PROGRAM

for the

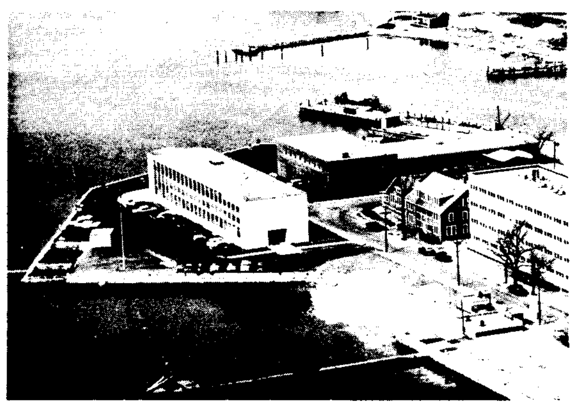
DEDICATION

of the

BUREAU OF COMMERCIAL FISHERIES

BIOLOGICAL LABORATORY

Woods Hole, Massachusetts



June 23, 1962

United States Fish and Wildlife Service
Department of the Interior

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Woods Hole Oceanographic Institution, Woods Hole, Mass.

DEDICATION PROGRAM

National Anthem

Mrs. Fred Nichy

Invocation

Reverend Father Edwin J. Loew

Introduction

David H. Hart
Chairman, Atlantic States Marine Fisheries Commission

Welcome to the Commonwealth

Charles H. W. Foster
Commissioner, Department of Natural Resources
Commonwealth of Massachusetts

Welcome to Community

John DeMello, Jr.
Chairman, Board of Selectmen, Falmouth, Massachusetts

Scientific Address

Dr. Detlev W. Bronk
President, The Rockefeller Institute

Dedicatory Address

D. Otis Beasley
Administrative Assistant Secretary
Department of the Interior

Benediction

Reverend Edgar Lockwood

Guests are invited to visit the Laboratory and Aquarium
after the Ceremony

WOODS HOLE - CENTER OF MARINE SCIENCES

Woods Hole, Massachusetts, has been an active center of marine research since the 1870's. In that decade Spencer F. Baird, U.S. Commissioner of Fisheries, and a staff of scientists conducted studies of the local fishes in summer at the Lighthouse Station in Little Harbor, while Louis Agassiz founded the Anderson School of Natural History on nearby Penikese Island where students came to study marine life under his inspiring tutelage.

After several summers at Little Harbor and elsewhere at various points along the Atlantic Coast, Spencer Baird was convinced that Woods Hole was the ideal spot for a permanent fishery laboratory. As a result of his interest and diligence, suitable land was acquired by the Government upon which a permanent laboratory was constructed in 1885. These buildings served the purposes of the "Fisheries", as the fisheries laboratory is usually called locally, until 1958 when they were razed to make way for the present structures.

The laboratory on Penikese was short-lived due to the remoteness of the island and lack of financial support, but the spirit of Agassiz and the general interest in a summer school for biologists and students was carried over to the organization of another laboratory which became established in Woods Hole. The Women's Education Association of Boston raised $10,000. which were used in the purchase of land and erection of buildings for the "Marine Biological Laboratory" in 1888. The first "MBL" building was a very modest frame structure with few facilities. The investigators depended upon the Fish Commission for vessels to collect marine animals and plants and for the saltwater supply to maintain them ashore. Through the generosity of individuals and private foundations, this Laboratory enjoyed a continuous growth and today boasts many permanent buildings, an outstanding library, and the best of laboratory equipment, particularly in the fields of physiology and biochemistry.

This Laboratory still functions primarily as a summer laboratory where biologists come from universities and research institutions from all parts of the country and foreign lands to carry on their researches. The organization of the "MBL" is unusual in that it is owned by the biologists themselves, many of whom return to Woods Hole each summer to carry out their investigations. Financial support comes largely from universities through rental fees for rooms and tables occupied by their teaching staffs and students. An endowment fund has been built up over the years from funds contributed by private individuals and foundations. These funds have not been adequate in recent years to meet all the demands for space so than an appeal to the Federal Government for help resulted in a grant from the National Science Foundation and the National Institutes of Health which was used to match funds contributed by the Rockefeller Foundation for the construction of their newest laboratory completed in 1960.

The Marine Biological Laboratory has a long history of scientific achievement. Although it has no year-round resident scientific staff, it deserves credit for the discoveries made by its corporate members, and visiting investigators. The accomplishments of these researchers reflects the progress in biological science in the country as a whole. The work here has always focussed on fundamental principles of biology rather than on the study of marine organisms per se, and on instruction offered to advanced students. Some of the outstanding discoveries in the fields of embryology, genetics, cytology, ultrastructure, physiology, and biochemistry were made in Woods Hole.

The "MBL" offers an unusual opportunity for students to spend two months of the summer dedicated to science in an atmosphere of research where they can associate with leading biologists, and attend courses in embryology, physiology, marine invertebrates, marine botany, and ecology.

The third and largest scientific institution in Woods Hole arrived relatively late. In 1927 the National Academy of Sciences formed a committee to review the status of oceanography particularly in the United States. The committee recommended in 1929 that an institution devoted to oceanography be established on the east coast of the United States.

The Woods Hole Oceanographic Institution was founded in 1930; supported by an initial grant from the Rockefeller Foundation of two million dollars. A portion of this sum used for the construction of a laboratory building and the construction of the oceanographic research vessels Atlantis and Asterias. Additional funds were contributed by the Foundation for the support of the research program during the first ten years. Because of the direct practical value of many phases of oceanographic research, the Woods Hole Oceanographic Institution has received substantial assistance from the Office of Naval Research and other governmental agencies. In 1954 the Navy constructed an additional building for the Institution.

The WHOI has a year-round program of broad oceanographic research dealing with all aspects of the science. It has a fleet of half a dozen vessels that cruise all areas of the North and South Atlantic in a study of ocean currents, bottom topography, structure of the earth, composition of seawater, and the interrelations of biological phenomena in the sea.

Taken together, the three scientific institutions of Woods Hole, (Fisheries, MBL, and WHOI) present a broad front in the attack upon the mysteries of the sea. With its large fleet of vessels the Woods Hole Oceanographic Institution studies the general circulation of the Atlantic and the theories of oceanographic processes. The fisheries laboratory focuses on marine fishery problems, many of which can be solved only through a study of oceanographic conditions. The Marine Biological Laboratory uses marine materials for delving deeper into the revelation of the nature of life itself, and turns its attention to more local situations.

