Chapter 3

Continental Shelf

I. Physical Appearance

Continental shelf is the zone around a continent, extending from the low-tide line to a depth at which there is a marked steepening of slope to a greater depths. The width of the shelf varies enormously. Conventionally, its outer edge is taken at 100 fathoms* (alternatively 200 meters), but it may lie between 20 and 300 fathoms. It is believed to average about 72 fathoms or 132 meters. The limits of the claims are expressed either in terms of the depth of the overlying waters in which case the isobath of 200 meters and 100 fathoms is generally used, or with regard to predetermined distance from the coast, in which instance 200 miles is used.

We will first define the various layers** of the oceanbed

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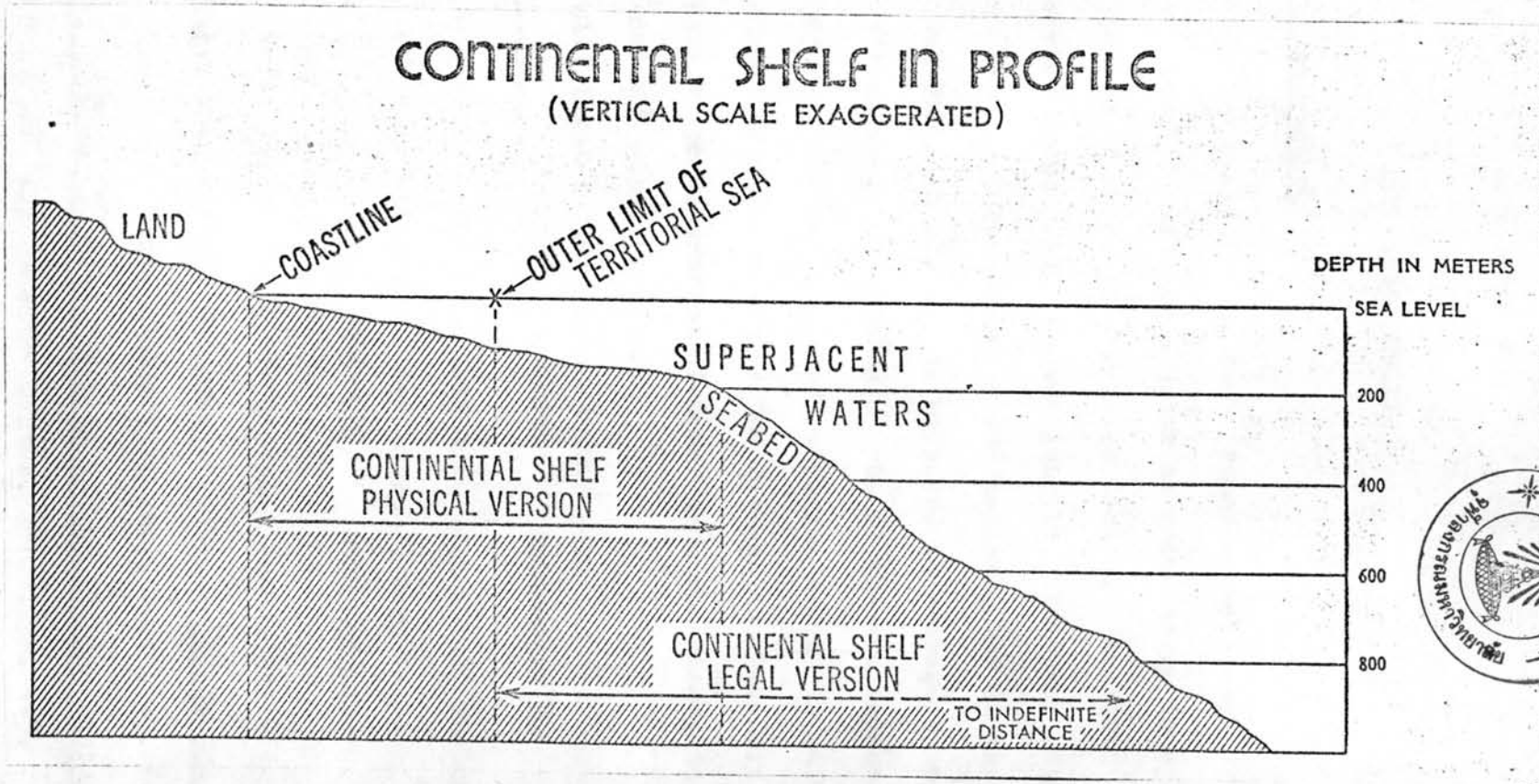
*It should be noted here that the depth of 100 fathoms is equal to 600 feet while the depth of 200 meters isobath equals to 656 feet or about 38 miles.

**The definitions of all these seabed terms, see Alexander (ed.), op.cit., pp. 148-154; Wolfgang Friedmann, The Future of the Oceans (New York: George Braziller, Inc., 1971), pp. 9-13; and Glossary of Commonly Used Terms in Law of the Sea Discussions Summary. (Bangkok: AUA Language Center, 1972), pp. 4-5.

Figure 4: Continental Shelf in Profile



Source: US. Department of State, Bureau of Public Affairs, 1974

as they move outward from the shore to the abyssal depths of the sea.

- First in line is the continental shelf. Studies have shown that the continental shelf is merely a seaward continuation of the continent. Off most mountainous coasts the shelf appears to be largely eroded in origin because it is shallowly underlain by bedrock. Off most flat coasts deposition has been more important, coupled with relative subsidence, so that the shelf is underlain by a thick sequence of sedimentary strata that gently dip seaward. The gently dipping surface of the seabed has been planned off by wave erosion or prograded by deposition of marine sediment. The average depth of the seaward edge of this feature is approximately 200 meters. The continental shelves underlie only 7.5 per cent of the oceans, but they equal 18 per cent of the earth's total land area.

Although the continental shelf is a geological feature common to all continents, there is no uniformity. There is great variety as to the depths at which the continental shelf ends and the continental slope occurs, the distance from the land at which the continental slope begins, and the steepness of the gradient of the continental slope. This is because the steepening of declivity at the shelf edge occurs in a distance of less than one to more than 10 kms., and locally two or more separate zones of steepening are present. Differentiation by depth alone is impractical, because the shelf edge ranges from 20 to 550 meters and averages 133 meters deep.

There are many examples of the imprecision of the shelf edge of the continental shelf which is the beginning of the continental slope. For example, Jacques Bourcart[1] on his "Note sur la Definition des Formes du Terrain Sous-marin", refers to the seabed of the Red Sea, 200 kilometers south of Jidda where the sharp drop-off starts at a depth of between 50 and 80 meters. Off the western Scandinavian coast the slope starts at depths between 80 and 300 meters. The broad continental shelf off Northern Siberia abruptly halts at 100 meters. The Sahul Shelf off western and Northwestern Australia descends to greater depths, at 300 fathoms in certain places, whereas in other places the shelf ends in quite shallow waters. In the area between 14 degree and 22 degrees south, the sea bottoms drop continually to 1,100 meters or more, and in areas off the northern shores of Scandinavia the sea bottom gently descends to 650 meters without a sharp break.

Just as we have noted that not all continental shelves start their slope at the same depth of water, we must also observe that not all shelves have the same profile. Some shelves drop to ocean depths in two or three steps. In other areas, such as the Pacific coast of South America, a sharp fall begins at the shoreline or within a few kilometers of it. A third

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[1] Quoted from Andrassy, op.cit., p. 8.

form, which occurs in the Barents Sea and in the Sea of Okhotsk, consists of shelves which abruptly descend from the coast to depths of 150 to 250 meters--the depth at which most shelves begin to fall off--and then level off into a broad flat platform.

Important differences with regard to the physical appearance of continental shelves exist to the width of the shelf. Sources differ as to the average width of the continental shelves. Some shelves, such as the ones off the western coast of South America and off the eastern coast of Asia, the northern coasts of the Indonesian Archipelago, Australia, the British Isles, Siberia, and the coast of the Bering Sea, extend hundreds of miles. Thus, some states have no continental shelf beyond the limits of their sovereignty, whereas others have extensive areas of shelf beyond their territorial sea. As a general rules, abruptly decending littorals have narrow continental shelves, while those having a flatter profile have broad continental shelves.

With these considerations in mind, the following suggestions are put forward as possible standards for defining the "legal edge" of the continental shelf.[2]

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[2]Richard Young, "The Legal Status of Submarine Areas Beneath the High Seas." American Journal of International Law, 42, 2(April, 1951), p. 235.

1) As a general rule, the seaward limit of the continental shelf should be considered to be the 100-fathom (or 200 meter) line. For the sake of uniformity, this should be the case even when the shelf in fact terminates at a lesser depth.

2) When the submarine terrain creates more than one such line, the outermost 100-fathom contour should be regarded as the limit of the shelf.

3) A possible boundary line should not be regarded as discontinuous merely because it may be interrupted by submarine canyons running out from land. On a principle somewhat analogous to the headland theory for bays, such canyons should be spanned by straight lines connecting the 100-fathom contours. By the same analogy, the permissible length of such lines might be limited to that applied by the coastal state to its bays.

4) Isolated patches of limited size which are over 100 fathoms in depth should be disregarded and absorbed into the shelf area. On narrow or land-locked seas particularly, depressions over 100 fathoms deep which do not connect with the ocean depths or which are of small size in relation to the total area of the sea in question, should be assimilated to the surrounding shallows.

- The next seaward geological boundary beyond the shelf-break is the base of the continental slope, a zone that extends from the shelf edge to a depth of 1,200-3,500 meters. The continental slope is approximately the true limits of the continents, or the general boundary between the light rocks of the continents and the denser rocks of the sea floor. Because of the density contrast and the thick section of light rocks that underlie the continents, this boundary is probably the most important geological one of the earth. Unfortunately, little is known (but

much is speculated) about its origin and the fundamental cause of the separation of continents and ocean basins.

The continental shelves and slopes of the world have an area of about 55.4 million km^2. This area is more than one-third the 149.8 million km^2 of the subaerial parts of the continents.[3] If added to the sovereign territory of adjacent nations it would expand some of them by a factor of more than ten while adding nothing to the areas of such inland nations as Bolivia, Czechoslovakia, and Mongolia. This is obviously an unfair distribution of new territory, depending only upon the chance that determined the positions and shapes of existing nations. It also fails to include potentially important mineral resources that are located still farther seaward.

- The continental slope is bounded on its seaward side by the continental rise with a generally smooth declivity from a depth of 3,500 to 5,500 meters. It is a vast apron of debris from the continents and of calcareous skeletal material from the sea surface. The apron shape reflects the landward source of the sediment and its movement and repleposition of by bottom currents that appear to flow parallel to the contours.

The boundary between the continental slope and the continental rise is not everywhere clearly marked, owing to the

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[3]Alexander (ed.), op.cit., p. 151.

fact that sediments of the continental rise overlap the continental slope and can eventually bury it. The boundary is unrelated to depth, for it ranges from less than 1,000 to more than 4,000 meters.

The main advantage of including the continental rise under the sovereignty of bordering nations is the potential value of petroleum in the upper part of the rise. Source beds are organic rich sediments that slowly accumulate on the continental slope in a depth zone of oxygen-deficient water, later some of these sediments slide away down the slope, accounting for a hummocky topography near the tops of some continental rise. Intermittent deposition of sand layers by turbidity currents may provide adequate reservoir beds. The volumes of the continental rises are enormous (the largest sedimentary deposits of the earth) and the quantities of the oil and gas may well be commensurate. The main obstacle to the investigation and exploitation of these possible oil and gas resources is the great depth of water above them about 1,500 to 4,500 meters ; in contrast, few oil wells now produce from beneath water depths of more than 150 meters.

- The continental shelf, continental slope, and continental rise together are known as the <u>continental margin</u> or <u>continental terrace</u>. It is within the margin, that virtually all of the oceans' nonliving organic resources are thought to lie--oil and gas deposits of major significance.

- Beyond the continental margin lies the abyssal plain which is the extremely flat area of the deep ocean floor, at depths generally in excess of 5,000 meters. On the abyssal plain beyond that are inorganic manganese nodules, the commercial importance of which has come to the fore only within the past decade. Most recently, it has been these small burnt-baked-potato-like objects, containing manganese, nickel, copper and cobalt, that have intensified the conflict over the uses of the world's oceans.

- Lastly, seamounts, atolls, and shallow banks, generally of volcanic origin and with diameters between 12 meters and 150 kilometers are scattered throughout the oceans.

II. Marine Resources of the Submarine Area

The present rapid spread of claims for exclusive continental shelf throughout the world comes from merely one major reason--the need for the exploration and exploitation of the rich resources embedded in the seabed of the ocean. And only within the past decade has the full potential of ocean resources been appreciated. Until quite recently men expended natural resources as though they were inexhaustible. Finally, however, in the last few decades, people have begun to realize that the supply of many minerals and foodstuffs essential not only to our economy but also to civilization as we know it, is finite in quantity. This is because as the world population swells at an expansionistic rate from the present 3.5 billion to what

will be more that double that number by the end of the century; there will be a proportionately increase in the demand for the enormous food and mineral resources contained in the oceans. Thus, two results of this realization have been the widespread initiation of conservation programs and the exploitation of new areas in search of mineral resources.

The quest for untapped resources took man to the sea, there the search has been quite rewarding. In addition to fishery resources, enormous quantities of oil and gas, in particular, have been uncovered in offshore fields along the continental shelves of several countries. Besides, three forces have worked to make the sea a center of exploitation and development today. First, scientific oceanography has generated new knowledge of what is and under the sea; it has also produced a much greater understanding of ocean processes. Second, new technologies in fish mining, and harvesting have overcome the obstacles of a hostile environment to facilitate access and extraction of resources at a competitive market price. And, third, new demands for every kind of raw material have followed the growth and industrialization of world populations.

Exploitable marine resources can be classed into two general categories: vegetable and animal wealth, and the mineral resources.

