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REMARKS BY DR. STANLEY A. CAIN, ASSISTANT SECRETARY OF THE INTERIOR FOR FISH AND WILDLIFE AND PARKS, TO A JOINT MEETING OF THE SHRIMP ASSOCIATION OF THE AMERICAS AND THE SOUTHEASTERN FISHERIES ASSOCIATION, MIAMI BEACH, FLORIDA, JUNE 21, 1965

The Importance of Research and Conservation to the Shrimp Industry

The modern world has gone down to the sea in ships, as did the Phoenicians and every race of adventurous men of the centuries since then, but today there is a new type ship and a new type explorer. I refer, of course, to the recent wave of scientific explorations of the open ocean. These voyages are taken by many nations, each for its own reasons, and by various combinations of nations in organized international cooperation.

Throughout history, as the curiosity and experience of men increased, they built and manned boats capable of wider probings of the unknown world, and this growing capacity to move more freely over the highways of the seas was both created and used to increase the scope of trade and to expand the political and temporal power of principalities, nations, and empires.

The sea was made to yield up more of its riches of fish, to give access to the riches of new lands, and to carry men and goods over greater distances. Nor have the centuries lacked adventurous men to set out into the unknown, not at the command of rulers nor to seek personal wealth, but more simply as explorers of whatever might lie just over the horizon.

Thus did most of the waters around the ancient civilizations of Asia become known, and the scope of the Mediterranean Sea. Later others went up Atlantic coasts to Ireland and farther north. The Scandinavians crossed westward to North America. Columbus discovered another more central part of the Western Hemisphere. The passage to India turned out to be elsewhere, the long way around Tierra del Fuego and into the Pacific, and the shorter -- but still long way -- around the

Cape of Good Hope and eastward to the spices of India. Thus it was also that the Polynesians and Micronesians found the remote islands of the Pacific centuries ago -- by appallingly courageous adventure.

It has seemed to me hardly understandable that the developing science of the past two centuries has been so little applied to oceans. Primitive people have always been good observers of the world about them -- they had to be alert and sure of their limited knowledge if they were not to die -- and knowledge of the stars was early put to practical use in navigation. But the scientific revolution has scarcely affected our knowledge of the oceans. Of course, it has improved the design and capacity of ships and the means of propelling them as man has moved from oar and sail to wood, coal, and diesel engines, and on to nuclear reactors as sources of power. But through all this, to the luxury liner, the oil tanker, and atomic submarines and aircraft carriers, attention has been focused on transport -- on the sea as a highway.

Only recently have a significant number of ships been designed for research (the Bureau of Commercial Fisheries now is in design stage for a possible atomic-powered research submarine) and only recently have the fantastic instruments of modern research been used to discover the physical and biological characteristics of the oceans.

Through the centuries such maps as there were had vast but steadily diminishing areas that were marked "terra incognita," land unknown. Today, if we were equally honest, we would still have to show on our maps areas of "mare incognito," sea unknown. The great land masses have been found, their boundaries determined and interiors explored, and most, perhaps all, of the islands charted. But this is land. Our great areas of ignorance are the seas themselves, especially ignorance of what lies below the surface, on the bottoms, and in the depths between. However, as I said earlier, attention is now being directed toward these blank spaces with fuller use of the powers of science.

The recent Indian Ocean Program was carried out by hundreds of scientists on dozens of ships flying dozens of national flags. Although much has already been published regarding their findings, the data gathered on physical conditions of the Indian Ocean and the life it contains will be analyzed, thought about, and published over the years to come.

A Special Committee for Antarctic Research, sponsored by the International Council of Scientific Unions, is carrying on cooperative research by many nations on that large southern continent and the ice and waters which surround it.

Various international treaties necessitate research on the fishery resources of the seas. The International Commission on Northwest Atlantic Fisheries, for example, cannot perform its delicate tasks and meet the needs of the thirteen constituent nations without pursuing research on that part of the ocean. Neither can the North Pacific Commission, the Tuna Commission, nor any other do its job of searching for just and amicable resolution of problems of the sea without the research which, and only which, can provide the necessary knowledge.

There cannot, I believe, be any disagreement on this point. But research can be expensive. Ship time for the larger and more effective research vessels runs $1,000 to $1,500 a day at sea. The suggested atomic research submarine I mentioned is estimated to cost $25 million, not including the power plant.

Just as inshore line, drag-net, trap, and weir fishing are ancient practices that are relatively cheap, so are certain kinds of inshore research. But research, like fishing on the high seas, is an expensive matter. How will it be done?

Because the resources of the open ocean are what the economist calls a common good and belong to the person or nation capturing them, they are "up for grabs". When two or more nations fish a common resource in the same place there is inevitable rivalry and conflict -- sometimes serious conflict.

We are gradually learning the way out of this situation. It is through international agreements among the interested nations. This is not only necessary to reduce conflict, it is indispensable to the conservation of ocean resources.