THE BUREAU OF COMMERCIAL FISHERIES PROGRAM IN FISHERIES OCEANOGRAPHY

The present Bureau of Commercial Fisheries derives its authority from the Fish and Wildlife Act of 1956 which provided for a Fish and Wildlife Service composed of two separate bureaus, a Bureau of Commercial Fisheries and a Bureau of Sport Fisheries and Wildlife. The Act charges the Bureau of Commercial Fisheries with many responsibilities relating to the development, protection and wise use of the resources of the sea.

Included in these responsibilities is the study of the resources in order to develop and recommend measures which are to assure the maximum sustainable production of fish and fishery products.

Since many saltwater fishermen sail hundreds of miles from home to procure their catches, the fishery resources with which the Bureau of Commercial Fisheries is concerned are found over large ageas of the oceans. Thus, in order to fulfill its obligations to the fishing industry and the American people, the Bureau has found it necessary to develop a number of research programs related to the high seas fisheries and oceanography over wide areas of the seas. These are conducted from 18 major research laboratories supported by 7 oceangoing research vessels.

The Pacific tuna program with staffs and vessels based in Hawaii and California extends over the tropical Pacific from California to areas well west and south of the Hawaiian Islands. To properly study the North Pacific salmon fishery biologists may be working anywhere on the high seas between Canada, Alaska, Japan, and Russia. The California sardine investigations take Bureau biologists and oceanographers to areas off the coasts of California and Mexico. In the Atlantic the important groundfish resources which have traditionally supported the New England fisheries require ocean studies between Cape Cod and Newfoundland. The great offshore shrimp fisheries of the South Atlantic States and the Gulf of Mexico are being studied from Galveston, Texas and St. Petersburg, Florida, with investigations ranging as far south as South America. The studies of the vast menhaden fisheries are centered at Beaufort, North Carolina, but the investigations range from Long Island to Texas. The Atlantic herring, known in the United States as the Maine sardine, receives attention at the Bureau's Laboratory in Boothbay Harbor, Maine. More recently the Bureau has turned its attention to the tropical Atlantic between Africa and the Americas in order to explore the tuna resource and to investigate oceanographic conditions in that area.

Since much of the marine fishery resources are in international waters the Bureau is obligated to conduct much of its work on an international basis. Any regulation of fishing on the high seas requires cooperation with other countries. Furthermore, research in these areas is greatly facilitated if planned and executed formally with other governments. As a result the Bureau's research is now concerned with nine international fishery commissions, and with other organizations such as the International Oceanographic Commission of UNESCO and the Special Committee on Oceanographic Research of the International Committee of Scientific Unions.

THE WOODS HOLE FISHERY LABORATORY'S PROGRAM TODAY

Although the methods and techniques in fishery science have changed, the objectives of the "fishery laboratory" today are the same as they were when Spencer F. Baird established this type of research in the last century: to increase our store of fundamental knowledge about the fish and fisheries of the sea so that exploitation may be both continuous and maximal; thus insuring a harvest for tomorrow as well as for today.

The present Laboratory program can be divided into two parts, (1) studies of the biology of population dynamics of important species with a view to management recommendations and (2) broad ecological and studies of the ocean waters in which these species live. Our work is concentrated on groundfish species, as other Laboratories along the coast direct their attention to pelagic fishes and inshore molluscs. There are specific programs conducted at Woods Hole for cod, haddock, silver hake, redfish, flounder, and sea scallop, while broader programs cover such subjects as oceanography, planktology, benthic organisms, groundfish ecology, physiology and fish behavior.

Limiting the fishing effort on a commercial marine species is extremely difficult to accomplish both from a technical and a sociological point of view. Methods which are used in inland sport fisheries, such as restricting the season of fishing or area fished, are not practical in a high-seas commercial fishery. The approach used to date has been to decrease the fishing pressure on the smaller sizes of fish while allowing full effort on the larger sizes. This has been accomplished by specifying large meshes in otter trawl nets, the standard type of gear used by United States commercial groundfish fishermen. To date only two species, cod and haddock, have been brought under minimum mesh size regulations as a result of research conducted in recent years at Woods Hole.

The marine fisheries beyond the three-mile limit are in international waters so that any regulation of fishing activity must be effected through international agreement. In the year 1950 the International Commission for the Northwest Atlantic Fisheries was brought into being for the "investigation, protection and conservation of the fishes of the Northwest Atlantic Ocean, in order to make possible the maintenance of a maximum sustained catch from these fisheries...." Thirteen nations with fishing interests in the convention area, which extends from Greenland to Rhode Island, are members of this Commission: Canada, Denmark, France, West Germany, Iceland, Italy, Norway, Poland, Portugal, Spain, USSR, United Kingdom and the United States of America. All fishery research conducted by member countries in the convention area is planned and reviewed annually by appropriate committees of the Commission. The Woods Hole Laboratory has the responsibility of fulfilling United States research committments.

Management measures today are concerned solely with regulating the fishing effort on the available stocks of fish. Nature does not provide a constant supply of fish much to the fisherman's discomfiture. Since the availability or abundance of fish fluctuates drastically from year to year, it is the responsibility of the fishery biologist to determine the factors of the environment which cause these variations in abundance. This requires a thorough knowledge of all aspects of the biology of the species and of the interrelation of the fish within this environment.

Developing this understanding requires a long range program of basic research fishery biology and oceanography. Marine fishes produce eggs by the hundreds of billions, but most perish in the first month of existence, falling prey to disease, and predators, or they drift off to unfavorable environments carried by the vagaries of ocean currents.

The old method of hatching eggs in the laboratory and then returning them to the sea has not proven successful for pelagic fishes. A million larvae "planted" in the sea sounds impressive, but it is not a drop in the proverbial bucket when compared to the numbers nature herself produces each year in her attempt to maintain the species in a precarious world.