Vegetable and Animal Wealth of the Seabed

As far as the vegetable and animal wealth of the seabed

is concerned, the continental shelf is undoubtedly the submarine area of greatest economic and commercial importance for man, conditions there being much more favorable for marine fauna and flora than in any other submarine area. Its waters are enriched by nutritious salts derived from coastal erosion, silt and chemical and biological decantation, and the sunlight penetrates practically to the bottom. Furthermore, plankton, the staff of life in the sea is abundant and varied on the shelf. Consequently, the ecological conditions and the variety of benthos cause the waters over the shelf to be richest in fish. And it is the fish together with other free-moving organisms which are the first and only one type that has been the subject of economic exploitation until very recently. The present ocean harvest was recently estimated at about 55 million metric tons per year, representing an income of approximately $8 billion.[4] Ninety percent of this consists of fin fish, the rest of whales, crustaceans, and mollusks, as well as other invertebrates. Three quarters of this total harvest is taken by fourteen countries. What is perhaps even more significant is the rate of increase in the ocean harvest. In the century from 1850 to 1950 the world catch increased tenfold, at an average rate of about 25 per cent each decade and it would double in the subsequent decade.[5]

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[4] Friedmann, The Future of the Oceans, op. cit., p. 18.

[5] Loc. cit.

Another important source of natural resources, not considered in the Geneva Convention, is sea farming i.e. pearl production, oyster farming and shell fish farming. These organisms are either stationary or more within very limited distances, and extraction has therefore been compared to a type of agricultural processing.

From the edge of the shelf, conditions of life gradually deteriorate as the slope becomes sharper; vegetable life diminishes until at a certain depth it finally disappears and in the same way the marine fauna tapers away to a steadily small number of species. Such resources as exist on the continental slope and in other submarine areas are extremely varied in nature. This complex of living resources is generally described as the "benthonic environment." The benthos is the aggregation of plants and animals normally associated in the depths of the waters. There may be considered to be three groups in the benthos: (a) those permanently attached to the bottom; (b) those that walk or crawl on the bottom; and (c) those that float or swim near the bottom.

This classification of the benthonic species coincides with the distinctions and definitions of biologists for this part of the marine fauna. One of the fullest and most up-to-date works on the matter defines these concepts as follows: "The benthonic bioma is made up of sedentary, burrowing and

moving species."[6] It is hence a heterogenous population living together in order to turn to best account the conditions of life in the same area of sea. The benthonic bioma or more briefly the "benthos" consists of the entire complex of organisms living on or on the floor of the sea. The term was introduced into science by Haeckel[7] who applied it to the "formation of life on the sea bottom" consisting of sedentary and mobile species and some nectonic species of benthonic life. It contains a large number of invertebrate species and fishes. These are partly sedentary organisms which settle in the substrata and partly others which can move along the bottom, though slowly, or borrow into it; finally there are also pelagic organisms which are merely temporary members of this community.

Mineral Resources

It must be said that what really aroused the marked and growing interest in the exploration and exploitation of the bed of submarine areas are the offshore minerals, of which oil and gas are by far the most important at the present time and it was the rapidly expanding consumption of oil and gas, coupled with the growing feasibility of offshore drilling, that led to the rapid spread of claims for exclusive exloitation of the

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[6] Amador, op. cit., p. 91.

[7] Quoted from, loc. cit.

continental shelf throughout the world.

It is estimated that in the foreseeable future, the continental shelf proper--and to a lesser extent but increasingly important extent, the wider continental margin--will absorb the greatest part of each nation's offshore activities, since 90 per cent of the world's marine food resources, now extracted at the rate of $8 billion per year, and nearly a fifth of the total world production of petroleum and natural gas, representing a value of about $4 billion, come from the continental shelves.[8]

In broad manner, the resources of the ocean can be grouped into three main categories: chemical-materials that are dissolved in the water, biological-plants and animals that live in the water, and geological minerals that occur on or beneath the bottom. (for details see Chart 1).

Chart 1: Division of Mineral Resources

1. Geological
   - authigenic
     - phospherites
     - manganese nodules
   - detrital
     - sand, gravel, shells
     - heavy detrital minerals
       - heavy heavy minerals, light heavy minerals,
       - gems
   - organic
     - oil and gas
       - petroleum
       - natural gas
     - coal, sulfur
2. Chemical - magnesium, sodium, chrorine, bromine, gold
3. Biological - sea food

[8] Friedmann, The Future of the Oceans, op. cit., p. 23.

The production of these resources from the ocean, as shown by Table 1, amounted to $10.5 billion in 1964, a large amount but still small in contrast with an estimated $333 billion production from the land areas of the world.[9]

All of the chemical resources, all of the geological resources, and about 90 per cent of the biological resources have come from the shelf. The productivity of continental shelf is only 5 to 17 per cent of that of the land. The present technological developments, however, indicate that great increase in the productivity of the shelf can be expected, particularly in chemical and geological resources.

Table 1: Important Productivity Statistics (1964)[10]

	Entire World	
	Ocean	Land
Resource (10^9)		
Chemical	0.3	0.2
Biological	6.4	260.0
Geological	3.8	73.0
Total	10.5	332.2

[9]Edmund A. Gullion (ed.), Use of the Sea (New Jersey: Prentice-Hall Inc., 1968), p. 31.

[10]Loc. cit.

(i) Geological Resources

The list of minerals in Table 2 to subdivided into three main groups: authigenic, detrital, and organic. Authigenic minerals are precipitated from solution in sea water. The process is so slow that recognizable deposits occur only where other kinds of sediments are excluded. They are most restricted to thin surface layers. Detrital minerals are ones that were weathered and eroded from strata on land, transported to the ocean mostly by streams or sea-cliff erosion, and deposited as widespread layers on the sea floor. Organic minerals result from activities of living organism. Because organic matters are easy to be destroyed, these minerals occur only at depths of hundreds or thousands of meters beneath the sea floor. Total production of these minerals in 1964 was $3.8 billion.[11]

(a) Authigenic Minerals. The two chief minerals that are formed by chemical precipitation from sea water are phosphorite and manganese nodules. Both are known only as thin surface deposits. Phosphorite occurs mostly in depths shallower than 300 meters. It is a brown hard mineral that encloses sand, gravel, calcareous organic remains and pieces of earlier phosphorite occur only in areas where floods of detrital and other sediments are excluded, usually by isolation atop shallow banks or at the seaward edge of continental shelves where sediments

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[11] Ibid., p. 33.

Table 2: Value of Production of Geological Resources from the Ocean and the Land (10^3)[12]

	Entire World	
	Ocean	Land
Authigenic		
Phospherite	0	375
Manganese	0	423
Detrital		
Sand and Gravel	100	2,000 ?
Titanium	33	37
Zircon	11	0
Tin	5	460
Diamonds	4	284
Monazite	1.5	0.3
Iron	0.7	5,300
Gold	0	1,310
Organic		
Oil and gas	3,600	27,500
Sulfur	15	240
Total	3,770.2	37,929.3

*Dollar value is at import rate. All data are for 1964.

[12] Loc. cit.

from shore are diverted by submarine canyons. More than 90 per cent of this mineral is used as fertilizer and the rest in the chemical industry. The best known large deposits are off southern California and northwestern Mexico, off Peru-Chile, off the southeastern United States, and off the Union of South Africa.

Manganese nodules are the second important authigenic mineral deposit. The nodules occur at depths usually greater than 4,000 meters. They contain significant amounts of manganese, essential for making steel, as well as other valuable metals, including copper, nickel, cobalt, iron, silicon and lead. Pacific alone is estimated to be carpeted with about 1.5 trillion tons of nodules (today worth up to $200 a ton).[13] One particularly rich belt runs east-west just south of Hawaii. Unlike other natural resources, the nodules form quite rapidly--at a rate estimated at 6 million to 10 million tons a year in the Pacific belt alone. About 100 companies and half a dozen governments are now actively working on nodule-mining technology. A hydraulic mining operation using one ship could expect to process metals (mainly copper and nickel) worth $67 million annually. The profit could come to about $27 million a year, for a reasonably attractive return on investment of 21 per cent --

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[13] "Squeezing More Out of the Seas," TIME (July 29, 1974), p. 42.

competitive with conventional mines.[14]

(b) Detrital Minerals. The term "detrital minerals" is a broad one. They encompass all minerals derived from the weathering and erosion of rocks, mainly on land. These rocks, including igneous, metamorphic, and sedimentary types, consist chiefly of the light minerals, quartz and feldspar with small percentages of many other minerals. Most of these other minerals have little value, but some of the rarer ones that contain little silicon are exceeding value. The most important minerals of this sort are sand and gravel and some heavy detrital minerals.

Sand and gravel ordinary contain quartz and feldspar, along with rock fragments and shell debris. Uses of these minerals are mainly for beach replenishment, land fill, and concrete aggregate. About $ 35 million worth of sand, gravel, and shells were dredged from the sea floor in 1964 mainly to deepen navigational channels, to create small-boat harbors, and to provide construction materials.

Heavy detrital minerals can be separated into three groups on the basis of their specific gravity and toughness. These are heavy heavy minerals, light heavy minerals and gems. The "heavy heavy minerals" consist of gold, tin and platinum, with specific gravities of 6.8 to 21. Because of their specific gravity, these kinds of minerals in economic

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[14] Ibid., p. 43.

deposits are nearly restricted to the vicinity of their primary sources in intrusive igneous and associated metamorphic rocks. The "light heavy minerals" consist chiefly of ilmanite and rutile, zircon, monazite and magnetite. These minerals require the high energy environment of the ocean shore to achieve satisfactory separation from the accompanying quartz and feldspar and accumulation of large enough deposits to be mined economically. For the last group of heavy minerals, "gems", are dominated by diamonds which are actually mined off the coast of Africa. Other gems such as sapphires and rubies are so fragile that production from the ocean is almost impossible.

(c) Organic Deposits. Deposits of organic are direct - or by - products of life processes. Oil, gas, and coal are good examples. Oil and gas are mainly from marine plants while coal comes from land plants. The most important organic minerals extracted from the sea floor, however, are petroleum and natural gas. In an effort to further increase his production of oil and gas, man has turned to the sea floor in his search for new resources.

Oil and gas production, which constitutes over 90 per cent by value of minerals extracted from the marine environment, has been limited to water depths of 340 feet and 70 miles from shore due to the rapidly mounting costs of moving into deeper waters. Offshore wells supply about 20% of the world's oil and 7% of its gas needs today. It is estimated that oil

production will probably surpass that bring recovered on land within a decade. In 1973, the world consumed about 20 billion bb.l. By U.N. estimates, proven reserves currently total 640 billion bb.l., including at least 115 bb.l. in offshore deposits.[15] But many scientists believe that the world's undersea oil supplies are far more extensive.

Although offshore petroleum is still in an early stage of development, production is now obtained of 22 countries and 17% of the world's total oil production (about 6 million barrels per day) and 6% of the world's natural gas production come from offshore wells. Within 10 years, offshore production is expected to reach 25 million barrels a day, or about 33% of total world output of 70 million barrels a day.[16] More recent figures suggest even Greater importance, it has been estimated that about 18% of the total supply of petroleum comes from offshore resources. It has further been predicted that by the year 2000 as much as 40-50% of the world's petroleum production will be derived from offshore sources.[17] For the petroleum potential of continental shelves of the world see table 3.

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[15] Loc. cit.

[16] Mineral Resources of the Sea. (New York: United Nations Department of Economic and Social Affairs, 1970), pp. 4-5.

[17] Lawrence Juda, Ocean Space Rights Developing U.S. Policy (New York: Praeger Publishers Inc., 1975), p. 2.

Table 3 : Petroleum Potential of Continental Shelves of the World[18] (Areas in thousonds of square miles)

	(i) Shelf Area	(ii) Excellent Potential			(iii) Fair Potential		
		Area	% of total shelf of region	% of world excellent shelf area	Area	% of total shelf of region	% of world fair shelf area
Total World	10,763	188	1.8	100.0	1,657	15.3	100.0
North America	2,140	40	1.9	21.3	315	14.7	19.0
South America	910	20	2.2	10.6	150	16.5	9.1
Middle East, Asia	200	40	20.2	21.3	65	32.5	3.9
East Indies Islands (Incl. Philppines)	1,350	35	2.6	18.6	305	22.6	18.4
Iron Curtain Countries (iv)	2,718	35	1.3	18.6	385	14.2	23.2
Other areas	3,445	18	5.2	9.6	437	12.7	26.4

(i) Areas to depth of 1000 feet of water.

(ii) "Excellent Potential" rating is given to areas containing or in continuity with excellent producing areas and with like geology.

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[18] Marine Science Affairs - A Year of Plans and Progress (Washington D.C.: U.S. Government Printing Office, March 1968), p. 218.

(iii) "Fair Potential" rating is given an area containing or in continuity with a fair producing area, or when geology is similarly favorable for commercial production.

(iv) Includes Europe, Africa, Far East, Oceania and Antarctica.

In addition to petroleum, natural gas and coal, important by-products of organic activity are sulfur, gypsum and anhydrite. Besides, in tropic regions, calcareous deposits are also mined. These deposits include reef rock used for concrete aggregate, and beachrock that occurs in slabs locally used as building stone. Apart from this, there are also aragonite, coral and colorful shells which are sold as decorations.

(ii) Chemical Resources

The two most abundant chemicals from the ocean are sodium and chrorine which can be used for snow and ice removal, water softening, and refrigeration. The purer forms of sodium and chrorine are used in the chemical industry. Besides these two chemicals, magnesium, bromine and gold are extracted from sea water at Texas and elsewhere.

(iii) Biological Resources

Biological resources are the living resources of the sea which can be used as food, i.e. fishes, oysters, crabs, and shrimps. These resources will deal in details in the next Chapter concerning fisheries conservation.

