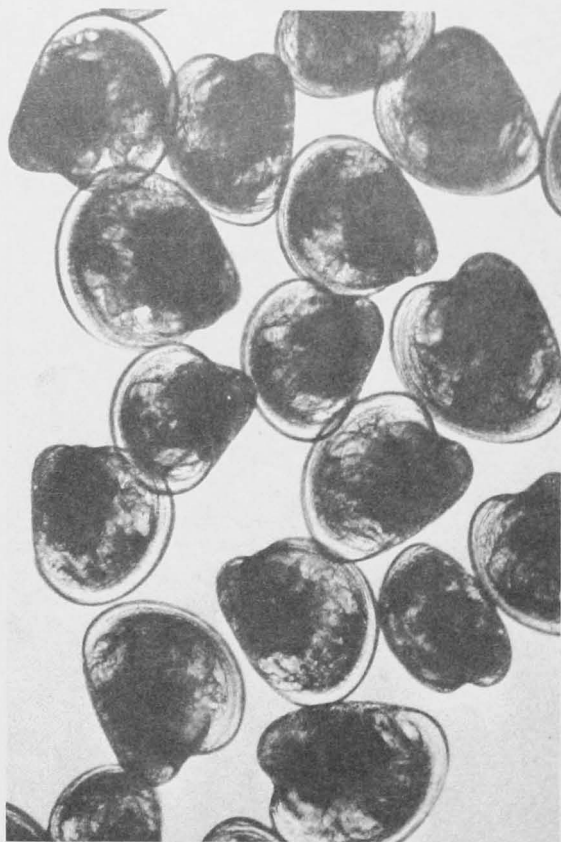
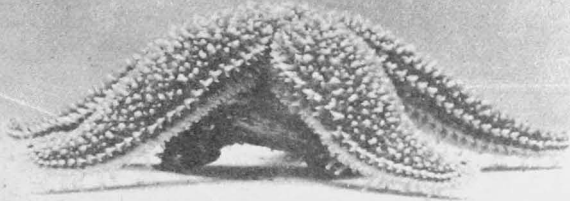


Bureau of Commercial Fisheries Biological Laboratory

Milford, Connecticut



UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE
Bureau of Commercial Fisheries



Starfish attacking an oyster.

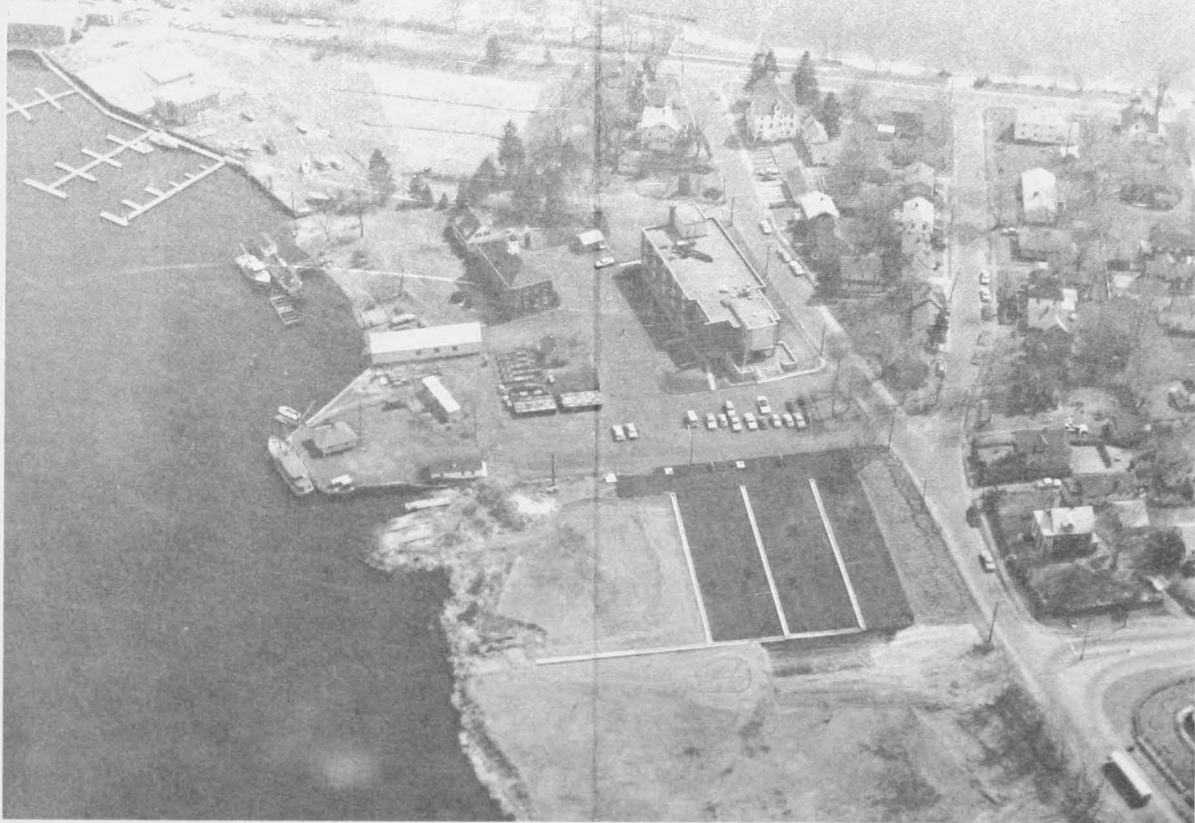
The Bureau of Commercial Fisheries Biological Laboratory, 212 Rogers Avenue, Milford, Conn. 06460, was established in 1931 when a full-time scientist was assigned to study biological problems of Connecticut's oyster industry.

