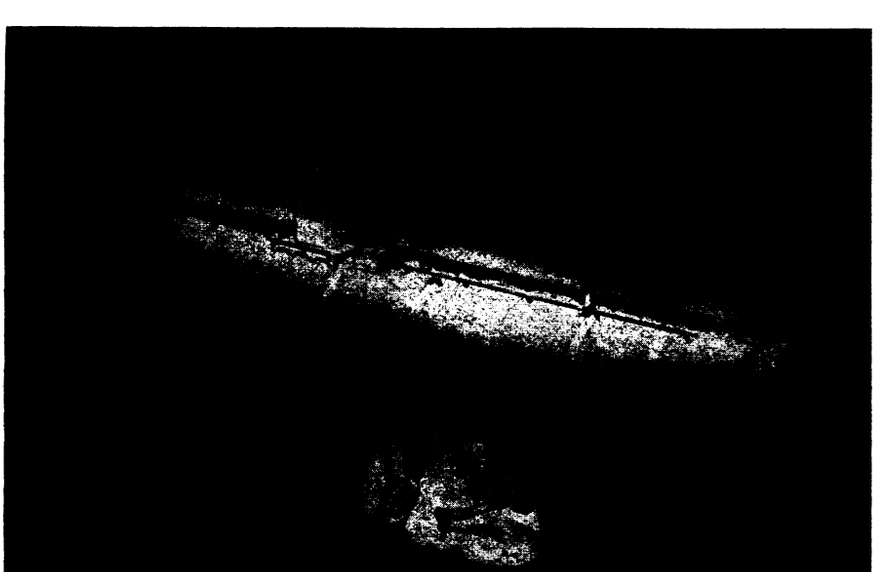

*REACH IN THE DEEP—The U. S. Navy's deep sea bathyscaph Trieste has been equipped with a mechanical arm for picking up samples of material from the ocean floor. Oceanographers can control the arm, built by General Mills, Inc., Minneapolis, Minn., from the sphere beneath the craft.*

PHYSICS

# Missile Radio Trouble

➤ DIFFICULTIES with radio and radar in high-flying missiles caused by gases (plasma) may soon be over.

The plasma forming on the missile's skin often behaves unpredictably because the missile's high speed causes large numbers of electrical particles to move very rapidly.

New theoretical work shows that if certain low-frequency ion waves are created in the plasma, very high frequency radio and radar signals would be able to go through the plasma and make communication possible.

If the theory proves correct, the low-frequency waves could be used in the Dyna-Soar manned space glider program as well as for other space craft, Dr. J. E. Drummond, Boeing Scientific Research Laboratories, told the American Physical Society meeting in Washington, D. C.

Other new developments in plasma physics include the achievement of a stable plasma for one-thousandth of a second in a machine for testing plasma called Toy Top III. This device consisting of a 40-foot tube in two stages produced dense plasma of temperatures of about 72 million degrees Fahrenheit, Dr. F. Coensgen, Lawrence Radiation Laboratory, Livermore, Calif., reported.

If the problems of instability of plasma can be overcome and applied practically, the result would be controlled thermonuclear reactors, a new source of power.

Dr. R. F. Post, also of Lawrence Radiation Laboratory, said that by 1965 the problem of instability will be settled one way or the other, as far as the magnetic mirror machine he is working with is concerned.

He said work done with instabilities in thermonuclear reactors may some day help explain astrophysical instabilities in the sun in the same manner that laboratory work helped explain the Van Allen radiation belts that surround the earth.

• Science News Letter, 79:279 May 6, 1961

## Cool Atom Smasher

➤ A COOL "atom smasher" operating at temperatures more than 400 degrees below zero Fahrenheit was foreseen as a means of reducing initial cost and upkeep on these expensive machines.

Dr. Cyril D. Curtis of Midwestern Universities Research Association, Madison, Wis., said the large magnets used in atom accelerators might be made of such superconducting materials as the niobium-tin alloy recently developed at Bell Telephone Laboratories.

Doing this would considerably reduce the size of the magnets required to achieve a specific energy for the particles being accelerated in the machine, he told the American Physical Society meeting in Washington, D. C.

One study showed that using magnets made of sodium and operated at a temperature of 432 degrees below zero Fahrenheit would cut costs of construction and power by 35%, or $85,000,000. With magnet rings having diameters of up to 800 feet, machines now under construction may cost up to a hundred million dollars or more.

• Science News Letter, 79:279 May 6, 1961

OCEANOGRAPHY

## French Ship to Explore South Atlantic Sea Life

➤ THE FRENCH oceanographic ship ship Calypso will leave for South America this September to explore the Atlantic ridge with photographic equipment and survey the sea life along the coast of the South Atlantic, its captain, Jacques-Yves Cousteau, said. Capt Cousteau is director-general of the oceanarium of Monaco.

In 1956, he led an expedition to survey the biological life in the water along the African coast at the same latitude as the area to be surveyed in the South Atlantic. And in 1959, the fauna along the island in the center of the Atlantic at this latitude were studied.

"The importance of the coming investigation of the ocean life along the coast of the South Atlantic is that it will provide a clear view of the exchange and development of fauna and, perhaps, shed some new light on why some specimens are common to all the explored areas. We will be able to see the links," Capt. Cousteau said.

Capt. Cousteau was in Washington, D. C., to receive the National Geographic Society's gold medal for oceanic research.

• Science News Letter, 79:279 May 6, 1961

## Find Rare Hydrogen

➤ THE RARE form of hydrogen known as tritium, an ingredient of hydrogen bombs, is formed in the sun during a flare, which is a tremendous outpouring of solar material.

The fact that tritium is produced by the sun was found for the first time by scientists when they examined the remains of a Discoverer satellite (No. 17) that was exposed to the full fury of the solar storm on Nov. 12, 1960.

"Because of its exceptional scientific importance," the satellite has been carved up and its pieces distributed to various laboratories for further study, Dr. Herman Yagoda of the Air Force Cambridge Research Laboratories, Bedford, Mass., said.

The sun also produces large quantities of carbon, oxygen, magnesium and iron nuclei during a flare, Dr. Yagoda told the American Physical Society meeting in Washington, D. C. These particles have sufficient energy to penetrate the satellite's skin, and are "especially effective in producing biological change." Dr. Yagoda said. This further complicates the shielding requirements for man in space if the launching should occur at the time of a solar flare, the sudden occurrence of which is not yet predictable.

The Discoverer 17 satellite carried a nuclear emulsion block in which tracks of the tritium, carbon, oxygen, magnesium and iron were found.

"Unlike the sparse rain of galactic cosmic radiation," Dr. Yagoda said, "when a flare occurs, the sun envelops the earth in an intense radiation field." This radiation is soft, however, and does not penetrate deeply into the atmosphere.

• Science News Letter, 79:279 May 6, 1961