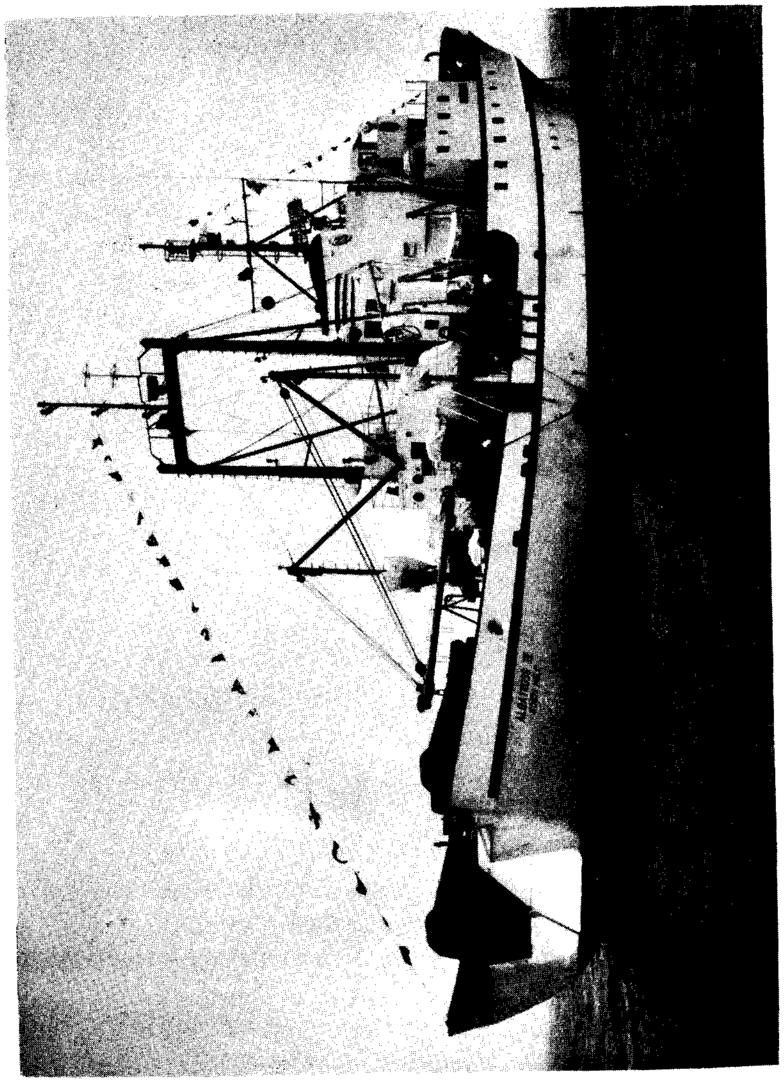
Our problem is to determine the normal fate of these billions of individuals, and to discover the conditions which are conducive to increased survival. There are so many aspects to a research program involving a study of the physical, chemical, and complex biological conditions of the sea that the scope of the investigators to have any hope of success, must necessarily be limited in geographic area. The Woods Hole Laboratory accordingly conducts its studies in the part of the ocean closest to home, namely, in the area between Nova Scotia and New York which includes the Gulf of Maine and Georges Banks.

What needs to be done now is to relate changes in the environmental conditions with changes in the fish populations. To accomplish this the Laboratory will embark this year upon an intensive series of oceanographic surveys in our area, extending over a five year period in order to build up the necessary data for such a study. A new vessel, the <u>Albatross IV</u>, is now being build, and will be placed in operation in October to carry out these studies.

The acquisition of this vessel, together with the new Laboratory buildings, will complete the replacement of all the old floating and shore facilities of the Woods Hole Fishery Laboratory.

United States
Department of the Interior
Stewart L. Udall, Secretary
Fish and Wildlife Service
Bureau of Commercial Fisheries

ALBATROSS IV



United States
Department of the Interior
Stewart L. Udall, Secretary
Frank P. Briggs, Assistant Secretary
Fish and Wildlife Service
Clarence F. Pautzke, Commissioner
Bureau of Commercial Fisheries
Donald L. McKernan, Director

ALBATROSS IV

Designed by

Dwight S. Simpson & Associates
Boston, Massachusetts

Built by

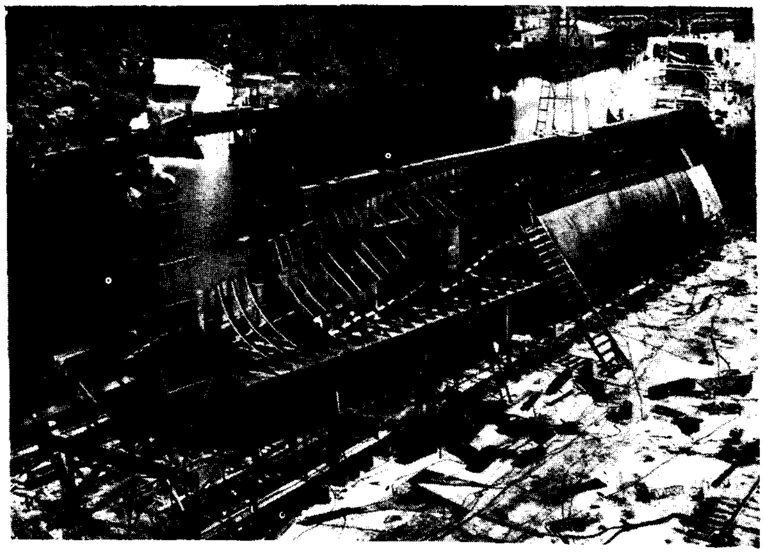
Southern Shipbuilding Corporation
Slidell, Louisiana

Laboratory Advisory Committee

Herbert W. Graham Laboratory Director
Robert L. Edwards Assistant Laboratory Director
Julius A. Posgay Fishery Biologist

Launched	April, 1962
Commissioned	May 9, 1963

The ALBATROSS IV



The Albatross IV is designed to conduct fisheries and oceanographic research in the Northwest Atlantic. She is especially equipped to collect information on the distribution and abundance of groundfish and sea scallops, and on the environmental factors which affect seasonal and long-term changes in the fish stocks. In addition, she is equipped to study the bottom organisms which form the food supply of groundfish, and to investigate plankton populations and oceanographic conditions generally.

Dwight S. Simpson & Associates, Marine Architects and Engineers of Boston, Massachusetts, designed the vessel to meet the operational requirements developed by the staff of the Bureau of Commercial Fisheries, Biological Laboratory, Woods Hole. Contract for the design was signed on February 23, 1960.

Contract to construct the vessel was given to the Southern Shipbuilding Corporation of Slidell, Louisiana in June 1961. Work on preparation of the working drawings, mold lofting and the shaping of frames and plates occupied most of that summer.

The erection of structural steel began in September of 1961. The laying of the keel is an event in the life of most ships that is second in importance only to the launching. Albatross IV, however, began life upside down and her keel was never "laid". It was installed more in the manner of the ridge pole of a house.