The Laboratory is located on Milford Harbor, about 300 yards from the open waters of Long Island Sound and within a short distance of mud flats, salt marshes, salt-water embayments, and tidal estuaries with bottom types ranging from soft mud to hard sand and rock.

The Laboratory has grown considerably since 1931. The present staff of about 24 includes 14 biologists. The original facility, a one-room wooden building supported on pilings, was replaced in 1940 by a brick building having about 4,800 square feet of floor space. This structure, in turn, was outgrown, and a modern three-story laboratory-office building was completed in October 1966. It has more than 28,000 square feet of floor space and contains 17 research laboratories, an experimental shellfish hatchery, administrative offices, a combined library-conference room, and a lobby-display area. Each laboratory can be supplied with up to 100 amps of electrical energy, hot and cold running sea water, hot and cold domestic water, fresh well water, natural gas, and compressed air. Eleven of the research laboratories have constant-temperature water tables. Two additional rooms—one for algal stock cultures and one for mass culturing of algae—can be maintained at 55° F. the year round. In addition, there are extensive sterilizing facilities, a walk-in refrigerator, deep freezer, and quick freezer.

The library is limited to publications that have a direct bearing on current research programs. Complete library facilities are available through Sterling Memorial Library and the Bingham Oceanographic Laboratory's library, both about 9 miles away, at Yale University, New Haven, Conn.

(Cover) Photomicrographs of free-swimming oyster larvae that have grown almost to the size at which they become attached (set) on shells, rocks, or other substrate (cultch).



Aerial view showing BCF Biological Laboratory and adjacent area.

Construction of a tank farm of 54 fiber glass tanks 30 feet by 4 feet by 18 inches will be completed in 1969. Some tanks will be used to rear clams and oysters that are large enough to be planted in open water with minimum loss. The effect of the rate of flow of sea water and density of planting on the rate of growth will be studied. Other tanks will be used to raise the offspring of many types of genetic crosses that must be kept under constant surveillance, because such crosses may have the accelerated growth rates and improved survival that are needed to rejuvenate the oyster industry. Tanks will have a constant supply of sea water pumped from Milford Harbor.

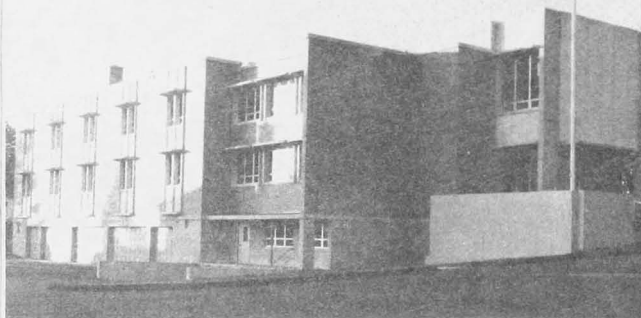
The Laboratory's equipment for offshore research includes a 50-foot research vessel, the *Shang Wheeler*, which operates year-round in Long Island Sound. It has standard hydrographic gear and dredge equipment for sampling bottom organisms. A small laboratory on the main deck can accommodate four to six scientists.

