NEWSLETTER

WOODS HOLE OCEANOGRAPHIC INSTITUTION

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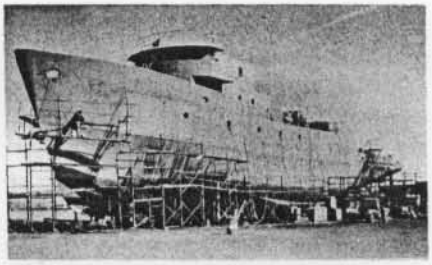


A LASTING TRIBUTE TO COLUMBUS ISELIN -- Oceanography's newest research vessel, named for the Director of W.H.O.I. from 1940 to 1950 and 1956 to 1958, as it appeared under construction in Jacksonville, Fla. The ship, which is owned by the University of Miami's Rosenstiel School of Marine and Atmospheric Science, was launched on March 1st (story on page 7).

NEW MARINE POLICY LECTURE SERIES BEGINS

A noted oceanographic author and engineer, influential in helping to formulate the emerging policies of the seas, said Thursday night (March 23) that the future of the marine sciences is in the hands of the political leaders more than any other group in the country, but that the government, at present, has no policy for marine affairs as well as no policy for science and technology across the board.

EDALHAB-LULU

William O. Rainnie reports that the FLARE - "Florida Aquanaut Research Expedition" is progressing at a very fast pace and that the diving operations have had excellent success. Bill said, "Only one scheduled operation has been scrubbed entirely because of the weather. All other planned habitat dives have only had slight interference from the weather."

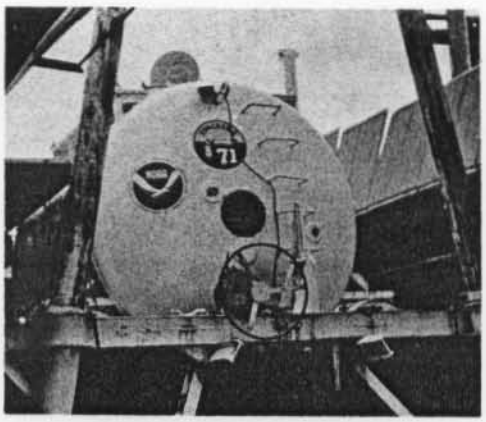
On one of the recent stations where dives were held, scientists found a large section of the coral reef off Miami Beach to be almost devoid of the algae that nourishes coral life, and largely dead. These observations were made in the area around Government Cut which is the main channel into Miami harbour.

The diver-scientists concluded that raw sewage flowing near the research site probably makes only a secondary contribution to the reef's deterioration. Silation, they feel, contributes primarily to the abnormal conditions of the reef by preventing penetration of essential sunlight through the upper layers of the water.

Scientists have been studying several reefs along the east coast of Florida and reports are not completed. Bill Rainnie said, "After the diver-scientist has spent two to four days in saturation diving and then an additional 20 to 24 hours in a small decompression chamber they are most anxious to go home and not stay around to give out interviews."

FLARE project is a multi-institutional operation with NOAA providing the funding of the operation. Twenty-eight agencies are involved either in the support of EDALHAB-LULU or the actual diving on the reefs. The project began on January 27th and will wind up operations on April 17th, when LULU returns to Woods Hole with the EDALHAB.

To date, six of the total ten habitat schedules have been completed with additional surface investigations being conducted by scientists on board the LULU to study diver operations.



In the development program, endowment funds reached $32,074,000 in 1971, compared with $19,211,000 in 1970. Of this growth, $4.4 million was in gifts, and the remainder in appreciation.

Gifts and pledges toward the $38 million development goal now total more than $20.6 million. Of particular importance during 1971: $1 million from The Kresge Foundation, provided we obtain an additional $1.5 million in matching funds before the end of 1972. The Richard King Mellon Foundation pledged $.5 million and The Hayden Foundation $50,000 to help match the Kresge grant.

The Edna McConnell Clark Foundation completed payment of its earlier pledge of $5 million. The Ford Foundation made a grant of $200,000 in support of the Marine Policy and Ocean Management Program. The Doherty Foundation transferred to the Institution its remainder interest in a number of trust funds, with an ultimate long-range value to the Institution of about $1.5 million

Other non-federal gifts and pledges to projects totaled more than $350,000.

The Ocean Industry Program now has seven companies on the rolls, with each contributing $25,000 per year to the Institution.