By November that part of the structure below the lower deck was complete and ready to be turned right side up. Three massive floating cranes performed this maneuver on November 4, 1961 before an admiring throng which served somewhat to compensate for the lack of a keel-laying ceremony. By the end of January, the steel hull up to the boat deck was complete and fabrication of the aluminum deckhouse began.

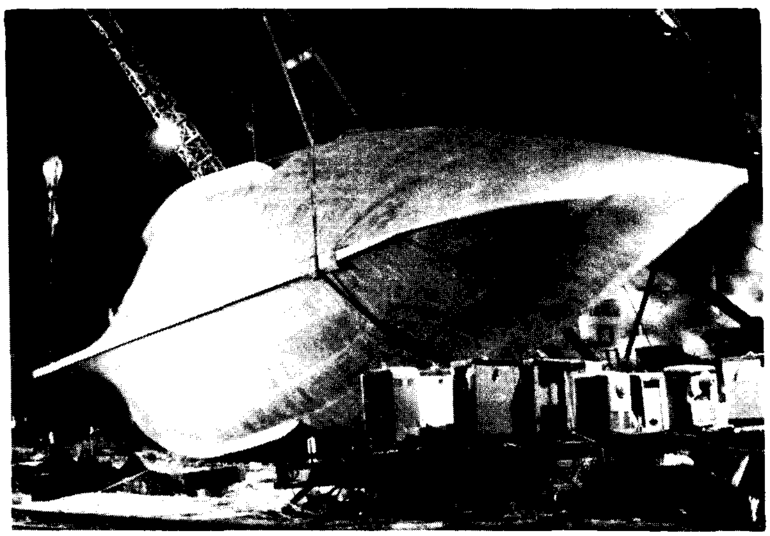
April 19, 1962 was a bright, sunny day in Louisiana, and promptly at 3:00 p. m. Albatross IV was launched into the Bayou Bonfouca. It was a perfect launching. The occasion was only marred by a leaking valve caused by a bit of debris which prevented it from closing fully. No damage was done and the leak was quickly stopped. The ship was completed in October 1962.

The vessel is designed for modern deep - sea fishery - oceanographic research. Special attention has been paid to provision of ample working space on the main deck; to the provision of adequate laboratory space for biological, chemical, and oceanographic work, and to the installation of special gear handling equipment and modern electronic devices.

The after part of the main deck is the main working area. Here is where all of the various kinds of gear will be lowered into the sea and recovered. There is a stern ramp for hauling nets and other gear aboard similar to that in use on many European stern trawlers. Sheaves for carrying trawl warps and other lines are suspended from a moveable gantry which can be rotated hydraulically 115° aft of the vertical and 90° forward and will lift 10,000 pounds. Its main function will be to handle the otter trawl, mid-water trawl, and heavy dredges.

The double drum main trawl winch is located on the lower deck. Each drum holds 6000 feet of 7/8-inch diameter cable with level winding gear which can be converted for other sizes of wire. The drum is 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 to a pair of 20-inch sheaves on the deck. They then run up through the overhead 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 4000 feet of 5/8-inch cable, is led in a similar manner along the mid-line of the vessel.

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 capstain and a small winch with 100 feet of 1/2-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. At each mast there is a 24-foot steel pipe boom with powered falls and hand operated vangs. If desired, the wire from the hydrographic winches can be led to these booms.

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 1000-pound load and deposit it on either the main deck or the boat deck anywhere within a 13-foot radius of its base.

The control station for the main trawl winch, dredging winch, the main boom vangs, and the 2 falls 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.

There are 2 hydrographic winches on the after end of the boat deck each with a capacity of 20,000 feet of 1/4-inch wire. Collector rings are provided for 5 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.

At 10 positions along the rail of the main deck there are brackets which will accept a utility davit, normally stowed below. Each of these davits is equipped with a small electric drum winch holding 300 feet of 1/4-inch wire rope and has a 1500-pound line pull. They are to be used for handling light gear at moderate depths

A watertight well, five by six feet wide, for servicing transducers runs from the main deck down to the bottom of the ship. On each side of the keel there is a hinged, water tight door to hold the sounding transducers. The transducers can be changed or serviced by putting a man in the well, pumping in air until sufficient pressure is created to prevent flooding, and then opening the lower doors.

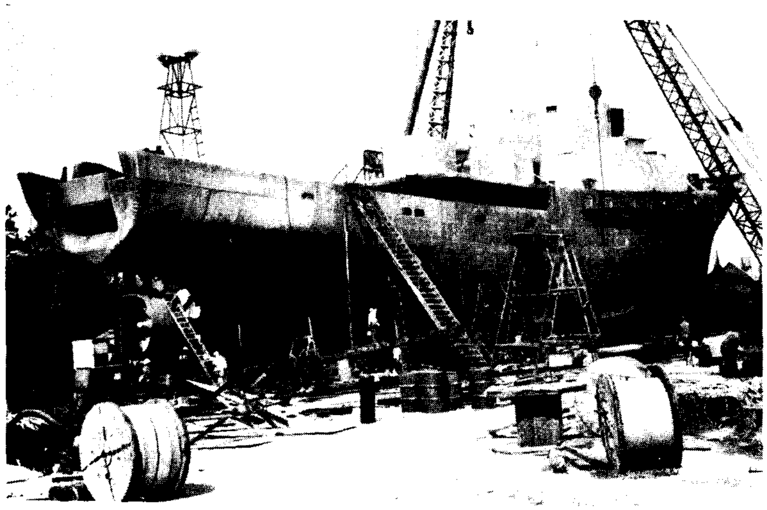
There is an instrument well in the wet laboratory and another in the hydrographic laboratory. These are three and a half feet square and, can be opened or closed by a diver or can be used to put divers in the water.

