to support plant inspections. The present-day plant manager should know before any outside inspection just how his firm stands in so far as bacterial counts are concerned. In short, each producer of seafood should establish some form of bacteriological control. This control is particularly helpful with the recent trend toward establishment of standards for frozen foods. Private consultants have provided this service satisfactorily for many plants.

The importance of bacteriological control is indicated by the fact that it has been the subject of many talks by other Bureau technologists. It should be a topic of interest to all who are concerned with the processing, handling, or storage of seafoods.

Much Technological Information Available

The Bureau publishes *Commercial Fisheries Abstracts,* which covers material pertaining to fisheries from all over the world, including its own scientific publications. These abstracts are on file in each Bureau office to assist us in answering your questions. Interested persons may have CFA mailed to them free of charge upon request by writing to the Director. In addition, other sources of information, such as the monthly journal *Commercial Fisheries Review* is published, which contains original articles of interest to commercial fisheries.

Many people familiar with the problem of getting scientific information into the hands of ultimate users have suggested an approach similar to that used by the Department of Agriculture in their County Agent program. Perhaps it will be possible some day to have the funds, facilities, and personnel available to carry the information directly to the plants where the seafoods are produced.

At Pascagoula, a step has been taken in that direction by the holding of a Canned Shrimp Seminar. Round-table discussion between members of the industry and the laboratory personnel resulted in the dissemination of information on problems from both the commercial processors and the research workers. Additional seminars covering other products are planned.

We invite all interested persons in Region 2 to send their requests for information on fishery technology to the Pascagoula Technological Laboratory.

Report on the New Albatross IV

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A NEW ERA in fisheries-oceanographic research will soon begin with the commissioning of the ALBATROSS IV. The new vessel has been built to serve the research needs of the Bureau of Commercial Fisheries Biological Laboratory at Woods Hole. It is one of several new vessels to be built by the Bureau to assist in meeting the pressing demands for a better understanding of oceanic resources.

The ALBATROSS IV perpetuates an illustrious name in the annals of marine research that started with the steamer ALBATROSS, launched in 1882. It was the first vessel built especially for marine research by any government, and like the Woods Hole Laboratory, it was originally conceived by Spencer F. Baird. For forty years it provided a platform for biological and oceanographic research from the North Atlantic to the North Pacific.

The ALBATROSS II was a converted Navy tug. It served the purpose of Walford, Bigelow, Herrington, and many other well known marine biologists in the New England area for six years prior to 1932 when it was inactivated.

The ALBATROSS III, also a conversion, was used for fishery research in the New England area from 1948 until 1959. Much of this research was concerned with the problems of the International Commission for the Northwest Atlantic Fisheries. This research made possible the regulation of the cod and haddock populations and generally advanced our knowledge of the techniques of fishery management. Particularly, it made possible the planning of a more profound study of the ocean environment when funds became available for a new and truly efficient and flexible research vessel.

Following long and careful consideration of the requirements for their new vessel by the Woods Hole staff, the ALBATROSS IV was designed by Dwight S. Simpson and Associates, Marine Architects and Engineers of Boston, Massachusetts, to meet these requirements.

It is a unique vessel in a great many ways, being designed for completely modern and efficient fishery-oceanographic research. It is, for example, the first

