MARINE ADVISORY BULLETIN
EDUCATION
TEXAS A&M UNIVERSITY • SEA GRANT PROGRAM • CENTER FOR MARINE RESOURCES

THIRD STUDENT CONFERENCE ON MARINE AFFAIRS

PROCEEDINGS OF THE THIRD STUDENT CONFERENCE ON MARINE AFFAIRS

WELCOME AND KEYNOTE ADDRESS

Welcome: *Dr. William Clayton,* Provost, Moody College of Marine Sciences and Maritime Resources, Texas A&M University, Galveston

Keynote Address: *Dr. Athelstan Spilhaus,* Special Consultant to NOAA, Washington, D.C.

Texas A&M's third Student Conference on Marine Affairs, sponsored by the Sea Grant College Program, provided a natural atmosphere for the free exchange of views between students and professionals on career opportunities and problems relating to marine and coastal resources.

Presented in conjunction with the Link Foundation and Texas A&M's Moody College of Marine Sciences and Maritime Resources in Galveston, the conference was organized around the theme, "Maritime Resources: Development and Utilization."

Sixty-nine students from 35 colleges and universities in the United States, and 20 professionals in marine related fields participated in the conference, held at the Flagship Hotel in Galveston on September 28-30, 1975.

Embracing professional interests such as fisheries, petroleum, recreation, conservation, science, law and coastal management, conference panelists represented governmental agencies, industrial concerns and educational institutions. The conference program also included a

special presentation by John Hill, research assistant, on Texas A&M scientists' participation in a Gulf of Mexico and Caribbean Sea cruise with Jacques Cousteau on his ship, the Calypso.

A 1977 conference on marine affairs will be conducted jointly by Texas A&M University and the Link Foundation. Representatives of state and national oceanographic concerns will be invited to discuss the future use of the ocean, the problems it faces and their possible solutions.

Monday, September 29, 1975

In his welcoming statement, Dr. William Clayton, provost of the Moody College of Marine Sciences and Maritime Resources, focused the attention of student delegates on the question of why an interest must be taken in marine affairs.

"The question is often asked, 'Why all the emphasis on conferences, particularly student conferences, on marine affairs?' " Clayton said. "And the question is the same as, 'Why all the interest here and abroad in the oceans and their development?' "

"We have to learn a great deal more about this last frontier on this planet," he continued, "because if we don't acquire the knowledge and utilize the resources accordingly, we won't survive."

Following Clayton, keynote speaker Dr. Athelstan Spilhaus said "there is no activity of man, productive or enjoyable, that cannot be carried out at sea."

"We look more and more imaginatively to the sea for every aspect, for every parallel, of what we do on land to see if we can do it economically and productively."

According to Spilhaus, mankind is faced with two related dilemmas. First, in many places man cannot control his own number; and second, over-population is the root of all man's problems.

"The solution is energy," Spilhaus said. "Energy is the fundamental currency of civilization."

Everything may be measured in terms of energy, he added. Energy is required to produce and consume food, recycle or substitute for natural resources, and clean up pollution.

"Mere survival is not enough," he said. "As an engineer I believe that I must use science, technology and good engineering to produce more of the things that ease our lives."

Spilhaus is convinced that man must study the ocean, but added that studies are not useful unless they produce a blueprint for doing something. Man must emphasize the positive and the productive. In considering energy as currency, energy economics demands that man measure the investment in energy against the productivity of the project.

"A balance between economy and ecology is necessary," he added.

"Pollution is the excess of anything, that by its excess harms the quality of human life," Spilhaus continued. "Human beings themselves, by their excess, are the greatest form of pollution."

On the subject of coastal management Spilhaus told delegates, "The most important thing coastal zone management can do is to explore how things are being done on the coast and see which of those things can be done more economically and practically, or equally, inland and which of those things can be done at sea, so we reverse the concentration; and we can provide recreation area for people. Recreation is one of the most important things we can do for people."

ENERGY FROM THE SEA

Chair: *Dr. Richard Wainerdi,* Associate Vice President for Academic Affairs, Texas A&M University

Panel: *Robert Bybee,* Department of Exploration, Exxon Co.