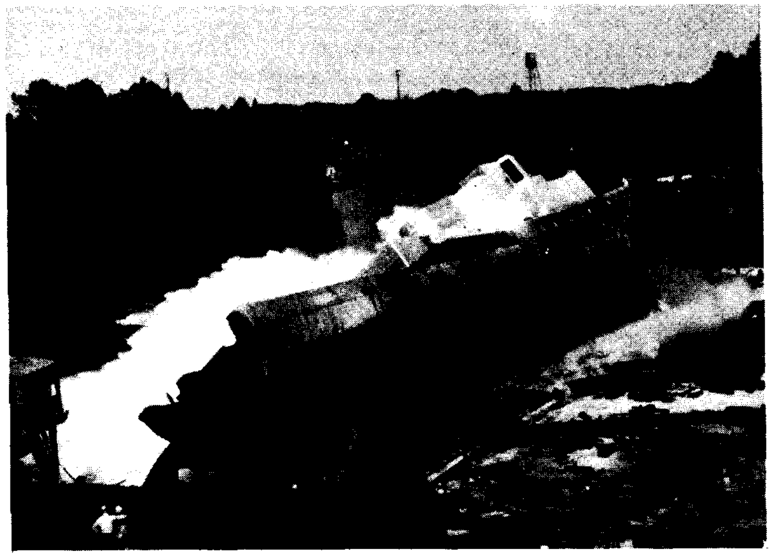
Provision is made for a 5-foot diameter fish well in the storage room. It is now part of the fuel oil tank system, but it can be made free-flooding by a minor alteration in the plating. It is anticipated that for the present, live fish will ordinarily be carried in portable tanks on deck or in the storage room supplied with sea water from the laboratory system.

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. Two hard rubber, 40-g. p. m. pumps discharge into a 60-gallon rubber-lined pressure tank. All piping and fittings are unplasticized polyvinyl chloride. All of the piping connections are made by gasketed flanges so that the system may be dismantled for cleaning. All branch lines end in a PVC valve so that the system may be easily extended for special purposes.

A major effort was made in the arrangement of the laboratory spaces to provide good communications between them as well as with the rest of the ship, but to keep them separate from the traffic of people engaged in other aspects of the ship's 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 sheltere by the house forward and the deck overhead, is a 32 foot by 10 foot area designea for the preliminary processing of the collections. There is a bathythermograph winch with 2000 feet of 3/16-inch wire at each rail. Collector rings are provided for the use of conducting cable. The BT wire is led over a sheave in an A-frame pivoted outboard of the rail and topped by an electrically driven worm gear. A dumb-waiter communicates with the storage room on the lower deck and up to the boat deck.





Forward of the rough laboratory on the port side is the 13 foot by 33 foot wet laboratory which can be divided into two separate spaces by a moveable bulkhead. Facilities include a wet gear locker, dumb-waiter to decks below and above, three sinks, three salt water tables, work benches, overhead cabinets, refrigerator, and storage lockers. Every three 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 foot by 13 foot space for chemical analysis. It has a sink, work bench, cabinets, freezer, salinometer, and spectrophotometer.

Forward of the chemistry laboratory, the dry laboratory, 15 feet by 11 feet, has a drafting table, two desks, a work table, cabinets, typewriter, and calculators. There is a fisherman's asdic and a 6000-foot sounder either of whose signals can be displayed on a precision graphic recorder.

A 5-foot by 6-foot photographic darkroom with all necessary furniture and equipment is just forward of the wet laboratory.

There is a 10-foot by 12-foot laboratory on the after part of the boat deck which is intended primarily for the monitoring, maintenance, and repair of specialized electronic equipment. It has work benches, cabinets, cable ports, 4 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 gyrocompass, radiotelephone, as well as power supplies and converters for the electronic equipment are housed in a room behind the pilot house on the starboard side.

About amidship on the starboard side there is a 13-foot by 13-foot study. It is comfortably furnished with 3 armchairs, a sofa, 4 straight chairs, a table, and bookcases.

The pilot house is about a third of the length of the ship from the bow one deck above the boat deck. It is completely equipped with modern controls and aids to navigation. The helmsman, looking forward, can see all necessary indicators and reach all controls. The officer on watch can go aft to a station just above t' winch operator and observe operations on the fishing deck. There is a direct tel phone connection from this station to the helmsman.

The chart room is just aft of the pilot house on the port side. The after part of the false stack is given over to a small duty cabin which can be converted to a radio room if a radioman is on board. Behind the electronics room, there is a space for the airconditioning unit and the emergency generator.

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.

The forward part of the main deck is occupied by berthing, toilet, and shower facilities for 16 crew men. Each of the eight rooms has 2 berths, 2 lockers, a settee, and a bureau. Berthing spaces for the master, chief scientist, mates, and engineers are on the boat deck where there is also a small office for the master.

Forward of the engine room are 6 cabins for scientists, one of which meets the requirements for a hospital room. Each cabin has 3 berths, lockers, bureau, and lavatory.

Forward of the uptakes on the port side there is a scientist's and officer's mess seating 14 and on the starboard side a crew's mess and lounge seating eight. The galley is forward on the starboard side. Meal service can be either cafeteria style through a hatch opening by the staircase or by mess boys. A dumb-waiter by the forward staircase is used to bring galley stores up from the lower deck or to carry them below from the forward weather deck.

Forward of the berthing area there is a laundry as well as space for frozen and refrigerated galley stores. Dry stores are on the deck below. The dumb-waiter serves the storage areas, the galley and the foredeck.

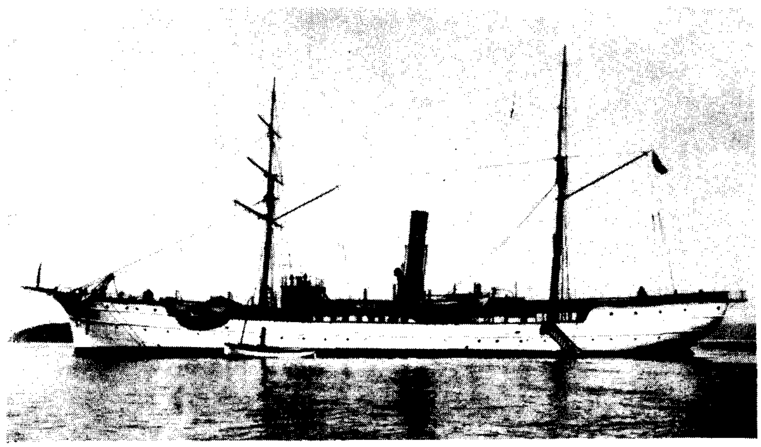
Two boats are carried, a 22-foot power launch and a 16-foot rowing wherry, both on mechanical boom davits operated by either power or hand. There are three 15-man inflatable covered life rafts stowed in Fiberglas containers.

One of the great problems of oceanographic research vessels is holding station and maintaining vertical wire angle. On this vessel this will be accomplished through the use of a controllable pitch propeller provided with a Kort type nozzle rudder and a bow thruster.

