Dementia Piscatoria—Sanitas Malta: The International Sea Service

The world is running out of fish. The law which is supposed to govern the world’s ocean fisheries has nearly collapsed and shows few signs of early regeneration. Still, despite the current paralysis of regulation by international law, the problems of marine fisheries are not beyond all help. The fisheries situation is a good example of an area where an International Sea Service, as proposed by the government of Malta, could play a valuable role. This Comment surveys some of the legal difficulties frustrating fisheries management and then discusses the Sea Service as a means of helping to overcome them, both under present law and under the Maltese proposals, scheduled for consideration at the 1974 Law of the Sea Conference in Caracas.

3 Fisherman.
   Master, I marvel how the fishes live in the sea.
1 Fisherman.
   Why, as men do a-land; the great ones eat up the little ones.

Shakespeare.
Pericles. Act II,
Scene 1, line 29.

Freedom of the seas beyond a narrow territorial limit has been accepted doctrine for several centuries. As long as there were enough fish for everyone and little interest in the other extractable ocean resources, unrestricted fishing on the high seas was the accepted rule. In recent decades this system has broken down. In its place we have a series of ambiguous and often ignored treaties, signed in Geneva in 1958, which are the source of much of the present confusion concerning the law of the sea. Both these and the generally inadequate assortment of regional organizations which together govern ocean fisheries will be surveyed briefly in the first part of this paper. The second section discusses Malta’s proposal to the United Nations General Assembly for an International Sea Service, which appears to be a realistic solution to some of the problems involved in the current legal crisis. The Sea Service would be a United Nations specialized
agency like the Food and Agricultural Organization or UNESCO. It would provide the other U.N. specialized agencies with an operating capability at sea. The organization would consist primarily of a fleet of research vessels which would be available to the specialized agencies to carry out tasks such as training sailors from developing countries or conducting fisheries research.

The Sea Service proposal is attractive for several reasons. It is practical because it offends no existing prerogatives, national or international, and because it is flexible enough to be implemented under any new regime of the oceans which may be adopted at the 1974 Caracas Law of the Sea Conference, or under the existing system if the Conference produces nothing new, as is discussed below. The Sea Service would be useful because it could circumvent many of the difficulties which now beset the governance of the seas. Though the organization could act in areas ranging from seabed surveys to meteorology, the discussion below centers on fisheries as an example, since this is probably today's most critical oceanic problem. Before summarizing the legal confusion and the possible role of the International Sea Service in ameliorating it, some background on the state of world fisheries is necessary.

I

PROLEGOMENA TO DEMENTIA

In the twentieth century both man's appetite for fish and his ability to catch them have increased dramatically. Huge factory ships can catch and process fish far at sea, not returning to port for weeks or months. Increased efficiency from devices such as the harpoon guns used in whaling, seine nets thousands of feet long, and sonar to locate schools of fish, have increased the total world catch from four million metric tons in 1900 to 21 million in 1955 and 64 million in 1968. Infrared surveying of the ocean from earth satellites and other advanced techniques are not far beyond the horizon. Already the result has been overfishing. Some species, such as some varieties of whales, have been so decimated by modern technology that they are threatened with extinction. Others, like Atlantic herring or the Peruvian anchovy, are

3. Jackson, Fisheries and the Future World Food Supply, in WORLD FISHERIES POLICY, MULTIDISCIPLINARY VIEWS 7 (B. Rothschild ed. 1972) [hereinafter cited as WORLD FISHERIES].
4. See Glazer, supra note 2, at n.2.
5. Overfishing is not the only threat to the sea's resources. Pollution from such diverse sources as off-shore oil drilling and on-shore paper mills is also an increasing and serious danger. W. FRIEDMANN, THE FUTURE OF THE OCEANS 30-31 (1971).
6. D. JOHNSTON, supra note 1, at 408-09.
not yet endangered species, but catch sizes and consequently the amount of food produced have seriously declined.\textsuperscript{7}

The difficulties of preserving living marine resources are complicated by their biological characteristics. Most important is that the richest stocks tend to be concentrated in coastal waters where they move about in response to hydrographic factors such as water movements, temperature, and salinity, with scarcely a thought of the width of the territorial sea or other man-made jurisdictional niceties.\textsuperscript{8} A second problem is the great variety of sea creatures. They vary from clams which spend their lives on the seabed where they may be governed by the law of the continental shelf, to salmon which swim from the high seas to the jurisdiction of Idaho. A final biological problem in fisheries management is that unlike minerals, fish are renewable, so there are great technical problems in determining for each species the "maximum sustainable yield," the maximum size of annual catch that can be sustained indefinitely at a constant level of effort without depleting the stock.\textsuperscript{9}

Because of the renewability and diversity of these resources, the marine sciences research necessary for their rational management is expensive. It is necessary to know, for example, when and where to fish and what quantity of fish to catch in various stages of their life cycles in order to produce the maximum sustainable yield. Fish normally should be caught at some time after a period of rapid growth and not long after reaching maximum size. They should also be allowed to spawn to produce new fish for the future. The appropriate seasons, areas, and minimum sizes are determined by such methods as tagging and recovery of fish, sampling water to monitor changes in the marine environment, and analyzing commercial fishing statistics. These methods require the use of numerous ships spending long periods at sea to collect the required data.\textsuperscript{10}

II

DEMENTIA—THE LEGAL CONFUSION

As man has come to realize that the supply of fish is not inex-


\textsuperscript{8} See D. Johnston, supra note 1, at 15-16.

