



Alcoa

**UNDERWATER CAMERA**—The almost all-aluminum deepwater motion picture system (DMPS) built by the Aluminum Company of America for the Bureau of Commercial Fisheries floods the ocean bottom with 80,000 candlepower as it takes pictures of the actions of fish and shrimp.

## OCEANOGRAPHY

## Man Can Dwell Undersea

A National Ocean Commission for the coordinated study of undersea research and a program of ocean science and engineering is strongly urged—By Barbara Tuffy

► CONSTRUCTION of undersea dwellings, laboratories and military establishments should be coordinated into a U.S. program of ocean science and engineering. This would establish the leadership of the United States in these fields, stated Dr. James H. Wakelin, president of Scientific Engineering Institute and chairman of a four-day Ocean Science and Ocean Engineering Conference in Washington, D.C.

Medical researchers could help in the study of how men can live and work under the sea, how they can better stand high pressures and how they might be able to obtain their life oxygen from the water itself, he explained.

In a strongly worded plea for establishing a National Ocean Commission which could clarify the role of the Federal Government, state governments, industries and universities in ocean research, Dr. Wakelin pointed out that the U.S. has come to the crossroads where current structures and organizations for studying the oceans are not adequate for the national effort.

He proposed establishment of a temporary commission of possibly 12 men, three from each of the four branches concerned, to analyze basic problems, develop a program and present recommendations to President Lyndon B. Johnson. This commission could effectively develop a program in about eight to 12 months, and then be disbanded.

In addition to further research on man's physiological problems, Dr. Wakelin pointed

out, other basic areas of ocean research programs, including more study on the distribution of marine life for future human food; thorough economic study of minerals and chemicals that could be removed from the sea; education and training of more scientists and engineers in the growing field of "aquaculture"; pollution and waste disposal problems, and more intense analysis and prediction of weather and wave conditions.

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### Need New Ocean Tools

► IN ORDER TO FATHOM the sea, study the bright lighted creatures that inhabit its dark depths, set out better warning systems for weather and tsunami tidal waves, today's scientists need more accurate equipment and manageable ships.

In the midst of the technological explosion and awakening nations' interests in ocean science, more versatile oceanographic ships are necessary, believes Roy D. Gaul, Texas A&M University, College Station.

The tremendous expense of men, equipment and ships could be drastically cut by construction of medium-sized ships whose unequipped hulls could be simply fitted out with portable tools and equipment needed for specific missions, with scientists bringing on board their individual POD's (portable ocean devices or portable labora-

tories). The construction would also save precious money appropriated for ocean research, which could be more wisely spent on men and equipment, Dr. Gaul told members of the joint ocean conference held by Marine Technological Society and the American Society of Limnology and Oceanography in Washington, D.C.

Another kind of equipment needed is deep-sea tide gauges, said Anthony J. Goodheart, Charles W. Iseley and Steacy D. Hicks of the U.S. Coast and Geodetic Survey.

As valuable equipment for setting up a warning system for tsunamis, as huge ocean waves are called, sensitive instruments encased in spheres would be strung out at intervals across the Pacific Ocean, suggested Dr. Harris B. Stewart Jr., of the Geodetic Survey, and co-chairman of the conference program.

These deep-sea tidal gauges could also gather more information about the tides created by the gravitational forces of the moon, the sun and earth.

By means of newly developed undersea cameras, biologists are learning more about the life of bioluminescent ocean creatures, pointed out Dr. G. L. Clarke, Harvard University and Woods Hole Oceanographic Institution.

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### Russian Oceanography Making Great Gains

► THE SOVIET UNION has jumped into second place, right behind the United States, in the field of oceanography.

Dr. Robert S. Dietz of the Coast and Geodetic Survey, U.S. Department of Commerce, reported that the Soviet Union, which has surpassed Great Britain and Japan, now has a total effort in ocean science about one-half to two-thirds the size of the United States.

"Their progress in the last decade is all the more striking," Dr. Dietz said, "when one considers that Russia has been traditionally a heartland country with her major interests directed inward to the land. Today, Russia is looking outwards to the world ocean."

Dr. Dietz, a member of the first U.S. oceanographic team to participate in the U.S.-USSR scientific information exchange program, spent four weeks visiting research centers in Moscow, Leningrad and other Russian cities. An authority on the nature and history of the ocean basin, he collaborated with Jacques Piccard on the early development of the bathyscaphe Trieste.

Broadly speaking, there are now about 1,200 oceanographers in the Soviet Union, compared with an estimated 1,500 to 2,000 in the United States, he said. Four out of about 40 Russian universities offer training in oceanography and about 50 oceanographers are graduated each year.

A great strength of Soviet oceanography is the amount of support by technicians. The U.S. oceanographer usually works alone and often becomes overwhelmed by piles of data.

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