In conclusion, we could see that the seas contains a large amount of invaluable resources. Offshore production has increased from an almost negligible amount two decades ago to about one - sixth of the total world production in 1964.[19] Thus causing the offshore mining emerges. (Summarizes of recent marine mining activities see Table 4). Today, hundreds of companies are involved in subsea oil and gas exploration and development around the world. Production is underway or about to start off the coasts of 28 countries, and exploratory surveys are being carried out on the continental shelves of another 50. Hence, problems often occur from the competition of the coastal states in exploiting these resources. Consequently, it is of great importance and great urgency to solve the legal and diplomatic problems in an orderly manner and timely way, so that a cooperative and peaceful use of the wealth of nations is possible.

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[19] Gullion (ed.), op. cit., p. 42.

Table 4 : Recent Marine Mining Activities[20]

Resource	(i) Activity	(ii) Depth(feet)	Location
Aragonite	Dredging	100 -	Bahamas
Diamonds	Dredging	100 -	Southeast Africa
Gold	Exploration	200 -	Philippines
	Exploration	600 -	Alaska
Heavy Metals	Exploration	200 -	Australia
	Exploration	100 -	New Zealand
	Exploration	100 -	Tasmania
Iron	Exploration	200 -	Philippines
Iron Sands	Dredging	30 -	Japan
	Exploration	200 -	Papua and New Guinea
Manganese nodules	Exploration	1200 ±	Canada (B.C.)
	Exploration	12000 +	Pacific Ocean
Phosphate	Exploration	600 ±	Union of South Africa
	Exploration	600 - 2400	Blake Plateau

[20] Marine Science Affairs - Selecting Priority Programs (Washington D.C.: U.S. Government Printing Office, April 1970), p. 68.

Resource	(i) Activity	(ii) Depth(feet)	Location
	Exploration	?	India
	Exploration	600 ±	California
	(inactive) Exploration	600 -	Australia
Phosphate Sands	Exploration	600 -	Mexico
	Exploration	600 -	North Carolina
Sand	Dredging	100 -	New England
Shell Sands	Dredging	150 ±	Iceland
Shells	Dredging	30 ±	California
Sulfide Muds	Exploration	600 ±	Red Sea
Sulfur	Mining (Frasch)	60 ±	Louisiana
Tin	Exploration	200 ±	Borneo
	Dredging	150 -	Indonesia
	Exploration	200 -	Malaysia
	Dredging	150 -	Thailand
	Exploration	200 -	Great Britain
	Exploration	200 -	Solomon Islands
Titanium	Exploration	200 -	Philippines

(i) Dredging operations generally include exploration activity. Does not include mines originating on land and drilled out under the sea floor.

(ii) Less than is represented by - ; more than is represented by + approximately is represented by ±.

III. The 1945 Truman Proclamation on the Continental Shelf and Other Claims.

The term "continental shelf" was not used by earlier generations of international lawyers, and its emergence in a juridical context was precipitated by the Truman Proclamation of 28 September 1945. In general, the seabed and subsoil of the high seas were regarded as being capable of occupation as "res nullius", provided such occupation did not derogate from the principle of the freedom of the seas. For very many years, it has been the practice of states to exploit, in different ways, the natural resources of the seabed and subsoil, for example, by carrying on sedentary fishes or by the tunnelling of mines that ran out from the coast under the sea. It was not, however, until advances in science and technology had made it possible to exploit the oil-bearing strata of the continental shelf that the question of the nature of the rights which a coastal state possessed in relation to the continental shelf adjacent to its territory became a matter of urgent importance.

The first instance of an international agreement between states to define their respective interests in the submarine areas adjacent to its coasts is the Treaty of 26 February 1942 between the United Kingdom and Venezuela relating to the submarine areas of the Gulf of Paria.[21] The Treaty appears to have been

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[21] J.A.C. Gutteridge, "The 1958 Geneva Convention on the Continental Shelf," The British Yearbook of International Law 1959 (New York: Oxford University Press, 1960), p. 102.

based on the view which had so long prevailed that the seabed lying beyond the limits of territorial waters was "res nullius" over which sovereignty could be acquired by occupation.

The 1942 agreement was followed by the Truman Proclamation of 1945. On September 28, 1945, President Harry S. Truman issued two surprising policy directives on ocean affairs which have already had some repercussions abroad, and which may lead to a general clarification of the rights of states in the continental shelf. Proclamation Number 2667 unilaterally extended American rights by stating that :

> Having concern for the urgency of conserving and prudently utilizing its natural resources, the government of the United States regards the natural resources of the subsoil and seabed of the continental shelf beneath the high seas but contiguous to the coasts of the United States as appertaining to the United States, subject to its jurisdiction and control. In cases where the continental shelf extends to the shore of another state, or is shared with an adjacent state, the boundary shall be determined by the United States and the state concerned in accordance with equitable prinsiples. The character as high seas of the waters above the continental shelf and the right to their free and unimpeded navigation are in no way affected.*

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*For complete text see Appendix 2.

No specific limitation by distance from shore or depth of water is contained in the proclamation itself. However the accompanying White House news release interpreted the area covered as "generally, submerged land which is contiguous to the continent and which is covered by no more than 100 fathoms (600 feet) of water is considered as the continental shelf."[22]

The other proclamation, Number 2668, dealt with coastal fisheries in relation to the high seas and served to carefully differentiate jurisdiction over conservation zones in the water column from that over resource on the seabed beneath. And these proclamation were implemented in turn, somewhat belatedly, by the passage of the Outer Continental Shelf Lands Act of August 7, 1953, which reserved for the United States all "political" and civil jurisdiction both in the subsoil and the seabed of the shelf beyond the seaward boundaries allowed to the states under the terms of the Submerged Lands Act of May 22, 1953.

Thus, the Truman Proclamation is generally taken to the starting point of a new era in the role of the oceanbed. It marked a radical development of the policy of the United States in respect to jurisdiction over the marginal sea. Because of its legal status, its economic significance, and its potential for political and military conflict it triggered a series of rapidly expanding and accelerating national claims to

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[22]P.E. Carbett, Laws and Society in the Relations of States (New York: Harcourt, Brace and Company, 1951), p. 137.

exclusive control over the continental shelf.

The principal motives or events leading to the 1945 Truman Proclamation came from the pressure of foreign long-distance fishing vessels operating off their coasts, and also from the question of petroleum exploitation. There was some dissatisfaction with the traditional 3-mile limit of exclusive coastal fishing and some fishermen suggested that national jurisdiction be extended over all the waters of continental shelf. This is because since the late 1930s, that the continental shelf had come to the attention of American policy makers as a result of concern with Japanese fishing activities off the coast of the United States. The Alaskan salmon industry feared depletion of the salman stock because the Japanese took the catch from the shallow waters over the continental shelf as they came from the ocean to inland waters to spawn. This Japanese "invasion" of salmon fisheries in the Bristol Bay area during the 1936-1938 period created tremendous resentment in the United States against the Japanese. The persistence of these fishermen led to strong political pressure on the United States Government to take action to limit the right of foreign nationals to fish in the waters above the continental shelf of Alaska.

Apart from the problem of offshore fishing, petroleum exploitation was another concern. As early as 1894 oil had been extracted from shallow submerged land off the coast of California. The existing technology was simple and for some time there was no question at all of operating beyond the 3-mile limit of territorial waters. In 1918, however, a private citizen wrote a

letter to the Department of State inquiring how he might acquire property rights to petroleum deposits that he believed to exist in land beneath the Gulf of Mexico about 40 miles from the closest land but in water of less than 100 feet. The State Department response noted that "the United States has no jurisdiction over the ocean bottom of the Gulf of Mexico beyond the territorial waters adjacent to the coast."[23]

In 1938 the Independent Exploration Company sought to be employed by the Department of Interior to perform geophysical exploration work beyond the 3 - mile limit in the Gulf of Mexico to ascertain the presence of oil. And again, the same question occurred of what limit of the depth supposed to be under the jurisdiction of the government. The Companany then made a request to the Department of Interior. This request caused considerable concern within the Interior Department, and this problem of rights to the submerged land beyond the 3 - mile limit came to the attention of the United States government soon after the request of the Independent Exploration Company.

Hence, due to these events which finally consequenced with the proclamation of the President with respect to the natural resources of the subsoil and seabed of the continental shelf. The proclamation called attention to the need for new sources of petroleum and other minerals, to the belief that such resources

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[23]Juda, op. cit., p. 12.

underlie many parts of the continental shelf off the coast of the United States. It then announced as the "policy" of the United States to regard these resources "as appertaining to the United States, subject to its jurisdiction and control." In cases where the continental shelf extended to the shores of another state, or was shared with an adjacent state, the boundary was to be determined by the United States and the state concerned "in accordance with equitable principles." All claim to the waters over the shelf beyond already accepted limits is again repudiated. The general right of unimpeded navigation is declared not to be affected. Installations necessary for the extraction of oil, for example, may cause some inconvenience to the movement of shipping, but will hardly rank as violations of this right. Finally looking back to the preamble, we find the statement that "the exercise of jurisdiction over the natural resources of the subsoil and seabed of the continental shelf is reasonable and just," which is tantamount to a recognition of a liberty in all states to take similar action.

Within 13 years of the Truman Proclamation it was possible to enact an international convention, which became effective in 1964, after the twenty-second ratification and has now been accepted by 50 states.* This proclamation was soon followed

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*See Tables of Ratification of the Major Multilateral Conventions of the Law of the Sea from S. Houston Lay; Robin Churchill and Myron Nordquist, New Directions in the Law of the Sea, Documents - Volume II (New York: Oceana Publications Inc., 1973), pp. 799-805.

by similar steps in other countries. By 1949, the example of the United States had been followed by Mexico, Argentina, Nicaragua, Chile, Peru, Costa Rica, Saudi Arabia, and by Great Britain in respect of the Bahamas and Jamaica. But most of the pupils had bettered their instructor, asserting not merely ownership of the natural resources, but sovereignty in the continental shelf and in the sea above it, thereby interfering with the freedom in the high seas.

In a declaration by the President of Mexico on October 29, 1945, Mexico claimed possession of the entire continental shelf adjacent to its coasts and all of its natural resources. Additionally, Mexico was to undertake the supervision, utilization, and control of fishery zones that were necessary for conservation. In so far as Mexico was making a claim to the mineral resources of its continental shelf, the United States was not perturbed. This was so in light of the fact that the Mexican declaration indicated that the character as high seas of the waters above the shelf and the right to free navigation was to be respected, and that the continental shelf was delimited by the 200 meter isobath. Thus, the limit of the shelf area claimed by Mexico was very similar to the 100 fathom limit suggested by United States authorities. Mexico was being informed that it could not unilaterally bar American fishermen from operating over the Mexican continental shelf beyond territorial waters where they had fished for some time.

Apart from the Mexican declaration, between 1948 and 1964 under the Colonial Boundaries Act. 1895,[24] a number of proclamations also made by the Rulers of British Protected States in the Persian Gulf. They all relate to the continental shelf and have one common feature. They all assert, in varying terms, that nothing in the instrument in question shall be deemed to affect the status as high seas of the waters above the seabed and outside territorial water. In contrast, the declarations and decrees by various South American states assert the sovereignty of the state concerned over the shelf, and whilst they may recognize freedom of navigation over the shelf, they make no reservation of the character, as high seas, of the superjacent waters.

The United States Proclamation, in fact made very modest claims, and was timid that it is doubtful whether it really "laid claim" to anything. In so far as the continental shelf is concerned, "jurisdiction and control" were claimed only over its natural resources, not over the seabed and subsoil thereof, and the superjacent waters expressly remained high seas. In contrast with the claim by the United States, a majority of the Latin American claims introduced true innovations in the traditional international law of the sea as it stood at the end of World War II. The majority of Latin American claims relative to

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[24] Gutteridge, op. cit., p. 104.

the continental shelf are also quite different from the Truman Proclamation.

Whereas the continental shelf declaration of Mexico could be interpreted as being consistent with the U.S. position as expressed in the Truman Proclamation, the stance taken by the government of Argentina was clearly out of line with American policy. In the Argentine Declaration of 9 October 1946, Argentina claimed the entire continental shelf and "epicontinental"* sea of its coast. Argentina, laid claim to the "epicontinental sea," in two instruments. One of these declared "that the Argentine epicontinental sea and continental shelf are subject to the sovereign power of the nation," and added that "for purposes of free navigation, the character of the waters situated in the Argentine epicontinental sea and above the Argentine continental shelf remains unaffected by the present Declaration."[25]

Consequently, the Argentine government claimed sovereign power not only over the continental shelf but also over the waters above the shelf. While free navigation was explicitly said to be unaffected in the area of the epicontinental seas, the claim of sovereign power suggested that a change could occur in subsequent declarations. Further the absence of any reference

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*The "epicontinental sea" is that part of the high seas which actually covered the continental shelf.

[25]Garcia - Amador, op. cit., p. 35.

to fishing rights indicated that fish in the epicontinental waters could be regarded as exclusively in Argentine resources. The claim of Argentina has surpassed that of the US.

Accordingly, the US. formally protested the Argentine decree. To have made no protest would have been viewed as acquiescence in and acceptance of the Argentine claim. Argentina was informed that the principles underlying its declaration differed in large measure from those of the US. proclamations and that they appeared to vary with generally accepted principles of international law.

Another claim belonging to the same group is contained in Panamanian Decree No. 449 of December 17, 1946.[26] The Honduran claims of 1950 and 1951 are similar in that they affect the living resources of the superjacent waters.

Soon after that, there followed the claims of Chile, Peru and Costa Rica. All three of these states made references in their proclamations to the preceding claims of the US., Mexico, and Argentina. Chile, Peru, and Costa Rica declared their national sovereignty over the continental shelf to whatever depth of water the shelf might extend. Additionally, all these states made claims to the epicontinental seas and declared fishery zones to a distance of 200 miles from their coasts. In the same term used to protest the claim of Argentina, the claims

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[26] Loc. cit.

of Peru and Chile were also protested by the US. For some unknown reason the US. apparently did not protest the decree of Costa Rica.

