

## OCEANOGRAPHY

# New Ocean Tools Needed

► TREASURES OF THE SEA lie only a thousand feet below a luxury liner's dance floor—yet they are as hard to reach as the far side of the moon, 240,000 miles away, said Cmdr. M. Scott Carpenter, U.S. Navy and member of the National Aeronautics and Space Administration.

New tools, interested young men and more experience are needed in order to tap the "riches beyond measure," such as pirate's treasure, fresh water, diamonds, gold, gas and oil from the ocean floor, he told members of the two-day symposium on Man's Extension into the Sea, sponsored by the Marine Technology Society, the American Society of Mechanical Engineers and other organizations interested in probing the oceans.

Many new ideas were gained from last summer's experience of Sealab II, said Astronaut Carpenter who was one of the aquanauts who lived for 30 days in the 57-foot cylinder standing 205 feet deep off La Jolla, Calif.

A more reliable communication system is needed to join divers, Sealab and the surface, as well as heated swimsuits to per-

mit aquanauts to stay out longer in the cold sea. Better equipment for supplying vital breathing gases and new methods for monitoring accumulated carbon dioxide are other things needed in the next experiment of undersea living, Sealab III.

In their efforts to explore the new frontiers of the oceans, men have used or adapted tools from naval, airline and space equipment, said James W. Miller of the Office of Naval Research. Special oceanographic gear is also being devised, such as a salvage gun that shoots quick-hardening foam into sunken objects, making them buoyant enough to help lift them to the surface.

A major breakthrough in metal forming arose from construction of the Sealab, said Lt. Comdr. Malcom MacKinnon, who headed the design and construction of Sealab II in the San Francisco Naval Shipyard. This is the underwater explosive forming of large steel concave sections. In four milliseconds, steel "dished heads" were bent into proper shape—an operation that would have taken a commercial firm six

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National Bureau of Standards

**NUCLEAR POWERED NOMAD—** U.S. Navy weather data station NOMAD, developed at the National Bureau of Standards, is here being anchored in the Gulf of Mexico. Weather-sensing devices visible include the anemometer, the wind-direction indicator and the IWF-storm sensor. The nuclear power source is below the hinged covers seen on the deck.

## CONSERVATION

# Sea Salt Kept From Land

► A 500-FOOT-DEEP WELL, first of a series, has been tested for pumping fresh water into sands to help keep the salty seas from seeping through coastal land.

The well is designed to pump about 400 gallons of fresh water per minute into the deep sands near the southern coast of Long Island and thus keep ocean water from moving in, reported Bruce L. Foxworthy, chief of the Long Island Project of the U.S. Geological Survey, Department of Interior.

In recent years, so much fresh water has been drawn from the ground by expanding communities, industries and agriculture that salt water from the Atlantic Ocean is beginning to replace it far beneath the surface. The five-year drought in the northeastern United States has also seriously depleted the fresh water supply.

The well is the first of a string of deep injection wells to be installed along Long Island's south shore and perhaps elsewhere in the nation to preserve vital fresh water reserves in our coastal regions, said Mr. Foxworthy.

The water to be pumped into the well is "renovated" waste water that has been purified to a drinkable level.

Regulated pumping of fresh water into the buffer zone is expected to flush out the salt chemicals from underground water-bearing rock and sands.

Designed by Philip Cohen and C. N. Dunfor of the Geological Survey, it is the first recharge well in the world to use multiple fiber-glass casing and pipes. It is

lined to a depth of 420 feet with an eight-inch-diameter fiber-glass casing. Underneath this extends a 60-foot long stainless steel strainer from which the water is injected into the sands. Constructed at the Bay Park Sewage Treatment Plant near East Rockaway, N.Y., the well will take as much renovated water as required to maintain a "head" or barrier along the seashore.

The Survey is cooperating with the Nassau County, N.Y., Department of Public Works in the experimental project.

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## TECHNOLOGY

## Wood Slicing Prevents Sawdust Pollution

► RESEARCHERS at United States Forest Products Laboratory in Madison, Wis., are testing a disposable pallet for industrial packaging. The disposable pallets are made by slicing wood into boards instead of sawing it, which means that no sawdust goes into streams to pollute them.

Since the manufacture of pallets for such purposes is increasing at a rate of 7% a year, the production of the disposable pallets could use up large amounts of the low grade oak, hickory and yellow poplar wood found in the depressed areas in the Appalachian Mountains, thereby creating employment opportunities.

Another new product at the laboratory is a decking material which is manufactured by a dry process without polluting waters.

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## GEOLOGY

## Search for Water, Oil Aided by Spacecraft

► THE SECRET SOURCES of water, fuel and minerals in faraway deserted places may be discovered by using a new tool for geologists—an orbiting spacecraft.

Cameras which detect infrared, ultraviolet and visible light and which orbit at a height of 100 or more miles will be an immense aid to geologists mapping the contours of the world and searching for new sources of oil, water and other vital resources.

A large step toward realizing this new mapping system has just been completed by an agreement between the U.S. Geological Survey and the National Aeronautics and Space Administration.

Astronauts in orbiting vehicles could man the cameras, or automatic instruments could be installed to photograph vast segments of the earth's surface. These pictures could be relayed electronically to research stations on earth for analysis and interpretation. By studying the tones and shadows, geologists hope to accurately pinpoint areas of earth formations.

Geologists are now studying areas in the United States that represent various geological features, in an effort to correlate their ground analysis with space photographs, said William A. Fischer, the Geological Survey's supervisor of the project.

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