GENERAL SCIENCE

Discovers Rock Faults

Other Talent Search winners study nutrition, mountains, fish, color perception and armament for supersonic aircraft. Plan careers in science.

➤ DISCOVERY of two rock faults not recorded in geological surveys of his home county was accomplished by 16-year-old John M. Dennison, a young Keyser High School senior who wants to become a geologist. He was one of the top 40 winners in the Tenth Annual Science Talent Search.

Mr. Dennison made a thorough geological survey of Mineral County. He collected samples of all the different kinds of rocks to be found in the county—69 in all—and determined to which geologic series and periods they could be assigned.

The two faults which Mr. Dennison discovered are along the north branch of the Potamac River, just outside of Keyser, W. Va. He discovered these during his explorations of over 100 miles in the county, mostly by foot and bicycle.

Mr. Dennison used the rocks he collected to construct a geologic column. In a glass column some 32 inches high he made a model of 12,000 feet of rock strata of his home county.

The young scientist also explored and mapped four caves in the county, but, he says, there are several more that have been called to his attention. In addition, he has made a collection of about 50 fossil types from the middle and lower Devonian rocks of the county.

Mr. Dennison will take his geologic column to Washington on March 1, when he and the 39 other winners will gather for the five-day Tenth Annual Science Talent Institute.

Dog Foods Fed to Rats

The price label on a can of dog food makes little difference to a rat. Sixteen-year-old Derrell L. Chambers drew this conclusion when he fed ten different brands of dog food to ten rats of the same litter.

The rat which gained the most weight received one of the cheapest dog foods—9½ cents a can, and the second best food was also the most expensive—15 cents. An 11th rat of the litter was fed a variety of mixed fresh foods and came out in second place, just above the rat with the most expensive diet.

Mr. Chambers is a senior at Paso Robles, Calif., High School. He wants to become the curator of a zoo when he finishes his education.

His 11 rats came from a male and female which he purchased. He kept the young rats in individual cages and fed them identical amounts of food and water.

The young scientist also concluded that the list of ingredients printed on the can labels made little difference in how his rats grew. The rat which ate the food with the longest list of ingredients came out sixth best, while the winner had only wheat bran added to the basic ingredients common to all brands.

All foods, he found, produced growth and varied only in the amount of growth. There was no evidence in eyes, nostrils or fur of any major deficiency.

Climbs Highest Mountain

Climbing the highest mountain in the United States, Mount Whitney, as well as several others above 14,000 feet, has been only part of the field work 17-year-old Carol L. DeDecker of Independence, Calif., has done in her study of the geology of the area in which she lives.

She has travelled over the Sierras, one of the highest and wildest areas in the nation, in order to find out about the geological history of that section.

The young scientist, who would like to do research work in geology when she completes her education, described the effects of glaciers on the area she covered by foot. The Whitney area, she found, appears to be near the southern limit of glaciation.

Miss DeDecker has spent the last eight summers in the high country of the Sierra Nevada.

At first glance, she said, the Sierra appears to be a jumbled mass of steep canyons and jagged pinnacles. A definite pattern, the old topography now carved glacially, becomes apparent only after prolonged acquaintance and views from many angles.

Miss DeDecker, a senior at the Owens Valley High School, has found that her mountain trips have been educational in all of the natural sciences. She calls it a small beginning in a field which she is seriously considering as her major in college.

Pipefish Habits Studied

A young scientist fisherman claims to have set a record for the largest northern pipefish ever caught and, like all good fish stories, this one has a photograph to prove the fisherman's contention.

The fisherman is 17-year-old James B. Stewart, who has made a detailed study of the northern pipefish and its habits. The pipefish, long thin things related to the seahorse, are characterized by their covering of bony plates and their snouts. He found his specimens in Long Island Sound.

The ones Mr. Stewart caught averaged about three inches in length. However, he caught one which measured ten and a half inches. The Harrison, N. Y., High School senior claims that this is about an inch longer than the greatest authenticated length he has been able to find in the records.