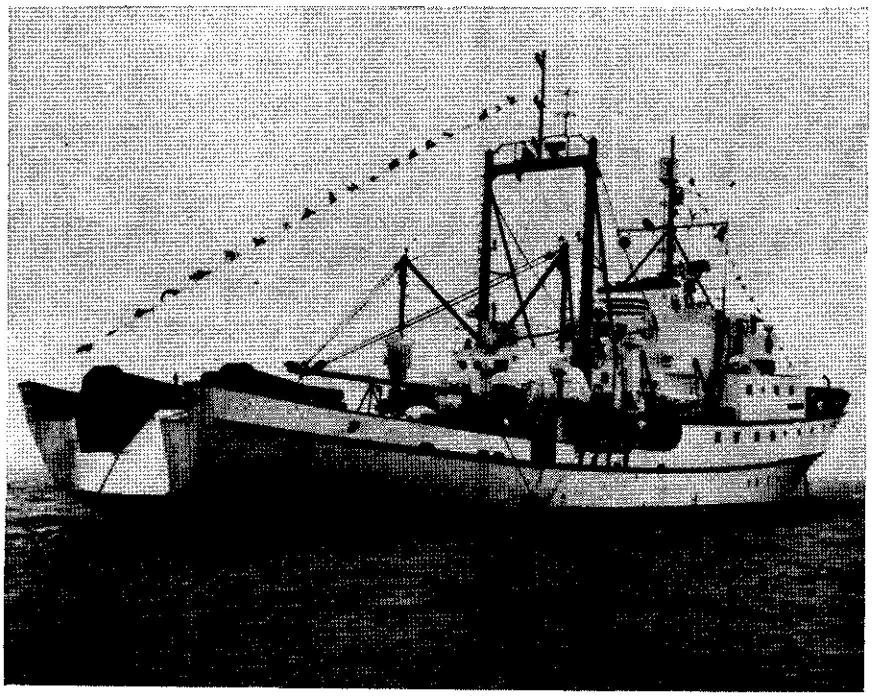

FIG. 1. The first stern trawler to be built in the U. S. A. The fishery - oceanographic vessel ALBATROSS IV will be operated by the U. S. Bureau of Commercial Fisheries, Woods Hole, Mass.

stern trawler to be constructed in the United States. Vessels with similar stern ramps have been used for many years now by various European countries, only a few, however, with movable gantries. The gantry is hydraulically controlled to move fore and aft through an arc of 115°. It can literally transport apparatus weighing up to 10,000 pounds from the surface of the water astern to a position well forward on the stern deck. Its principal functions will include handling fishing nets, bottom dredges, heavy bottom samplers, and similar gear.

The new vessel is unusually maneuverable. Precision research frequently requires the exact positioning of the vessel with regard to bottom topography, currents, wind, and so forth. ALBATROSS IV can literally move sideways against a considerable wind. This is accomplished through the combined action of the bow thrust engine and the Kort nozzle. The Kort nozzle replaces the conventional rudder, and is essentially a movable tube enclosing a variable pitch propeller.

The double-drum, main-trawl winch is located out of the way on the lower deck. Each drum holds 6,000 feet of ⅞-inch diameter cable with a level mechanism that can be adjusted for various wire sizes. The drums are driven through a reduction gear by a 125 h.p. electric motor to develop a stalled line pull of 30,000 pounds on both warps. From the winch, the warps run forward and up to a pair of 20-inch sheaves on the main deck and aft to the towing blocks just inside the throat of the gantry. The warp from the dredging winch, with 4,000 feet of ⅝-inch cable, is led in a similar manner along the midline of the vessel. The winch is equipped to handle conductor core cables.

The sheaves on the main deck for the trawl and dredging winches are covered by a 36-inch high counter which also supports a vertical capstan and a small winch with 100 feet of ½-inch cable at each end.

The main boom is set on the mid-line of the ship at the forward end of the fishing deck. It will lift 10,000 pounds at a 34-foot radius and has two sets of falls, each with its own winch. On each mast there is a 24-foot steel pipe boom with powered falls and hand operated vangs. The control station for the main trawl winch, dredging winch, the main boom vangs, and the two fall winches on the boom is located at the after end of the boat deck just to starboard of the center line. From here, the winch operator has a clear view of the entire fishing deck.

At the after end of the boat deck, on the port side, there is an articulated hydraulic crane which can reach down to the water line, pick up a 1,000-pound load and deposit it on either the main deck or the boat deck anywhere within a 13-foot radius of its base. There are two hydrographic winches on the after end of the boat deck as well, each with a capacity of 20,000 feet of ¼-inch wire. Collector rings are provided for five electrical conductors. The control console is on the end of a 20-foot extension cable so that each winch can be operated either at the winch, at the rail, or on the main deck.

A watertight well, 5 by 6 feet wide, for servicing transducers, runs from the main deck down to the bottom of the ship. At the bottom, on each side of the keel there are hinged, watertight doors that hold the sounding transducers. The transducers can be changed or serviced at sea by putting a man in the well, pumping in air until sufficient pressure is created to prevent flooding, and then opening the lower doors. In addition are two instrument wells, one in the wet laboratory and another in the hydrographic laboratory. These are approximately three and a half feet square and can be opened or closed by a diver or can be used to put divers in the water.

Salt water is supplied to the wet laboratory, the rough laboratory, and the fishing deck by a non-corrosive, non-toxic system. The suction is located so that the entering sea water is not contaminated from any of the ship's discharges.

The arrangement of the laboratory spaces was carefully designed to provide good communication between them as well as with the rest of the ship, but at the same time to keep them separate from the traffic of people engaged on other business. As little of the furniture and equipment as possible is permanently fastened to the ship's structure so as to permit easy rearrangement to meet the needs of the future.

