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Law Notes

SEAMOUNTS AND GUYOTS: A UNIQUE RESOURCE

THE NECESSITY FOR EXPRESS RECOGNITION IN THE FORMULATION OF AN INTERNATIONAL REGIME OF THE SEABED

I. INTRODUCTION

With the availability of natural resources decreasing, and the population of the earth continuing to increase, nations of the world are turning to the oceans and seas of the planet as a source of food, water, minerals, and, in some cases, territory. Until recently, little attention was paid to national intrusions into the oceans. But as advances in technology permit greater penetration into and exploitation of the resources of the oceans and seas, it is rapidly becoming clear that a legal regime for the management of the seabed is vital if the oceans are to supply and replenish the needs of mankind. Attention at first was primarily focused on the Continental Shelf,¹ but recent advances in technology, spurred by the need to discover new food and energy sources, have effectuated the exploration of the deep seabed, with results indicating that a wealth of resources exists for the taking. This realization, in turn, has fostered concern for the establishment of a legal regime for the

1. Convention on the Continental Shelf, *done* at Geneva, April 29, 1958, 15 U.S.T. 471, T.I.A.S. No. 5578, 499 U.N.T.S. 311.

regulation of the ocean floor, the general feeling being that existing principles of International Law either do not, or cannot, effectively apply to the deep seabed beyond national jurisdiction. Negotiations have been held in an effort to resolve this dilemma, with yet another round planned for 1973.² The 1973 Conference on the Law of the Sea will attempt the formulization and adoption of an integrated plan, governing most of the submerged lands of the world, with the ultimate goal of exploitation and development of ocean resources for the benefit of mankind as a whole.

Past conferences have characterized all submerged lands as seabed; no distinction has been made between geological phenomena, other than continental shelf and seabed or abyssal depth. There are, however, a great number of underwater formations which rise from the sea floor close to the oceans' surface, and which present, for that reason alone, a factual context entirely different from the surrounding seabed or continental shelf. These formations, characterized as seamounts or guyots, do not fall within the legal regime established for land territory, but their physical characteristics require that they be considered independently when formulating any legal regime for the seabed. This independent consideration is dictated by the fact that seamounts and guyots may well serve as the starting point for any large scale utilization of submerged lands, many of them being already within the range of modern technological capabilities.

The purpose of this paper, then, will be to evaluate the legal status of seamounts and guyots under current international law with regard to the possible uses to which these underwater phenomena may be put. Further, an attempt will be made to formulate a legal regime which properly acknowledges the different physical characteristics of the seabed, with an examination of the situations which are likely to occur should there be a failure to establish such a regime.

II. GEOLOGICAL CHARACTERISTICS

Seamounts and guyots are underwater mountains formed by volcanic activity.³ Seamounts are similar in appearance to land vol-

2. Two preparatory meetings will be held by the United Nations Seabed Committee during 1973, and the Third United Nations Conference on the Law of the Sea will convene April-May, 1974, in Santiago, Chile.

3. Seamounts are basically composed of basalt, an igneous rock which emerges through the earth's crust as magma and solidifies. For an in-depth study of the geological nature of seamounts, see W. MENARD, *MARINE GEOLOGY OF THE PACIFIC* (1967), and C. KING, *AN INTRODUCTION TO OCEANOGRAPHY* (1969).

canoes with a cinder cone and summit crater, but the slopes are generally steeper, due to the rapid solidification of the lava underwater.⁴ Guyots, on the other hand are truncated.⁵ It is generally believed this difference is caused by the fact that seamounts never reached above sea level, while guyots did protrude above the ocean's surface at some point during their development. Water and wind eroded the volcanoes until the summits were levelled, and subsequent settling and shifting of the ocean floor caused them to sink to their present elevation.⁶

Seamounts (which, for convenience, will be used to refer to both seamounts and guyots) are classified as such when their elevation reaches one kilometer or more from the surrounding ocean floor.⁷ Because they are created by the shifting of the ocean floor, which in turn causes cracks through which lava can escape to form a volcano, the majority of seamounts are found in the Pacific Ocean, the world's center of volcanic activity. It is estimated that some 10,000 seamounts exist in the Pacific; over 2000 have already been discovered and mapped,⁸ the most famous of which is Bikini. Others have been discovered in the Indian Ocean, the Caribbean, the South China Sea, and the Gulf of Alaska.⁹

4. C. KING, *supra* note 3, at 70-71.

5. Guyots (descriptively called tablemounts) were discovered by Prof. H.H. Hess during World War II operations in the Pacific. Hess recorded numerous soundings of the sea bottom and discovered the flattopped mountains which he named after the nineteenth century cartographer Arnold Guyot. Lobanov-Rostovsky, *Seamounts, Keystones to the Earth*, OCEANS (No. 3) (1972) 66 at 67.

6. While this theory has received much support from scientists, see MENARD and KING, *supra* note 3, actual proof that guyots were once above water, and later sank to their present elevations below water was provided by the results of research conducted by Scripps Institute of Oceanography. During exploration in the South Pacific, reef fauna were discovered atop guyots whose peaks rested as far as 1500 meters below the surface. Rounded and polished cobbles were found as well. Scientists felt the stones could only have been rounded by surface wave action, the motion at their present depth being inadequate to polish the stones to that degree. Further, the presence of the reef coral, which could not have grown in the colder waters of the greater depths, not below the light zone—approximately 100 meters—confirmed the hypothesis. Lobanov-Rostovsky, *Seamounts*, *supra* note 5, at 67.

7. Dr. H.W. Murray published the first major work on seamounts in 1941. In that work he characterized them as underwater volcanoes with steep sides, at least one kilometer in height.

8. W. MENARD, *supra* note 3.

9. W. FRIEDMAN, *THE FUTURE OF THE OCEANS* 12-13 (1971).

Like other volcanoes, seamounts generally occur in chains, along a rift in the earth's crust. The Hawaiian Ridge is the best example, and is considered the youngest of the mid-Pacific chains.¹⁰ Other examples are the Emperor Seamounts, running northward from the western tip of the Hawaiian chain, and the Marshall and Line Island chains in the south-central Pacific. There are also two short chains in the Gulf of Alaska.¹¹

Seamounts are found at varying depths below the surface, the depth at which the tops rest depending upon the age of the seamount, and the conditions to which it has been subjected. Several, however, rise to within several meters of the ocean's surface. Of those now mapped in the Pacific which are outside the territorial waters of any nation, seventy rise to within 200 meters of the surface.¹²

The largest known seamount is located northwest of Midway and lies 1500 feet below the surface. It is approximately seventy miles long and forty-five miles wide, rising some 15,000 feet from the ocean floor.¹³ Other seamounts which have been explored include the Vema Seamount¹⁴ off the southern coast of Africa, and the Cobb Seamount, whose summit lies within 122 feet of the surface, 270 miles west of Washington state.

III. POSSIBLE USES

The common characteristic which all seamounts possess and which makes them of immediate concern and value is their elevation above the sea floor, and their relative proximity to the ocean's surface. Those which rise very close to the surface may provide a base for above water operations; while those which rise thousands of feet above the deepest parts of the ocean may be used, when technology permits, as stepping stones from the surface to the abyssal depths. It is clear, therefore, that this geological difference between seamounts and the surrounding seabed cannot be discounted when evaluating the status of the seabed. It is this characteristic which will be exploited, and upon which most foreseeable uses will depend. The uses are many and varied, and the following discussion is in no way exhaustive. While many of the

10. Lobanov-Rostovsky, *Seamounts*, *supra* note 5, at 67.

11. *Id.*

12. OCEAN SCIENCE NEWS, Vol. 11, No. 18, May 2, 1969.

13. Lobanov-Rostovsky, *Seamounts*, *supra* note 5, at 67.

14. See generally Mallory, *Exploration of the Vema Seamount*, 1966 INT. HYDROGRAPHIC REV. 17 (1966).

suggested utilizations may not be technically feasible at this time, none is impossible given the present state of technology, and the nature of research and development currently being conducted.

Proximity of seamounts to the surface will permit the construction of installations which protrude above water, or provide bases for the construction of artificial islands.¹⁵ These are in existence today, and as methods are developed for construction in deeper water, more areas of the high seas will be opened up to these artificial islands and installations. Once established, the uses to which they may be put are limitless, including the possible construction and establishment of island nations.¹⁶ Completely submersible installations have been developed and tested in shallow water, and once technology permits, there would seem to be no bar to the construction of these installations on the deep seabed.¹⁷ Seamounts would appear the logical location for such installations, providing a deep sea environment while avoiding the problems inherent in descending to the abyssal plain which averages in excess of 5000 meters in depth. Accordingly, evaluation of the possible uses to which seamounts might be put requires consideration of both above and below water installations.

15. The subject of artificial islands is on the agenda for the Third Conference, one of the topics on the list prepared by Subcommittee II of the Seabed Committee. 10 INT'L LEGAL MATERIALS 1174. See Note, *Jurisdictional Problems Created by Artificial Islands*, 10 SAN DIEGO L. REV. 638 (1973).

Creation of a new island nation has already been attempted in the South Pacific on the Minerva Reefs. An island was constructed by a private firm, and a sovereign state declared, after which the "nation" intended to solicit the registration of vessels under its colors. OCEAN SCIENCE NEWS, April 7, 1972, at 2-3.

16. Although there have been attempts made, no "nations" have been completely successful, and there is some question as to whether they would be legal under current international law. See Section IV, *infra*.

17. Cousteau and Piccard are two oceanographers responsible for the development of many of the submersibles and diving techniques currently utilized for exploration of the deep sea. The American Sea Lab experiment placed men in underwater habitats for forty-five days. Cousteau equipped an underwater station with divers and equipment, and conducted diving experiments from there for 23 days. The Soviets have also experimented with underwater living, having conducted extended operations in the Black Sea. W. FRIEDMAN, *supra* note 9, at 24-25. Given the fact that all of these major technological achievements have occurred within the last fifteen years, there would seem no reason to doubt the existence of such underwater installations within the near future.