\textsuperscript{9} "Maximum sustainable yield" may mean either maximum sustainable physical yield, the number of tons of fish per year, which is the meaning here, or maximum sustainable economic yield, the size catch appropriate to the maximum dollar value of the catch, either for a given year or indefinitely. See D. Johnston, supra note 1, at 49-55.

haustible, and as undersea minerals, particularly petroleum, become important,\textsuperscript{11} it is no longer possible to accept the \textit{laissez-faire} regime of the past. As the value of these resources has become recognized, a great confusion of claims and agreements has arisen about the width and nature of the coastal seas and the use of international fishing grounds. The trend has been strongly toward national expansion with consequent national control of coastal fisheries, but above all toward disagreement.\textsuperscript{12}

The traditional international law of fisheries was simple and widely accepted: a territorial sea of three miles width was within the national territory of the coastal state; the right of foreign vessels to innocent passage through the territorial sea did not include the right to fish except by treaty or in compliance with the laws of the coastal state.\textsuperscript{13} Beyond three miles lay the high seas where fishing was unrestricted.

In recent decades this system has broken down under heavy competition for scarce ocean resources. Ocean fisheries are now largely governed by two bodies of law, the numerous bilateral and regional fisheries agreements, and the treaties produced at the Law of the Sea Conference at Geneva in 1958. The 1958 Conference failed to determine the width of the territorial sea, which was its primary task, and the regional agreements often fail just when they are most needed.

\textbf{A. The 1958 Geneva Treaties}

The 1958 Conference produced four treaties which include the basic rules of ocean fisheries law. Both the Convention on the High Seas\textsuperscript{14} and the Convention on Fishing and Conservation of the Living

\textsuperscript{11} The recent development of interest in undersea minerals threatens the national appropriation of the entire seabed if some controls are not imposed soon. \textit{See} \textit{E. Wenk, The Politics of the Ocean} 319-25 (1972).

\textsuperscript{12} \textit{See} \textit{Food \& Agric. Org. of the U.N., Fisheries Division, Limits and Status of the Territorial Sea, Exclusive Fishing Zones, Fishery Conservation Zones and the Continental Shelf (with particular interest to fisheries)} (1969).

\textsuperscript{13} \textit{See} \textit{D. Johnston, supra note 1}, at 105-06, 335 n.37.

Resources of the High Seas provide for freedom of fishing on the high seas. The Convention on Fishing also establishes the obligation of states engaged in high seas fishing to negotiate conservation agreements concerning shared fisheries, and to submit disputes arising under such agreements to binding arbitration. This provision was actually only an adoption of already widespread regional treaties, such as the one establishing the Inter-American Tropical Tuna Commission discussed below.

The Convention on the Territorial Sea and the Contiguous Zone maintains the right of coastal states to control fishing in the territorial sea and also permits a contiguous zone of the high seas beyond the territorial sea in which the coastal state may exercise some limited police functions, which since 1958 have customarily come to include control of fisheries. The Convention on the Continental Shelf gives the coastal state control of the living and non-living resources of its continental shelf, regardless of the distance from shore.

There have been serious difficulties with each of these treaties, principally the ambiguity or ineffectiveness of their terms and the refusal of a substantial number of nations to accept them.

For example, although the concept of the high seas is generally accepted, its extent is in dispute. The definition in the High Seas Convention is “all parts of the sea not included in the territorial sea . . . .” This definition would present no difficulty if there were agreement on the width of the territorial sea, but that issue remains unresolved; it is not mentioned in the Territorial Sea Convention or elsewhere. The Territorial Sea Convention did achieve agreement regarding the width of the contiguous zone, however, setting its outer limits at no more than 12 miles from the baseline of the territorial

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16. Id. arts. 4, 9. See note 35 infra and accompanying text.
19. More precisely, “The term 'high seas' means all parts of the sea that are not included in the territorial sea or in the internal water of a State.” High Seas Convention, art. 1, supra note 14.
20. The Territorial Sea Convention did agree on the baselines from which the territorial sea should be measured but not on its width. See Territorial Sea Convention, § II, supra note 17. A second conference in 1960 tried again, but it also failed. See M. McDougal & W. Burke, The Public Order of the Oceans 540-48 (1962).
so that *a fortiori* the territorial sea should extend no more than 12 miles. Unfortunately only 49 states, not including several in Latin America with important coastal fisheries, have signed the High Seas Convention, and only 41 have accepted the Territorial Sea Convention.

This minimal response reflects the variations in claimed coastal jurisdictions. One recent count shows a minority of states still claiming three miles, a majority at 12 miles of either territorial sea or fishing zone, and many claiming more than 12, with about ten Latin American nations claiming various kinds of zones 200 miles wide. When one country claims 50 or 200 miles, and another recognizes no more than 12, conflicts develop, such as the "tuna wars" between the United States and Ecuador and Peru, or the recent "Cod War" between Britain and Iceland.

The Continental Shelf Convention is also frustratingly imprecise, leading to conflicts about rights to the continental shelf comparable to those concerning the territorial sea. The treaty grants sovereignty to the coastal state over both minerals and "sedentary" living organisms of the continental shelf. The shelf is defined as the seabed and its subsoil to a depth of 200 meters or deeper where "the depth of the superjacent waters admits of the exploitation of the natural resources . . . ." In most areas the outer edge of the geological continental shelf is actually about 200 meters deep, but the effect of this definition is that legally the shelf and its rights extend as far seaward as exploitation of the seabed can be carried out. In 1958 exploitation at depths much greater than 200 meters was not contemplated, but now mining of manganese nodules on the sea floor under 5000 meters of water is possible, producing the absurd result that the continental shelf extends from California to China.

21. Territorial Sea Convention, art. 24, *supra* note 17. There was, however, no agreement on a fishing zone. See Kasahara, *supra* note 17, at 21.

22. Venezuela is the only country in South America which has signed either convention. See U.S. DEP'T OF STATE, TREATIES IN FORCE 332, 333 (1972).


A further built-in confusion is the ambiguity of "sedentary" living organisms. The Continental Shelf Convention does attempt a definition, but controversies have developed over whether the term includes only sponges, seaweed, and oysters, or crabs and lobsters as well. If the definition does include the crustaceans which hop along the bottom but are not attached to it, then sovereignty over them exists as far to sea as a lobsterman can set his pots, and some lobsters and crabs live as deep as 1000 meters. The Continental Shelf treaty, like the High Seas treaty, has 49 signatories, but several important Latin American nations with very narrow continental shelves are not included.

