BIOLOGY

Biology by the Sea

The Bermuda Biological Station, situated at a world famous vacationland, is providing scientists with answers to the mysteries of the sea.

By HOWARD SIMONS

➤ THE SAME CLEAR blue water that provides scenic beauty and recreation for countless thousands of visitors to Bermuda may also provide clues to some scientific mysteries.

Each summer, about two dozen men and women from the United States and a few other nations come to an old sea resort nestled on a small knoll, just opposite Kindley Field, the U. S. Air Force base in Bermuda. As other comers to the Island, they wear Bermuda shorts and go fishing, skin diving and boating. But, these are neither honeymooners nor vacationers. They are scientists. And their fishing, skin diving and boating is not for pleasure, but part of their research.

They come to Bermuda because it is a permanently anchored science station in the Atlantic Ocean, with the deep sea close at hand, an abundance of sea life, and some of the clearest ocean water in the world.

The old sea resort hotel is now the Bermuda Biological Station, a meeting and working place for scientists engaged in research to learn more about the world and its inhabitants. The Station is representative of many others like it in other countries throughout the world.

Unknown Oceans

The ocean, which covers two-thirds of the surface of the earth, is becoming more and more important to the land dweller. Yet, man knows less about the ocean than he knows about most other parts of his environment. Great amounts of money are being spent to explore upwards into outer space. Comparably, almost nothing is being spent to explore the depths.

Many scientists are convinced that if the world is going to be capable of feeding, clothing and sheltering an overpopulated community, it will have to turn to the sea to do it. As Dr. William H. Sutcliffe, Jr., director of the Bermuda Biological Station, put it, "If we stop to think about it, everything that is grown and eaten, and everything that is mined and made, eventually ends up in the sea. Somewhere along the line, we will have to get it back."

It is not surprising, therefore, that some of the studies at this island marine biology station are directly aimed at learning how man can best harvest the sea.

One study, for example, involves probing the Sargasso Sea, a 1,000,000 or so square mile eddy lying mostly to the southwest of the Island. It is one of the most impoverished areas in the world. The cause of its apparent near sterility is that it lacks nutrients to sustain little more than a sparse population of tiny plants and animals called plankton. The sea, like the land, needs fertilizers, particularly nitrates and phosphates. Normally, these show up in the ocean from either runoff from land masses or from an upwelling of ocean water. The Sargasso Sea has neither source.

The Sargasso Sea is so barren of animal life that few large fish make their permanent home there. But the tiny animal populations and how they sustain themselves is highly important to researchers. Their sustenance is what interests Dr. David W. Menzel of the Bermuda Biological Station staff.

He is one of a team of researchers currently making a year-round study of the productivity of nutrients in the Sargasso Sea in collaboration with the Woods Hole Oceanographic Institute under a grant from the Atomic Energy Commission.

It is conceivable that the picture Dr. Menzel will be able to paint at his research's end will provide fishermen everywhere with a system for predicting commercial fish populations. Plankton depend on nutrients. Small fish depend on plankton. Large edible fish depend on small fish. By following the nutrients in the sea, one might be able to follow fish.

Other scientists from the United States, France and Sweden are studying underwater optics, how fish navigate and what the constant chattering between underwater creatures means.

Not all the research involves the sea itself. Many of the studies at the Station depend on the sea for experimental animals. Work on what happens during the development of the cells in these animals, for example, can be applicable to what happens in human cells.

