

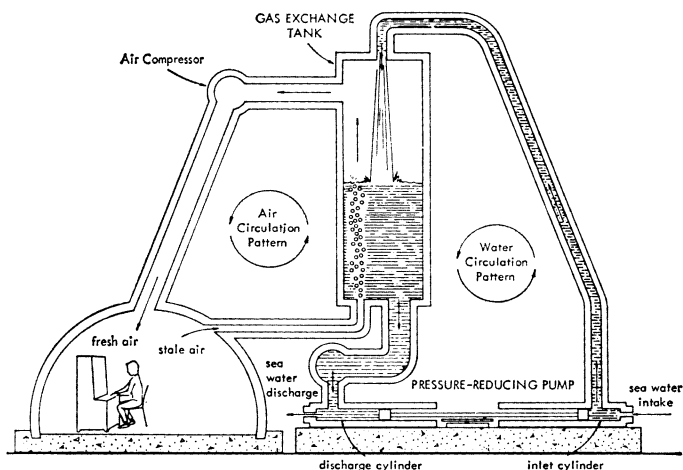
Technology Notes

OCEANOLOGY

Air from the Sea for Oceanauts

A system for pulling oxygen out of seawater to supply underwater dwellings indefinitely has been developed at the U.S. Navy Civil Engineering Laboratory, Port Hueneme, Calif.

Devised by Dr. Harold P. Vind of NCEL, the inexpensive system uses basically a tank, some tubing and a pressure-reducing pump. In the system, oxygen-deficient stale air is forced into a gas-exchange tank where it meets a continuously circulating stream of seawater.



The surfaces of the many droplets and bubbles act as diffusion membranes. The excess carbon dioxide in the stale air diffuses into the seawater, and the oxygen in the seawater diffuses into the air. The revitalized air is returned to the living chamber of the structure.

The pressure-reducing pump is particularly important, the Navy points out. An ordinary pump would have to be very powerful (and thus bulky) to discharge the water back into the ocean, due to the pressure difference between the inside and the outside of the system. The new pump essentially uses the high pressure of the incoming water to push the used water through the discharge valve. Thus, the pump can run on little more power than that needed to overcome the friction of its components.

Rats have lived comfortably for eight hours in a chamber using the system. The Navy is studying the idea for both fixed shelters and undersea vehicles.

TRANSPORTATION

Driving from Without

An eight-wheeled vehicle that can be driven from the outside and which is reportedly capable of traversing more than 90 percent of the jungle and mountain terrain of Vietnam, has been developed by LTV Aerospace Corp., Dallas.

Called MACV (Multi-purpose Airmobile Combat-support Vehicle), the carrier can be driven by an operator seated or lying prone inside, or it can be used as a double stretcher carrier and operated through a five-foot-long remote control cable.

A 20-horsepower air-cooled engine powers the vehicle through two right-angle transmissions, each of which drives four wheels on one side. The vehicle has a maximum payload of 1,000 pounds, and top speeds of 20 miles per hour on land and three mph on water.

MATERIALS TRANSPORT

European Oxygen Network

An international oxygen network 250 miles long is about to be constructed to produce and transport more than 1,000 tons of the gas per day to steel mills in Germany, France and Luxembourg.

The source of the oxygen will be the largest plant of its kind in Europe, to be built on the Saar River in West Germany by Oxysaar Huettensauerstoff GmbH. The pipeline will cross the German-French border near Karlingen. The international project will cost an estimated \$7.5 million.

ATOMIC ENERGY

Nuclear Power for Belgium

For the first time, Belgium is now using its own production of nuclear power on a commercial scale.

This came about with the linking of the joint Franco-Belgian SENA nuclear power station in the French Ardennes to the Belgian electricity grid. Contracts have also been let for two nuclear stations within Belgian borders, one near Antwerp and the other at Huy.

METALLURGY

New Alloy-coating Technique

A new method of creating Space Age alloys on the surface of a wide variety of materials has been invented by a scientist at General Electric Co., Schenectady, N.Y.

Called metalliding, the technique reportedly can be used with some 50 different elements to create alloy coatings not possible by any other practical method. It was developed by Dr. Newell C. Cook.

Heart of the system is a bath of molten fluoride salts, which are used as a "solvent" to electrolytically diffuse metals and metalloids (such as boron and silicon) into the surface of other metals and alloys. The resulting compositions often have properties radically different from those found in either material alone.

Molybdenum, for example, is a relatively soft metal; when boron is metallided into it, the resulting surface alloy is apparently second in hardness only to diamond.

The thickness of metallided coatings can be carefully controlled, and continuous processing is now being investigated. In many cases, GE reports, two different starting materials can be diffused one after another into the same surface.

Among the areas being investigated by Dr. Cook is the diffusion of chromium into low-cost steels to create inexpensive materials with corrosion and wear-resistance comparable to stainless steel.