OCEANOGRAPHY

Aluminum Sub Readied

A submarine that will dive to depths of 15,000 feet and permit exploration of more than half the world's ocean floor is being constructed of aluminum—By Barbara Tufty

➤ THREE MILES UNDER the ocean, the submarine Aluminaut will be diving deeper than any other research submarine.

When launched late this summer, the aluminum submarine, first of its kind, will be diving to depths of 15,000 feet under the sea. Tremendous water pressures will contract its hull about two inches shorter in length and in diameter than normal.

The deepest going research submarine in actual operation today is the Diving Saucer, which can descend to depths of 1,000 feet to scan the ocean's floor. This two-man saucer-shaped vehicle is now diving off the coast of California.

Still in production are the three-man sub, Deepstar, designed to operate at depths of 12,000 feet under the sea, and the two-man sub, Alvin, designed for depths of 6,000 feet. Both submarines are scheduled for completion later this year.

Man reached his greatest depth yet in the Navy's thick-hulled bathyscaphe Trieste, which set the world's record in 1960 by descending 35,800 feet. This submersible ship has a spherical watertight cabin attached to its underside and uses gasoline and shot for ballast.

The Aluminaut, designed by Reynolds International Inc., Hamilton, Bermuda, will be equipped with instruments such as underwater television, lights to shine in the dark murky depths, and mechanical devices to retrieve samples from the ocean bottom. It will have space for a pilot and two scientists, and will be able to explore about 60% of the world's ocean floor, much of it for the first time.

The reason this 50-foot long, eight-foot diameter submarine can operate at such unusual depths is that it is being constructed almost entirely of aluminum.

Aluminum is one-third the weight of steel and has greater strength for its weight than other available metals. This allows fabrication of a hull thick enough to withstand tremendous pressures at great depths, yet light enough to stay afloat without external buoyancy.

The first hull section, six and one-half inches thick, was cast from the world's largest aluminum ingot, weighing 34,000 pounds. Twelve other huge ingots were also used in casting the sub's 11 rings and two hemispherical heads which compose the hull.

A single vertical propeller will permit the Aluminaut to hover and stay in place for special observations as well as assist in controlling the rate of descent and ascent. Twin screws run by batteries permit the sub to scan the ocean at a cruising speed of about 3.8 knots. The maximum length of time the sub can stay submerged is about 72 hours.

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Reynolds Metals

15,000 FEET DOWN—An artist's conception shows the Aluminaut, the world's deepest diving submarine being built by Reynolds International, Inc., of Reynolds Metals Company.

NATURAL RESOURCES

U.S. Watering Down River

➤ U.S. TECHNICIANS are watering down the Colorado River to make it less salty as it flows south of the border, down Mexico way.

Since last October, some 92 wells have been busy pumping underground water in the Lower Colorado River area and adding this water to the river itself.

This reduces the salt concentration to slightly below 2,000 parts to a million parts of water, a report on the Delivery of Water to Mexico by the Department of the Interior's Bureau of Reclamation said.

This is part of a large plan to lessen salt concentrations and to help President Lyndon B. Johnson keep a promise to President Lopes Mateos of Mexico. The second and third steps of the project, not yet approved by Congress, call for more wells and pumps to increase the water supply and thus decrease the salt concentration.

During the presidential meeting last month, President Johnson promised to speed up a solution to the problem that has been literally rubbing salt into Mexican soil.

Each year, according to the Water Treaty of 1944 between the United States and Mexico, the United States guarantees that 1.5 million acre-feet of water will flow into Mexico. Within the last few years, however, the concentrations of salt, including minerals from the soil, fertilizers and other sources, have increased gradually.

Salinity increases in the river each year during the months of October through February, when precipitation is locked in the form of ice and snow on the mountains, and there is less water in the river.

During the months of April through July, the snows melt and the river water increases, decreasing the salt concentration.

It has been proposed that about 35,000 acres of land be turned over to growing cotton plants instead of alfalfa and Bermuda grass. Cotton is a hardy plant in this arid region where only about 3½ inches of rain falls each year and consumes less water than the other plants.

At present there is no proposed project for actually removing the salt from the soil and river by desalination processes.

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ICHTHYOLOGY

Salmon X-Rayed in Canadian Health Study

➤ TWO CANADIAN scientists are X-raying the blood circulation of salmon to see if recent hydroelectric developments, water pollution and other disruptions are damaging fish. The scientists were able to make the X-ray film with the salmon swimming in a large can of water.

Techniques used by radiologists to study the circulation of humans were applied. To make blood vessels visible on X-ray film, a liquid is injected. The scientists inserted the liquid through a tube in a mouth artery to prevent interference with swimming.

Michael J. Smart, radiologist, and G. R. Bell, biologist, of the Canadian Government's Fisheries Research Board biological station, Nanaimo, B. C., reported the project at a meeting of the Canadian Association of Radiologists in Vancouver, B. C.

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HYDROGRAPHY

Purer Drinking Water Tapped From Reservoirs

➤ A NEW METHOD of stratifying the water in large reservoirs according to mineral content and temperature will improve the quality of drinking water.

Engineers at the California Institute of Technology, Pasadena, have found that these layers can be selectively tapped without mixing. Purer top layers will provide for municipal use and irrigation, while lower layers containing mud or minerals will be used for generating electrical power and flushing silt from streams.

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