

Chapter 4

High Seas



I. Concept of Freedom of the High Seas

The term "high seas" means all parts of the sea that are outside the boundary of any country, or, in other words, all parts of the sea which are not included in the territorial seas or internal waters of any country. Article 1 of the 1958 Geneva Convention on the High Seas defines "high seas" as that part of the sea which are not part of territorial sea or internal water of a state. The high seas comprise over 70 per cent of the world's surface, and the commerce of the world moves uninterrupted in their limitless tracks. This flow of commerce is uninterrupted and unimpeded because the high seas are free. They are open to the use of all nations, and no state can appropriate them solely to its own use. The high seas, unlike land, cannot be occupied in order to acquire title, the high seas have an established legal status which requires freedom of navigation and freedom of use for all.

The principle that the high seas are open and free to the use of all nations was not recognized in its full extent until the first quarter of the 19th century. The early Roman jurists looked upon the sea, as upon the air, as common to all mankind. But with the development of commerce in the later Middle Ages, maritime states began to claim dominion over parts

of the open sea adjacent to their territories. The Adriatic Sea was claimed by Venice and the Ligurian Sea by Genoa. The Baltic Sea was shared by Sweden and Denmark. England not only claimed sovereignty over the Narrow Seas and the North Sea, but staked out the Atlantic Ocean itself by a line drawn from Cape Finisterre in Spain around the British Isles to Stadland in Norway. One of the early English Kings, Edward III, claimed for himself the title "King of the Seas." For many centuries the Italian States claimed the Mediterranean as their private lake.

These claims reached the height of their extravagance when Portugal and Spain, in dispute as to the extent of their territorial possessions in the Atlantic and the Pacific, entered into the treaty of Tordesillas in 1494 under Bulls of Pope Alexander VI,¹ delimiting their boundaries of discovery in the New World by a line drawn 370 leagues west of the Cape Verde Islands, Spain receiving the lands west of the line and Portugal those to the east. Thereupon Portugal claimed sovereignty over the Indian Ocean and the south Atlantic, and Spain over the Pacific and the Gulf of Mexico. Some of these claims to exclusive jurisdiction were acquiesced in by other powers. England on its part succeeded, by the power of its navy, in compelling foreign fishing vessels to take out licenses to fish in the

¹Fenwick, op. cit., p. 497.

North Sea, while foreign vessels entering the waters claimed by England as territorial were obliged to strike their topsails and take in their flags in recognition of its sovereign jurisdiction. On the other hand, the excessive pretensions of Spain and Portugal were stoutly resisted by England, as illustrated in the famous statement of Queen Elizabeth, who, untroubled by the inconsistency of English claims, informed the Spanish Ambassador that "the use of the sea and air is common to all; neither can a title to the ocean belong to any people or private persons, forasmuch as neither nature nor public use and custom permitteth any possession thereof."² On the whole but little law was recognized in the matter. Each state asserted such claims as seemed warranted in its own eyes and obtained recognition of them in proportion to its power to defend them.

Naturally the conflicting claims of states gave rise to a corresponding doctrinal controversy. The Dutch jurist, Hugo Grotius, made the first effective plea for a larger freedom of the seas. Grotius wrote two works on international law, the "De jure praedae" in 1604, and the "De jure belli ac pacis" in 1625.³ The former of these, in which he supported the claim of the Dutch East India Company to the capture of a prize from the

²Loc. cit.

³J.L. Brierly, The Law of Nations: An Introduction to the International Law of Peace. (5th ed.; New York and Oxford: Oxford University Press, 1960), p. 27.

Portuguese, was never published by him, and was not discovered until 1864. It was then found that a short work which he published anonymous in 1609, the "Mare liberum," contending, in opposition to the claims of the Portuguese, that the open sea could not be appropriated by any state, had been written as one of the chapters of the "De jure praedae." "Mare liberum" of Grotius maintained that the sea could not be made the property of any state. It is as established to defend the right of the Dutch to navigate the Indian Ocean, claimed by Portugal to be its exclusive territorial waters. His argument was based upon a priori principles derived from the Roman Law, that the sea could not in fact be "Occupied" as in the case of land and therefore must have been intended by nature to be free to all. Moreover, the sea, being inexhaustible in use, was not in principle susceptible of occupation, which was necessary in the case of things the utility of which could only be conserved if they became private property.

Certainly what Grotius said at the time made good economic, as well as philosophic, sense: "The sea, since it is as incapable of being seized as the air, cannot have been attached to the possessions of any particular nation."⁴ "All property is grounded upon occupation which requires that movables shall be

⁴Swing, op. cit., p. 528.

seized and immovable things shall be enclosed; whatever therefore cannot be so seized or enclosed is incapable of being made a subject of property. The vagrant waters of the ocean are thus necessarily free. The right of occupation, again, rest upon the fact that most things become exhausted by promiscuous use and that appropriation consequently is the condition of their utility to human beings. But this is not the case with the sea; it can be exhausted neither by navigation nor by fishing, that is to say, in neither of the two ways in which it can be used."⁵

Interesting enough, however, Grotius' philosophy of "freedom of the seas" also involved the concept of common ownership, "res communis omnium", an idea surely closely akin in principle to Pardo's "common heritage" enunciated after. "Freedom of the seas" came to mean that, except within an area extending three miles from the shoreline (the distance on 18th century cannon could reach) -- which came to be the "territorial sea" of the coastal power -- the rest of the oceans were high seas, free, as a matter of law, to all except pirates.

This doctrine propounded by Grotius laid down that beyond the limits of territorial sea, on the high seas every one can enjoy the freedom of navigation and fishing, uninterrupted by others, except under the jurisdiction of the state whose flag

⁵Colombos, op. cit., p. 58.

the ships fly. It is also laid down that each state in the exercise of its freedom of the high seas, should not unreasonably interfere with the exercise of similar freedom by other states or their nationals. Subsequently, the doctrine of freedom of the seas included, in addition to the freedom of navigation and fishing, the freedom of overflights and the freedom to lay submarine cables and pipelines under the high seas.

The attack of Grotius was met by several authors of different nations. He was answered by a number of advocates of territorial claims. Gentilis defended Spanish and English claims in "*Hispanicae advocatiois libri duo*"⁶, which appeared, after his death, in 1613. The most important of these works defending maritime sovereignty is that of Selden. He wrote his "*Mare clausum sive de Domino Maris*"⁷ in 1618, but it was not printed until 1635. Selden controverted the theories of natural law with the bald fact that parts of the sea had actually been appropriated by England. King Charles I, by whose command Selden's "*Mare clausum*" was so much impressed by it that, through his ambassador in the Netherlands, he complained of the audacity of Grotius and requested that the author of the "*Mare liberum*" should be punished. In 1653 Sir John Burroughs published a

⁶Fenwick, op. cit., p. 498.

⁷Oppenheim, op. cit., p. 585.

further defense of British claims under the title "The Sovereignty of the British Seas proved by Records, History, and the Municipal Laws of this Kingdom."⁸ On defence of the claims of the Republic of Venice, Paolo Sarpi published in 1676 his book, "Del Domino del Mare Adriatico."⁹

For the time being Grotius appeared to be in the minority, but by the 18th century new writers came to his support, notably Bynkershoek, whose work, "De domino maris,"¹⁰ was published in 1702. Bynkershoek recognized, however, the fact that the seas could be effectively occupied to the extent of the maritime belt measured by the range of a cannon - shot. Vattel repeated in 1758 in his work "Le Droit des gens"¹¹, the a priori arguments of Grotius, and his principles found a ready hearing among the writers of the early 19th century.

The concept of freedom of the seas, as formulated by Grotius was not generally accepted until the term was asserted by the Geneva Convention on the High Seas in 1958. Article 2 of the Convention states that freedom of the high seas comprises, inter alia, freedom of navigation, freedom of fishing, freedom

⁸Loc. cit.

⁹Loc. cit.

¹⁰Fenwick, loc. cit.

¹¹Brierly, op. cit., p. 37.

to lay submarine cables and pipelines, and freedom to fly over the high seas. These freedoms may also be enjoyed by land - locked states, which are given the right to sail ships under their own flags on the high seas (Article 4); states lying between land - locked states and the sea should negotiate agreements with land - locked states in order to give the latter the right to use their ports and rights of transit through their territory (Article 3).

A ship on the high seas is subject only to international law and to the laws of the flag-state. This makes it important to know which state is the flag-state. The "flag-state" really means the state whose nationality the ship possesses; it is nationality which creates the right to fly a country's flag, and not vice versa. The nationality of warships does not give rise to any problems, but the same is not true of merchant ships. Apart from very small ships, the nationality of merchant ships is determined in virtually all countries by registration, a ship has French nationality, for instance, if it is registered in France. The conditions which states lay down before placing a ship on their register vary from state to state. The traditional shipowning countries like the United Kingdom lay down stringent requirements about the nationality of the shipowners, the nationality of the crew, or the place of construction. Other states -- the so-called "flags of convenience" countries -- are prepared to register virtually any ship in return for payment of a fee.

Flags of convenience are mainly used as a means of avoiding payment of taxes and statutory wage-rates. But they can also be used for more sinister purposes. A vast amount of the law of the sea is contained in treaties -- dealing with such matters as ships' lights, safety regulations, the slave trade, insurance, "pirate" radio stations, oil pollution and the conservation of fisheries -- which, of course, are only binding on states parties to them. It is dangerously easy for shipowner to avoid compliance with such treaties by registering their ships in states which are not parties to them. The popularity flags of convenience is shown by the fact that Liberia has been the largest shipowning nation (in terms of registered tonnage) since 1967.

As we have seen, the coastal state has certain powers of arrest over foreign merchant ships in its internal powers, territorial sea and contiguous zone. The right of "hot pursuit" is designed to prevent the ship avoiding arrest by escaping to the high seas. It is regulated in some detail by Article 23 of the Geneva Convention on the High Seas, 1958, the most important provisions of which read as follows:

1. The hot pursuit of a foreign ship may be undertaken when the competent authorities of the coastal state have good reason to believe that the ship has violated the laws and regulations of that state. Such pursuit must be commenced when the foreign ship or one of its boats is within the internal waters or the territorial sea or the contiguous zone of the pursuing state, and may only be continued outside the territorial

sea or the contiguous zone if the pursuit has not been interrupted... If the foreign ship is within a contiguous zone, as defined in Article 24 of the Convention of the Territorial Sea and the Contiguous Zone, the pursuit may only be undertaken if there has been a violation of the rights for the protection of which the zone was established.

2. The right of hot pursuit ceases as soon as the ship pursued enters the territorial sea of its own country or of a third state.

3. ... The pursuit may only be commenced after a visual or auditory signal to stop has been given at a distance which enables it to be seen or heard by the foreign ship.

4. The right of hot pursuit may be exercised only by warships or military aircraft, or other ships of aircraft on government service specially authorized to that effect.¹²

The right of hot pursuit does not include the right to sink the pursued vessel deliberately; but accidental sinking in the course of arrest may be lawful.

Aside from the "hot pursuit", another significant subject in the area of high seas is "piracy". Piracy is a so-called "international crime" and a pirate is considered an outlaw, a "hostis humani generis"¹³ or the enemy of every state, and can be brought to justice anywhere. Piracy can be committed on the open sea only. Piracy is, and always had been, a crime against

¹²Akehurst, op. cit., pp. 223-224.