A. Research

Perhaps before any practical use will be made of seamounts, the scientific research which will make such use and exploitation possible will move from land and ship based operations to installations located in or on the high seas. Manned installations on the open seas, unaffected by winds and current, would permit more detailed studies than do research vessels which have limited range and maintenance capabilities. Underwater installations would permit the study of every facet of the marine environment, including sea life, currents, and the seamounts and seabed as well.¹⁸ Experimentation on such stations on a small scale will help scientists determine which of the anticipated utilization programs of the sea will be feasible, both technically and economically, thus helping to guide the progress of the exploitation of the oceans' resources.

B. Military Utilization

A most obvious use of seamount installations would be for the establishment of military bases of varied nature.¹⁹ Missile sites, both offensive and defensive, could be located on above and below surface structures, affording greater protection to the establishing nation, and providing, presumably, a greater deterrent to bellicose nations. Unmanned missile installations could be operated at depths greater than those at which manned submersibles can currently operate efficiently, at the same time affording a greater degree of protection against enemy detection and destruction. Radar stations above and below the surface could provide a nation with a highly effective warning system, providing that nation a more ex-

18. Lobanov-Rostovsky presents and develops the hypothesis, already accepted by many, that seamounts hold the key to the theory of "moving plates" on the ocean floor, which, in turn, is the basis of the concept of "continental drift;" *supra* note 5, at 66-68.

19. See Gehrig, *Legal Rules Affecting Military Uses of the Seabed*, 54 *MIL. L. REV.* 168 (1971); W. FRIEDMAN, *supra* note 9, at Chapter 5. Quasi-military utilization, other than ordinary naval operations, has already been made of some parts of the seabed. The hydrogen bomb experimentation at Bikini may have sparked much of the controversy over possible military use of the seabed. In that context, see Margolis, *The Hydrogen Bomb and International Law*, 64 *YALE L.J.* 629 (1955). Those experiments, and the continued escalation of the arms race may also have been partly responsible for the treaty recently signed by the United States and others, prohibiting the emplacement of missiles and other weapons on the sea floor; Treaty on the Prohibition of the Emplacement of Nuclear and Other Weapons of Mass Destruction on the Sea Bed and the Ocean Floor and in the Subsoil Thereof, done at Washington, London and Moscow, February 11, 1971, T.I.A.S. No. 7337, G.A./4355 Annex to G.A. Res. 2660 (XXV), 10 *INT'L LEGAL MATERIALS* 145 (1971). For the applicability of current international law and treaties to seamounts, see Section IV, *infra*.

peditious alert than would a costal or land-locked system.²⁰ Functions related to the employment of submarine warfare would be more effectively conducted from undersea bases, by extending the range of the underwater vessels, and making them independent of surface supply and maintenance facilities. A network of such installations located outside the territorial waters of a nation at accessible depths would permit worldwide support of submarine fleets, while maintaining the secrecy considered essential to the effective employment of submarines.

C. Mineral Resource Development

Perhaps the most important use of seamounts and guyots will be connected with the exploration of the seabed for mineral resources. The nations of the world are turning to the sea as a source for many vital minerals which are becoming less available on the land masses, and are known to be in great abundance on and under the seabed.²¹ Although technological limitations pres-

20. For a view that warning systems are not desirable, but that the anti-missile system is the better system to employ, see Brennan, *The Case for Missile Defense*, FOREIGN AFFAIRS, April, 1969.

21. Manganese nodules are the principal and most abundant form of seabed surface deposit, and present the richest source of undersea wealth other than petroleum deposits which are not known to be present under the high sea bed. In a memorandum delivered to the First Committee of the United Nations General Assembly, Ambassador Pardo of Malta stated that the manganese nodules of the entire seabed contain the following minerals:

43 billion tons of aluminum—20,000 years reserve as compared to land reserves of 100 years at 1960 consumption rates;

358 billion tons of manganese—400,000 year reserve compared to land reserves of 100 years;

7.9 billion tons of copper—600 year reserve as compared to land reserves of 40 years;

1 billion tons of zirconium—100,000 year reserve as compared to land reserves of 100 years;

14.7 billion tons of nickel—150,000 year reserve as compared to land reserves of 100 years;

5.2 billion tons of cobalt—200,000 year reserve as compared to land reserves of 40 years;

further, the Pacific Ocean alone contains 207 billion tons of iron, 10 billion tons of titanium, 25 billion tons of magnesium, 1.3 billion tons of lead, 800,000 tons of vanadium, and others. Reproduced in W. FRIEDMAN, *supra* note 9, at 21. *But see*, Leigh Ratiner, supplemental statement before the Subcommittee on Oceanography of the House Merchant Marine and Fisheries Committee, March 1, 1973, for a more recent appraisal of the expected short-term gains from manganese nodule exploitation.

ently exist, it is only a matter of time before full scale commercial exploitation of the minerals of the seabed, and seamounts and guyots themselves, proceeds. Seamounts can serve as bases for underwater mining operations, by providing support for drilling platforms, temporary storage facilities, or even processing stations for retrieved materials. While there is no indication that seamounts are a source of hydrocarbons, they are believed to contain hard mineral deposits;²² and, in any event, they could be instrumental in the extraction of any deep sea petroleum deposits. Manganese nodules, abundant in the deep sea, are present on the flat topped guyots, and hence more readily accessible than nodule deposits on the abyssal plain.²³

D. Transportation

In connection with plans for the exploitation of oceanic minerals, many writers foresee the use of underwater barges rather than surface craft for the transportation of these and other cargoes.²⁴ Underwater cargo vessels would avoid the problems of wind, tide, and wave action, and afford a greater degree of safety from detection or destruction by an enemy power. Barges could pick up and deliver cargoes at undersea collection points, for delivery to other undersea ports or surface destinations. Final delivery could be

22. W. FRIEDMAN, *supra* note 9, at 10-11.

23. Commercial exploitation of manganese nodules is currently underway on a limited scale. A Japanese firm has developed a continuous bucket line system for nodule retrieval at depths of up to 12,000 feet. Deep Sea Ventures, an American enterprise associated with a West German firm, plans to operate a 1 million ton nodule processing plant by the mid 1970's, the nodules to be retrieved from the Pacific between the United States and Hawaii. Hughes Tool Company has developed a vessel to operate in 10,000 feet of water, due to be operational later this year. Auburn, *The Deep Seabed Hard Mineral Resources Bill*, 9 SAN DIEGO L. REV. 491 (1972). Other nations including France and the Soviet Union are involved in expeditions to find valuable mining areas, and in the development of mining techniques.

A strong argument against the concept of profitable extraction of seabed mineral resources is made by Schaefer, *The Resources of the Seabed and Prospective Rates of Development as a Basis of Planning for International Management* in *THE LAW OF THE SEA: THE UNITED NATIONS AND OCEAN MANAGEMENT* 71 (Proceedings of the Fifth Annual Conference on the Law of the Sea Institute, 1970). In that speech Mr. Schaefer indicates that the seabed will not provide a large portion of the world's hard mineral resources within the foreseeable future, and that the importance of these deposits is being overrated. Furthermore, he believes that the minerals which can be found in the high seabed are also available near shore, so there need be no problems with national incursions into the seabed beyond national jurisdictions.

24. *E.g.*, see Johnston, *Law, Technology and the Sea*, 55 CAL. L. REV. 449, 452 (1967); W. FRIEDMAN, *supra* note 9, at 54-55.

made by using either smaller submersibles, or surface craft, which would take on the cargoes unloaded from the underwater barges, and deliver them to any type of coastal port or facility. The logistics of underwater transfer of cargo have not as yet been determined, but an appropriate delivery method will be developed with the advent of the undersea barges. Any commercial system utilizing these underwater transports will be faced with the same operational requirements as our military submarine fleets; ports and bases to service, load and unload, and resupply the craft without the necessity of surfacing. Such bases could be conveniently located on seamounts, particularly if mining or drilling operations were situated nearby. The barges could shuttle retrieved minerals, processed or raw, to land based plants for final processing, resupplying marine installations on return voyages.

Super-tankers, those already operational, as well as those currently planned, because of their immense size may also be forced to rely on ports located in the open sea, some distance from the ports and harbors of their destination state.²⁵ Seamounts relatively close to shore would make ideal locations for installations to load and unload petroleum products, which could be piped to the mainland, and other cargoes, which could be loaded onto barges when brought to or from offshore freighter ports. All this could be conveniently handled without the risk of the giant tankers and freighters approaching shallow waters.

E. Fishing

Next to transportation, the fishing industry makes the greatest commercial use of ocean resources at the present time, and it, too,

25. *An Almanac of Tanker Ships*, OCEANS (No. 3) (1972) at 36-37 discusses the new supertankers, including those which draw 80 feet, and some planned with drafts considerably larger. These tankers do not as yet call at U.S. ports, as the channels of the deeper eastern ports average 60 feet. These tankers will call at U.S. ports in the foreseeable future, however, and the article's prediction—offshore terminal facilities. See also *FOR-TUNE*, Feb. 1973, at 95. A report there discusses the world's largest drydock facility at Lusnave, Portugal. That shipyard recently completed construction of a 1 million ton drydock facility, the mere existence of which, experts feel, will encourage the building of bigger ships. Of course the environmental fears may slow down the development of these giants, but once sophisticated methods are developed for preventing or controlling marine pollution problems presented by these larger ships, necessity will dictate the construction of the larger, more economical ships.

responds to changes in technology.²⁶ As many of the traditional fishing grounds are suffering from over-exploitation, the fishing industry may have to turn to other areas of the high seas for survival. It is logical to assume that high sea installations on seamounts could play an important part in the revitalization of the fishing industry.²⁷ Bases located far from home ports would be more accessible to national fishing fleets, permitting extended operations, and providing needed support. Processing plants located at these sites would permit the immediate processing of the catch, and the freshly cleaned fish could then be shipped directly to the consumer nations, rather than indirectly through the ports of the fishing nation.²⁸

To use installations in this way, however, might be more detrimental to the fishing industry than it would be helpful. The capacity of a fishing fleet would be multiplied, and the exploitation would only be that much more harmful. Perhaps seamount installations could be used as research sites for the fishing industry, studying ways to foster the growth of marine life, developing large scale stocking operations, and conducting conservation and control programs. In this sense, seamount bases would be performing a most valuable service to the industry.