Of the four treaties, the Convention on Fishing and Conservation has created the greatest difficulties. The requirements of negotiated conservation agreements and binding arbitration make this the most demanding of these treaties. This may be why the Convention has only 32 signatories, with several major fishing powers which signed the other conventions not among them. The binding arbitration provision apparently never has been used. The conservation agreements referred to establish various regional fisheries commissions which deserve particular attention from the viewpoint of the fisheries role of the International Sea Service.

B. The Regional Organizations

A brief review of these regional fisheries arrangements mandated by the Convention on Fishing and Conservation, many of which long antedated the 1958 treaties, will illustrate some of their problems and perhaps suggest some improvements.

28. "The natural resources referred to in these articles consist of the mineral and other non-living resources of the seabed and subsoil together with living organisms belonging to sedentary species, that is to say, organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil." Continental Shelf Convention, supra note 18, at art. 2, para. 2.


30. ENCYCLOPEDIA, supra note 10, at 358.

31. Argentina, Brazil, Chile, Ecuador and Peru are prominent among the missing. See U.S. DEP'T OF STATE, TREATIES IN FORCE 332, 333 (1972).

32. Id.

33. See Kasahara, supra note 17, at 22.

34. For a survey of the most important of these agreements and the approximately twenty organizations established under them, some of which are discussed infra, see A. Koers, INTERNATIONAL REGULATION OF MARINE FISHERIES, A STUDY OF REGIONAL FISHERIES ORGANIZATIONS 77-118 (1973). For a discussion with more depth but less breadth, see Chapman, supra note 29.
The fundamental purpose of the regional treaties and the commissions frequently established by them is conservation. Conservation measures normally are based on biological research conducted or coordinated by the commissions. When fishing reaches the maximum sustainable yield, a second purpose—allocation among member nations—often comes into play.

One illustrative regional group is the Inter-American Tropical Tuna Commission, (IATTC), established in 1949 by the United States and Costa Rica to investigate possible overfishing of East Pacific tuna. The several species of these tuna are found worldwide, congregate along coasts, and often swim from the Indian Ocean to the Pacific Coast of the Americas. Membership in the organization now includes Panama, Mexico, Canada, and Japan. Members provide financial support for the Commission in proportion to their share of the area’s total catch. The Commission’s own staff of about 25 scientists conducts research on the basis of which it makes recommendations for maintaining the maximum sustainable yield of tuna. Implementation of these recommendations requires unanimous vote of the member states at annual meetings.

The Commission’s research work has been quite successful. Its most notable accomplishment was its recommendation in 1961 of an annual quota for yellowfin tuna following its finding that yellowfin fishing had reached the maximum sustainable yield. The quota was adopted voluntarily, although the United States blocked its official

35. Another such group is the International Whaling Commission, unique in that its competence is worldwide rather than regional, and famous as the apex of ineffectiveness in conservation. It has had even worse problems than the Tuna Commission, including strong resistance to shipboard inspections. See Chapman, supra note 29, at 427-30.

One of the more successful regional agreements is the Pacific Fur Seal Convention, which over the past 60 years has rescued the seal population from near extinction and substantially restored it. See D. Johnston, supra note 1, at 372.

Other regional organizations are described in Chapman, D. Johnston, and A. Körs, supra note 34.


37. Ecuador was a member but withdrew in 1968. See U.S. DEP’T OF STATE, TREATIES IN FORCE 274 (1968); id. at 309 (1972). While the conservation of resources has been claimed as one reason for unilateral coastal control, as in Republic of Ecuador, Ministry of Foreign Affairs, Ecuadorian Position on the Law of the Sea 4 (1971), the ineffectiveness of unilateral supervision is suggested by Ecuador’s approach. While detaining numerous foreign tuna boats operating in its claimed waters, Ecuador did not hesitate to denounce the treaty as the Commission’s quotas, became an inconvenience for Ecuador. See Chapman, supra note 29, at 408, 426-27; Encyclopedia, supra note 10, at 481.

38. A. Körs, supra note 34, at 96.

39. Id.

adoption until 1967.\textsuperscript{41} As a result of the annual yellowfin quota fisherman have turned increasingly to the skipjack species, which has apparently not yet reached its maximum sustainable yield.\textsuperscript{42}

Despite the success of the yellowfin quota, the IATTC has had its difficulties. The problem of allocation has been particularly difficult.\textsuperscript{43} The result of overall quotas for all the participants is shorter seasons; the season ends when the quota is reached. A shorter season means that the less efficient equipment of developing countries, particularly Mexico, prevents those countries from taking their traditional share of the catch.\textsuperscript{44} These countries are particularly angered when they see the larger tuna boats of other countries sail off to other available fishing grounds after the yellowfin season while their own boats must stand idle until the following year.\textsuperscript{45} To alleviate the imbalance some country-by-country allocation of the total catch in favor of the less-developed members has been adopted, but such measures have been very difficult for the organization to agree upon, and the result may prove no better than the present undifferentiated quota which favors ships of large capacity and high efficiency.\textsuperscript{46}

A problem related to allocation is enforcement. The IATTC has not yet experienced this difficulty, but it is a common one. There must be some legal mechanism for inspection of fishing vessels to prevent fishing in closed waters or off-season, the use of illegal equipment, or the taking of undersized fish. Merely achieving inspection has been a difficult problem, well illustrated by the experience of the North-East Atlantic Fisheries Commission. NEAFC is an organization of 14 nations concerned with all the fisheries in its intensively exploited area of competence. Despite scientific agreement on the need for severe measures to control the rapid decline of the populations of several species, particularly herring, discussion of inspection continued for several years before any action was taken. Limited shipboard inspection is now accepted, but even the members of NEAFC seem to agree that the present level is inadequate to control overfishing.\textsuperscript{47}