¹³Oppenheim, op. cit., p. 609.

the safety of traffic on the open sea, and therefore it cannot be committed anywhere else than on the open sea. Article 15 of the 1958 Geneva Convention on the High Seas defines the piracy as consisting of the following acts:

(1) Any illegal acts of violence, detention or any act of depredation, committed for private ends by the crew or the passengers of a private ship or a private aircraft, and directed:

(a) on the high seas, against another ship or aircraft, or against persons or property on board such ship or aircraft;

(b) against a ship, aircraft, persons, or property in a place outside the jurisdiction of any state;

(2) Any act of voluntary participation in the operation of a ship or of an aircraft with knowledge of facts making it a pirate ship or aircraft;

(3) Any act of inciting or intentionally facilitating an act described in sub-paragraph 1 or sub-paragraph 2 of this article.¹⁴

An act of piracy is considered to be a violation to the freedom of navigation on the high seas so that it is regarded as the strong enemy to the mankind.

One main important problem of the high seas is the fishing and conservation of the living resources. As the world population

¹⁴ Brownlie, op. cit., pp. 83-84.

increases hunger, the oldest and strongest urge, will drive man to put greater effort and ingenuity to harvest the seas in order to feed the population which already crowds the planet.

II. Fishing and Conservation of the Living Resources of the High Seas

Harvesting fish from the seas is one of the oldest activities of man. Over the centuries it has provided man with food, income, and adventure. Fishing is also characterized by the fact that it is one of the few activities of man in which the participants and the countries they represent are in direct confrontation with each other over a common resource. Of all the uses of the oceans, fishing has been the cause of the most sustained and prevalent conflicts. The main cause of the expansion of fishing effort is because of its wealth.

Fishery Resources

By fishery resource, the author means any living resource of the ocean capable of being harvested practically by man and used by him for food or other purposes. The significance of fishery resource becomes heightened particularly in the world today when mankind is facing serious problems of rapid population expansion. Even today many people are under-nourished or improperly nourished, and this problem is certain to be aggravated as the population increases. The world's rapidly increasing population portends an urgent need for increased supplies of food

from all sources. By the year 2000 -- one generation from now -- more than 6 billion people will be competing for the earth's food and resources. Already many developing areas of the world are critically short of animal protein.

Oceanographers are frequently asked whether these teeming millions can be fed by the produce of the sea. This is because the oceans contains large unused fishery resources and fisheries offer an opportunity to assist in closing the protein gap with many latent fisheries lying within easy assess of nations plagued by serious protein deficiencies. The pooling of knowledge about these resources could contribute significantly to development and management of world fisheries resources. The fishing industry can contribute to domestic and international economic development, provide employment, conduct research to assist in using the oceans more effectively, and provide food for combating hunger and malnutrition in the nation and the world.

The living resources of the sea can contribute importantly to meeting a part of the worldwide need for animal protein. Men today take only 3 per cent of its potential animal resources. The present harvest of the ocean is roughly 64 million tons annually,¹⁵ half of which is consumed directly and half converted into

¹⁵Marine Science Affair - Selecting Priority Programs, op. cit., p. 83.

fish meal. In 1967, 45 million metric tons of fishery resources plus 73,194 whales were harvested by man from the world ocean. In 1954 this harvest had been 23.6 million tons plus 60,983 whales.¹⁶ Thus the marine harvest had approximately doubled in 10 years. But in the same period, ocean research had indicated that of the kinds of living resources of the sea that some groups of men were harvesting, or of kinds as large and amenable to harvest and use as those, the ocean was actually producing about 2 billion tons per year. Thus in 1954 about 2 per cent of this potential was taken, and in 1964 about 4 per cent. The rest that the ocean was producing died and decayed back to the web of life in the ocean unused by man. Seafood production is one of the few major foodstuffs increasing faster than population growth. The Food and Agriculture Organization (FAO) estimates indicate that a well - managed world fishery could yield three to five times the current output. And a far greater yield could be realized if new species were exploited and new fishing methods were used.

Some of the marine products which we harvest are herbivores. Examples of herbivores are small fish such as the anchovy, and shellfish such as oysters, clams, and mussels. Currently about 40 per cent of the world fisheries harvest consists of small fishes, such as the herring, sardine, and anchovy,

¹⁶Alexander (ed.), op. cit., p. 87.

or of mollusks or crustaceans.

Part of these marine fisheries harvest is not eaten directly by man, but is used for the production of high protein food supplements for poultry and livestock. Full utilization of all species of fish in an exploited area can be achieved by reserving the more desirable species for human consumption and using the less desirable, so-called trash fish, for the production of the fish meal, fish oil and other industrial products.

In 1946 it was estimated that, for a period before World War II, the food supplies in areas occupied by one - half of the world's population were not adequate to furnish the minimum caloric requirements of the average individual -- it is to be emphasized that the reference is to "food supplies" and not to actual caloric intake. Six years later, the FAO concluded that in comparison to the prewar period "not only has there been an appreciable fall in the average caloric supply for the world as a whole but also the large gaps between the better and worse fed nations have widened."¹⁷ More importantly, for present purposes, about four-fifths of the population receive inadequate amounts of "protective foods", those which furnish minerals vitamins and proteins. In respect to proteins, meat is one of its most important sources and, for this purpose, fish is the equivalent to meat.

¹⁷McDougal and Burke, op. cit., p. 455.

It is estimated that the ocean contains 90% of the "possible food material" of the world and that each year the ocean produces one billion tons of fish. But despite this theoretical abundance, somewhat less than 30 million tons of fish are now caught each year, and it is calculated that fish comprise only about 10% of the world supply of animal protein.¹⁸

Recently, "Food-from-the-Sea" program of the Agency for International Development (AID) had established commercial processes for the production of Fish Protein Concentrate (FPC).¹⁹ FPC is bacteriologically and biochemically safe and stable, highly nutritious, and almost tasteless and odorless. It can easily be added to a number of prepared foods, such as bread or cereals. Ten grams of FPC would provide enough animal protein to meet the daily needs of a growing child at a cost of about two dollars per year. The introduction of FPC in poorly nourished countries offers promise of solving some of the serious problems of protein malnutrition. Assuming that all of this sea food could be used as human food and could be distributed among the world population that accelerated the exploitation of the world fisheries in many parts of the world.

¹⁸Ibid., p. 457.

¹⁹Gullion (ed.), op. cit., p. 53.

Regulations of Fishing Rights

A serious deterrent to the deliberate enhancement of marine production is the fact that the fish are common property; they belong to no one or to everyone, depending upon the point of view, until they are reduced to possession aboard a fishing vessel. In the open seas, fishing is absolutely free to all. Grotius placed fishing in the sea on the same footing as navigation and rather looked upon interference with the freedom of fishing as a graver offense than interference with navigation, no doubt with an eye to the dispute between the United Dutch Provinces and England over the right to fish in the waters around the British Isles. He used such terms as "barbarous", "inhuman", and "insane cupidity" about efforts to impose restrictions on the activities of foreign fishermen on the high seas.²⁰

But within territorial waters, however, each state is entitled to enact regulations reserving to its nationals the right of fishing or restricting its exercise within specified limitations. William Welwood, writing in 1613, gave a lucid explanation of this fundamental idea, which he based "on the primitive and exclusive right of the inhabitants of a country to the fisheries along their coasts; one of the principal reasons for which this part of the sea must belong to the littoral state

²⁰Sorensen, op. cit., p. 211.

being the risk that these fisheries may be exhausted as a result of the free use of them by everybody."²¹

Nonetheless, in demanding either exclusive rights of exploitation or exclusive competence to prescribe conservation measures, states frequently allege that adjacent fisheries are not adequate to support both local and foreign exploitation either because of biological limits operating upon the fish population in its environment, or because of cost and income factors, or for both reasons. It is urged, accordingly, that the territorial sea must be widened in order that local fishermen may have exclusive access to a larger ocean area or so that the coastal state may be permitted exclusively to prescribe measures for preserving the future yield, including, presumably, the authority to determine the allocation of shares in the catch if any foreign fishing is to be allowed at all.

As a consequence, many nations are now claiming exclusive fishing rights over much wider areas of the adjacent oceans than the part identified as their territorial limits.* The most common breadth of the zone of fisheries jurisdiction is now 12 miles

²¹Colombos, op. cit., p. 134.

* A summary of the fishing limits claimed by members of the United Nations system is given in the Appendix 1.

and the parties to the European Fisheries Convention recognize the right of member nations to establish a three-mile exclusive fishing zone seaward of the three-mile territorial sea plus an additional six-mile fishing zone restricted to the Convention nations. Several countries claim rights to the continental shelf which varies in width from a few miles to 100 miles or more and the superjacent waters. Still other countries claim fishing jurisdiction over waters which are well beyond the limits of the continental shelf, such as the claims of Peru, Chile and other nations for jurisdiction to a distance of 200 miles from the coast. Even if these claims for jurisdiction over wide areas were commonly recognized, the basic problems in encouraging commercial participation in the development of new or increased living marine resources would not be solved.

The problem of regulating fisheries and other marine resources outside national waters has inevitably suggested international organization. An outline of organization and functions for an International Fisheries Office was worked out by Dr. L. Larry Leonard at the end of his Carnegie monograph on the "International Regulation of Fisheries."²² This plan recognizes the immense density of subject-matter and conditions, with which such an office would have to deal, by recommending, in addition

²² Corbett, op. cit., p. 134.

to central organs, regional fishery and scientific boards. A modest start in the direction of organized co-operation has been made by the Fisheries Division of the Food and Agriculture Organization. A statistical service has been established, studies in the standardization and marketing of fisheries products are being promoted, and regional councils are being created. The functions of the FAO in this field as elsewhere are scientific and advisory; it has no power of control.

On the other hand, a drive to project national control beyond present territorial waters was well under way, before the outbreak of the second world war, in the countries and areas most interested in coastal fisheries. One of the first and most important conventions adopted for the regulation of fishing on the high seas was the "Hague Convention of 1882 for the Regulation of the Police of the Fisheries in the North Sea outside Territorial Waters."²³ This agreement made provision for the registration of fishing vessels and for a special emblem to be borne by them, while specific rules were laid down for the avoidance of conflicts between vessels of different nationalities. An exceptional provision, of great, collateral importance, is the authorization of the cruisers of the signatory powers to exercise a reciprocal right of visit, search, and seizure of the vessels of their several flags for the enforcement of the rules laid down.

²³Fenwick, op. cit., p. 500.

A second general convention adopted in 1887 was directed toward the abolition of the liquor traffic among fishermen in the North Sea.

Apart from this, on the Pacific coast of the United States, a stimulating factor was popular indignation over the "intrusion" of Japanese fishermen in the Bristol Bay salmon fisheries off the Alaskan littoral, Champions of the local interest, seizing upon an idea already mooted in Europe, urged Congress to assume, if not full sovereignty, at least control of fisheries, over the entire "continental shelf." This is the shelving fringe of the continental land-masses out to a depth of one hundred fathoms. It is on this fringe that the principal food species of fish find their feeding grounds.

