

# Who Owns Which Ocean?

As the possibilities of harvesting food and fuel supplies from under the sea increase, the issue of legal ownership of the oceans becomes vital

► THE QUESTION of which nation or state owns which body of water—and more important, the minerals, chemicals and life within it—is turning into a vital international concern in today's crowded world.

Men are looking at rich areas of the sea to explore and exploit, much as their forefathers looked at new uninhabited lands to discover and settle.

In this watery world where fish and undersea crops can be harvested, oil and chemicals can be extracted, ores can be mined, and men might set up new undersea communities in which to live, boundaries are becoming vitally necessary.

The past, present and future of laws governing the seas and their resources were discussed by lawyers and advisers from Washington, Philadelphia, New York and Evanston at a conference on "Exploiting the Ocean," sponsored by the Marine Technology Society.

Today, international maritime law recognizes five zones of ocean space: 1) inland waters, which include rivers, harbors and bays; 2) territorial seas, which lie in a belt around the continents; 3) the contiguous zone which

extends into the oceans as far as 12 miles; 4) the continental shelves, which are the underwater extensions of the continents to an undetermined depth and 5) the high seas, the deep areas that presumably start where the continental shelves leave off.

Each one of these zones is complicated to define, and has been under controversial discussion for years, even centuries.

The inland or internal waters are governed by the adjacent coastal state, even though exact boundaries of low tide line or water line are much disputed, as are rights to islands fringing these waters.

Territorial seas extend three, six, 12 or even more miles into the sea, according to different nations.

The gently sloping continental shelves were not technologically exploitable until recently, pointed out Dr. William Griffin, Temple University School of Law, Philadelphia. Development of techniques for exploiting this submerged land has brought up urgent questions of legal rights. In only 16 years, the legal concept of this area has grown from its first claim of right in 1942 to its confirmation by

the Convention on the Continental Shelf in 1958.

Two years ago, the United States legally acquired basic rights on new territory larger in size than any territorial acquisition since the Louisiana Purchase, said Capt. Alban Weber, University counsel at Northwestern University, Evanston, Ill. This territory is the continental shelf off the shores of both coasts of the Continental United States including Alaska, as well as off Hawaii and our island territories.

Doctrines of international law over the waters and ocean floors have been inextricably intertwined with basic doctrines of sovereignty, territorial acquisition and freedom of the seas.

• *Science News*, 90:23 July 9, 1966

## PHYSIOLOGY

### Organic Fluids Can Be Breathed by Animals

► SURVIVAL of animals breathing organic liquids offers hope that a safe method may eventually be developed to support man's breathing underwater without cumbersome equipment.

Cats, mice and goldfish have been able to breathe oxygen-saturated silicone oils, and some of the animals did even better with fluorocarbon liquids, two researchers reported in *Science*, 152:1755, 1966.

Lung damage, however, remains a major hazard to man breathing any organic liquid available at the present time.

Whether the pulmonary damage observed in the experimental animals is due to solvent activity, the presence of toxic impurities, a chemical interaction of the fluorocarbon structure with the lung, or some other factor is not yet clear.

Organic liquids, since they can support respiration with oxygen at atmospheric pressure and have other unique qualities, may find use in submarine escape, undersea oxygen support facilities and medical research.

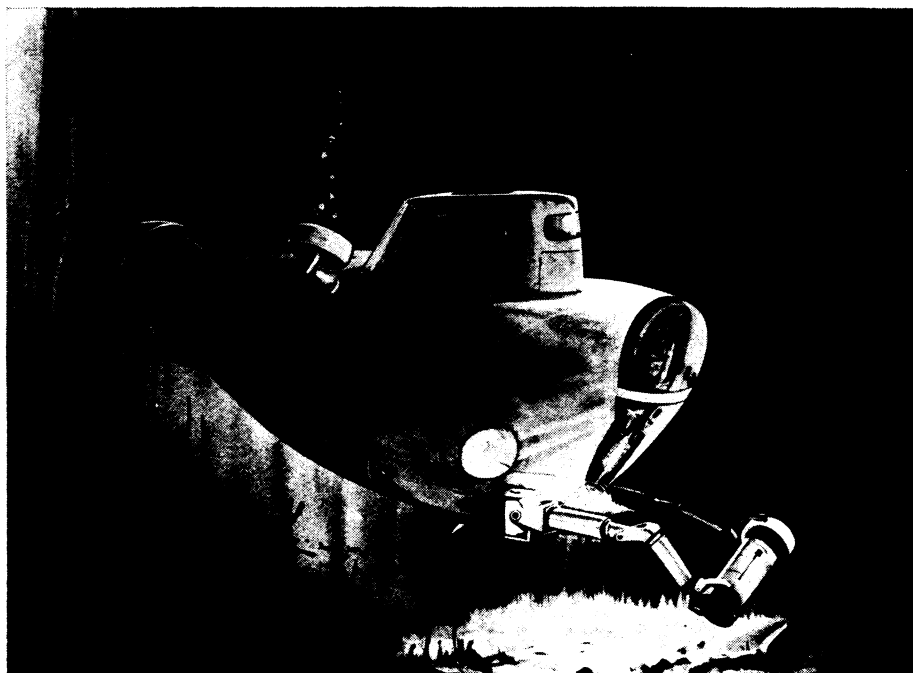
Mice and rats have previously survived complete immersion in oxygen-saturated silicone oils, although they died when they were removed from the fluid and returned to air breathing. Goldfish survived under silicone oil for several weeks.

Anesthetized cats breathed oxygen-bubbled fluorocarbon through a tracheal cannula.

One cat was observed for five days following liquid breathing, walking about and drinking milk, but his lungs were affected and he died within 15 minutes after the injection of hydrocortisone.

Reporting the study were Drs. Leland C. Clarke Jr. of the Medical College of Alabama, Birmingham, and Frank Gollan of the University of Miami School of Medicine, Coral Gables, Fla.

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General Dynamics

**AQUANAUTS' HELPER**—Two of these 25-foot-long research and work vessels are being built for the U.S. Navy by General Dynamics. This artist's drawing shows how the mechanical arms will enable the little subs to perform tasks underwater. Electrically driven side pods will enable them to thrust forward or to hover.