The bow thruster is a 36-inch, symmetrical propeller driven through bevel gears by a reversible 125-h.p. electric motor. It operates in a traverse, circular duct with its center about 7 feet below the water line and 9 feet from the stem. The increased maneuverability will be advantageous in docking and undocking as well as in station keeping.

Earlier ALBATROSS'S

The First ALBATROSS



The Albatross IV perpetuates an illustrious name among research vessels starting with the steamer Albatross of the United States Fish Commission. In the year 1881, at the suggestion of Commissioner Spencer Fullerton Baird, Congress authorized an appropriation totaling $148,000 for the construction of the vessel. Plans were drawn by Charles W. Copeland of New York and a contract for construction was awarded to Pusey & Jones of Wilmington, Delaware. The keel was laid in March 1882, the ship was launched in August, and she made her trial run on December 30.

"Thus began the long career of the United States Fish Commission steamer Albatross, the first vessel built especially for marine research by any government. During her forty years of service she surveyed the Newfoundland Banks, the Bering Sea, visited scattered archipelagoes of the Pacific, and served in two wars". (Hedgpeth, 1945, American Neptune, vol. 5).

The Albatross was an iron twin-screw vessel propelled by two independent two-cylinder steam engines designed by Mr. Copeland and built by Pusey and Jones. Each engine developed about 200 net shaft horsepower delivered independently to each of the screws which were nine feet in diameter and constructed of cast iron. Steam was generated by two coal stoked boilers which were placed fore and aft in the hold of the vessel. The vessel had a cruising speed of somewhat under 10 knots and consumed a little over 100 pounds of coal per mile at this speed.

The Albatross was also rigged as a brigantine and carried the following sails: mainsail, gaff-topsail, foresail, fore trysail, foretop-sail, foretop-gallant sail, fore staysail, jib and flying jib. Her total sail area was 7,521 square feet.

Her hull statistics were as follows:

Length over all	234 feet
Length at 12-foot water line	200 feet
Breadth of beam, moulded	27'6"
Depth from top of floor to top of deck beams	16'9"
Sheer forward	3'
Height of deck-house amidships	7'3"
Displacement on 12-foot water line	1,074 tons
Registered tonnage (net)	384 tons

The vessel was provided throughout with electric lights and, it is said that it was the first government vessel to be so equipped. The dynamo was designed by Mr. Edison who selected a particularly fine steam engine manufactured by Armington & Sims of Providence, Rhode Island to drive it. The dynamo generated 51 volts and a current for 120 lamps.

Edison electric lamps also were used for underwater observation of marine organisms at night and for attracting fish and other animals to night light stations. The deep-sea cable used for the light was 940 feet long.

The vessel was especially designed for dredging and the collection of bottom samples and animals at all depths. She had two well equipped large laboratories for the preservation and study of biological materials and the chemical analyses of water samples. One laboratory on the main deck was 14 feet long and occupied the entire width of the deck house. Another laboratory on the deck below was 20 feet long and equipped with a photographic darkroom and a chemical laboratory.

The Albatross carried five boats: a Herreshoff Steam Cutter, a steam gig, a seine boat, a whale boat and a dinghy. The 26 foot cutter seated 8 people, was powered with a 16 horse power steam engine, and could make 8 knots, but it was also provided with sliding gunter masts and sails, schooner rigged. Her bunkers held 1,000 pounds of coal.

The steam gig was 25 feet long, powered with 7-1/2 horse power engine and was generally lighter than the cutter. It had a speed of 7 knots and seated 7 persons. A peculiar feature of the boat was the location of the propeller under the bottom, about half the length from the stern. This prevented racing in heavy seas and made her performance in a sea-way remarkable.

The seine boat was designed especially for mackerel seining. It was 38 feet long, pulled eight oars and was schooner rigged with sliding gunter masts. The whale boat was 26 feet long, pulled six oars and was also schooner rigged with gunter masts. The dinghy was 18 feet long, pulled three pairs of sculls and was rigged with a split lug sail.

Since the Albatross was especially designed for deep sea dredging, her dredging equipment was one of its most interesting features. She carried 4,500 fathoms of 3/8 inch galvanized wire rope. The main dredging winch was on the main deck, but the wire was stored on a reel on the deck below. The wire rope from the dredge passed over the dredging block at the end of the dredging boom, then under a sheave in the heel of the boom, then upward and over a block suspended from a special rubber accumulator, and then to the central gypsy head of the main dredging winch.

After leaving the dredging winch the wire was passed below deck and lead under a governor, then to a leading block forward of the storage winch, and finally back to the reel of this winch. Through the action of the governor uniform tension was maintained on the rope, compensating for the surging on the dredging winch. A level wind distributed the rope evenly on the storage reel.

Deep soundings were made with a Sigsbee Sounding Machine powered by a Bacon one-cylinder steam engine. It could reel in the sounding wire at the rate of 100 fathoms per minute. A Tanner sounding machine was used in depths of less than 200 fathoms and for navigational purposes.

Subsurface samples of water were collected with a Sigsbee water bottle (then called a water-specimen cup) and an improved bottle invented by Kidder, Flint, and Tanner. Temperatures were taken with Negretti and Zambra deep-sea thermometers. Sea water densities were measured by Helgard's ocean salinometer.

The Albatross was built as a result of discoveries made by the Fish Commission vessel Fish Hawk in New England waters and the first five years of the Albatross' investigations were confined to the waters of the Atlantic Shelf from Cape Hatteras to Newfoundland. After the trial runs in the winter of 1882-1883 she made her first scientific cruise in the summer of 1883 from April to November, running from Washington to Woods Hole and return but investigating the fishes and bottom in a wide area of the coastal shelf and Gulf Stream. On this cruise she began amassing what was destined to become one of the greatest collections of marine organisms ever made by a single vessel. Innumerable publications have appeared based on the collections of this pioneer vessel.

From 1884 to 1887 she continued work in the Northwest Atlantic and in the Caribbean, making intensive dredging surveys and hydrographic stations. In March 1887 she was sent to the Pacific to investigate the fisheries of Alaska. She worked in these waters for three years investigating the fishery resources and fishing grounds of the Northeastern Pacific and Bering Sea, and in conducting hydrographic work. She was assigned particularly to the study of salmon, the Pribilof Islands seal herds and halibut.

In 1891 the Albatross made a special expedition to the tropical Pacific off the west coast of Mexico, Central America and the Galapagos Islands under the direction of Alexander Agassiz of Harvard University. Many of the collections of this and later cruises under Professor Agassiz' direction were deposited in the Museum of Comparative Zoology of Harvard University.