F. Communications

Communication stations, both civilian and military, might well

26. According to the Food and Agriculture Organization of the U.N. (FAO), world production of fish totalled 64 million metric tons in 1968, and reflected an average growth rate of 25% per decade. Further, it is estimated that the demand for fish in 1985 will be 65% to 100% greater than the demand in 1965. Jacobson, *Bridging the Gap to International Fisheries Agreement: A Guide for Unilateral Action*, 9 SAN DIEGO L. REV. 454, 460 (1972).

27. It is of interest to note that schools of tuna congregate over seamounts in the open sea. This is due to the presence of seamounts in the path of undersea currents. The seamounts divert the currents toward the surface, carrying microorganisms from the bottom, which foster the growth of plankton. The plankton attract smaller fish on which the tuna feed.

28. Factory ships permitting the handling of greater quantities of fish by the fleets, while retaining mobility, are currently part of the Soviet, Japanese, and Norwegian fleets. While these ships are partly to blame for the exploitation of certain prime areas, perhaps the economics involved in maintaining these vessels is a cause of the problem. While fixed installations would certainly have greater operating expenses, at least in the short run, and would lack the mobility which these ships possess, if their utilization as research and conservation control stations were coupled with a part in a scientifically controlled fishing industry, some of these problems might be alleviated. Overexploitation will also be controlled to a degree with adoption of a now highly desirable international fishing agreement. See Jacobson, *supra* note 26.

be positioned on seamounts, both to aid in the navigation of surface and subsurface vessels, and to provide a link in the global communications scheme made possible by the orbital satellites. The U.S. Coast Guard currently operates LORAN²⁹ stations, built on atolls or small islands, but much of the ocean area is not covered to the extent which might be considered desirable. Use of seamounts would permit the completion of a network of these stations, thus reducing the chance of vessel loss, and increasing the possibility of recovery in case of accident by permitting accurate and continuous monitoring of vessel location.

G. *Weather Forecasting and Control*

Installations constructed on the high seas, away from the influence of the land masses, could be beneficially employed in weather forecasting. Permanent sites would afford a greater degree of safety than surface craft, while facilitating the evaluation and analysis of weather phenomena created over the oceans. When, and if, weather control becomes a reality, these installations on the high seas, where scientists believe much of our weather originates through air-water interaction, would permit the harnessing of otherwise harmful conditions before population centers and agricultural lands were affected. Similarly, such establishments would be the logical place for the "creation" of desired weather conditions.

H. *Expansion of Territory*

While mention has already been made of the availability of seamounts as bases upon which to build artificial islands, such islands might serve more than a purely economic purpose. The land-locked nations of the world have a great interest in the sea,³⁰ and their inaccessibility to coasts and ports may be a contributing factor as to why the majority of them are underdeveloped. Seamounts

29. Long Range Aid to Navigation.

30. See The Study of the Question of Free Access to the Sea of Land-Locked Countries and of the Special Problems of Land-Locked Countries Relating to the Exploration and Exploitation of the Resources of the Sea-Bed and the Ocean Floor Beyond the Limits of National Jurisdiction, A/AC.138/37 (1971); and Note, *The Interest of Land-Locked States in Law of the Sea*, 9 SAN DIEGO L. REV. 701 (1972).

may offer opportunities to the land-locked nations, possibly permitting the extension of sovereignty through the construction and maintenance of facilities on the high seas. The effect would be to make available to these states the benefits which come from participation in world trade through one's own ports.

This narrative is far from complete, and there are many uses to which these undersea mountains might be put which are related to those previously mentioned. Underwater agriculture or "aquaculture" is currently being investigated as part of the search for new sources of food.³¹ Should research determine that food can be raised under controlled conditions and economically harvested from the sea, unpolluted areas will be sought out and utilized. Seamounts might present an opportunity for aquaculture, in that they are abundant in the high sea, many parts of which are relatively unpolluted by the advance of technology. The concept of using the ocean for the creation of recreational communities and parks has received much attention, and plans are underway for the construction of both above water and undersea resort hotels. While much of the construction is planned for reefs and archipelagoes, seamounts lying relatively close to shore, such as are prevalent in the Pacific, would be equally suitable.

IV. THE LEGAL STATUS OF SEAMOUNTS

There have been no specific references to seamounts and guyots in the international agreements on law of the seas to date. The primary reason for the absence of such considerations can be safely assumed to be a general failure to recognize these geological phenomena as distinct from the seabed in general. Some excuse for the oversight exists for the early discussions and perhaps even for the Geneva Conventions of 1958. At that time technology which would allow for productive exploration of most of the seabed was unavailable; however, such technology was foreseeable.³² Even so, the extent of foresight as to the possibilities of exploitation must have had its limits. By 1967, there should have been greater aware-

31. Fish farming has been suggested as a method of replenishing the over-exploited prime fishing areas. Kelp production off the California coast is another facet of ocean agriculture, the 1971 harvest yielding 160,000 tons. Oyster farming, long practiced in the waters of Japan is another example of a practical use of the sea, and may have contributed to the decision made by the Public Health Service to designate 10 million acres of seabed as suitable for raising shellfish. W. FRIEDMAN, *supra* note 9, at 110. See Galton, *Aquaculture is More Than A Dream*, N.Y. TIMES MAGAZINE, June 10, 1967, at 13.

32. D. BOWETT, *THE LAW OF THE SEA* at 33 (1967).

ness and some serious discussion as to the special problems looming in the near future.³³ Technological and scientific progress by that year had made it clearly predictable that the seabed would be a source of riches, and that seamounts could provide necessary access to otherwise virtually inaccessible depths. Nevertheless, the significance of seamounts has remained unacknowledged by most commentators, and the existing legal status of these structures must be presumed to be the same as that of the seabed itself.³⁴

Provisions pertaining to the present status of the seabed, for purposes relevant here, are primarily encompassed in three of the 1958 Geneva Conventions: the Convention on the Territorial Sea and the Contiguous Zone,³⁵ the Convention on the High Seas,³⁶ and the Convention on the Continental Shelf.³⁷ As this article is limited to seamounts located outside the exclusive jurisdiction of any nation, the second convention should give the most substance to the law involved, but in fact it contributes little by itself. What law there is on the high seabed must be deduced from the provisions of all three conventions and other outside material.

A. *The Convention on the Territorial Sea and The Contiguous Zone*

Two important definitions provided in the Convention on the Territorial Sea and the Contiguous Zone are those of "islands"³⁸ and "low tide elevations."³⁹ As islands must be above water at high

33. After the 1958 Conventions, the United Nations had little to do with the sea. Serious discussion in the General Assembly began again in 1967 with G.A. Res. 2340 (XXII) (1967), 7 INT'L LEGAL MATERIALS 174 (1968).

34. The problems with the continual failure to distinguish seamounts from the seabed in general are pointed out *infra*, FAILURE TO AGREE, Section VII.

35. Convention on the Territorial Sea and the Contiguous Zone, done at Geneva, April 29, 1958 [1964], 15 U.S.T. 1606, T.I.A.S. No. 5639, 516 U.N.T.S. 205.

36. Convention on the High Seas, done at Geneva, April 29, 1958, 13 U.S.T. 2312, T.I.A.S. No. 5200, 450 U.N.T.S. 82.

37. Convention on the Continental Shelf, *supra* note 1.

38. Convention on the Territorial Sea and the Contiguous Zone, *supra* note 35, Sec. II, Art. 10:

1. "An island is a naturally-formed area of land, surrounded by water, which is above water at high tide."

2. "The territorial sea of an island is measured in accordance with the provisions of these articles."

39. Convention on the Territorial Sea and the Contiguous Zone, *supra*

tide, seamounts cannot be so categorized, but those near the surface might belong to the latter class. It is not clear whether these low tide elevations are subject to claims of national sovereignty.⁴⁰ The importance of this classification is that low tide elevations have no territorial waters.⁴¹ In light of recent technology, particularly the fact that seamounts and guyots could be developed into islands, the denial of territorial waters is potential grounds for dispute. Also, the possibility of an underwater dormant volcano erupting and becoming an island presents an issue as to the concept of "territory".⁴² For example, a seamount which is classified as part of the seabed, located on the high seas, would be subject to no territorial claim of sovereignty. If volcanic action caused the mount to "rise" so that it remained above water at high tide, thus qualifying as an island, a question arises as to whether territorial claims might be made.⁴³ Such a nonstatic concept of territory might wreak havoc in any international regime which attempts to formulate broad rules without consideration of the various structural phenomena of the ocean floor.

B. *The Convention on the High Seas*

Perhaps the most applicable provision in this treaty, in terms of

note 35, Sec. II, Art. 11:

1. "A low-tide elevation is a naturally-formed area of land which is surrounded by and above water at low-tide but submerged at high tide"

2. "Where a low-tide elevation is wholly situated at a distance exceeding the breadth of the territorial sea from the mainland or an island, it has no territorial sea of its own."

40. The United States contends that they are not, while some other countries contend that they are, subject to national jurisdiction. This dispute came to a head in connection with the Guano Islands and low tide elevations which the United States relinquished to Colombia and Honduras recently.

41. See note 39 *supra*. However, installations and structures built upon low-tide elevations would probably be entitled to a 500 meter safety zone under Art. 5 of the Shelf Convention, if they were used for the purpose of exploiting the natural resources of the area, and if one can infer that the rules applicable to the shelf in this respect would also pertain to the high seas.

42. That such a possibility exists can be concluded from a history of the growth of the Hawaiian Island chain. See Craven, *United States Options in the Event of Nonagreement*, in *THE LAW OF THE SEA: THE CONSEQUENCES OF FAILURE TO AGREE 46* (Proceedings of the Sixth Annual Conference of the Law of the Sea Institute, 1971). See also, Matthews, *This Changing Earth*, *NAT'L GEOGRAPHIC* (Vol. 153, No. 1) (Jan. 1973) at 1, about the island of Surtsey which "burst from the Atlantic" in 1963.