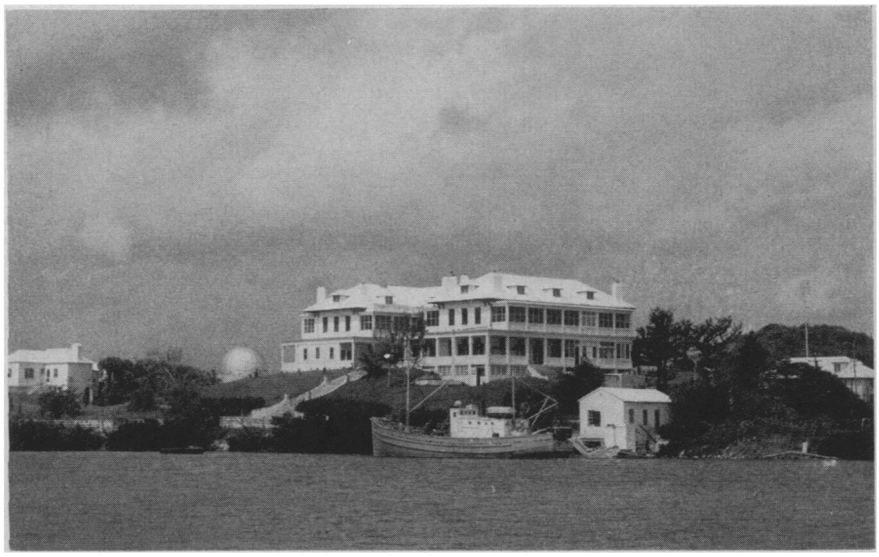
Other studies are aimed at trying to fit together some of the pieces of that giant jigsaw puzzle we call life. Dr. Ivan M. Goodbody of the University College of the West Indies, Mona, Jamaica, for example, is hoping to explain why a small sea animal known as the tunicate stores some of its waste, rather than passing it out of its body.

Dr. Sutcliffe himself is engaged in research, something he squeezes in between the constant demands made of him as the Station's chief administrative officer. He is studying the plankton in the Bermuda area to determine where the spiny lobster originates. This clawless delicacy is a commercial sea animal and important to the Island.

School for Biologists

The Station is also providing several medical students with an opportunity to perform research and, at the same time, study a tailored course in marine biology being taught by a group of working researchers. This project is being conducted in cooperation with New York University.

What the scientists find in their relatively short stay at the Station often takes months to analyze, interpret and record. Much of this is done back in the universities from which the researchers have come to Ber-



BERMUDA FOR SCIENTISTS—This one-time sea resort hotel is now serving science as the Bermuda Biological Station where researchers from throughout the world gather to skin dive, boat and fish—not for fun, but to unravel the mysteries of man and his environment. The Station's 60-foot research vessel, the Panulirus, is in the foreground.

muda. Almost all the scientists at the Station are also professors.

Their work is supported, in large measure, by grants from many sources—either their universities, the Station itself, or such Government agencies as the National Institutes of Health, National Science Foundation, the Atomic Energy Commission and the Office of Naval Research.

The Station, in turn, is supported by funds from an original endowment by the Rockefeller Foundation, grants, and by fees charged to the scientists who use its research boats, laboratories, equipment and housing facilities.

Historically, the Bermuda Biological Station for Research was established in 1903 through the joint efforts of the Bermuda Natural History Society, Harvard University and New York University. The present Station was officially opened in 1932. Although it had its ups and downs until after World War II, the Station today is considered one of the best of its kind in the Western Hemisphere.

Because of its location in the Atlantic Ocean, it offers scientists ready access to the study of problems in oceanography and biology. Collecting and field work can be maintained throughout the year.

Important, too, is the fact that life at the Station for both the permanent staff and the visiting scientists is a pleasant one. In many respects, it resembles a college campus in its friendliness and atmosphere.

The character of this marine biology station is perhaps best caught when the layman strolls around and eavesdrops, as this writer did. On his first visit, the first words he heard were, "Hey, Dave, your eggs have hatched!"

Science News Letter, October 4, 1958

ENGINEERING

Solar Furnace Features Front-Surface Mirror

See Front Cover

➤ A GIANT solar furnace, dedicated at the U. S. Army's Quartermaster Research & Engineering Command in Natick, Mass., on Sept. 30, can bring a sample of material at the image position to a temperature of 5,000 degrees Fahrenheit.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows some of the 180 spherical mirrors, each two feet square, that make up the concentrator or heart of the furnace. All the mirrors are contained in a 30-square-foot frame.

Through the development of a special slumping technique, American Optical Company scientists were able to curve each mirror to a radius of 472 inches without grinding and polishing. The collector mirror is front-surfaced by vacuum deposited aluminized reflecting material with a protective silicon monoxide coating.

It is believed that the use of a front-surface mirror will be more efficient than the conventional back-surfaces due to less heat loss by absorption. Concentration of the sun's radiation results in an image approximately four inches in diameter focused within the test chamber.

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