That same winter she surveyed the ocean bottom between San Francisco and Hawaii to determine the best route for a submarine telegraph cable to the Islands. For the next several years she was occupied with Alaskan fishery investigations including continued study of the Pribilof Islands fur seals; studying their pelagic life as well as the rookeries on the islands. She even became involved in enforcement work after the fur seals came under international regulations.

Interspersed with the Alaskan duties were numerous biological surveys conducted in various areas of the west coast of the Americas: a survey of San Diego Bay in 1894, Puget Sound salmon fisheries in 1896-1897, halibut surveys, and a systematic survey of all salmon streams in 1897.

In 1898, during the war with Spain, she was detailed to the Navy. Her dredging and collecting equipment was stored in Mare Island Navy Yard and alterations made to her deck house and bunkers.

The second Agassiz-Albatross expedition was conducted in 1899-1900. During this cruise the Albatross made collections over a wide area of the South Seas and Japan, adding enormously to our knowledge of the flora and fauna of the Pacific.

In the period 1900-1904, surveys were made along the West Coast, in Hawaii, and Mexico, under the direction of a number of scientists from Stanford University and the University of California, including David Starr Jordan, Barton Warren Evermann, Walter K. Fisher, Harold Heath, and C. A. Kofoid.

The third Agassiz expedition (1904-1905) took a number of scientists down the west coast of South America to Galapagos, Easter, and Gambier Islands.

In 1907-1910 the Albatross made her famous Philippine expedition which resulted in a wealth of information on the fishery and aquatic resources of these fascinating islands. This expedition was under the personal direction of Hugh M. Smith, Deputy Commissioner of Fisheries. F. M. Chamberlain was naturalist on board. Others in the scientific party included such well known biologists as H. C. Fasset, Lewis L. Radcliffe, Paul Bartch, Albert L. Barrows, Alvin Seale, and Roy Chapman Andrews.

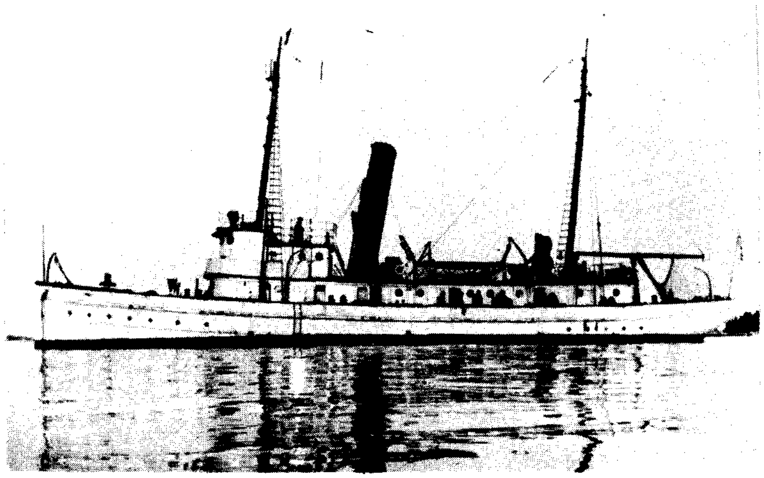
After this great expedition the vessel returned to Alaskan studies and surveys of the West Coast. During the year 1912-1914 she made an intensive survey of San Francisco Bay which resulted in a classical monograph of this area.

From then until the First World War she continued dredging and hydrographic surveys along the West Coast. During the war years, 1917-1919 she was placed under control of the Navy and transferred from the West Coast to Guantanamo,Cuba for patrol duty in the Caribbean and Gulf of Mexico.

After the war she returned to research in the North Atlantic, having been away for over 30 years. In 1919 she worked in the Gulf of Mexico in the environs of Cuba and off the South Atlantic coast. W. W. Welch was in charge with E. P. Rankin as ship's naturalist. In 1920 she surveyed the Gulf of Maine under the direction of Henry B. Bigelow, conducting hydrographic and biological investigations. This was the last scientific trip. In 1921 she returned to Woods Hole, the center of the Commission's research in the North Atlantic, where she was decommissioned on October 29.

The vast collections in the museums of this country, and the library of scientific papers that resulted from her cruises substantiate the fame this vessel acquired in all scientific circles of the world.

The ALBATROSS II



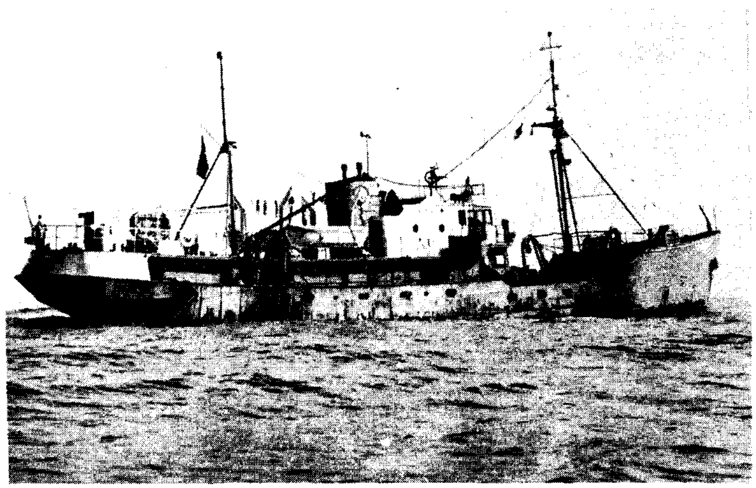
In 1926 the Bureau of Fisheries acquired from the Navy an obsolete sea tug, the Patuxent, for conversion to a fishery research vessel for work in the North Atlantic. This vessel which was built in 1909 was a two-masted steamer with steel hull. She weighed 521 gross tons, and an overall length of 150 feet, her header was 29 feet 6 inches and her draft 12 feet 3 inches.

The Bureau renamed her the Albatross II and used her in fishery research for six years. During the First World War she had been used as a minesweeper. By the time the Bureau received her she was so antiquated that operational funds were mostly consumed by costly repairs. She was taken out of service in 1932, and returned to the Navy in 1934.

During her years in marine research the Albatross II was used for surveying the New England fishing banks, and in studying the biology of some of the more valuable species. The important studies of haddock eggs and larvae by Walford, the studies of mackerel biology by Sette and plankton research by Bigelow and Sears were based, in part, on collections made by the Albatross II.