Following is a summary of non-federal giving since 1965:

Individuals:	$16,850,726
Foundations:	$ 3,614,905
Corporations:	$ 185,958

Questions about the development program are welcome, and should be directed to Fred Mangelsdorf.

The newly expanded library in the Redfield Building at the Bermuda Biological Station is in need of textbooks and reference works in the marine sciences and related fields. Red Wright, extension 259, will be happy to receive any contributions.

The project also will extend the study of the Atlantic Ocean formation by Woods Hole Oceanographic scientists, which has been underway for several years on the North American continental margins and now includes the west coast of Africa with the cruise of ATLANTIS II. The scientists are learning more about the formation of the Atlantic Ocean basins and the land on both sides of the ocean with the studies.

While U.S. scientists did not feel they could turn to I.D.O.E. and the National Science Foundation for matching funds to start the research, Brazilian scientists and Petrobrás felt that it was of such importance that they proposed that Petrobrás underwrite the entire initial inshore studies. The research will be divided into two phases: nearshore, in the shelf and upper slope area, and an offshore investigation extending to the Mid-Atlantic Ridge. Brazilian representatives have agreed that they will fund the entire first phase of the study and would pay a share of the second phase.

In September, a marine geology and oceanography symposium will be held in Belem, Brazil, sponsored by Sociedade Brasileira de Geologia (Brazilian Geological Society). Some of the studies of the Brazilian Continental margin will be presented at the symposium before representatives of Brazilian, U.S., and international organizations.

EDUCATION AND DEVELOPMENT PROGRESS IN 1971

EDUCATION AND DEVELOPMENT PROGRESS IN 1971 was reported to Trustees and Members of the Corporation on January 19.

Student enrollment in the Joint Program totaled 55. Forty were in physical sciences, eight in Ocean Engineering and seven in biology.

Financial support of students: W.H.O.I. - 49 percent; M.I.T. - 33 percent; outside (Navy and NSF) - 16 percent; and 2 percent without aid.

During the 1970-71 academic year 16 W.H.O.I. Joint Program Students were supported by fellowships. Seven were research assistants, and one was a teaching assistant.

Thirteen doctorate degrees have been earned thus far in the Joint Program.

Other year-round students in 1971: nine postdoctoral; four predoctoral, three Marine Policy and Ocean Management. One student in the W.H.O.I. degree program, and two special (non-degree) students.

WOODS HOLE NOTES

WOODS HOLE NOTES, bi-monthly profiles of the resident scientific staff, is suspending publication this month subject to a review of the total publications effort by a newly-appointed committee composed of Michael Schofield, Chairman; Townsend Hornor (Trustee); and Red Wright. The NOTES have been published for the Associates and other constituencies since February, 1969. Publication will be renewed this spring, with an anticipated change in format and approach, and written by Michael Schofield. Bill Lambert is now assigned to full-time work in fund-raising.

FIRST INTERNATIONAL CONTRACT SIGNED

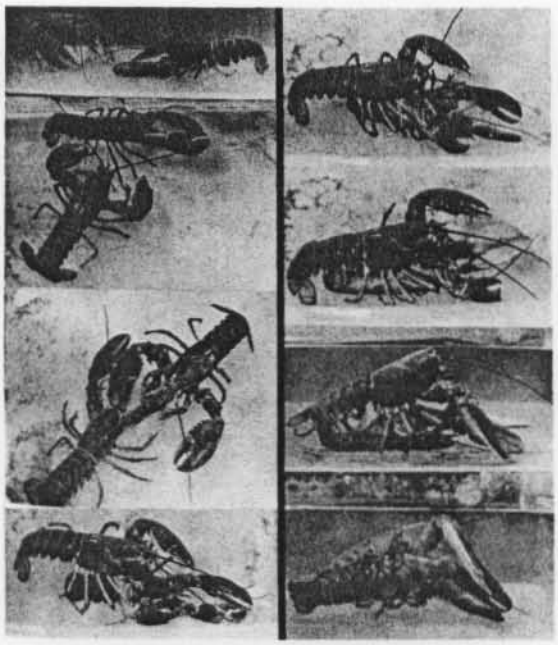
The Oceanographic Institution and the Government of Brazil have announced the signing of a contract to conduct geological and geophysical studies on the continental margin of Brazil.

The first international contract between Brazil and the Institution for the co-operative study of the Brazilian continental margin is the culmination of three years of discussions between scientists of Woods Hole and Petrobrás (Petróleo Brasileiro S.A.), the national petroleum company of Brazil. The contract is the first in which a foreign nation has agreed to supply funds, ships, equipment, and technicians to a United States oceanographic institution for a study of its offshore waters.

