

## GEOPHYSICS

# New "Planet" for Sun

The first known flight of a man-made object free of the earth's gravitational pull will be an American achievement if an attempt to orbit a satellite around the moon succeeds.

► THE SOLAR system may soon have a new "baby" planet.

That is the probable fate of the fourth stage rocket and its payload of experimental instruments to be sent on a lunar probe, with the launching from Cape Canaveral, Fla., expected on Aug. 17. Details of the test flights into interplanetary space were revealed at a press conference by Roy W. Johnson, director of the Defense Department's Advanced Research Projects Agency, Washington.

If successful, the launching will mark the first known flight by a man-made object free of the earth's gravitational pull. All satellites so far hurled into earth-circling orbits have soared not more than 2,300 miles into space. The moon rocket is expected to break free of the earth's pull and, with luck, to come within 50,000 miles of the moon.

The chances are, however, that it will become a new object in space, or perhaps be lost forever to earth-bound trackers, revolving around the sun but too tiny to be tracked after its radio goes dead.

The most important instrument carried by the first test vehicle of the lunar probe series will be a TV-like device to take crude pictures of the moon's hidden side, the roughly 40% of the lunar surface never seen by man. The scanner may, however, be along only for the ride. Its mission will be accomplished only if perfect functioning of more than 300,000 complex and interdependent parts is achieved.

Failure of any one of the parts could nullify "complete success" of the flight, Mr. Johnson said.

Ideally, with every component functioning perfectly, the rocket robot would circle the moon six times, about the most the moon could be expected to hold such an object in its gravitational field. The chances of this happening even later in the test series are exceedingly remote, and the chances of actually hitting the moon are even less.

For the first test shot, Defense Department officials and scientists say they will be satisfied to reach an escape velocity and test conditions in space farther than has yet been reached, and delighted if the rocket robot comes within 50,000 miles of the moon, which varies between 221,000 and 252,000 miles from earth.

Included in the 30 pounds of instruments will be equipment for measuring the impact of micrometeorites and other particles in interplanetary space, a magnetometer to measure magnetic fields, and temperature-sensing devices. Their information will be broadcast at 108 megacycles.

The communications problems are of unknown scope and magnitude so that data

acquired may never be received, or even if received may be subject to varying interpretations and degrees of verification.

Launching a rocket to come relatively close to the moon to take pictures of the unseen side is a tricky problem in three-body astronomy, requiring that the relative positions of the launch point, the moon, and sun be exactly so. These conditions occur only on four consecutive days each month, and on each of these days for only a few minutes.

The moon vehicle will be launched by an Air Force Thor intermediate range ballistic missile as the first stage, a modified second stage Vanguard rocket and a solid-propellant third stage rocket. A terminal rocket may be fired by command from earth to alter the vehicle's course as it nears the moon.

Technical difficulties during the complex, hours-long "count-down" could therefore create delays postponing a firing for as long as a month. After the Aug. 17 to 20 period, the required conditions recur every 28 days.

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*FLAT BUOY—Scientists prepare to launch one of the two buoys that were used to check currents along the ocean floor. Three special torpedo-shaped current meters were suspended from each buoy. Located near the surface, mid-depth and as close to the floor as is practicable, the meters measured the direction and velocity of the currents. The information is automatically radioed back to the research ship.*

## ● RADIO

Saturday, August 23, 1958, 1:30-1:45 p.m. EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Mr. Davis will discuss "Genetics."

## OCEANOGRAPHY

## Divers Will Probe Moving Sand Ridges

► TWO AQUA-LUNG divers of the U. S. Coast and Geodetic Survey spent a week attempting to solve the mystery of the apparent migration of underwater sand ridges on Georges Shoal about 120 miles off Cape Cod, Mass.

Dr. Harris B. Stewart Jr. and Garret G. Salsman, Survey scientists, injected colored dyes into the submerged ridges, then photographed the movement on color film for future study. They took both still and motion pictures. Their underwater activities also included sediment samplings from specific parts of the ridges.

The Survey ship, Hydrographer, sailed from Boston on Aug. 4 carrying oceanographers to conduct this and other special projects, including measurements of the currents at the edge of the continental shelf 600 feet beneath the surface.

Rear Adm. H. Arnold Karo, Survey director, said recent observations of Georges Shoal revealed a change in position for the elongated underwater sand ridges that cross the crest of Georges Shoal. The apparent movement may result from the more accurate surveying methods adopted since the last survey 26 years ago, but other information suggests actual movement of the ridges.

Some of the ridges are four miles long, up to 40 feet high, and rise to within 20 feet of the surface.

After a week, the 165-foot Hydrographer moved to a position at the edge of the continental shelf, where instruments suspended from two buoys placed ten miles apart checked the currents on the ocean floor.

Oceanographers suspect that currents along the outer edge of this underwater plateau should be stronger than those closer inshore, but actual measurements are lacking. These observations may help to show the role bottom currents might have in transporting and dispersing radioactive wastes dumped in the sea.

Georges Shoal is a shallow crest of the more extensive Georges Bank, whose inshore edge is only 60 miles east of Cape Cod and Nantucket. The bank extends eastward to the edge of the continental shelf where the bottom slopes to a depth of 1,000 fathoms, or 6,000 feet, in a distance of only seven miles. It covers an area of about 15,000 square miles.

Georges Bank, which includes some 5,000 square miles of water shallower than 30 fathoms or 180 feet, has become famous as a fishing ground for vessels out of Boston and other New England ports.

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