Herrington conducted experiments on the vessel which were designed to test the effectiveness of large mesh nets in permitting the escape of undersized fishes through the otter trawls. This work in "savings gear" laid the foundation for further experiments which ultimately led to the mesh regulations now in force for groundfish in the international fishing grounds of the Northwest Atlantic.

The ALBATROSS III



The Albatross III, like the Albatross II, was designed for other purposes and later converted for fishery research. The Albatross III, however, suffered a double conversion before she was put to the study of the sea.

Originally named the Harvard she was built in 1926 as a steam trawler and fished New England waters until 1939 when she was sold by the General Seafoods Corporation to the Government for $1.00 to be converted into a fisheries research vessel. In 1942, her conversion was well under way when she was taken over by the Coast Guard to be used for patrol duty; the Second World War was in full swing and vessels were badly needed. The Navy effected an extreme conversion by lengthening the vessel from 140 feet to 179 feet overall, removing trawling gear and adding armament and other military equipment. She was then renamed the Bellefonte.

Toward the end of the War (in 1944) the vessel was returned to the Fish ar Wildlife Service and once more was scheduled for conversion to a research vesse.. This was finally accomplished in 1948 and she was commissioned at the Boston Fish Pier on March 19 of that year.

As finally converted for research work the Albatross III resembled a Boston trawler although much longer than most of that fleet. She had an overall length of 179 feet, beam of 24 feet, and draft of 12 feet. Her displacement was 525 tons and cruising range 4,500 miles.

She was powered with a Fairbanks-Morse 7-cylinder, 805 horsepower diesel engine. Three diesel motor-generator sets generated 140 kilowatts of 110 volt DC power. The trawl winch was electric powered carrying 600 fathoms of 7/8 inch wire on each of its two drums, permitting trawling operations in 200 fathoms of water. The deck was fitted out in the fashion of the standard Boston trawler.

The Albatross III was originally provided with a fish hold to carry 50,000 pounds of fish on ice as in a commercial trawler. It was planned that fish caught in research operations would be landed and sold to the credit of the vessel, thus reducing the net cost of operation. After a few cruises this plan proved impractical and was abandoned. Two freezer units, however, proved more useful. One of these provided for quick freezing and maintained a temperature of 20° below zero, the other room held temperatures at about freezing. These were successfully used for the storage of scientific specimens, freezing replacing alcohol and formaldehyde as methods of preservation.

The laboratories were located on the main deck just aft of the trawl winch. The wet laboratory opened onto both the port and starboard decks through Dutch doors. It was fitted with a stainless steel sink in the center, suitable for handling and examining fish. Two small sinks located in the cabinets on the outside bulkheads were designed for chemical and hydrographic work. A dry laboratory or library, located aft of the wet laboratory, was provided with a large work table, chairs, bench, and shelves, and was used originally as an office for scientists for the preliminary study of data collected at sea. On later cruises it was crammed with electronic gear concerned with underwater television research.

Hydrographic booms and winches were located on the bridge deck on both the port and starboard sides. These booms featured travelers to which the lowering blocks were attached and which regulated the distance of the lowering wire from the rail.

Living quarters provided accommodations for the ship's crew and scientific personnel. The master's stateroom was located aft of the chart room on the bridge deck. The officers', mates', and engineer's rooms were located aft of the engine room on the main and lower decks. There were four scientists staterooms located around a wardroom on the lower deck forward of the galley and crew's mess. A stateroom for the steward and cook was located just forward of the crew's mess while the crew's quarters were in the forecastle on the lower deck. There were accommodations for a total of 35 men. Originally there was a crew of 21 men and a complement of 6 scientists, leaving 8 extra bunks available for additional scientific personnel or crew members as needed. The crew was later reduced to 18.

The Albatross III remained in the possession of the Government for eleven years, during which time she added materially to our knowledge of the fisheries and oceanography of the Northwest Atlantic. However, her usefulness to fishery research was impaired by a chronic shortage of operational funds.

She made her first scientific cruise on May 17, 1948. For the rest of that year and until September 1949, she worked fairly consistently surveying the New England Banks, conducting experiments on the selectivity of various sizes of mesh in otter trawls, and in hydrographic-plankton work. In 1950 she was able to operate only until September. Her financial difficulties were resolved in February 1951, when she was loaned to the Woods Hole Oceanographic Institution for work under an Office of Naval Research contract. In 1952 she was operated by the Fish and Wildlife Service under a similar contract. She returned to fishery research for the period March to September 1953, after which she was tied up at the Woods Hole dock until January 1955.

At this time new funds were obtained and the Albatross III was placed in continuous operation until March 1959. By this time increased maintenance costs of the ageing ship, and increased operational costs forced the Bureau to bring to a close the work of the third of the Albatross series. She was put up for sale under closed bids and sold to the Island Steamship Line, (Joseph T. Gelinas, President) of Hyannis, Massachusetts, in November 1959.

During her active life as a fishery - oceanographic research vessel, the Albatross III conducted 128 cruises in the waters off New England and in adjacent areas. She contributed greatly to the study of the wise utilization of the groundfish resources of the Northwest Atlantic. Much of her work related to the program of the International Commission for the Northwest Atlantic Fisheries which is concerned with the regulation of the fisheries in this area. These great fisheries are now under regulations imposed through the action of this Commission which is composed of thirteen countries with substantial interests in the area.

The work of the Albatross III has laid the foundation for a broader and more intensive program of investigation of the fisheries of this area developing the knowledge required for an intelligent approach to the management of the fisheries, and toward a better understanding of the relation of environmental conditions to the productivity of the area in terms of fishery resources.

SHIP'S GENERAL CHARACTERISTICS:

Length overall	187'0"
Length waterline	173'9"
Length B. P.	165'0"
Beam (moulded)	33'0"
Depth (moulded)	19'2-1/2"
Displacement tonnage	1000 tons
Draft (mean) Abt.	13'9"
Horsepower, main engines	1000-1100
Speed, designed	12 knots
Range at designed speed,	9000 nautical miles

Generators--Two, 150 kw. Diesel generators. 120/240 volt d. c.: one, 30 kw. emergency generator.

Fuel capacity	Abt. 182 tons
Fresh water capacity	Abt. 80 tons
Lube oil capacity	Abt. 3.5 tons

Accommodations:

Officers	6
Crew	16
Scientists	16