Original discussions on the joint venture began more than three years ago with meetings in New York and Rio de Janeiro between Drs. John D. Milliman and Kenneth O. Emery and members of Petrobrás. At present, Brazil produces less than 40 percent of its consumption of petroleum, but a potential for oil appears to lie offshore. The Brazilian shelf and slope are essentially unstudied but the Brazilians became interested in having the U. S. ocean scientists explore the area and train their own scientists in modern techniques of ocean studies. Subsequently, Petrobrás has sent some of its young scientists to the U.S. for training in marine geology, and some Brazilian scientists also are receiving training on the Oceanographic Institution's research vessel ATLANTIS II, currently cruising off the west coast of Africa through June of this year as part of the International Decade of Ocean Exploration (I.D.O.E.) program.

The new funding will also allow Drs. Atema and Todd to continue to study the effects of the interference of pollutants in the chemical communication of marine animals. A small study on the West Coast has shown that oil has an effect on the sexual response of a female crab in that it extinguishes responses to the sex stimuli, but this research is thus far inconclusive.

The plans for the project call for the Chemotaxis staff to increase to 10 persons with the addition of a chemist, a histologist, and a behaviorist. The funds will also assist in the expansion of existing facilities at the Quissett Campus for the studies.



JOHN TODD TO SPEAK AT ASSOCIATES' DINNERS

Dr. John H. Todd of the Chemistry Department will be the guest speaker at this year's spring dinner meetings of the Associates of the Oceanographic Institution. The subject of the talks, to be given on April 4th at the Museum of Science in Boston and on April 6th at the Tavern on the Green in New York, will be "Mysteries of Animal Communication in the Sea".

Dr. Todd is presently doing research in chemotaxis at a recently-constructed building on the Quissett Campus with Dr. Jelle Atema. The two Assistant Scientists came to the Institution in 1970 to design and set up the facility which focuses on studying chemical communication in fishes and in developing a behavioral theory to predict the fate of stressed marine environments. The research has been principally funded by the Charles E. Culpeper and Sarah Mellon Scaife Foundations.

The spring dinners are held annually by the Associates, who now number some 550 members interested in the Institution's work.

and studies will be undertaken to try to learn more about the origin of a huge concentration of natural gas trapped in the waters of Lake Kivu. Half of the lake contains methane and carbon dioxide, unlike other lakes in the world, and relatively little decomposition occurs because of its anerobic quality, with no organic life except micro-organisms existing below 50 meters. The biologists will study the microbial production of methane in the sediments.

While the area, in which French and Swahili are the major languages, is one of the most remote in the world, transportation is being accomplished through major airlines, a small four-seater aircraft, and overland by bus and truck. An old barge will be utilized for research on Lake Kivu, a wooden platform with two outboards and twin pontoons has been built for the 70-mile long Lake Edward, and a fishing boat has been chartered for the studies on Lake Albert.

The Oceanographic's team of two geologists, two biologists and three chemists has been joined by other scientists from M.I.T., the University of Illinois, Switzerland, and the Congo. The expedition is funded in its entirety by the National Science Foundation.

GRANTS AWARDED TO CHEMOTAXIS PROJECT

The Institution has received two grants totalling $177,300 for continuing research by Drs. Jelle Atema and John Todd of the Department of Chemistry in Chemotaxis -- the study of marine animals and how they communicate. The National Sea Grant program awarded $137,300 for the research and the National Science Foundation recently announced a $40,000 grant.

The focus of the work is the lobster because of its commercial value and abundance in the New England area. The animal has showed marked responses to chemicals and behavior patterns can be studied in the laboratory duplicating the natural conditions of the environment.

Two types of animal communication can be distinguished: one, where the animal responds to a chemical emitted from another animal, or where a chemical aroma is given off by the animal to mark his territorial surroundings; secondly, where the animal responds to his environment because of its different chemical characteristics, as in the alewife's recognition of the home stream.

The project will work on both of these areas in order to obtain more information on the range of chemical communication in the ocean. There has been little known of the subject for two reasons: the ocean is a diffiucit habitat to study; and smell and taste, which are primary sensory receptors for the chemical communication of marine animals, are senses with less importance for humans. However, these senses can be crucial for the survival of marine animals.