Mr. Stewart caught his fish lurking at the surface of bays in clumps of Irish moss or floating eel grass. He found this to be very effective camouflage for the pipefish. They need this because the fish are clumsy and not very fast when alarmed. Their method of escape, he said, was to attempt a wiggling rush, not unlike an eel, but even then it was easy to catch them in his hand.

The young scientist wants to be an engineer.

Colors That Aren't There

Study of black and white tops, which, when spun, seem to produce colors, has convinced 17-year-old Paul L. Sieffert that the colors don't really exist. Mr. Sieffert is a senior at North Catholic High School, Pittsburgh, Pa.

The young scientist, who wants to be an aerodynamicist, said that his experiments showed that the colors one sees when the tops are spun exist only subjectively, that is in the mind of the viewer.

He first made a large number of disks with different patterns and proportions of black and white. He found that he could get the same supposed color with different amounts of black and white and different colors with the same proportions of black and white merely by changing the speed of rotation of the disks.

Taking his disks which produced color—which they did at moderate speeds—he increased the speed. This did not change the colors produced, but did move the bands of various colors outwards toward the rims of the disks. He found in these experiments that the color was subjective: not actually there.

Mr. Sieffert turned a stroboscopic light on his whirling disks. Thus he was able to regulate the light so he could see the color in one half of the disk and how the black and white patterns seemed to the eye to be overlapping on the other half.

He concluded that eye fatigue produced the color sensation, and believes that further experiments, including color photographs, should support this conclusion.

Rockets for Supersonic Planes

A new armament system for supersonic aircraft, designed by 17-year-old Conrad V. Chester, Roslyn Heights, N. Y., will have an edge over present systems in range, power and versatility, its designer claims.

The system consists of rockets, which he designed himself, and a radar-controlled automatic firing device.

The young scientist, who is a senior at Roslyn High School, claims that a direct hit by one of his missiles would knock down a bomber. It is comparable, he says, to a 4-inch strato-gun shell, and a plane armed in this manner would be a flying anti-aircraft battery without the terrific weight of conventional anti-aircraft weapons.

Mr. Chester admits drawbacks to his system. The missiles, he says, are expensive, heavy and hard to handle. The loading system he has designed is complicated and, he adds, the whole thing will require a heavier combat aircraft than now exists. He suggests something like a B-47.

The young scientist, who would like to become a chemical engineer, designed an automatic firing system because, he said, supersonic speeds do not give the pilot enough time to aim and fire manually. He designed the casing, propellant, warhead and loader of the rocket after much computation and experimentation.

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For other descriptions of work of STS winners, See SNL, Feb. 24.

ENGINEERING

House of Molasses

➤ A HOUSE of molasses is not just one man's dream—such a house has actually been built with a molasses driveway leading up to it.

Dehydrated molasses is the basic ingredient in the new building material. Heavy residual oil acts as the catalyst to turn it into a plastic, reports George W. Rappleyea, its inventor.

Mixed with clay and sand, a strong plastic adobe building brick is produced. Combined with clay, pulp or fiber, it creates a durable facing material that can be sprayed on. The basic product, of molasses and heavy oil, is good for paving streets and roads, playgrounds, tennis courts and landing strips.

First step in the production of Plas-mo-falt, as Mr. Rappleyea has dubbed this new molasses plastic, is to completely dehydrate the molasses. First the blackstrap molasses is forced by a high pressure pump through an atomizer into a drying chamber. Here within a few seconds the molasses particles surrender their moisture to form small grains of dried molasses.

This dehydrated molasses is suitable for cattle feed, but is also the basis of a durable building material.

A building of this plastic adobe brick costs only one-third to one-half as much as a similar edifice of ceramic brick, claims Mr. Rappleyea. The brick insulates against both heat and sound, is fireproof, insect proof and can be painted or plastered.

A liquid form of this material can be applied with a spray gun under pressure for four cents a square foot, the inventor figures. An attractive Spanish-type home using this material can be built for as little as $150 a room, exclusive of plumbing and electrical costs.