In September of 1950, El Salvador adopted a new constitution, which started in Article 7[27] that its territory included the adjacent seas to a distance of 200 miles and the corresponding air space and continental shelf. In a note to the government of El Salvador, the US. pointed out that sovereignty over ceastal waters was limited to the narrow belt of territorial seas recognized under international law. It was observed that if the provisions of Article 7 were executed, the exclusive jurisdiction and control of El Salvador would extend into wide areas of the high seas. Consequently, the US. would not consider its nationals, ships, or aircrafts as being subject to the stipulations of that Article or to any measures designed to give it effect.

In addition to the long running dispute between the US. and a number of Latin American states on the scope of the continental shelf and on rights in regard to the epicontinental waters, disagreements between other states have erupted in connection with the continental shelf. Conflicts arising from claims to offshore areas have involved a number of states including Denmark,

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[27]Juda, op. cit., p. 26.

the Netherlands, and West Germany; China and Japan; Japan and Australia; the Soviet Union and Japan, South Korea and Japan; France and Brazil; and Greece and Turkey. In the face of recent developments and concern expressed about offshore areas, the United Nations General Assembly decided to convene a diplomatic conference on the law of the sea.

IV. Limits of National Jurisdiction Over the Seabed as Provided by the Continental Shelf Convention

"Exploitability" Clause

Perhaps no new doctrine of international law has ever before developed so rapidly with so little precedent and with such potency to marine affairs as the Convention on the Continental Shelf. Within 10 years it was to be shredded with controversy. The main problem of the Convention considering the exploitation of the resources of the seabed is the question of the depth of exploitation and its limit. This is bacause the key word -- exploitation -- is not defined strictly in the 1958 United Nations Conference at Geneva in its Convention on the Continental Shelf. The Convention fails to set any real limits. Accordingly, the half-dozen nations that now are or soon will be competent to drill or otherwise exploit mineral resources of the deep - sea floor are likely to have different interpretations of what is thine and what is mine.

The problems of limits are primarily on the seaward side. How far and how deep, does the coastal state's flag march under

water ?

Article 1 of the 1958 Convention on the Continental shelf provides that:

> For the purposes of these articles, the term "continental shelf" is used as referring (a) to the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 meters or, beyond that limit to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas; (b) to the seabed and subsoil of similar submarine areas adjacent to the coasts of islands[28]

This wording is based on Article 67 of the International Law Commission's draft Articles on the Law of the Sea. The 1951 draft of the ILC had defined the continental shelf as follows:

> As here used, the term "continental shelf" refers to the seabed and subsoil of the submarine areas contiguous to the coast, but outside the area of territorial waters, where the depth of the superjacent water admits of the exploitation of the natural resources of the seabed and subsoil.[29]

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[28] Marjorie M. Whiteman, "Conference of the Law of the Sea: Convention on the Continental Shelf," American Journal of International Law, 52, 4 (October, 1958), p. 633.

[29] Loc. cit.

The corresponding article of the 1953 draft of the ILC read:

> As used in these articles, the term "continental shelf" refers to the seabed and subsoil of the submarine areas contiguous to the coast, but outside the area of the territorial sea, to a depth of two hundred meters.[30]

The 1956 draft of the ILC, on which the Geneva draft is based to a considerable extent, read:

> For the purposes of these articles, the term "continental shelf" is used as referring to the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 meters (approximately 100 fathoms) or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas.[31]

This must not, however, be taken to imply that Article 67 of the IIC's draft was not subjected to criticism by the Fourth Committee of the 1958 Geneva Conference. Its 13th to 19th Meetings were, indeed, exclusively devoted to consideration of that definition. There were numerous proposals to change or amend the draft of this article as it come from the IIC. The Canadian delegate on the Fourth Committee pointed out that there

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[30] Loc. cit.

[31] Loc. cit.

were five possible methods of defining the continental shelf, none of which, taken separately, appeared to provide a completely satisfactory definition of the continental shelf.

> 1.) The first method would be to lay down an agreed distance from the coast in terms of miles or kilometres, but this method bears no real relationship to geographical or geological facts or to the realities of the situation with regard to exploitation.
>
> 2.) The second method would be to define the continental shelf by the geological characteristics of the seabed or by the type of aquatic inhabitants found there. This method was rejected on the grounds that the continental margins did not have ths same origin and consequently differed widely in structure and in the types of living organisms they supported.
>
> 3.) The third method would be to fix the limit of the continental shelf in terms of depth, the commonly suggested figure being 200 meters (approximately 100 fathoms)
>
> 4.) The fourth criterion was that of possible exploitation; this the Canadian delegate, in common with a number of other delegates, criticized as being insufficiently objective, and also open to the objection that technical and scientific knowledge was increasing so rapidly that a limit thus defined would tend to expand continuously, thus creating much uncertainty.
>
> 5.) The fifth possible method would be to fix the boundary of the continental shelf at an actual edge in a geographical sense this, however, presented a difficulty in that the physical edge of the shelf was not always well defined.[32]

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[32] Gutteridge, op. cit., pp. 106-107.

The definition adopted by the International Law Commission was a combination of the third and fourth methods refered to above. It is, however, obvious that the decision of the Commission to maintain the limit of a depth of 200 meters, but to add to its words which would give the coastal state authority to exploit the natural resources of areas beyond this depth should this prove practicable, was not reached without difficulty. And the draft definition presented was the one which now appears as Article 1 of the Convention on the Continental Shelf. All other alternative propcsals were all defeated, they were : 550 meters but not over 100 miles from the outer limit of the territorial sea, proposed by Yugoslavia; deletion of depth - of - exploitability test, proposed by France and Lebanon; 550 - meters test only, proposed by India; shelf edge or 200 meters, Canadian proposal embraced by Germany; shelf edge or 550 meters, proposed by Canada; shelf and slope (continental terrace), proposed by Panama; and exploitability test only, proposed by Korea.

The consequences of the open-ended definition of the continental shelf have been many, with probably many more to come. The first, and perhaps the most obvious, response to the "exploitability" loophole has been the gradual erosion of the 200 - meter isobath as the normal depth limit of the continental shelf. As oil drilling, even though it is most experimental at this time, and alternative methods of exploitation become available, the claims expand. However, any precise limitation at a given time is apt to be short-lived.

In fact, the Law Commission of the Convention thought that the limit of 200 meters would be considered to be sufficient for all practical purposes at that time (1958) and possibly for a long time to come. One possible explanation of this lack of foresight is that maritime technology in the fifties was quite backward compared to the progress attained by the midsixties. Oil drilling, the most important means of exploitation during the period preceding the Conference, was not then feasible beyond a depth of 280 feet; projects to develop methods of drilling in deeper waters had not yet begun; and the bathyscaphes, sealab and submersibles were in there infancy. Many of the defenders of the open-ended exploitability test comforted themselves with the contention that exploitation at depths greater than 200 meters would not occur in the near future. In his paper prepared for the Geneva Conference a leading expert, the late Admiral Mouton,[33] declared that exploitation at great depth would not be possible for at least 20 years; he believed it would take a minimum of 10 years to develop structures that would permit drilling at 400 feet -- a depth well within the 200 - meter limit of the Convention.

To be sure, the International Law Commission and the delegates to the 1958 Geneva Conference were aware of isolated

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[33]Friedmann, The Future of the Oceans, op. cit., p. 36.

warnings that future exploitation might be possible at depths greater than 200 meters so that the exploitability test would permit exclusive claims. For example, in their comments on the draft, the Chilean and South African governments drew attention to the fact that with the advance of technical efficiency, the boundaries of the continental shelf would be subject to continual revision. The Commission took the view that the adoption of such fixed limit would have considerable advantages, in particular with regard to the delimitation of continental shelves between adjacent states or states opposite each other. The adoption of different limits by different states might cause difficulties of the same kind as differences in the breadth of the territorial sea.

However, most of the delegates at Geneva apparently did not believe that technological advances would be rapid enough to make the exploitability test a lever of constantly expanding claims. Anyway, the astounding technological developments of the last decade seems to render the 200 - meter depth out-of-date. First, the economic pressure for the exploitation of oil and gas at ever - increasing depths, principally concentrated in the continental shelves is an inevitable consequence of the constant acceleration in mankind's demand for oil, gas, and other vital minerals. Second, technological progress makes full exploitation of the resources of the continental shelf proper, and more selective exploitation of mineral resources in the continental margin beyond the shelf a practical prospect

within the next decade. Third, there has been amazing progress in a man's ability to spend prolonged periods and/or near the bottom of the ocean at depths well exceeding the limits of continental shelf proper.

And this technological progress plus the economic pressure for resources exploitation makes full exploitation and exploration jumping to self - interpretation of exploiting the seabed resources of the oceanbed beyond the continental shelf to the limit of continental margin. In sum, the coastal states jump to the conclusion that there is here an inherent right or "adjacency" right which is sometime called a "claim - jumping" or "creeping jurisdiction"*

Substitution of the concept of the "continental margin" for that of the "continental shelf" represents an even more blatantly distorted interpretation of the Geneva Convention. This is because the continental margin comprises not only the shelf but also the continental slope and the continental rise, or in other words, the entire oceanbed up to the abyssal depth, an area representing approximately 23 per cent of the total

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*This "creeping jurisdiction" refers to the phenomenon of coastal states in which they primarily claim jurisdiction over an area for one purpose (special purpose jurisdiction) and then expand the claim into general purpose jurisdiction.

ocean floor. Not surprisingly it has been interpreted as doing away any limiting geographical criterion and giving exclusive rights to the coastal state over any part of the ocean where resources can be exploited.

In another disturbing clause, Article 1 (b) of the Geneva Convention allotted separate continental shelves "to the seabed and subsoil of similar submarine areas adjacent to the coasts of islands." This has had some extraordinary consequences. While the majority of the colonial possessions of the Western powers are now independent states, a number of small islands remain colonies of such countries as Britain and France. There would have been some political and geographical sense in limiting separate continental shelves to those islands that are either independent sovereign states -- like Barbados, or Trinidad and Tobago in the West Indies -- or to the main coast of the state of which they are a part. But since the Continental Shelf Convention failed to make any such limitation, tiny islands that are still colonial possessions -- such as the French - owned Clipperton, off the coast of Mexico, and St. Pierre et Miquelon, off the Gulf of St. Lawrence, or the British possession of St. Helena in the Atlantic where Nepoleon died in exile -- can claim separate continental shelves which in some cases add enormous areas to the states to which they belong.

Thus, we could see that while the convention is laudatory in its attempts to foresee and avoid disputes over the continental shelves, several questions remain unanswered because of

Article 1. Article 1 of the Convention defines "continental shelf" as that body of land off the coast of a continent which extends from the coastline to the point (1) where the sea is 200 meters or (2) "where the depth ... admits of the exploitation of the shelf", whichever is further. This dual standard accords the coastal nation a minimum area of sovereignty to 200 meters depth, and a maximum that is limited only by the actual extent of the shelf and technical ability in the exploration of the shelf itself. As a matter of fact, the language of the latter extent is susceptible of at least two interpretations : (a) that the outer boundaries of the shelf are dependent upon the "actual geographical" aspects and upon the "technological ability" of the particular nation concerned and (b) that boundaries are determined by the technological ability of the most advanced nation.

Confirmations can be made supporting either interpretation. The accord under-developed nations, it can be said that to extend the offshore boundaries of a less-developed nation to the farthest range capable of exploitation by the most advanced nation is uneconomical and unproductive even though the argument was refuted when considering the application of the basic principle on which the convention was founded at Geneva in 1958. The convention was predicated on the notion that each nation, whether technologically advanced or not, has sovereign rights over its portion of the continental shelf. The convention explicitly provides that its rights are not diminished by failure to

exploit; indeed, allowing offshore resources of minerals and foodstuffs to lie fallow might be a prudent conservation measure in the best interests of the entire world.

Wise or not, however, each nation's portion of the continental shelf is its alone, to exploit or not to exploit as it sees fit. This is because, even though the strict equality is observed, the inequality in fact, particularly in economic and geographical terms, compels the conclusion that the definition of "continental shelf" is to be the same for each country. The inequalities, in fact, can be parcelled out in many respects:

First, one state may have a coast and another no coast at all. There are at present 29 land-locked states, which have no coast whatsoever and therefore cannot claim any adjacent submarine area for their exclusive jurisdiction. While a few of these states--such as Austria and Switzerland--are among the world's industrially developed nations, the great majority of the landlocked countries is found among the new and poorer states of Africa, with a few in Asia, Latin America, and Eastern Europe.

Second, one state may have a long coastline while another a short one. If one state has a 100 mile coast and another has a 1,000 mile coast, for every single mile coastal states sovereignty is moved sea - ward, the first state gains 100 square miles while the second gains 1,000 square miles. And if those coastal states claiming national jurisdiction to 200 miles, the latter state is giving no less than 200,000 square miles of seabed, as opposed

to 20,000 square miles of the former state. Is this equitable to other states?

Third, one state's coast may be on an enclosed or semi-enclosed sea, and another's on the open ocean. A state facing the open ocean might theoretically contemplate benefiting from agreements extending national jurisdiction to extreme limits, or from a rule which permits each coastal state to fix its own limits. But the maritime limits of a state on an enclosed or semi-enclosed sea soon collide with these of its neighbors.

Fourth, there may be a large continental margin off the coast of one state and a narrow margin* that contains most of the known off-shore petroleum and gas reserves. Petroleum and gas are a far greater potential source of revenues from the seabed than are hard minerals. Thus, no limit of coastal state jurisdiction--whether measured by depth or distance from shore--can store equality to a coastal state with a narrow continental margin off its coast.

In fact, only about 24 nations of the world would gain substantially from very wide limits of national oceanbed jurisdiction. But since the extension of sovereignty still has a magic appeal to today's nation states--old and new, developed and undeveloped--each and every state will seek to extend the geographical area of its sovereignty, regardless of how small

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*Country with small continental shelf called "shelf-locked country" e.g. Singapore.

the benefits from such an extension might be.

Finally, and it is of the most important is that not all maritime nations have continental shelves as defined earlier. And since the world production of petroleum and natural gas come from the continental shelves, this means that certain states are excluded from the sudden accretion of national wealth that has come with the extension of national sovereignty to their resources.