\textsuperscript{41} See A. Koers, \textit{supra} note 34, at 96; D. Johnston, \textit{supra} note 1, at 437-38.
\textsuperscript{42} See A. Koers and D. Johnston, \textit{id}; Joseph, \textit{supra} note 10, at 100.
\textsuperscript{44} A. Koers, \textit{id.}
\textsuperscript{45} Joseph, \textit{supra} note 10, at 10, 112-13; Encyclopedia, \textit{supra} note 10, at 697.
\textsuperscript{46} Joseph, \textit{supra} note 10, at 112-14; Chapman, \textit{supra} note 29, at 444-45.
\textsuperscript{47} See North-East Atlantic Fisheries Comm'n Report of the Third Meeting 42 (1965); \textit{id.}, Report of the Eighth Meeting 75 (1970); \textit{id.}, Report of the Ninth Meeting 14, 76-77 (1971); \textit{id.}, Report of the Extraordinary Meeting on North Sea Herring and the Special Meeting at the Level of Ministers 7-8 (1971).

Another important North Atlantic organization is the fourteen member Interna-
Some agreements, such as the North Pacific High Seas Fisheries Convention, go beyond inspection to permit arrest of the violator’s ship, but even in these cases the violator must usually be turned over to his own country for any prosecution, so the punishment is likely to be minimal.48

An additional problem of the regional groups is the new entrant, a non-member nation fishing in the waters covered by the agreement. IATTC has had some difficulty with non-members moving into the East Pacific tuna fishery, with the result that its yellowfin quotas are difficult to maintain,49 but the problem has been more acute in the North Pacific where the three signatories to the North Pacific Convention, Canada, Japan, and the United States, have recently faced aggressive competition for salmon from non-members South Korea and the U.S.S.R. As yet, no action has been taken.50

Probably the greatest difficulty faced by the Inter-American Tropical Tuna Commission is the conflict of claims over the width of the territorial sea. The United States, which is by far the largest participant in the East Pacific tuna fishery, recognizes only a 12-

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48. The North Pacific agreement was signed by Canada, the United States, and Japan in 1952, when Japan was in no position to argue about its terms. It provides primarily for the principle of abstention, an allocation device by which in theory each party abstains from fishing in the other’s historical fishing grounds. In practice abstention means that Japan must abstain from the rich salmon and halibut fisheries of the Northeast Pacific while Canada and the United States are not seriously restricted. See J. CRUTCHFIELD & G. PONTECORVO, THE PACIFIC SALMON FISHERIES, A STUDY OF IRRATIONAL CONSERVATION, 190-94 (1969).


50. A. KOERS, supra note 34, at 219-20; McKeman, World Fisheries—World Concern, in WORLD FISHERIES, supra note 3, at 42.
mile limit. Ecuador claims 200 miles. The result has been the arrest of numerous United States tuna boats in Ecuador's claimed territorial waters and a consequent diplomatic impasse. The inability of the Commission to resolve the issue is indicated by Ecuador's withdrawal from the Commission shortly after the yellowfin quota was adopted in 1966.

The most fundamental problem facing any fishery regulatory body is research. Without adequate information on which to base its regulations, the organization cannot effectively conserve the resource or help its members to raise their catches without overfishing.

The most basic limitation on research is money. Even the IATTC, one of the few fisheries groups which has its own research staff, has been restricted by lack of funds. More common is the situation of the International Council for the Exploration of the Sea (ICES), a long-established independent research organization which supplies information for the North-East Atlantic Fisheries Commission. ICES has only a modest research capability; its primary function is to coordinate the research of others.

Problems of geography and slow feedback also limit effective research. For example, the IATTC is not equipped to study the overlapping tuna populations of the Indian, Pacific, and Atlantic Oceans, but that capability is necessary to fully study their natural history. In addition, the inherent slowness of research is a constraint. Though technology and capital investment can radically alter a pattern of exploitation, as Peru's growth in one decade from relative insignificance to being the world's leading fishing nation indicates, the ability of the scientists to respond quickly to such development is limited by such slow processes as tagging and recovery, and compiling and analyzing catch statistics. The rapid return of Peru from preeminence to relative insignificance in the space of three years may illustrate the difficulty.

52. AGRIC. ORG., supra note 12, at 9.
53. See note 24 supra. It should be noted that two American firms, Del Monte and Van Camp, already own more than 50 percent of the Ecuadorian tuna industry. FISHING NEWS INT'L, Oct. 1972, at 17-18.
54. See note 37 supra.
55. A. KOERS, supra note 34, at 96.
57. A. KOERS, supra note 34, at 77-79.
59. Id.
An additional serious limitation on the effectiveness of scientific research is the risk of built-in national bias and consequent suspicion of data by a country adversely affected. The risk is particularly great for those regional organizations which follow the usual pattern of relying on research done by others, usually nationals of member nations, rather than doing their own research work as the IATTC does. Even with internationally sponsored studies, however, the danger is still present. Support for IATTC, for example, comes primarily from the United States, the world's largest user of tuna, and the Commission's headquarters are in La Jolla, California. The developing countries have more limited numbers of scientists specializing in fisheries, and can often use them better at home than in the service of an international commission. The result is that the staff of a given commission, if it has one at all, is likely to be drawn heavily from the wealthier countries. Where the scientists' recommendations directly affect national interests, it may be difficult for them to reject entirely their own national biases, and it will be still more difficult for diplomatic representatives of the nations involved, particularly representatives of the scientifically less represented countries, to avoid the suspicion of national bias. The direct effect of such suspicion, aside from any general animosity, is that the suspicious party will demand more complete proof of the need for his country to submit to restrictions. Conservation measures to avoid serious damage to the fishery can thus be delayed, despite emergency situations which require quick action based on incomplete information.

III
SANITAS—CIRCUMVENTING THE LEGAL CONFUSION

The problems of the various legal regimes affecting ocean fisheries are numerous, diverse, and of increasing urgency. There is, of course, no simple or single solution to them. The proposed International Sea Service, however, could be a catalyst in ameliorating many of these difficulties.