No conclusive action had been taken in the United States upon this matter up to the end of 1941, when war forced it into the background. But on September 28, 1945, President Truman proclaimed the following policy of the United States of America with respect to coastal fisheries in certain areas of the high seas:

In view of the pressing need for conservation and protection of fishery resources, the Government of the United States regards it as proper to establish conservation zones in these areas of the high seas contiguous to the coasts of the United States wherein fishing activities have been or in the future may be developed and maintained on a substantial scale. Where such activities have been or shall hereafter be legitimately developed and maintained jointly

by nationals of the United States and nationals of other states, explicitly bounded conservation zones may be established under agreements between the United States and such other states, and all fishing activities in such zones shall be subject to regulation and control as provided in such agreements. The right of any state to establish conservation zones off its shores in accordance with the above principles is conceded, provided that corresponding recognition is given to any fishing interests of nationals of the United States which may exist in such areas. The character as high seas of the areas in which such conservation zones are established, and the right to their free and unimpeded navigation are in no way thus affected.²⁴

The declaration, however, still limited in scope; for, though areas affected are to be "contiguous to the coast of the United States", no definition of contiguity is supplied.

Following the 1945 Truman Proclamation on Fisheries was the agreements on the territorial sea and the high seas convened by the United Nations Conference at Geneva, Switzerland on February 24, 1958 and closed on April 27, 1958. In this conference, 86 countries were represented, and a separate Convention on Fishing and Conservation of the Living Resources of the High Seas was adopted. The basic work of the conference was divided among four committees : First Committee - Territorial Sea and Contiguous Zone; Second Committee - High Seas : General Regime; Third Com-

²⁴For full detail of the Truman Proclamation on Fisheries see Appendix 4.

mittee - High Seas : Fishing, Conservation of the Living Resources; Fourth Committee - Continental Shelf.

The countries which played an active role in the Third Committee might be divided into three groups based on their general attitudes toward high seas fishing. The first might be termed conservatives, since their interest was primarily in maintaining the past freedoms to fish with the minimum of restrictions on such activities; the second group might be termed radicals or extremists since their efforts were directed toward completely overturning the established order for the purpose of securing maximum control by coastal states over the fishery resources in waters adjacent to their coasts (regardless of the extent to which they were utilizing these resources or the likelihood that they would utilize them in the foreseeable future). A third group, which might be termed as moderates, sought some modification of the established order primarily for the purpose of securing a sound and practicable international conservation system that would assure the continued productivity of the resources of the high seas. As the issues became clear and delegates became convinced of the need for an effective world conservation system, the group of moderates increased somewhat in number. This was encouraged by the conclusions of some of the more reasonable conservatives and extremists that they could not secure adequate support for their preferred objectives and that they had better settle for a sound conservation system in preference to nothing or chaos.

The United States fishing industry includes important fisheries on the high seas off foreign shores as well as off their own coast, and this helped to work out a United States position which to a considerable extent represented a blending of the interests of the overseas and coastal types of fishing. Thus, the United States interests lay with the moderates and the generally united backing of fishing industry helped to make it possible for the United States representatives to play an important role in leadership of the moderate faction.

As the conference developed, it became clear that the various delegations were principally concerned with three issues: (a) the kinds of limitations on freedom of fishing on the high seas, (b) the obligations which fishing nations have with respect to the conservation measures for the stocks of fish they are harvesting, (c) the special interests of the "coastal states" over the resources off their coast. And these three principal issues are reflected in the fisheries convention as follows: freedom to fish is covered in Article 1, paragraph 1; obligations of fishing states are covered in Article 1, paragraph 2 and Articles 3, 4, and 5. Special interests of coastal states are covered in Article 6 and 7. Definition of conservation is included in Article 2.

Shortly speaking, the Fishing and Conservation of the Living Resources of the High Seas Convention guarantees to all states the right to fish on the high seas subject to any treaty obligations, the rights and interests of the coastal states recognized in the Convention, and the provisions on conservation

measures. A coastal state is recognized as having a special interest in the maintenance of the productivity in the living resources in the area of the high seas adjacent to its territorial sea. If a coastal state can establish that there is an urgent need for conservation measures, that the measures are based on appropriate scientific findings and that the measures are not discriminatory against foreign fishermen, the coastal state is entitled to adopt unilateral measures of conservation in respect of any stock of fish or other marine resources in any area of the high seas adjacent to its territorial sea, if negotiations with foreign states have not led to any fruitful conclusion within six months.

Besides the coastal fishing rights, there is still another type of fishing -- distant fisheries zone. On our maps of internal and territorial waters of the world we should now add "extraterritorial fisheries zone." The international debate on fishing rights over the last few years, including the deliberations of the Geneva Conference, has been characterized by the overriding problems of whether the restrictions in these high seas fisheries zones apply to all countries or only to certain ones; and, second, what the particular restrictions on freedom to fish are. Certain countries may agree among themselves to adopt restrictions on their fishing effort within a particular offshore area, but such restraints are not binding on non-signatory powers. It seems probable, in years to come, that more and more bilateral and multilateral agreements will be

made concerning fishing activities and the problem of compliance by non - signatory states may become an extremely serious one.

There are various types of control a coastal state may seek to exercise in an extraterritorial fisheries zone. The most drastic claim is to exclusive fishing rights, a claim which may be tempered by the recognition of the historic rights of certain other countries to exploit the fisheries of the zone. Thirty countries of the world out of 85 with specific territorial breadths, have extraterritorial exclusive fisheries zones, with or without the recognition of historic rights. Of these, 24 countries, with territorial breadths ranging from 3 to 10 miles, claim exclusive fishing rights out to 12 miles. Two other countries, with no clearly defined territorial limits, also claim exclusive fishing rights out to 12 miles. If we add to these the 26 countries with 12 miles territorial belts, we find that foreign fishermen are generally forbidden to come within 12 miles of the coasts of 52 countries, or nearly half the coastal states of the world, either because of territorial or exclusive fisheries limits. In addition, foreign fishermen must stay more than 12 miles from the coast of 11 other nations²⁵

A coastal state may not only recognize certain countries' historic rights, but even further and permit entry into

²⁵Alexander (ed.), op. cit., p. 80.

the fisheries of the extraterritorial zone by all nations, subject to the licensing regulations of the coastal state. By issuing licenses, this state can still control entry by foreigners into its offshore fisheries and thereby maintain what it feels to be a rational management program. But there may be genuine disagreement among governments as to what constitutes a "rational" management program for those particular offshore waters. From this, two questions arise : for what purposes is the management program intended and on which party or parties rests the burden of proof of the need for and efficacy of the program ?

Limiting foreign entry into offshore fisheries may be done primarily to protect the economic interests of the coastal state's fishermen. It may also be done for biological reasons, that is, in an effort to achieve maximum sustainable yield. There was more concerning the need for rationalizing the ocean fisheries of the world through large scale management programs in the 1958 Geneva Conference. Such programs would, for the most part, exist without regard for the fixed boundaries marking the outer limits of a coastal state's fisheries zone.

The least drastic of the extraterritorial fisheries claims is contained in the 1958 Geneva Convention on Fishing and Conservation of the Living Resources of the High Seas,²⁶ whereby

²⁶Brownlie, op. cit., pp. 90-97.

a coastal state has the right to unilaterally adopt conservation measures in the waters beyond its territorial limits. Such measures must not discriminate against foreign fishermen, but must be adhered to by foreigners, under a set of carefully phrased conditions which, among other things, permit the foreigners to appeal to an international body. This represents a far more rational approach to the world fisheries problem than are unilateral proclamations of exclusive (and often ineffective) fisheries zones, although the latter situation appears to be on the increase rather than decline.

There are, of course, examples of other types of extraterritorial claims, such as those of neutrality zones extending several hundred miles out from the coast, or the reserving of certain ocean areas for a specific length of time for military or scientific testing.

However, the extraterritorial claims reveal one significant point. They produced a conflict of interests of coastal fisheries as opposed to those of high seas fisheries. These two groups of interests relate primarily, but not exclusively, to different types of economic and technical organization. Coastal fishing is mostly carried out by small boats and primitive gear, not requiring great capital investment, whereas high sea fishing requires larger vessels and more complicated gear and is, in general, considerably more capital consuming. Underdeveloped countries or communities are therefore practically excluded from

participating in high sea fishing, and they are reduced to coastal fisheries, often based on a very long tradition. The identification of the interests of underdeveloped countries with those of coastal states was one of the salient features of the Geneva debates.

It should not be overlooked, however, that even highly developed fishing countries have local communities depending upon local fisheries. This is true of Canada and even the United Kingdom, quite apart from the overseas territories under British administration. A country in such a position will often have a difficult choice in deciding which of the two groups of interest should prevail in case of conflict. On the other hand, countries which by other standards have not attained a high stage of economic development may, by tradition, have a well - developed high sea fishery. This is the case of Portugal and Spain.

The interests of coastal fisheries and high seas fisheries clash most conspicuously in areas such as the northern Atlantic, where seagoing fishing vessels must approach foreign coasts to exploit rich fishing grounds. High sea fishing fleets, with trawlers, factory ships, and other efficiently operating vessels, may deplete the stocks on which local fisheries depend. The understandable reaction of the coastal state is to claim an extension either of the territorial sea or the area in which it can exercise exclusive rights.

The states on the west coast of South America have a somewhat different position, based on special circumstances.

The prime example of this has been Peru, which came from being almost a non-fishing country in 1954 to the greatest fish producing country in the world in 1964, when it produced by volume about 20 per cent of the total ocean production.²⁷ Peru is economically dependent not only on certain species of fish living far from the coasts, but also on the guano - producing birds feeding on certain species of fish in an extensive area of the Pacific adjacent to the coasts. The claims to sovereign rights up to 200 miles from the coast is based on the theory that the "biological boundary" is 80-100 miles from shore in summer and 200-250 in winter.

As these developing countries develop coastal fisheries, they tend almost at once into becoming longer and longer range fishermen as well, fishing off the coasts of other countries as a part of their necessary fishery economics just about as naturally and necessarily as the fish migrate for biological necessity. This is particularly true of developing countries who witness large sophisticated, integrated foreign fishing fleets operating off their coasts and frequently catching stocks of fish that local fishermen have historically fished. These countries are well aware of the fact that the distant - water fleets can move over thousands of miles from one fishery to

²⁷Alexander (ed.), op. cit., p. 92.

to another, while their own fishermen suffer because they cannot move beyond local fishing grounds. Examples of these developing countries are provided by Mexico, Panama, Ecuador, Peru, Chile, Guayana, Cuba, Senegal, Ivory Coast, Ghana, Pakistan, and Thailand.

Nevertheless, for a number of reasons, an extensive exclusive fisheries zone does not respond to the present and anticipated demands of the world community. Some of these reasons are the following:

a. No matter what lines are drawn on the ocean, fish will ignore them.

b. The demand for protein is so great that living resources should not be allowed to lie fallow and unused in national preserves.

c. Countries engaged in distant-water fishing will not accept unilateral extensions of jurisdiction. Developed countries are not the only ones engaged in distant-water activities: an increasing number of developing countries look upon fisheries, both coastal and distant-water, as a primary means of obtaining food and foreign exchange.

d. A reality in ocean affairs is the acknowledged tendency for a jurisdiction created for one purpose to expand into other activities and uses of the high seas. This is known as "creeping jurisdiction," and its final result would be absolute control by coastal states over vast areas of the oceans. Such a

situation would be detrimental to all countries of the world, whether coastal or landlocked, and would interfere not only with fishing but with other ocean uses as well.²⁸

In conclusion, with regard to the practice of states' fishing rights, states fall into three classes: (a) states which adopt the exclusive right of fishing in favor of their nationals within their territorial waters (Great Britain, France, Russia, Germany and Spain); (b) states which grant special favors to their nationals without excluding foreigners (Norway, Sweden and Italy); and (c) states which give liberty to all to fish but subject to reciprocity (Portugal and Greece)

Distribution of the Sea's Wealth in Fisheries

What are the characteristics of ownership of international fisheries? Who has ownership rights, what do these rights include, and how can ownership rights be evaluated and priced in economic terms? To begin with the most general aspect, there is question as to whether the fishery resources of the high seas belong to no one or conversely, are the common property of the world community. If the first interpretation is accepted without qualification, then the resources are up for grabs. Any nation feeling capable of it could assert unilateral authority over high seas fishery far distant from its shores.