Al Askew, Executive Director of the Governor's Energy Advisory Council, Austin, Texas

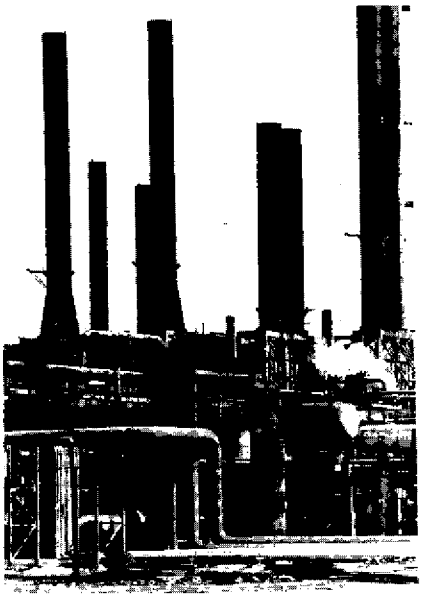
Monday, September 29, 1975

Dr. Richard Wainerdi opened the discussion by stating that, "in the last 100 years we have come to view energy as a throwaway resource."

He added that this view has changed only with the last few years. As a result of the Arab oil embargo and a growing awareness that fuel resources are not inexhaustible, it is now becoming necessary to find substitutes for fossil fuels. Possible substitutes listed by Wainerdi which might be derived from the sea include wind and solar energies; oil, gas and other minerals; temperature differentials (geothermal energy); bio-mass (the use of cellulose and other hydrocarbon materials for the production of alcohol and other simple fuels); tidal differential; fuel cells; offshore sites for power plants and other large enterprises; and energy from fusion.

Robert Bybee reviewed past and current offshore development for the delegates, adding that while 40 percent of the United States oil and gas consumption is imported, the Atlantic, Alaskan and Southern California coasts remain closed to offshore production.

"For the rest of this century the world must use fossil fuels as major



sources of energy," Bybee predicted. "The other developing types will be coming on at the end of the century."

Al Askew also expressed concern over development of the nation's offshore oil and gas deposits.

"It is important for governmental agencies to accelerate offshore leasing and development," he said. "Major objections to offshore production lie in environmental concerns."

"Standardized design and assembly procedures for nuclear power plants could aid in their development for at-sea siting," Askew said, turning his attention to an alternative power source. "The plants could be constructed on large platforms in a shipyard-type location, towed to sea and permanently anchored. Energy would be transmitted to shore through underwater cables."

Askew listed the requirement of less actual acreage for location, abundance of cooling water, insulation from seismic shock, and ability to be centered closer to coastal locations as advantages of siting nuclear power plants offshore.

COASTAL AREA MANAGEMENT

Speaker: *Robert Armstrong,* Texas Land Commissioner, Austin, Texas

Monday, September 29, 1975

Robert Armstrong outlined the development of the Texas coastal management program for delegates.

"Coastal management in Texas began with 'beach package', a series of bills introduced in the state legislature by Senator A. R. 'Babe' Schwartz," Armstrong said. "This gave us our first basic coastal management capability, and was followed by the Texas Act, or Little Coastal Zone Management Act."

In 1972, the federal government signed the Coastal Zone Management Act into law. The Act provided funding to help coastal states develop individual coastal management programs, Armstrong added.

The Texas General Land Office is currently involved in the first phase of developing a coastal management program, he said.

"The first year, we assess the capabilities of the state coast as is," Armstrong said. "We must grow within the renewable resource capabilities of the state, and we must find ways to grow without destroying natural productivity."

Some of the problems facing Texas include erosion, subsidence, and dredge disposal, according to Armstrong. Numerous economic dilemmas, such as the economic value of the coast as a tourist attraction versus preserving natural estuarine nurseries, also plague the state.

"All agencies, including educational institutions, are active participants in the land office program," Armstrong said. "Eventually we will present the Legislature with a series of alternatives for development of a final coastal management program."

RECREATION AND TOURISM

Chair: *Dr. Robert Ditton,* Associate Professor of Recreation and Parks, Texas A&M University

Panel: *John Crompton,* Executive Director, Recreation Planning Consultants, Ltd., Loughborough, England

Monday, September 29, 1975

Very little study had been done in the field of recreation and tourism prior to 1962. In that year, the Presidential Outdoor Recreational Resources Review Commission presented the first national study of what people do in terms of outdoor recreation and the first national inventory of natural resources used for outdoor recreation. The findings of the commission led to the founding of the Bureau of Outdoor Recreation and the passage of the Land and Water Conservation Fund Act.

The new interest in recreation and tourism created a need for people with training and experience in recreation resource planning and led to further study in the areas of recreation behavior, coastal recreation and business, and recreation policy.

The major problem with recreational resources to date is the misdistribution and misallocation of recreational resources. More than 98 percent of the United States shoreline is privately owned and use conflicts exist on the small percentage that is publicly controlled.