60. Contributions to the organization are based on percent of the tuna catch used, not the percent caught. Since tuna is an expensive commodity, the developing countries often trade it for foreign exchange and eat something cheaper, so even though the U.S. is the leading tuna-catching nation in IATTC, its share of support for the organization is still greater because it is a net importer of tuna. See Joseph, supra note 10, at 94-97, 106.


62. A. Koers, supra note 34, at 70; Koers, supra note 56, at 191; Chapman, supra note 29, at 444, 453; Gulland, supra note 61, at 182.

63. Gulland, supra note 61, at 181; Kasahara, supra note 17, at 27.
The International Sea Service as conceived in the Maltese proposal\textsuperscript{64} would be a fleet of ships engaged in scientific and technical research and education concerning the oceans. It would work in such diverse areas as oceanography, fishing, and navigation. The Sea Service would be the seaborne agent of the United Nations specialized agencies, including any future seabed authority, and would have no direct relationship with states or other international organizations.\textsuperscript{65} It would, in effect, book time aboard its ships and make available competent technical and scientific mixed-national crewmen to undertake a variety of research tasks for the U.N. agencies. If an agency, such as the Food and Agricultural Organization, UNESCO, or the International Maritime Consultative Organization, is given a mandate by a state or a regional organization to undertake fisheries research, training, or the formulation of conservation regulations, the agency could delegate all or part of its authority to carry out such a project to its seaborne agent, the ISS. Although fleets similar to the proposed Sea Service exist already for some aspects of ocean management, principally under the Food and Agricultural Organization's Department of Fisheries, there is still much important work, often neglected, that could be done by a supplementary, not substitute, autonomous organization more easily than by such specialized and often poorly coordinated vessels as those of the FAO.\textsuperscript{66}

\textsuperscript{64} See Glazer, \textit{supra} note 2, at n.91 ff. and accompanying text for a full discussion of the Maltese proposal.

\textsuperscript{65} It should be possible to extend the clientele of the ISS to include regional fisheries bodies and similar organizations without doing harm to the ISS concept, but that is not what has been proposed.

\textsuperscript{66} The specialized agency which would benefit most from the ISS in the fisheries field is the Food and Agricultural Organization (FAO). The Fisheries Department of the FAO now conducts a wide variety of research, economic analysis and, primarily in developing countries in conjunction with the United Nations Development Program, fisheries industry development projects. The organization is an important source of assistance, both scientific and developmental, to such groups as the International Council for the Exploration of the Sea and the IATTC on matters not within their own competence.

It is the auxiliary machinery concept which saves the ISS from redundancy in the fisheries field. The FAO conducts most of its work through joint programs with related organizations, such as the various regional fisheries councils it has sponsored and the UNDP, and with numerous developing countries. While the organization has made many valuable contributions, the result of these diverse projects has been considerable inefficiency, loss of continuity, and even lost ships. The Sea Service, as autonomous auxiliary machinery belonging to the specialized agency rather than a partner in various poorly coordinated projects, frequently could assist when establishing a new FAO project would be too cumbersome. The ISS would be able to act at the request of existing U.N. agencies without the creation of any new program to facilitate its work, provided only that the particular assignment were within the jurisdiction of the organization making the request. One such organization would be the FAO.

On the FAO generally see A. Koers, \textit{supra} note 34, at 104-13; on its relation with existing regional tuna organizations see Joseph, \textit{supra} note 10, at 97-98; on the FAO's
The unique feature of the ISS proposal which makes it especially useful in the fisheries field at the present time is that the type of Sea Service contemplated could operate well either under the various reforms suggested for the 1974-75 United Nations Conference on the Law of the Sea or under existing regimes. The functions of the ISS as envisaged are considered here both in connection with the problems discussed above and in relation to some of the current proposals for fisheries reform.

Under the auspices and direction of its principals, the technical and scientific agencies within the U.N. system, the activities of the International Sea Service as these affect fisheries would be essentially threefold: (1) research to produce the data necessary for rational exploitation; (2) education and technical assistance for fishermen and fisheries scientists, particularly in developing countries; (3) recommendation of regulations for the use of regional or other fisheries organizations.

It is important to emphasize that the ISS would not normally conduct continuous programs of its own or jointly managed projects with other organizations. Rather it would perform its various functions autonomously, but only at the request of agencies within the U.N. system invested with the jurisdiction but not the operating capability to do the job themselves. The Sea Service's range of competence would be worldwide; as with the U.N. specialized agencies its staff would be members of the international Civil Service, not employees of the countries of their origin. The ISS itself would be politically neutral. These qualities of research autonomy and political neutrality would be basic to much of the work the Service would perform in the fisheries field.

A. Malta

The Maltese proposal of an International Sea Service is important because of its flexibility. Since it would act only as the agent of other specialized U.N. agencies, its success would be independent of the existing structure of the international law of the sea. The convenience of such independence and flexibility is illustrated by considering the ISS both in the context of the most thorough and utopian proposal for change that the current Law of the Sea Conference will consider, Malta's draft Ocean Space Treaty,67 as well as from the viewpoint of problems of efficiency and coordination see U.N. Joint Inspection Unit, Report on the Utilization of Shipping (FAO), U.N. Doc. JIU/REP/72/9 (1972). On the relation of the FAO and the ISS, see Glazer, supra note 2, at nn. 117-120 and accompanying text.

67. See note 72 infra and accompanying text. The United States' proposal to
the existing enervated structure, which may well survive the Caracas conference.

The Maltese initiative began in the General Assembly with the Seabed Proposal of 1967.68 In contemplation of the rush of technology which was seen as threatening to divide the seabed into exclusive national zones, Malta declared that the laissez-faire regime of the past should be replaced by the concept of the seabed as "the common heritage of mankind."69 The proposal recommended a treaty to establish this principle, and also to prevent military use of the seabed and to dedicate the wealth from seabed exploitation to the development of the less developed countries.70 The proposal was an important one which led to a treaty banning weapons from the seabed,71 to a draft Ocean Space Treaty, and to the current Law of the Sea Conference; but the plan had little, if anything, to do with fisheries.