NEW FACES

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Randolph D. Borys
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P.O./G. Metcalf
Smith 305; Ext. 275

Thomas P. Bourgault
Co-op Student
O.E./H. Berteaux
Blake Bldg;Ext. 418

Samuel W. Churchill
Laboratory Assistant
O.E./M. Rosenfeld
Swift Hse;Ext. 437

Christopher W. Chute
Student Helper
Admn./C. Innis
Fisher Hse; Ext. 256

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Technical Typist
Admn./ C. Innis
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261

Edward C. Gough
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O.E./R. Walden
Blake 102; Ext. 215

William J. Gould
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P.O./F. Webster
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David A. Howes
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Rudiger Harazim
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Bradley J. Hennemuth
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W. H. Robitaille
Security Guard
Admn./A. Wessling
Smith Lobby; Ext. 251

OCEANOGRAPHIC TEAM STUDIES AFRICAN LAKES

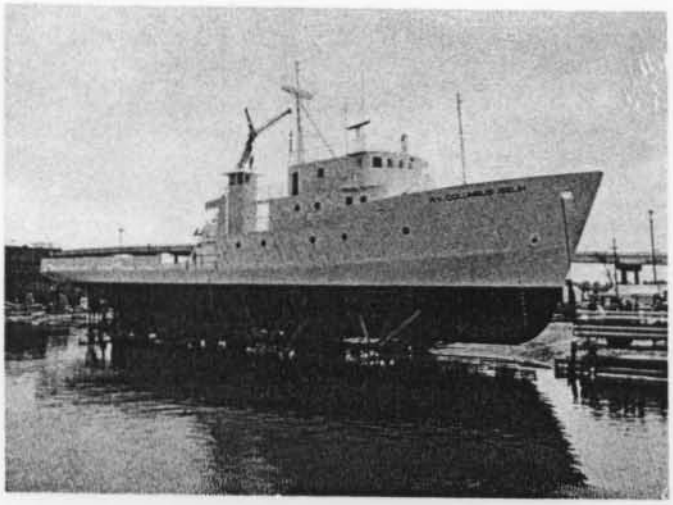
A seven-man scientific party from the Oceanographic Institution has embarked on a 34-day research expedition to Lakes Kivu, Albert, and Edward in eastern Africa. The scientists left in two groups from Boston's Logan International Airport on February 24th and 29th.

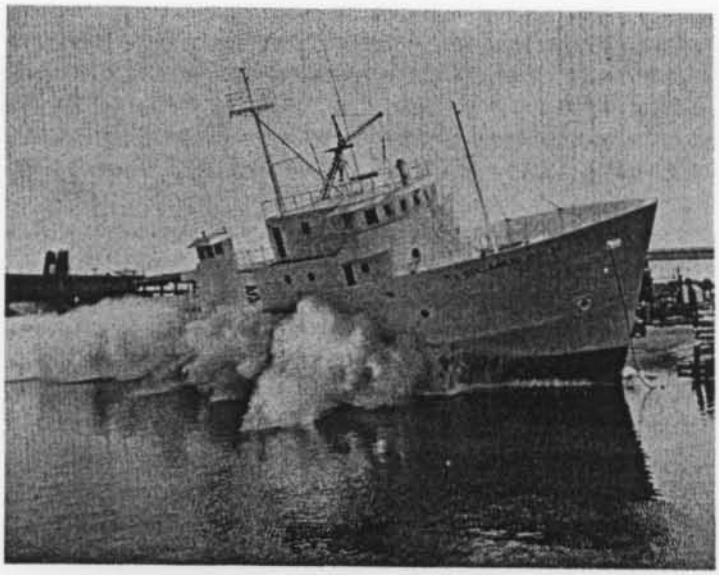
The expedition is part of a continuing interdisciplinary research program on the East African rift lakes and their relationship to the Red Sea and to the Gulf of Aden. Just as the Mid-Atlantic Ridge runs through the North and South Atlantic, the scientists theorize that the Mid-African rift valley with its land-locked lakes of Malawi, Tanganyika, Kivu, Edward and Albert may be part of a rift system extending from the Red Sea and the Gulf of Aden. The mid-ocean ridges are long scars of global proportions near the centers of the ocean basins and mark the zone of sea-floor spreading. A new ocean basin may be in the making in the rift from the Red Sea and Gulf of Aden basins and is believed to have begun to open some 25 million years ago. Lake Tanganyika, the most outstanding lake in the East African rift system, was studied in 1970 by Institution scientists, and Lake Kivu, located about 100 miles north of Lake Tanganyika, was similarly investigated last year.