43. It should not be inferred from this question that seamounts below the surface of the water are not also possibly subject to something similar to a territorial claim. See *Traditional International Law*, *infra* Subsection D.

assigning some existing law to the seabed beyond the continental shelf, is Article 1. "The term 'high seas' means *all parts* of the sea that are not included in the territorial sea or in the internal waters of a state."⁴⁴ (Emphasis added) This may imply that "all parts" includes the seabed, although there is no indication of an intention to include it.⁴⁵

Article 2 provides for the high seas to be open to all nations: ". . . no state may validly purport to subject any part of them to its sovereignty." Assuming that the seabed is included as part of the high seas, then it also would be incapable of occupation by any state,⁴⁶ and open to the same freedoms as the sea above it.⁴⁷ C. Colombos believes this to be the better interpretation.⁴⁸ These freedoms, coupled with the added condition of "reasonable regard to the interests of other states,"⁴⁹ could play an important role in restricting the exploitation of seamounts as long as nations con-

44. Convention on the High Seas, *supra* note 36.

45. "There is no implication that 'all parts' of the high seas includes the seabed; in fact, the situation is just the opposite. The International Law Commission's commentary to the draft article which became Article 1 of the Convention on the High Seas states:

The Commission has not made specific mention of the freedom to explore or exploit the subsoil of the high seas. It considered that (apart from the continental shelf) . . . such exploitation had not yet assumed sufficient practical importance to justify special regulation.

Although Brazil submitted a proposal which would have substituted 'waters of the high seas' for 'high seas,' the stated purpose being to avoid confusing the seabed with the superjacent waters and establishing a legal regime for the high seas, which proposal was rejected, it seems unquestionably clear that the 1958 conferees did not regard any of their work as being applicable to the seabed, except insofar as cables or pipelines might rest there as a result of that enumerated freedom." Professor H. Gary Knight, in a letter dated March 29, 1973.

46. C. COLOMBOS, *THE INTERNATIONAL LAW OF THE SEA* at § 81 (1967).

47. Convention on the High Seas, *supra* note 36, Art. 2.

"These freedoms, and others which are recognized by the general principles of international law, shall be exercised by all States with reasonable regard to the interests of other States in their exercise of the freedom of the high seas."

48. C. COLOMBOS, *supra* note 46, at § 81. This view has been rejected by most other commentators, e.g., see Creamer, *Title to the Deep Seabed: Prospects for the Future*, 9 HARV. INT'L L.J. 205 (1968). Cf. Professor H. Gary Knight believes that the Convention on the High Seas is inapplicable to the seabed, and that the area should be considered *res nullius* because it is not subject to any jurisdiction at the present time and international law has always regarded unappropriated territory as *res nullius*.

49. See note 47 *supra*.

tinue to recognize these structures as part of the high seas covered by the Conventions. When it becomes advantageous to consider them as unique, however, the problem of undefined and unspecific law in regard to seamounts will arise to haunt the shortsighted.

Article 3 of the treaty, recommending free access to the sea for land-locked states is noteworthy here, but not in the context of "access" as ingress and egress.⁵⁰ Rather, the provision for these countries is important as evidencing international agreement that the high seas should be open to all nations, including those with no coast.⁵¹ The developmet of a seamount into a port-type complex on the high seas might possibly afford a land-locked nation a coast away from home.⁵²

Since weather stations, communication centers and transportation facilities are among the proposed uses of seamounts and guyots, Articles 24-26 of the Convention on the High Seas appear to be notably significant. Specifically, these provisions govern the duties of nations in regard to pollution, radiation and cables. Foreseeably, some of these propositions would require the utilization of apparatus which comes under the purview of the Convention. Furthermore, nuclear energy has already proven itself a valuable tool in the conquest of the ocean. No doubt its usefulness will again be demonstrated when seamount installations become a reality. These installations, to some degree, must emit pollutants; depending upon the circumstances these provisions will be applicable. In fact, the Convention on the High Seas may, in this context, prove a more powerful regulatory instrument than appearances would lead one to believe.

C. *The Convention on the Continental Shelf*

A major problem left unresolved by the 1958 treaties is the width of territorial waters and the continental shelf. The primary criterion for the shelf is that it be "adjacent" to a state's territorial waters.⁵³ As no definite limit has been determined for ter-

50. The term "recommending" is used here because of the wording of the treaty.

1. In order to enjoy the freedom of the seas on equal terms with coastal States, States having no sea coast *should* have free access to the sea. (Emphasis added).

Convention on the High Seas, *supra* note 36, Art. 3. See generally, note 30 *supra*.

51. Further evidence that the land-locked states are to share in the development of the high seas appears in the discussions surrounding the preparations for the 1973 Conference. See PROPOSALS, Sec. V. *infra*.

52. W. FRIEDMANN, *supra* note 9, at 46.

53. Convention on the Continental Shelf, *supra* note 1, Art. 1:

ritorial waters, the extension of the continental shelf is necessarily indeterminable as to its landward boundary, although the indeterminability of the landward boundary is unimportant in regards to the discussion here, since a coastal state would have a presumptive claim to any seamounts or guyots within its territorial sea. The seaward boundary is even more nebulous—" . . . to a depth of 200 metres or beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas;"⁵⁴ Obviously, the designation of the 200 meter qualification presents few interpretational difficulties, but both criteria have been made meaningless in light of rapid technological progress.⁵⁵ There are other problems involved with the current limitations. While the meaning of adjacency is clear, it is not clear whether "legal adjacency" is "broken" by a deep trench, not susceptible to exploitation, although the coastal state is capable of exploiting the entire surrounding area. The ability to exploit is present, but the legality of using a natural bridge to cross such a trench, or merely ignoring the fact that there is a break in the area of possible exploitability (and hence in "legal adjacency") is undetermined. A related line of inquiry deals with the meaning and import of the term "exploitation." There is no distinction made between exploitation of a natural non-removable resource⁵⁶ (a seamount, for instance) and removable resources; nor is it clear exactly what kind and degree of activity is required to constitute exploitation.

It appears that the members of the 1958 Conventions had only mineral resource extraction in mind as the probable use of the seabed; had they foreseen other possibilities, more specific law on the use of the seabed would have been in order.⁵⁷

For the purpose 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: . . .

54. *Id.*

55. W. FRIEDMANN, *supra* note 9, at 37.

56. In *United States v. Ray*, 423 F.2d 16 (5th Cir. 1970) the court held that building on a coral reef was considered to be building on "natural resources" within the meaning of the Shelf Convention. *See, Recent Case*, 6 SAN DIEGO L. REV. 487 (1969).

57. *See generally*, Study prepared by the Secretary of the United Na-

By Article 2 coastal states are given sovereign and exclusive rights for the purpose of exploring and exploiting natural resources, which rights are not dependent upon occupation or express proclamation. A literal interpretation of the grant of sovereignty, coupled with merely the exploitability limit, leads to the incredible conclusion that the entire seabed is potentially susceptible to claims of exclusive rights to explore and exploit. The problem of breaks in "legal adjacency" remains, but with advancing technology this obstacle could be overcome.⁵⁸ Since the seabed would merely have to be "exploitable" and not necessarily exploited, seamounts and guyots distant from a coastal state could be exploited and claimed on the theory that the area in-between is exploitable.⁵⁹

The fact that the high seas are partly defined as that which remains after territorial claims, and the provision in Article 3 excepting the superjacent waters of and airspace over the high seas from the provisions on the continental shelf, make it clear that national claims could encroach into what otherwise would be the high seas. This concept follows the pattern set by the Truman Proclamation of 1945,⁶⁰ which claimed for the United States the natural resources of the seabed and subsoil of the continental shelf around the United States. The extent of the claim is not precisely defined, but is estimated to extend up to 250 miles from the coast over the high seas in some areas.⁶¹

The limits on possible exploitation and uses of seamounts may be inferred from Article 5, emphasizing the freedom of navigation on the high seas, protection against pollution, and preservation of traditional fishing rights. For example, no installations could be built upon seamounts so as to impede international navigation.

tions for the Ad Hoc Committee to Study the Peaceful Uses of the Sea-Bed and the Ocean Floor Beyond the Limits of National Jurisdiction, U.N. Doc. A/AC.135/19, 13-18, 24-26, 28-34; and Oxman, *The Preparation of Article 1 of the Convention on the Continental Shelf*, 3 J. OF MARITIME LAW AND COMMERCE 245, 445, 683 (3 parts, 1972).

58. The United States has "explored" the deepest spot in the oceans—the Marianas Trench at the Challenger Deep, 35,760 ft.; and in 1960, the U.S. descended to 35,802 ft. in an area 36,198 ft. deep.

59. However, see Young, *The Legal Regime of the Deep-Sea Floor*, 62 AM. J. INT'L L. 641, 644 (1968): "While 'adjacency' is not specifically defined, it undoubtedly conveys a notion of limitation which cannot be reconciled with indefinite extension into the great oceans."

60. Proclamation No. 2667, "Policy of the United States With Respect to the Natural Resources of the Subsoil and Sea Bed of the Continental Shelf," Sept. 28, 1945, 59 Stat. 884 (1945).

61. C. COLOMBOS, *supra* note 46, at § 86. A State Department announcement accompanied the proclamation and defined the extent as 600 feet. 13 DEP'T ST. BULL. 484 (1945).

Perhaps a port or a processing installation which would attract additional traffic would have such an effect. Nor could a use be made of a seamount which might destroy existing fishing grounds in the area, such as a use causing increased activity in the vicinity which would drive the fish away or disrupt reproduction patterns. Likewise, an island built upon a seamount for recreational or industrial purposes would come under international law in regards to dumping its waste materials and/or radioactive pollutants.⁶²

Since the breadth of territorial waters has not been uniformly set, and since the continental shelf seems potentially boundless, it is important to recognize the uniqueness of seamounts and buyots—unique in that their relatively shallow depths make them foreseeably accessible and exploitable in the near future. Nevertheless, the conclusion must be drawn that the 1958 Conventions would permit a sovereign claim to the use of seamounts and guyots in the high seas, either by an outright extension of territorial waters,⁶³ or by an extension of the continental shelf.⁶⁴

D. Traditional International Law

Traditional international law outside the 1958 Conventions is also applicable to the legal status (or potential legal status) of seamounts and guyots. A claim of sovereignty, or territorial authority, is generally associated with occupation. Most commentators have rejected Mr. Colombos' view that the seabed is subject to the same rules as the high seas and thus unclaimable.⁶⁵ The historic reservation to the acceptance of the notion of claiming the seabed is based upon the physical incapability to occupy and exploit. Some authorities believe that exploitation without occupation may be sufficient to stake a legal claim to part of the seabed.⁶⁶ Mr. Creamer contends that the "adjacency" requirement for claiming sovereignty over the continental shelf does not pertain to territory

62. See Newton, *Seabed Resources: the Problems of Adolescence*, 8 SAN DIEGO L. REV. 551, 557 (1971).

63. Such an extension would, of course, actually eliminate the legal concept of high seas and would in all probability fail to gain recognition from the international community.