As a result, it was hardly to be expected that states excluded from such an enormous extension of the wealth of certain countries would not seek some kind of compensation. The most disadvantaged of these states -- the 29 landlocked countries -- so far have not made moves other than to support an international oceanbed regime under which at least some of the wealth of the seabed would be redistributed. A more specific response was that of those Latin American countries that, because of their steeply declining coastlines, do not enjoy an exploitable continental shelf. Chile, Ecuador and Peru, in the Declaration of Santiago, in 1952, proclaimed their sole jurisdiction and sovereignty over the area adjacent to and extending 200 nautical miles from their coasts including the sea - floor and subsoil of those areas. And that was just enough to embrace the broad reaches of the Humbolt current, one of the richest fishing grounds in the world. Following this declaration, several other Latin American states, including Argentina , subsequently made similar proclamations. This assertion of sovereignty over territorial waters to 200 mile goes further than

the interest in the resources of the seabed and subsoil, with which the continental shelf and margin claims are concerned. It includes the right to exclude foreign fisheries and to coastal navigation of all kinds.

Moreover, the degree of technological advancement of most nations in fact bears important relation to the extent of exploration and exploitation sponsored and undertaken by them. Although as we shall see, certain legal arrangements could mitigate this technological handicap, it gives an initial advantage to the few countries that combine exploitable seabed and subsoil resources with advanced technology. The under-developed countries still make up a large majority of the world's nations, and although individually and collectively they have asserted their claim to the exploitation of natural resources over which they exercise sovereign rights and are gradually building up a reservoir of trained scientists, engineers, and administrators, the gap remains wide and will continue to be for many years. The various aspects of ocean technology require an even greater scientific and technological sophistication as well as capital investment than most land - based operations. Thus, we gain nothing by delay in better defining of sovereign limits through hope that the problem will "go away," because the problem is bound to increase as the half dozen active nations continue to develop their capability for undersea investigation and exploitation.

In short, the extension of sovereign rights to both mineral and living resources of the continental margin has tended to accentuate rather than mitigate existing national inequalities, creating a new potential for political and social tension, and rendering even more important the need for some form of international oceanbed control for the redistribution of resources.

Rights of the Coastal State over the Continental Shelf

The general debate which took place in the Fourth Committee of the 1958 Geneva Conference on the Law of the Sea disclosed that there were, broadly, two different approaches to the question of the nature and extent of the coastal state's rights over the continental shelf.

There was, on the one hand, a group of countries, notably Argentina, Mexico, Peru, Chile and Uruguay, who claimed that the coastal state had complete sovereignty over the continental shelf. They justified this contention "both by reason of the physical nature of the continental shelf and by reason of the nature of rights vested in states." The submarine areas known as the continental shelf were, they maintained, "dependent on or an appurtenance of the mainland and their ownership vested in the owner of the mainland. Hence, the coastal state, as the sovereign of the land, also exercised sovereignty over the

continental shelf."[34]

A large number of other delegations rejected the conception of the coastal state's complete sovereignty over the continental shelf, and regarded its rights as limited to those necessary for the exploration and exploitation of certain resources of the continental shelf. In general these delegations accepted the views of the International Law Commission, and attached much importance to maintaining the principle that "the rights of the coastal state over the continental shelf do not affect the legal status of the superjacent waters as high seas, or that of the air space above those waters."[35]

It was undoubtedly the question of the legal status of the superjacent water which marked the principal divergence between those delegations who wished to see the principle of complete sovereignty by the coastal states to have only certain rights, falling short of complete sovereignty, over the continental shelf. If it were to be accepted that the coastal state had complete sovereignty over the continental shelf, it would also have to be accepted -- as is clear from the statements of these delegations which advocated complete sovereignty -- that the coastal state would claim the exclusive right of exploring

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[34]Gutteridge, op. cit., p. 111.

[35]Loc. cit.

and exploiting all the natural resources of the continental shelf and of reserving to itself, if it so wished, the exclusive right of fishing within the waters lying above the shelf. This would undoubtedly have constituted a far- reaching encroachment on the freedom of the high seas which is only to a very limited extent endangered by the exploration and exploitation of the mineral resources of the shelf and of such living resources as are attached to the bed of the sea.

At the final decision, it is clear that the coastal state does not, under the Convention, possess unlimited sovereign rights over the continental shelf. Article 2, paragraph 1 of the Continental Shelf Convention which based on Article 68 of the International Commission's draft articles expressed the limitation in general terms by providing that "the coastal state exercises over the continental shelf sovereign rights for the purpose of exploring it and exploiting its natural resources."[36]

Article 2, paragraph 4 of the Continental Shelf Convention provides a guideline as to what is to be considered as "natural resource of the continental shelf." This provision reads:

> The natural resources referred to in these articles consist of the mineral and other non - living resources of the seabed and subsoil together with living organisms belonging to sedentary species, that is to

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[36] Ibid., p. 117.

> say, organisms which, at the harvestable stage, either are immobile on or under the the seabed or are unable to move except in constant physical contact with the seabed or the subsoil.[37]

The reason why a definition of "natural resources" was necessary was clear from the International Law Commission's commentary. The resources covered by the definition proposed in the joint amendment were "mineral and other non-living resources" and also "living organisms belonging to sedentary species." Most of the non-living resources of the seabed and the subsoil were, of course, mineral resources but the words "and other non-living resources" had been added so that the article would apply to resources such as the shells of dead organisms. So far as the living resources in question were concerned, the sponsors of the amendment for the Commission's draft articles on continental shelf considered that it was the permanent intimate association of certain living organisms with the seabed which justified giving the coastal states exclusive rights in regard to such organisms. The permanent association of some living resources with mineral resources of the seabed and subsoil was such that it was best that both those types of resources should be exploited jointly. They were harvested in such a way that it was appropriate to give the coastal state exclusive rights in respect of both types. Some sedentary

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[37] Juda, op. cit., p. 53.

living organisms were such permanent features of the seabed that it was inadvisable to provide that they might be exploited by any state.

The living organisms of the seabed and subsoil belonging to sedentary species comprised coral, sponges, oysters, including pearl oysters, pearl shell, the sacred chank of India and Ceylon, the trochus and plants.

It would be senseless to give coastal states exclusive rights over mineral resources such as the sands of the seabed but not over the coral, sponges and the living organisms which never moved more than a few inches or a few feet on the floor of the sea.

The sponsors of the amendment had agreed that no crustacea or swimming species should be covered by the definition. Swimming species were obviously not sedentary. It was true that the term "crustacea" included all crabs, of which some species were unable to move except in contact with the seabed or subsoil; but those species could move considerable distances.

In sum, no problem arose in relation to the matter of mineral resources of the shelf, but substantial differences were in evidence in regard to living organisms. Italy, for example, expressed the view that the term "natural resources" should apply only to "inorganic natural resources" while Iceland, on the other hand, claimed that the coastal state should have jurisdiction over free-swimming fish in the waters above the continental shelf. A number of states favored the inclusion

of, at least, "sedentary species" of living organisms as natural resources of the continental shelf while there was little support for the view that fish and other living resources, whether sea-mammals or invertebrates like shrimp, swimming in the water above the continental shelf should be included. This relates also to the "bottom-fish" and other fish that occasionally have their habitat at the bottom or are bred there, but otherwise live in the sea.

A distinction, therefore, should be recognized between "sedentary species" and "sedentary fisheries" or "swimming species." Sedentary species refer to types of living organisms that have a natural and close relationship to the sea bottom. Sedentary fisheries refer to the fishing process that uses fixed gear attached to the sea bottom. There are persuasive arguments, both scientific and practical, for the contention that so-called "sedentary fisheries" do not properly belong under the shelf regime. Logically, it would seem that the dividing line between the two domains could best be drawn between animate and inanimate resources. Biologically, it is extremely difficult to define satisfactorily a "sedentary species." Practically, the living resources of the seas are so intimately dependent on one another that the regulation of some species under one regime and of others under another is bound to create problems. Legally, the unilateral regulation of any fishery in the high seas is a dubious proceeding, and creates a serious hazard to the freedom of high seas fisheries in general. Sedentary fisheries are also

treated in Article 13 of the Convention on Fishing and Conservation of the Living Resources of the High Seas.

The 1958 Convention recognized exclusive sovereign rights to the seabed and subsoil resources of any continental shelf to a depth of 200 meters, or, beyond that limit, to where the depth of the "superjacent" waters permitted the exploitation of the natural resources of the shelf. If a coastal state chose not to exploit such resources, its sovereign rights prevented any other state from undertaking such exploitation without the express consent of the coastal state. The treaty further provided that the rights of the coastal state over the shelf did not depend on occupation or on any express proclamation (Article 2). The rights of the coastal state over the shelf did not or in any manner affect the legal status of the superjacent waters as high seas or that of the airspace above those waters (Article 3).

The coastal state was not permitted to impede the laying or maintenance of submarine cables or pipelines on the continental shelf, subject to its right to take reasonable measures for the exploration of the shelf and for the exploitation of its resources (Article 4). These legitimate activities were not to result, however, in an unjustifiable interference with navigation, fishing, or the conservation of the living resources of the sea above the shelf (Article 5).

Subject to these restrictions, the coastal state was entitled to construct and operate on the continental shelf

installations of various sorts necessary for its exploration and exploitation of its natural resources. Safety zones not to exceed a distance of 500 meters from such installations could be established by the coastal state. For obvious reasons, any installations constructed by the coastal state on the shelf were denied the status of islands. They thus lacked any territorial sea of their own and their existence could not affect the delimitation of the territorial waters of the coastal state. Such installations were forbidden altogether where their presence would interfere with the use of recognized sea-lanes utilized in international navigation. If another state should wish to sponsor or undertake research on the continental shelf, the consent of the coastal state would be required (Article 5).

As a point of interest it should be mentioned that each coastal state had and has a perfect right to exploit the subsoil of the seabed by means of tunnelling, regardless of the depth of water above the subsoil in question (Article 7).

It should be obvious that whenever the coastal state is mentioned in a discussion of the right to exploit the resources of a continental shelf, such coastal state may conduct the exploration and exploitation through its own governmental agencies or may, at its discretion, grant the necessary concessions for such undertakings to private individuals or corporations.

The Delimitation of Continental shelf in Special Circumstances

In dealing with the problem of boundaries on the same continental shelf, both as between states opposite one another and as between states adjacent to each other along the same coast, Article 6 of the Convention rightly stresses agreement among the states concerned as follows:

> 1. Where the same continental shelf is adjacent to the territories of two or more states whose coasts are opposite each other, the boundary of the continental shelf appertaining to such states shall be determined by agreement between them. In the absence of agreement, and unless another boundary line is justified by special circumstances, the boundary is the median line, every point of which is equidistant from the nearest points of the baselines from which the breadth of the territorial sea of each state is measured.
>
> 2. Where the same continental shelf is adjacent to the territories of two adjacent states, the boundary of the continental shelf shall be determined by agreement between them. In the absence of agreement, and unless another boundary line is justified by special circumstances, the boundary shall be determined by application of the principle of equidistance from the nearest points of the baselines from which the breadth of the territorial sea of each state is measured.
>
> 3. In delimiting the boundaries of the continental shelf, any lines which are drawn in accordance with the principles set out in paragraphs 1 and 2 of this article should be defined with reference to charts and geographical features as they existant a particular date, and reference should be

made to fixed permanent identifiable points on the land.[38]

In sum, Article 6 of the Convention sets forth the procedures for dividing the shelf among the littoral nations. These three procedures might be analogized to contract, legislation, and litigation.

- The first and preferred procedure is agreement among the nations concerned, strongly advocated by the convention.

- In the absence of such agreement, however, the convention declares that the "principle of equidistance" is to be applied. By this principle all claimant nations would have exclusive rights from the baselines from which their territorial seas are measured to that point at which equidistant lateral lines drawn from their baselines would meet. The rule of equidistance or median line, is a well-known method applied in various situations: to fix state boundaries on rivers and waterways (an alternative boundary in this situation is the middle channel line of Thalweg), and to set limits of a state's territorial sea. It is important to note that the median or equidistance line is often characterized as a "general rule." It is deemed to lead mostly to equitable results, which are acceptable to the interested parties, and it is useful for

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[38]Whiteman, op. cit., pp. 648-649.

avoiding protracted boundary disputes. It does not, however, eliminate the need for agreement in order to set an exact boundary line.

This formula, based on geometrical principles made familiar largely through the work of the late Dr. S. Whittemore Boggs of the Department of State,[39] has merit chiefly in providing a point of departure for negotiations. Its application in complex geographical situations is not always easy; and if applied strictly, it often produces a line which is unduly complicated or which, in the light of other considerations, appears inequitable or impracticable.

As noted above, Article 6 provides for an exception to the principle of equidistance when special circumstances justify. However, the text of the Convention does not indicate what these special circumstances may be; what the alternative guiding principles should be; or how the existence of the special circumstances or appropriate guiding principles should be ascertained. What constitutes "special circumstances" is not defined, and no method is provided for determining their existence, so the phrase does provide a means by which a disputant state can indefinitely delay the application of the convention rule by pleading "special circumstances" in any particular case. Yet

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[39] Quoted from Young, op. cit., p. 737.

in view of the fact that special circumstances do exist in numerous cases, the provision seems warranted.

Besides, if the "exceptional circumstances" clause were too often applied, the purpose of Article 6 would be determined. It is difficult to determine what the "special circumstances" exception means. These words imply that the exception should not be invoked unless the area in question has such a higher degree of unusual geographical configuration that one of the adjacent states would suffer great injustice if its portion of the continental shelf were delimited according to the principle of equidistance.

Instances in which it would be appropriate to apply the exception clause are the Channel Islands and the North Sea case. The British Channel Islands are located very near the French coast. On the basis of this situation the British part of the continental shelf would be substantially enlarged while France's would be correspondingly diminished. In that case, an application of the clause would be justified and a solution could be found by negotiations and agreement.

