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NATIONAL AQUARIUM RESEARCH FACILITIES WILL BE EXTENSIVE

The National Fisheries Center and Aquarium being designed for construction in Washington, D. C., will serve the dual function of an educational center and aquatic research institution, and it promises to be outstanding in both fields, the Department of the Interior reports.

The self-supporting $10 million Fisheries Center will display one of the world's largest collections of aquatic life--1,300 different kinds in near-natural habitat, ranging from dolphins to barnacles.

Behind the scenes, but basic to operation of the Center, will be research accommodations for 32 scientists. They will come from several agencies of the Federal Government, from private institutions and universities, and from foreign countries.

The Fisheries Center will be operated by the Department's Bureau of Sport Fisheries and Wildlife. The Bureau's scientists will conduct research in genetics, reproduction, nutrition, fish diseases, experimental ecology, behavior of aquatic organisms, and production of antibiotics and chemicals by marine animals.

Secretary of the Interior Stewart L. Udall said the broadly based research program is expected to make important contributions to the fishery sciences and to human health. Some of the studies may have application in national defense.

The Office of Naval Research, for example, seeks answers to some of its most vexing problems through biological research on marine organisms. The studies may lead to better ship design, more efficient underwater communications, and better protection against dangerous forms of sea life.

ONR and several other Government agencies are being interviewed by William Hagen, acting director of the Fisheries Center, to learn how the new facility can serve their research programs.

Dr. Sidney R. Galler, head of ONR's Biology Branch, proposes that the Fisheries Center include facilities for growing and maintaining marine invertebrates, such as squid and barnacles.

He said a problem common to all such research is a shortage of healthy marine animals and plants for experiments. If the National Fisheries Center can help ease this shortage, he said, it would provide a valuable service to the country's scientific community.

The squid is of special research importance because its large central nerve fiber permits a variety of experiments. Also needed is a better supply of the Nubilis barnacle, because of its large muscle sheath.

ONR's Hydrobiology Research Program is supporting more than 120 basic research projects in academic and industrial institutions in the United States and abroad. One of the most important quests is for ways to prevent the fouling of ships and underwater equipment.

Dr. Galler said more than 2,000 marine plants and animals have been implicated as fouling pests. The cost to the Navy alone for protecting ships, waterfront structures, and other equipment from these pests is about $100 million a year.

The continued development of new kinds of underwater equipment will further increase the cost. Both the military and industry are beginning to place large stationary structures on the bottom of the ocean, or close to the bottom. These include acoustic devices and other instruments for geophysical and marine biological exploration.

Once the structures are submerged, it will be impossible in some cases to retrieve them for maintenance and repair. There will be no way to clean off accumulated marine organisms that could impair operation of the equipment. The solution appears to be in long-life protection against fouling.

The research approach is to learn more about the steps or links in the chain of biological processes which govern the life of the offending organisms. Scientists hope that weak biological links can be found and that they will offer a key to control methods.

Another research objective is to find ways to repel or deter dangerous forms of marine life which hamper underwater and amphibious operations. Better protection is needed against sharks, barracuda, moray eels and other carnivorous animals. Researchers also are attacking the problem caused by a variety of poisonous organisms in the sea.

Scientists are trying to learn more about the ability of some marine organisms to emit light so this phenomenon can be controlled. During World War II several ships were attacked because the wake of their propellers churned up the organisms and caused them to glow in the dark.

Dr. Galler said the intensity and rate of biological light emission also is a useful tool for measuring energy conversion in living tissue. This information, he said, is important to a variety of biomedial investigations.

There is interest in the ability of some marine animals to navigate over long distances with extreme accuracy and in their ability to communicate efficiently with each other.

Dr. Galler said the Navy hopes that by discovering the biological basis for these capabilities, it may be able to simulate some of the desirable features by mechanical or electronic means.

One of the animals of particular interest is the dolphin, which has a remarkably well-developed natural sonar. The dolphin uses his echo-ranging ability to find food and to avoid obstructions in murky water. Some experiments indicate that he can even distinguish the shape and texture of hidden objects. It is generally conceded that his natural sonar is far superior to the man-made version.

The hydrodynamics of the dolphin also offers a promising field of research. The dolphin swims through water with an almost complete absence of drag. When researchers find out how, the answer may result in better design for both surface ships and submarines.

Other areas of scientific interest include the ability of some aquatic organisms to dive deeply without the adverse effects sometimes suffered by human divers. There also is interest in the development of artificial gills to obtain oxygen from water, and the use of algae to purify air in underwater equipment.

Hagen said the National Fisheries Center will provide every possible assistance to ONR in reaching its research objectives.

Design of the Center is expected to be completed in about 16 months, and completion of construction is anticipated in 1967. The construction site is at Hains Point on the Potomac River a few blocks south of the Nation's Capitol.

Authorizing legislation voted by Congress in 1962 provides that the Center must be self-supporting. Construction and operating costs are to be paid from an admission charge to all visitors except supervised youth groups. More than three million persons are expected to visit the Center annually.

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