Several small motorboats are on hand for inshore work, and standard SCUBA equipment, including an air com-

pressor unit, is available. A member of the staff is a trained diver/biologist.

The aim of the Laboratory is to develop basic biological information for increasing production of mollusks such as oysters and clams through development of commercially feasible techniques of "seed" production and methods of predator control. The principal research projects include: Physiological requirements and behavior of larval and juvenile mollusks; effect of environment on growth and fattening; genetics (to produce higher quality meats and disease-resistant strains); physiological requirements of marine algae utilized as food by molluscan shellfish; and development of mechanical and chemical methods to control predators such as starfish and oyster drills.

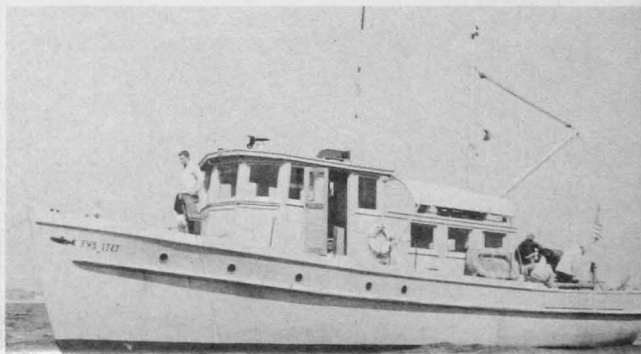
The Milford staff has made significant contributions to knowledge in its evaluation of the ability of adult bivalve mollusks to tolerate changes in their environment; in development of techniques for inducing spawning of mollusks through the year; and in development of standard methods for rearing molluscan larvae. The



The Laboratory's new building.

successful rearing of larvae has permitted extensive studies of their food requirements and of the ranges of temperature, salinity, pH, and turbidity that they can tolerate. A study of the factors producing rapid growth of juvenile mollusks has shown the importance of temperature and salinity, and particularly of an adequate flow of sea water immediately over the beds, to replenish constantly the available food supply. More than 80 algal species are maintained for distribution to commercial hatcheries and to other investigators. Much has also been learned of how the survival and growth of larvae are affected by various concentrations of toxins that occur in domestic and industrial pollution and in estuarine runoff from pesticide treatments for agricultural purposes. As a result of this work, some persons who have received training at Milford have established commercial molluscan shellfish hatcheries in the United States. In addition, scientists from Denmark, Scotland, England, France, Spain, Canada, Korea, India, and Thailand have been trained in laboratory culture techniques.

The BCF research vessel *Shang Wheeler* in Long Island Sound with diver/biologists preparing to go off stern to check effects of treated oyster bed.





Tank farm.

The Laboratory has also developed a successful chemical method to control oyster drills in Connecticut and New York and has made progress in developing chemical controls for other predators, competitors, and fouling organisms.

Facilities are available throughout the year for one or two visiting investigators. Requests for space and an outline of the research program contemplated must be submitted to the Laboratory Director 3 months in advance.



The national objectives of the Bureau are to:

Increase the net contribution of aquatic, living commercial resources to the Nation's economy;

Increase efficiency so that the economic status of those engaged in the fishing industry is improved;

Provide for the growing and diversified demands of the American people for fish and shellfish products whether in the form of edible foods or other products, from efficient and economical sources;

Seek means of bringing more of the world's aquatic resources into economic, commercial production for the benefit of all mankind;

Contribute to man's understanding and control of aquatic living resources and their environment.

Fishery biologist and research geneticist examine adult and juvenile oysters, *Crassostrea virginica*, as a part of the heritability study currently under way to selectively breed improved shellfish stocks.

UNITED STATES
DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES
WASHINGTON, D.C. 20240

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The Department works to assure the wisest choice in managing all our resources so each will make its full contribution to a better United States—now and in the future.

December 1969