²⁸Brittin and Watson, op. cit., p. 128.

Conversely, the resources might be considered to be the property of the world community as a whole. This appears to be the general trend in interpretation. At least, some feeling for world ownership may be serving to restrain unilateral appropriation of fisheries. The basis for this feeling may be mixed. It may, in part, be an unwillingness to incur unpopularity. It may be fear of retaliation. It may be that a nation finds world ownership advantageous to its own interests. Or, indeed, it may be from some sense of equity. But whatever the motivations, the evidence is that world fisheries are coming to be considered as belonging to the world community, at least this is implied in the conservation agreements that impose an obligation upon nations to "conserve" fishery resources.

If then, the resources are the common property of the world community, how can each nation define its share of this property? If a resource is bottomless and no one can exclude anyone else from sharing the resource, there is no market place for the resource and no price that can be directly attached to it. Sunshine is obviously important to everyone, but it cannot be bought and sold under certain conditions where scarcity and exclusion become involved.

Concerning the problem of distribution of the wealth of fisheries, we will look to four of the different possible systems that might evolve for the distribution of the sea's wealth in fisheries. These are the continuation of the present

system of open access; a distribution on the basis of "historic rights"; unilateral appropriation by coastal states; and some form of international control on behalf of the world community.

- Under the "open access" system, presently maintained, the wealth is distributed on the basis of a nation's willingness and ability to invest in exploitation. No nation is excluded, and every nation may, if it wishes, exercise its option to participate in a fishery. Such regulations will either prohibit technological innovation or impose other severe costs on harvesting. The losses will be borne both by the world community and by the fishery industries. It is clear that this system of unrestrained access cannot be maintained.

Similarly, a generalized right of access to fisheries has no value unless scarcity and exclusion become attached to the right. Under these conditions, wealth, such as it is, is distributed on the basis of nations' abilities and willingness to exploit the fisheries. Those that do not exploit, do not share in the wealth. They do, however, keep the option for exploiting sometime in the future, and cannot be excluded from exercising this option.

In some cases, rights of access have acquired scarcity and a semblance of exclusion so that the rights have been bought and sold. The Japanese and the Canadians have sold their rights to catch fur seals. The United Kingdom and the Netherlands have sold their rights to take whales in the Antarctic. And the adop-

tion of the doctrine of abstention in 1952 involved the sale of rights of the Japanese to fish for salmon in the eastern North Pacific. It involves the giving up of a fishing right in return for something of value. The value may be explicitly stated in monetary terms; it may be in terms of physical quantities; or it may be a non - quantifiable reward completely unrelated to the fishery resources. But whatever the terms of trade the right of access in these instances has been valued and has become an item of wealth. The difference between the generalized rights mentioned above and the specific, saleable rights is that the latter rest on an historic right of access to the resource. That is, the selling nations have made use of their freedom of opportunity to exploit a fishery and thereby have established a right that has a recognized value.

- One of the three other systems is to divide the fisheries on the basis of "historic rights." Under this system, where a fishery has been developed and is being exploited wastefully, the participants would agree among themselves to control on the amount of effort. They could, as in the North Pacific Fur Seal Treaty, leave exploitation in the hands of a single producer and then share the profits. Or they might agree to proportionate reductions in effort so that the relative amount of effort of each nation would remain the same as it was before the agreement. An additional alternative would be to reach agreement on a quota for the total catch and then divide the quota among themselves, permitting each nation to determine its

own level of effort, this has been done for the Antarctic whales.

Looking at this system on the basis of current trends in national fishing effort, it is clear that this would lead to distribution in favor of the Soviet Union and the Japanese. The extension of these nations' distant water vessels to all corners of the sea would give them strong claims to the resources, if the principle of historic rights should become the guide for distribution. Most other nations of the world would also find themselves excluded from many of the world's fisheries.

Under historic rights that exclude new entrants, the wealth goes to those who exploit, or who have exploited, the fisheries. But if ownership is interpreted as a right to share in the resources, then the wealth would be distributed to all nations. Obviously, there are difficulties with each of these interpretations -- difficulties with respect to the goal of economic efficiency and to the goal of acceptability. Permanent distribution on the basis of historic rights is not likely, therefore, to be widely acceptable.

- A third system for distribution, and one that would also receive considerable opposition, is that of "unilateral appropriation" of resources by the coastal states. Some claims along these lines have already been asserted. Chile, Ecuador, and Peru have claimed exclusive right out to 200 miles from their shores. A 12 mile limit of exclusive rights has no biological or economic rationale. Its political rationale is based only on the fact that a large number of nations have asserted claims out

to that limit. In view of growing demands and increasing competition for scarce fishery resources, there will be growing pressures to emulate or exceed the assertions of the C.E.P. (Chile, Ecuador, Peru) countries. Only a relatively small number of nations would benefit from such a distribution scheme.

- Under the fourth system, "internationalization," the distribution of the sea's wealth in fisheries could follow any of several different patterns. Initially, some of the wealth produced under this system might be used to "buy out" historic rights, i.e., to help those nations with large investments to ameliorate the transitional hardships that would accompany the loss of access to the resource. Several different schemes or combination of them could be followed -- population, need, length of coastline -- or the income could be used for some generally accepted purpose. But whatever the scheme, it would have to be worked out by all nations, and it would have to be demonstrated that this system for distribution is better than the alternatives.

Further, we will discuss three techniques for controlling entry or to equally distribute the marine fisheries : that of direct license limitation; that of the appropriation of economic rent; and that of the appropriation of the resource. Each of these techniques calls for a greater degree of authority than now exists on the sea, but this is inevitable no matter what shape the future regime will take. Each technique also will undoubtedly be accompanied by transitional hardship, as participants

find themselves excluded from the fishery. There are, however, ways in which these hardships can be ameliorated.

(i) License Limitation. One possible method is by the direct limitation of the amount of effort. The most effective way would be by granting licenses only to the number of producers that would yield the greatest revenue to the industry. There are many difficulties with such a scheme. First, since the fishermen come from different nations with different wage/price structures, conclusions as to the potential net economic revenue and the appropriate amount of effort are likely to vary.

A second difficulty lies in describing the unit of effort that is to be licensed. If it is a single vessel, then the temptation would be to build bigger and faster vessels in order to get as great a share of the catch as possible. This could lead to a race in technological innovation that would be economically inefficient. It could also lead to depletion of the resource and heavier costs for future harvesting. These effects might be overcome by licensing a vessel of a certain size and catching power.

But an even greater difficulty would lie in the acceptability of such a scheme. If the licenses are granted only to those nations with historic rights in the resources, then the non-participating nations would either be excluded or have to buy a license from a retiring license. This would mean that a nation would have to purchase what is now or free right of access, and it would mean that the wealth of the seas

would lie, essentially, in the hands of those with historic rights. It is unlikely that this proposal would receive wide acceptance.

If, in order to overcome this, free right of access is to be maintained, then the exercise of this right would mean either the granting of additional licenses (and the breakdown of the scheme) or the loss of the licenses.

(ii) The Appropriation of Economic Rent. A second and less direct method for controlling entry would be by the appropriation of the economic rent produced by the industry. A license fee, determined by auction or other means, would add to the costs of effort and discourage the excess producer from participating in the fishery. But some of the same difficulties of the license limitation scheme would attend this proposal. There would be difficulties in determining an appropriate license fee or tax, in describing the unit of effort, and in allowing for a rational rate of technological innovation. Also, the right of access would no longer be free.

But the essential difference between this proposal and the license limitation method is that the wealth of the seas would be appropriated by a single agency rather than by the participants. This raises the question as how to distribute the wealth.

(iii) The Appropriation of the Resource. The third method for limiting entry is by the appropriation of property rights to the resource itself. If a single managing agent has

full control of the resource and of all access to it, then the common property characteristics are removed. In this case, the problems of economic efficiency, technological innovation, flexibility of management, and similar problems, would be no more difficult than those of an ordinary former of businessman. The manager, or owner, would invest only as much capital and labor as would produce the maximum net revenue. He would buy his inputs in the cheapest market and sell his products in the dearest market. He would have little difficulty in choosing how much of each species to produce, since the market would be his guide. It is important to point out that this case calls for the appropriation and use of exclusive rights by a single managing agency. Nothing is gained, for example, by an agency's acquiring these rights and then granting open access to those producing units under its jurisdiction.

In sum, the world has to select any of these alternatives or a combination of them for controlling the access of marine fisheries. One can only hope that the selection will be based on rational objectives; on clear foresight; and that it will be made with a sense of equity and generosity.

Conservation of Fisheries in the High Seas

It follows from the doctrine of the freedom of the high seas that fishing everywhere on the high seas is open to the subjects of all states. This doctrine was originated at a time when the resources of the high seas were assumed to be inexhaustible; but nowadays fishing techniques have improved,

and the fishing industry is encouraged by subsidies in many states, the result is that the resources of the high seas have been shown to be anything but exhaustible. At the present time when the demand for fish products is growing and the world fishing catch is increasing (Table 5); even if technological innovation is prohibited, the presently developed fisheries will become severely depleted and those fisheries that are less developed at present will begin to feel the costs of declining catches per unit of effort.

Table 5 : World Fishery Catches of Leading Countries (Only those countries catching more than 1 million metric tons in 1970 are listed)

Year	1958	1966	1967	1968	1969	1970
Peru	900.2	8,712.1	10,034.1	10,440.5	9,143.4	12,481.1
Japan	5,506.0	7,102.6	7,850.9	8,670.1	8,613.4	9,314.3
Norway	1,438.9	2,871.9	3,264.9	2,838.1	2,437.0	2,855.7
U.S.A.	2,703.4	2,542.9	2,430.4	2,479.4	2,495.7	2,758.3
India	1,064.4	1,367.4	1,400.2	1,525.9	1,605.0	1,745.9
Thailand	196.3	708.1	847.2	1,089.0	1,270.1	1,594.9
Spain	844.9	1,352.8	1,432.1	1,500.1	1,481.7	no figure given
Canada	922.2	1,315.9	1,258.5	1,452.2	1,351.2	1,323.0
Denmark (excluding Faeroes)	598.1	850.7	1,068.4	1,463.7	1,277.3	1,228.7
Chile	220.9	1,383.3	1,052.8	1,376.1	1,076.9	1,161.0
United Kingdom	1,136.3	1,052.6	1,004.5	1,017.9	1,062.4	1,075.3

The totals are given in thousand metric tons and do not include whale catches.