The North Sea Continental Shelf Cases[40] were quite recently

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[40]See Andrassy, op. cit., pp. 96-99; and "International Court of Justice-Judgement in Dispute over North Sea Continental Shelf," Kissing's Contemporary Archives 1969-1970, 17, 1462 (January 1, 1969-December 31, 1970), p. 23352.

pleaded before the International Court of Justice (ICJ), and the Court's Judgement gives much help in the interpretation of Article 6 of the Geneva Convention. The ICJ delivered judgement on February 20, 1969 in a dispute over the delimitation of the continental shelf between the Federal Republic of Germany and Denmark on the one hand, and between the Federal Republic of Germany and the Netherlands on the other. Germany's coast is situated on that part of the North Sea where the curvature of the coast deeply recesses, while the neighboring Danish and Dutch coasts are projected relatively outward. In such a case, the effect of the use of the equidistance method is to pull the line of the boundary inward, in the direction of the concavity. The lines of equidistance meet at a relatively short distance from the coast of the disadvantaged states. In this case, the result would give Germany a continental shelf area of 23,600 square kilometers, the Netherlands 61,800, and Denmark 61,500. Denmark and Netherlands claimed that the delimitation of the continental shelf should be governed by the rules of Article 6 of the Convention and that the equidistance rule is applicable.

In its decision, the Court rejected the contention of Denmark and Netherlands, holding: (a) that the Federal Republic, which had not ratified the Convention, was not legally bound by the provisions of Article 6; and (b) that the equidistance principle was not a necessary consequence of the general concept

of continental shelf rights, and was not a rule of customary international law. The Court observes that in certain geographical circumstances which are quite frequently met with, the equidistance method, despite its known advantages, leads to inequity.

- The third procedure is an optional protocol, not ratified by the United States, which provides the compulsory settlement of disputes by submission to the International Court of Justice or to an arbitral tribunal.

A further technical difficulty in Article 6 arises with respect to its provision that boundary lines shall be constructed with reference to the respective baselines of the states concerned. This presents no problem if those states all establish their baselines on the same principles: but if one claims advanced baselines while another follow a more restrictive practice, the boundaries will be correspondingly affected to the disadvantage of the more conservative state.

One is led by these considerations to the conclusion that in spite of the effort in Article 6 to provide an acceptable method of determining boundaries in the event of disagreement, the only reliable boundary line remains one fixed by agreement or by the judgement of a competent tribunal.

V. International Seabed Beyond the National Jurisdiction.

The Continental Shelf Convention allows coastal states exclusive rights to explore and exploit these natural resources

out to the 200-meter isobath, and beyond to where the depth of the superjacent waters admits of exploitation. Since World War II there have been a number of technological improvements which have allowed offshore production to take place in increasingly deeper water. Advancing technology has focused attention on one of the world's last frontiers--the deep seabeds and the ocean floor in the submarine areas.

Until the 1960 s there was little information on what valuable resources were present on the seabeds and in the ocean floor. During that decade, two significant developments occurred. First, scientific community advanced its research technology to a point that indicated the probable presence of significant petroleum and hard mineral resources in and on the seabeds beyond the 200-meter isobath. Such research also confirmed that no commercially harvestable living resources existed as those greater depths. Second, major developed countries, with the United States in the lead, began to develop the equipment and technology that would permit exploitation of the resources of the seabeds. Just how extensive these resources are, of course is not yet fully known but, based on evidence collected to date, several authorities have made estimates. In 1968, in an article entitled: " The Political and Legal Problems of Using the Seabed for Peaceful Purposes," S.N. Kibirevskiy reported:

> American specialists believe that concentrated on the surface of the 5 billion tons of cobalt, 43 billion tons of aluminum, 100 billion tons of copper, about 1 billion tons of zirconium, 15 billion tons of nickel,

> 100 billion tons of titanium, and 25 billion tons of magnesium. This does not, of course, exhaust the wealth on the floor of the world ocean. There are some scientists who suggest that the amount of oil, for example, under the seabed and ocean floor is many times that of all the continents and islands put together.[41]

As an example of how far technology has advanced, an American mining company reported in 1971 that it had solved all the technical problems that had prevented it from mining manganese nodules from the seabeds, and was prepared to conduct such mining. Furthermore, what make these internationally affected issues unique is that 85 per cent the marine technology involved is beyond national sovereignty, in the areas where resources must be considered as held in common.

To meet these present realities and to define a more definite legal regime of the seabed and ocean floor in the submarine areas, the International Law Commission took up the problem of submarine areas in connection with its study of the regime of the high seas during its second session at Geneva in the Summer of 1950. As summarized in the Commission's report to the General Assembly, it stated that:

> ...the seabed and subsoil of the submarine areas above refered to were not to be considered as either "res nullius" or "res communis". The seabed and subsoil were subject to the exercise, by the littoral states, of control

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[41] Brittin and Watson, op. cit., p. 132.

> and jurisdiction for the purposes of their exploration and exploitation. The exercise of such control and jurisdiction was independent of the concept of occupation. There could be no question of such right of control and jurisdiction over the waters covering those parts of the seabed... The Commission considered that protection of the resources of the sea should be independent of the concept of the continental shelf.[42]

According to the latest information available, some thirty governments have put forward claims to jurisdiction over submarine areas lying beyond the traditional limits of their territorial waters. Thus, in order to reach agreement on the continental shelf, the question of who owns the seabed beyond that boundary also has to be resolved.

Proposals for an International Regime for Submarine Areas

An international agreement on a new definition of the continental shelf, particularly the deletion of the exploitability clause from Article 1 of the Continental Shelf Convention may stop the gradual extension of individual national rights over ever larger parts of the submarine areas. It cannot, however, stop the technological progress and prevent the growing possibilities for exploration and exploitation of the natural resources of the seabed and its subsoil in regions with ever

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[42] Young, op. cit., p. 226.

deeper superjacent waters. As soon as some kind of exploitation of these resources becomes technically feasible and commercially rewarding, enterprises will seize this occasion and proceed to exploit the respective resources by drilling, dredging, or some other method already known or yet to be invented for that purpose. Consequently, human activities will take place in submarine areas outside the national parts of the continental shelf.

Since these areas will not be under the authority of any state, the question is how an order can be established which will avoid possible clashes between different exploring and exploiting groups. In this area, it is generally accepted that the coastal state would have exclusive rights over offshore installations affecting its economic interests. The area must be subject to appropriate international standards for:

> - Protection of other uses of the area, particularly protection of navigation and other high seas freedoms;
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> - Preservation of the marine environment;
>
> - Protection of the integrity of agreement and investments made in the area;
>
> - Provision for compulsory dispute settlement; and
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> - Provision for revenue sharing for international community purposes.[43]

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[43] U.N. Law of the Sea Conference 1974 (Washington D.C.: U.S. Department of State/Bureau of Public Affairs, 1974), p. 4.

Our conclusion is that timely international agreement on an effective regime for the development of deep seabed resources must be established. Thus the question arises what sort of regime would be most appropriate.

Several alternatives were suggested concerning the status of the seabed beyond the limits of the continental shelf. One was that any development of the minerals of the seabed or subsoil beyond the shelf might be seen as justifying an extension of the shelf itself, with no limit placed on the depths involved. But would the extension of one country's capabilities and control to depths, say, of 600 meters, imply that all other coastal countries might also lay claim to the seabed off their own coasts to an equal depth ? If actual exploitation becomes the criteria for claims beyond the 200 - meter isobath, would this not favor the technically advanced countries which has exploitable resources on or beneath the seabed off its coasts might permit exploitation of these resources by one of the technically advanced countries and thus would be able to claim the seabed, out to and including the site of these resources, as its own ?

- A second alternative might be that nationals of a particular coastal state might secure possession of the seabed off that country's coast in the name of the country -- as a result of exploitation -- but possession would be limited to the immediate site of the resource development, without affecting the status of the rest of the seabed.

- On the other hand, it might be that any country could secure possession to a limited area of the seabed in any part of the world on the basis of exploitation, the only criteria being that one of its own companies is actually exploiting the seabed and that there is a "genuine link" between this company and the country making the claim.

- The most radical wished to entrust an international organization with the exploitation of the natural resources of the continental shelf. Arguments advanced in support of this idea were : that the resources of the seabed and subsoil of the high seas were "res communis", and that the property of the whole of mankind should be exploited for the benefit of mankind as a whole.

- Still another possibility would be to rest ownership of the bed of the high seas with the United Nations, or some other international agency, with the power to lease portion of the seabed to companies which will exploit the resources. Rent from the leases could revert to the international agency.

- Further trend of proposals is in favor of an international administrative authority which would grant licenses for exploration and exploitation of submarine natural resources all over the world.

- Another category of proposals limits the task of an international agency to a supervisory and consultative activity. This idea appears, for instance, in the comments of the Dutch government on the draft articles of the International Law Commission. They recognize that "in theory it might perhaps be preferable to give jurisdiction over these submarine area to the international community as a whole," but feel "that the practical difficulties of doing so would prove insuperable". The reason for this is also given:

> Such a system would indeed make it impossible to exploit submarine resources properly in the interests of mankind... (But the Dutch Government continues that it) would like to suggest that an international body should be established to control and advise on the progressive exploitation of the submarine areas, so as to promote the most effective use of these resources in the general interest.[44]

- Finally, it was suggested that the wisest course is to resist any new laws and to wait until situations develop in which some arrangements are necessary for ownership of the seabed.

The creation of an international agency was first proposed at the Conference on Petroleum and the Sea at Monte Carlo in 1965. In a paper on the regime on the continental shelf, Guarino and Kojanec[45] declared themselves in favor of establishing, by international agreement, an agency acting in the interest of the international community with respect to resources which belong to that community. The oil industries, which are mostly multinational, would operate on the basis of international licenses. The said agency could issue uniform regulations for the exploitation of resources and fix the royalties which could constitute a solid financial basis for the activities of several existing international organizations.

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[44] Andrassy, op. cit., p. 134.

[45] Quoted from, Ibid., p. 135.

At the Geneva Conference itself voices were raised in favor of some form of internationalization. This idea was supported by Paul de Lapradelle, the delegate of Monaco. He supported the creation of an international organization as a consulative and advisory body which would help governments in the adoption of decisions fully consistent with the law of the sea. His suggestions were not pursued. Germany made a formal proposal to set up a body of rules regulating the exploitation of the natural resources of submarine areas of the high seas. the observation of these rules should be secured by the coastal state closest to the installation erected for the purposes of exploration and exploitation. That state should act on behalf of the international community. Regional agreements could be entered into by the interested states in order to delimit the areas of supervision and to provide for the establishment of joint bodies empowered to perform the supervisory functions in place of the coastal state. The proposal was opposed by several delegations and abandoned.

(i) The Maltese Proposal

The most powerful stimulus to international debate on the continental shelf was detonated by UN. Ambassador Arvid Pardo of Malta on August 17, 1967. The substance of his proposition was concisely projected in the request by Malta to inscribe on the agenda of the General Assembly at its 22nd session an item entitled "Declaration and Treaty Concerning the

Reservation Exclusively for Peaceful Purposes of the Seabed and of the Ocean Floor, Underlying the Seas Beyond the Limits of Present National Jurisdiction, and the Use of Their Resources in the Interests of Mankind."[46]

> The Maltese government explained:
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> In view of the rapid progress in the development of new techniques by technologically advanced countries, it is feared that the situation will change and that the seabed... will become progressively and competitively subject to national appropriation and use. This is likely to result in the militarization of the accessible ocean floor through the establishment of fixed military installations and in the exploitation and depletion of resources of immense potential benefit to the world, for the national advantage of technologically developed countries.[47]

The Maltese expressed the fear that advancing technology and existing international law as applied to offshore areas would lead to competition between states for the appropriation and use of more distant offshore areas. This, in turn, it was believed, would be likely to result in the progressive militarization of such areas and to greater levels of international tension. Furthermore, the rewards of offshore exploitation

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[46]Edward Wenk Jr., The Politics of the Ocean (Seattle and London: University of Washington Press, 1972), p. 260.

[47]Andrassy, op. cit., p. 138.

would be limited to only a few states; the potential for benefit to less developed states would be forever lost. In accordance with these views, the delegation of Malta suggested that the time had come to declare the seabed a "common heritage of mankind."

In the discussion of this matter Ambassador Pardo of Malta spoke in detail of the need for international action on the seabed. Remarking on the great wealth be found there and the fact that three quarters of the earth's land area is covered by oceans, Pardo observed that current international law encouraged the appropriation of this vast area by those with the technical competence to exploit it. He noted that states were leasing offshore land for exploitation at points increasingly distant from shore; in this regard he directed attention specifically toward the United States; Department of the Interior and the leasing policies.

To put a halt to this process and to allow all states to benefit from the exploitation of the seabed, the Maltese delegate proposed that the UN should internationalize the seabed beyond some narrow limit of national jurisdiction by a particular interpretation of the Convention on the Continental Shelf or, if necessary, by its amendment, and that it create a new UN organ to administer this internationalized seabed. The creation of an international agency with leasing authority over sea bottom area beyond the limits of national jurisdiction was suggested. Proceeds would be disbursed to the less developed countries. It was claimed by Ambassador Pardo that by 1975 this agency could

have a gross income of about six million U.S. dollars per year, of which, about five billion dollars, and this was said to be a conservative estimate, would be available for development purposes.[48]

In these propositions, the definition of seabed geography lying beyond national sovereignty was linked to institutions by its management. Clearly, the narrower the band of jurisdiction by coastal states, the greater the area of seabed resources, especially those just adjacent to the continental shelf, would be available to be shared by the international community.

Therefore, the Maltese government considered that the time had come to declare the seabed and the ocean floor a common heritage of mankind and that immediate steps should be taken to draft a treaty embodying the following principles:

> (a) The seabed and the ocean floor, underlying the seas beyond the limits of present national jurisdiction, are not subject to national appropriation in any manner whatsoever;
>
> (b) The exploration of the seabed and of the ocean floor, underlying the seas beyond the limits of present national jurisdiction, shall be undertaken in a manner consistent with the Principles and Purposes of the Charter of the United Nations;
>
> (c) The use of the seabed and the ocean floor, underlying the seas beyond the limits of present national jurisdiction,

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[48] Juda, op. cit., p. 83.