Whereas recreation is readily defined, tourism is often difficult to label, especially when many definitions are used for promotional purposes. Tourism is an elastic, price-based industry which has seen a

Photo Courtesy: Texas Highway Department

rapid increase in growth since the 1960's. It may be loosely defined as people traveling to attractions supported by services and utilities.

Both public and private concerns may work together to finance recreational development and thereby promote tourism. Possible combinations include:

1. public agency offers land on long lease at nominal rate to developer
2. public agency builds facility and leases it to developer
3. planning games — public agencies change zoning ordinances, make concessions to aid developer
4. developer builds and leases back to the public sector
5. public sector loans money to developer — municipal bonds have lower interest rates than conventional loans
6. pump priming — state puts in small amount of money, generating more private investment
7. complimentary action — public agency can secure an interest structure for developer
8. public sector rescue — subsidizing bailing out a failing development
9. non-profit corporation — public and private combine to finance project

To encourage the development of tourist-attracting facilities, the public must not automatically hold the attitude that the commercial developer is trying to exploit an area, particularly when proper planning tools exist to guide development.

SEAFOOD-ECONOMICS, TECHNOLOGY AND MARKETING

Chair: *Dr. Sam Gillespie,* Head, Department of Marketing, Texas A&M University

Panel: *Dr. Ranzell Nickelson,* Seafood Technology Specialist, Texas A&M University

Dr. John Nichols, Associate Professor of Agricultural Economics, Texas A&M University

Monday, September 29, 1975

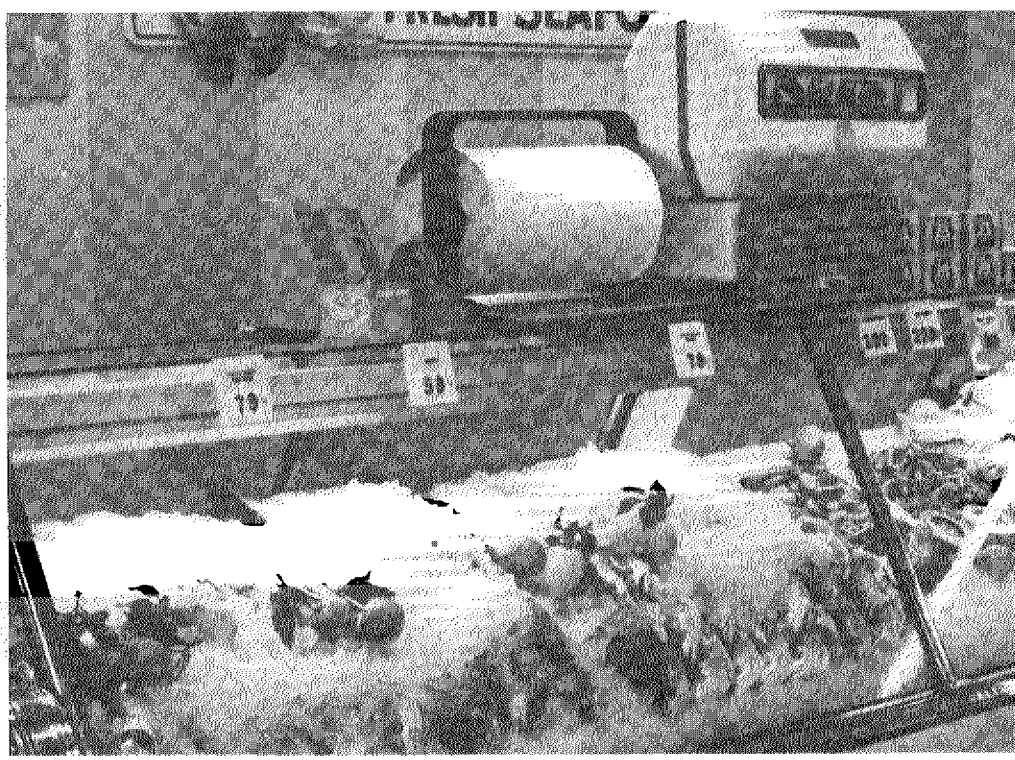
For generations, man has believed that food from the sea would solve all the world's hunger problems, and that the more man learned about the sea, the more he could gain from it. Today, man finds that the sea is not a limitless resource.

At present, it is questionable whether current levels of food being taken from the sea can be increased or even maintained. Many of the existing stocks of commonly fished species are being depleted and the world's protein-hungry population is steadily increasing. In addition, despite the increasing number of fishermen and advanced technology, the fisherman is fishing more and catching less.