Source : FAO Yearbook of Fishery Statistics 1970, Vol. 31

Note : The figures for USSR and the People's Republic of China are not known, but almost certainly they are among the world's leading fishing countries.

With technological innovation and no control on the number of users, whole stocks of fish might be wiped out in a single season. This would be especially true if some of the advanced techniques become feasible. New methods of fishing have proved so destructive and wasteful that if they are allowed to go on unrestricted, they will inevitably lead to the partial extinction of fisheries over large areas of the seas. Our increased knowledge of the life of fish shows that it is absolutely necessary to establish close seasons and to prohibit the use of injurious means of capture. Over-exploitation has already brought many marine species, such as the American lobster, halibut, haddock, tuna, cod and salmon, close to extinction. There is therefore a widespread need for conservation of fisheries, i.e. limitations on fishing in order to maintain the level of food supplies in the future. French Diplomat Michel Lennuyeux - Comnene, a spokesman on fisheries policies, says that the seas are being so badly overfished that there may well be "no more fishing" within the period of only 20 years. He warns: "We're literally eating our capital."²⁹

Demands that fisheries be conducted in a manner to insure that they would be available for future generations became the cornerstone upon which the 1958 Geneva Convention on Fishing was built. Its central purpose was the conservation of

²⁹"Squeezing More Out of the Seas." TIME, op. cit., p. 43.

the living resources of the sea. Thus, one of the basic obligations placed upon ratifying countries was to conduct their fisheries, whether on a national, bilateral, or multilateral basis, so as to insure that fisheries would be maintained at a level of population which provided for a maximum sustainable annual yield.

The total number of the fish in the population, their total weight, their average size, and their average age decrease as the production of the fishery increases. This process continues until a certain point beyond which all of these things continue except the yield of the fishery, which beyond this point begins, also, to decrease no matter how much effort is put into the fishery. This is called the point of "maximum sustainable catch." It is the point at which the resource is yielding the maximum amount of food or other product useful to man on a sustainable basis.

It was agreed that the harvest of the commonly owned resources of the high seas would be governed in such a manner as would render possible the optimum sustainable yield from such resources so as to secure the maximum supply of food and other marine products. This is also confirmed by the 1958 Convention on Fishing and Conservation of the Living Resources of the High Seas which defines "conservation" as "the aggregate of the measures rendering possible the optimum sustainable yield from these resources so as to secure a maximum supply of food and

other marine products."³⁰

The Geneva Convention on Fishing and Conservation of the Living Resources of the High Seas, 1958, makes a modest attempt to deal with the problem. The Convention gives the coastal state two special privileges : a right -- regardless of whether its nationals fish there -- to participate in any system of research and regulation aimed at conserving the living resources in the high seas adjacent to its territorial sea, and a right to initiate negotiations for the purpose of preparing an agreement of the conservation of the living resources. It concedes the special interest of the coastal states in conservation of the fish stocks off their coasts provided these rights are strictly related to the needs of conservation and could not be used to discriminate against foreign fishermen. The coastal state also has the right to initiate negotiations with a view to prescribing by agreement the measures necessary for the conservation of the living resources in the same area. If no conservation agreement is reached within 6 months of the start of negotiations, the coastal state may adopt unilateral measures which will be valid for other states if certain requirements indicated by the Convention are fulfilled.

One of the most important facts about fish, which alone would make it virtually impossible to establish a conservation

³⁰Fenwick, op. cit., p. 503.

program or to claim meaningful exclusive access, within a fixed zone of a specific width, is that even the relatively sedentary type may range rather widely within the confines of the continental shelves, and pelagic species move over vast expanses of water. While it is important to note that fish are most commonly found in commercial quantities in the relatively restricted areas above the continental shelf, and therefore in some proximity to a particular state, this does not establish a particularly precise location of the place fish are caught in relation to the adjoining land mass. Fish move horizontally, that is roam from one place to another, and vertically, at different depths, and no uniform width for the territorial sea could encompass the range within which fish move in all their life phases. Not only do fish move in and out of territorial seas, even those of rather exaggerated width, such as 12 miles, but they move laterally along coasts and where a coast is divided into several sovereign states the fish may move through waters under the exclusive competence of several states. No unilaterally conceived and implemented program of conservation or exploitation could make sense under such circumstances.

The "salmons" come down out of the streams and mix thoroughly in the ocean, those from Asiatic streams coming over close to the American continent and those from American streams moving over toward the Asiatic coast; those from New England and Scotland in the sea off Greenland. The "Norwegian cod," which conducts the major part of its spawning in the internal waters

of Norway, or at least within the territorial sea, moves out and is fished for throughout the Arctic, north of the Atlantic, wherever the water conditions are right. "Albacore" are born somewhere in the western central Pacific, migrate over to the California coast where they are fished by Americans who have tagged them. We have found that such tagged fish move to the Asiatic coast the next year, or the year after. They are fished there by Japanese, who catch some of those tagged off California. "Skipjack tuna" tagged off Mexico are caught off Hawaii. The "bluefin tuna" are commonly caught in the territorial sea of Mexico and California but do not spawn in the eastern Pacific at all. They spawn south of Japan and north of the Philippines, and individuals tagged off Mexico are captured the other side of Japan, in the sea of Japan. "Fur seals" feed off California and sometimes as far south as northern Mexico. Their nearest breeding ground is the Prabilof Islands in the Bering Sea. "Gray whales" pass through the territorial sea of southern California proceeding to their calving grounds in the internal waters of the lagoons of northern Mexico; and, having fulfilled this biological purpose, migrate back across the Pacific to the feeding grounds off Kamchatka and the western Bering Sea. "Sable fish" are tagged in Puget Sound and returned from Bering Sea. Etc., etc.³¹

³¹Full details see Alexander (ed.), op. cit., pp. 88 and 96-97.

There is no system of lines or barriers that can be erected to provide a sensible system of ownership over these resources. The problem of conservation of these resources is simply not tractable to this sort of management system.

Therefore, there are four quite severe problems involved in the control of the harvesting of marine resources:

1) At some in its development, each fishery must restrict its operation so as not to harvest a given resource beyond the point of maximum sustainable yield.

2) The profits derived from such conservation must be divided among the fisheries harvesting the resource since each is one of its owners.

3) Ownership of a given resource in a particular area does not necessarily result in effective control of that resource since it itself is not a stable factor, in that the fish population in that area may move from it for obvious biological reasons.

4) Because various fish populations migrate in different patterns and respond in different ways to the pressure of fishing within the area, each individual population constitutes its own problem

Although the great fisheries of the world are mostly located within relatively short distances from the coasts of continents and islands, and thus within the range of economic exploitation, it appears that some of them have not been exploited fully and effectively. For example, it is estimated that 98% of

the world's catch comes from fisheries located in the Northern Hemisphere. The great fisheries in this half of the globe have been fished for many years, and even centuries in some cases; yet observers have nevertheless declared that certain fisheries are not being exploited to their full potential and that some fisheries in this hemisphere are not fished at all. The Southern Hemisphere, which contains the greater part of the world's waters and 80% ocean, furnishes only 2% of the world's catch and is apparently capable of greatly increased production. While observers differ greatly in their estimates of the possibilities of exploitation in the southern oceans, very general assessments indicate that the latent resources are most extensive. Fisheries Expert, Roland F. Smith of the National Oceanic and Atmospheric Administration (NOAA), believes that protein from the sea could feed 1.5 billion people -- almost half the world's population. Smith notes that the 65 million metric tons of fish caught annually represent only one two - thousandth of the ocean's yearly fish production. One way to squeeze more out of the sea, he suggests, would be to wean people away from the 55 most popular species and get them to try some of the 30,000 to 40,000 underutilized varieties.³² And this is one of the means to solve the problem of the shortages of food, and extinction of fisheries.

³²"Squeezing More Out of the Seas." TIME, op. cit., p. 44.

The Need for an Effective International Fisheries Organization

The need for an effective international fisheries organization and joint enterprises in the exploitation of the living resources of the seas is perhaps even stronger than in the field of mineral resources. There have been calls for new approaches that would promote efficiency and conservation, divide or allocate ocean fishing resources, avoid conflict, reduce interference with other uses of the sea. Among alternatives that have been discussed are:

- 1) Comprehensive internationalization that would allow an international authority to run the fisheries of the world
- 2) Establishment of an international agency with authority to develop and enforce conservation regulation.
- 3) The negotiation of a comprehensive treaty establishing the fishing rights of different nations and creating an international agency to enforce the treaty. (The treaty might even require a fishing license from the agency).
- 4) A right of "innocent fishing" which would allow fishing and fishing research by all nations even in coastal waters.³³

In the formulation of international fishery regimes, however, there is also the complexity of the tasks and the need

³³Gullion (ed.), op. cit., p. 86.

for additional research. First, no matter what objective for fisheries management is chosen, arrangement must be technically possible. The prime distinction between minerals of the sea floor and the fisheries of sea waters is that the former are fixed in place and the latter are mobile. The freely swimming fish pay no respect to national boundaries or other artificial divisions of the oceans. Some fish, such as salmon and tuna, may cover several thousand miles during their brief life span, and may appear in the territorial waters of various nations. Other species may be homebodies, but even in these cases, their environment may be influenced by actions far from their habitats. In all cases, it is necessary to define a viable management unit. For those fish that roam great distances, it may be the stock itself. In other cases, a regional approach covering several interrelated species may be most desirable. It is clear that there will be great difficulties involved in defining management units, particularly if the fish enters the territorial waters of an uncooperative coastal state.

Another criterion is that the regime be sufficiently flexible to deal with changes in the patterns of demand. Currently, there are only a relatively few species of fish that are sought by fishermen. Vast quantities of so-called underutilized species exist in the oceans simply because the market for these species is not sufficient to warrant investment in catching them. It is a common plea of commercial fishermen that every

effort be undertaken to increase the demand for these "under utilized" species.

In any event the requirement that a fishery be subjected to a unified management by no means necessarily supports an argument that such management must be exercised by a single state for its own benefit; economists have been careful to point out that exclusively local, or coastal, control is not the only alternative. It may be undesirable from an over-all community perspective to undertake the organization of a unified management of a given fishery or to establish a conservatory regime, even if it could be established through extensions of the limits of the territorial sea. There have been strong suggestions that the conservation measures promulgated to maintain the yield of the Pacific Halibut fishery have resulted in a waste of resources, and it has been further suggested that there is no "clear-cut evidence that halibut fishermen were made relatively more prosperous by the control measures." Of more general significance is the assertion of Professor Scott in The Fishery : The Objectives of Sole Ownership that

Some assets, such as oil fields, fisheries and watersheds, occur on an immense scale, and it is a very real problem to know whether the efficiency gained from unified management provides a social gain sufficient to offset the possible dangers of the creation of some immense sole-ownership organization (such as a cooperative, a government board,

a private corporation, or an international authority).³⁴

The similar general point was made by Burkenrood in his Theory and Practice of Marine Fishery Management from a somewhat different perspective:

Reduction of a stock below the level for maximum equilibrium yield thus has results which are clearly definable in terms of wasted effort. However, the social benefits of saving this effort by management are not so easy to demonstrate...³⁵

In other words, wholly unregulated exploitation may be more desirable in certain circumstances, or less desirable, than attempts at planned use.