64. See Young, *supra* note 59.

65. *E.g.*, Creamer, *supra* note 48.

66. Hurst, *Whose Is the Bed of the Sea?*, 4 BRIT. Y.B. INT'L L. 34, 43 (1923).

in the high seas since the need for coastal security does not apply there.⁶⁷ Furthermore, he contends that technological advances necessitate the recognition of claims based upon national occupation. "Placement of manned installations and extraction of minerals should certainly constitute effective occupation of an undersea area."⁶⁸ Sir H. Waldock, in agreement, states that activity which would, in effect, meet the requirements of adverse possession or prescription (that is, open, notorious claim and use) should be sufficient for purposes of occupation.⁶⁹ Whereas an island in the high seas could actually be subject to a territorial claim, a seamount or guyot, being a part of the seabed, could be claimed only for exclusive rights to explore and exploit natural resources.⁷⁰ The significance of this limitation in most instances is very little in light of the expressly limited holding in *United States v. Ray* which may have implied that building upon a submarine structure is equivalent to exploiting natural resources.⁷¹ In other words, almost every possible use of a seamount could amount to an exploitation of natural resources, at least as far as the United States courts are concerned. Just what degree of occupation would be required to constitute a valid claim is still undetermined (a problem hopefully to be avoided by the establishment of an international regime for the seabed). One facet of the question which, until recently, was considered to be a barrier to any effective claim of the seabed is the delineation of a narrow enough area to be recognized (which may be called the problem of "fencing-in"). With modern technological advances, the ascertainment of definite claims is quite feasible, especially in the case of seamounts. "It is perhaps not hard to say that a particular seamount, limited in area and with a well-defined perimeter, can become 'occupied' when a manned station is built upon it, or even when an unmanned installation is placed there."⁷² The real limitations on making such claims on the high seas are the freedoms of navigation and fishing expressed in the Conventions and reflected in traditional law of the seas. Mr.

67. Creamer, *supra* note 48, at 215.

68. *Id.* at 216.

69. Waldock, *Legal Basis of Claims to the Continental Shelf*, 36 *TRANSAC. GROT. SOC'Y.* 115, 142 (1950), reported in Creamer, *supra* note 48.

70. Convention on the High Seas, *supra* note 36, Arts. 1 and 26.

71. 423 F.2d 16 (5th Cir. 1970). The limited holding of the case dealt with building upon a coral reef, but it is safe to infer that the United States would resist any attempts to build upon any submarine structures where the effect might impede its territorial security.

72. Young, *supra* note 59, at 646. It is interesting to note that while Young recognized the potential for seamount development, he completely passed over and failed to recognize the same as a source of potential conflict.

Creamer does not believe that these requirements would hinder high seas development as long as claims of right are not unreasonably large.⁷³

Determinations of "reasonableness" in regard to the use to which the seabed is being placed, in consideration of the burden being imposed upon the rest of the international community and the physical extent of the area involved, are supposed prerequisites to a legal use of any part of the high seas under a conglomeration of existing international law.⁷⁴ In practice, however, some of the history of the use of the high seas appears to reflect the theme of "might makes right." Specifically, the use of the ocean by the United States and France as a testing ground for nuclear weapons has been criticized as having violated the basic rules of freedom of the high seas.⁷⁵ If such action is a preview of what is in store for international law when exploitation becomes profitable, then perhaps that theme sums up the legal status of the seabed, seamounts and guyots included. Significantly, declarations by the United States in recent months give signs that such pessimism is unwarranted.⁷⁶

Further existing law along the line of military uses for the seabed is the Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Seabed and the Ocean Floor and in the Subsoil Thereof.⁷⁷ This treaty, effective May 1972, prohibits the emplacement of weapons, structures, launching installations, storage and testing facilities upon the seabed and the subsoil in the area "beyond the outer limit of a seabed zone."⁷⁸ That area is defined as coterminous with the twelve-mile outer limit of the contiguous zone provided for in Part II of the Geneva Convention on the Territorial Sea and Contiguous Zone, measured by Part I, Section II (the territorial sea). Since the

73. Creamer and others feel that the ocean, being so expansive, provides sufficient territory for both the freedoms of navigation and fishing to be freely exercised concurrent with the exploitation of deep sea resources.

74. *E.g.*, see note 47 *supra*.

75. Margolis, *supra* note 19.

76. See the Nixon proposal, Section V, *infra*.

77. Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Seabed and the Ocean Floor and in the Subsoil Thereof, *supra* note 19.

78. *Id.* at Art. I, paragraph 2.

territorial water concept has not been legally limited, the treaty could be left virtually ineffective by expansions of those waters by nonsignatory states. However, such is unlikely to be the case in view of the general acceptance of a concept of a high seas area (either the traditional concept of *res nullius* or the newly favored concept of *res communis*), and also in view of the fact that these major powers made the effort to meet and agree on such limitations. But, the existence of the treaty itself points out the importance of arriving at some definite conclusion on the issues of territorial waters (from which a limit on the contiguous zone would naturally follow), the continental shelf, and a regime for the high seas. As seamounts and guyots could provide ideal platforms for such underwater weapons, the drawing of territorial limits may keep many of the most accessible mounts from being used for such purposes.

There is another aspect to the current legal status of the seabed which is extremely relevant in regard to the forthcoming Geneva Conference. On December 17, 1970, the General Assembly of the United Nations adopted the Declaration of Principles Governing the Seabed and the Ocean Floor and the Subsoil thereof Beyond the Limits of National Jurisdiction.⁷⁹ While there is great divergence in views as to the legal force of the Declaration,⁸⁰ its effect seems to be at least that of a "gentleman's moratorium." An actual moratorium on further exploitation of the seabed pending the establishment of an international regime was approved by the General Assembly, but was dissented to by the major powers.⁸¹ The dissents, plus the fact that the area of the high seas and seabed have not been limited, greatly detract from the legal forcefulness of the moratorium. The underlying principle of the Declaration was first enunciated by Ambassador Pardo of Malta in 1967, as a proposal for adoption by the General Assembly.⁸² This proposal has become

79. G.A. Res. 2749 (XXV) (1970), 10 INT'L LEGAL MATERIALS 220 (1971), adopted by a vote of 108 to 0 with 14 abstentions.

80. See Brown, *The Consequences of Nonagreement*, a lecture presented to the 1973 Conference on THE LAW OF THE SEA: THE CONSEQUENCES OF FAILURE TO AGREE 1 (Proceedings of the Sixth Annual Conference of the Law of the Sea Institute, 1971).

81. G.A. Res. 2574D (XXIV) (1969), 9 INT'L LEGAL MATERIALS 419, 422 (1970), was adopted by a vote of 62 to 28 with 28 abstentions Dec. 15, 1969. Among the powers voting against the resolution were the United States, the Soviet Union, the United Kingdom, France and Japan.

82. U.N. Doc. A/6695 (1967), Examination of the Question of the "Reservation Exclusively for Peaceful Purposes of the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, Underlying the High Seas Beyond the Limits of Present National Jurisdiction, and the Use of Their Resources in the Interests of Mankind."

commonly known as the Maltese Item, and its underlying concept is the "benefit of mankind." In December of 1968, the Assembly established a permanent committee to explore Ambassador Pardo's suggestion.⁸³ What has come to be a generally accepted principle—the peaceful use of the ocean to benefit mankind—was actually a new concept and quite a deviation from traditional law of the seas. As the 1958 Convention on the High Seas illustrates, the underlying theme was freedom of the high seas. Although some "lip-service" was paid to the right of non-coastal states to share in this freedom, the spirit was generally "first come, first serve." Limitations on this principle were placed only in so far as freedom of navigation was concerned. The idea that the strongest and most developed countries should be restrained from full exploitation for self-interest is certainly a departure from custom.⁸⁴ Recognition of the principle by almost all nations indicates a split from the purely territorial basis of the ocean regime. Whether this concept is one of legal, moral or political character is left to the negotiations at the 1973 Conference.⁸⁵

In connection with the concept of *res communis* is the necessity of organizing machinery for the governing of an international regime which would effectively control exploitation. If the Conference does succeed in this scheme, it would be important that some specific mention be made of seamounts in order that their relationship to both the international law and the seabed be delineated with precision. Further clarification on the status of artificial islands is also mandatory in view of the technological possibilities of building the same in the high seas, possibly atop a seamount or guyot. The probable consequences of a failure to reach agreement have fostered several proposals and will be a primary motivating factor in the 1973 discussions.

83. Permanent Committee on the Peaceful Uses of the Sea Bed and the Ocean Floor Beyond the Limits of National Jurisdiction. G.A. Res. 2467 (XXIII) (1968).

84. It is precisely because this principle has gained acceptance that the lack of definite limitations to the Territorial Sea and the Continental Shelf are incongruous and unacceptable now. See Henkin, *The General Assembly and the Sea* in *THE LAW OF THE SEA: THE UNITED NATIONS AND OCEAN MANAGEMENT 2* (Proceedings of the Fifth Annual Conference of the Law of the Sea Institute, 1970).

85. See generally Gorove, *The Concept of 'Common Heritage of Mankind': A Political, Moral or Legal Innovation?* 9 SAN DIEGO L. REV. 390 (1972).

V. PROPOSALS MADE TO DATE

Nearly everyone concerned with the law of the seas has suggested some solution for the existing dilemma.⁸⁶ The proposals can be categorized into four major themes, which Francis Christy has denoted: Wait and See, National Lakes, Flag Nation Regime, and International Regime.⁸⁷ Since no author has yet discussed any of these theories in view of the special problems presented by seamounts and guyots, they are directed primarily at the seabed in general, and particularly at the extraction of hard mineral resources. An attempt will be made here to analyze the basic concepts in terms of seamounts, pointing out the weaknesses of the proposed solutions for a regime of the seabed as a whole.