Future possibilities which might brighten the fisheries industry include better utilization of less popular species, better control of seafood quality, and aquaculture.

The management of fisheries is governed not by the open market, but by government agencies. Current important issues in fisheries which may influence their economic health include the 200 mile limit, limited entry into sovereign waters by foreign fishing fleets, import controls, and achieving operating efficiencies within individual firms.

Fisheries products also experience problems in the consumer market. Before an under-utilized species can be marketed economically, the consumer must be convinced to buy the product. Factors which determine whether or not a consumer will purchase a specific item include nutritional value, price, preparation, taste and family preference. In most cases seafoods rank high in the first two categories, but are lacking in the last three. These prejudices must be overcome by selective marketing



strategies, including attractive displays, in-store samples and distribution of simple, palatable recipes.

LAW OF THE SEA

Chair: *John Seymour,* Associate Professor of Management, Texas A&M University

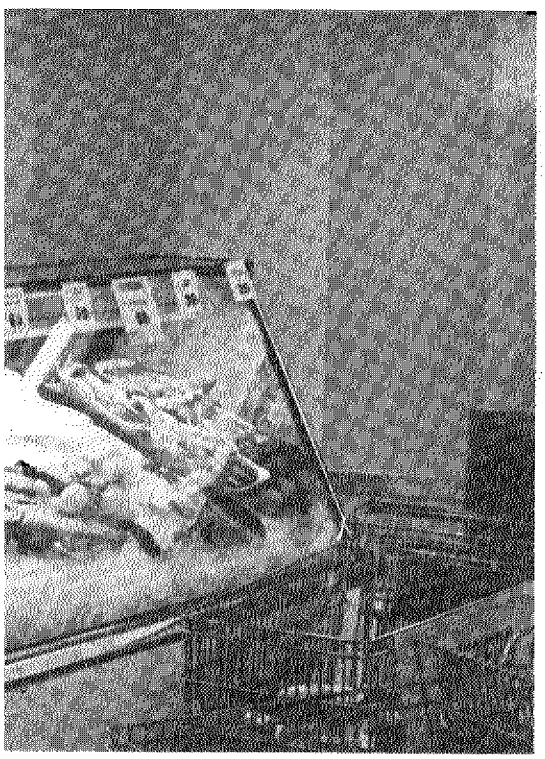
Panel: *Nancy Poquette,* Graduate Assistant, Texas A&M University

Frank Lawlor, Graduate Assistant, Texas A&M University

Monday, September 29, 1975

The law of the sea was originally "freedom of the seas," allowing all nations unlimited use of the oceans' "inexhaustable" resources. The first claims to offshore resources in addition to the territorial sea came during the Truman administration, when the United States unilaterally declared that it would have the exclusive sovereign right to extract minerals along its continental shelf.

The first comprehensive international law of the sea treaty was



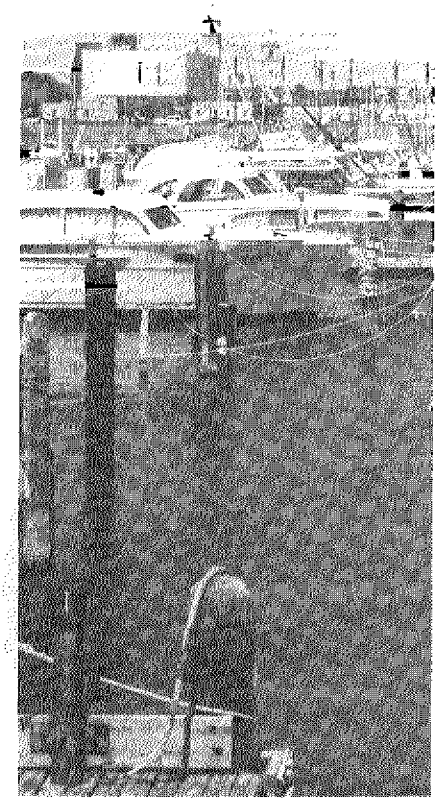


Photo Courtesy: Texas Highway Department

adopted in 1957 at the United Nations-sponsored Geneva Convention on the Law of the Sea. This convention divided the coastal waters into internal waters, territorial seas, contiguous zones (12 mile limit), and the high seas. In addition, each coastal state possessed the sovereign right to explore and exploit the continental shelf to a depth of 200 meters or to the depth of exploitability.