The draft Ocean Space Treaty, presented by Malta to the U.N. Seabed Committee in 1971,72 deals with the whole of "hydrospace"73 including fisheries. It would establish a comprehensive system of licensing and enforcement which is probably too idealistic to be adopted. If parts of the Malta draft treaty were adopted, the Sea Service would serve it well, because much of the treaty is based on scientific management to conserve marine resources, the area of special competence of the ISS.

The Maltese draft envisions a large and active world-scale organization consisting of an Assembly, a Council, an International Maritime Court, a Secretariat, and several supporting technical organs, the whole to be called the "international ocean space institutions."74 The fisheries aspect of the plan contemplates two rather separate regimes for "national ocean space" (within 200 miles of the coast)75 and "international ocean space" (the rest).76

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68. See Glazer, supra note 2, at text accompanying nn.14-41.
69. Id. at n.25 and accompanying text.
70. Id. at n.26 and accompanying text.
71. Id. at n.32 and accompanying text.
73. Glazer, supra note 2, at text accompanying n.60.
74. 1971 Malta Draft, supra note 72, at art. 94.
75. 1973 Malta Draft, supra note 72, at arts. 1, 11.
76. 1971 Malta Draft, supra note 72, at art. 1.
Fisheries within national ocean space, including those of species which migrate to international waters, would be governed by the coastal state, with a few caveats. The coastal state would be obligated to conserve living resources so as to produce the "optimum sustainable yield." The state would conduct research and establish appropriate regulations in consultation with the international ocean space institutions and relevant regional bodies. The coastal state would also be able to enforce its regulations by inspection, arrest and trial of foreign vessels within its space, in contrast to the present situation in which violators are usually turned over to their home countries.

The potential role of the International Sea Service is apparent, the Service could assist in the research necessary for states to establish effective conservation measures and could also recommend model regulations. The work might be done through a United Nations Development Program joint enterprise with a developing coastal country, or through another project of a U.N. specialized agency to assist a coastal state, a regional organization, or the international ocean space institutions in fisheries research and the establishment of regulations.

The international ocean space regime would be similar to the national regime with the institutions analogous to the coastal state. The institutions would issue licenses to member states for fishing in various areas of the sea. The licenses would limit the quantities of fish taken and require other conservation measures as well. Enforcement would be by means of cash deposits for the licenses, inspection, and penalties, including license revocation.

Again the role of the ISS is clear. In order to establish effective regulations for the licensing program the institutions need scientific data on which to base them. The technical organs of the institutions might be U.N. specialized agencies themselves which could call on the Sea Service directly for its assistance, or if not they could request technical support from a specialized agency which would in turn rely on the operating capability of the Service. The educational function of the ocean space institutions could be similarly assisted by the Sea Service.

The Malta plan has one serious weakness. It is very unlikely to be adopted. The jealousy of national sovereignty shown by Latin American insistence on complete control within unilaterally defined zones of the sea, suggests these countries are unlikely to accept the limitations on national discretion implied by the compulsory conserva-

77. See 1973 Malta Draft, *supra* note 72, at arts. 82, 84, 85, 90.
78. 1973 Malta Draft, *supra* note 72, at art. 81.
79. See note 48 *supra* and accompanying text.
80. See 1971 Malta Draft, *supra* note 72, at arts. 91(6), 91(7), 139, 140.
tion measures of the Malta plan. Similarly, United States fishermen, are unlikely to submit willingly to possible arrest and trial by any coastal nation which does not have a long distance fishing fleet of its own and so does not risk similar sanctions by others. The difficulty of achieving even the often minimal restrictions now imposed by the regional fisheries organizations also indicates that the greater surrender of sovereignty implied in licensing high seas fisheries will be all the more difficult to accomplish.

Although adoption of the Maltese proposal would provide a sorely needed rational system of ocean fisheries, unfortunately sovereignty does not yield so easily, though less demanding reforms, such as those suggested by the United States,81 might be more acceptable. Consequently it may be more realistic to review the usefulness of the ISS in light of the crazy quilt of national jurisdictions which already exists.

B. Research in the Present Regime

The ISS alone is not the ideal solution contemplated in Malta's draft treaty, but it can be a useful and practical catalyst for rational

81. The United States has submitted a set of Draft Articles on the territorial sea, straits and fisheries, which, like the Malta proposals, would coordinate well with the ISS. See Draft Articles on the Breadth of the Territorial Sea, Straits, and Fisheries Submitted to Sub-Committee II by the United States of America, originally U.N. Doc. A/AC.138/SC.II/L.40, reprinted in 26 U.N. GAOR, Supp. 21, at 241-45, U.N. Doc. A/8421 (1971). Fundamentally, the U.S. Draft Articles adopt the present system of regional fisheries organizations, but with the addition of new rules concerning enforcement and the distribution of the catch.

The allocation arrangements suggest a particularly useful role for the ISS. One of the allocation principles of the Draft Articles is that the percentage of the allowable catch of a coastal stock that can be harvested by the coastal state shall be allocated to that state. Id. art. III.2.C. Here the educational role of the ISS comes into play, since technical training of developing countries' fishermen on ISS ships through a U.N. specialized agency project would increase the harvesting capacity of coastal developing countries. The U.N. agency, using ISS data developed during the training program, could then recommend increased quotas, and under the U.S. plan the regional organizations would automatically allocate the catch according to the particular coastal state's ability.

The U.S. plan preserves the abstention principle, by which states which have not participated in a fishery historically dominated by some other country shall abstain from that fishery. Abstention would be an exception to the rule of coastal states' percentage based on capacity. Id. art. III.2.E. This principle has been used to good effect by the United States and Canada to keep Japan out of the valuable northeast Pacific salmon and halibut fisheries, but is not likely to stir much enthusiasm among developing countries. See note 48 supra.