The Wait and See theory can be summed-up as an acceptance of the status quo for the time being. Advocates of this course believe that technology has not yet advanced to a stage where jurisdiction and ownership of the high seas present a problem.⁸⁸ At the same time they feel that international law, particularly the new concept of "benefit of mankind," has not been given time to fully develop, therefore, any agreement arrived at would be premature and probably unworkable after a short time. They deny the feasibility of working out the problems on a piecemeal basis, holding that all aspects of oceanic problems (for example, fishing quotas, territorial limits, and territorial claims) are interdependent.⁸⁹ The Wait and See theorists believe that there is sufficient time to work out a modification of the Shelf Convention by substituting a fixed standard for the indefinite exploitability delimitations and to see what problems actually develop with the law in its present state.⁹⁰ This contention is precisely where the weakness of the theory becomes apparent, rather distinctly in light of the possibilities available for seamounts. Technology is presently available for the de-

86. See U.N. Doc. A/AC.138/L.10 (1972).

87. Christy, *Alternate Regimes for Minerals of the Sea Floor*, 1 NAT. RES. LAW. (No. 2) 63 (1968).

88. Wilkey, *The Deep Ocean: Its Potential Mineral Resources and Problems*, 3 INT'L LAW. 31 (1969); and Ely, *American Policy Options in the Development of Undersea Mineral Resources*, 2 INT'L LAW. 215, 217 (1968) and *A Case for the Administration of Mineral Resources Underlying the High Seas by National Interests*, 1 NAT. RES. LAW. (No. 2) 78 (1968).

89. Cf. authors such as McDougal, *Revision of the Geneva Conventions on the Law of the Sea—The Views of a Commentator*, 1 NAT. RES. LAW. (No. 3) 19 (1968), and Johnston, *supra* note 24 who call for functional differentiation of the points of contention and independent solutions for each.

90. See Young, *supra* note 59.

velopment of shallow seamounts and guyots.⁹¹ The lack of controlling law in the area will result in a land-grabbing contest with the major powers as predetermined winners, and the landlocked and developing countries left behind. Exploitation of the deep seabed was merely a wistful vision in 1958—it is a reality today, with seamounts and other low tide elevations presenting themselves for use in the very near future. The laws created in 1958 cannot effectively control the plans of today. The failure to take preventative measures can do nothing but present even greater complexities and problems for any agreement in the future.⁹²

The second proposal, National Lakes, calls for a division of the ocean into sectors to be owned by coastal states.⁹³ This theory is predicated on the supposition that the coastal states have full right to the enjoyment of the ocean and its resources, similar to the common law riparian rights of real property owners on the shore of a lake, that is the rights to, and determined by, a median line. The underlying rationalization for this suggestion is the coastal states' need for security,⁹⁴ and a belief that only the coastal states are in a position to manage and regulate oceanic activities. The faults with this system are obvious. Land-locked states are entirely excluded from the opportunity to explore and exploit the resources of the ocean, thus maintaining the great disparity already in existence. Likewise, shelf-locked states are severely limited in their right to participate, while islands would get disproportionate control over seabed areas.⁹⁵ Such inequities will surely multiply when the ocean becomes widely utilized as a source of minerals and other resources.⁹⁶

The Flag Nation Regime is also a modification of the status quo. Its major premise is that existing law is adequate to treat most of the issues that will arise with an expansion of our employment of

91. See note 23, *supra*.

92. See FAILURE TO AGREE, *infra* Sec. VII.

93. See the map created by F. Christy and H. Herfindahl, critics of this theory, demonstrating the geographical difficulties to be encountered in dividing the ocean among the coastal states. F. Christy and H. Herfindahl, *A Hypothetical Division of the Sea Floor*, reproduced in W. FRIEDMANN, *supra* note 9 at 4-5. For the view of an early supporter of the concept see Bernfeld, *Developing the Resources of the Sea—Security of Investment*, 2 INT'L LAW. 67 (1967) and 1 NAT. RES. LAW. (NO. 1) 82 (1968).

94. *But see* Creamer, *supra* note 48, at 215.

95. See Newton, *supra* note 62.

96. See Note, *Land-Locked States*, *supra* note 30.

the sea. Followers of this approach advocate that states could occupy the seabed (for purposes of claiming exclusive rights to resources) merely by the link between a surface ship and work being done on the seabed. Presumably, such occupation would be sufficient for a claim of exclusivity with no limit on duration other than a fairly continuous use of that area. The types of exploitation that could be carried on would be restricted only by the existing law of the seas, that is, by the need to maintain freedom of navigation, fishing, laying cables, and laws regulating pollution. A Flag Nation approach could be very appealing to developed nations in view of the accessibility and relative practicability of claiming a seamount. A system of international registration of claims is also embodied in this concept.⁹⁷ This proposal, without collateral controls and enforcement, may engender even more conflicts than it is designed to curb. Developing countries lose out in any race to secure a claim to valuable undersea resources, and land-locked countries would probably fall into the same disadvantage. The major developed powers might find enough common ground to avoid doing battle, but the concept of *res communis* is lost. It is of interest to note that while these nations would undoubtedly profit from an enactment of this proposal, not one has endorsed it.⁹⁸ In terms of seamounts and guyots, an acceptance of this regime would mean that the major powers would dominate those areas of the seabed which are most accessible and which would otherwise offer the most practical bases for deep sea operation to the countries which are technologically unequipped to venture into the deep sea.

The fourth approach to solving the problems of the high seas calls for the establishment of an international regime. There are factions within this camp as to just what kind of regime is necessary, the arguments basically following two lines. The concept of some type of international regime *res communis* has become generally accepted, as evidenced by the "Principles" Resolution.⁹⁹ The major contention among supporters centers around the proper method of operation.

97. See discussions in Young, *supra* note 59, at 648, and Christy, *supra* note 87. See also W. BURKE, TOWARDS A BETTER USE OF THE OCEAN 11 (1969) describing such a registration system for use pending the establishment of an international regime, which proposal won approval at the Stockholm Symposium, 1968.

98. For an example of U.S. opposition, see *Hearings on S. 2801 before the Subcommittee on Minerals, Materials, and Fuels of the Committee on Interior and Insular Affairs*, 92d Cong., 2d Sess. (1972).

99. See note 79, *supra*. See generally, THE LAW OF THE SEA: A NEW GENEVA CONFERENCE (Proceedings of the Sixth Annual Conference of the Law of the Sea Institute, 1971).

For the most part, advocates of an international regime for the high seas opt for a landlord-tenant situation under which dominion of the seabed resources would be vested in some international organization. Under this system, states and private corporations would acquire leases for the development of defined areas of the seabed. It has not been made clear whether seamounts and guyots are included as part of this seabed. If they are impliedly included by the failure to distinguish any geological characteristics, then their importance should be manifest. Such an arrangement, the leasing of defined areas of the seabed, lends itself to immediate application on seamounts since their territory is definable. If seamounts and guyots are excluded from the seabed proposal, then the drafters are overlooking what is bound to be a most pressing problem due to present technological capabilities; the exclusion would also serve to defeat the concept of international dominion, at least in part. Rents and royalties derived from the exploitation of the seabed would be paid to the international organization, while the developers would be entitled to draw a profit from their exploitation, thus, preserving the incentive to explore and exploit the deep seas.

Exactly what type of organization would be set up to manage and enforce the arrangement is also a point of controversy. Mr. Young believes that the United Nations is not equipped to handle such long-term and continual management operations.¹⁰⁰ He and others have suggested an organization developed along the lines of the World Bank. No matter what differences exist as to the type of landlord for the job, there is uniform agreement among the followers of this theory, that the returns (rents and royalties) collected should be distributed among the international community, with special consideration given to the land-locked and developing nations.¹⁰¹ Mention is also made of the possible direct distribution of the resources derived from such exploitations, which would, in a sense, directly increase the participation of the recipient states making it more of an internationally oriented program.

A primary adherent of this policy is the present United States administration. In a May, 1970, statement by President Nixon on

100. Young, *supra* note 59 at 650.

101. See Proceedings, *supra* note 99.

United States oceans policy, an affirmation of the *res communis* concept and a willingness to join in an international venture were underlying themes.¹⁰² The President called for national claims to be limited to a depth of 200 meters (calling back into use the fixed limit of the Geneva Convention on the Continental Shelf¹⁰³) with the remainder to be considered as high seas, the resources of which would be the common heritage of mankind. The proposed restriction of 200 meters for national claims implies that seamounts located beyond this boundary would also fall into the international regime and their exploitation would only occur under the auspices of an international organization. The use and profits for international distribution is acquiesced to, along with a statement calling for effective control over pollution and “. . . to assure the integrity of the investment necessary for such exploitation”¹⁰⁴ The departure from the ordinary plan for an international regime is in the type of machinery suggested for authorizing exploitation.

First, I propose that coastal nations act as trustees for the international community in an international trusteeship zone consisting of the continental margins beyond a depth of 200 meters off their coasts. In return, each coastal State would receive a share of the international revenues from the zone in which it acts as trustee and could impose additional taxes if these were deemed desirable.

As a second step, agreed international machinery would authorize and regulate exploration and use of sea-bed resources beyond the continental margins.¹⁰⁵

There are several interesting factors to be noted here. First, there is the concept of the continental margin as a trusteeship zone. The continental margin is not defined by the President, but is presumed to be the remainder of the continental shelf (geographically) after the 200 meter mark. Seamounts in this zone would then be subject to the control of the coastal state, thus diminishing actual international participation in their development. What was markedly omitted from the President's proposal is a definition of the type of trusteeship to be set up. The amount of discretion to be left with the trustee (the coastal state), and the power to remain with the “settlor” (the international community) are unstated. President Nixon's proposal was not met with an extremely favorable response,¹⁰⁶ most likely because of the obvious attempt to reserve

102. 9 INT'L LEGAL MATERIALS 806, (1970). The United States Draft of a United Nations Convention on an International Seabed Area, August 3, 1970, encompasses the same concepts as the Nixon proposal. 9 INT'L LEGAL MATERIALS 1046; Public Papers of the Presidents: Richard Nixon 1970, No. 160, p.454.