By the mid-1960's, it became apparent that the treaties of the 1950's were inadequate and this resulted in the current law of the sea convention, the first meeting being held in Caracas, Venezuela in 1974. A second meeting was held in Geneva in 1975, and a third in New York in 1976.

At present, three negotiating texts appear to have emerged as possible future laws of the sea. These include the possibilities of extending the territorial seas to 12 miles, the establishment of an exclusive economic resource zone to extend 200 miles around a coastal state, and the regulation of the deep sea beds by an international leasing authority, with proceeds going to the international community.

The establishment of the 200 mile exclusive economic resource zone will probably create a number of conflicts, requiring a new level of government bureaucracy. In addition, national fisheries will find it necessary to establish varied cooperative arrangements if they wish to continue fishing in many bodies of water currently open to them.

Another important legal issue relating to the coastal waters of the United States, particularly the Gulf of Mexico, is what to do with offshore platforms no longer producing oil. A series of alternative uses have been proposed for the platforms, including removal and relocation at new sites, bases for scientific research, artificial reefs, training facilities for offshore workers and conversion to fish processing plants.

Also, uses as fisheries cooperatives, mariculture operations, recreation and tourism facilities, marine sanctuaries, and bases for extracting energy forms other than fossil fuels are possible alternatives.

MARINA OPERATION AND MANAGEMENT

Chair: *Kathryn Delaune,* Marina Recreation Specialist, Industrial Economics Research Division, Texas A&M University

Panel: *George Gable,* Marina Manager, City of Corpus Christi, Texas
Rod Russell, Galva Foam Docks, Osage Beach, Missouri
Rick Smith, Marina Owner, Belton, Texas

Monday, September 29, 1975

Increased industrialization, urbanization and population have led and will continue to lead to more leisure time for people. Due to this increased amount of leisure time, the concept of the marina has been streamlined in the past 30 years.

Marinas originated as private yachting clubs organized to end harbor conflicts arising between commercial and pleasure craft. Today, there are more than 6,000 public and private marinas, the average size containing 40 slips.

Public marinas are municipally owned and operated, and vary in size and operation. A marina's success depends on its manager, an individual who must combine studies in business administration, municipal government, boating regulations and seamanship with extensive on-the-job training.

The marina manager shoulders the dual responsibilities of management and public safety. In addition, he or she works closely with the U.S. Army Corps of Engineers, Parks and Wildlife Department, port authorities, marine technology schools, yacht clubs and environmental groups. He must keep abreast of boating trends through periodicals and club memberships and keep well-trained in boat operation in order to understand the desires and needs of the boating public.

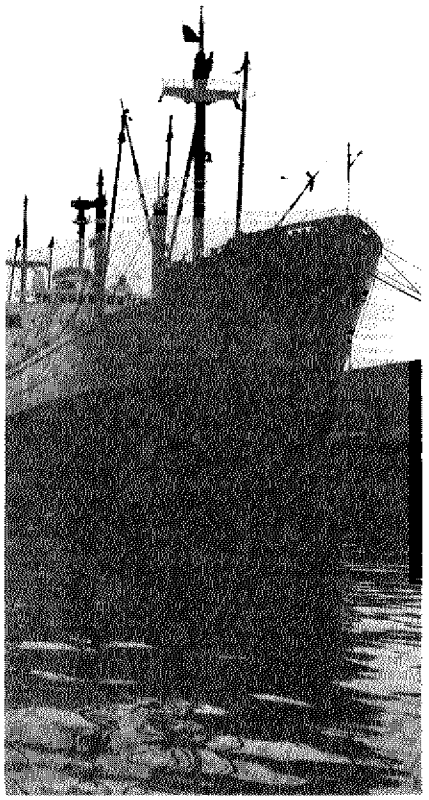


Photo Courtesy: Texas Highway Department

The private marina owner or manager is not unlike his municipal counterpart. In the marina business, profit is a management problem, and a successful business (and profit) requires that there be a need met by a service. The average marina makes about five percent clear profit.

Marinas are highly competitive businesses demanding all of the operator's time. The business season is limited by the weather, averaging 50 days in length, spread over five to six months. Despite these limitations, 50 percent of all marinas have been in business for 15 years or more.

One of the newer developments in marina construction is a more sophisticated dock built of galvanized steel floating on poly foam. Manufacture of these structures has created a wide range of labor needs, including personnel with training in basic construction skills, engineering, management and sales.