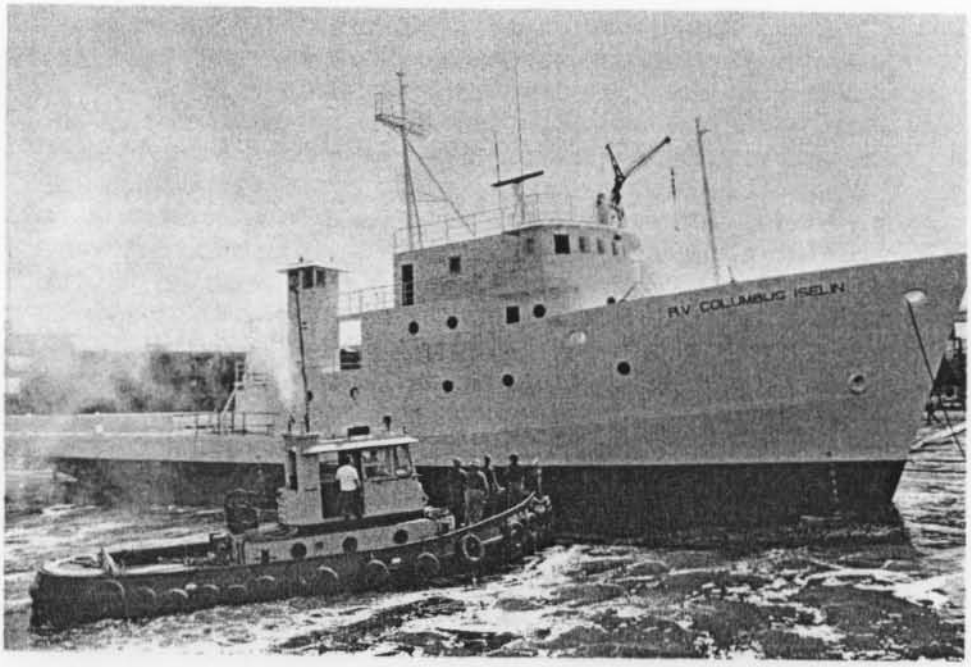
The East African rift lakes are considered to be the closest continental analogy to the mid-ocean ridge. Their geological structure will be studied to get more of an idea of what occurred when the Atlantic Ocean began to form and to learn more of the dynamics of sea floor spreading.

The Red Sea-Gulf of Aden rift zone, believed to have formed about 25 million years ago, is relatively young in comparison with the Mid-Atlantic Ridge from which the Americas, Europe, and Africa began to separate from each other some 200 million years ago. In contrast to the open ocean, the area of the land-locked lakes extending south from the Red Sea and Gulf of Aden could reflect the origins of oceanic evolution, showing what happens as an ocean begins to form, which would occur if East Africa ultimately split from the rest of the African continent.

The East African rift lakes are among the oldest in the world. Their evolution which has been going on for several million years, is of special interest. In Lake Tanganyika, for example, there are some 300 different species of fish which exist nowhere else in the world. To learn what some of the major environmental factors are controlling the evolution of the organisms, the researchers plan to take several corings from the floors of the lakes for the subsequent study of planktonic forms. The area also will undergo seismic profiling






R.V. COLUMBUS ISELIN

R/V COLUMBUS ISELIN LAUNCHED IN FLORIDA

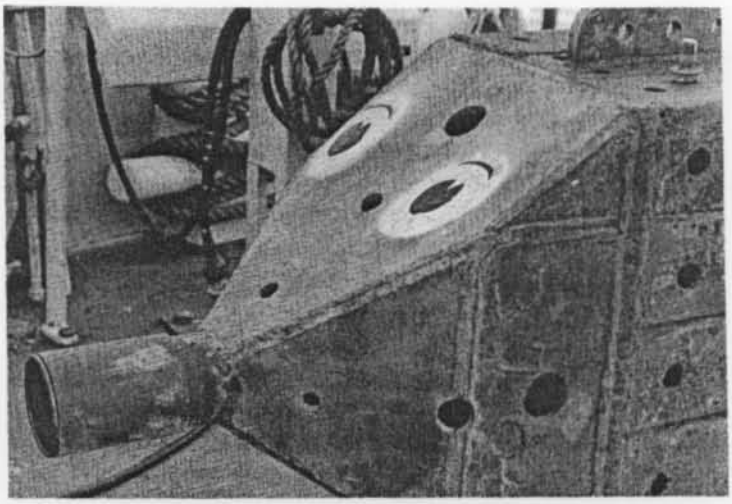
The nation's newest oceanographic ship, R/V COLUMBUS ISELIN, named for the former Director of the Oceanographic Institution, was launched in Jacksonville, Florida on March 1st for the University of Miami. Dean F. G. Walton Smith said the name of the new vessel was particularly appropriate because in 1942 he was encouraged by Columbus Iselin to establish at the University the marine laboratory now known as the Rosenstiel School of Marine and Atmospheric Science.