103. Convention on the Continental Shelf, *supra* note 1, Art. 1.

104. The Nixon proposal, *supra* note 102, at 808.

105. *Id.*

106. See Proceedings, *supra* note 99.

so much beneficial control in the coastal states (*i.e.*, the right of the coastal state to determine who will exploit and the manner and time of exploitation). A second significant factor, and another reason for the luke-warm reception of the proposal, is that it is dependent upon the international acceptance of a 12-mile territorial sea and free transit through international straits.¹⁰⁷ Third, the President specifically rejected the United Nations approved moratorium on further development of the seabed until agreement is reached, instead calling for the issuance of permits which would be subject to any regime accepted at a later date, while at the same time protecting the integrity of investment made in the interim period. In connection with this proposal, Senate Bill S. 2801 was introduced by Senator Metcalf.¹⁰⁸ This bill provides for the issuance of permits for deep sea hard mineral resources development, subject to the adoption of an international regime.¹⁰⁹ For purposes here, the importance of Mr. Nixon's proposal is that it would place many accessible and potentially exploitable areas within control of the United States, particularly the Hawaiian Ridge seamounts.¹¹⁰ The exploration of this chain may be forthcoming in the not too distant future, and the United States is naturally anxious to avoid potential conflict as to jurisdiction and ownership.

The other faction of advocates of an international regime would like to see the regime be all inclusive, rather than merely act in the landlord capacity. Most authors have labeled the notion as unrealistic.¹¹¹ The all-inclusive regime would be fully operative; in other words, it would direct, own and control all the machinery for developing the seabed. Thus, it would act as a proprietor rather than a landlord, and would hire states and corporations to

107. This is a fairly obvious attempt to appease the military needs and desires for extensive submarine freedom of movement. The problems of dispute on the territorial sea limits are too many for discussion here. For a good background, see generally *THE LAW OF THE SEA: THE UNITED NATIONS AND OCEAN MANAGEMENT* (Proceedings of the Fifth Annual Conference of the Law of the Sea Institute, 1970). See also, Knight, *The 1971 United States Proposals on the Breadth of the Territorial Sea and Passage Through International Straits*, 51 ORE. L. REV. 759 (1972).

108. S. 2801, 92d Cong., 1st Sess. (1971).

109. See Auburn, *The Deep Seabed Hard Mineral Resources Bill*, 9 SAN DIEGO L. REV. 491 (1972).

110. See Craven, *supra* note 42.

111. *E.g.*, see Young, *supra* note 59 at 648.

perform the work. The eventual objective of this formula would be to have an entire agency of the United Nations or some other international organization composed of seabed experts, including engineers and businessmen desirous of earning income for the enterprise.¹¹²

Any proposed international regime should be considered with a sense of urgency in light of the potentially early exploitation of the seabed, and especially of seamounts and guyots which are so readily available.

VI. RECOMMENDATIONS

What is desired, in view of the rapid advances of technology, is a regime for seamounts and guyots which will prevent their unilateral claim and exploitation by nations to the exclusion of other nations, and avoid those problems inherent in claiming and occupying unowned territory. A regime for the entire seabed has long been sought, but the urgency which often fosters such agreements is lacking because most of the seabed is still economically out of reach for all practical purposes. Such is not the case with seamounts and guyots. As previously indicated, they are within reach, and are currently prospects for massive exploitation, and possibly occupation, by a few developed countries. Accordingly, a regime governing the status of seamounts is essential now, and must be adopted without undue delay. But a regime of this scope would be very narrow, and would not aid in the formulation of an international agreement for the seabed as a whole. It must do this because, as indicated, seamounts are clearly the path technology will follow to full utilization of the ocean bed and its resources. *The regime established for seamounts must of necessity, therefore, be part of an all-inclusive program covering every aspect of the ocean as an area for exploitation and development.*

Although many writers disagree on the proper form which an international regime for the seabed should take, most writers agree that an operational international monopoly would be clearly unacceptable to most countries.¹¹³ It may well be argued that only this type of actively operating organization could best serve the concept of *res communis*,¹¹⁴ which most scholars agree must be the guiding principle of any international regime dealing with the sea-

112. See Christy, *supra* note 87, Young, *supra* note 59; see also, RECOMMENDATIONS, Sec. VI, *infra*.

113. E.g. Young, *supra* note 59, at 648; but see U.N. Doc. A/AC.138/49 (1972).

114. See Gorove, *supra* note 85.

bed. An operational organization would be best equipped to control the withdrawal of minerals and the exploitation of resources, and distribute the wealth of the sea floor to the nations of the world, thus preventing the effective domination of the seabed and its resources by the developed countries.¹¹⁵ As a necessary element of being operational, the regime would be income-receiving, which would insure its independence and continued feasibility. While some writers argue that the expense of deep sea non-living resource utilization is prohibitive at this time,¹¹⁶ the fact that commercial development is being undertaken is an indication that seabed exploitation is, or very soon will be, profitable to the extent that it will be a major enterprise.¹¹⁷ It would be worthwhile to emphasize here that the goals and maximum efficiency of such an operation would not be obtained in the near future, or perhaps even the foreseeable future. Ultimate success will depend on technological advances, international cooperation, and a continually increasing demand for seabed resource utilization, as well as an effective administration for an international organization of this type. But given the results which can be expected from such an organization, a lengthy trial period and forgiving membership, the end result would be an enriched world community, economically, politically, and morally, drawn together through international exploitation of an as yet undeveloped asset of the globe.

The initial step in the creation of a regime of this nature would be the claim by an internationally created organization¹¹⁸ of a

115. The theory of an international leasing organization would accomplish this to a limited extent. However, should the organization attempt to withhold certain areas of the seabed as a reserve for the developing countries, the result would be a waste of resources; and, in all probability, the application of pressure by the exploiting countries for the organization to open up these prime areas for exploitation would follow. The practical result in the long run would probably be domination of the seabed by the developed countries.

116. See W. FRIEDMAN, *supra* note 9, and Schaefer, *supra* note 25.

117. See note 23, *supra*.

118. The United Nations might be a likely candidate in which to vest title to the seabed, were it not for the strenuous opposition which this idea has received. *E.g.*, see Burke, *A Negative View of a Proposal for United Nations Ownership of Ocean Mineral Resources*, 1 NAT. RES. LAW. (No. 2) 46 (1968); also the objections of the United States and the Soviet Union that they were opposed to the idea of the United Nations having an independent source of income. Accordingly, the international organization referred to will be designated the International Oceans Agency (IOA) and

vested right to all territory outside the exclusive jurisdiction of the coastal states, and all non-living resources of the high seabed for the benefit of mankind. The title claimed would not encompass the area of the "legal" continental shelf (that is, the area adjacent to the coast which, under the regime, would be subject to the exclusive jurisdiction of the coastal state), the living resources of the oceans, nor the water of the high seas. The legal status of these separate elements would be subject to international treaties¹¹⁹ and customary international law, including such concepts as freedom of the seas.¹²⁰

A. *Removable Marine Resources*

The first employment which will be of interest will be the exploration for and exploitation of extractable mineral resources. As mentioned, seamounts will play an important part in this enterprise, and when vast sums are allocated for the retrieval of minerals from a certain area,¹²¹ it is very possible that conflicts could arise between competing interests. Procedures must be established for seamounts to prevent such conflicts from occurring and which will be equally effective for the capitalization of the sea floor. A regime which treats the two areas independently, or the total absence of any regulation of seamounts, will cause even further problems than are currently foreseeable.

Two possibilities would be open to the I.O.A. at this stage with the goal of producing revenues for regional or international de-

it will be considered as an independent international creation, established through international agreement for the control of the seabed.

119. Obviously, international agreement in the undertaking of such a venture is fundamental, and the program would be impossible without the consent and support of the developed nations and major powers. Another essential element is the establishment of a uniform territorial water limit for all coastal states. While depth and exploitability are currently criteria, and a combination of depth and lateral distance has received support, any solution that is workable and uniform would be adequate. In any event, unilateral encroachment into the high seas would be totally antithetical to the concept of an international regime.

120. Other rules which have been established for the oceans include those relating to pollution and radiation. Any major installation on the high seas would have to solve its waste disposal problems without violating regulations covering pollution. Similarly, any installation which might utilize atomic power would be subject to international provisions relating to radiation contamination of the high sea.

121. One estimate predicts the capital cost of an efficient production unit processing about 1 million tons of manganese nodules per year is \$180 million, which would not include any of the costs incident to development of equipment for retrieval, and extraction. Committee of the Peaceful Uses of the Seabed and Ocean Floor Beyond the Limit of National Jurisdiction, U.N. Doc. A/AC.138/SCI (1971).

velopment banks or agencies: contracting with the developed nations (or private firms thereof) or long term leasing of desirable ocean areas. The former would put the I.O.A. in the position of the developer, soliciting bids from nations or private firms capable of doing the necessary undersea exploration and exploitation, for the right to remove mineral resources from the seabed. Those bidding for the right would have to pay royalties to the I.O.A., while retaining sufficient profits from the undertaking to make the endeavor worthwhile. Furthermore, reasonable incentives would encourage the technological developments necessary to make such operations more profitable in the future. The I.O.A. would receive proceeds from the exploitation of these harvested resources, or, where desired, the fees could be paid in kind from the minerals retrieved. The right to process materials retrieved might also be let out on a contractual basis, until such time as it became economically advantageous for the processing to be done internally. Fees could be paid out in monetary form and transferred to international banks and treasuries; or the finished elements could be transferred to nations in need which were incapable of acquiring the resources on the open market. Technological development would be encouraged by a program of this nature, in that the nation or firm with the ability to retrieve or process the minerals at the lowest cost would be awarded the contracts. And, the greater the proceeds accruing to the contracting party, the more funds would be available for research and development. Likewise, the proceeds to the I.O.A. would be greater. Under this system, the less advanced nations who were interested in ocean research would not be precluded, for they could secure the right to exploit the shallower areas of the ocean as they developed the technological capability, while the nations with ability to extract minerals from greater depths could be set to the task of harvesting the yield from the deep sea floor.

Long term leases of undersea areas present another possibility, which is perhaps more feasible at this time. Nations or private enterprises could bid for leases of submerged lands considered ripe for exploitation, leases being granted in return for a portion of the value of the extracted minerals. The nation or firm doing the exploitation would retain sufficient profit to recognize a suitable return on investment and permit further development, while the in-

ternational community would receive funds or the minerals themselves. The granting of leases should also avoid the possibility of conflict from competing interests, as the lessee would have sovereignty over the area leased, subject only to I.O.A. control. A sufficiently long term lease on a rich area would foster the development of sophisticated equipment and techniques for mineral retrieval, but would have the disadvantage of precluding some nations whose technological capability was inadequate to secure leases. The developed nations would undoubtedly lease the shallower areas for the initial phase of the development, thus precluding the participation of nations which might become capable of limited undersea mining operations within the period of the leases. Considering the vast area involved, however, the problem does not appear insurmountable.