As Dr. Richard A. Cooley's book, "Politics and Conservation," has shown concerning the 90-year history of the decline of Alaska salmon, and as the last few years of experience with the Bristol Bay red salmon is showing, conservation of a fishery resource is impossible without adequate international agreements. And they, in turn, depend on technical knowledge of the fishery as well as on mutual good will.

My reason for going into this problem as far as I have is because those of us here today have a common interest in a fishery. It is gratifying that persons of our two nations who are deeply and vitally interested in shrimp and other biological resources of the Gulf region can meet together -- industry people from Florida to Texas and from our good neighbor Mexico.

While recognizing our common interests in these fisheries and the possibilities for misunderstanding and differences of opinion among the States and nations, I would express pleasure at the beginnings of cooperation in the conservation management of the resources and in furtherance of studies of the Gulf and related waters. For without the facts that can come from extended research we can only have beliefs and opinions. Ignorance and emotion can provide us no economic or other security either as individuals, companies, States, or nations. I would make a plan, then, for a significantly stepped-up research program. As quickly as we can, we should increase our knowledge of our territorial waters and also extend our studies throughout the Gulf.

There are variations in the year-to-year abundance of shrimp species that are not understood. More knowledge is needed of the physical environment and of the ecological requirements of the species -- of their food chains and related needs during their stages of development in the Gulf and in estuaries and bays.

We must increase our efforts and, in some cases, combine them as States, trade associations, companies, and nations. Because the shrimp industry is made up largely of many small firms, its real strength lies in its combinations into associations. I am aware that some joint efforts are being made. Perhaps $100,000 a year is being spent by industry segments of the Gulf region for promotion of products, and even more is spent on product development and quality control.

In the United States, the Federal Government is carrying the load of fundamental research. The States are doing something, but the major effort is that of the Federal Bureau of Commercial Fisheries using, of course, the tax money of our citizens. In addition, the universities, through their marine and oceanographic research stations financed by private and public funds, are likewise making significant advances. And Mexico is stepping up its studies. This is good and proper. I would recommend to you, however, that industry should make a more significant investment in basic research. This is a matter of enlightened self-interest.

Just as you have united your efforts in one way and another to petition government -- which is your right -- and just as you have combined your efforts to improve and promote products, so, I believe, you can unite in the field of research with long-term benefits to yourselves.

In this regard, I would like to make a suggestion: Do not start out on some grand and costly scheme. Instead, start on some program and

test its worth to you. My suggestion is this: Support the education and training of highly qualified fishery and oceanographic scientists. Fishing, like other segments of American life and effort that depend on objective data, depends on qualified researchers. In common with many other fields, there is a real shortage of qualified manpower, so let us start to produce more physical and biological scientists, economists, and people to work in ocean engineering. They are necessary so they can devote knowledge, skills, and understanding to research on the great unknown -- the conditions of the seas. Industry, including such a specific one as the shrimp industry, cannot but benefit from an investment in brains.

There is nothing new about this process. I will give you an example that is rather close to the scale of your operations -- not an example from petrochemicals or the steel industry, with their billions of dollars, but from a segment of the forest industry.

Aspen is a small and rather insignificant species of tree especially abundant in the States around the Upper Great Lakes. Despite the many millions of dollars spent annually by the States and the Federal Government on forest research -- silviculture, management, products, etc. -- the paper industry, which has learned to use aspen and some other species formerly neglected as weeds, has responded to its own need for more basic knowledge. As a result, several companies have joined together to tax themselves so much for every cord of aspen wood harvested. The money they raise this way is used to finance selected graduate research projects in the colleges and universities of the region.

The industry gets two benefits for the price of one. The price, in this sense, is the cost of the research and the first benefit, of course, is the research results. The second benefit, a sort of byproduct, is more important -- the advanced training of young men in the skills of forest research and the resulting relief of the manpower shortage in this field.

These men who have been enabled to continue their studies and acquire Masters' and Doctors' degrees -- which they could not have done without financial help to themselves and their schools -- are an investment in human capital that certainly is as important as physical capital.

If this kind of private support of education is important to the fast-moving industries, it is surely important to fishery industries which, if not fast-moving ones, would like to be and should be in rapid development.

What would it cost the shrimp industry to get into this field? How much

can you spend? Or, perhaps, how much can you afford not to spend?

I cannot and would not suggest a figure, but I can tell you the range of cost of a unit of production. The education of a graduate student in fisheries at the Master's degree level will cost about $5,000 to $7,000 a year, counting living expenses, tuition, equipment, and other basic costs. A Doctoral student will usually cost more.

Good fishery schools and research stations already exist and you know where they are. As good as many of them are, they all need strengthening, and all could handle more graduate students and research projects if money were available.

I have the temerity to give you this advice, and to ask you to think it over.

Since I am in the advising mood today, I will discuss one more problem area and ask you what you can do about it.

I have referred to the open oceans as unknown territories, but have also said that there are recent significant and sometimes massive efforts to increase scientific and technical data and understanding of the seas. That is good. There has been a longer effort in studying fresh-water areas than there has been in oceanography, and in many places around the world fundamental knowledge of still and flowing fresh waters -- their hydrology and their physical and biological characteristics -- has been obtained. More research effort is needed, even though fresh-water fisheries may be less complex and less difficult to study than marine ones.

