

ASTRONOMY

Probe Sleeps Lunar Night

A MOON VEHICLE that will collect information and relay it back to earth during the lunar day, 14 earthdays, and "sleep" during the lunar night, will be remotely-controlled from earth as part of the exploration of the moon planned by the U. S.

This "remote-controlled roving vehicle," that may be available in five years, could explore the moon's surface extensively before man himself sets foot on the moon, Dr. Robert Jastrow of the National Aeronautics and Space Administration told the Geological Society of Washington, D. C.

The robot will pick up actual samples of the moon's surface and analyze lunar conditions as it slowly crawls in any direction its operator on earth directs it.

The roving vehicle may operate indefinitely using solar cells for power.

However, before the project of the roving vehicle can become reality, other unmanned forms of moon exploration must be undertaken. First the lunar surface must be surveyed by moon-orbiting satellites or by crash landings of instrument systems that will send information back to earth from a stationary position.

Suitable landing sites could be spotted by instrumental systems landed on the moon. The images of such sites on the surface could be obtained by television or photography, or both. Dr. Jastrow said that it was likely TV would be used first. He said it is hoped that the images will be at least 100 times better than those we can now obtain by our best telescopes from earth.

One of the most important instruments to be sent to the moon in the earliest exploration will be a gamma ray spectroscope. Mounted in a lunar satellite or a space capsule, it will show the level of radioactivity in the moon's crust which is expected to contain radioactive potassium, thorium and uranium.

"Soft" landings of an impact speed of about 50 miles per hour or less will be attempted later to carry other measuring equipment to the moon before the roving vehicle, and finally man, can land on the moon.

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BIOLOGY

Subtle Differences Found In "Identical" Chemicals

SUBTLE DIFFERENCES are showing up among supposedly identical chemicals in plants, animals and man as the result of new techniques developed by a team of scientists in Waltham, Mass.

The scientists have been studying dehydrogenases, a group of chemical catalysts or enzymes. They were able to analyze these chemicals by separating the dehydrogenase molecule into its components on filter paper, by passing an electric current through it, or by producing antibodies that selectively destroyed the activity of the molecule.

The Brandeis University researchers found that lactic dehydrogenase, the producer of energy in the heart muscle, differed

from lactic dehydrogenase of leg muscle.

The heart enzymes of the different mammals were much more similar to each other than the heart and muscle enzyme of one species. In other words, the enzyme in man's heart is closer in properties to the heart enzyme of the rat or cow than to the enzyme in man's muscle, Dr. Nathan O. Kaplan explained. He was assisted in this work by Miss Margaret M. Ciotti, Robert E. Bieber and Dr. Milton Hamolsky, at Beth Israel Hospital, Boston.

So far, 100 species have been studied. In each of the species and strains studied, more or less distinctive kinds and amounts of various dehydrogenases have been found. The scientists have been able to classify the dehydrogenases much as animals have been classified, according to their form.

For instance, the muscle enzyme for man, rat and cow are all quite similar but different from that of the lobster. The lobster enzyme, on the other hand, is very similar to the muscle enzymes of other crustaceans such as crabs and crayfish. The enzymes from the flounder, halibut and sole are all similar. These are all flat fish, and their enzymes are different from other fish such as mackerel and herring.

The scientists are trying to determine what causes this alteration of enzymes during evolution. They hope to establish chemically the evolutionary kinship of the various forms of life. Dr. Kaplan's work is supported by the American Cancer Society, the American Heart Association and the National Cancer Institute.

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ENGINEERING

Fire-Fighting Float Stays Put While Working

A NOVEL TYPE of fire-float has been put into service at the big petroleum terminal in Swansea Harbor, South Wales, through which 3,000,000 tons of crude oil are imported annually.

The two-man float has been designed to overcome some of the drawbacks of using sea-going tugs in fire-fighting.

An ordinary tug, no matter how powerful its engine, cannot maintain a steady position relative to the scene of the fire, due to the reaction on the tug exerted by the extinguishing jets of water. These jets push the tug away from the blazing tanker.

The new fire-float, named the "B. P. Firemaster," has been designed so that the engines can counteract the jet reaction and it can move in any direction, even in a strong wind, or keep the craft in a set position.

The "Firemaster" was designed by S. H. Dobson, superintendent-engineer of the B. P. Tanker Company. It is 60 feet long and is surmounted by an open pyramid of four tubular supports, which form a tower having two platforms, a control cabin and a wheelhouse, all linked by two-way loud-hailer radio.

On its three decks are nine fire-fighting nozzles. Seven can be operated in any one direction at once.

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FIRE-FLOAT—The "B. P. Firemaster," a fire-fighting float designed at the B. P. Tanker Company, is being tested in Swansea Harbor, South Wales. It is 60 feet long, and seven of its nozzles can simultaneously pour 3,100 gallons of water or 12,500 gallons of foam a minute on a burning tanker.