for living

things, for the ozone layer absorbs three bands of radiation from the sun. Most important, it shields the earth from the invisible ultraviolet rays, absorbing a great part of the sun's radiation with wavelengths shorter than 3,450 angstrom units. An angstrom unit is four billionths of an inch.

A limited amount of ultraviolet light is essential to keep the earth healthy. It kills germs, but if very much more penetrated the atmosphere it would kill about everything else as well.

The ozone layer also stops some yellow-green radiation, and it is the 50-year record of variations in this light that Smithsonian scientists are now using to trace changes in the ozone layer. No particular significance was attached to the variations at the time they were recorded.

Besides ultraviolet and some yellow-green radiation coming to the earth, the ozone layer stops some infrared, or heat radiation, coming from the earth itself. It may thus be a minor factor in keeping up the planet's temperature.

In general, Mr. Hoover states, the ozone layer is thick in spring and thin in autumn, thin over the equator and thick over the two poles.

Science News Letter, February 21, 1953

ENGINEERING

Blueprint Curlicues Go As Draftsmen Get Scarce

► "IF YOU can make it clear with one line, forget the fancy curlicues," draftsmen are being told these days at the General Electric Company, Schenectady, N. Y.

"Remember our slogan: 'A superfluous line is a waste of time.' In the light of the skilled manpower shortage, we can't afford to waste a minute. Knock out the non-essentials, and don't be afraid to throw in a little judicious free-hand work."

These revolutionary instructions to the shirt-sleeved men behind drawing boards produced immediate results. One blueprint formerly 57 square feet in area shriveled to four square feet. Nothing was sacrificed except extra views and lines that were not needed. The time needed to draw it dwindled from eight days to two.

Science News Letter, February 21, 1953

PHYSIOLOGY

Athletes Get Oxygen During Rest Periods

► ATHLETES AT the University of Pittsburgh, Pa., get oxygen during rest periods. The idea is not to "supercharge" them but to help them recover more quickly from fatigue. (See p. 117.)

As evidence of the help given by the oxygen, Dr. H. C. Carlson, director of student health at the University, reports the following results of tests he performed with members of the Pitt basketball squad:

Average pulse rate of group that breathed oxygen increased 45.4% compared to an increase of 73.9% in the group that breathed air. Average respiration rate of the oxygen group increased only 91.4% compared with 106% for the air breathers.

The oxygen was supplied through a mask attached to a compact, portable unit called the Vitalator, consisting of a refillable 40-cubic-foot oxygen cylinder mounted in a light frame with handle. It is made by Mine Safety Appliance Company, Pittsburgh.

Science News Letter, February 21, 1953

ELECTRONICS

Electronic "Brain" To Work Problems

► GUIDED-MISSILE PROBLEMS as well as brain twisters involving aircraft design and ballistics soon will be solved for the U. S. Air Force by an electronic calculator that can "remember" 10,000 ten-digit numbers.

The machine uses 1,400 electronic tubes and 7,000 germanium diodes. It is scheduled for "early shipment" to the Wright Air Development Center, Dayton, Ohio, from the General Electric Co. at Syracuse, N. Y., where final tests now are being run.

Science News Letter, February 21, 1953