What I wish to emphasize is that there is a big gap between strictly marine and the strictly fresh-water systems -- a gap in our knowledge. I refer, of course, to brackish waters -- to the marshes and shallow waters of estuaries where the fresh waters of the land and the salt waters of the sea intermingle and interact in the flow of currents and the surge of tides.

Tidal waters have been a sort of no-man's land in research. I will not take the time to explain why this is so, but will add that many studies have been undertaken, especially recently, because there is a growing concern over the use and abuse of estuaries.

I mention this today because the protection of estuaries and bays are extremely important to the shrimp industry. Not only shrimp are involved; many important finfish, shell fish, and crustacea depend on natural estuarine conditions for all or critical parts of their lives. The catadromous shrimp are an important example. Spawned in the sea and

matured in the sea, they return, inexplicably, to the estuaries for the important sub-mature stage of their life-cycle.

If sizable stocks of shrimp in the Gulf are to be maintained, adequate estuarine habitats must be conserved. If we permit the deterioration, degradation, and destruction of these indispensable habitats, the shrimp industry cannot be stabilized or even maintained over the long run.

I would be wrong in suggesting that the fishing industry can itself preserve the necessary habitats for the species of interest to it the way lumber companies can buy forest land, but it can certainly join with those who are trying to have enlightened conservation practiced along our coasts as well as on farm and forest land. Your industry can certainly muster its powers in the chambers of local, State, and Federal Government to help check the thoughtless and sometimes ruthless destruction of estuaries. The fishing industry properly lobbies for laws it wants and against those detrimental to it. I would ask of you in this connection to extend the sphere of your activity to insist on proper conservation of estuary resources.

Some say that the conservation movement in this country started with forest problems, and the first step was the Forest Reserves. Forestry, however, quickly moved on to forest management and the concept of sustained yield. Early forest utilization has been compared to mining -- the extraction and using up of natural resource capital. As the industry matured, trees were harvested and managed as a crop even though half a century or more might elapse between crops on a given acre. Finally, the public forests of the nation and many of those of some of the larger private companies are being managed for multiple as well as sustained use. This recognizes the many different resources in forested land and the variety of possible uses for them.

The situation is not basically different for bodies of water. They contain many natural resources and have many different possible uses. In both of these complex situations some uses are in conflict. One beneficial use may be destructive to another beneficial use at a given place and time. Some conflicts can be resolved in the market place and by competition, but others must be resolved in the chambers of government.

I would like to make the point specific by saying a few words about estuaries and bays and the threats to them. Such waters are deteriorated by pollution of many kinds, the pollutants coming from many different private and public sources. Coastal locations are becoming increasingly valuable for developments of many kinds -- for housing, for industry, and for recreation. With the ever-growing American affluence and the generally attractive features of coastal land and water, real estate developers are changing coastal conditions at a fantastic rate. This is good

business for them, but it can and does produce irreparable losses to other potential users of the environment and its natural resources, including yourselves.

There are a multitude of groups and agencies at work on our estuaries -- filling, dredging, or diking them; draining fresh waters away from them; dumping waste loads into them; or generally changing their surroundings. These are mostly single-purpose interests concerned with water supply, flood control and drainage, navigation, sewerage, land development, roads or the like. Much of this change is destructive to aquatic and wetland habitats with consequent important losses to fisheries, natural and scenic values, and recreation.

As I said of forestry, which grew from single-purpose "mining" of capital resources to sustaining multiple-use management, many other conservation fields have experienced an enlargement of the scope of their interests. This seems to me to be based on a growing realization of the inter-relatedness of all natural resources accompanied by the understanding that the conservation of one resource requires the effective cooperation of all conservation-minded persons.

I would ask you, then, whether your interest in certain marine fisheries does not increasingly call for your concern for the natural "health" of estuaries and other inshore habitats? For instance, have you considered using the strength of your industry to assist efforts to stop destruction of Everglades National Park? Deterioration of the important waters of Florida Bay stems from disruption of the natural flow of water from the north. These and other changes are not unrelated to the shrimp fishery of the Tortugas, and all around the Gulf there are other situations of which you are aware.

Meetings like this one accomplish the exchange of information and ideas and create a setting for rewarding personal contacts among persons with common interests.

I have not reported to you on current economic data and on research results and projected studies undertaken by the Bureau of Commercial Fisheries. These matters are the province of able representatives of industry and government. I hope that it has been appropriate for me today to depart a little from the usual role of public servant and to speak to you, not of our activities, but of your own opportunities to enlarge the functions of your associations.

On our part, we aim to keep our programs responsive to the varying needs of the industry. There are several mechanisms to help us do this: meetings such as this one, industry advisory committees, and direct personal communication with Washington and the Bureau's nationwide network of offices and research stations. I have little doubt but that we will hear from you, but I want to invite you, anyway, and encourage you to keep in touch with us.

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