Under either of these systems, funds would become available to the I.O.A. which could be applied to the ultimate goal of construction and operation of an independent resource utilization program, entirely owned and operated by the international community. Consideration for leases or contractual rights might take any form, including monetary return, minerals in raw or processed form, or even the delivery of equipment or scientific know-how to the U.N. in exchange for the right to operate for certain periods and recover profit sufficient to permit continued participation. In time, the I.O.A. could be the owner of fleets, installations, and processing plants through which operations would be conducted. Funds resulting from the development would permit the organization to go to national and private organizations for the creation of needed equipment or technological capability, much as the governments of the world do now. The industry which has grown up around the concept of deep-sea utilization would thus not be eclipsed by the vesting of title in an international ocean agency.

Once the entire enterprise attained some degree of efficiency, the minerals of the seabed would be readily available to the world market. Proceeds from sale might be reinvested in various phases of the operation, while resources needed by developing nations could be delivered to them through international machinery. Contributions to this international undertaking could be made by all nations, developed or otherwise, in the form of scientific research, equipment, or manpower.

B. Non-Removable Marine Resources

In addition to the minerals resources of the seabed, there are the non-removable resources of the ocean. Here seamounts play an

important part, because of the possible uses to which they may be put. As with the removable resources, problems will arise if no regime is established for seamounts before full scale utilization is underway, or if a regime covering seamounts and guyots alone is established which later conflicts with a regime for the deep seabed. Most of the uses for seamounts which involve completely underwater operations may, sometime in the future, be carried out on the abyssal plain. To make a set of regulations governing seamounts now, which is not a part of an overall scheme for the seabed, will preserve the seamounts for the public good, but may well accelerate the race to the sea floor. A system which acknowledges and provides for both these areas while they are still unexploited to any great degree will insure healthy and beneficial development of the ocean's non-removable resources.

With title to all non-territorial submerged territory vested in the I.O.A., permission would have to be sought and obtained before a project could be undertaken. Leasing of certain areas for the completion of these projects would be the logical result of such requests, with the cost of the lease to be determined by the nature of the enterprise anticipated. Profit-producing installations, such as surface and subsea ports, fixed fishing installations,¹²² communications systems, privately owned resorts and hotels, and others would call for the payment of rents, while LORAN stations or research bases operated for the benefit of the world community would be entitled to nominal rents or free utilization altogether. Again, the nature of the regime is ownership of the ocean's resources by the U.N., specifically for the receipt of income, with provisions for nations or private firms to exploit resources under the authority of, and subject to the mandates of the international control organization.

One problem area is that involving uses by nations which are neither entirely profit making, not entirely for the benefit of the world community. An example would be a weather forecasting (and control) station constructed by a nation on the high seas off its coasts, to forecast (and control) the weather that would affect its territory. Such enterprises would be categorized by their ef-

122. It would be the fishing installation, and not the fish extracted which would be subject to control.

fect. If only the constructing nation was benefitted, even though its motive was not a profit making one, it would then be subjected to the payment of rents; if the station benefitted other nations as well, the use might be considered sufficiently international in scope to warrant free use of the ocean resource. In any event, each utilization will have to be evaluated in terms of its purpose and ultimate effect on the land masses and the sea itself.

Another area of possible conflict would involve safety installations, such as LORAN stations, which are constructed by one nation, but benefit others as well. There is no reason why the country which constructs the installation should have to pay for the right to utilize an ocean resource; likewise, there is no reason why the I.O.A. could not carry out such projects itself, manning them with international personnel.¹²³ However until such time as this is feasible, there would be no need to reimburse any nation for a unilateral expenditure of this type. The installations are currently being built with no thought of future repayment by the world community. Such advantageous projects should be entitled to operate without charge, whether individual nations continued to man them, or their control was turned over to the international regime.

The operation of offshore installations by international, rather than national, personnel would alleviate many of the security fears which are voiced by coastal states when the concept of such constructions is presented. A nation should not fear the presence of any offshore enterprise conducted by an international agency with no interest in the coastal state's military capability or security. To dispel further fears, however, preference should be given to coastal states, or their allies, in the initial stages of the international organization's mining operations. Care should be taken to avoid permitting the utilization of a fixed resource by one nation near the coast of an historical enemy. These are subjects for negotiation, but it would seem that they would be likely resolved if an international regime of the scope suggested here were ever created.

All of the revenues accruing from the initial operation of this organization should be earmarked for further seabed development for the benefit of the world community. Once an independent source of income was established for the international community, funds would be made available for underdeveloped countries, not merely

123. Projects similar to this are already underway under the auspices of the United Nations. A good example is the World Meteorological Organization (W.M.O.) which was set up through the U.N. to establish weather stations and conduct weather research all over the world.

in times of crisis, as is currently the case, but for long range development in all areas. The increase in the availability of minerals on the world market would lower the prices, and permit countries which might otherwise be excluded from world markets to participate.¹²⁴ Land-locked nations might be afforded an opportunity to utilize ocean resources through installations on the high seas, funded through I.O.A. contribution, and repayable from the profits accruing to the constructing nation. The long range forecast for an operation of this type is that, while it must be immense because of the vast area involved,¹²⁵ it could be successful, and once operational, should justify the difficulties in formation, and reward the nations of the world for participation in an international venture.

VII. FAILURE TO AGREE

The failure to formalize a concrete agreement reflecting the spirit of *res communis* for the seabed will leave the area virtually uncontrolled except for the traditional limits of the law of the sea (freedoms of navigation and fishing, etc.). The result would be that the doctrine of *res nullius* continues in operation, thus permitting ". . . portions of the seabed to be appropriated and exclusive national claims to be extended even to the open seas—particularly the sea shallows and seamounts scattered throughout the ocean."¹²⁶ That this result would be acceptable to very few is apparent from the numerous proposals which have been made to avoid it, and from the general attitude which has developed since the introduction of the Maltese Item in 1968.

Some authors have proposed that there need be no sense of urgency in the development of a solution to the problems of the seabed.¹²⁷ This paper has attempted to demonstrate that a failure to

124. Schaefer, *supra* note 23, makes the point that development of the ocean's resources rather than land based reserves of the same minerals might well hinder the development of the disadvantaged nations. The basis of this belief is the fact that a substantial portion of the world's needs for the resources available from the seabed is supplied by the developing nations, and many of the resources are also plentiful in the same nations. Accordingly, full scale exploitation of undersea resources would be competing with these developing nations for a share of the world market.

125. The area of the ocean floor is estimated at 140 million square miles.

126. FRIEDMAN, *supra* note 9, at 48.

127. See note 88, *supra*.

agree in 1973, or at some time within the near future, would further complicate the problems, hinder development of the resources, and constructively prevent the land-locked, shelf-locked and developing nations from obtaining a share in the newly found wealth. The oversight of the special nature of seamounts and guyots has led to this misconception. These formations, particularly the low tide elevations, present potential for exploitation in the near future, and are the next step to the deep seabed. Predictions as to the consequences of a failure to agree in 1973 vary, as do the predictions of the likelihood that agreement will be reached,¹²⁸ but the far-reaching consequences must be kept in the forefront of the minds of the negotiators.

Existing problems will be further complicated as a natural result of an ability to exploit and the actual exploitation of the seabed when coupled with a vacuum of international law. The developed countries which can take advantage of technological advances will have a vested interest in the areas which they exploit. The consensus of opinion is that fairly massive exploitation will be required in order to realize a profit. Once countries and corporations have expended vast amounts exploring the seabeds and setting up the necessary equipment for exploitation, the desire to share the outcome will be minimized. Full cooperation will never again be so available as it is at the present time when no one has yet a great vested interest in the seabed. Another aspect of this same problem is that at the present time, although scientific speculation has been made as to the abundance of wealth to be found in the seabed, including the availability of seamounts and guyots for other than mineral exploitation, no truly accurate determination of the real potential of the area is possible. If and when the facts become known, the stakes may rise and national self-interest in accumulation could predominate.

At the present time, development of technology for exploring and exploiting the depths of the high seas is underway. Concern has already been shown for the security of investments in the area.¹²⁹ Once the exploration point is past, developers will necessarily be wary of investing further and hesitant to emplace expensive equipment on the sea floor if the danger exists that the same may be appropriated by an international regime. Agreement for the international machinery, one that assures a fair profit to those who would exploit, can only serve as incentive for the further development of the seabed. Conversely, substantial investments made under the

128. See Proceedings, *supra* note 99.

129. See note 98, *supra*.

present, manifestly inadequate, law of the seas will serve to pressure the governments of developed nations into accepting a stance inimical to the concepts underlying *res communis*. As only the major developed countries have the immediate ability to venture into this frontier by way of seamounts and guyots, and since the expenditure of vast amounts will result in the acquisition of vested interests in the seabed, there may be little left of value by the time the less developed and land-locked states are able to enter the race. Such a result will surely increase the frustrations of these excluded nations, in turn increasing the tensions in the international arena. The concept of *res communis* will be defeated, and any idealistic hopes for the benefit of mankind will also be crushed. The laissez-faire exploitation of the ocean floor will continue to help the "rich get richer . . ." The international community will lose out, not only because of added tensions, but because by refusing to cooperate and share in the efforts of exploitation, the job will not be performed with the greatest possible efficiency.

Seamounts and guyots present the possibility of exploitation of the seabed in the near future. This special feature should not be overlooked when negotiating an international regime for the seabed. Awareness of the immediacy of the problem and the consequences at stake should bring a new sense of urgency to the debate. Although these geological structures present a unique picture for the present, it must be remembered that they are merely a part of the seabed which is more accessible today. An attempt to deal with seamounts as a separate problem would be unrealistic, and would fail to achieve any purpose. Any international agreement which is arrived at should specifically include these structures as part of the seabed, yet still provide for the unique uses to which they lend themselves. The problems associated with seamounts and guyots are part of the "deeper" problem of the seabed, but part of a problem that must be faced today.

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