

AERONAUTICS

Convertiplane Unveiled

Cross between helicopter and conventional plane has two wingtip propellers that provide lift for take-off and thrust for forward flight.

See Front Cover

► A PLANE designed to take off like a helicopter and fly like a conventional plane, unveiled at Fort Worth, Texas, is the second in a series of three revolutionary "convertiplanes" being perfected for the Army.

The unique feature of the XV-3, developed by Bell Aircraft Corp., is its two large wing-tip propellers that perform the double function of lifting the plane from the ground vertically and pulling it to high speeds in level flight.

An earlier convertiplane, the XV-1, developed by McDonnell Aircraft Corp. in St. Louis and shown last February, has a large stationary helicopter rotor above the fuselage powered by small jet units at the tip of each blade. Another small "pusher" propeller mounted between the double tail assembly gives thrust for level flight. This model is now undergoing flight tests.

In the Bell XV-3 convertiplane, shown on the front cover of this week's SCIENCE NEWS LETTER, the props are mounted on streamlined knobs at the end of the craft's relatively short wings. These triple-bladed rotors spin horizontally on take-off, landing, low speed and hovering maneuvers, but tilt forward about 90 degrees for conventional flight at over 175 miles per hour. The plane is scheduled for flight tests in the spring. It should be able to operate out of rough, confined areas like the helicopter but have the additional advantage of longer range and far greater speed.

The props on the XV-3 will convert from rotor to propeller attitude in a gradual operation that takes 10 to 15 seconds. The transition will be smooth, without loss of altitude, and the change could be accomplished while the craft is in a steady climb. During the switch the load is transferred from the rotors to the wings.

The plane is 30 feet long and 13 feet high with a 30-foot wingspan. The props are powered by a single Pratt and Whitney engine behind the cockpit. A ski assembly is used as the landing gear.

The new model will carry four on reconnaissance missions, or a pilot, a medical attendant and litter space for two in evacuation and rescue operations.

The third company which was awarded a joint Army-Air Force contract in 1951 to develop a variation of the convertiplane principle is the Sikorsky Aircraft Division in Bridgeport, Conn. This model has not been completed. Its designs employ a new approach that is a military secret.

Commercially, convertiplanes are expected to make air transportation available to al-

most every city in the world, including those which cannot support an airport. It is expected, also, that convertiplanes might eventually find large scale use in short inter-city flights.

Science News Letter, February 19, 1955

ASTRONOMY

Gray Clouds, Flares Suggest Mars Volcanoes

► ORIGIN OF strange gray clouds billowing from the planet Mars and bright points of light on the Martian surface remain a mystery.

Sun-dogs in reverse might explain the intense flares, Dr. Dean B. McLaughlin of the University of Michigan has suggested in transmitting to *Sky and Telescope* (Feb.) observations of these strange events by Japanese scientists. Reflection of sunlight from ice crystals in the Martian atmosphere might cause the sun-dogs in reverse.

The ash-colored clouds seen in January and March, 1950, and in February and April, 1952, might result from volcanic activity, Tsuneo Saheki of Osaka Planetarium, Japan, reported. The brilliant flares were spotted in 1937, 1951 and 1954, he said.

Dr. McLaughlin (see SNL, July 3, 1954, p. 11) proposed that dark features of Mars may be wind-blown drifts of ash coming from volcanoes, not vegetation as has often been proposed. This would mean that conditions on Mars might correspond to an early stage in the earth's development, one in which oceans have yet to form and life to appear.

Science News Letter, February 19, 1955

ENTOMOLOGY

Half Young, Half Aged Insects Are Produced

► INSECTS THAT are half young and half aged have been produced by using carbon monoxide and beams of light in experiments being conducted to find out how humans grow and age.

Almost any part of an insect can now be made to grow and age, while the rest of the insect remains young, Dr. Howard A. Schneiderman of the zoology department at Cornell University in Ithaca, N. Y., found.

"If scientists could learn how growth is turned on and off," Dr. Schneiderman explained, "they would understand abnormal or malignant growth and aging."

In his investigations, the New York scien-

tist is using hundreds of giant *Cecropia* silkworms. Prof. Schneiderman pointed out that the chemical machinery responsible for cell growth of all organisms is fundamentally the same. He illustrated this by showing that many of the chemical processes underlying cell growth in potatoes, peas and oats are the same as in silkworms.

"Silkworms and most other insects," he reported, "produce two important hormones, a growth hormone and a juvenile hormone. The growth hormone causes the cells of the insect to increase in size and number, and the juvenile hormone prevents these cells from aging."

Dr. Schneiderman has been able to put growing insects or plants into a state of suspended animation with carbon monoxide. The poisonous effects of this gas were prevented by exposing the organisms to bright light.

In this manner, and by directing the light to a specific part of the insect, Dr. Schneiderman produced half young, half aged insects.

Within the past year, he stated, German scientists have succeeded in isolating the growth hormone and extracting 1/500th of an ounce of the hormone from two and a half tons of silkworms. Discovery of how these hormones operate, Prof. Schneiderman added, would mean a great step forward in understanding growth and aging.

The Cornell scientist has also found that silkworms in "diapause" or suspended animation are highly resistant to excessive oxygen as well as to damage caused by X-rays. A diapausing silkworm pupa, for example, withstands 100 times as much X-ray radiation as a human being.

Prof. Schneiderman received a five-year grant from the National Institutes of Health to continue his investigation of cell growth and aging.

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MEDICINE

By-Product May Be Better Than Aspirin

► DISCOVERY OF a new aspirin type of drug that is more effective and less toxic than aspirin is announced by a team of scientists from the British government's Chemical Research Laboratory, Teddington, and Allen and Hanburys, Ltd., in *Nature* (Jan. 29).

The drug has the long chemical name of 4-hydroxyisophthalic acid. It is a by-product in the manufacture of salicylic acid, which is a close relative of aspirin. It is found in the "brown dust" residues left in a purifying process used in salicylic acid manufacture.

Tests in rabbits and rats showed that it was less toxic than aspirin, and more effective in counteracting pain and fevers. Trials on human patients are now being made.

The studies were made by Allen and Hanburys scientists G. B. Chesher, H. O. J. Collier, F. A. Robinson and E. P. Taylor; and S. E. Hunt, J. Idris Jones and A. S. Lindsey of the Chemical Research Laboratory.

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