One of the world's foremost oceanographers, Columbus Iselin died a year ago after a distinguished career which began when, as a student under Dr. Henry B. Bigelow in 1926, he made a study of the Labrador Current in his schooner CHANCE. In 1928, again with his own schooner he investigated the mid-Atlantic ridge as part of a trans-Atlantic expedition. When the Woods Hole Oceanographic Institution was founded in 1930, Dr. Iselin became the first permanent staff member. As the first Captain/Chief Scientist of the ketch ATLANTIS, he spent subsequent years in his studies of the Gulf Stream system which led to the publication of several papers that are classics in physical oceanography.

R/V COLUMBUS ISELIN is the first major deep sea oceanographic vessel designed by a Florida naval architect and built by a Florida shipyard. The vessel was designed by naval architect, Rudolph F. Matzer and Associates and built at the J. Bellinger shipyard and was constructed with funds provided by the National Science Foundation.

Guests of honor of Dr. Henry King Stanford, President of the University of Miami, and Dean Smith at the launching ceremony of the ship named in honor of their father were Miss Eleanor Iselin and Thomas Iselin. Other guests included federal and state officials, and representatives of Oceanographic Institutions. Several Woods Hole representatives were present when the ship went down the ways to the Jacksonville River to start her career in the marine studies, including Dr. Fye, Jan Hahn, Jess Stanbrough, and Allyn Vine. The vessel was christened by Miss Mary Johrde, head of the Office for Oceanographic Facilities and Support of the National Science Foundation.

Charlie Hollister and students in KNORR's main lab check out core sample retrieved from sea floor by "Super Straw".



"Super Straw" needed eyes for this job -- even if they did wind up being painted bloodshot by Al Driscoll

The core samples were found to contain a valuable record of sedimentation in the Antilles Outer Ridge and revealed a wide variety of unexpected bedding structures. The two samples totaled nearly a ton of mud and the scientists are confident that with an improved tripping device they can begin to routinely take long, large diameter cores in the deep sea from KNORR. It will make the ship the first in the Institution's fleet that has this capability.

The consensus of the entire scientific party and ship's crew is that they could not have successfully completed the task of sampling and extruding this large volume of mud without the help of the students, who worked long and hard. There seems to be no doubt that this type of cruise is beneficial both to the scientist and to the students and the excitement and esprit de corps shown by the students was a delightful experience.

SUPER JOB DONE WITH "SUPER STRAW"

KNORR's recent cruise from Woods Hole to San Juan featured the first attempt in the deep sea to use "Super Straw", a giant corer with which scientists hope to be able to obtain core samples of 100 feet or more. According to Dr. Charles Hollister, Chief Scientist on the cruise, "Super Straw's" performance bodes good things for future geological studies of the ocean with the rig.

KNORR left W.H.O.I. on Sat., Feb. 5, in strong bitter winds and proceeded toward San Juan in very heavy weather, experiencing rolls of upward to 40 degrees. Besides the normal watch-standing duties for the run south, seminars were planned to instruct the 15 students who were taking part in their first venture at sea. The scientific party was from W.H.O.I., Worcester Polytech Institute, Dartmouth College, M.I.T. and the Scripps Institution of Oceanography. About half the complement were ill during the first few days, but soon recovered.

Hydrographic casts and camera work were started the day before the coring operations. In between the core stations, approximately 13 hydrographic stations were occupied and 9 bottom photograph stations were completed. Each student watch-stander assisted in these operations and conducted the stations under supervision.

On the first attempt to launch Super Straw, the giant core pre-tripped in heavy rolls, but was recovered without loss. Another attempt was made the next day. But a similar pre-trip was caused by the ship's rolling and releasing the pilot weight. The next step was to change to a 700 lb. pilot weight, but this ended with the weight wrapping around the core, preventing it from tripping when it hit bottom. The core penetrated about 35 feet into the bottom, bent and broke, and tripped on its return to the surface.