Just forward of the fishing deck, open aft and on both sides, but sheltered by the house forward and the deck overhead, is a 32- by 10-foot area designed for the preliminary processing of the collections. There is a bathythermograph winch with 2,000 feet of 3/16-inch wire with its own hydraulic "A" frame at each rail. A dumb-waiter communicates with the storage room on the lower deck and up to the boat deck, to facilitate the transportation and storage of specimens and supplies.

Forward of the rough laboratory on the port side is the 13-foot by 33-foot wet laboratory, divided into two separate spaces by a movable bulkhead. Facilities include a wet gear locker, dumb-waiter to decks below and above, sinks, salt water tables, work benches, overhead cabinets, refrigerator, and storage lockers. Every 3 feet along the permanent bulkheads are outlets for 110 volt alternating current, compressed air, cold salt water, hot fresh water, and cold fresh water.

Forward of the rough laboratory on the starboard side is a 10-foot square hydrographic laboratory for the immediate processing of water samples. It has Nansen bottle racks, storage cabinets, work bench, sink, and desk. Over the desk is an instrument panel giving time, ship's heading and speed, water depth, wind direction and velocity, air temperature, relative humidity, sea surface temperature, and barometric pressure. The indicating and recording unit for the telerecording bathythermograph is also visible from the desk. Communicating with the hydrographic laboratory is a 7- by 13-foot space for chemical analysis. It is equipped with a sink, work bench, cabinets, freezer, salinometer, and spectrophotometer.

Forward of the chemistry laboratory, the dry laboratory, 11 by 15 feet, has a drafting table, desks, a work table, cabinets, typewriter, and calculators. Here the asdic and 6,000-foot sounder signals can be displayed on a precision graphic recorder for study and analysis.

There is a 10- by 12-foot laboratory on the after part of the boat deck intended primarily for underwater television research, and the monitoring, maintenance, and repair of specialized electronic equipment. It has work benches, cabinets, cable ports, four kinds of electric power, and a dumb-waiter communicating with the main and lower deck. Like all other laboratory spaces, it can be readily converted to other purposes.

The after 50 feet of the lower deck is a single large compartment. Both outboard bulkheads are lined with bins for fishing gear and shelves and cabinets for sample containers. The trawl winch and dredging winch occupy the center of the room. Aft of the winches there is an elevator set under a flush hatch in the trawl deck to move heavy gear between the two decks. A walk-in refrigerator and a freezer are at the forward bulkhead.

Forward of the engine room are six cabins for scientists, one of which meets the requirements for a hospital room. Each cabin has three berths, lockers, bureau, and lavatory. These facilities, as others, can be expanded to carry a larger crew if so required.

This is but a brief resume of the facilities and equipment of the ALBATROSS IV. At the moment, perhaps its best feature is that it is capable of severely challenging an experienced fishery scientist to realize its full potential as a scientific tool.

The Shellfish Research Program of The Public Health Service

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Abstract

The Public Health Service has for almost fifty years participated with the States in a program designed to insure that oysters, clams, and mussels will not serve as a vector of disease. The Public Health Service has carried on a research program in support of this program, and for several years maintained a small microbiology laboratory at Pensacola, Florida. A new shellfish research center, which will have a staff of about 35, is being constructed at Dauphin Island, Alabama. This facility will carry on research projects in estuarine microbiology, the presence of chemicals in shellfish, biologically-active agents in marine organisms, and the influence of commercial practices on the quality of shellfish as marketed. Emphasis will be placed on the development of a practical system for shellfish depuration. On a longer range basis it is probable that the research program will be extended to encompass the broader areas of environmental oceanography and marine food protection with investigations ordinarily directed toward the public health elements of these fields.

TO UNDERSTAND THE PAST RESEARCH PROGRAMS of the Public Health Service and to better understand our probable future course of action, it is desirable to have an understanding of the role the Public Health Service has in the shellfish sanitation field and of the areas of our research interests. Discussions of the Public Health Service's shellfish sanitation activities have been presented before many health oriented groups; however, it has been our experience that it is not generally well understood by the conservation or the fishery research agencies.

The objective of the Cooperative State-PHS-Industry Program for the Certification of Interstate Shellfish Shippers may be stated simply as the assurance that shellfish—fresh or frozen oysters, clams, and mussels—shipped in interstate commerce will be safe to eat. This concern stems from the fact that these species of shellfish (a) ordinarily grow only in estuarine areas where, under certain conditions, they may be subject to varying degrees of pollution with domestic sewage; (b) are filter feeders; and (c) are eaten whole. In addition, these shellfish have the unusual ability to concentrate certain highly toxic materials such as paralytic shellfish poison or other industrial or agricultural chemicals. These factors, plus the fact that they may get only superficial cooking, give shellfish an unusual potential for the transmission of diseases and poisons.