SEAWARD EXPANSION

Chair: *Carolyn Dry,* Assistant Professor of Environmental Design, Texas A&M University

Panel: *Dr. Athelstan Spilhaus,* Special Consultant to NOAA, Washington, D.C.
Professor Wolf Hilbertz, Professor of Architecture, University of Texas, Austin, Texas

Tuesday, September 30, 1975

Recent interest in resource preservation and other environmental concerns has encouraged the development of possible alternative locations for man's productive and enjoyable activities.

A wide variety of formerly land-oriented activities may soon be conducted at sea, including industry, transportation, power production, waste disposal, resource harvesting, residential and recreational activities.

New technologies may one day make it possible for man to build at sea using conventional and ocean-derived energies and materials. Seawater contains all the minerals found on land in solution, and it is possible to precipitate these minerals onto an ionized surface using electrochemical reactions. Mineral deposits on structures could be supplemented by encouraging the growth of sea organisms, such as coral and barnacles. This natural material, when used in at-sea construction, is called sea-crete, similar to land-based concrete.

Seaward expansion is not simply taking land architecture and using it at sea, but developing new ideas to be returned to land as

problem-solving devices. Man first moved to sea with lighthouses, light and weather ships, and oil drilling rigs. Today, he is studying the possibilities of moving entire cities out to sea.

These sea cities could be made practical by locating nuclear power plants at sea to supply energy. Buildings could be built like icebergs, with only a few stories visible above the water. Undersea and underground pipelines could be used to transport many materials to and from sea cities and shore. Ports located at sea could provide quick turn-around times for all types of commercial vessels.

EDUCATION, PERSONNEL NEEDS AND OPPORTUNITIES

Chair: *Dr. Levan Griffis,* Vice Provost, Southern Methodist University, Dallas, Texas

Panel: *Dr. William Clayton,* Provost, Moody College of Marine Sciences and Maritime Resources, Texas A&M University, Galveston, Texas

Dr. Robert Stephenson, Professor of Management, Texas A&M University

Tuesday, September 30, 1975

The Sea Grant Program has three purposes: (1) enlightened use and exploitation of our marine resources; (2) integration of educational programs across the many disciplines of higher education applied to marine activities; and (3) practical and useful dissemination of new knowledge and experiences into the community, industry and government planning agencies. The three component parts of the program are research, education and advisory services.

Educational activities within the Sea Grant Program include developing credit and non-credit educational programs for the general citizenry, continuing education programs for people engaged in activities related to the ocean environment, and developing vocational and technical training programs. Within the universities and colleges, the program also seeks to develop courses which involve additions and innovations in the traditional disciplines of engineering, law, economics, business administration and science.

By defining areas where there are needs for more knowledge, future personnel and educational opportunities can be estimated. Currently, there is need for study in the fields of marine law, commerce and defense; food, water, minerals and energy from the sea; and coastal management.

More study is needed in areas affecting society, as opposed to strictly scientific applications. For example, there is currently little demand for marine biologists, while more jobs exist for naturalists, ecologists and environmentalists.

THE NATIONAL SEA GRANT PROGRAM AND COLLEGE ACT was the first significant marine resources program devised by Congress. Its initiation reflected the growing interest in the ocean as a contributor of food resources. Interdisciplinary teams of researchers and educators participate in Sea Grant projects, which may require the services of economists, lawyers, sociologists, teachers or medical doctors, as well as oceanographers and engineers.

In 1971, Texas A&M University, a long-time leader in the study of the ocean, became one of the first four universities in the nation to be designated Sea Grant Colleges. Today, the Texas A&M program funds more than 55 active individual projects concerning marine education and training, advisory services, public information, resources management, environmental quality, marine processes and engineering, fisheries and seafood technology and shrimp mariculture.

THE LINK FOUNDATION, founded in 1953 by Mr. and Mrs. Edwin A. Link of Binghamton, New York, was established to promote general welfare through the advancement of scientific, technological and general educational projects.

Early in the development of the Foundation, its trustees decided to focus on projects relating to the mastery of air, space and/or sea. The Foundation promotes the teaching and study of these subjects from grade school through post-graduate education through fellowships, scholarships, special research and curriculum planning projects.

In its 20 years of operation, the Link Foundation has funded grants totaling over $700,000, including over $55,000 awarded in 1975 to institutions concerned primarily with aerospace and oceanographic research and training. More than 100 of these grants were in the form of graduate fellowships.

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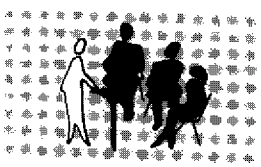

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