After much difficulty, the gravity core was recovered and readied with 4 tons weight and a 80 foot pipe. The entire core and weight penetrated the mud, returning with a multicolored sediment sample.

KNORR's Bos'n, Jerry Cotter, and Armand Silva of Worcester Polytech Institute then rigged spacing guides to keep the tripping weight away from the main core pipe. Finally a successful launch was made and the corer tripped on contact with the bottom. Recovered was a 71 foot core of undisturbed mud.

During the run into San Juan the entire scientific party began an around-the-clock operation to process the mud from the cores collected. This continued after arrival in port.

The tuna was originally caught and tagged from a charter boat "MAKO II" owned by Captain Bob Linton, Saunderstown, R.I. Captain Linton has been active with the tagging program of Frank Mather since 1964. Since that time he has tagged 287 bluefin tuna and 141 of these tags have been returned to Woods Hole. The fish that won the lottery was tagged by Capt. Linton south of Block Island weighing 8-10 lbs. When it was returned from Canada the fish weighed over 20 lbs.

The objectives of the tagging program are to provide a definition of the tuna's migratory patterns and population and estimate the effects of large-scale commercial fishing of the northwestern Atlantic stock. Previous results have indicated that this stock is small and heavily exploited.

Tag returns have also revealed mass migrations of small bluefin tunas across the Atlantic in both directions. Catch statistics indicate that these migrations, which appear to occur irregularly rather than annually, have decisively affected commercial fisheries in the respective areas. The help of sport fishermen who have cooperated with the tagging programs has been invaluable in obtaining these results.

The lottery included tags collected from fish recovered by fishermen and cannery workers of Canada, Cuba, France, Ghana, Japan, Korea, Netherlands, Senegal, Spain, the U.S.A. and Venezuela. The project will be expanded in 1972 and it is expected that more than 10,000 tag releases will be made.

This was the scene at the International Press Club of Madrid on March 1st as the first annual tuna tag lottery was held by the International Commission for the Conservation of Atlantic Tuna. Representatives of embassies of countries concerned, persons connected with Spanish tuna fishing activities, and members of the press attended the function.

DRS. FYE AND KETCHUM NAMED TO U.S. DELEGATION ADVISORY COMMITTEE FOR LAW OF THE SEA CONFERENCE

Drs. Paul M. Fye and Bostwick H. Ketchum have been named to a special advisory committee for the U.S. delegation to the U.N. Law of the Sea Conference, scheduled for Geneva in 1973. The Institution's Director and Associate Director will be part of a group whose purpose is to advise the delegation to the U.N. Committee on the Peaceful Uses of the Seabed and Ocean Floor.

On march 9th, a special staff meeting at Redfield Auditorium dealt with a related subject, "Freedom of Science at Sea". Under discussion was a questionnaire from the State Department recently received by about 100 staff members with Dr. Fye providing background to the upcoming Law of the Sea Conference.

Dr. Fye mentioned the possibility of a large sector of the oceans near shore being precluded from scientific research "unless a great deal of statesmanship is exercised to work out red tape". He felt that the U.N. Conference in Geneva in 1973 "may be the last opportunity the world has to accommodate the diverse uses of the oceans."

Dr. Fye is presently working on a position paper entitled "Freedom for Science in the Oceans" with Drs. Warren Wooster of Scripps Institution of Oceanography and John Knauss of the University of Rhode Island, which could be adopted as U.S. policy for presentation at the U.N. Conference.

TUNA TAGGED FOR W. H. O. I. TURNS INTO A WINNING NUMBER

A young lady working in a Canadian tuna cannery was the winner of the first annual tuna tag lottery held by the International Commission for the Conservation of Atlantic Tunas (ICCAT). The drawing occurred in Madrid on March 1st and the winning number came from a bluefin tuna tagged off the New England coast on August 14th, 1970 by the Oceanographic Institution.

The lottery capped a world-wide tagging program launched by ICCAT modeled after Frank Mather's program. Some 4,600 tunas and billfishes were tagged throughout the Atlantic during the 1971 season.

The tagging was done by scientists and fishermen from various countries and 280 tags have been returned for $5.00 rewards. In turn they were placed into the lottery for the $300 grand prize won by Miss Sangster who is employed by the fish cannery of the Canadian Tuna Co., St. Andrews, New Brunswick, where she found the tag.

advancement for the less developed countries as well as greater international harmony. To me these are the directions in which we must move. Oliver Wendell Holmes once said, talking about the ship of fate, 'We must sail sometimes with the winds, sometimes against it, but we must sail and not drift nor lie at anchor.'