Much of the material for these building blocks can be secured locally, thus keeping the cost to a minimum. Sand and clay are usually readily available. If an oil field is near, crude oil right from the producing wells can be mixed with the dehydrated molasses. For buildings on distant islands, heavy fuel oil from the ship's bunker fuel oil tanks can be employed.

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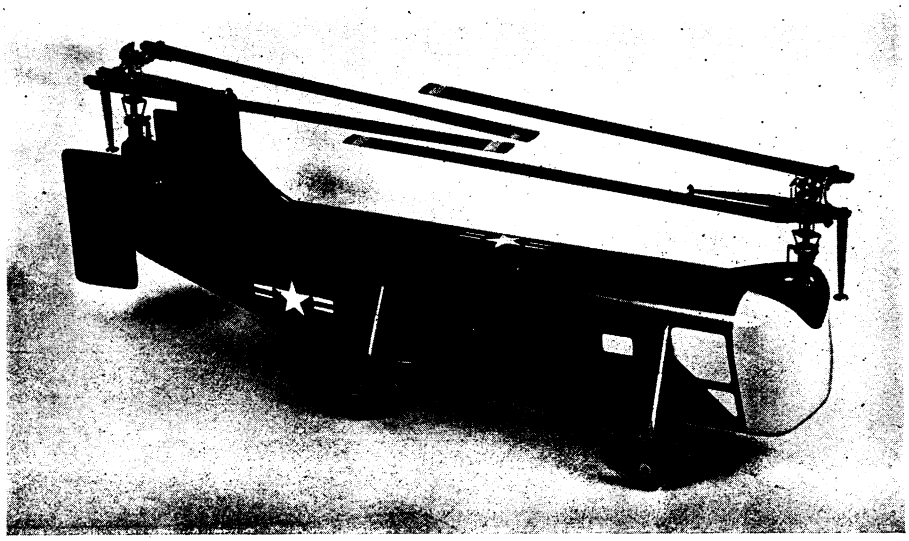

TANDEM-ROTORED—This unconventionally designed helicopter has its rotors folded so as to occupy less space on the deck of a carrier. This is an artist's conception of how the new helicopter will look.

HORTICULTURE

Predict Picking Date For Fruit Crops

➤ FORECASTING the ripening date of fruit crops such as apricots, prunes and pears is getting to be almost as accurate as predicting an eclipse.

Apricot picking time, for example, can be forecast with certainty within four days, using a mathematical formula, states Reid Brooks, of the University of California Agricultural Experiment Station.

During a 17-year period, all predicted apricot maturity dates were spotted within four days. Almost equally successful have been forecasts of prune and pear ripening dates.

By knowing in advance the approximate date of crop maturity, the fruit grower can plan to share his labor and make other necessary preparations for harvest well ahead of time, Mr. Brooks pointed out.

The mathematical formula is based on the number of heat units the trees have accumulated within the first six weeks after full bloom. A heat unit is one degree Fahrenheit per day above a given base temperature of 45 degrees.

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AERONAUTICS

New Helicopter Has Two Rotors in Tandem

➤ THREE helicopters of the tandem-rotored type are under construction by the Bell Aircraft Corporation. They are designed particularly for anti-submarine warfare and are being built for the U. S. Navy.

The more familiar helicopter has but one set of rotating propeller blades to provide both lift and forward motion. However, two-rotored helicopters are in use, and even three-rotored craft have been developed. This tandem-rotored helicopter marks Bell's first departure from the single rotor type.

The Bell Aircraft Corporation was awarded this contract after winning a Navy anti-submarine helicopter competition last summer. The rotors of the Bell craft are at forward and rear ends of an elongated body. They are interconnected and power is supplied by a Pratt and Whitney R-2800 engine.

In the new helicopter, basic Bell rotor system principles are incorporated, particularly the rigid two-bladed rotors and an automatic stabilizing device. Rotor blades can be folded to a position over the body to aid in the transportation of the aircraft on an aircraft carrier or other type of vessel.

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