> and their economic exploitation shall be undertaken with the aim of safeguarding the interests of mankind. The net financial benefits derived from the use and exploitation of the seabed and of the ocean floor shall be used primarily to promote the development of poor countries;
>
> (d) The seabed and the ocean floor, underlying the seas beyond the limits of present national jurisdiction, shall be reserved exclusively for peaceful purposes in perpetuity.[49]

The functions of the proposed international agency were described as follows:

> (i) to assume jurisdiction, as a trustee for all countries, over the seabed and the ocean floor, underlying the seas beyond the limits of present national jurisdiction;
>
> (ii) to regulate, supervise and control all activities thereon; and
>
> (iii) to ensure that the activities undertaken conform to the principles of the provisions of the proposed treaty.[50]

It became immediately apparent that the Pardo speech had impressed the representatives of many states. The possibility of creating a new source of much needed development funding was enthusiastically noted by a number of the less developed states. The position of the United States government on the Maltese proposal, however, was friendly but distinctly cautious. In a statement before the first committee of the General Assembly,

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[49] Friedmann, The Future of the Oceans, op. cit., p. 65.

[50] Loc. cit.

Ambassador Goldberg indicated that the United States shared the concerns of the Maltese delegation. He noted that on July 13, 1966 President Johnson gave an eloquent warning that:

> Truly great accomplishments in oceanography will require the cooperation of all the maritime nations of the world. And so today I send our voice out from this platform calling for such cooperation, requesting it, and urging it.
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> .....
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> We greatly welcome this type of international participation. Because under no circumstances, we believe, must we ever allow the prospects of rich harvests and mineral wealth to create a new form of colonial competition among the maritime nations. We must careful to avoid a race to grab and to hold the lands under the high seas. We must ensure that the deep seas and the ocean bottoms are, and remain, the legacy of all human beings.[51]

Of key importance was President Johnson's reference to the sea as a "legacy of all human beings," a phrase that was to become of critical importance in dealing with the later concept of "a common heritage of mankind." Ambassador Goldberg observed, though, that the matter raised by the representative of Malta was very complex indeed and that any hasty action would be imprudent. He suggested that it was too early to make any final decisions on proposals for a comprehensive regime

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[51] Wenk, Jr., op. cit., p. 258.

for the deep ocean floor, but noted that the United States would energetically participate in the studies which were needed before such decisions could be made. In terms of immediate action, Ambassador Goldberg called for the establishment of a committee on the oceans to study relevant problems and to make recommendations to the General Assembly.

American caution reflected the uncertainty within the US. government on this issue. By the middle of October 1967, the State Department had prepared a position paper for the US. delegation to the UN. entitled "The Maltese Proposal Regarding the Deep Ocean Floor." It indicated American concern because the suggestion of Malta might prove to be superficially attractive to many states; the State Department felt that, prior to careful examination, any fundamental decision on the disposition of the resources of the ocean floor by the General Assembly was undesirable. The State Department concluded that Assembly action could best be prevented by developing an attractive and constructive alternative to the Pardo proposal. The alternative decided upon the Department of State was to provide for the establishment of a General Assembly Committee on the Oceans, to encourage cooperation in the acquisition of knowledge about the ocean and its resources, and to consider general principles to guide states in the exploration and exploitation of the deep ocean floor.

Members of the Congress assure that it did not support the full intent of the Maltese Proposal or the plan of Senator Frank Church[52] of Idaho in granting title to mineral resources beyond the continental shelf to the United Nations. The belief that a plan such as that of Senator Church or that of Malta might lead to a financially independent or a stronger UN. provided in itself a motive for opposition to plans of this type. One might, for example, heed the comment of Representative Gross who stated, "I don't think the UN. stands for much of anything. It never has and probably never will and that is one of the reasons why I don't want to see any authority in this matter vested in the UN."[53]

(ii) The Nixon Announcement on United States Oceans Policy Toward an International Oceanbed Control

Apart from the Maltese Proposal, there is also another proposal for the international oceanbed control. The announcement was made by President Nixon on May 20, 1970, regarding US. ocean policy, followed by a draft convention presented to the United Nations Seabed Committee in August.

Since the effective decision - making power still rests overwhelmingly with each country, and in this area parti-

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[52] Juda, op. cit., p. 86.

[53] Loc. cit.

cularly with the major industrially and technologically advanced coastal states, President Nixon's announcement of the United states oceans policy and the subsequent draft convention are of special importance. But in assessing their implications, we must bear in mind that the President of the United States, however powerful, cannot make a law without the approval of the Congress, and that until now the preliminary studies and statements formulated both by the Senate and the House of Representatives have been overwhelmingly in favor of the expansion of United States claims and against any effective international authority limiting or controlling such expansion.

First, the President of the US. affirms that decision of "momentous importance" face mankind about "whether the oceans will be used rationally and equitably and for the benefit of mankind or whether they will become an arena of unrestrained exploitation and conflicting juridictional claims in which even the most advantaged states will be losers."[54] But such sentiments have been uttered before (by President Johnson in 1966), and more important are the concrete proposals to stem the "unrestrained exploitation and conflicting jurisdictional claims" spelled out in the draft convention of August 3, 1970.

The US.' initiatives, nevertheless, constitutes the first modest attempt to redirect a race that during the past

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[54]Friedmann, The Future of the Oceans, op. cit., p. 71.

quarter of a century has been entirely in one direction : the outward and downward expansion on national claims to the seas at the expense of international freedoms.

The first welcome proposal is to confine the continental shelf proper to a depth of 200 meters, which exceeds only slightly the 100 - fathom (183 - meter) limitation of the Truman Proclamation, to obligate all nations to renounce national claims beyond this depth, and, to agree to regard the resources of the high seas beyond as "the common heritage of mankind."

Second, the US. proposes an international regime for the exploitation of seabed resources beyond the limits of national jurisdiction. An International Seabed Resources Authority is to have power to collect mineral royalties for international community purposes, particularly economic assistance to developing countries. It is also to establish rules to protect the other uses of the ocean and to prevent pollution. On the other hand, it is "to assure the integrity of the investment necessary for such exploitation."

The crucial question, therefore, is what is meant by "international trusteeship." The draft convention submitted by the US. to the United Nations Seabed Committee in August 1970, bears out and clarifies the general statement made by President Nixon. In the international trusteeship area, Article 27 says that each coastal state shall be responsible for:

a) Issuing, suspending and revoking mineral exploration and exploitation licenses;

b) Establishing work requirements, provided that such requirements shall not be less than those specified in Appendix A*

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*Appendix A -- to which Article 27 refers -- distinguishes between non - exclusive exploration licenses and exclusive exploitation licenses. The latter alone give the right to undertake deep drilling for exploration or exploitation. As the authorizing party, the coastal state must certify the operator's financial and technical competence and require him to conform to the terms of the license. There are detailed provisions concerning matters such as the size of the blocks to be licensed, the scale of fees to be charged for exploration and exploitation respectively, the submission of work plans and data under exploitation licenses and production plans prior to beginning commercial production. Particularly important from the standpoint of the interests of the international community is the proportion between 50% and 66-2/3 per cent of the revenues derived by the trustee state from license fees, rentals, and other proceeds that would be handed over to the International Seabed Resource Authority, to use "for the benefit of all mankind", and particularly to promote the economic advancement of developing states' parties to the convention, irrespective of their geographic location.

> c) Ensuring that its licenses comply with this Convention, and, if it deems it necesdary, applying standards to its licenses higher than or in addition to those required under this Convention, provided such standards are promptly communicated to the International Seabed Resources Authority;
>
> d) Supervising its licenses and their activities;
>
> e) Exercising civil and criminal jurisdiction over its license, and persons acting on their behalf, while engaged in exploration or exploitation;
>
> f) Filing reports with the International Seabed Resources Authority;
>
> g) Collecting and transferring to the International Seabed Resources Authority all payments required by this Convention;
>
> h) Determining the allowable catch of the living resources of the seabed and prescribing other conservation measures regarding them;
>
> i) Enacting such laws and regulations as are necessary to perform the above functions.[55]

This feature of the draft proposal has been the subject of frequent comment, on the one hand, by countries that favor extensive jurisdiction by the coastal state and, on the other hand, by countries that favor a minimum area of state jurisdiction and extensive area of international control. The international trusteeship area concept would serve to accommodate the above two views. On January 23, 1971, in Colombo,

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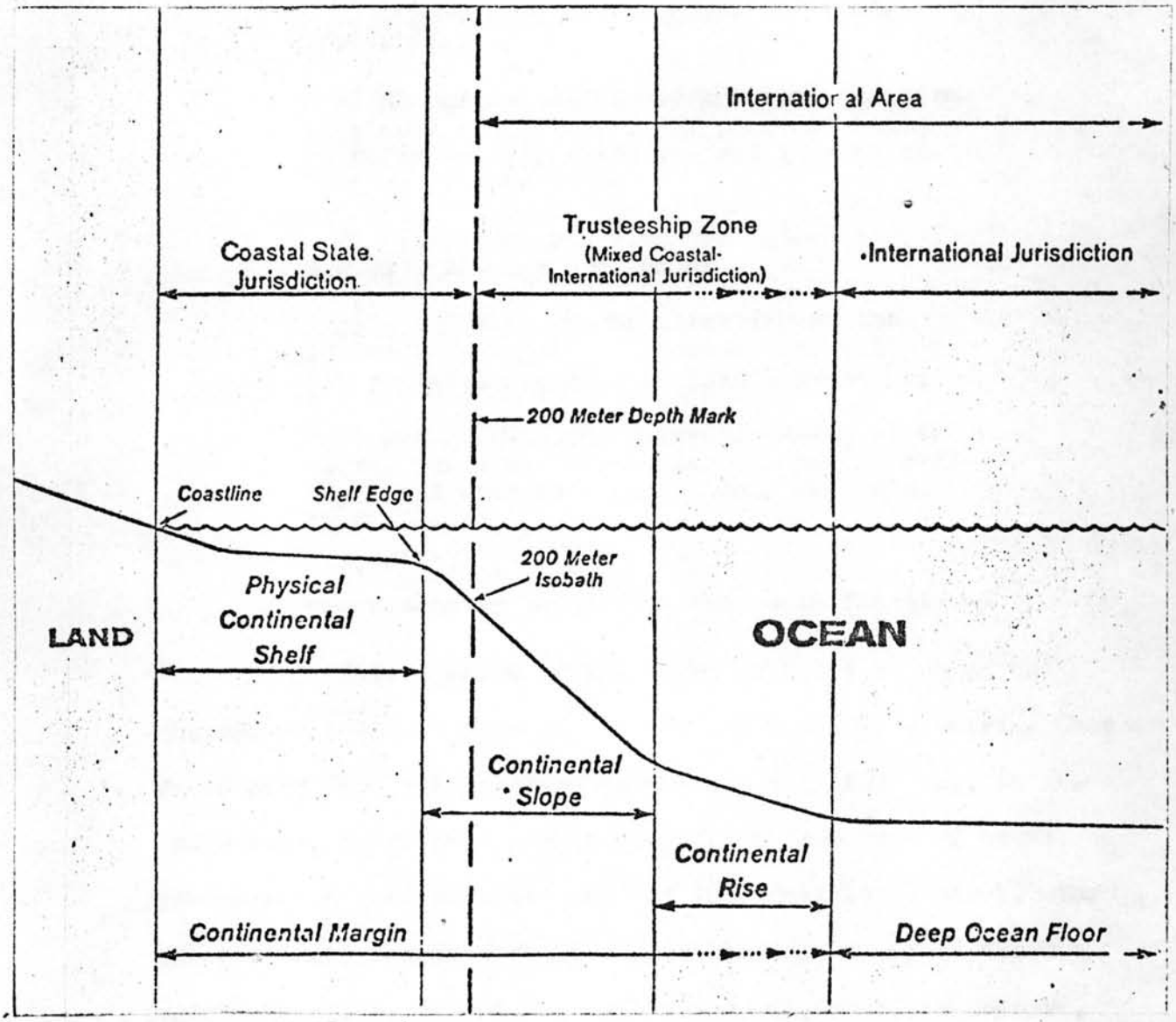
[55] Ibid., pp. 73-74.

Figure 5: Schematic Representation of the Seabeds and Ocean Floor Proposed by the Nixon's Announcement



Source: Glossary of Commonly Used Terms in Law of the Sea Discussion Summary. (Bangkok: AUA Language Center, 1972), p. 6

Ceylon, the accomdation of interests sought was described succintly by Mr. Bermard Oxman, Assistant Legal Adviser for Ocean Affairs, Department of State:

> It is true that a 200 meter limit discriminates against states with narrow continental margins or with states having long coastlines. Part to give every coastal state a seemingly compensatory seabed area off its ocast to a fixed distance would only give the appearance of equity. In geographic and economic terms it would be very inequitable indeed. Only through an international regime, with international sharing of benefits, can more equity be introduced. Thus the underlying thesis of the trusteeship proposal is to maximize the area of the new international regime and, in this context, provide substantial but limited rights for coastal states as Trustees over the resources of a substantial area in order to accommodate their interests with their own, as well as other states' international interests.[56]

In sum, both the Maltese Proposal and the US. proposal all agree on the necessity of some kind of international control authority over an area of the oceanbed determined to be "beyond the limits of national jurisdiction." Further we will look to the steps undertaken by the UN. concerning this matter.