The United States also proposes that percentages of catch based on capacity not apply to highly migratory species such as tuna. U.S. Draft art. III.2.C. Thus, whether tuna is considered highly migratory or coastal when it is concentrated along the coast of Ecuador, United States domination of the fishery would be preserved despite any increase in Latin American capacity. Despite their self-serving aspects, however, the
fisheries management within the present legal context. The key to the concept of the International Sea Service is that it would function regardless of any change in sovereign prerogatives. Under the present regime of fisheries management the Sea Service would be available to other U.N. specialized agencies which could call upon it for technical and scientific support of their own programs.

Fisheries research by the Sea Service would be conducted only as a supplement to that performed by existing fisheries organizations, not as a substitute for what is now done. The work done by the few regional organizations that have their own research capability and by the FAO's Department of Fisheries has been quite valuable and need not be duplicated. However, due to such problems as limited budget and geographical competence, national suspicion and poor management discussed above, such research has not supplied what is needed to rationally manage the world's fisheries.

One of the greatest restrictions on fisheries research in the past has been limited budgets. Tagging and collecting fish, particularly highly migratory ones, requires ships and scientists to survey large areas over substantial periods of time, and is therefore quite expensive. As numerous national or regional groups duplicate this effort, the cost multiplies. The contemplated ISS as a U.N., rather than a regional agency, would have the resources to conduct such wide-ranging and continuous studies of the world's various fisheries; and by conducting numerous studies at the same time with the same crews and equipment, the costs of duplicated facilities could be reduced. Additional savings would result because the research of the Sea Service would not be limited to fisheries. These activities, ranging from seabed surveys to meteorology, would be carried out by the same ships and crews.

The ISS would avoid other problems frequently encountered. Because of its worldwide seaborne operating capability, the organization

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U.S. Draft Articles do suggest a valuable role for the Sea Service through both the continuation of scientifically determined quotas set by regional organizations and through changes of quotas according to ability.

82. There are three such organizations among those with regulatory responsibility: the Inter-American Tropical Tuna Commission, the International Pacific Halibut Commission and the International Pacific Salmon Commission. A. Koers, supra note 34, at 81, 84, 96. Other regional organizations rely on separate bodies such as the International Council for the Exploration of the Sea (see note 57 supra and accompanying text) or more commonly on research by member states. See, e.g., A. Koers, supra note 34, at 93.

83. See note 66 supra.

84. Larkin, A Confidential Memorandum on Fisheries Science, in WORLD FISHERIES, supra note 3, at 190.

85. A. Koers, supra note 34, at 72.

86. See text accompanying note 10 supra.
could study a population of fish wherever found on the high seas, thus avoiding the political limitations which have restricted such regional organizations as the Inter-American Tropical Tuna Commission.

A further advantage would be the possibility of easier access to territorial waters and the contiguous zone which would be more available to a respected public international neutral than to a foreign national or suspect regional research group. Ecuador, for example, might be more willing to permit study of tuna within 200 miles of her coast if it were done by an ISS which could at the same time be assisting Ecuador in developing its own long range tuna fleet, than if the research were done by a tuna-fishing rival nation or even by the North American-dominated IATTC. Such cooperation might be still more easily achieved some years after the commencement of the ISS when its study of tuna in Ecuador's claimed waters could be conducted in part by ISS-trained Ecuadorian nationals serving on the ISS research staff.87

Perhaps the greatest value of research conducted by the International Sea Service rather than by other organizations is the avoidance of national bias. Now fisheries research is dominated by the developed countries with resulting resistance to scientific recommendations by the less developed,88 but the ISS would emphasize the role of the less developed.89 With its ships having their home ports in the developing countries and its scientific and other personnel being composed in part of their nationals, the stigma of domination by the wealthy nations would be removed. Sea Service personnel would not serve as representatives of any particular country, however, but rather as the staff of the ISS. Thus national rivalry would be minimized as would political suspicion of scientific evidence. If needed conservation measures are now delayed by fear of national bias, such delays would be reduced.

In conclusion, highly respected and trusted scientific work is particularly important because of the difficulty of enforcing fishing regulations. Past enforcement measures have been weak,90 and the ISS, as only auxiliary machinery to the specialized agencies without enforce-

87. Another area in which political barriers might be overcome by the Sea Service is on the continental shelf. For example, the U.S.S.R. recognizes crabs as sedentary creatures of the continental shelf and thus subject to the jurisdiction of the coastal state, but Japan does not. Any resulting political barriers to research might well be overcome by the neutral Sea Service, just as they could be with Ecuador's claim of a wide territorial sea. See Chapman, supra note 29, at 442; see also Kasahara, supra note 17, at 22.
88. See notes 60-63 and accompanying text supra.
89. See Glazer, supra note 2, at nn.141-148 and accompanying text.
90. See note 48 and accompanying text supra.
ment power of its own, could take no direct corrective action. It could help to reduce the need for enforcement, however, by facilitating voluntary compliance, which has been the basis of most successful fisheries management in the past, as the experience of the Inter-American Tropical Tuna Commission indicates. Past experience also suggests, by contrast of the IATTC experience with Ecuador and with other countries less hostile to the United States, that as the political acceptability of scientific data increases, voluntary compliance with recommendations based on that data also increases. The International Sea Service, as the source of highly acceptable data, would thus reduce the need for enforced compliance.

C. Education in the Present Regime

ISS research would be closely tied to activities in education. Under the auspices of the scientific and technical agencies in the U.N. system, scientists ashore and aboard ISS vessels would train additional scientists. Sea Service vessels would also train fishermen and other specialists necessary to the development and conservation of marine fisheries. Education, like research, would emphasize the developing countries. The impact of the ISS educational program would be multiplied because of its relationship with the research activities and technical recommendations of the U.N. agencies using the Sea Service.