In a brief analysis, one can say only that these suggestions represent more or less radical solutions for the grave problems that beset the fishing industry. There is little basis for confidence, or even hope, that any of these solutions is likely to be attempted in the near future. Comprehensive internationalization to replace national fishing seems out of the question. The problem, then, will remain that of achieving some accommodation between competition and conservation, between coastal nations and others, between nations with some historic claims in an area and newcomers. It may be different to achieve

³⁴ McDougal and Burke, op. cit., p. 505.

³⁵ Loc. cit.

agreement on a universal treaty with a universal formula. But, whatever universally or regionally, new agreements are necessary, as are new institutions with additional functions. An international body to develop and enforce a conservation program would seem a basic need.

Another activity which has been growing rapidly in recent years is the increasing number of specialized inter-governmental fisheries commissions. The prototype for this type of commission, which is both governmental and scientific in structure is the International Council for the Exploration of the Sea. Initially, its area of interest was limited to the North Sea, but this has now expanded to include most of the fisheries of the North Atlantic. The commission discusses scientific problems of importance to the conservation and wise exploration of various fish stocks and the working groups may suggest cooperative research programs or recommend conservative methods.

Intergovernmental Fisheries Commissions have been established for specific areas or for particular species of fish. Those commissions to which the United States adhere are listed in Table 6. One objective of each commission is to conserve its given resource so that predictable harvests may be made year after year -- in short to maintain a renewable resource, not one to be exploited to extinction. But not all of the commissions are so effective. The commissions have no power to enforce regulations, and nations may refuse to sign treaties

establishing conservation measures, and continue to harvest the unowned resources of the high seas. The importance of these international commissions lies in the fact that they represent a concerted to base conservation methods on the best scientific information available, and that the objective is to achieve the maximum productivity of the fisheries on a renewable basis.

- Table 6 : International Fisheries Commissions Adhered to by the United States.³⁶

North Pacific Fur Seal Commission (1911)
 International Pacific Halibut Commission (1924)
 International Pacific Salmon Fisheries Commission (1937)
 International Whaling Commission (1948)
 Inter - American Tropical Tuna Commission (1949)
 International Commission for North West Atlantic Fisheries (1949)
 International North Pacific Fisheries Commission (1952)
 Great Lakes Fishery Commission (1955)
 International Atlantic Tuna Commission (1966)

³⁶Gullion (ed.), op. cit., p. 67.

III. Prevention and Control of Pollution of the Marine Environment.

Our coastal zone is a thin strip of water which comprises only 10 per cent of the total volume of the sea. We use this strip of water as a resource for food, for minerals mining, transportation, recreation and last, but certainly not least, waste disposal. Nations used to feel that what they did with their water was their own concern. But this can no longer be. The dilemma is that we see the ocean in two conflicting ways : as a big wet waste basket covering 70 per cent of the earth, and as a jewel box of resources for which all nations hunger.³⁷

Today, in many places, the ocean's ecological balance is endangered. Man has acquired and employed the means, deliberate or accidental, to alter the ocean environment, and measured in the time of evolutionary change the living creatures in that environment do not have the time to adjust. Contamination of the ocean has begun. Chemical wastes from factories, heat from powerplants, domestic wastes and sewage from cities and towns, insecticides and fertilizers from land runoff, atmospheric fallout of gasoline vapors, low level radioactive wastes from reactors, laboratories, and hospitals are following into the

³⁷Russel E. Train, An International Organization for Ocean Protection (Bangkok: AUA Language Center, 1972), p. 1.

ocean. The sheer bulk of the material disposed of and the presence of new types of nondegradable waste products are now beginning to affect the ocean at an increasing rate. The wastes can no longer so readily be diluted, dispersed or degraded.

Dumpings and discharges into the water are only part of the problem. Physical changes in the coastal environment result from erosion due to wind, waves, tides, storms, and man's uses and misuses of coastal lands. Erosion introduces pollutants into the water. The material moved and deposited clogs navigation channels and suffocates marine life. Modifications of submarine areas by dredging and mining disturbs the habitat of marine and marsh life. Upstream dams and river diversions permit saline water intrusion from ocean to estuary to the detriment of marine life.

As a consequence of these actions and activities, ocean pollution -- once of little concern because the ocean was considered so large as to be unlimited in its capacity to absorb wastes -- is recognized as a growing problem. We have found today, as we found earlier with our rivers and lakes, that every body of water, including the ocean, has limited capacity to absorb and neutralize inflowing materials. All the wastes from man's activities which are not disposed of in the soil or in the atmosphere, are assimilated by the receiving water and eventually reach the ocean. With national development, urbanization, and rapid growth, these wastes increase in both volume and variety. There are no visible economic returns to pollution

control. It is difficult to make money out of sewage treatment. Therefore, the sea will continue to be the ultimate sink for most of our wastes for a long time to come. It is going to need protection, though, through pollution control legislation, enforcement, public awareness, and government support.

Characteristics of Ocean Pollution

Pollution of the ocean has several pronounced characteristics. The most important of all is that it is longlasting. Rivers renew themselves each year and carry pollutants from their course, and lakes can cleanse themselves over decades or centuries. But the ocean is the final depository of pollutants which will remain there for thousands of years. This is particularly true of materials which do not dissolve or readily breakdown in water. Lead from gasoline exhaust entering the oceans today will be circulating or deposited on the sea floor centuries from now.

Some pollutants in the sea may accumulate in the ocean's food chain where they build up in the marine life cycle. Entering the food chain in marsh water from agriculture runoff, DDT travels through the food chain and accumulates in fish-eating birds in often injurious concentrations.

The global ocean is a great circulating system in constant horizontal and vertical motion. Pollutants entering the system may travel long distances over the earth's surface. Pesticides used on the African Continent have been found in the Bay of Bengal and the Caribbean Sea after traveling in the

monsoon and the northeast trade winds. Some of the pesticides found in the Great Lake coho salmon appear to have originated far inland. Acetone and butyaldehyde, harmful to life, have been detected in surface waters of the Florida Straits, the Mediterranean Sea, and the Amazon estuary.

Nor is ocean pollution any respecter of political boundaries. Like the ocean environment, it reaches the shores of many states and nations. Air and ocean pollutants travel long distances and can menace the ecological balance and environmental quality of nations far from the source.

Sources of Pollutants

What we are going to discuss now is that what kind of wastes are reaching the sea, how many of them there are, their effects on the biological life of the sea, and how they may be stopped within the economic restraints of the growing economy.

Pollutants enter the ocean from many sources. The quantity of municipal, and agricultural waste deposited in the ocean is enormous. With urbanization, oceanic waste disposal is increasing, particularly affecting the quality of water near population concentrations and in estuaries. Of all the pollutants of the ocean; oil pollution, nuclear pollution, and other sources such as lead and mercury and DDT are the main sources of pollutants.

(i) Oil Pollution*

Oil pollution is an increasing threat to the marine environment. The world's annual oil production of 1,800 million metric tons, is increasing 4 per cent each year. Some 60 per cent (or 1,000 million metric tons) is transported by sea, much of it in restricted shipping lanes. Estimates indicate that 0.1 per cent of the total transported, or about 1 million tons per year is spilled or leaked into the marine environment.³⁸

Major potential hazards of oil or petroleum pollution in the sea include blow-outs in connexion with drilling or work-over rig operations, blow-outs and storage losses resulting from ship collisions, platform operational accidents or failures of submarine pipelines, blow-outs and storage losses resulting from hurricanes, blow-outs and fire resulting from lightning strikes and natural petroleum seeps that continuously discharge at unknown rates from certain subsurface petroleum reservoirs, particularly the high pressure reservoirs in many of the highly petroliferous basins. In addition, small quantities of hydrocarbons and other drilling fluid additives used in wildcat

* For recent examples see "Demolition Derby at Sea." TIME (January 24, 1977), pp. 41-42; and "Massive Search Fails to Find Lost Tanker." Bangkok Post. (January 8, 1977), p. 9.

³⁸ Marine Science Affairs - Selecting Priority Programs, op. cit., p. 21.

drilling may also find their way into the sea.

There are many kinds of oil : crude oils, residual fuel oils, lubricating oils, and there are miscellaneous kinds of oils, and varieties of sludges and tars. These are referred to as persistent oils. There are distinguished from the light fuel oils, such as gasoline, kerosene, and gas oils which spread and evaporate very rapidly when spilled. The chemical composition of oil has a very definite bearing on both their toxicity and the changes they undergo when spilled at sea. The most toxic elements in oils are the more volatile hydrocarbons. During the early stage of a spill, an aromatic crude which has a very high sulfur content of 2.5 per cent and the reason that this is significant is that sulfur tends to inhibit oxidation in oils. Oxidation, regardless of what kind of oil, or how crude it is, will be catalyzed by sunlight, and this of course is important in the tropics. And these products of the oxidation of crude oils, may be soluble themselves in sea water, or they may be surface active. There is absolutely no predicting ahead of time unless one has done the chemical analysis. And as far as behavior is concerned, as crude oil spreads, its more volatile components will evaporate. Now, an interesting sidelight to this, because crude oil evaporates, it contributes to air pollution.

(ii) Nuclear Pollution

Nuclear wastes enter the ocean from at least four major sources : from the deposit of radioactive wastes, the

experimental detonation of nuclear weapons, accidental intrusion of radioactive elements, and detonations of nuclear materials for purposes other than the testing of weapons. States contend that contamination of the oceans by depositing radioactive elements is a violation of freedom of the seas and, therefore, an impermissible use, irrespective of the safeguards adopted. And three types of hazards may be considered in oceanic disposal of radioactive wastes:

1) Direct hazards, in which a sufficient concentration of radioactive material exists to injure anyone in contact with it.

2) Indirect hazards, from the concentration of radioactive wastes by organisms living in the sea and their subsequent use as human food.

3) Ecological hazards, that may produce unpredictable changes in the biological communities in the ocean³⁹

The contemporary state of knowledge of nuclear radiation and oceanography, and reasonable projections of future behavior, do furnish us with some guides for policy. First, there seems to be no question of that deposit of radioactive substances in the oceans can cause harm to mankind if it is not properly planned and managed. In terms of potential harm, pollution by radioactive elements is not comparable to other types

³⁹I. Eugene Wallen, "Atomic and Other Wastes in the Sea," Ocean Sciences (Annapolis: US. Naval Institute, 1964), p. 383.

of contamination since chemical wastes and other debris do not normally endure for prolonged periods or offer any grave threat to well-being. Radioactive elements, on the other hand, may continue to emit radiation for a very long time, although it is of considerable importance to realize that radioisotopes differ very greatly in this respect, some with a half-life measured by minutes and others by several decades. The most important danger to mankind arises not from the "direct" effect of radiation from discarded radioactive materials, but indirectly through the sources of human food in the oceans which may concentrate radioactivity, initially present only at low levels, in such a way that real injury may be caused to a consumer.

Second, it does seem to be likely that in a short period of time, before the beginning of the 21st century, relatively large quantities of radioactive wastes will be produced and that the ocean may appear to be the best available dumping area for them. It is apparently not now possible to predict these quantities with any accuracy except that they will be very large and may pose such a difficult problem of disposal on land for some states, including even large ones such as the US., that the ocean will appear to be a highly attractive burial area.