(iii) The United Nations' Actions

The Pardo Proposal triggered a series of conferences, symposia, monographs, and further proposals, both official and unofficial. As a result, the General Assembly of the UN. adopted

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[56] Brittin and Watson, op. cit., p. 137.

on December 18, 1967, Resolution 2340 (XXII), which established an ad hoc, thirty-five member committee to "study the scope and various aspects of this items" and to report to the General Assembly on such topics as:

> (a) A survey of the past and present activities of the United Nations, the specialized agencies, the International Atomic Energy Agency and other inter - governmental parties with regard to the seabed and the ocean floor and of existing international agreements concerning these areas;
>
> (b) An account of the scientific, technical, economic, legal and other aspects of this item;
>
> (c) An indication regarding practical means to promote international co-operation in the exploitation, conservation and use of the seabed and the ocean floor, and the subsoil thereof, as contemplated in the title of the item, and if there resources, having regard to the views expressed and the suggestions put forward by member states during the consideration of this item at the Twenty-Second Session of the General Assembly.[57]

The Ad Hoc Committe established by the General Assembly held three meetings, working in groups dealing with economic and technical questions, and with legal questions. The final report submitted to the General Assembly contains an extensive review of technical, economic, and legal problems. There are two sets of proposals : one concerning a declaration

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[57] Andrassy, op. cit., p. 139.

or statement of general principles governing the submarine areas beyond the limits of present national jurisdiction, the other concerning the question of disarmament or limitation of armaments.

A proposal concerning the International Decade of Ocean Exploration proposed by the US. President Nixon and another dealing with the danger of sea pollution were also submitted and found wide support. There was also a general agreement on the establishment of a submarine area beyond the limits of national jurisdiction. All the major industrial powers, both capitalist and socialist, either voted against the setting up of a permanent committee to study the establishment of an international oceanbed authority, or abstained from voting. This vote clearly showed that none of the major powers was prepared to commit itself to an international control authority.

In December, 1968, as a result of the special committee report, the General Assembly established a permanent committee named the "Seabed Committee" composed of 47 states for the peaceful uses of the seabed and the ocean floor beyond the limits of national jurisdiction. The committee was instructed : (1) to study the legal principles and norms that would promote international co-operation in the exploration and use of the seabed and the subsoil beyond the limits of national jurisdiction; (2) to study the means of encouraging the exploitation and use of the resources of this area in the light of foreseeable technological development and economic implication,

"bearing in mind the fact that such exploitation should benefit mankind as a whole"; (3) to review and stimulate the exchange and widest possible dissemination of scientific knowledge on the subject; (4) to examine proposals to prevent marine pollution that may result from resource exploration and exploitation.

In this period, that is on December 21, 1968, four resoultions -- 2467 (XXIII) A, B, C and D -- were also adopted.

- Resolution A established a Committee on the Peaceful Uses of the Seabed and Ocean Floor beyond the Limits of National Jurisdiction (hereinafter called the Seabed Committee), and instructed it to study different aspects connected with the matter in close cooperation with bodies dealing with the respective problems, requesting it to submit reports on its activities at each subsequent session of the General Assembly, and to make recommendations on the questions involved.

- Resolution B requested the Secretary-General to undertake a study of measures that may be taken to protect against possible pollution arising from exploration and exploitation of the seabed and ocean floor.

- Resolution C requested the Secretary-General to undertake a study on the question of the establishment of international machinery for the promotion of the exploration and exploitation of the resources of this area, and the use of these resources in the interests of mankind.

- Resolution D welcomed the concept of an International Decade of Ocean Exploration and invited the member states, the International Oceanographic Commission, and the Secretary-General

to cooperate with each other in this respect.

In "Moratorium" Resolution 2574 (XXIV) convened in 1833 rd plenary meeting on 15 December 1969 and adopted in January 1970, a divided Assembly declared that

> ...pending the establishment of the aforementioned international regime:
>
> (a) States and persons, physical and juridical, are bound to refrain from all activities of exploitation and of the resources of the area of the seabed and ocean floor, and the subsoil thereof beyond the limits of national jurisdiction;
>
> (b) No claim to any part of that area or its resources shall be recognized.[58]

The major powers dissented from this resolution -- whose significance is in any even limited as long as "the limits of national jurisdiction" are not clearly clearly defined. But the refusal of the major powers to assent to any moratorium indicates clearly enough their reluctance to limit the exploration and exploitation of areas they consider to be within the limits of national jurisdiction, pending the conclusion of any international treaty that would define and limit such jurisdiction.

The General Assembly invited the Seabed Committee to continue its work and to submit a draft declaration on the

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[58]Friedmann, The Future of the Oceans, op. cit., p. 69; and Lay, Churchill and Nordquist, op. cit., p. 737. (Full text see Appendix 5).

principles of international cooperation in the exploration and use of the seabed and subsoil,[59] and on the economic and technical conditions that are to govern the exploitation of their resources. Held in the summer of 1970, the Geneva session of the Seabed Committee ended in complete deadlock. The Latin American states were unwilling to abandon or restrict their claims to absolute sovereignty over a 200 - mile zone. The USSR displayed its customary aversion to an international authority equipped with effective powers. The US. draft treaty did not even reach the stage of serious discussion.

However, any appraisal of the briefly outlined work of the UN. in this area must take the following points into consideration: (a) it has not yet reached the stage of concrete operative proposals; (b) any resolution that might be passed by the General Assembly would not be directly legally binding upon the member states but would have only moral force; and (c) any legal commitment would have to follow from a treaty, or a series of treaties, as they might result from future sea-law conferences. But this would be a prolonged and highly complicated process, and it is doubtful that it would attain even the minimum ofjective of revising the First Article of the Geneva Convention in order to

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[59]For further details of "the agreed - upon principles" see Brittin and Watson, op. cit., pp. 134-136.

fix the boundaries of the continental shelf. In the meantime, it is to be feared that within the limits of technological and commercial feasibility, the coastal states will proceed with the utmost expansion of national claims and interests.

Characteristics of Agency for an International Regime

We now turn to the question of how to organize the authority responsible for uses of the seabed and subsoil of the ocean space, and the exploitation of their natural resources. The major questions concerning the structure and powers of an international oceanbed authority can be summed up as follows:

First, what should be the basis of its constitutional authority ? Specifically, to what extent, if at all, should an international oceanbed authority be linked with the UN ?

Second, what should be its function ? In particular, should it be an operative agency, directly concerned with the exploitation of the resources of the seabed ? Should it be a licensing authority ? Or should it be a purely advisory and consultative agency ?

On the first question, the weight of expert opinion is strongly in favor of an agency linked with the UN -- although not necessarily limited to its members -- but not under direct UN control, and structured somewhat differently from other UN agencies. The reasons for this attitude are evident. If the ultimate control of the exploitation and distribution of the

resources of the land and sea were in the hands of the UN. or some other supranational authority, the many inequalities in the existence, extension, and exploitability of the continental shelves -- and the wider continental margins -- would not greatly matter. Under such a worldwide regime and system of distribution the resources of the oceanbed could in fact be used to mitigate the many inequalities that today make different states rich or poor in natural resources. However, a world federation is a distant dream, and the United Nations has so far failed to develop into an effective supranational authority, in the military, political or economic sense.

The host of specialized agencies created within the framework of the UN. indicate at least the aspiration toward international cooperation in such matters as food and agriculture (FAO), world health (WHO), control of nuclear energy (IAEA), labor and social welfare (ILO), air transport (ICAO), global communications (ITU, IMCO, INTELSAT), and cultural cooperation (UNESCO). But these agencies are all essentially advisory and consultative. With minor exceptions, they have no power to lay down laws of conduct in their respective spheres of the member states. Any resolution, convention, recommendation -- even when passed by the appropriate majorities in the international agencies -- needs separate acceptance and ratification by each of the signatories.

Besides, as the UN. has expanded in membership, it has become imbalanced because of the decline of the Security

Councils authority and the corresponding increase in the relative weight of the General Assembly, in which all members have equal votes. Nominal voting power in the General Assembly is no longer relevant to the political power, financial responsibility and technological capacity. Resolutions tend to be determined more and more by political bloc alignments rather than by practical considerations and needs. Far and away the most effective international agencies affiliated with the UN. are those like the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (World Bank or IBRD) which are operationally and functionally autonomous.

Financial autonomy and managerial expertise have combined to detach both the IMF and the IBRD from the political maneuvering and conflicts of the general UN. organization. Both the World Bank and the IMF are more comparable in the method of their financing to a shareholding company than to the typical UN. agency, with their funds supplied by capital subscriptions by the member states, according to their economic possibilities. Although the United States is the largest single contributor to both organizations, their constitutions regulate the voting power in such a way that no single state can obtain a majority. The main advantage of this form of financing is that neither organization has to submit an annual budget for approval to the UN., which in turn depends on the contributions of its member states. The IBRD has never had to call on more than a fraction of the member states' subscriptions; it has received a steadily

increasing revenue from the interest and service commissions on its loan and technical advisory operations, and it has also been able to raise much additional capital by the issue of bonds, which are highly rated international securities. An equally important consequence of financial autonomy has been the ability of the IBRD and the IMF to appoint highly qualified staffs chosen for ability and expertise rather than on a nationality -- quota basis -- which is the case in most other UN. agencies.

It must be hoped that the lessons of the postwar international organizations can be applied to the establishment of an international seabed authority. It will need independence, expertise, and initiative to fulfill its functions, and this means independence from the inevitable multiple political pressures of a direct affiliation with the UN. If we keep in mind that the tasks and responsibilities concerning the ocean space and its natural resources are fairly extensive and have a special character, the establishment of a separate new agency might appear as justified.

In considering the question of the functions of such a new agency responsible for ocean space affairs, the following considerations must be taken into account.

(i) Membership

The membership in the agency should be open to all nations, as is appropriate for an organization responsible for a "common heritage of mankind." The universality of the agency should be improved in comparison with the existing international organization where admission and exclusion of members

exist. True universality cannot be attained if there is no automatic admission to membership of all existing states. However, there cannot be an obligation to become a member. Therefore a formal application should be made declaring the willingness of the applicant state to become a member and to assume the obligations imposed by the statute and other rules governing the activity of the agency.

The responsible organ should only register the application and notify the entry of the new member to other members. The application may be dismissed if the responsible organ considers that the applicant does not qualify as a state. The International Court of Justice might be asked to decide whether the applicant is or is not a state eligible for membership. If the decision is in the affirmative, the applicant must be registered. Every member of the agency should be given the right to question the eligibility of an applicant for admission and to refer the question to the Court.

The universality of the organization does not tolerate the procedure of a formal exclusion. Members acting against the rules or aims of the organization could only be suspended from the exercise of their rights and/or from the sharing of the benefits. However, the organization cannot be compulsory. Therefore, members should have the right to withdraw from membership. In that case, the member state would lose rights acquired during the period of his membership.

(ii) Organs

The normal pattern of similar agencies shows a three-tier organizational structure. There are usually three principal organs: an assembly of all members, as the policy-making organ; a board or council having a restricted number of members and exercising certain administrative, executive, and supervisory functions; a director or secretary-general as the chief executive organ. This general pattern may undergo various modifications corresponding to the needs of the respective tasks and to the views of the founding members.

In the case of an agency dealing with ocean space matters, there will be a large number of administrative and executive tasks which demand quick and definite solutions. Thus, the administrative and executive organ should be able to make decisions. Having in mind the extensive functions of the respective organ with respect to ocean space and its resources, some projects propose that the organ at this level should not be one individual person but a board or council composed of several persons in their individual capacity. The project of the Center for the Study of Democratic Institutions[60] proposes such a body (commission) composed of individuals chosen on the basis of their competence only, responsible to the assembly of

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[60] Andrassy, op. cit., p. 159.

the organization, and independent of any influence by the governments of their respective states. An analogous organ is established in the European Communities.[61] Bodies composed of personalities not representing their states are to be found also in some specialized agencies, although not on the executive level.

In view of the special task of the agency, much could be said in favor of a scheme where the policy-making organ would have a composition different from the ordinary one-state-one-vote pattern. This is because in general opinion, an assembly of all members, everyone having one vote, could not be a very appropriate organ for taking binding decisions. The great number of tiny states in the United Nations itself has prompted discussions on the advisability of introducing a weighted voting system. Weighted voting has been introduced in some organizations, especially in the European Communities, but not on the most important level.

The normal pattern for the executive organ is a monocratic system. The director or secretary-general of the organization is elected or nominated by the policy-making organ or by the council, or by both. He is responsible for the work of the secretariat, which is working under his orders.

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[61] Ibid., p. 160.

(iii) Functions

(a) Research work: exploration of various factors, the knowledge of which is important for those who use the sea, both on the surface and in the depths; mapping of the sea bottom and its depths; of surface and underwater currents; of the temperature and salinity on the surface and in various depths, etc. Making these data available for all members of the international community.

(b) Service for member states such as weather forecasting and warning from other risks underwater and on the bottom, services which will be badly needed for communications and for exploration and exploitation work; the establishment of a worldwide marine geodetic system.

(c) Regulation of all uses of the sea, its bottom, and subsoil, especially in order to avoid interference of one kind of use to the detriment of another: surface and submarine navigation; fisheries, cables; pipelines; surface, underwater, and on-the-bottom installations, moving or stationary, for exploration and exploitation of the natural resources of the sea, of its bed, and its subsoil outside the domain of national jurisdiction (territorial sea and continental shelf as restricted in conformity with the amended or reinterpreted Convention on the Continental Shelf); and location of areas reserved for pollution waste disposal.

(d) With respect to the exploration and exploitation of the natural resources of submarine areas: either

simple registering of effectively undertaken works for exploration and/or exploitation, or granting of licenses to that effect, in conformity with regulations set forth by a multilateral international agreement entered into to that effect, or laid down in acts or resolutions of responsible international bodies.

(e) Improvement of existing regulations in international agreements, after appropriate studies and consultations: (i) by initiating and convening of international conferences to that effect and proposing draft regulations, or (ii) by issuing such rules on the basis of an authorization granted to that effect in international agreements.

In short whether or not the world community endorses the essential features of the idea of the international regime for seabed control, every year that passes without effective measures diminishes the prospect of international ocean control. For with every year countries will repeat and extend the pattern they have developed on land: establishing exclusive national, political, military, and economic interests that will be enormously more difficult to modify or abolish than if they had never existed. Time, therefore, is desperately short. And all this has tremendous significance for the future of the oceanbed, which in turn threatens to become another major aspect of the worldwide power conflict.