"My own feeling is that the obstacles to progress for the future are no greater than they were before," said Dr. Wenk in his concluding remarks. "But it is the support of the President that makes the difference. The future of marine affairs in the United States is neither riotously exhilerating nor certainly is it mundane. It is not widely expanding nor will it ever be static. It's not at the top of the nation's priority lists nor should it be at the bottom. Marine Sciences have many promises to keep, and the future is in the hands not only of those competent scientists and creative engineers, but also commercial entrepreneurs and dedicated bureaucrats. It's especially going to be in the hands of the political leaders."

Dr. Wenk's lecture, "The Politics of the Ocean", took its name from his forthcoming book to be published by the University of Washington Press. Currently, he is a member of the National Advisory Committee on Oceans and Atmosphere and the National Academy of Engineering, serving as Chairman of the latter's Committee on Public Engineering Policy. The author of numerous articles in marine affairs and science policy, ocean engineering, applied mechanics, and submarine design, he served as Executive Secretary of the Cabinet-level National Council on Marine Resources and Engineering Development which was instrumental in reviewing the sea as a potential resource.

From 1942 until 1956, Dr. Wenk was a research engineer and administrator at the David Taylor Model Basin and was responsible for the Navy's ship structural research program. As a specialist in submarine strength, he developed criteria used in hull design of nuclear and Polaris vessels, and was in charge of the first deep dive of new submersibles, including the Nautilus. In 1959, he completed design of the research submersible, Aluminaut. Last year, he served as guest scholar of the Woodrow Wilson International Center for Scholars and as a Fellow of the Ford Foundation, and in October was appointed by President Nixon to the statutory National Advisory Committee on Oceans and Atmosphere.

The second lecture in the series will be delivered on May 4th at Woods Hole by Dr. Arvid Pardo, of the permanent mission of Malta to the United Nations, who in 1967 first presented to the U.N. the idea of preparing a treaty for the control of the seabed and the ocean floor beyond national jurisdictions.

Dr. Edward Wenk, Jr., Professor of Engineering and Public Affairs at the University of Washington, who has served in and directed science advisory groups for the Congress and for the past three presidents, made the observation at the Oceanographic Institution while delivering the first of the J. Seward Johnson lectures in marine policy, a series which honors Mr. Johnson for his long-time interest in international law and world peace. Having been a Trustee of the Oceanographic Institution for more than 10 years, Mr. Johnson assisted in the establishment of the Marine Policy and Ocean Management Program at Woods Hole, currently in its first year of operation. In cooperation with Harvard, the Fletcher School of Law and Diplomacy, and M.I.T., the program stresses interdisciplinary investigations of the increasing problems stemming from man's use of the sea.

"We have no science policy as far as the government is concerned," said Dr. Wenk in his lecture. "The shrinkage in support of research and developmemt from 12 percent (of the budget) to a low of 6.7 percent and now coming back to 6.9 percent has led to some hasty attempts to try to find ways of effectively utilizing some of our scarce scientific and engineering skills. Coming from Seattle, I can tell you I have seen some of these unemployed -- but the employment in a quick fix like the SST, in my view, is not the answer. And yet we must do something to match unused talents with unsolved social and economic problems. This will take both ideas and leadership.

"As far as marine affairs are concerned," he continued, "as I see it, the past is really prologue. As far as the setting is concerned, the federal government is still going to be the main actor. The Congress which serves as our constitutional balance wheel has also been the major stimulus to marine affairs; it must continue that role in making sure that the direction and momentum are at the level consistent with our nation's needs. But until we have a more powerful constituency than exists today, it is very difficult to see the kind of political engine which will cause this machine to run much further or faster. Now we have some alternative futures and some of these may lie in future organization, but I think one of the most important things to bring to the public's attention -- and those who are interested in marine affairs -- is that reorganization (of related agencies into the new organization of NOAA, the National Oceanic and Atmospheric Administration) never was going to be a miracle cure. And it's especially not going to be the miracle cure if it is an organization focused on means rather than an end. There was a difference from 1966 to 1970, when there was a focus on goals in terms of areas of public need to which the oceans could furnish some partial solution. Such goals would include improved management of the coastal zone, control over oil pollution, fish protein to meet world hunger, and international cooperation such as I.D.O.E. (International Decade of Ocean Exploration) which could be a significant vehicle toward