Third, the current use of the oceans for deposit of relatively small amounts of radioactive materials emitting low-level radiation seems now to be considered safe, when appropriate safeguards are observed, but the lack of knowledge of the oceans

is a major barrier to future deposits of the large amounts that may accrue from increased use of atomic energy. Our knowledge of just what share of these fission products can be safely introduced in the ocean is incomplete because we simply do not know enough about the physical, chemical, and biological processes. If the sea is to be considered as a dumping ground for any large fraction of the fission products that will be produced even within the next ten years, it is urgently necessary to learn enough about these processes to provide a basis for engineering estimates. It seems to be widely agreed among scientists that high-level wastes ought not to be deposited in the oceans, at least as long as contemporary information about the ocean deeps is more widespread.

A fourth consideration relates to the ocean as a physical feature and to the conditions for depositing radioactive materials therein. Once wastes are deposited in the oceans they are likely to be largely beyond control and whatever harmful effects may ensue can therefore no longer be prevented. Further, the ocean has its own interdependences of a highly complex and subtle kind, still most imperfectly understood, and because of these interdependences the impact of radioactive contamination may spread far beyond the area immediately affected. Whatever one state does in the oceans in respect of radioactive waste is of direct concern to all other states, and this includes deposits within its own territorial sea.

In sum, it appears that within a few years, states may look to the ocean as a depository for large quantities of potentially harmful radioactive elements, as they already have for small amounts, and present knowledge is insufficient to predict accurately and safely, on a generally applicable basis, how such deposits may be made to eliminate substantial risk of harm to mankind.

(iii) Other Pollution.

Besides oil and nuclear pollutions, the oceans -- or today known as the world's trash can, still receiving other toxic elements such as mercury and other toxic industrial wastes, surplus chemical weapons, garbage and sewage, pesticides, and radioactive fallout in addition to the ubiquitous petroleum.

Two heavy metals, lead and mercury, enter the ocean in part through manmade discharge. Estimates indicate that about 10,000 tons of lead are introduced yearly. Lead concentrations in the Pacific surface waters have jumped tenfold since tetraethyl lead was first used in gasoline 45 years ago.⁴⁰ While some 4,000 to 5,000 tons of mercury are estimated to enter the oceans annually by natural erosion, man introduces an equivalent amount. The element accumulates in fish and plants.

⁴⁰ Marine Science Affairs - Selecting Priority Programs, op. cit., p. 22.

One of the most abundant of the manmade pollutants in the sea is DDT, which is transported in the form of agricultural run off. Like many other manmade substances DDT does not degrade readily in water. Nature's natural decomposing forces cannot break it down. Some scientists believe that two-thirds of the 1.5 million tons of DDT produced by man may still be adrift. Moreover, DDT concentrates in the food chain and today is found in all oceans and all marine organisms as well as man. Additionally, DDT which is used to apply to crops on the African continent appears in the Bay of Bengal, also causing concern because such chemicals are concentrated by marine organisms, including commercially important fish.

Exploitation of surficial deposits by dredging and by the use of chemicals in recovering of minerals at sea also cause bottom-dwelling organisms to be harmed. But the possible effects on the benthonic biological regimes and their susceptibility environmental changes are almost completely unknown. Future large-scale production dredging of off-shore surficial deposits, particularly off the densely coastal areas, would lead to some interference with other uses of the sea and the seabed, including fisheries, ocean transportation, waste disposal, recreation and construction and other engineering operations on the sea floor.

Other forms of environmental degradation result from man's activities. Physical modifications, such as dredging and filling, construction of dams, diversions, hurricane barriers and heavy waste disposal, alter natural processes and cause

pollution. Agricultural wastes include salt from erosion, fertilizers, and pesticides. Industrial wastes consist of acids, chemicals and animals and vegetable matter produced by paper, steel, meat processing, and other industries. Heating of coastal waters by industry decreases the oxygen carrying capacity of water, adversely affecting marine life.

Nonetheless, as the efforts to clean up polluted beaches are costly and not always effective, pollution problem still remains a long-lasting and greater problem for those who are supposed to solve.

Effects of Ocean Pollution

The current effects of marine pollution are serious problems which lie ahead if it is not curbed. The long-range consequence of pollutants is not clear. The effect of the ocean's increased lead content upon marine life is unknown, as is the long-range impact of the accumulation of solid smoke particles in ocean sediments. New chemical substances are created at the rate of 400 to 500 annually. Many of them are toxic and will find their way to the ocean. Yet full knowledge of their biological effects is lacking and removal methods for them are poorly developed. At the present stage of research it is not possible to predict reliably the effects of a solid waste on the marine environment. Man is still largely ignorant of the long-term and low-level effects of chronic crude oil pollution, such as that released from tankers flushing storage tank at sea. These

effects may be serious and longer lasting. Their dangers are likely to become more critical as transportation of oil, its products and synthetics increase and as petroleum production shifts increasingly to continental shelf sources.

The most serious effects of oil leaking, and this has been well documented and known to certain, are on birds, particularly the seabirds, the ducks, the gilmonts, the penguins, and so on. They are most affected because they are in the wrong place at the wrong time. They happen to be living at the surface where the oil is. But for the others, there is no oil autopsy of these other animals. Fish, there seems to be little direct effect on the fish themselves. They can swim, and not only that, if they are covered with oil, the oil washes off very quickly from the mucuous surfaces of the fish when they go back down under the oil. But it is well documented here that many fisheries have been damaged because of the tainted fish. Fish that have been in oil do have a strange taste and this is not eaten by man, nor is it saleable.

However, fish can also be contaminated from other toxic elements such as mercury and other toxic industrial wastes. And with these toxic concentrated, marine organisms sometimes carry serious disease to man such as the "Kogai"⁴¹ disease.

⁴¹The full detail see Teiji Shimizu, "Public Hazards in Japan," The Bangkok Post (June 20, 1973), p. 24.

This disease is well-known when a team of university professors in Southern Japan announced that a variety of fish and shellfish taken out of coastal waters had been contaminated by deadly mercury poisoning, that led the eater to death or crippled.

Apart from this, physical modifications of the shoreline, while they may be beneficial to man in numerous ways, can also be harmful. They alter the natural environment and sometimes speed up or slow down the effects of erosion. Dredging unsettles bottom sediments, removes bottom dwelling marine life, reduces the water's ability to assimilate oxygen-demanding wastes, and masks out light required by aquatic plants. Dam construction creates barriers to upstream breeding migrations of marine fish, alters water salinity, and affects marine life such as crabs, shrimp and oysters. Hurricane barriers disturb the normal circulation of bay waters important to aquatic life.

In short, it can be concluded that the marine pollution causes serious hazards directly to the environment and indirectly in this period to man. Pollution of the sea need not be overlooked, particularly in this period when the world's rapidly growing population is clustering near the coastlines. The growth of population and its migration to the shore have led to expanded activities on and uses of the sea, worsening the pollution problem. With more uses of the coastal zone, the threat of harmful pollution increases.

International Concern for Pollution Control

There seems to be considerable emphasis in the scientific

community upon the necessity of international agreement about the conditions of permissible disposal and, presumably, about the details of impermissible disposal. While it may be possible now for individual states to formulate disposal programs incorporating reasonable scientific safeguards, from coastal perspectives, the fact remains that the ocean is a global phenomena, used by and affecting all states of the world, and the cumulative impact of individually conceived programs devised without regard to those of other states and without cooperative efforts could conceivably endanger future safe uses of the oceans. This emphasis by the scientists who are most intimately aware of the difficult problems involved, and of the potential hazards, ought to serve as a warning of the grave necessity for achieving such agreement within the shortest possible time.

Pending the conclusion of an international agreement, there would appear to be a clear common interest that states finding it necessary to dispose of wastes should do so only under the strictest safeguards, including particularly the recording and monitoring that will be required if eventual international regulation is to be fully effective. Since the use of relatively small disposal sites for packaged wastes may inhibit or exclude other uses of the waters, every effort should be made to avoid areas subjected to varying uses, especially fishing, and where disputes arise the burden should be placed upon the disposing state to justify the choice of the area selected. In the event harm results from occurrences in packaging the wastes, selecting

the sites, transporting the waste, placing it in the ocean, or from the subsequent events connected with the deposit, liability should be imposed on those conducting the operation. In the interest of promoting safe disposal, if agreement could be reached on substantive standards, the courts of every state might be considered competent to prescribe and apply policy for such occurrences.

Other action which need not and must not await international agreement consists of the continued emphasis upon oceanographic research recently observable both in individual states and in the general community of states. Almost every prominent scientific study into problems of waste disposal places great stress upon the gaps in our knowledge of the oceans and its resources as a factor affecting the proposals made and urgently recommends that efforts be intensified for enlarging our understanding of the oceans. These efforts are, of course, wholly useful in themselves for many other purposes, but the prospects for sound international agreement on disposal methods are heavily dependent upon this research. The hiatus in achieving an international resolution can be fruitfully used for acquiring data to make that resolution more certain and desirable.

Since the impact of pollution is usually upon coastal residents, the coastal state has an understandable interest in preventing the discharge of oil and oily substances in such a way that harmful pollution results. A coastal state could exercise

sufficient effective control to prohibit the discharge of oil that would, or could reasonably be thought to, damage marine life and property in the vicinity. Reasonable enforcement would include apprehension of vessels infringing the prohibition and imposition of a penalty on such vessels. It would be acceptable also to seek to require that ships install any available and effective equipment for reducing or eliminating the deleterious effects of the substances discharged.

General international concern over this problem appears to have originated in the decade after World War I when first the United States and the League of Nations undertook to foster explicit agreement upon measures to combat pollution. Since every few states have sought to extend legislation regarding pollution beyond the territorial sea, and it is not apparent that any have actually sought to apply prohibitory regulations beyond that area, it seems accurate to say that all significant prescriptive activity has taken the form of seeking international agreement.

although prior to World War II the League actively promoted efforts for securing agreement on this problem, nothing concrete was achieved until 1954 when, with the leadership of the United Kingdom, the International Convention for the Prevention of Pollution was concluded after a conference in London. The work accomplished by the "Faulkner Committee" proved of great assistance by the resolutions adopted in the "International Convention for the Prevention of Pollution of the Sea by Oil"

signed in London on May 12, 1954 and became effective on July 26, 1958.⁴² They established "prohibited zones" in the territorial waters and harbors of the contracting parties and call for municipal legislation making it an offense for ships registered in their respective countries to discharge persistent oil, as for instance, crude oil and fuel oil, within the prohibited zones. The Convention prohibits in Article 3 certain discharges of oil and any oily mixture within zones, defined separately for tankers and for other vessels, in the Adriatic Sea, North Sea, Atlantic Ocean, and the Pacific near Australia. The same article provides in paragraph 3 that any contravention of the prohibition "shall be an offence punishable under the laws of the territory in which the ship is registered."⁴³ Application is thus left to the flag state of an offending vessel. Great Britain has already passed legislation enforcing the provisions of this Convention. The Act makes it an offence for British ships registered in the United Kingdom to discharge within this zone "any oil or any mixture containing oil which fouls the surface of the sea."⁴⁴

Other articles provide that ships registered in the territory of contracting states shall be fitted with certain

⁴²Colombos, op. cit., p. 393.

⁴³McDougal and Burke, op. cit., p. 850.

⁴⁴Colombos, loc. cit.

facilities for avoidance of pollution and that, within 3 years of the time the Convention enters into force, the main ports of the contracting states shall also be equipped with facilities for disposal of oily substances. Implementation of the Convention is furthered by a provision that ships carry an oil record book, in which entries must be made of the details of discharges, and which may be inspected by authorities of a contracting state within a port of that state.