The value of research and education conducted together is not only the intrinsic educational value of clinical education but also the consequent greater acceptability of both programs to the countries involved: for example, research conducted with students from Ecuador, who themselves soon become senior researchers and teachers, is more likely to be considered trustworthy in Ecuador than if Ecuadorians are not involved. The research itself is also likely to benefit both from local expertise, if the subject of the research is the local coastal fishery, and from the likelihood of greater access to a coastal state's national resources when its nationals are involved. However, the most important reciprocal relation of research and education is simply that education concerning a particular fishery resource becomes more valuable as the fishery becomes better understood.

The direct effects of education are also important. More and better-trained fishermen and scientists in a developing country normally mean more income and food from the sea. A serious restriction, however, is capital. An important part of Mexico's dissatisfaction

91. See Kasahara, supra note 17, at 25.
92. Id.; Chapman, supra note 30, at 446-47.
93. See text between notes 71 and 72 supra.
with the quotas of the Inter-American Tropical Tuna Commission, for example, is that when the annual quota is met the large boats of other countries can sail off to the tuna grounds of the Atlantic or elsewhere, but the smaller Mexican boats must wait until the following year.\textsuperscript{94} Part of the answer to the shortage of capital is education. When Mexican tuna fishermen have been trained to handle the large, long-range tuna boats, capital to buy such equipment should become easier to secure from the United Nations Development Program, the International Finance Corporation, or other private foreign investment\textsuperscript{95} than when the personnel for the larger boats is unavailable. While such training alone certainly will not determine investment decisions, local availability of people skilled in the many aspects of modern fishing would be an important factor affecting such an investment.

D. Recommendation of Regulations in the Present Regime

Because of its research and educational functions, the ISS would be in a unique position to recommend conservation and allocation regulations for a U.N. specialized agency asking it to do so. Such recommendations might then be used by regional organizations of coastal states dealing with the particular fishery.\textsuperscript{96} The unusual value of these recommendations is that they would be based on information both gathered and, because of the Sea Service’s educational activities, affected by the ISS. Recommended conservation regulations would be developed primarily from the neutral and worldwide scientific resources of the organization, but they would also be based on the information available to the Sea Service concerning the technological capabilities of the various nations affected. Allocation recommendations especially would be determined by the capabilities of the parties involved.

\textsuperscript{94} See Joseph, supra note 10, at 112-13; see also text accompanying notes 43-46.

\textsuperscript{95} See generally, W. Friedmann & J. Béguin, Joint Int'l Business Ventures in Developing Countries (1971). For an example of UNDP work see Idyll, The Anchovy Crisis, Scientific American, June 1973, at 22-29. On IFC and also, for example, on the Overseas Private Investment Corporation see Practicing Law Inst. Investment in Developing Countries 28-34, 88-90 (1972).

\textsuperscript{96} It is important that the Sea Service limit its clientele to respected neutral international organizations in order to preserve both its efficiency and its credibility as a trustworthy scientific neutral. The pattern of numerous joint enterprises which appears so to delay and waste the resources of the FAO (see note 66 supra) and the descent into politics which so weakens the regional commissions would be avoided by the Sea Service’s autonomous control of projects undertaken only on behalf of other international organizations. Such clients might include regional fisheries commissions, but cf. note 65 supra. The Sea Service would not enforce its recommendations, but because of the reliability and acceptability of the data on which they were based they should be at least as respected and enforceable as the regulations now formulated by the regional fisheries bodies themselves.
The unique role of the Sea Service is that through its involvement in the interrelationship of research and education, it would be instrumental in determining a nation's fishing capabilities. For example, the Sea Service might supply the technical resources for a United Nations Development Program project to develop the Mexican tuna industry. First, the UNDP project, using data developed by the Sea Service, would determine what varieties of tuna appear near Mexico at what times and how best to catch them to produce the maximum sustainable yield. Second, the project would use the Sea Service's educational resources to improve Mexico's fishing capability through training Mexican fishermen and scientists, possibly injecting new capital into the Mexican fishing industry. As Mexico's capacity grows under the project's tutelage, the UNDP, using Sea Service data, would recommend adjusted allocations to the Tuna Commission to reflect the effects of the educational work. The impartiality and reliability of such recommendations should increase their acceptability to regional organizations. Favorable adjustments of allocations should also encourage developing countries' cooperation with research and educational programs in the future, as well as encouraging cooperation with UNDP recommended regulations.97

A further device to encourage cooperation with conservation regulations without any enforcement mechanism would be some minimal inspection program, under, for example, FAO sponsorship. On-board inspection of fishing vessels has been very difficult to achieve in the past, as the experience of the International Whaling Commission and the North-East Atlantic Fisheries Commission demonstrates,98 but that would not be necessary. Much effective inspection could be accomplished by Sea Service ships observing the activities of fishing vessels from a short distance away with the consent of the governments concerned. Seasons and closed areas could be monitored simply by observing who was fishing where and when. More could probably be seen with various electronic underwater fish-following devices which seem to multiply daily.99 While it would not be the role of the Sea Service to take any enforcement action if it observed violations of regulations, its principal could publicize them and, like an ombudsman, exercise whatever moral suasion it possessed to effect compliance with conservation measures. Even without a formal inspection program, the mere presence of the Sea Service, as a respected scientific neutral organization rather than as national inspectors, might exercise a deterrent effect on potential cheaters.

97. See text accompanying notes 43-46 supra.
98. See note 35 and text accompanying note 47 supra.
99. See, e.g., the advertising in any recent issue of FISHING NEWS INTERNATIONAL.
CONCLUSION

It is clear that the world's marine fisheries are in serious difficulty and that existing legal structures are not adequate to meet the problems. It is also clear that such a complete solution as the licensing plan of the Maltese draft treaty is unlikely to be adopted. Environmentalists and fish eaters should not despair utterly, however, for amelioration of the current difficulties is possible within the present regime. The proposed International Sea Service could be a valuable instrument to stimulate improvements. Since the organization would not encroach on present sovereignty or prerogatives, it offers a workable compromise to nationalists and internationalists now debating the future of the seas.

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