

GEOPHYSICS

Launch Sub-Satellites

Aluminum-coated plastic objects that inflate automatically after ejection will be hurled from third rocket booster that takes satellites into earth-circling orbits.

► SOME of the earth satellites that will be fired hundreds of miles high as a part of the research programs of the International Geophysical Year will carry "sub-satellites."

The sub-satellite will be made from aluminum coated plastic, and will be automatically inflated after it has been ejected from the third rocket booster that sends the satellite itself to its maximum altitude.

William J. O'Sullivan, Jr., aeronautical research scientist at the Langley Aeronautical Laboratory of the National Advisory Committee for Aeronautics, is credited with having conceived the novel manner of construction.

The sub-satellite will be inflated to a diameter of 20 inches, the same as the satellite itself. Including the necessary inflation gear and container, the sub-satellite will weigh only 10-1/2 ounces. Larger sub-satellites that would be visible to the human eye may be built for later use.

A sub-satellite will be especially valuable in measurement of the density of air in the extreme outer limits of the earth's atmosphere and in determining the satellite's drag. The information which will be obtained by visual and radar observation from the ground, will be of great interest because of its bearing on the design of future satellite vehicles, long-range, rocket-boosted hypersonic gliders, and intercontinental ballistic missiles, Mr. O'Sullivan said.

The basic material of the sub-satellite is the plastic Mylar, with an extremely thin coating of metallic aluminum. Mr. O'Sullivan said that the thickness of the plastic material (25 ten-thousandths of an inch) even after the application of aluminum (6 ten-thousandths of an inch) is about the same as that of the foil used to wrap chocolate bars. By itself, the sub-satellite will weigh less than one-quarter of a pound.

The IGY satellites will be fired sky-ward by multi-stage rockets, then released to orbit around the earth. The sub-satellite will be ejected immediately after the satellite is released from the final rocket booster.

If it were possible for a man to be watching, it would look as if a wad of tinfoil had been tossed out. A very small pressure capsule, filled with hydrogen, will be triggered to inflate the sub-satellite to precisely the desired degree.

Mr. O'Sullivan said design and construction of the inflation device had to be carefully worked out because of the need to insure a high degree of accuracy of operation and very low weight.

The metallic covering of the sub-satellite is to give the plastic structure adequate rigidity after inflation so that it will keep

its shape even after the inflating gas has been released.

The aluminum covering serves other useful purposes; it protects the plastic from the action of ultraviolet and other radiation, and increases greatly the reflectivity of the sub-satellite for ground observation, both visual and radar.

Because of its extreme lightness, compared to its size, the sub-satellite will be affected to a correspondingly greater degree by the drag of the minute concentration of atmosphere. This fact will increase similarly the ability of the ground observation stations to obtain accurate drag measurements.

Science News Letter, December 29, 1956

BIOLOGY

Honey Bees Are Found To Eat and Smell Alike

► THE HONEY BEE'S HIVE is one big "welfare state," where everyone shares the same food and smells alike, Dr. Ronald Ribbands of Cambridge University, England, has found.

A single sample of sugar or nectar, brought home by a forager bee, Dr. Ribbands says, makes the rounds of the entire bee colony. It is passed on from honey bee

to honey bee irrespective of age or occupation until upward of 50,000 offspring from a single queen bee have shared a stomachful.

Sharing the same menu also results in sharing the same smell. This odor, Dr. Ribbands states in the annual report of the Smithsonian Institution, is a "scent language" that is a basis of the bee's extremely complex social life.

This building up of a distinctive colony odor, Dr. Ribbands explains, enables members of the colony to recognize each other. The honey bees use this odor differentiation as a burglar alarm and password, thereby protecting their hive and food against bees from another colony.

Science News Letter, December 29, 1956

Plane in Antarctic Lands At South Pole First Time

See Front Cover

► THE FIRST AIRPLANE LANDING to be made at the South Pole was achieved by seven men of Task Force 43, now in the Antarctic in support of Operation Deepfreeze II.

The aircraft is shown in the photograph on the cover of this week's SCIENCE NEWS LETTER. Rear Admiral George J. Dufek, U.S.N., was the expedition's leader.

Other members of the history-making crew included Capt. Douglas Cordiner, U.S.N., Capt. William Hawkes, U.S.N., Lt. Comdr. Conrad Shinn, U.S.N., Lt. John Swadener, U.S.N., and John Strider and William Gumbie Jr., Navy Specialists.

The airplane is based at Williams Air Operating Facility at McMurdo Sound.

Science News Letter, December 29, 1956



FLAG AT SOUTH POLE—Rear Admiral George Dufek stands beside the flag planted by his group at the South Pole after making the first airplane landing there. With him is Capt. W. M. Hawkes, also of the Navy.