Two additional Resolutions were passed by the International Conference on Oil Pollution of the Sea held at Copenhagen in July 1959.⁴⁵ It recommended that the governments of all countries and the Inter-Governmental Maritime Consultative Organization (IMCO) should, as a matter of urgency : (1) make preparations for holding, as soon as possible, a further Inter-Governmental Conference in order to achieve total avoidance of the discharge of oil into the sea, and (2) to extend the prohibited zones to cover the Gulf of St. Lawrence, the Grand Banks of Newfoundland and the eastern seaboard of North America. The greater part of these recommendations were approved at the Conference convened in London in April 1962.

The question of pollution of the high seas has also been considered by the Geneva Sea Conference of 1958. Primarily the International Law Commission made only modest recommendation,

⁴⁵Loc. cit.

providing in Article 48 (1) that "Every state shall draw up regulations to prevent pollution of the seas by the discharge of oil from ships or pipelines or resulting from the exploitation of the seabed and its subsoil, taking account of existing treaty provision on the subject."⁴⁶ But with slight change the Commission article was adopted by the 1958 Conference and is now Article 24 of the High Seas Convention:

Every state shall draw up regulations to prevent pollution of the seas by the discharge of oil from ships or pipelines or resulting from the exploitation and exploration of the seabed and its subsoil, taking account of existing treaty provisions on the subject.⁴⁷

The US initially sought the deletion of this provision and argued:

It would be unwise to consider subjects already under the study by the UN and specialized agencies and subjects of a technical nature; oil pollution was being examined by the Transport and Communications Division of the UN and the Economic Commission for Europe which had called for studies by the World Health Organization⁴⁸ and the Food and Agriculture Organization.

Instead the US wished to see the adoption of a resolution recommending both "all possible assistance" to the international

⁴⁶ McDougal and Burke, op. cit., p. 851.

⁴⁷ Colombos, op. cit., p. 394.

⁴⁸ McDougal and Burke, loc. cit.

organizations studying the problem and adoption of "national programs designed to minimize the possibility of the pollution of the sea by oil". Ultimately the US withdrew the proposed substitute resolution and noted the belief that Article 48 (1) of the International Law Commission expressed the intention "that each government should take immediate steps to minimize the evil of oil pollution and should adopt or promote definite and effective programs to that end."⁴⁹

Apart from the 1958 and 1960 Geneva Conferences, the Stockholm Conference on the Human Environment in 1971 brought world-wide attention to the need for multilateral action on this subject. Some coastal states have sought jurisdiction for protection of the marine environment from all sources in an area coextensive with their resource claims. With respect to pollution from exploration and exploitation of seabed resources, coastal states should have this authority -- subject to an obligation to observe at least minimum international standards. But with respect to vessel source pollution, the difficulty here is that if one were to shift to coastal state standards for vessel source pollution, anarchy would exist for ships going through many different areas in the world's oceans, and going through many different straits (there would be as many of 119 different coastal state competing standards on vessel source

⁴⁹Loc. cit.

pollution). Most interestingly of all, we have discovered that recognition of coastal state jurisdiction to make and enforce pollution prevention standards, such as construction standards for vessels, could seriously endanger freedom of navigation. About 61 out of the 119 coastal states, would be totally zone-locked if there were any form of jurisdiction capable of affecting navigational freedom.

Of even greater importance is the provision of measures to prevent pollution of the seas from the dumping of radioactive wastes. Only a few states now dispose of radioactive wastes at sea, and only a very limited number have established regulations aimed specifically at contamination from this source. Among the disposing states, the United States and the United Kingdom are the most active. The US. has authorized the disposal at sea of limited quantities of low-level wastes since 1951, either through government agencies or government-licensed private contractors, and its nuclear-powered submarines also release low-level wastes in their operations. The advent of nuclear-powered merchant vessels suggests another productive source of contaminants in the not-too-distant future. The quantity of packaged wastes dumped by the US., in terms of radioactivity, apparently has been quite limited and, for the most part, the sites chosen have been a considerable distances from shore and in deep water.

The UK., in addition to disposal of packaged wastes, has adopted the practice of discharging wastes directly (that is,

uncontained) into the sea from a pipeline extending into the Irish Sea for a distance of 3 kilometers. Extensive and intensive investigation, prior and subsequent to the initial disposal, apparently indicates that the first estimates of safe quantities were too conservative and that approximately 20,000 curies a month could safely be disposed of in this fashion.

On the international level the International Commission on Radiological Protection, a private group established in 1928 has long dealt with standards of permissible dose and working procedures for the safe use of radiation, but has not sought to make proposals regarding radioactive waste disposal in the oceans. Consistent concern for this problem on a government level perhaps can be dated from the time the International Law Commission discussed the matter.

The discussion did not occur until 1956 and then it became entangled with the highly emotional problem of weapons tests and it was with difficulty that the Commission was able to consider the disposal problem separately. Those who wished to put the Commission on record only as providing that states were under an obligation to take steps to prevent pollution from radioactive waste disposal were more successful, and Article 48 (2), which was to have this effect, was adopted without dissenting vote. On the matter of weapons tests the Commission was content to recommend cooperation between states which was adopted in Article 48 (3). Later this Article 48 (2, 3) of the Commission

was adopted in Article 25 in the context of the Geneva Conference as follows:

Every state shall take measures to prevent pollution of the seas from the dumping of radioactive waste, taking into account any standard and regulations which may be formulated by the competent international organizations.

All states shall co-operate with the competent international organizations in taking measures for the prevention of pollution of the seas or air space above, resulting from any activities with radioactive materials or other harmful agents.⁵⁰

The Conference further adopted a Resolution on April 27, 1958, recommending that "The International Atomic Energy Agency (IAEA), in consultation with existing groups and established organs having acknowledged competence in the field of radiological protection, should pursue whatever studies and take whatever action is necessary to assist states in controlling the discharge or release of radioactive materials to the sea, in promulgating standards, and in drawing up internationally acceptable regulations to prevent pollution of the sea by radioactive materials in amounts which would adversely affect man and his marine resources."⁵¹ Apparently as a result of the

⁵⁰Colombos, loc. cit.

⁵¹Loc. cit.

resolution approved by the Geneva Conference, the IAEA is now engaged in the study of the disposal problem through the agency of expert panel composed of scientists from several states and of observers from FAO, WHO and UNESCO.

Besides, the Conference also adopted a Convention for the constitution of a permanent Inter-Governmental Maritime Consultative Organization (IMCO) whose objects are those contained in the draft convention of 1946, but with the added task to "encourage the consideration of matters concerning unfair restrictive practices by shipping concerns."⁵² The IMCO, the FAO, the WMO, and the UNESCO have established a joint Group of Experts on the Scientific Aspects of Marine Pollution. In November 1969, the IMCO assembly decided to convene an international conference to consider adopting a convention on questions relating to marine pollution from oil. The IMCO's Comprehensive Outline of the Scope of the Longterm and Expanded Program of Oceanic Exploration and Research provides for scientific studies on ocean pollution.

The organs of the IMCO are an Assembly; a Council of 16 members, composed as to 12 of representatives appointed as to 6 each by the governments of the nations with the largest interest in providing international shipping services and in international seaborne trade, and as to 4, of 2 each elected by the Assembly

⁵²Ibid., p. 400.

from among the governments of the nations having "substantial" interests in these fields; a Maritime Safety Committee; and a Secretariat. The IMCO was brought into relationship with the UN as a specialized agency. Provision is made in the constitution to enable the functions in maritime matters which under numerous Conventions have been entrusted to various individual governments, to be centralized in this new Organization. The head quarters of IMCO are established in London.

The IMCO is currently studying certain aspects of the problem as a direct consequence of the wide scale pollution which occurred following the stranding of the Torrey Canyon in April 1967. IMCO has embarked on an intensive program of studies aimed at solving the difficult problems inherent both in implementing stricter international rules to prevent pollution of the sea by oil and other noxious and hazardous agents, and in taking action, after pollution occurs, against its effects.

On the technical and navigational side studies are proceeding on the following subjects:

- new means of construction and equipment of ships with a view to limiting the risk of collision or stranding and to avoiding or minimizing the escape of oil, or hazardous or noxious cargoes from ship into the sea as a result of such accidents;
- the possibility of routing merchant ships and providing for traffic separation in certain areas;

- establishing of prohibited areas or areas to be avoided by ships of certain classes and sizes to reduce the risk of oil pollution or dangerous cargoes in case of accidents;
- approved training and certification of masters and officers;
- new agents for absorbing or precipitating the oil;
- new chemical and mechanical agencies for protecting coastal areas from pollution, including construction and use of booms, emulsifiers, etc; and
- how deliberate marine pollution can be detected in order that it may be penalized⁵³

Studies mentioned above are conducted by IMCO in close cooperation with other agencies of the UN family, the ILO, UNESCO, FAO, WHO and IAEA, and with a number of non-governmental organizations in consultative status with IMCO. In particular the problem of training and certification is the subject of a joint committee between IMCO and the ILO.

The question of nuclear tests, however, was partially settled outside the framework of international organization.

⁵³Report of the Inter - Governmental Maritime Consultative Organization. (New York: United Nations Economic and Social Council, April 29, 1968), pp. 3-4.

In producing the Nuclear Test Ban Treaty (Moscow Treaty) of 1963, the US., Great Britain and the Soviet Union signed on August 5, 1963, and in force on October 1, 1963, an agreement among the three powers to "prohibit, to prevent, and not to carry out any nuclear weapons test explosion or any other nuclear explosion"⁵⁴ in the atmosphere, in outer space, or underwater. Nevertheless, such agreement is insufficient for the guarantee of the waste disposal from nuclear test, what is need is a new effective international organization in the field of marine resources and pollution control. Its aimed task is to collect and disseminate information, to conduct research and promote education in modern technologies applicable in particular regions.

On the non-governmental side, ~~the principal protagonist side,~~ the principal protagonist has been the International Council of Scientific Unions (ICSU) and its constituent bodies. The council is a consortium of scientific organizations; its national members are academies of science or equivalent bodies and its scientific members are unions devoted to one or another discipline of science. In order to promote interdisciplinary action ICSU has tried several devices, including union commissions, and the special and scientific committees. The first, created in 1957, was the (now) Scientific Committee on Oceanic

⁵⁴Glahn, op. cit., p. 325.

Research (SCOR).⁵⁵ Its first project was development of the International Indian Ocean Expedition, the coordination of which was later taken over by the Intergovernmental Oceanographic Commission (IOC) in 1960.

The interactions between SCOR and IOC concern mainly on the subject of marine pollution. This group --SCOR -- on estimation of primary production under special conditions, has looked particularly at turbid conditions found in estuaries, heavily polluted, and exceptionally eutrophic waters. In addition, SCOR at present is cooperating with the International Council for the Exploration of the Sea in developing a cooperative baseline study of pollution in the Baltic. This cooperation is intended to facilitate the participation of all countries surrounding the Baltic in the proposed investigation. So in this stage, we can only hope that SCOR will be able to do something on this matter in the near future.



⁵⁵For the full detail sees Warren S. Wooster, "Interactions Between Intergovernmental and Scientific Organizations in Marine Affairs." International Organization, 27, 1 (Winter, 1973), pp. 103-114.

